SPECIFICATION

of Work and Materials
under the contract for

S N LOW RESIDENCE
5 Walter Place
Glenorchy
Queenstown

ISSUE: 6 November 2026
Building Consent

a n d e s i t e ARCHITECTS LTD.
4 Morning Star Terrace, Arthurs Point
Queenstown
P: 409 0989 M: 021-0388933

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PRELIMINARIES AND GENERAL

(P & G 1) SITE
The site of the works is situated at 5 Walter Place, Glenorchy, Queenstown.

(P & G 2) CONTRACT DOCUMENTS
The Contract Documents shall be comprised of the following:-
1. The Architect's Drawings.
2. The Architect's Specifications and attached documents.

All the foregoing documents are complementary and what is called for by one shall be binding as if called for by all.

(P & G 3) RETURN ALL DOCUMENTS
The Contract Documents supplied to the Contractor for the execution of the Contract are instruments of service only and shall be returned to the Owner before Final Payment is made.

(P & G 4) SCOPE OF WORKS
The general scope of the work comprised in this contract shall cover
- together with all site works and all necessary services, all as described in the Contract Documents, and the clearing away and making good of all damage, in so doing to leave the works ready in all respects for the Owner's occupation.

(P & G 5) MATERIALS AND WORKMANSHIP
Provide all materials, carriage and fixing of same, all implements, scaffolding, etc and all workmanship necessary for the completion of the works in accordance with true intention of the Contract Documents. Materials and workmanship shall be of the best quality of their kinds. All materials for which there is a New Zealand Standard or failing that an Australian Standard shall conform thereto.

(P & G 6) CONTRACTOR'S PUBLIC LIABILITY INSURANCE AND EXTENSIONS & CONTRACTOR'S MOTOR VEHICLE LIABILITY INSURANCE

Contractor To Insure
The Contractor shall arrange Insurance in the joint names of the Principal, Main Contractor, and Subcontractors for their respective rights and interests.

Amount of Indemnity
The indemnity under the said Policy in respect of any one accident or series of accidents arising out of the same occurrence shall not be less than the sum of $1,000,000.00 (ONE MILLION DOLLARS)

Period of Indemnity
The said Policy shall be affected at the commencement of the works and shall be maintained until the Contractor has been issued the Practical Certificate of Completion.

Special Risks
The said Policy arranged by the Contractor shall be extended to include liability arising from the following Special Risks:-
a. Goods / Products installed.
b. Vibration, removal or weakening of support of land or buildings which shall be subject to a deductible / excess at the Contractor's risk of $1,000,000.00 each and every accident arising from the event.
c. Cranes, lifts, hoisting equipment and other plant including trailers and vehicles whilst being used as Contract machinery.
d. Damage to Principal's property caused by Contractors.
e. Damage to Principal's employees personal effects and property.
f. Liability for personal injury not covered by the Accident Rehabilitation and Compensation Insurance Act 1992, or any other Act passed in its place.

g. Penalties and defence costs the Principal and the Contractor incur as a result of any unexpected and unintended event leading to a prosecution under the Health and Safety in Employment Act 1992

The Policy shall also extend to include the following special Clauses:-
a. Gross Liability.
b. Breach of Warranty.

(P & G 7) INSURANCE OF THE WORKS: BY CONTRACTOR

Contract Works Policy
The Contractor shall arrange in the joint names of the Owner / Contractor and all Subcontractors for their respective rights and interests a Policy of Contract Works Insurance on general All Risks Conditions.

Earthquake Damage
The Contractor shall affect indemnity against Earthquake Damage as defined by the Earthquake and War Damage Act 1944.

Amount Insured
The amount of the insurance shall be the full value of the works as established from the original Contract's sum plus the costs of demolition and clearing of the site after occurrence of the loss or damage plus the amount of Professional Fees.

Period of Indemnity
The said policy shall be affected at the commencement of the works or at some earlier date at the discretion of the Contractor and shall be maintained until completion of all maintenance.

Special Risks
The said Policy arranged by the Contractor shall be extended to include the following risks and / or property:-
a. Temporary Works.
b. Non cessation of Insurance following partial occupation by the Owner.
c. Off site storage of materials to be used or incorporated in the works.
d. Transit to the site of the works of material to be used or incorporated in the works.
e. Damage or costs resulting from earthquake for which indemnification is not provided within the terms of the Earthquake and War Damage Commission Act 1944.
f. Increased costs of working following operation of an Insured Peril including express air freight and overtime charges.
g. Damage arising during running up and testing of any plant incorporated or to be incorporated in the Contract.
h. Temporary removal.
i. Automatic reinstatement of sum insured following a loss.
j. Excess / Deductible each loss occurrence $500.00 (excluding loss by fire, lightning, or explosion) which shall be the responsibility of the Contractor.
k. Loss or damage arising due to cessation of work.

(P & G 8) FOOTNOTES TO INSURANCE

Contractor's Right to Insure Separately
Nothing shall affect the rights of Contractors to arrange in their own names such additional insurance's as they may consider expedient or necessary including insurance against loss or damage to their equipment or plant, owned or hired but the premium shall be the responsibility of the Contractor and the cost shall not form part of the Contract.

Deductible / Excess Contractor's Responsibility
Any Deductible / Excess failing to be borne under the insurance shall be the responsibility of the Contractor and the cost, if any involved, shall not form part of the Contract.

Notice To All Parties
The Contractor shall arrange on request for the Architect and any of the parties named in the Policies to have copies of relevant insurance documents.
The Principal shall also supply to all interested Parties a summary of the Insurance's and the manner of claim notification and procedures.

(P & G 9) BYLAWS
The Contractor shall comply with any Act of Parliament or any Bylaw or Regulations (including Statutory Rules, Orders, and Instruments) of Local Authorities and Public Service Companies or Authorities to the full satisfaction of the Inspectors of such Authorities and the Architect. These Bylaws constitute a part of this Contract

(P & G 10) BUILDING CONSENT
The Building Consent will be applied for and paid for by the Owner.

(P & G 11) CODE COMPLIANCE CERTIFICATE
The Contractor is to apply for and obtain a code compliance certificate on the owner's behalf.

(P & G 12) SETTING OUT AND LEVELLING
The Contractor shall set out and level the works and will be solely responsible for the accuracy of same.

(P & G 13) CONTRACTOR'S RESPONSIBILITY
The Contractor shall keep all persons (including those employed by Subcontractors) under his control and within the boundaries of the site and he will be held responsible for the care of the works generally until their completion.

(P & G 14) POWER, WATER, LIGHTING AND HOARDINGS
The Contractor shall supply and erect and maintain all hoardings and fencing necessary to protect the works during normal and after hours work. The Contractor shall arrange for the provision of all necessary lighting, water and power for the work.

(P & G 15) ACCESS TO SITE
Access to the site is to be from Walter Place.

***(*P & G 16) SHEDS & TOILET**
Provide, erect and maintain proper sheds, etc for the storage and complete protection of materials, etc and for the execution of work which may be fabricated on the site.

(P & G 17) TELEPHONE
Provide a separate telephone (or mobile phone) for the works and pay all charges in connection with same during the whole period of the execution of the works

(P & G 18) COVER UP AND PROTECT
The Contractor shall cover up and protect the whole of the works from any weather which could be in any way detrimental to the work.

(P & G 19) ATTENDANCE
The Contractor shall allow for the general attendance of one trade upon the other.
This includes nominated subcontractors.

(P & G 20) FINISHING WORK
Should any trade consider that any surface or work executed by a previous trade in any way prevents the execution of a satisfactory finish the General Foreman, or Contractor's representative, shall be immediately notified and no work shall proceed until the necessary improvement has been made.

Failure to give such notice shall not relieve the finishing trade concerned of responsibility for a poor result. Any work executed by a finishing trade on any surface shall be deemed to be an acceptance by that trade that the surface is satisfactory.

(P & G 21) SUBCONTRACTORS
The Contractor shall allow for general attendance upon subcontractors and nominated subcontractors including the free use of scaffolding and providing all reasonable facilities for carrying out their contracts. The Contractor shall be held responsible for notifying subcontractors of the importance of the general Clauses of this specification.

(P & G 22) APPROVED SUBCONTRACTORS AND FIRMS
If a tenderer proposes to sub-let any of the trades or work specified hereinafter he shall supply with his tender, the names of companies, firms, or individuals to whom it is proceed to sub-let the work, and the nature of the work concerned. Any tender unaccompanied by this list of subcontractors may be treated as informal.

(P & G 23) FOREMAN
The Contractor shall allow for a properly qualified general foreman to be constantly on the works throughout the period of their execution. Any directions or explanations given to the general foreman, in writing, shall be held to have been given to the Contractor.

(P & G 24) SPECIFICATION
The items shown in any section cover most of the work in that section but do not limit it. The work that shall be provided by the Contractor shall be all that is necessary in accordance with best trade practice to complete the works as collectively and / or individually implied by the drawings and this specification for all trades.

(P & G 25) CLEAR AWAY
On completion take down and clear away all plant and temporary work including offices and sheds, etc and make good. Remove all rubbish, debris, and surplus materials as they accumulate and on completion clean all floors, paving, external surfaces and glass both sides. Touch up all paintwork, clean off any surfaces inside and out in any way marked and leave the completed works in a thoroughly clean condition for the Owners occupation

(P & G 26) CLEANING
The Contractor shall, at frequent intervals, remove from the building and site all rubbish and litter which may accumulate and shall take all responsible precautions to protect finished surfaces from damage or disfigurement. Each individual trade shall take steps to prevent damage or disfigurement of the finished work of other trades and will be responsible for the cost of restoring any surface harmfully affected.

As soon as they are installed all floors, windows, sanitary and other fittings shall be thoroughly cleaned and on completion the building shall be left clean, tidy and ready for immediate occupation.

All subcontractors shall note that the removal of their rubbish and debris is their own responsibility and they must clean up and remove frequently and in any case whenever the Main Contractor so directs.

Failure or neglect to comply with such a direction to clean up will allow the Main Contractor to carry out the work on behalf of the subcontractor concerned and deduct the cost from payments due to the subcontractor.

(P & G 27) VARIATIONS
It is emphasised that the whole of the Condition of Contract and the Specification are intended to be strictly enforced, and no extra charges in respect to extra works will be allowed, unless they are clearly outside the spirit and meaning of the Drawings and Specification and unless such works have been ordered, in writing, by the Owner only.

Any instructions given verbally are deemed to be instructions for the proper execution of the work not involving extra charges.

(P & G 28) GUARANTEES

The Contractor shall arrange and be responsible for forwarding to the owner, guarantees for the following items. The guarantees shall be in the name of both the Main Contractor and the Subcontractor involved.

Roofing
Aluminium door and window joinery
Plumbing
Electrical
Drainage
Heat pump

(P&G 29) SEPARATE CONTRACTS

The Principal may be entering into separate contracts for work not included in this contract that will be carried out on the site. The Contractor is to co operate with all separate contractors and co ordinate their work with them.

(P&G 30) OWNER SUPPLIED ITEMS

1. Appliances
2. Plumbing fittings
3. Door hardware

EXCAVATOR & SEDIMENT CONTROL

(E 1) GENERAL
Visit the site and make all necessary investigations as to conditions prior to submitting your tender.

(E 2) EXCAVATING
Scope of work involves excavation for
1. Concrete foundation footings for concrete floor slab of house.

Site landscaping floor finish as shown on site plan:
2. Concrete foundation footings for exposed aggregate concrete finish to site landscaping.
3. Concrete foundation footings for plain concrete floor slab to site landscaping.
4. Foundation footings for low garden retaining wall as shown on site plan.

5. Provision and installation of the sediment control measures as described below.

(E 3) EXCAVATING
Excavate for the new foundation footings to the depths and widths shown on the drawings. Trim ground to required profiles, batters falls and levels and remove all loose material. Protect all cut faces from collapse and keep excavations free from water.
If suspect ground conditions are found that will affect the amount of excavation required during the excavation, the Architect shall be notified and allowed to inspect.

(E 4) TOPSOIL RETAINED ON SITE
OTHER EXCAVATED MATERIALS AND RUBBISH
Topsoil shall be stockpiled on site where directed. Other excavated material and rubbish to be removed immediately from site. (Confirm with Owner)
Place 300mm thick screened and clean topsoil to new landscaped areas where required on site.

(E 5) VEHICLE CROSSING
Relocate existing vehicle crossing to 5 Walter Place to new location as shown on site plan. Existing infrastructure i.e. telecom, water toby and power connection along site boundary to remain as shown on site plan.

(E 6) EXPOSED AGGREGATE FINISH CONCRETE TO SITE LANDSCAPING
Provide 100 mm min. reinforced concrete slab c/w perimeter footings thickness to engineer's detail and min. 3mm wide sawcuts to the yard as shown on the site plan.
Basecourse to be a minimum of 100mm of hardfill placed and thoroughly compacted in layers on compacted subgrade.
Concrete to be a minimum thickness of 100mm with 665 reinforcing mesh.
Provide a sample area for approval by the architect before beginning work.

(E 7) SEDIMENT CONTROL
TO BE READ IN CONJUNCTION WITH THE SEDIMENT CONTROL PLAN DRAWING
Responsibility for installation, maintenance and actioning of the following procedures lies with the main contractor.

During Construction the contractor will:
- Minimise the removal of existing vegetative cover
- Avoid excavation and stormwater works during wet weather
- Minimise excavation and excavate no sooner than is required for the construction programme
- Lay granular fill on working surfaces to protect natural material from surface flows and rainfall

- Minimise the tracking of sediment from the site by ensuring site access is via a stabilised area. Vehicles with significant debris adhering are to be washed down in an area within sediment controls.
- Ensure roof drainage systems do not drain across bare ground
- Locate stockpiles and work requiring flowing water such as washing or water cooled cutting in areas upslope of protective measures and within the property boundaries
- Divert water flow from disturbed areas and stockpiles where practicable
- Cover stockpiles
- Cover exposed faces with erosion control blanket or matting or mulch and/or surround with silt fences
- Cut vertical faces and benches in loess soils rather than battered slopes
- Ensure any protective measures such as silt fences are in place down-slope prior to excavation
- Backfill service trenches, cap with topsoil and compact to a level 75-100mm above adjacent ground
- Maintain the protective measures for the control of sediment during the construction period.
- Established vegetative cover is to be retained wherever possible.

(E 8) COMPLETION

Remove and dispose off the site any surplus excavated material. Leave the site clean and tidy and make good any damage to adjoining property, existing work or services at no cost to the Principal.

DRAINLAYER

(DR 1) CONTRACT
Comply with all Clauses under 'Preliminaries and General' and requirements of all other Trades and Special Clauses.

(DR 2) GENERAL
Provide all materials, labour and plant necessary to complete the work in accordance with the Drawings, Specification and other Contract Documents together with Local Authority and Health Department Regulations notwithstanding any omission herein and to the complete satisfaction of the Architect and Inspector.
Nothing in this specification shall be interpreted to permit work forbidden or of a lower quality than the requirements of the New Zealand Building Code, sections B2/AS1 (Durability/ Acceptable Solution), G13/AS1 (Foulwater/Acceptable Solution) and E1/AS1 (Surface Water/Acceptable Solution). The Contractor shall allow for the more costly requirements should a conflict exist.
Work to be undertaken under this section includes sewer and stormwater drain construction.

(DR 3) NOTICES
Give all necessary notices and pay all fees to Local Authorities and arrange for the inspection and testing of work.

(DR 4) MATERIALS
Pipes for sewer and stormwater drain construction located in accordance with the drawings.

Sewer pipes shall be:-
Ø100mm plasticised PVC pipes sewer drain quality complying with NZS 7649:1974 rubber ring jointed. All junctions shall be factory made reducing junctions rubber ring jointed.

Stormwater pipes shall be:-
Ø100mm plasticised PVC pipes stormwater drain quality with reducing junctions solvent jointed.

(DR 5) EXCAVATING
Excavate as necessary for all drains and sumps to depths required, gradients, lengths and directions as shown on the plans to ensure complete job.

(DR 6) LAYING DRAINS
All drains shall be commenced at the point of outfall and worked back to the highest part with at least 300mm of cover where possible; all branches and other connections being put in as the work proceeds. The whole of the drains shall be laid to a true and even gradient as required on a minimum 75mm deep layer of ballast material evenly placed. All joints shall be carefully made with approved solvent joints. Fit inspection Y's and eyes where required. All in accordance with Manufacturers recommendations.

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

The whole of the site shall be reinstated to its original condition prior to the drainage works.

(DR 7) SEWER DRAINS
Supply and lay 100mm sewer drain from house and connect into new wastewater disposal system.
Allow for road opening and all required permits etc.
Allow for any inspection chambers or eyes required by the NZBC, NZ Standards or Local Bylaws.

(DR 8) STORMWATER DRAINS
Supply and lay 100mm stormwater drains from all downpipes and sumps and connect into the new storm water manhole.
Connect all strip drains to the stormwater system.
Allow for any inspection chambers or eyes required by the NZBC, NZ Standards or Local Bylaws.

(DR 9) CAST IRON GRATES TO DOWNPIPE SUMPS
Fit removable cast iron gratings to downpipe sumps.

(DR 10) GULLY TRAPS
Provide and install approved Gully Traps firmly embedded in a concrete surround where shown on the Drainage Plan, c/w galvanised steel grating.

CONCRETOR

(Cn 1) CONTRACT
Comply with all clauses under 'Preliminaries and General' and requirements of all other Trades and Special clauses.

(Cn 2) SCOPE
Concrete work shall consist of

1. Foundations – fair faced finish F5 to outside. Exposed concrete base foundation shall be smooth off-the-form finish.
2. Concrete floor slabs on grade - Concrete class U2 float finish.
3. Exposed aggregate concrete floor slab for front & rear patio and pavements – with control joints as shown on site plan.
   Min. 100mm thick concrete, reinforced with centrally placed 665 mesh on 100mm min. compacted backfill on compacted subgrade.
   Specification: READY Exposed aggregate – Autumn Gold from Allied Concrete.
   Contact: Allied Concrete
   Shane Tell , Queenstown Branch Manager
   Ph:03-441 4381 or 027-220 9022.
   Email: shane.tell@alliedconcrete.co.nz
6. Supply and laying of DPC.
7. Building in or grouting of all bolts, plates, fixing and the like, including all items necessary to complete the work indicated on the drawing but not specifically described in the specification.
8. Supply and installation of all required reinforcing.

(Cn 3) CONCRETING
Concrete and concreting workmanship shall be according to the best practice and shall conform to the requirements of NZSS 3109. Concrete shall be a good workable mix but excessive water producing sloppy mixes shall be avoided. Concrete shall be well worked into forms. Refer structural engineer specification for concrete MPa strength.

(Cn 4) BOXES
Boxings are to be of 25mm dressed boarding or plywood fixed level and true in all respects, strutted, well braced and tightened up. Care must be taken to prevent admixture of earth with concrete foundations.
All concrete foundations shall have a fairfaced finish F5 to outside and to extend into original ground to the minimum dimensions shown on the drawings.

(Cn 5) REINFORCING
Reinforcing shall be of NZ origin complying with NZS 3402:1989. It shall be securely placed in position and at the required cover distances from the boxing. Reinforcing shall be placed, as indicated on the drawings, and shall be lapped so as to be fully continuous at corners and junctions, and throughout all members.
Reinforce all floor slabs with SE72 Seismic mesh. All mesh shall be supported at the correct height on plastic chairs.
Note: Starter bars epoxied into existing concrete foundations.

(Cn 6) DAMP PROOF MEMBRANE
Beneath slabs lay 0.25mm Thermakraft – Thermathene Black damp proof membrane parallel with the direction of the concrete pour. The joints shall be lapped a minimum of 150mm, sealed with pressure sensitive tape and the material turned down against the foundation walls. Any damage to the vapour barrier shall be repaired before placing concrete.

(Cn 7) CONCRETE SLAB
Lay concrete slab as per structural engineer's specification to on fill. The finish shall be by machine finishing such as to attain a dense smooth surface free from trowel marks, roughness, voids, ridges and abrupt irregularities. The finish shall not vary more than 6mm in

3 metres. Where slabs do not meet the required standard the Contractor shall grind the surface, at his own cost, to the Architects approval.
Note set downs in slab to receive shower bases and set downs to receive door sills.

(Cn 8) CONSTRUCTION SAW CUTS
Provide shrinkage control joints 50mm deep in the ground floor slab to minimise the risk of random shrinkage cracking, in accordance with NZS 3604:1999 clause 7.5.8.6.
At re entrant corners provide additional diagonal steel as per NZS 3604:1999 figure 7.17.
Saw cuts are to be made as soon as practicably possible after the slab has been laid.

Location of control joints to be agreed in advance in consultation with the Architect.

(Cn 9) PRODUCER STATEMENT FOR CONSTRUCTION
At the completion of the contract, the contractor shall provide to the Engineer a Producer Statement - Construction, covering the work described in this section. The statement shall be issued by the Contractor to the owner, shall describe the building work and contain a statement indicating that the contractor has completed all the works in accordance with all of the contract documents, contract instructions and site report.

CARPENTER

(C 1) CONTRACT
Comply with all Clauses of 'Preliminaries and General' and requirements of all other Trades & Special Clauses. Comply with all requirements of the New Zealand Building Code and NZS 3604: 1999.

(C 2) GENERAL
All materials must be of the very best quality and to be in the longest possible lengths, sawn square and true. The whole of the work is to be of the best possible description and the whole of the framing is to be framed, bolted and nailed together in a manner befitting best trade practise. The distances between the centres of the framing are to be in every case a maximum.

(C 3) TIMBER
All framing timber, not otherwise specified or detailed on the drawings, shall be thicknessed treated Radiata Pine No 1 Framing Grade, properly seasoned and to hold to the full dimensions figured on the drawings.

H3.2 treated Pinus Radiata shall be used for all external wall framing, roof framing and all framing to wet areas.

H1.2 treated Pinus Radiata shall be used for all internal wall framing

(C 4) SEASONING
All timber shall be seasoned either in the open air or in an approved kiln by approved processes; Radiata Pine and other Exotics shall be kiln dried in all cases.
All timber throughout shall have a moisture content based on oven-dried weight not greater than the following percentages:-

1.	Exterior Finishing Timbers	-	16%
2.	Interior Finishing Timbers	-	12%
3.	All Interior Joinery, Doors etc	-	12%
4.	All Framing Timbers	-	16%

All seasoning shall take place before machining.

(C 5) PRESSURE TREATED TIMBER
Timber grades and species required to be treated by NZS 3602 1995 shall be treated to the current specifications of the Timber Preservation Authority and the NZ Wood Preservers Association (Inc.). **Treatment shall be LSOP or Boron**.

(C 6) PRIMING (All By PAINTER.)
All exposed sides of exterior and interior timber (except Cedar) shall be treated with one coat of paint (or clear coating) specified before fixing.
All exposed sides of Cedar members shall be treated with one coat of finish specified before fixing.

(C 7) D P C
Provide and lay between all timber in contact with concrete or blockwork Moistop D P C full width of timber.

(C 8) STRAPS, BOLTS, FIXINGS ETC
Provide all neces*sary bolts, straps, nail plates, joist hangers, multi grips etc required.*

(C 9) FRAMING
1. Frame up walls with schist stone cladding and specific walls as shown on floor plan with 140 x 45mm studs at 400 crs and dwang for linings at 600mm crs.
2. Stud spacing at other 90 x 45mm at 400crs and dwang for linings at 600mm crs.
Provide additional dwangs for fixing of plumbing fittings etc. Refer structural drawings for fixings dimensions and vertical shiplap timber framing manufacturer specification.
Fix 2/90 x 45mm opening studs to all door openings except where otherwise specified. See structural drawings for window lintels etc.

(C 10) ROOF FRAMING & TRUSSES

Roofing work consists of

-Specific Engineer Design (SED) roof : See structural drawings for raked ceiling.

-Proprietary roof truss design : by accredited Mitek fabricator. Refer attached roof truss design.

Contact: Central Trusses & Frames, Luggate, Wanaka. Brian Ruddle, ph: 03-443 8756

Roofer: Install Dimond Styleline profile metal roofing over H3.1 45x45mm battens at 270mm over heavyweight building paper on timber roof structure to SED or manufacturer's specifications.

Carpenter: Provide battens for new roofing.

See structural plans to confirm sizes and centres.

(C 11) TIMBER BEAMS

All concealed timber beams shall be No 1 framing grade Treated Radiata Pine with a moisture content between 12-16% and selected to avoid large imperfections. Dimensions of the beams to be within 6mm of the call size of 75mm and greater and within 3mm for 50mm timber.

(C 12) EXPOSED TIMBER STRUCTURES

Exposed roof timber structure at patio:

Solid timber posts & exposed rafters & beams

Species: Alaskan Yellow Cedar

Durability Class: Class1 Durability above ground

Surface finish: Dressed face and sanded. Oil stain finish to match timber cladding.

Dryden's Wood-X Exterior oil – Pioneer : One coat only (due to high natural oil content in timber species)

(C 13) SCHIST STONE WALL CLADDING

Supply and install selected stacked schist stonework to exterior walls with schist clad individual pieces with 90 degree corners unless otherwise shown to stone mason installation and instructions.

Schist stone colour shall consist of silver hues only. No green hue.

Schist stone substrate shall be 9mm fibre cement board BGC Stonesheet.

(C 14) VERTICAL SHIPLAP WEATHERBOARDS – WALL CLADDING

Supply and install dressed Alaskan Yellow Cedar

Grade: Hermpac Premium Clears No. 1(PC1):

Profile No: CP1739 Vertical Shiplap Weatherboard – 115mm cover

140mm x 18.5mm thick, 6mm negative detail

on H3.2 Pinus Radiata 19mm castellated timber cavity battens @ 600crs on wall underlay on timber framing as per the details. Refer attached specification.

Factory pre-finishing - Machine coat with Dryden's Wood-X Exterior oil – Pioneer : One coat only (due to high natural oil content in timber species). As per manufacturers recommendations on the specific wood species of Alaska Yellow Cedar, only a single re-coating is required when ongoing maintenance is due.

All fixings must be 316 Stainless Steel rosehead nails. Fix with Hermpac nails (2 per fixing) at even centres.

HERMPAC YELLOW CEDAR

Product:	Hermpac Yellow Cedar products
Timber Species:	Alaskan Yellow Cedar
Origin :	British Columbia and Alaska Canada
Chain of Custody:	PEFC certified

HERMPAC - VERTICAL SHIPLAP TIMBER CLADDING

Location:	As per plans
Species:	Yellow Cedar
Grade:	HERMPAC Premium Clears No.1 (PC1)
Profile Number:	CP1739
Profile type:	Vertical Shiplap
Cover dimensions:	115mm, 6mm negative detail, 140mm x 18.5mm finish
Thickness:	18.5 mm
Cavity Fixing system:	Drained 18mm -WRC Cavity batten
Surface finish:	Dressed face (DF) & sanded – sanding is an additional process after dressing for highest quality finish
Moisture content:	≤18 % at fixing

HERMPAC – CEILING TIMBER SOFFIT

Location:	As per plans: At external entrance soffit and rear patio soffit
Species:	Yellow Cedar
Grade:	HERMPAC Premium Clears No.1 (PC1)
Profile Number:	CP3356
Profile type:	Panelling
Cover dimensions:	110mm, 6mm negative detail, 116mm x 12mm finish
Thickness:	12mm
Surface finish:	Dressed face (DF) & sanded – sanding is an additional process after dressing for highest quality finish
Moisture content:	≤18 % at fixing

FACTORY FINISH - WOOD OIL - FLOOD COAT INUNDATION

Brand:	Machinecoat (NZ) Ltd
Product:	Wood- X Exterior Oil
Coating process:	Machinecoat (NZ) Ltd. Flood Coat Inundation
Colour:	Pioneer
Factory coats:	One (applied to all four sides, edges and ends of boards)

(C 15) ROOF FASCIA

Supply and install 180x28mm dressed Alaskan Yellow Cedar - Hermpac HP72 Fascia.
Fix with Stainless Steel Hermpac 316 Stainless Steel rosehead nails (2 per fixing) at even centres. No timber treatment due to high natural oil content of timber species.

(C 16) TIMBER CEILING PANELLING & SOFFIT

Supply and install dressed Alaskan Yellow Cedar Grade PC1 timber ceiling panelling square negative Profile No: CP3356 110mm cover, 6mm negative detail
116 x12mm thick. As per Reflected Ceiling Plan. Secret fix and stained finish.
Fix with Stainless Steel Hermpac 316 Stainless nails.

(C 17) COLORSTEEL FLASHINGS

Provide and fix 0.55 Colorsteel flashings to the roof barge, wall junctions and other miscellaneous flashings and cappings as shown on drawings. Colour: Flaxpod to match steel roofing.

(C 18) STRUCTURAL PLYWOOD ROOF SARKING

To all roof areas except for rear patio roof, lay 12mm CD H3.2 treated plywood sarking (screw fixed to framing) with suitable finish for roofing.
Fix in strict accordance with the membrane manufacturers recommendations.

(C 19) BUILDING PAPER
Provide and install Thermakraft Watergate Plus to areas where building paper is required and all areas where in direct contact with steel structure.

(C 20) INSULATION
Provide and install the following. House insulation includes garage. Ecoinsulation glasswool from Carters.

1. Roof Insulation
Provide and install **ECO** insulation glasswool with DriTherm Technology manufactured by Knauf Insulation:

Single layer roof insulation:
- Skillion roof : R7.4 265mm ECO insulation to entire enclosed skillion roof structure.
- Truss roof : R7.0 330mm ECO insulation to entire enclosed truss roof structure.

Min. roof insulation for housing up to 300m² Climate Zone 6: R6.6

2. Roofing Building Paper
Under ROOFER in this contract

3. Insulation to external timber framed walls and internal acoustic walls
- Provide and install R3.2 140mm **ECO** insulation glasswool thermal wall batts with DriTherm Technology to external 140mm timber framed walls.
- Provide and install R2.2 90mm **ECO** insulation glasswool thermal wall batts with DriTherm Technology to external 90mm timber framed walls.

Min. wall insulation for housing up to 300m² Climate Zone 6: R2.0

4. Insulation to internal timber framed walls (acoustic)
Provide and install R2.6 90mm **ECO** insulation glasswool thermal and acoustic wall batts with DriTherm Technology to internal timber framed walls at the following areas:
- internal surround walls of laundry room
- internal surround walls of bedrooms adjacent to common areas

5. Underslab insulation to concrete floor slab
Provide and install R1.8 50mm thick EXPOL-X extruded rigid polystyrene foam insulation (XPS) to underslab of standard concrete floor slab on blinded hardfill in 150mm max. layers. Min.floor insulation R1.7. Proposed R-value R1.8

(C 21) PLASTERBOARD CEILINGS ON METAL BATTENS
Generally, 13mm Gib standard plasterboard ceiling linings shall be screw fixed to Rondo metal ceiling battens @ 600mm crs fixed to underside of floor joists, ceiling joists or rafters with proprietary Fix Clips.
To be fixed in strict accordance with the Manufacturers recommendations to provide a perfectly flat and even ceiling surface.

(C 22) PLASTERBOARD LININGS
This work is to be carried out by a specialist firm of Plasterboard Contractors in strict accordance with the Manufacturer's recommendations. Neatly stop joints and nail holes with approved tape and Jointing Compound.
Fix Gib Plasterboard GIB Goldline paper faced metal trims to all external and internal corners. Line areas scheduled below with first quality Plaster Board.

(C 23) LINING SCHEDULE
Walls
Ensuites & powder room- 10mm Aqualine Gib board stopped and ready for wall tiles
(with Hardies 9mm Villaboard to shower surrounds)
All other areas (including behind joinery & cupboard interiors):
- 10mm Gib board stopped to a Level 4 finish

Ceilings

- General ceiling: 13mm Ultraline Gib board on metal battens Gib Rondo 310 Direct Fix System. Use A311 Gib Quiet Clip at skillion roofing for rain sound dampening.

- En suites and powder room – The lowered ceiling 10mm Aqualine Gib board shall be fixed to 140mm timber ceiling joists using Gib Rondo 310 Direct Fix System. Stopped to a Level 4 finish.

- All other areas (including behind joinery & cupboard interiors): 10mm Gib board on metal ceiling battens stopped to a Level 4 finish

(C 24) WALL LINING & WATERPROOFING TO BATHROOMS SHOWER
Provide and install Hardies 9mm Villaboard over wall framing to shower surround, ready for waterproof membrane and wall tiles.

(C 25) WALL BRACING
Allow to fit bracing elements to walls as indicated on drawings and the bracing schedule. Fix in strict accordance with Structural Engineer's and manufacturers' recommendations.

(C 26) SKIRTING
Supply and install 60 x 10mm fin timber skirting (paint finish) as detailed.
Skirting top edges should be the same throughout the house. Do not fit skirting to tiled walls.
No skirting at specific walls as shown on plan A2-5.

(C 27) TIMBER FLOORING SUPPLIED BY OWNER
Allow to install floating engineered timber floor on 2mm Ecofloors cork underlayment on concrete floor slab.

(C 28) ALUMINIUM THRESHOLDS
Supply and install 15x15mm silver anodised aluminium angles to timber flooring thresholds with flagstone paver and tile flooring.

(C 29) TRIMMING FOR EXTRACT FANS & RANGEHOOD
Allow to trim for extract fans in kitchen rangehood, ensuites and powder room.

(C 30) BATHROOM ACCESSORIES SUPPLIED BY OWNER
Allow to install:

Robe hooks	(6)	Robe hooks (2 to each). Confirm location with Architect.
Towel ring	(3)	1 adjacent to each basin (1 to each bathroom)
Toilet roll holders	(3)	Paper holders

(C 31) INTERNAL DOORS
Install all internal doors as supplied by Joiner.

(C 32) DOOR HARDWARE SUPPLIED BY OWNER
Allow to install door hardware.

(C 33) DOUBLE SIDED WOOD FIREPLACE -SUPPLIED & INSTALL BY OWNER
Provide a complete working installation.
Qualified fireplace installer to install wood fireplace Spartherm Double Sided Varia A-FDh-P8 by Stokes Fires c/w flue and gas cowl.
Allow to install custom make ventilation grilles by HolyOake as required as shown in drawings.
Refer attached fireplace specification in Appendix. Contact Henry Jenkins, Stoke Fires, Queenstown. Ph: 027-4418178.

(C 34) VENTILATION GRILLES
Allow for all grilles to be primed & painted to colours to be chosen by the architect.
Ensuites, powder room & laundry ventilation grilles to be supplied & installed by Electrician.

Fireplace - Custom made powdercoated aluminium ventilation grilles by HolyOake– colour to match aluminium window joinery colour. The fireplace ventilation grilles supplied by owner and to be installed by qualified fireplace installer.

(C 35) ALLPROOF CHANNEL DRAIN SYSTEM
Allow for custom length Slimline Stainless Steel Channel drainage by Allproof to ensuites and powder room. A Grate – 316 Wedge Wire, 38mm.

(C 36) LETTERBOX
Supply and install schist stone letterbox 400 x 400 x 950mm high with built-in letterbox. 50mm schist paving cladding to match retaining wall with 40mm schist stone capping. Confirm type of letterbox face plate, house numbers and location of fixing with Architect before proceeding.

ROOFER

(RF 1) CONTRACT
Comply with all Clauses under 'Preliminaries and General' and requirements of all other Trades and Special Clauses.

(RF 2) ROOFING WORK
All roofing work shall be carried out by approved specialist Roofing Contractors and materials shall be fixed strictly in accordance with the manufacturers recommendations.
Note: All downpipes, spouting and roof flashings to be undertaken by a Certified Plumber under the roofing contract.

(RF 3) PREPARATORY WORK
Inspect and check that all preparatory and other work that may affect this trade is satisfactory. No work shall be commenced until any faults are made good.

(RF 4) SCOPE
Roofing work consists of:
1. Dimond Styleline metal roofing and underlay to house and patio, complete with all accessories required to complete a weathertight installation.
2. Dimond 200 Half Round gutter and Ø100mm downpipes from the roof complete with bracket system.
3. Rainwater Harvesting Marley Ø80mm downpipe from the roof complete with bracket system.
4. Nuralite membrane roofing system.
5. Folded metal custom spouting as detailed in construction drawing.
6. Other miscellaneous roof flashings and cappings including plumbing penetrations

(RF 5) METAL ROOFING
Underlay
Self supporting heavyweight building paper Thermakraft Covertek 407 fire retardant.
Building paper to run horizontally.

Roofing
Install 0.55mm Dimond Styeline profile metal roofing – complete with all accessories required to complete a weathertight installation.
Finish: COLORSTEEL MAXAM
Colour: Flaxpod

Fixing
The fixing shall be in accordance with the manufacturer's recommendations for high wind zone.

(RF 6) CEILING AIR BARRIER MEMBRANE AT SKILLION ROOFING
Supply and install Thermakraft Covertek 407 fire retardant -air barrier membrane above ceiling lining at skillion roofing.

(RF 7) MEMBRANE ROOFING
Supply and install Nuralite – Nuraply 3PM double layer membrane roofing system on plywood substrate. Colour: Charcoal. Refer attached specification.

(RF 8) SPOUTING
Supply and install 0.55mm steel Dimond 200 Half Round gutter -South Island, complete with bracket system by roof manufacturer. Ensure South Island production -continuous seamless surface spout. No indent on surface spout as in North Island.

(RF 9) DOWNPIPES
Provide and fit Ø100mm steel downpipes to the house complete with bracket system.
Colour: Flaxpod to match roofing.

(RF 10) RAINWATER HARVESTING MARLEY - Supply by owner
Fit Ø80mm steel downpipe from the roof to connect to rainwater harvesting marley complete with bracket system. Refer attached brochure specification.

(RF 11) LEAF GUARD
To all spouting supply & install a proprietary UV resistant uPVC leaf guard mesh.
Colour: Flaxpod to match roof)

(RF 12) GUARANTEES
The completed corrugated metal roof and membrane roofing system shall be guaranteed by the specialist firm carrying out the work for a period of not less than 15 (FIFTEEN) years. Such Guarantees shall cover watertightness, workmanship, and materials. The GENERAL CONTRACTOR shall be responsible for obtaining a written guarantee and forwarding it to the OWNER.

(RF 13) COMPLETION
The one specialist subcontractor shall be entirely responsible for the complete watertightness of all roofing, shall leave all roofs watertight in perfect order, remove all debris, and leave the site clean.

PLUMBER

(PLU 1) CONTRACT
Comply with all Clauses under 'Preliminaries & General' and requirements of all other Trades and Special Clauses.

(PLU 2) GENERAL
Provide all material, labour and plant necessary to complete the work in accordance with the Drawings and Specifications to comply with all Local Authority By Laws, the N Z Building Act, the N Z Building Code and approved documents, in particular B2/AS1 (Durability/Acceptable Solution), E1/AS1 (Surface Water/Acceptable Solution), G12/AS1 (Water Supplies/Acceptable Solution), G13/AS1 (Foulwater/Acceptable Solution) and to the complete satisfaction of the Architect, not withstanding any omission here-in.

Nothing in this Specification shall be interpreted to permit work forbidden by or of lower quality than the requirement of the Drainage and Plumbing Regulations under the Health Act and Amendments or the N Z Building Act and the Contractor shall allow for the more costly requirements should a conflict exist.

All plumbers work shall be of the best description and special care must be taken to leave the job thoroughly watertight with all fittings clean and in perfect working order.

(PLU 3) NOTICES
Give all necessary notices and pay all fees to Local Authorities and arrange for the inspection and testing of work.

(PLU 4) SCOPE OF WORKS
1. Provide and install all new hot & cold water pipework to the new plumbing fixtures and fittings.
2. Provide all new Waste & Soil pipes and all associated required vents
3. Hot water heater – Rinnai Enviroflow Hot Water Heat Pump GR280L
4. Provide and install all plumbing fixtures. Refer Appendix for Mico specification of plumbing fittings to be supplied by owner. Allow to install by plumber.

(PLU 5) MATERIALS
All as per N.Z. Building Code and any relevant N.Z. Standards
All materials shall be the best of their respective kinds. Unless otherwise specified all materials shall be as follows:-

Water Pipes
Hot and cold water pipes to House shall be FUSIOTHERM pipe of approved, utilising the appropriate pipe fittings for joints, all in accordance with the manufacturer's recommendations.

Waste and Soil Pipes
Fit regulation wastes to all fittings. Waste pipes shall be rigid PVC of approved manufacture. They shall be built into walls so as to discharge immediately over gully traps. Wastes in fill under concrete shall be PVC wrapped in Denso Tape.

Traps Wastes and Vents
Allow for all traps, wastes and vents with all necessary cleaning eyes etc in rigid PVC in positions shown on plans, to comply with NZS 7641 and installed strictly to manufacturer’s specifications and recommendations. Provide and fit backvents to units shown on drawings where required - all in accordance with Local Authority requirements.

Flashings to vents through roof by ROOFER.
All roof flashings etc shall be carried out by the Roofing Contractor as previously specified under ROOFER.

Grading, Drains and Venting
Hot and cold water pipework shall be given a constant grade on horizontal pipes of 13mm in 3m in the direction of flow. The high points in water filled mains are to be vented to approval by means of

automatic air eliminators. Provide manual drain valves in all low points of H W flow, H W return, and cold water mains. Drain valves are to be 15mm gate valves and are to be fitted with brass removable screwed plugs.

Pipe Expansion
Accommodate thermal expansion pipe movement by means of pipe bends, loops, and offsets. Suitable bends, loops, and offsets are to be provided and supports are to be located that they efficiently accommodate expansion and contraction without undue stress in the pipework.

Valves
Screwed valves shall be Methven GV 100 wedge disc gate valves with non-rising spindle with ends screwed BSP complying with NZS/BS 21:1985 suitable for a pressure of 1600KPa.

Pipe Testing
Test water pipes by hydraulic pressure to 700KPa or twice the working pressure, whichever is the greater. Pipework is to be tested before being connected and due allowance is to be made for testing sections of the work if the whole of the work cannot be tested at one time. Isolate any of the plant not designed for the test pressure. The duration of all tests is 8 hours or overnight where convenient.

Note:
All runs of hot and cold water piping shall be concealed in wall or ceiling space.

(PLU 6) COLD SUPPLY SERVICE
Connect to the existing water meter at the street boundary. Confirm location of water meter prior to beginning work.
Serve all fittings shown on the drawings.

(PLU 7) PIPE INSULATION (To meet Building Code Requirements)
All pipework and plant operating in a heated condition or running within external walls are to be insulated under this contract.
Insulate pipes with preformed flexible closed cell 'Armaflex' tube insulation or equal as approved by Architect. 'Armaflex' to be installed strictly in accordance with manufacturers instructions.
Exposed cold water pipework run in ceiling space to be insulated as above.

(PLU 8) DOWNPIPES ETC
All roof flashings, gutters and downpipes shall be carried out by the Roofing Contractor as previously specified under ROOFER.

(PLU 9) TAPS, VALVES AND SANITARY FIXTURES
Allow to install the following:
All bathroom fixtures and fittings as per MICO specification. SUPPLIED BY OWNER

In-Sink-Erator SUPPLIED BY OWNER

Supply and install all required water supply pipes, waste pipes, traps, angle filters, elbows, fixing sets, bolts and all other items required to install plumbing fittings.

Note: - Accessories are to be fitted by Carpenter.
- Heated towel rails are to be installed by Electrician.

(PLU 10) WHOLE HOUSE WATER FILTER SYSTEM **-** SUPPLIED BY OWNER
Allow to install the following:
Whole house water filter and water softening system as per MICO specification.

(PLU 11) HEAT PUMP HOT WATER HEATER SUPPLIED BY OWNER
Allow for cold water supply to selected hot water heater.

(PLU 12) CONNECTION OF HEAT PUMP CONDENSATE DRAINS
Allow to connect Ø32mm heat pump condensate drain pipes to the nearest gully traps.

(PLU 13) WATER CONNECTION TO FRIDGE-FREEZER
Allow for water supply to fridge-freezer.

(PLU 14) COMPLETION
Allow for leaving the whole of the work, including hot and cold water supply and all sanitary fixtures, in perfect working order and in perfect condition ready for the Owners occupation.

NOTE: The Plumbing Contractor may be allowed to alter in detail any part of the Plumbing layout provided that:-
1. It meets with the approval of the Local Authority Health Inspector.
2. The final scheme is as good as or better than shown.
3. No alteration to the placing of the fixtures is entailed.
4. No extra work to the Main Contractor.

If the Plumbing Contractor wishes to take advantage of this clause he must give:-
a. The alternative price.
b. Full description of work for the approval of the Architect.

ALUMINIUM WINDOW & DOOR FABRICATOR

(AL W 1) CONTRACT
Comply with all Clauses under 'Preliminaries and General' and requirements of all other Trades and General Clauses.

(AL W 2) MANUFACTURE
Aluminium joinery shall be manufactured & installed by a specialist firm.
All windows and doors shall be site measured prior to fabrication.

(AL W 3) APPROVAL OF SHOP DRAWINGS
No windows shall be manufactured until shop drawings have been approved by Architect.

(AL W 4) STANDARDS
All work shall be carried out in accordance with
NZS 4211 - Performance of Windows
AS 3715 - Powder coatings to Aluminium
NZS 4223 - Glazing in Buildings Parts 1, 2, & 3
NZS 3504 - Aluminium windows
Architectural Aluminium Association Aluminium Window Handbook
Architectural Aluminium Association of NZ Installation Code 1993

(AL W 5) FINISH
The finish shall be a powdercoated aluminium finish. Colour: Metropolis Coal Dust Matt

(AL W 6) SEALANT
Where indicated on the details run fillet of ‘Silaflex’ (or similar) sealant around window frame (except to sill sections)

(AL W 7) ALUMINIUM SECTIONS
The aluminium sections shall be
- APL Architectural Series Thermal Heart for 2.7m high windows and doors including entrance door with pivot door system.
- APL Metro Series Thermal Heart for 2.2m high windows and doors.

(AL W 8) GLAZING
ALL DOUBLE GLAZED IN CLEAR FLOAT GLASS UNLESS OTHERWISE STATED.
All bathroom windows glass and laundry window to have Matelux toughened safety glass.
It is the responsibility of this Contractor to ensure on completion that all glass types, glass sizes are correct, and in accordance with the NZ Building Act and NZS 4223: Part 3 : 1993 (Human Impact Safety Requirements).
The thickness of the glass shall be as recommended by the manufacturer for the size of the pane.

Double Glazings
All windows other than those listed below are to be double glazed in clear float glass.
Spacers to double glazed units shall be ‘black’.

Note: The exterior pane is to be in clear toughened glass, the interior pane is to be in clear laminated glass.

Glass
The AGP System: Solux E, Argon gas, ATS – Architectural Thermal Spacer.

(AL W 9) HARDWARE PROVISIONAL SUM
Provide and install the following hardware:

All opening window sashes
Provide and fit Vantage Urbo in Metropolis Coal Dust Matt powdercoat (to match window

frame) venting window fasteners with no visible flap or wedge and casement / awning friction stays to windows.

All hinged doors
Vantage Urbo lever door handles both sides (powdercoat to match door frames) with narrow mortice key locks with internal snibs.

Sliding Doors
Vantage Urbo surface mount sliding door handles both sides (powdercoat to match door frames) with narrow mortice key locks with internal snibs.

Bifold doors and windows
Vantage Urbo bi-fold handles (powdercoat to match door frames) with internal key locks/ snibs.

Allow for single master key to all locks on windows and doors.

(AL W 10) FLASHINGS AND MISCELLANEOUS TRIM
Provide and install all ancillary aluminium flashings, angles and flats having the same powdercoated aluminium finish.
All windows and doors are to have flashings on all four sides, as detailed.

(AL W 11) POWDERCOATED ALUMINIUM PANELS
Provide and install all powdercoated aluminium panels and flashings between windows as shown on the elevations and window schedule (colour to match the window frames)

(AL W 12) INSTALLATION OF WINDOWS AND DOORS
Erect all frames plumb both ways, square and in proper alignment, well nailed to wooden framework. Fixing shall be at not more than 750mm intervals with a minimum of (3) to each jamb and (2) to each head.

The manufacturer of all aluminium windows, doors shall be entirely responsible for the full performance and installation of his product in consistent appearance, exactitude of fitting, strength, and the complete watertightness of all frames, sashes and glazing.

This subcontractor may negotiate with the General Contractor to take delivery of the prefabricated windows etc on site and to install them, which will in no way negate the entire responsibility for the full performance of the works as noted herein upon the MANUFACTURER who shall also provide the Guarantee.

(AL W 13) INSTALLATION OF ENTRANCE DOOR – Supply and install by aluminium window joinery APL.
Entrance pivot door in Grandor Stone by Parkwood Doors. Face: Steel black.
Provide and fix Raven weatherbrushes and seals as required for weatherproofing.

(AL W 14) INTERIOR INSECT SCREEN – Supply and install by owner.
Insect screen Securo Pull Down Blind - from Window Treatments. Top fix installation (inside fit). Composition: Phiferglass Pool and patio mesh – a woven fibreglass coated with PVC: 60mm housing system: for windows W4,W5 and W6

(AL W 15) COMPLETION
It is the responsibility of this Contractor to ensure on completion that all glass types, glass sizes are correct, and in accordance with the Building Act and NZS 4223 and that all frames and all glazing is completely watertight.

(AL W 16) GUARANTEE
A guarantee covering materials, weather-tightness & workmanship shall be provided for a period of not less than 5 years & forwarded to the owner.

GLAZIER

(G 1) CONTRACT
Comply with all Clauses under 'Preliminaries and General' and requirements of all other Trades and Special Clauses.

(G 2) GLAZING
All glass shall be free from waves, streaks, bubbles, or other imperfections and to the entire satisfaction of the Architect. Allowance shall be made in all cases for sufficient clearance being given to all glass edges to prevent breakages of glass on account of expansion.

The thickness of the glass shall be as recommended by the manufacturer for the size of the pane.

(G 3) MIRRORS (see Bathroom Drawings) – Supply by owner
Vertical hung mirrors are to be screw fixed to the wall above basins as shown in drawings. To hang securely in place on the wall, this mirror requires 2 screws.

(G 4) COMPLETION
On completion leave in clean condition.

TILER

(T 1) CONTRACT
Comply with all Clauses under 'Preliminaries and General' and requirements of all other Trades and General Clauses.

(T 2) WORKMANSHIP
All tiling work shall be carried out by skilled specialist tilers. Confirm all tiling work with Owner before commencing work for exact colour of tiles, grouting etc.

(T 3) SCOPE OF WORK - Supply of tiles by owner.
Tiling consists of the installation of the following, plus supply and install all required aluminium angles & trim to all bathrooms, ensuite & laundry rooms.

(T 4) FIXING
Ensure that the substrate is clean, sound and free of any grease, wax, oil, curing compound and any form of contamination. Floor areas are to be swept clean of dust and dirt and washed off using clean water.
After final positioning and cutting in, tap tiles firmly into place. Grout with coloured grout as specified. In each instance the manufacturer's recommendations shall be followed with respect to setting out, tile adhesives and grouting on completion for all tiles.

(T 5) WALL TILES SUPPLIED BY OWNER
Allow to install tiles to walls of the rooms listed above (check drawings for extent).
Install a waterproof membrane over the wall linings to the shower before installing wall tiles.
Tiles are to be installed vertically with 2mm mortar joints (check with supplier) and joints are to match floor tiles. Grout Colour: to match tile.
Substrates are generally: 9mm Hardies Villaboard to shower walls, with Gib Aqualine elsewhere.

(T 6) FLOOR TILES & ELECTRICAL UNDERTILE HEATING
- SUPPLIED BY OWNER
Allow to install tiles to concrete floor slab at Ground floor as shown on Floor finishes plan.
Floor tiles are to be laid out as drawn on floorplans with 2mm mortar joints with a 5mm (max.) adhesive bed. Grout Colour: to match tile.
Floor tiles surface finish shall be slip resistant.

Electrician: Install electrical undertile heating in en suite 1 & 2 and powder room. Allow to install 6mm F-board insulation on concrete floor slab as per attached manufacturer's specification.

(C 7) SHOWER SURROUND MEMBRANE
Provide and lay waterproofing moisture barrier Ardex WPM 300 to entire floor of all bathrooms and ensuite and up wall linings 300mm - except full height around shower surround walls (to 600mm beyond shower surround over plasterboard wall lining) in strict accordance with manufacturer's recommendations.
S
(T 8) COMPLETION
On completion tiles shall be cleaned down and left in perfect condition. No mortar stains will be accepted.

ELECTRICAL

(El 1) GENERAL
Refer to the General Conditions of Contract, Specific Conditions and Preliminary and General section of this specification which applies to all work of this section.

(El 2) SCOPE
This section includes the connection and supply (unless otherwise stated) of all electrical fittings and socket outlets shown on the drawings and described in the specification.

(El 3) REGULATIONS
Standards and Regulations relating to work in this section include but are not limited to:
New Zealand Building Code G9/AS1 for people with disabilities
Electrical Act 1992
The Electrical Regulations 1993
NZS 6401 PVC insulated cables

(El 4) PERMITS AND FEES
Notify Local Electrical Supply Authority of installation and obtain permission before proceeding with any work. Pay all necessary fees including the provision of a boundary box etc, other than the Building Consent and arrange all inspections.

(El 5) PREPARATORY
Prior to submitting tender, inspect the existing house to ascertain locations of existing supply and scope of work involved.
Give the Main Contractor reasonable notice of positions and details for ducts, holes, chases, voids, and recesses to be provided in concrete sections of the work. Cut all chases, voids, recesses, etc in all other type construction.

(El 6) ATTENDANCE
Cooperate with the Main Contractor and arrange work to cause the minimum of inconvenience and delay.

(El 7) CONNECTION TO SUPPLY
Arrange to bring an underground supply to the Meter Board.

Allow for the supply and installation of the 50mm dia. conduit beneath the slab shown to provide access for the incoming cable and allow to connect the supply cable to the Switch Board.

(El 8) MAINS AND SUB MAINS
Size sub main to allow a spare margin of 25% above the estimate of maximum demands, and in addition to the spareways on distribution boards.
Obtain metering current transformers from the Supply Authority designated by the Owners and place in position.

(El 9) MAIN SWITCHBOARD
Supply and install PDL Resi 9 to location on shown on electrical plan.
The switchboard is to be fitted with RCD fuses to protect all powerpoints and any other electrical connections as required by the relevant Electrical Regulations.

(El 10) METER BOX
Supply and install a standard meter box with a powdercoated galvanised steel cover. Refer Electrical Plan for location.

(EL 11) FUSES AND CIRCUIT BREAKERS
Where new circuit breakers are required use miniature circuit breakers and/or fuses of approved manufacture.
Where fuses are required use only HRC type Category AC4 or 5 to NZS 160.

(El 12) CIRCUIT CABLES

Lighting

Provide TPS (minimum of 1.5mm² TPS) circuit wiring to all lighting points indicated. Connect no more than 1000 watts to any one circuit.

Switch socket outlet circuits

Provide TPS (minimum 2.5mm² TPS) circuit wiring to all switch socket outlets indicated. Connect no more than four outlets to any one circuit.

All cables shall be concealed.

(El 13) EARTHING

Earth all parts of the electrical installation as required under the Electricity Regulations. (Note: All lighting circuits shall be wired for earth fittings).

(El 14) LIGHT SWITCHES

Insulated flush type lighting switches, single or multi-gang rocker type as required. Unless otherwise indicated on the plans, mount switches 1200mm above floor level measured to the centre of the plate.

(El 15) SWITCH PLATES

Supply and install PDL 600 Series white lighting switches, single or multi-gang type as required. Unless otherwise indicated on the plans, mount switches 1200mm above floor level measured to the centre of the plate.

(El 16) SWITCHED SOCKET OUTLETS

Supply and install PDL 600 Series white sockets insulated 3 pin type with 10amp rating. Unless otherwise indicated on the plans, mount switches 300mm above floor level measured to the centre of the plate. Mount sockets over benches 200mm above benchtop level to the centre of the plate.
All switches above benches shall be horizontal type.

Outdoor twin socket shall be PDL Weathershield with clear flap over socket outlet– colour grey.

(El 17) CONFIRM MOUNTING POSITIONS

Confirm locations and heights of all light switches, socket outlets and fittings on the job with the Architect before proceeding.

(El 18) LABELLING

Clearly label all equipment such as, fuses, circuit breakers and isolating switches to show the controlling circuit. Labels may be plastic self-adhesive punched tape transfers or such other permanent label as permitted by the Electricity Regulations.

(El 19) ELECTRICAL FITTINGS – SUPPLY & INSTALL

Supply and Install the following fittings:

Ensuites & powder room

Supply and install **ceiling mounted extract fan** to each ensuite and powder room.To be surface mounted.

Manrose - Centrifugal extract & condensation control fan.
(3) Manrose Designer Series Contour Fan Systems High Steam Area fan – 150mm with round fascia. White (without LED) FAN 7033
Complete with universal mounting accessories, including backdraught shutter and outlet grille.

Bathroom extract fans to be individually switched (ie not with light fittings) and to have adjustable run-on timers FAN2444 timer model.
Grilles to be primed & painted (by Painter) to match painted linings.

(El 20) ELECTRICAL FITTINGS- INSTALL ONLY. SUPPLIED BY OWNER
Allow to connect to the power supply the following fittings installed by others.
Provide fixed outlets and connections complete with isolating switches as required.

Ensuites & powder room
(3) Heated towel rails

Kitchen
Cooktop
Kitchen rangehood
Oven
Dishwasher
Fridge-Freezer
Waste disposal (installed by Plumber) and provide switch underbench.

(El 21) LIGHT FITTINGS SUPPLIED BY OWNER
Install selected light fittings. Check electrical drawings for locations.

(C 22) INTERIOR DOWNLIGHTS
Interior downlights shall have downlight classification CA135.

(EL 23) HOUSE HEAT PUMP BY OWNER
Allow to connect power supply to the selected heat pump (installed by specialist contractor).
Rinnai Heat Pump

(EL 24) UNDERTILE HEATING BY OWNER
Allow to install electrical undertile heating in en suite 1 & 2 and powder room.

(E 25) TELEPHONE, DATA AND TELEVISION CABLING
Supply and install all TV, data & telephone jack points (as shown on the electrical plan).
All outlets to have cover plates colour to match light switches.

(El 26) SECURITY SYSTEM
Allow to install security alarm sensors and security alarm key pad.

(El 27) GUARANTEE
On completion of the work supply to the Main Contractor a guarantee on workmanship and materials under this contract. The form of guarantee is bound with this specification.

(El 28) COMPLETION
At completion leave all work neat, tidy, clean and operating correctly. Remove all plant, tools, rubbish and debris from the site.

JOINER

(J 1) CONTRACT
Comply with all Clauses of 'Preliminaries and General' and requirements of all other Trades & Special Clauses. Comply with all requirements of NZS 3604: 1999.

(J 2) JOINERY
The joiner shall perform all necessary mortising, tenoning, tonguing, housing, rebating and all other works necessary for correct jointing. All glued joints shall be cross tongued or otherwise reinforced and finished in the best manner.

Except where otherwise specified, all finishing timbers shall be paint quality treated Radiata Pine. All exposed timber shall be sanded. Doors and other prepared joinery are to stand, when finished, the full size specified or shown on the details. The joiner shall confirm all appliance sizes prior to fabrication.

(J 3) SPRAY LACQUER
To all MDF joinery units with a spray lacquer finish specified use:
Mirotone Uraglaze 5545 Polyurethane sealer
Mirotone Mirobuild AC 3633 clear topcoat (10% gloss finish)
All spray lacquers are to be applied strictly as per manufacturer's instructions.

(J 4) INTERIOR DOOR FRAMES
In general interior door frames shall be 40mm (fin) machine sanded paint quality timber (rebated for wall linings) with 30 x 10mm (fin) planted timber stops as detailed.
Paint finish by Painter.

(J 5) INTERIOR DOORS
Provide the following doors for installation by Carpenter. All in frames as described above unless otherwise stated.
All hinged doors to be fitted on three satin chrome butt hinges to suit unless otherwise stated.
Check Door Schedule for door widths etc.
Refer Door & Window Schedule for size, hardware,description and details.

<u>Hinged doors</u>
Solid core paint quality door leaves with a 10mm solid timber clashing strip to edge. Paint finish by Painter.

<u>Frameless Cavity Sliders</u>
CS Cavity Sliders with soft close, all sliding doors ceiling mounted top track in stainless steel finish.
Allow to install hardware, supplied by carpenter. Paint finish by Painter.

(J 6) KITCHEN
All sink inserts shall be undermount. Confirm sink models with Owner prior to fabrication.
SUPPLY AND INSTALL IN BENCHTOP BY JOINER.

THE FOLLOWING FITTINGS ARE TO BE SUPPLIED AND INSTALLED BY THE JOINER:

Cutlery tray	Blum Orga-Line
Container set Part no. ZSI.550BI1N + ZSI.550BI3	
Utensil tray	Blum Orga-Line
Utensil divider set Part no. ZSI.550BI1N + ZSI.550KI3N	
Rubbish bin	Blum Wesco top mount rubbish bin solution 2x20L bins with fixed steel lid & hanging frame components. Set no. 380 002 02

Pull out unit (400mm cabinet)	Hafele Kessebohmer Junior III pull-out, Arena Classic Art. no. 545.11.202

ALLOW TO FIT THE FOLLOWING APPLIANCES AS SUPPLIED BY THE OWNER
Confirm all models with Owner prior to fabrication

Dishwasher
Wall Oven
Cooktop

(J 7) WARDROBES

Cupboard fronts	18mm MDF with paint finish painter
Internal shelving	-white melamine prefinish on 25mm MDF shelves
Hanging Rails	Hettich aluminium oval wardrobe rail, chrome plated, high gloss

(J 8) COMPLETION
On completion leave in clean condition. Remove all sawdust from inside units.

Risk Matrix Calculation

to E2 / AS1 Building Envelope Risk Matrix

Project	**Proposed new dwelling at**
Location	**Lot 56 Alfred's Terrace, Glenorchy**
Wind Zone	**HIGH**

BUILDING ENVELOPE		
Risk Factor	**Risk severity**	**Score**
Wind Zone	**HIGH**	**1**
Number of storeys	**LOW**	**0**
Roof/wall intersection design	**MEDIUM**	**1**
Eaves width	**VERY HIGH**	**5**
Envelope complexity	**MEDIUM**	**1**
Deck design	**LOW**	**0**
Total risk score	**0**	**8**

Suitable Claddings

Suitable claddings over nominal 20mm drained cavity:
Masonry veneer
Rusticated weatherboard

5 Walter Place, Glenorchy
H1 Compliance - Schedule method
6 November 2026

Based on H1 Energy Efficiency Acceptable Solution H1/ AS2 for buildings up to 300m², the house complies with the following requirements :

2.1.2.1 Schedule method
(a) The glazing area is 30% or less of the total wall area.

Total wall area : 241.8 m²
Total vertical glazing area : 70.8 m²
Glazing area : 29.3 %

(b) The combined glazing area on the east, south and west facing walls is 30% or less of the combined total area of these walls.

Combined glazing area on the E, S and W facing walls : 36m²
Combined total area of these walls : 154.4 m²
Combined glazing area : 23.3 %

(c) The skylight area is no more than 1.5 m² or 1.5% of the total roof area (whichever is greater) – N/A no skylights.

(d) The opaque door area is no more than 6 m² or 6% of the total wall area (whichever is greater).

Total opaque entrance door AJ1 area : 2.6m²

6% x total wall area 241.8 m² : 14.5m²

Data:

North elevation facade

	Area m²	Joinery	Window/ door	Area m²
Living wall 1	21.3	W1	Window	2.3
		W2	Window	2.3
		W3	Window	2.3
Dining wall 2	9.4	AJ7	Bifold door	4.9
Dining wall 3	17.5	AJ8	Bifold door	4.9
		AJ9	Bifold door	4.9
Dining wall 4	8.1	AJ10	Bifold door	4.9
Side entry	7.7	AJ11	Hinged door with window	2.0
Bedroom 2 wall	16.3	AJ12	Sliding door	6.3
Trombe wall	7.1			
Total North wall area	87.4	Total glazing area		34.8

West elevation facade

	Area m²	Joinery	Window/ door	Area m²
Wall 1	42.6	AJ1	Total window	2.3
		AJ2	Window	3.4
		AJ3	Window	1.8
		AJ4	Window	1.5
		AJ5	Sliding door	6.6
		AJ6	Window	2.6
		AJ15	Sliding door	6.3
Wall 2	4.5			
Total West wall area	47.1	Total glazing area		24.5

South elevation facade

	Area m²	Joinery	Window/ door	Area m²
Wall 1	45.3	W4	Window	0.7
		W5	Window	0.7
		W6	Window	0.7
		W7	Window	1.1
Wall 2	18.7	AJ13	Hinged door with window	2.0
		AJ14	Sliding door	6.3
Wall 3 -joint wall	1.5			
Total South wall area	65.5	Total glazing area		11.5

East elevation facade

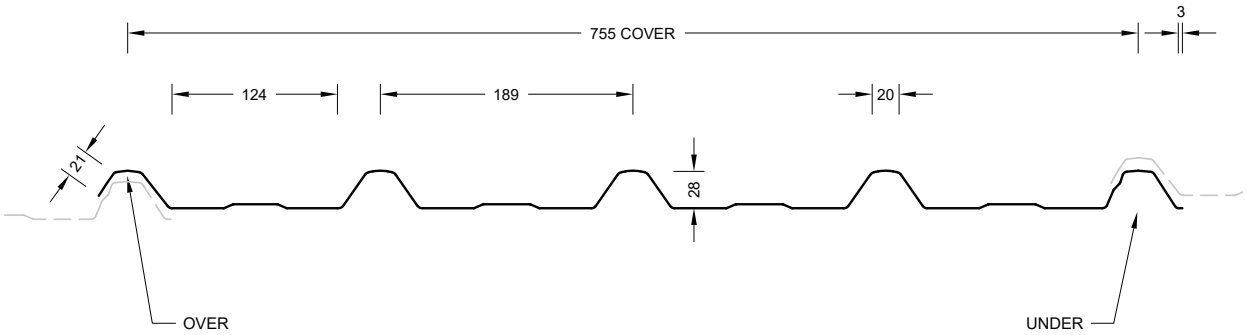
	Area m²		
Wall 1	37.2		
Wall 2	2.3		
Wall 3	2.3		
Total East wall area	41.8	Total glazing area	No glazing.

Combined glazing area on the E, S and W facing walls : (11.5 + 24.5) m² : 36 m²
Combined total area of these walls : (41.8 + 65.5 + 47.1) m² : 154.4 m²

Total wall area: (154.4+ North wall area 87.4) m² : 241.8 m²
Total glazing area: (36 + North glazing area 34.8) m² : 70.8m²

Building element	Minimum construction R-value (m².K/W) for climate zone 6	Proposed R-value
Roof	R6.6	Level ceiling: R7.0 Earthwool glasswool ceiling batts 330mm.
		Skillion roof: (Check roof rafter size). R7.4 Earthwool glasswool ceiling batts 265mm (290mm rafter)
Wall	R2.0	All external 90mm walls: R2.2 Earthwool glasswool wall batts 90mm.
		External 140mm walls at stacked schist stonework: R3.2 Earthwool glasswool wall batts 140mm.
		Acoustic wall insulation for laundry room internal wall surround: R2.8 Earthwool glasswool wall batts 90mm.
Slab-on-ground floor	R1.7	R1.8 50mm thick EXPOL-X extruded rigid polystyrene foam insulation (XPS) to underslab of concrete floor slab on blinded hardfill in 150mm max. layers.
Windows and doors	R0.50	R0.50 Double glazing thermally broken aluminium frame. Glass: Low E/ Clear gas: Argon

PRODUCT TECHNICAL STATEMENT



Styleline® has been specifically designed to produce contrasts of light and shade. Its stylish shape and the way it plays with light reflection means you only see the best from every angle, adding a contemporary look to your building.

SHEET TOLERENCES

Cover: ± 5mm - Sheet length: +10mm, -0mm (steel)

Cover: +10mm, -15mm – Sheet length: +0mm, -15mm (aluminium)

RECOMMENDED PRODUCT/DESIGN USE

- **Minimum Pitch:** 3 degrees
- **Cover (mm):** 755mm
- **Applications:** Residential/ Industrial/ Commercial Roofing and Wall Cladding
- **Materials:** Specified coating and material based on environmental conditions in accordance with E2/AS1. Available in metallic coated and pre-painted steel in 0.40mm, 0.55mm - Aluminium 0.90mm BMT (base material thickness) Matching translucent sheeting is available in G.R.P. (fibreglass)
- **Material Thickness:** Steel 0.40mm, 0.55mm – Aluminium 0.90mm
- **Colours:** Available in pre-painted ColorCote® ZinaCore™, MagnaFlow™ and MagnaFlow® COLORSTEEL® MAXAM™, Altimate®, UniCote® LUX Refer to www.colorcote.co.nz, www.colorsteel.co.nz, www.unicote.com.au
- **Durability:** All material selections must be compatible with the prevailing environmental conditions and adjacent materials. Areas not naturally exposed to rain will require scheduled maintenance.

ENVIRONMENTAL PRODUCT DECLARATION

Dimond Roofing® has been implementing green building principles across the industry for several years now and has developed a fully realised environmental sustainability pathway to reach our goal of reducing our carbon emissions by 30% by 2030. Dimond Roofing® has met the criteria for "Level A" certification for the Global GreenTag™ GreenRate™ ecolabel and as part of Dimond's Toitū carbonreduce® accreditation, essential Scope 1 & 2 emissions, are being measured as well as voluntarily measuring Scope 3 emissions.

Dimond Roofing® profiles are accredited with Eco Choice Aotearoa when manufactured from COLORSTEEL®. All manufacturing sites have been Audited by NZ Steel.

Dimond Roofing® recycle all steel scrap waste and offcuts which can then be remelted down and reused in other steel-based products. At the end of its useful life as a roofing profile can be recycled back by remelted down.

NEW ZEALAND BUILDING CODE COMPLIANCE

When used in accordance with Dimond Roofing installation and maintenance requirements, facilitate with meeting the following provisions of the NZBC:

- **B1 Structure:** Performance clauses B1.3.1, B1.3.2, B1.3.3 (a) (b) (c) (g) (h), B1.3.4 (b) and (d)
- **B2 Durability:** Performance clauses B2.3.1(b) and (c)
- **C3 Fire affecting areas beyond the fire source:** Performance clauses C3.4(a) and C3.9
- **E2 External moisture:** Performance clauses E2.3.1 and E2.3.2
- **F2 Hazardous building materials:** Performance clause F2.3.1
- **G12 Water Supplies:** Performance clauses G12.3.1 and G12.3.2

To comply with the performance clauses of NZBC E2 all cladding to be installed in accordance with:

- Acceptable Solutions NZS E2/AS1 or an Acceptable Alternative Solution
- MZ Metal Roofing Manufacturers Code of Practice
- Dimond Roofing Specification; details available on www.dimond.co.nz

Dimond Roofing is not subject to any warning or ban under section 26 of the Building Act 2004.

MAINTENANCE

In general, NZ metal roofing materials exposed to rain washing can be expected to comply with NZBC B2 without manual washing, or replacement of protective finishes.

Areas not directly exposed to rain, such as soffits, wall cladding under eaves, the undersides of gutters, fascia's, and sheltered areas like garage doors, will require scheduled maintenance.

Refer to ColorCote® Minimum Maintenance Schedule and COLORSTEEL® Maintenance Recommendations Brochure.

MATERIAL CLADDING TESTING AND PREFORMANCE

All cladding testing is carried out in accordance with the NZMRM Code of Practice – Testing and MRM Standards.

Material Options	Steel			Aluminium H36	Duraclad® (GRP)
Thickness (BMT) mm	0.40	0.55	0.75	0.90	1.7
Nominal Weight/lineal metre (kg/m)	3.17	4.27	N/A	2.28	3.0
Drape curved – min. radius (m)	80	40	N/A	40	12
(1) Purlin spacings for drape curving (m)	1.2	1.4	N/A	1.4	1.1
(2) Machine crimp curved - min. radius (mm)	900	400	N/A	400	N/A
(3) Unsupported Overhang (mm)	200	250	N/A	200	100

(1) Recommended maximum purlin spacings at minimum radius
(2) N/A
(3) Based on 1.1kN point load support, but not intended for roof access
N/R – Not recommended
N/A – Not available.

Roll-forming facility location: Whangarei, Auckland, Hamilton, Wellington, Christchurch and Dunedin
Crimp curving facility location: Hamilton and Christchurch
Manufacturing location for DuraClad®: Auckland
Sheet lengths: Styleline® is custom run to order.

Where long sheets are used consideration must be given to:

- Special transportation licences for sheets over 25m
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion.

DIMOND STYLELINE® LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed serviceability loads in kPa)

Serviceability Category		Unrestricted-Access Roof		Restricted Access Roof			Non-Access Roof & Wall		
G550 Steel 0.40mm	End Span			600	800	1000	1100	1300	1600
	Internal Span			900	1200	1600	1700	2000	2400
	Serviceability			**3.5**	**2.7**	**1.8**	**1.6**	**1.2**	**0.9**
G550 Steel 0.55mm	End Span	800	1000	1100	1300	1500	1500	1700	2000
	Internal Span	1200	1500	1600	1900	2200	2300	2600	3000
	Serviceability	**4.0**	**3.3**	**3.0**	**2.5**	**2.0**	**1.8**	**1.5**	**1.1**
5052 H36 Aluminium 0.70mm	End Span				600	800	900	1100	1300
	Internal Span				900	1200	1300	1600	1900
	Serviceability				**2.4**	**1.9**	**1.8**	**1.2**	**0.8**
5052 H36 Aluminium 0.90mm	End Span		800	900	1000	1100	1200	1500	1700
	Internal Span		1200	1300	1500	1700	1800	2200	2600
	Serviceability		**2.8**	**2.7**	**2.2**	**1.7**	**1.6**	**1.4**	**1.1**
Duraclad® 1.7mm (Note 4)	End Span					700	800	1000	1200
	Internal Span					1100	1200	1500	1800
	Serviceability					–	–	–	–
	Ultimate	**N/R**	**N/R**			**4.5**	**4.4**	**2.6**	**1.6**

Notes:

1. In Restricted Access Roof and Non-Access Roof & Wall applications, spans exceeding the maximum values shown should not be used. The maximum spans for Restricted Access Roofs are based on static point load testing as a guide and are further limited by practical experience of roof performance under dynamic foot traffic loads. For Non-Access Roof & Wall applications, the maximum spans are limited to ensure satisfactory appearance for wall cladding.
2. Loads given are based on 4 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. Duraclad®
   – Serviceability Limit State loads are not applicable to the Duraclad® material, as it does not experience permanent deformation.
   – System must include Safety Mesh if intended for use as a Restricted-Access roof. Refer Section 2.2.1.8.
5. N/R = not recommended.
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. Design Criteria for Limit State Capacities

   a) Serviceability Limit State (SLS Design)
   No deflection or permanent distortion that would cause unacceptable appearance, side lap leakage or water ponding, due to foot traffic point loads, inward or outward wind loads or snow loads.

   b) Ultimate Limit State (ULS Design)
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. System Design
   The span capacity of the roofing or cladding profile is determined from the Load Span Table, using the section of the chart appropriate to the grade and type of material, and the category of serviceability selected from the two categories above. Serviceability loads have been derived by testing according to NZMRM procedures. To obtain an ultimate limit state load, we recommend factoring the serviceability load by 1.4 in line with NZMRM guidelines.

   Note: The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are provided for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if point loads are placed carelessly.

   Service Category
   Refer to MRMCOP 3.7.4 Roof Traffic. The designer must consider the degree and type of foot traffic expected on a roof. The following requirements are subjective standards and must be considered in line with customer expectations, building use, and type. More robust design than specified below (such as reducing purlin spacing or adding protection from mechanical action) is required for roofs that are regularly accessed, used as staging by subsequent trades, or areas adjacent to access points, particularly step-down access.
9. Wind Pressure Guide
   As a guide for non-specific design the following S.L.S. design loads in accordance with the MRM Roofing Code of Practice can be used for buildings less than 10m high, otherwise AS/NZS 1170.2 should be used Low wind zone = 0.68kPa, Medium wind zone = 0.93kPa, High wind zone = 1.32kPa, Very high wind zone = 1.72kPa and Extra high wind zone = 2.09kPa.

FASTENERS

The durability of the fasteners should equal or exceed that of the material being fastened, and the fastener metal or coating must be compatible with the cladding material if in contact. Refer to NZS E2/AS1 table 20 for compatibility requirements.

The minimum embedment of 30mm is the requirement for screws fixing into timber and minimum of three threads to pass through steel. When fastening through cavity battens, thermal break materials etc ensure the length of the screw is increased to accommodate the extra material.

Common Fastener Lengths* – Roof Cladding – Crest Fixed			
Cladding Material	Timber Purlins (mm)	Steel Purlins/Girts up to 2.5mm (minimum 3 threads) (mm)	(1,2) Load Spreading Washers (LSW) (When required)
Steel	TT 12g x 65 with neo	ST 12g x 55 with neo	Steel with 30mm EPDM washer
Aluminium	TT 12g x 73 Alutite with neo and LSW TT 12g x 65 304 stainless steel with neo and LSW	ST 12g x 50 304 stainless steel with neo and LSW	Aluminium with 30mm EPDM washer

*Class 5 fasteners are recommended with steel-based material
(1) – When Using LSW increase fastener length by 10mm
(2) - When using LSW pre-drill a 10mm oversized hole to accommodate the EPDM washer

Common Fastener Lengths* – Wall Cladding – Pan Fixed		
Cladding Material	Timber Dwangs/Nogs (mm)	Steel Girts up to 2.5mm (mm)
Steel Direct fix	TT 12g x 40 with neo washer	ST 12g x 20 with neo washer
Steel On 20mm (nom.) Cavity Batten	TT 12g x 55 with neo washer	ST 12g x 35 with neo washer
Aluminium Direct fix	TT 14g x 35 Alutite with neo washer	**ST 12g x 25 304 stainless steel with neo washer
Aluminium On 20mm (nom.) Cavity Batten	TT 14g x 55 Alutite with neo washer	**ST 14g x 50 304 stainless steel with neo washer

*Class 5 fasteners are recommended with steel-based material.
**Stainless steel fasteners require to be separated from aluminium.

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to an average of 2 screw fasteners/sheet/purlin. If this is done, the distributed load capacities given in the chart should be reduced using a multiplying factor of 0.5.

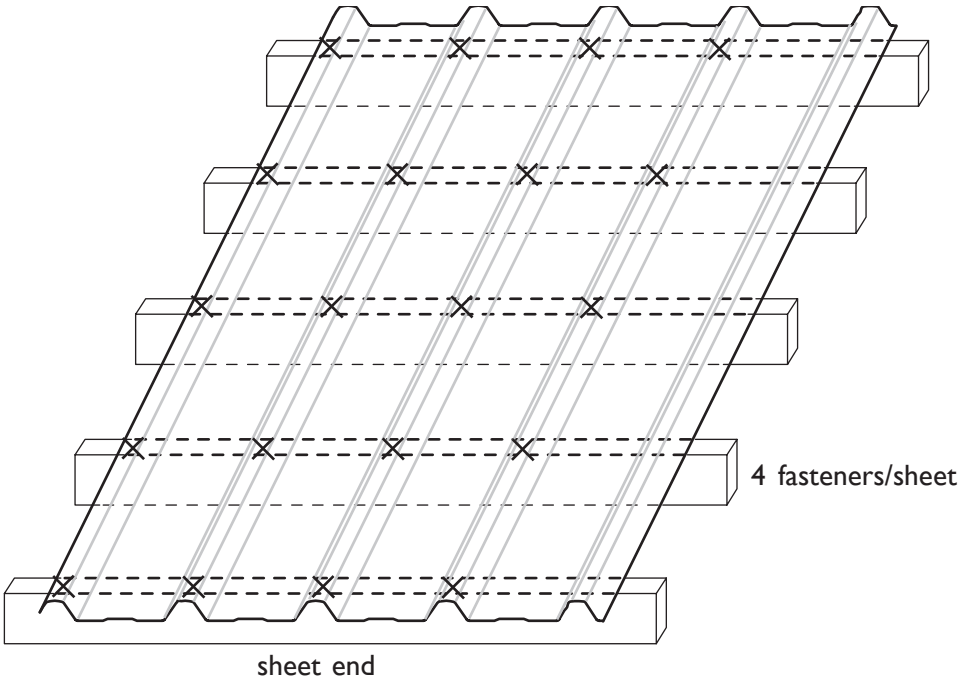
Long spans may require the specification and use of side lap stitching screws – see Section 2.3.2C Installation Information: Layout and Fastening.

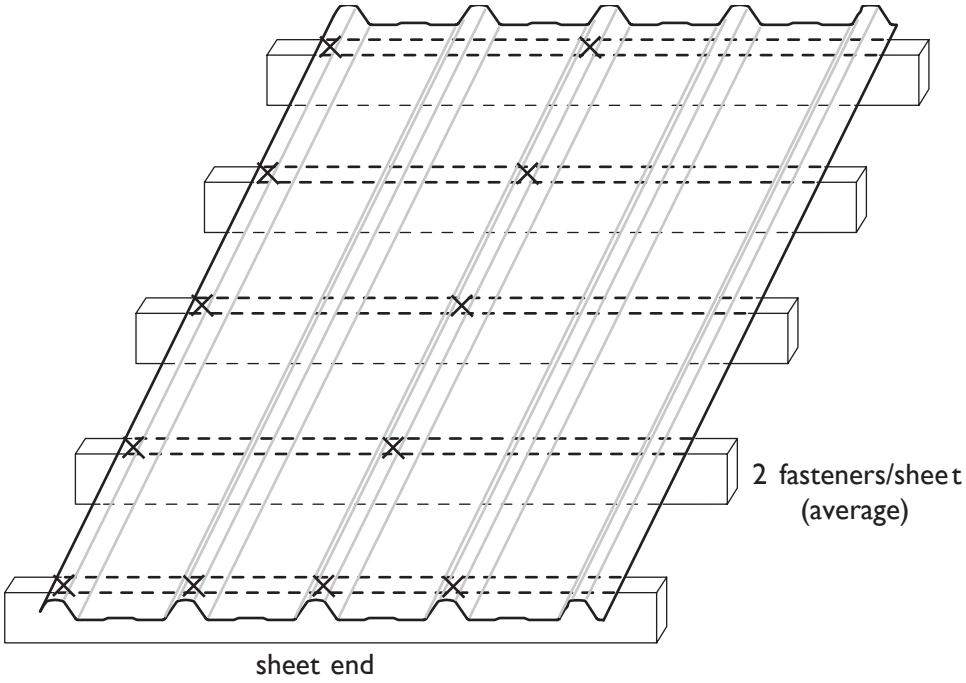
DESIGN EXAMPLE

Restricted access roof, 0.55mm G550 steel Styleline® has a maximum end span of 1500mm and a maximum internal span of 2200mm. The following distributed load capacities apply.

	4 fasteners/sheet	2 fasteners/sheet
End Span	1500mm	1500mm
Internal Span	2200mm	2200mm
Serviceability	2.0 kPa	1.0 kPa

DIMOND STYLELINE® FASTENER LAYOUT OPTIONS





DESIGN DETAILS

Design details covering residential & commercial roof & wall claddings are available at www.dimond.co.nz in PDF, DWG & RVT files under each product section.

PUBLICATIONS

To achieve the product's full potential, it must be designed, installed, and maintained in accordance with Good Trade Practice. For more information, please refer to:

NZS E2/AS1: www.building.govt.nz

NZMRM: New Zealand Metal Roofing and Wall Cladding Code of Practice – www.metalroofing.org.nz

NZMRM: Installation Guide – Metal Longrun Roofing and Cladding - www.metalroofing.org.nz

RANZ: How to Guides - www.ranz.co.nz

Pacific Coil Coaters: Choose the Right Roof www.colorcote.co.nz

Pacific Coil Coaters: Maintenance Schedule www.colorcote.co.nz

Pacific Coil Coaters: Environmental Product Declaration www.colorcote.co.nz

New Zealand Steel: Environmental Categories, Warranty & Product Maintenance Recommendations Brochure www.colorsteel.co.nz

New Zealand Steel: Maintenance Recommendations Bulletin - www.colorsteel.co.nz

New Zealand Steel: Installers Guide www.colorsteel.co.nz

UniCote LUX: Performance - www.unicote.com.au

UniCote LUX: Technical & Warranty – www.unicote.com.au

BRANZ: Good Profiled Metal Roofing and Wall Cladding - www.branz.co.nz

MBIE: Guide to tolerances, materials and workmanship in new residential construction 2015 - www.mbie.govt.nz

THERMAL NOISE

All profiled metal roofs and wall cladding can produce thermal noise from time to time. This occurs as the roof expands and contracts due to temperature changes, with darker colours potentially increasing the noise. The NZMRM Code of Practice addresses this issue.

According to the MBIE's 2015 "Guide to Tolerances, Materials, and Workmanship in New Residential Construction," noise from metal roofing's thermal expansion is considered normal and should be expected.

OIL CANNING

Differential thermal movement between wide, flat surfaces and ribs or corners within a metal sheet can create a visual effect known as oil canning. This refers to the visible waviness or undulations in the flat sections of metal cladding, roofing, or walling. Oil canning is an inherent architectural characteristic of flat metal surfaces and is not indicative of any performance issues with the product.

It may occur during the forming and installation processes, as well as throughout the roof's lifecycle due to thermal expansion. The visibility of oil canning can vary depending on lighting conditions, sun angles, and the gloss level of the coating.

For more details, please refer to Section 12.4 of the New Zealand Metal Roof and Wall Cladding Code of Practice.

Dimond Roofing, NZBN 9429037626563

Contacts: Technical Advice 0800 766 377 • Sales and Supply 0800 346 663

Website: https://www.dimond.co.nz/

Email Specification Team: roofspec@dimond.co.nz

Email Technical Team: rooftech@dimond.co.nz

Address: 48 Victoria Street, Onehunga, Auckland 1061.

Place of Manufacture: Aotearoa New Zealand

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Date of issue: June 2025, Version: V02.300625

Contact us

Dimond Roofing®
Ph. 0800 Roofspec (0800 766 377)
or 0800 DIMOND

dimond.co.nz

Dimond Roofing®

BRANZ Appraised
Appraisal No. 650 [2020]

HERMPAC VERTILINE VERTICAL SHIPLAP WEATHERBOARD CAVITY SYSTEM

Appraisal No. 650 (2020)

This Appraisal replaces BRANZ Appraisal No. 650 (2014)

Amended 18 July 2022



BRANZ Appraisals

Technical Assessments of products for building and construction.

Hermpac

Herman Pacific Limited
PO Box 35 209
Browns Bay
Auckland
Tel: 09 421 9840
Fax: 09 426 7638
Email: technical@hermpac.co.nz
Web: www.hermpac.co.nz

BRANZ

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is a cavity-based shiplap timber weatherboard external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 The system consists of vertically fixed Hermpac shiplap weatherboards, ventilated cavity battens, flashings and accessories and is finished with a premium penetrating oil, stain or an exterior paint system to Hermpac specifications.

1.3 The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with a minimum 18 mm drained cavity.

Scope

2.1 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating oil or stain finished Western Red Cedar, Yellow Cedar, and DuraLarch weatherboards and paint finished Yellow Cedar, DuraLarch and AshinDura weatherboards, has been appraised as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

2.2 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating oil or stain finished weatherboards has also been appraised for weathertightness and structural wind loading when used as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to building height and floor plan area; and,
- constructed with timber framing subject to specific engineering design; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

2.3 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating paint finished Western Red Cedar weatherboards has been appraised as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including, Medium when dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including, Very High when dwangs or structural Vertibat cavity battens are at maximum 400 mm centres.

2.4 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must only be installed vertically on vertical, flat surfaces.

2.5 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(Note: The Appraisal of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.)*

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets the requirements for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 (a), (h), (j) and (q)]. See Paragraphs 9.1-9.5.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.2. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets these requirements. See Paragraphs 10.1 and 10.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets this requirement. See Paragraphs 14.1-14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets this requirement.

Technical Specification

4.1 System components and accessories supplied by Hermpac are as follows:

Hermpac Shiplap Weatherboards

- Hermpac shiplap weatherboards are manufactured from Canadian Coastal Western Red Cedar and Yellow Cedar. Selected weatherboards are also manufactured from DuraLarch and AshinDura.
- The weatherboard lap and rebate profiles are in accordance with NZS 3617 and BRANZ Bulletin 411.
- The weatherboards are supplied minimum 18 mm thick, and are available in a range of widths and face profiles. They are supplied in random lengths up to 6.1 m. Lengths outside of the general specification may be available by special contract.
- Western Red Cedar and Yellow Cedar finger-jointed weatherboards (CedarOne and CedarLine) are minimum 17.5 mm thick, and are available in a range of widths and face profiles. They are supplied in random lengths up to 6.1 m. Lengths outside of the general specification may be available by special contract.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

- Western Red Cedar, Yellow Cedar (including CedarOne and CedarLine) and DuraLarch weatherboards are supplied unfinished for site finishing with oil, stain or paint prior to installation, or prefinished using the flood coat application method by Machinecoat NZ Limited. AshinDura weatherboards are treated to Hazard Class H3.1 and must be paint finished only. They are supplied primed, or prefinished by Machinecoat NZ Limited. Refer to the Appraisals listing on the BRANZ website for details of the Hermpac shiplap weatherboard profiles covered by this Appraisal. *(Note: This Appraisal is only valid when weatherboards with profiles as listed are supplied by Hermpac.)*

Accessories

- **Hermpac external corner mouldings** - 40 x 40 mm, 42 x 42 mm and the Hermpac 'Smart Corner' series of profiled external corner moulds supplied in lengths 1.8 m and longer.
- **Hermpac internal corner mouldings** - 18.5 x 18.5 mm through to 39 x 39 mm and the Hermpac 'Smart Corner' series, supplied in lengths 1.8 m and longer.
- **Hermpac cover boards** - 18 mm thick boards in widths of 69 and 90 mm. The cover boards are supplied in lengths 1.8 m and longer.
- **Hermpac eaves moulding** - 40 x 27 mm, 26 x 15 mm and 30 x 18 mm bevelled profile, supplied in 1.8 m and longer.

  (Note: All timber accessories are manufactured from Canadian Coastal Western Red Cedar, Yellow Cedar or DuraLarch.)
- **Hermpac J Mould Flashing** – an optional extruded aluminium J-shaped flashing to cap the ends of the weatherboards at window and door jambs. The J Mould is available 20 and 29.5 mm wide with a 70 mm return and is supplied in 2.4 and 3 m lengths.
- **Hermpac aluminium cavity closure** – an extruded aluminium cavity closure available 20 and 40 mm wide. The cavity closure is supplied in 2.4 and 3 m lengths.
- **Vertibat cavity battens** – 45 x 20 mm (V1), 45 x 40 mm (V3), 45 x 45 mm (V5), 70 x 20 mm (V2), 70 x 40 mm (V4) or 70 x 45 mm (V6) radiata pine battens treated to Hazard Class H3.1 or H3.2. Vertibat cavity battens 45 x 18 mm (V8 and V9) are available in Western Red Cedar (refer to BRANZ Appraisal No. 1189). The top and bottom edges are bevelled with a slope. The front and back face of the batten are grooved with 20 mm wide x 5 mm deep rebates at 100 mm centres. The grooves are offset on each face.
- **Vertibat cavity batten fixings** (for 40 or 45 mm thick battens when fixed to studs only) – 12 g x 65 mm long Grade 304 stainless steel screws (for 40 mm battens) and 12 g x 75 mm long Grade 304 stainless steel screws (for 45 mm battens).
- **Hermpac oil or stain finished shiplap weatherboard fixings** (for Vertibat battens fixed to dwangs) - silicon bronze, or Grade 316 stainless steel annular grooved Hermpac crown head, rose head or flat head nails. The nail shank must be minimum 3.25 mm diameter and the length must allow minimum 30 mm penetration of the wall frame.
- **Hermpac oil or stain finished shiplap weatherboard fixings** (for 40 or 45 mm Vertibat battens fixed to studs only) - silicon bronze, or Grade 316 stainless steel annular grooved Hermpac crown head, rose head or flat head nails. The nail shank must be minimum 2.8 mm diameter and the length must allow minimum 30 mm penetration of the Vertibat batten.
- **Hermpac paint finished shiplap weatherboard fixings** - Grade 316 stainless steel annular grooved jolt head nails. The nail shank must be minimum 3.25 mm diameter and the length must allow minimum 35 mm penetration of the wall frame or Vertibat cavity batten (for 40 or 45 mm Vertibat battens fixed to studs only).
- **Hermpac weatherboard screw fixing** - Grade 316 stainless steel starcap screws to give a minimum 21 mm penetration of wall framing or structurally fixed cavity batten.
- **Hermpac clinch nails** - 27 x 2, 40 x 2 or 50 x 2 mm Grade 316 stainless steel annular grooved nails with an off-set flat head.
- **Hermpac cover board fixings** - 50 x 2.8 mm silicon bronze, or Grade 316 stainless steel annular grooved Hermpac crown head, rose head or flat head nails.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

4.2 Accessories used with the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System which are supplied by the building contractor are:

- **Flexible wall underlay** - building paper complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible wall underlay support** - polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible wall underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: Mesh and wire galvanising must comply with AS/NZS 4534.]*
- **Rigid wall underlay** - plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- **Flexible sill and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Window and door trim cavity air seal** - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Vertibat cavity batten fixings** (18 mm and 20 mm thick batten) - 40 x 2.5 mm flat head hot-dip galvanised nails or 50 x 2.87 mm hot-dip galvanised gun nails to temporarily fix the battens in place prior to installation of the cladding.
- **Vertibat cavity batten fixings** (40 or 45 mm thick battens when fixed to dwangs) - 60 x 2.8 mm flat head hot-dip galvanised nails or 60 x 2.87 mm hot-dip galvanised gun nails to temporarily fix the battens in place prior to installation of the cladding.
- **Cavity closure strip** - uPVC, aluminium or stainless steel, punched with 3-5 mm diameter holes or slots complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.
- **Flashings** - including external corner flashing, internal corner flashing, horizontal inter-storey joint flashing, balustrade and parapet saddle flashing, and balustrade and parapet cap flashings. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 and Table 21 for durability and material compatibility requirements.
- **Aluminium joinery head flashings** - as supplied by the joinery manufacturer or contractor.
- **Flexible sealant** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.

Finishing System Specification - Oil or Stain Finish

4.3 Prior to the installation of oil or stain finished weatherboards, the back, face, ends and edges of the Hermpac shiplap weatherboards not supplied prefinished must be sealed with an exterior grade oil or oil-based penetrating stain. At least two coats of an exterior grade quality oil or oil-based penetrating stain must be used over the front face of the Hermpac shiplap weatherboards to protect the weatherboards and give the desired finish colour to the exterior walls. The oil or stain must be recommended for use as a wall cladding oil or stain by the manufacturer and must be applied in accordance with the manufacturer's instructions. Proprietary oil or stain systems have not been assessed, and are therefore outside the scope of this Appraisal. *[Note: Hermpac recommends the use of oils and oil-based stains manufactured by Resene and WoodX.]*

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Finishing System Specification – Paint Finish

4.4 Prior to the installation of paint finished weatherboards that are supplied unprimed, the back, face, ends and edges of the Hermpac shiplap weatherboards must be primed in accordance with the Technical Literature for the relevant timber type. All exposed edges, including top edges at sills and all bottom edges of Hermpac shiplap weatherboards and accessories not supplied prefinished, must be finished with at least two coats of an exterior grade paint complying with any of Parts 7, 8, 9 or 10 of AS 3730 to protect the weatherboards and give the desired finish colour to the exterior walls. The paint must be recommended for use as a wall cladding paint for the selected timber by the manufacturer and must be applied in accordance with the manufacturer's instructions. Proprietary paint systems have not been assessed, and are therefore outside the scope of this Appraisal. *(Note: For Hermpac shiplap weatherboards, Hermpac recommends using paint with a colour that has a Light Reflectance Value (LRV) of ≥ 40% for Western Red Cedar, Yellow Cedar or AshinDura, or ≥ 45% for DuraLarch.)*

Handling and Storage

5.1 Handling and storage of all materials supplied by Hermpac or the building contractor, whether on-site or off-site, is under the control of the building contractor. Hermpac vertical shiplap weatherboards must be stacked flat and true, clear of the ground by a minimum of 150 mm and supported on dry and clean timber bearers at maximum 900 mm centres. They must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. Care must be taken to avoid damage to edges, ends and the weatherboard surfaces.

5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- VertiLine Vertical Shiplap Weatherboards Cavity System Installation Specifications, May 2022V2.
- All drawings referenced in HC-SHIP-000 and HC-SHIP-001, both issued 2022.
- All drawings referenced in HC-SHIP40-000 and HC-SHIP40-001, both dated 18/10/2017.
- All drawings referenced in VC-RWD-000 and VC-RWD-001, both dated 15/4/2020.

6.2 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

Framing

Timber Treatment

7.1 Timber wall framing behind the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres. Where Vertibat cavity battens are fixed to dwangs, the dwangs must be fitted flush between the studs at maximum 480 mm centres. Where interior linings compliant with NZS 3604 Section 12 are installed directly to the interior face of the wall framing and Vertibat cavity battens are structurally fixed to studs in accordance with Paragraph 17.3 of this Appraisal, dwangs are not required. Refer to NZS 3604 Section 8.5.4 for further information.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

7.3 Additional framing may be required at soffits, internal and external corners, and window and door openings for the support and fixing of cavity battens and the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System.

7.4 Timber wall framing behind where weatherboards are joined over a cavity batten must be nominal 50 mm thickness (i.e. 45 mm minimum finished thickness).

7.5 Timber wall framing must have a maximum moisture content of 24% at the time of the cladding application. *(Note: If Hermpac shiplap weatherboards are fixed to framing with a moisture content of greater than 24% problems may occur at a later date due to excessive timber shrinkage.)*

General

8.1 When the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is used for specifically designed buildings up to 2.5 kPa design differential ULS wind pressure, only the weathertightness aspects of the cladding and maximum framing centres are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 Punchings in the cavity vent strip must provide a minimum ventilation opening area of 1,000 mm^2 per lineal metre of wall in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 (b). *(Note: Vertibat cavity battens can be used to provide vermin proofing at the bottom of the cavity.)*

8.3 The ground clearance to finished floor levels as set out in NZS 3604 must be adhered to at all times. At ground level, paved surfaces, such as footpaths, must be kept clear of the bottom edge of the cladding system by a minimum of 100 mm, and unpaved surfaces by 175 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Table 18.

8.4 At balcony, deck or roof/wall junctions, the bottom edge of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must be kept above the top surface of any adjacent roof flashing by a minimum of 35 mm, in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.

8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for Wind Zones up to, and including, Very High, and rigid underlays for buildings in the Extra High Wind Zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the weatherboard fixing lengths must be increased by a minimum of the thickness of the underlay.

8.6 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

8.7 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 m in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 (b).

Structure

Mass

9.1 The mass of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is less than 30 kg/m^2. The system is therefore considered a lightweight cladding in terms of NZS 3604.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Impact Resistance

9.2 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has good resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

Wind Zones

9.3 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating oil or stain finished Cedar or DuraLarch weatherboards is suitable for use in all Wind Zones of NZS 3604, up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa design differential ULS wind pressure where buildings are specifically designed.

9.4 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating paint finished DuraLarch, AshinDura and Yellow Cedar weatherboards is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1.

9.5 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System incorporating paint finished Western Red Cedar weatherboards (fixed with jolt head nails) is suitable for use in NZS 3604 Wind Zones up to, and including Medium when dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including, Very High when dwangs or structural Vertibat cavity battens are at maximum 400 mm centres.

Durability

Serviceable Life

10.1 Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System installations are expected to have a serviceable life of at least 20 years provided the system is maintained in accordance with this Appraisal and the Hermpac shiplap weatherboards are continuously protected by a oil, stain or paint finish. *(Note: For oil or stain finished weatherboards, this opinion only covers serviceability with regards to structural and weathertightness performance. It does not cover appearance, which may deteriorate significantly, especially when proper and regular maintenance is not carried out.)*

10.2 Microclimatic conditions, including geothermal hot spots, industrial contamination and mild corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of weatherboards in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

11.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.

11.2 Regular cleaning (at least annually) of the oil, stain or paint coating is required to remove grime, dirt and organic growth, and to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent.

11.3 Recoating of the oil or stain finish will be necessary throughout the life of the cladding system. Recoating must be carried out, on average every 2-3 years or in accordance with the oil or stain manufacturer's instructions. Recoating will be required more frequently on exposed northern and western facing walls. When recoating, care must be taken to ensure bottom edges and shiplap edges are well covered and penetrated with the oil or stain.

11.4 Recoating of the paint finish will be necessary throughout the life of the cladding system. Repainting must be carried out, on average every 7-10 years or in accordance with the paint manufacturer's instructions. When repainting, care must be taken to ensure bottom edges and shiplap edges are well covered with the paint.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

11.5 Annual inspections must be made to ensure that all aspects of the cladding system, including flashings and joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration, which would allow water ingress must be repaired immediately. Sealant, oil, stain or paint coatings, flashings or the weatherboards must be repaired in accordance with the relevant manufacturer's instructions.

11.6 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the system. *[Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System.]*

Control of External Fire Spread

Vertical Fire Spread

12.1 This Appraisal only covers buildings 10 m or less in height. NZBC Functional Requirement C3.2 identifies that external vertical fire spread to upper floors only needs be considered for buildings with a building height greater than 10 m. Control of external vertical fire spread is therefore outside the scope of this Appraisal.

Horizontal Fire Spread

12.2 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has not been assessed for a peak heat release or total heat released rating and therefore cannot be used within 1 m of the relevant boundary or Risk Group SI Buildings.

12.3 Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 and NZBC Verification Method C/VM2 for fire resistance rating and control of external fire spread requirements for external walls.

Prevention of Fire Occurring

13.1 Separation or protection must be provided to the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and NZBC Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

14.1 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, when installed in accordance with this Appraisal and the Technical Literature, will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with NZBC Clause E2.3.5.

14.3 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.

14.4 The details given in the Technical Literature for weather sealing are based on the principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal, and are the responsibility of the designer for compliance with the NZBC.

14.5 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System, where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirements for junctions, penetrations, etc. to remain weather resistant.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Internal Moisture

15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

15.2 The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirement

16.1 All design and building work must be carried out in accordance with the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System. 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.

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System. Flexible wall underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid wall underlay materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems must be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the wall underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Vertibat Cavity Batten Installation (to Dwangs)

17.2 Vertibat cavity battens must be installed horizontally over the wall underlay to the wall framing (dwangs) at maximum 480 mm centres. (Refer to Paragraph 9.5 for the maximum dwang spacings for paint finished Western Red Cedar weatherboards fixed with jolt head nails.) The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with 40 x 2.5 mm flat head hot-dip galvanised nails or 50 x 2.87 mm hot-dip galvanised gun nails (for 20 mm thick battens), or 60 x 2.8 mm flat head hot-dip galvanised nails or 60 x 2.87 mm hot-dip galvanised gun nails (for 40 mm thick battens) to temporarily fix the battens in place prior to installation of the cladding. *(Note: Stainless steel finishing brads or nails can also be used.)*

Vertibat Cavity Batten Installation (to Studs)

17.3 40 or 45 mm thick Vertibat cavity battens must be installed horizontally over the wall underlay to the wall framing (studs) at maximum 480 mm centres. (Refer to Paragraph 9.5 for the maximum Vertibat cavity batten spacings for paint finished Western Red Cedar weatherboards fixed with jolt head nails.) The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with one 12 g x 65 mm long Grade 304 stainless steel screw at each stud crossing (maximum 600 mm centres) for 40 mm thick battens, or one 12 g x 75 mm long Grade 304 stainless steel screw at each stud crossing for 45 mm thick battens.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation

17.4 Hermpac shiplap weatherboards may be cut on-site by power or hand saw. Holes and cut-outs may be formed by using a hole saw.

17.5 Hermpac shiplap weatherboards must be dry prior to installation.

17.6 Before oil or stain finished Hermpac shiplap weatherboards are installed, the back, face and edges must be sealed with an exterior grade oil or oil-based penetrating stain. During installation, cut ends must be sealed with an exterior grade oil or oil-based penetrating stain.

17.7 Before paint finished Hermpac shiplap weatherboards are installed, the back, face and edges must be primed with an exterior grade primer. During the installation of paint finished Hermpac shiplap weatherboards, cut ends must be sealed with two coats of an exterior grade alkyd timber primer.

17.8 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner, external corner moulding etc. The necessary flashings must be installed before commencing weatherboard fixing and the cavity closure must be installed continuously around the bottom of the cavity.

17.9 Hermpac shiplap weatherboards must be installed starting at the corner of the wall section being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50 mm. The weatherboards should be installed with the lap facing away from the prevailing winds.

17.10 Immediately prior to installing the weatherboards over the internal and external corner flashings, a continuous bead of sealant must be applied to the face of the flashing along the fixing line.

17.11 Hermpac shiplap weatherboards must be overlapped a minimum of 25 mm, with an expansion gap of 2 mm at the overlap. In NZS 3604 Wind Zones up to, and including, Very High, it is recommended that the top of the weatherboard lap is restrained using the Hermpac clinch nail at every cavity batten. Hermpac clinch nails must be used to restrain the top of the weatherboard lap in the Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa.

17.12 Fix weatherboards in full lengths where possible. Where joints are unavoidable, scarf the weatherboard at 30° over a cavity batten and fix with one fixing through the overlapping board.

Nail-Fixing Weatherboards

17.13 Hermpac shiplap weatherboards must be pre-drilled with a hole diameter slightly smaller than that of the nail. Each weatherboard is to be fixed with one nail per board at every cavity batten.

17.14 For nail-fixing of the weatherboards, silicone bronce or Grade 316 stainless steel annular grooved Hermpac crown head, rose head, flat head or jolt head nails must be used. The nail length must allow minimum 30 mm penetration (35 mm for jolt head) of the timber framing or structurally fixed cavity batten. Note that jolt head nails are for paint finish only.

17.15 Fixing must be located 30-35 mm in from the weatherboard lap and a minimum of 32 mm from the end of the board. Crown head, rose head or flat head nails must finish flush onto the surface of the weatherboard, not into or below the surface. Nails must be installed with a slight upslope to reduce capillary draw. Jolt head nails must be punched a maximum of 2 mm beneath the surface of the board.

Screw-Fixing Weatherboards

17.16 Hermpac shiplap weatherboards must be pre-drilled with a hole diameter slightly smaller than that of the screw. Each weatherboard is to be fixed with one screw per board at every cavity batten.

17.17 For screw fixing of the weatherboards, Grade 316 stainless steel Hermpac starcap screws must be used. The screw length must allow minimum 21 mm embedment of the framing timber or structurally fixed cavity batten.

17.18 Fixing must be located 30-35 mm in from the weatherboard lap and a minimum of 32 mm from the end of the board. The base of the screw head must finish flush onto the surface of the weatherboard, not into or below the surface.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Aluminium Joinery Installation

17.19 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5-10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

Finishing

17.20 The coating manufacturer's instructions must be followed at all times for application of the oil or stain finish.

17.21 To prevent swelling of the weatherboard around punched fixings, the fixing must be filled immediately, or alternatively the weatherboard and the head of the fixing must be primed with a premium alkyd timber primer.

17.22 The paint coating manufacturer's instructions must be followed at all times for the application of the paint finish. Hermpac shiplap weatherboards must be painted as soon as practicable following fixing and must be clean and dry before commencing. If the Hermpac shiplap weatherboards are exposed to the weather for more than 2 months they must be reprimed with one coat of primer prior to the application of the finishing coats. Allow the recommended drying time between coats and follow the temperature limitations for application.

Inspection

17.23 The Technical Literature must be referred to during the inspection of Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System installations.

Health and Safety

18.1 Cutting of Hermpac shiplap weatherboards must be carried out in well ventilated areas and dust masks, eye and hearing protection must be worn.

18.2 Safe use and handling procedures for the components that make up the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is based on testing and evaluation of all details within the scope and as stated within this Appraisal. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System was tested to NZBC Verification Method E2/VM1. The testing assessed the performance of the Vertibat cavity battens, foundation detail, window head, jamb and sill details, meter box head, jamb and sill details, vertical joints, internal and external corners and balustrade to wall junction. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for cavity-based weatherboard claddings.
- Fastener pull through testing. BRANZ determined design wind suction pressures, and by comparing these pressures with AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Other Investigations

20.1 Structural and durability opinions have been provided by BRANZ technical experts.

20.2 The performance of timber weatherboard wall cladding products in New Zealand has been considered, including the structural and durability performance, and non-hazardous nature.

20.3 Site inspections have been carried out by BRANZ to assess the practicability of installation.

20.4 The Technical Literature for the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of Hermpac shiplap weatherboards has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality of materials, components and accessories supplied by Hermpac is the responsibility of Hermpac.

21.3 Quality of installation on-site of components and accessories supplied by Hermpac and the building contractor is the responsibility of the installer.

21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and joinery, wall underlays, flashing tapes, air seals, cavity battens and the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System in accordance with the instructions of Hermpac.

21.5 Building owners are responsible for the maintenance of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System in accordance with the instructions of Hermpac.

Sources of Information

- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 4534:2006 Zinc and zinc/aluminium-alloy coatings on steel wire.
- BRANZ Bulletin Number 411, April 2001, Recommended Timber Cladding Profiles.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 3617:1979 Specification for profiles of weatherboards, fascia boards and flooring.
- NZS 4211:2008 Specification for performance of windows.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 18 July 2022

This Appraisal has been amended to remove reference to Cavibat cavity battens, add Yellow Cedar back into the Appraisal, add CedarOne and CedarLine, add the option of screw-fixing of the weatherboards and adjust the minimum thickness of the weatherboards.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

BRANZ

In the opinion of BRANZ, the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System 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 Herman Pacific 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. Herman Pacific 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 Herman Pacific 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 Herman Pacific Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
27 May 2020

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

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VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

1.0 General Information

1.1 Introduction

The VertiLine Vertical Shiplap Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

The cladding system consists of vertically fixed Hermpac shiplap timber weatherboards installed over ventilated battens, flashings and accessories and is finished with a premium penetrating oil/stain or paint finish to Hermpac specifications.

The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with an 18/20/40 and 45mm minimum drained cavity.
Herman Pacific Ltd currently purchases timber under the following chain of custom schemes: FSC and PEFC.

1.2 BRANZ Appraisal

The VertiLine Vertical Shiplap Cavity System has been appraised by BRANZ. Refer to Appraisal No. 650 (2020).

1.3 CODEMARK Certification

The VertiLine Vertical Shiplap Cavity System has the Codemark Certificate of Conformity. Refer Certificate No. GM-CM30036.

1.4 Hermpac Vertical Shiplap Weatherboards

Hermpac vertical shiplap weatherboards are manufactured from Canadian Coastal Western Red Cedar and Yellow Cedar. Selected weatherboard profiles are manufactured from Kanda and AshinDura. NB: AshinDura available as paint finish only.

The weatherboard lap and rebate profiles are in accordance with NZS 3617 and BRANZ Bulletin 411. The weatherboards are available in a range of sizes and face profiles. They are supplied as a random length supply. Select lengths are outside of the general specification and are available by special contract.

1.5 Cavity Battens

The VertiLine Vertical Shiplap Cavity System uses Vertibat timber cavity battens to separate the weatherboards from the wall frame and form the cavity.

The Vertibat batten is installed horizontally over nogs/dwangs to provide support for the weatherboards at fixings points. The 40 and 45mm thick Vertibat battens can be structurally fixed, installed horizontally across the studs and the weatherboards are then fixed into the batten only.

Cavity battens are Vertibat 45 x 18mm (V8/V9) Western Red Cedar, 45 x 20mm (V1), 45 x 40mm (V3), 45 x 45mm (V5), 70 x 20mm (V2), 70 x 40mm (V4), 70 x 45mm (V6) thick Radiata pine treated to Hazard Class H3.1 or H3.2. The top and bottom edges are bevelled with a slope. The front and back face of the batten is grooved with nominal 20mm wide x 5mm deep rebates at 95mm centres. The grooves are offset on each face. Refer BRANZ Appraisal 1189 (2021) Hermpac Cedar Horizontal Cavity Battens.

1.6 Accessories

Accessories supplied by Hermpac for use with the VertiLine Vertical Shiplap Cavity System include:

- Hermpac external corner mouldings – HP40 (40 x 40mm) and HP42 (42 x 42mm) and the Hermpac 'Smart Corner' series, profiled external corner moulds.
- Hermpac internal corner mould – HP41 (18.5 x 18.5mm), through to HP110 (39 x 39mm) profiles and the Hermpac 'Smart Corner' series.
- Hermpac cover battens – HP201 (69 x 18mm) and HP202 (90 x 18mm).
- Hermpac cover batten fixings – 50 x 2.8mm silicon bronze or Grade 316 Stainless Steel annular grooved Hermpac Crown, Rose or Flat Head nails for oil/stain finish or Grade 316 Stainless Steel annular grooved Jolt Head nails for paint finish.
- Hermpac eaves moulding – HP32 (40 x 27mm), HP33 (26 x 15mm) and HP7 (30 x 18mm) bevelled profile.
- Screw fixings for 40-45mm thick Vertibat cavity batten fixed to studs only – 12gauge x 65-75mm long Grade 304 Stainless Steel screws. Minimum 25mm penetration to frame required.
- Hermpac scribers - HP11 - HP18, with bevelled or radiused edges (cut to suit as required).
- Hermpac scriber fixings - length to suit scriber size (minimum 50 x 2.8mm) Stainless Steel annular grooved Hermpac Crown, Rose or Flat Head nails for oil/stain finish or Jolt Head nails for paint finish.
- **Nail fixing - Oil/Stain finished weatherboard fixing** – Silicon Bronze or Grade 316 Stainless Steel annular grooved Hermpac Crown, Rose or Flat head nails. NB: Nail shank diameter and length as per Hermpac construction drawings. Must allow minimum 30mm embedment into framing timber (nog/dwang) or structurally fixed cavity batten.
- **Screw fixing - Oil/Stain finished weatherboard fixing**- Grade 316 Stainless Steel or Bronzed Stainless Hermpac Starcap Screw. NB: Must allow minimum 21mm embedment into framing timber (nog/dwang) or structurally fixed cavity batten. NB: Kanda Vertical Shiplap weatherboards **must be** screw fixed.
- **Paint finished weatherboard fixings** – Grade 316 annular grooved Hermpac Jolt head nails. Nail shank diameter and length as per Hermpac construction drawings. Must allow minimum 35mm embedment into framing timber (nog/dwang) or structurally fixed cavity batten. NB: If Crown, Rose, Flat head nails or Starcap Screws are used, refer to fixing clauses above.
- Hermpac clinch nails – Grade 316 Stainless Steel annular grooved nails with an off-set flat head.
- Hermpac aluminium flashings – widths to suit specified corners – 2.4m or 3.0m lengths – no substitutions.
- Hermpac J Mould Flashing – for window jambs – 20mm or 29.5mm, 2.4m or 3.0m lengths.
- Hermpac aluminium Cavity Closure – 20/40/45mm, 2.4m or 3.0m lengths.

1.7 Handling and Storage

Hermpac vertical shiplap weatherboards must be stacked flat and true, clear of the ground by a minimum of 150mm and supported on dry and clean timber bearers at maximum 900mm centres.
The weatherboards must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. Care must be taken to avoid damage to edges, ends and the weatherboard surfaces. Water must not be allowed to enter the stack.

2.0 Design Information

2.1 Design Responsibility

The Specifier for the project must ensure that the details in this literature are suitable for the intended application and that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature.

2.2 Scope

This specification covers the use of the VertiLine Vertical Shiplap Cavity System as an external vertically fixed wall cladding system for buildings within the following scope:
All oil/stain finished Hermpac weatherboards fixed with crown/rose/flat head nails or Starcap screws. Paint finished Yellow Cedar, and AshinDura weatherboards fixed with annular grooved jjolt/crown/rose or flat head nails.

Paint finished Western Red Cedar weatherboards fixed with annular grooved crown/rose/flat head nails:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including 'Extra High'.

Any oil/stain or paint finished weatherboards if fixed with annular grooved flat/crown/rose head nails, or Starcap screws only, for weathertightness and structural wind loading for 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,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

Paint finished Western Red Cedar weatherboards (including CedarOne/CedarLine) fixed with annular grooved jolt head nails:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Medium when nogs/dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including Very High when nogs/dwangs or structurally fixed Vertibat cavity battens are at maximum 400mm centres.

For applications which are outside the scope of this literature and details which are not in this literature the specifier must ensure that the design meets the relevant performance requirements of the NZBC. Hermpac recommends that professional design advice is sought in these circumstances.

2.3 Building Regulations

The VertiLine Vertical Shiplap Cavity System if designed, used and installed in accordance with the statements and conditions of this literature and the supporting BRANZ Appraisal, will meet the following provisions of the New Zealand Building Code:

- Clause B1 Structure
- Clause B2 Durability
- Clause E2 External Moisture
- Clause F2 Hazardous Building Materials

2.4 Ground Clearances

The finished floor level must have a minimum clearance to paved or unprotected ground as required by NZS 3604:2011. Hermpac weatherboards must overhang the floor structure by a minimum of 50mm as required by NZBC Acceptable Solution E2/AS1, Table 18.

The bottom edge of the VertiLine Vertical Shiplap Cavity System must finish a minimum of 100mm above paved surfaces or 175mm above unprotected ground.

At deck or low pitch roof/wall junctions, the bottom edge of the Hermpac weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm.

2.5 Structure & Framing

Timber wall framing behind the VertiLine Vertical Shiplap Cavity System must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Use of timber framing must be in accordance with framing manufacturer's specifications.

In all cases studs must be at maximum 600mm centres. Where Vertibat cavity battens are fixed to nogs/dwangs, the nogs/dwangs must be fitted flush between the studs at maximum 480mm centres. Where 40-45mm thick Vertibat cavity battens are structurally fixed at studs only, nogs/dwangs are not required. Refer Paragraph 7.2 of BRANZ Appraisal No. 650 (2020) for more information.

Note: For paint finished Western Red Cedar weatherboards (including CedarOne/CedarLine) fixed with annular grooved Grade 316 Stainless Steel Jolt head nails, nogs/dwangs or structurally fixed Vertibat cavity battens must be at a maximum 480mm centres for NZS 3604 Wind Zones up to, and including Medium and at a maximum 400mm centres for NZS 3604 Wind Zones High and Very High.

2.6 Framing Tolerances

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604:2011.

2.7 Cavity Closure Strip

The VertiLine Vertical Shiplap Cavity System must incorporate a cavity closure strip to close off the bottom of the cavity and provide resistance against the penetration of vermin. The cavity closure strip must be in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3. The cavity closure strip must be manufactured from uPVC, aluminium or Stainless Steel, and be punched with 3-5mm holes or slots which provide a minimum ventilation opening area of 1000mm² per lineal metre of wall.

2.8 Wall Underlay

The VertiLine Vertical Shiplap Cavity System must be installed over wall underlay complying with NZBC Acceptable Solution E2/AS1, Table 23, or wall underlays covered by a valid BRANZ Appraisal.

All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including 'Very High', and rigid underlays for buildings in the 'Extra High' wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure.

Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the weatherboard fixing lengths must be increased by a minimum of the thickness of the underlay.

2.9 Inter-storey Junctions

Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4(b).

2.10 Hermpac Vertical Shiplap Weatherboards

The weatherboards shall be pre-coated with the selected coating (prior to site delivery and installation) by Hermpac associate Machinecoat (NZ) Ltd, by the flood coat inundation method or in-line spray coat system (subject to coating type selected).

Pre-finished vertical shiplap weatherboards shall be over-coated and maintained in accordance with the coating manufacturer's specification. All cut ends and/or uncoated surfaces to be double coated during installation to protect against the penetration of moisture, post installation.

The weatherboards shall be fixed to nogs/dwangs (or structurally fixed to 40-45mm Vertibat cavity battens) at 400-480mm maximum centres using Hermpac shiplap weatherboard fixings (refer to Section 1.5 of this specification).

NOTE: Pinning of laps or board faces will not comply with Hermpac Installation details.

External corners shall be weatherproofed by the use of Hermpac aluminium corner flashings and corner facings, e.g. Hermpac proprietary profiles HP40, HP42 the Hermpac 'Smart Corner' series or cover battens HP201 and HP202.

Internal corners shall be weatherproofed by the use of Hermpac aluminium corner flashings along with internal mouldings, e.g. Hermpac profiles HP41 and HP110 or the Hermpac 'Smart Corner' series.

3.0 Installation Information

3.1 System Installation

The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the VertiLine Vertical Shiplap Cavity System.

Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints.

Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

The selected cavity closure strip must be installed so a minimum 15mm drip edge to the bottom of the weatherboards is maintained at all times.

There are several options available for the installation of cavity battens as outlined below.

Vertibat Cavity Battens to Nogs/Dwangs

Vertibat cavity battens must be installed horizontally over the building underlay to the wall framing (nogs/dwangs) at 400-480mm maximum centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with 40 x 2.5mm flat head hot-dipped galvanised nails or 50 x 2.8mm hot- dipped galvanised gun nails (for 18 or 20mm thick battens), or 60 x 2.8mm flat head hot-dipped galvanised nails or 60 x 2.8mm hot-dipped galvanised gun nails (for 40 or 45mm thick battens) to temporarily fix the battens in place prior to installation of the cladding.

40 or 45mm thick structurally fixed Vertibat Cavity Battens to Studs

40 or 45mm thick Vertibat cavity battens must be installed horizontally over the building underlay to the wall framing (studs) at 400-480mm maximum centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with one 12gauge x 65mm long (for V3 or V4) or 12gauge x 75mm long (for V5 or V6) Grade 304 Stainless Steel screw at each stud crossing (maximum 600mm centres). A 25mm minimum penetration of the framing is required.

Where Hermpac cavity battens are installed horizontally, at greater than 450 mm centres, and a flexible building underlay is used, a building underlay support in accordance with NZBC Acceptable Solution E2/AS1 Paragraph 9.1.8.5 must be installed over the building underlay, behind the cavity battens, at 300 mm centres horizontally to prevent bulging of the building underlay into the drainage cavity.

3.1.1 Aluminium Joinery Installation

Aluminium joinery and associated head flashings must be installed in accordance with the window manufacturer's instructions. A 7.5-10mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6 after the joinery has been secured in place.

3.1.2 Hermpac Vertical Shiplap Weatherboard Installation

Hermpac vertical shiplap weatherboards must not be wet prior to installation. Prior to installation, the back face and edges of the weatherboards to be sealed with an exterior grade oil-based penetrating oil/ stain or paint. During installation, cut ends and edges and all fresh cuts or exposed timber must be double sealed with an exterior grade oil-based penetrating oil/stain or paint.

Hermpac shiplap weatherboards must be installed starting at the corner of the wall section being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50mm. The weatherboards should be installed with the lap facing away from the prevailing winds.

Immediately prior to installing the weatherboards over the internal and external aluminium corner flashings, a continuous bead of sealant must be applied to the face of the flashing along the fixing line.

Hermpac shiplap weatherboards must be overlapped 25mm with an expansion gap of 2mm at the overlap. The bottom lap needs to be restrained with the clinch nail at every cavity batten, ensuring a minimum 2 mm gap between weatherboards at the back of the board.

Clinch nails are a proprietary component of this cladding system. Use on all installations. Mandatory for installations in 'Extra High' wind zones and above.

NOTE: Pinning of laps or board faces will not comply with Hermpac Installation details.

Hermpac shiplap weatherboards must be pre-drilled on a slight up-slope, with a hole slightly smaller than that of the fixing. Fix each weatherboard with one nail/screw per board at every cavity batten.

The fixing must be located 30-35mm in from the weatherboard lap, be located no closer than 32mm (where practical) from the end of the board. Fix weatherboards in full lengths where possible. Where joints are required, scarf the weatherboard at 30° over a cavity batten and fix as per detail 'HC-SHIP-413' or 'HC- SHIP40-413'.

Nail fixing - oil/stain finished weatherboards
Weatherboard fixings must be either Silicon Bronze or Grade 316 Stainless Steel annular grooved Hermpac Crown, Rose or Flat head nails. The nail shank diameter and length as per Hermpac construction drawings. Must allow minimum 30mm embedment into framing timber or structurally fixed cavity batten. Finish flush onto the surface of the weatherboard, not into or below the surface.

Nail fixing - paint finished weatherboards
Weatherboard fixings must be Grade 316 Stainless Steel annular grooved Hermpac Jolt head nails. The nail shank diameter and length as per Hermpac construction drawings. NB: Must allow minimum 35mm embedment into the framing timber or structurally fixed cavity batten. Punch nails 2mm below the weatherboard surface, prime nail holes and fill prior to sanding and finishing.
NB: If Crown, Rose or Flat head nails are used with paint finished weatherboards, refer to fixing clause above.

Hermpac recommend the use of paint quality profiled weatherboards. Please ensure (PQ) profiles are ordered. Paint quality profiles are machined with a dressed face and then sanded.

NOTE: "Through pinning" of laps and/or rebates or board faces will not comply with Hermpac Installation details.

Screw Fixing oil, stain or paint finished weatherboards
Weatherboard fixings must be Grade 316 Stainless Steel or Bronzed Stainless annular grooved Hermpac Starcap screw. The screw diameter and length as per Hermpac construction drawings. Must allow minimum 21mm embedment into framing timber or structurally fixed cavity batten. Finish flush onto the surface of the weatherboard, not into or below the surface. NB: Kanda Vertical Shiplap weatherboards **must be** screw fixed.

3.1.3 Boxed Corners, Cover Battens and Mouldings

External and internal corners must be finished in accordance with the installation detailing.

Most Hermpac 'Smart Corners' mouldings can be fixed by applying a continuous bead of sealant to the inside surfaces of the moulding or the faces of the flashing to which the moulding is to be bonded. Excess coating should be wiped off areas of the moulding intended to contact the adhesive.

Wherever possible, the moulding should be bonded to the flashing prior to installation. If this is not possible, the moulding shall be temporarily held in place while the sealant cures.

A continuous bead of sealant should also be applied at the join between the moulding and the end-grain cross section of any butted weatherboard and direct to flashing along the line of weatherboard nail fixing (if the weatherboard fixing will pierce the flashing).
Sealant options for Wood-X Oil or Resene Waterborne Woodsman Stains include Sikaflex 11FC or Sikaflex-123 MS Bond (with Sika Primer 3N), Sikaflex AT Façade, Gorilla MS Sealant or Bostik (Seal N Flex FC). Always follow manufacturer instructions. (NB: for other coatings please check with the manufacturer to determine the most suitable sealant).
Further or sole mechanical support of the Moulding- Flashing interface can be achieved in some cases with a pre-drilled and suitably placed Hermpac nail. The requirement for a continuous bead of sealant as detailed above still applies.

3.1.4 Finishing

Wood oil or oil stain finish
Prior to install, a minimum single envelope coat of the selected coating system. Post install and subject to coating type, either two or three coats of an exterior grade quality oil-based penetrating wood oil or oil stain must be used over the front faces and edges of the weatherboards to protect the weatherboards and give the desired finish colour.

The oil/stain must be recommended for use as a wall cladding oil/stain by the manufacturer and must be applied manually (on site) or factory applied by Machinecoat NZ Ltd. Hermpac recommends the use of oil based stains manufactured by Wood-X and Resene.

Follow the oil/stain manufacturer's instructions at all times for application of the oil/stain finish.

Paint finish
Prior to install, a minimum single envelope coat of the selected coating system. Post install and subject to coating type, either two or three coats of an exterior grade quality paint must be used over the front faces and edges of the weatherboards to protect the weatherboards and give the desired finish colour.

The paint must be recommended for use as a wall cladding paint by the manufacturer and must be applied manually (on site) or factory applied by Machinecoat NZ Ltd.

To ensure a top quality paint finish, the selected weatherboard profile/s will be paint quality (PQ) and the process below followed:

1. Any sharp edges should be removed to provide a radius to aid in uniform paint film coverage.
2. Double coat all cut ends and bare timber surfaces with a premium alkyd oil or acrylic based primer.
3. Punch nail holes and prime promptly after punching.
4. Fill holes with a suitable filler and allow to dry.
5. When filler is fully dry and cured, sand areasmooth.
6. Apply one coat of an alkyd oil or acrylic based primer to sanded area and allow to fully dry before sanding lightly.
7. Ensure surface is clean and free from any chalking, dirt, dust, mould or other contaminants prior to painting top coats.
8. Apply two coats of premium high quality 100% exterior grade acrylic to surface allowing adequate time for drying between coats.

Timber is a natural product. For best results use a colour with a LRV of 40-45% or above. Please consult with us for a specific recommendation minimum for your chosen timber.

Follow the paint manufacturer's instructions at all times for application of the paint finish.

Refer Section 4.0 for maintenance requirements.

4.0 Maintenance

Building owners are responsible for the maintenance of the VertiLine Vertical Shiplap Cavity System. Annual inspections must be made to ensure that all aspects of the cladding system, including flashings remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Sealant, coatings, flashings or the weatherboards must be repaired in accordance with the relevant manufacturer's instructions.

Regular cleaning (at least annually) of the surface finish with water and a mild detergent is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the cladding.

Recoating of the oil/stain finish will be necessary throughout the life of the cladding system. Re-staining must be carried out, on average, every 2-3 years in accordance with the oil/stain manufacturer's instructions. Re-staining will be required more frequently on exposed northern and western facing walls. When re-staining, care must be taken to ensure bottom edges and shiplap edges are well covered and penetrated with the stain.

Recoating of the paint finish will be necessary throughout the life of the cladding system. Re-coating must be carried out, on average, every 7-10 years in accordance with the paint manufacturer's instructions. When re-coating, care must be taken to ensure bottom edges are well covered and penetrated with the paint

5.0 Health & Safety

Cutting of Hermpac shiplap weatherboards must be carried out in well ventilated areas and dust masks, eye and hearing protection must be worn.

All relevant sections of AS/NZS2311:2017 "Guide to the painting of Buildings" should be adhered to. Technical Data Sheets and Safety Data Sheets for the specified coating should be obtained from the coating supplier and consulted prior to commencing work. MBIE guidelines and regulations must be followed at all times

PRODUCT
DATA SHEET

Thermakraft™
WATERGATE
Plus



Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Thermakraft™ WATERGATE PLUS

New Zealand's all-purpose, fire retardant wall underlay.

Kingspan Thermakraft™ 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 performance qualities.

BRANZ Appraised
Appraisal No. 695

CodeMark
CMNZ10002

Kingspan®

Watergate Plus
Synthetic Wall Underlay

Watergate Plus comes in five roll sizes and two soffit roll sizes:

Roll Dimensions			
Product Code	**Width**	**Length**	**Coverage**
WGP1370025	1370mm wide	18.5m long	25m2 coverage*
WGP1370050	1370mm wide	37.0m long	50m2 coverage*
WGP1370100	1370mm wide	73.0m long	100m2 coverage*
WGP2740050	2740mm wide	18.5m long	50m2 coverage*
WGP2740100	2740mm wide	36.5m long	100m2 coverage*

Soffit Roll Dimensions			
Product Code	**Width**	**Length**	**Coverage**
WGP600025SOF	685mm wide	36.5m long	25m2 coverage*
WGP600050SOF	685mm wide	73.0m long	50m2 coverage*

* **Note:** m^2 is the roll size. For actual coverage, allow for laps and joins.

Custom Branding Available – Contact your Kingspan Insulation Representative for more details

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. Maximum 90 days exposure for wall application.

Scope of Use

Watergate Plus can be used as a wall underlay on both residential and commercial buildings within the following scope:

- Can only be used in lined applications. Section E2 of the New Zealand Building Code defines lining as "the rigid sheet covering for a wall, ceiling or other interior surface."
- 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 NZBC Acceptable Solution E2/AS1 and E2/AS4.
- Situated in NZS3604:2011 and NASH 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.
- Refer to BRANZ Appraisal No. 695 and CodeMark Certificate CMNZ10002 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 to flash off in a well ventilated area. Recommended minimum 7 days.
- Watergate Plus is not subject to a warning or ban under section 26 of the Building Act 2004 when used as per the product scope.

Limitations

- Must NOT be used as a roof underlay.
- Must NOT be exposed to the weather or UV for more than 90 days.
- Watergate Plus is NOT a vapour barrier.
- Must NOT be used in any unlined applications, including but not limited to sheds, warehouses, garages, canopies, soffits and lean-to designs. Warranty void when used in unlined applications.

Compliance

- Watergate Plus has been appraised with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 and E2/AS4, 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 Kingspan Insulation NZ Ltd.

Watergate Plus
Synthetic Wall Underlay

Flammability Index
Watergate Plus Underlay has an AS 1530 Part 2:1993 Flammability Index of not greater than 12 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 a), for the requirements of suspended flexible fabric used as an underlay to exterior cladding that is not exposed to view in occupied spaces. Due to the updated scope of use limiting Watergate Plus to lined applications only, the flammability requirement is now **not greater than 12**. Watergate Plus meets a flammability index of **not greater than 5**, it is not suitable for unlined applications due to UV control requirements.

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 90 days.
- Installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used.*

* **Note:** specifiers and product user must confirm wall cladding system compatibility with the underlay before installation.

Product Warranty
Standard Kingspan Thermakraft Warranty applies. Refer to Kingspan Thermakraft Warranty statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Recycling and Waste
All of our synthetic underlays are fully recyclable through saveBOARD™ New Zealand. For a recycling site nearest you, please contact **info@kingspaninsulation.co.nz** or visit us at **thermakraft.co.nz**.

Property Performance
The following data represents the minimum pass rates required by the NZBC. This product tests well beyond the minimum standards. If you require actual performance results, please contact your local Kingspan Insulation representative.

NZBC E2/AS1 Table 23 (NZS2295:2006) Wall Underlay Properties	Absorbency	Vapour Resistance	Shrinkage	Water Resistance	Air Resistance
Property Performance Requirement	≥ 100gsm	≤ 7 MN.s/g	≤ 0.5%	≥ 20mm	≥ 0.1 MN.s/m^3
Property Performance	Pass	Pass	Pass	Pass	Pass

BRANZ Appraised
Appraisal No. 695

CodeMark
CMNZ10002

0800 806 595
www.thermakraft.co.nz
Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.

The recommendations contained in Kingspan's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Kingspan (for example quality of workmanship and design), Kingspan shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found online. E&OE.

Issue 12.0, May 2025



PRODUCT DATA SHEET

Thermakraft™
COVERTEK
407

Thermakraft™ COVERTEK 407

Heavy duty self-supporting roof and wall underlay

Kingspan Thermakraft Covertek 407 is our strongest synthetic underlay, designed as a means of managing condensation, water vapour transfer and water ingress in the most trying conditions including applications where the roof pitch is 3° and above. Covertek 407 is fire retardant.

Covertek 407 comes in four standard roll sizes:

1250mm wide	20m long	25m² Coverage[2]
1250mm wide	40m long	50m² Coverage[2]
2550mm wide[1]	29.5m long	75m² Coverage[2]
2740mm wide[1]	18.3m long	50m² Coverage[2]

Cut to Length and other roll lengths available – Contact your Kingspan Insulation Representative.

1 **Note:** made to order.
2 **Note:** m² is the roll size for actual coverage, allow for laps and joins.

BRANZ Appraised
Appraisal No. 651

CodeMark
CMNZ30028

Kingspan®

Covertek 407

Heavy duty self-supporting roof and wall underlay

Scope of Use

Roof Application

- Can only be used in lined applications. Section E2 of the New Zealand Building Code defines lining as "the rigid sheet covering for a wall, ceiling or other interior surface."
- Suitable with masonry tile, metal tile and profiled metal roof cladding.
- Suitable for timber or steel framed buildings.
- Not suitable for roof pitch less than 3 degrees.
- Can be used on roofs up to and including NZS 3604:2011 Extra High wind zones.
- Self-supporting - Refer to installation guide regarding underlay support requirements.
- Maximum 30 days exposure for roof applications.

Wall Application

- Can only be used in lined applications. Section E2 of the New Zealand Building Code defines lining as "the rigid sheet covering for a wall, ceiling or other interior surface."
- Can be used with timber and steel framing, either direct or in conjunction with an 18mm minimum drained cavity.
- Suitable with absorbent (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Suitable with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions.
- Is suitable for use in Wind Zones of NZS 3604:2011 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.
- Maximum 120 days exposure for wall application.
- To use in early close applications, follow the Covertek 407 Early Close Installation Guide.

General

- Is 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.
- Tear resistant and strong.
- Covertek 407 is not subject to a warning or ban under section 26 of the Building Act 2004 when used as per the product scope.

Limitations

- Must NOT be exposed to the weather or UV for more than 30 days as a roof underlay and 120 days as a wall underlay.
- Must NOT be used under translucent sheeting.
- Must NOT be used in any unlined applications, including but not limited to sheds, warehouses, garages, canopies, soffits and lean-to designs. Warranty void when used in unlined applications.

Compliance

Roof Application

- Can be used as a roof underlay within the scope limitations of NZBC Acceptable Solution E2/AS1, Subsection 1.1.1, with regards to building height and floor plan area.
- Or within the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings.
- Refer to BRANZ Appraisal No. 651 and CodeMark Certificate CMNZ30028 for full details.

Wall Application

- Can be used as a wall underlay within the scope limitations of NZBC Acceptable Solution E2/AS1, Subsection 1.1.1, with regards to building height and floor plan area.
- Or within the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings.
- Refer to BRANZ Appraisal No. 651 and CodeMark Certificate CMNZ30028 for full details.

Flammability Index

Covertek 407 Underlay has an AS 1530 Part 2:1993 Flammability Index of not greater than 12 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 a), for the requirements of suspended flexible fabric used as an underlay to exterior cladding that is not exposed to view in occupied spaces. Due to the updated scope of use limiting Covertek 407 to lined applications only, the flammability requirement is now **not greater than 12.** Covertek 407 meets a flammability index of **not greater than 5**, it is not suitable for unlined applications due to UV control requirements.

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), C3 Fire Affecting Areas Beyond the Fire Source C3.4 (c) E2 External Moisture, and F2 Hazardous Building Materials F2.3.1, providing:

- It is not damaged.
- Is installed in accordance with instructions.
- Is not left exposed for more than 30 days (roof) same day coverage recommended.
- Is not left exposed for more than 120 days (wall).
- Is installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used*.

* **Note:** specifiers and product user must confirm roof and wall cladding system compatibility with the underlay before installation.

Covertek 407

Heavy duty self-supporting roof and wall 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 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 the NZ Metal Roof and Wall Cladding Code of Practice (COP) 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 Metal Roof and Wall Cladding COP).

Product Warranty

Standard Kingspan Thermakraft Warranty applies. Refer to Kingspan Thermakraft Warranty statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Recycling and Waste

All of our synthetic underlays are fully recyclable through saveBOARD™ New Zealand. For a recycling site nearest you, please contact **info@kingspaninsulation.co.nz** or visit us at **thermakraft.co.nz**.

Property Performance

The following data represents the minimum pass rates required by the NZBC. This product tests well beyond the minimum standards. If you require actual performance results, please contact your local Kingspan Insulation representative.

NZBC E2/AS1 Table C.2.1.1 (NZS2295:2006) Roof Requirements	Absorbency	Vapour Resistance	pH of Extract	Moisture Shrinkage	Water Resistance	Air Resistance
Property Performance Requirement	≥ 150gsm	≤ 7 MN.s/g	≥ 6.0 and ≤ 9.0	≤ 0.5%	≥ 100mm	≥0.1 MN.s/m3
Property Performance	Pass	Pass	Pass	Pass	Pass	Pass*

*Note: Can be used as an air barrier.

BRANZ Appraised
Appraisal No. 651

CodeMark
CMNZ30028

0800 806 595
www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.

The recommendations contained in Kingspan's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Kingspan (for example quality of workmanship and design), Kingspan shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found online. E&OE.

Issue 10.0 January 2026

Rinnai



Enviroflo
Hot Water Heat Pump

GR Series

Enviroflo GR Series
Hot Water Heat Pump

The Rinnai Enviroflo GR Series Electric Integrated Hot Water Heat Pump systems are your reliable choice for efficient hot water. Designed to meet a variety of installation needs across New Zealand, the GR Series offers capacities of 215L, 265L and 280L, making it suitable for diverse site requirements.

Featuring as standard a single element boost, you can enjoy hot water comfort, anytime. The GR Series is Solar PV compatible*, allowing for integration with solar energy systems to enhance efficiency.

Built to withstand New Zealand's unique climate, these systems operate effectively under water pressures up to 1000kPa, ensuring durability and dependable performance. Plus, they utilise R290, an environmentally friendly refrigerant, making them a sustainable choice for your hot water needs.

Available in 215L, 265L and 280L capacities

Designed to operate quietly

Built in Wi-Fi for convenient control

Can be networked with solar PV*



* When used with third-party interface.

GR Series Features and Benefits

Choice
Available in capacities of 215L, 265L and 280L to suit your hot water needs.

Quiet Operation
Operates quietly at a low 46dB(A), quieter than the average noise level of a household dishwasher.

Built in Wi-Fi
The built in Wi-Fi module allows for convenient control from anywhere.

Solar PV Compatible*
Can be networked with grid tied Solar PV for enhanced efficiency and savings.

Energy Efficient
With a high Coefficent of Performance (COP) of 4.0**, it delivers reliable and cost-effective hot water heating by maximising energy efficiency when compared to standard electric cylinders.

Environmentally Focused
High efficiency R290 refrigerant with a low Global Warming Potential of just 3.

Versatile
Multiple operating modes (Standard/ECO/Hybrid/ Electric/Vacation).

Adaptable for All Climates
Operates in ambient air conditions ranging from -7°C to 45°C.

Renowned Quality
Designed and built with a high level of product quality, backed by over 50 years of Rinnai's excellence in hot water.

Defrost Control
Built in anti-frost function to protect the evaporator in colder climates.

Reliable
Inbuilt electric element to ensure you always have a reliable supply of hot water.

Auto Disinfection
Auto disinfection preventing the potential growth of legionella.

Automated
Auto restart function - in the event of a power outage it will automatically restart once the power is re-instated.

Off-Peak Compatible
Option to run only at off-peak times, when the electricity cost is lower.

* When used with third-party interface.

** Performance estimated according to AS/NZS 5125:2014. Coefficient of Performance was measured at the following conditions: Inlet water temperature 19°C, Outlet Water temperature 55°C, Dry Bulb Temperature 19°C.

How Our Enviroflo GR Series Hot Water Heat Pumps Work

Using advanced refrigeration technology, the Rinnai Enviroflo GR Series Electric Hot Water Heat Pump naturally moves thermal heat energy and transfers it to the stored water. The higher the ambient air temperature, the higher the system efficiency, this is also known as Coefficient of Performance – COP.

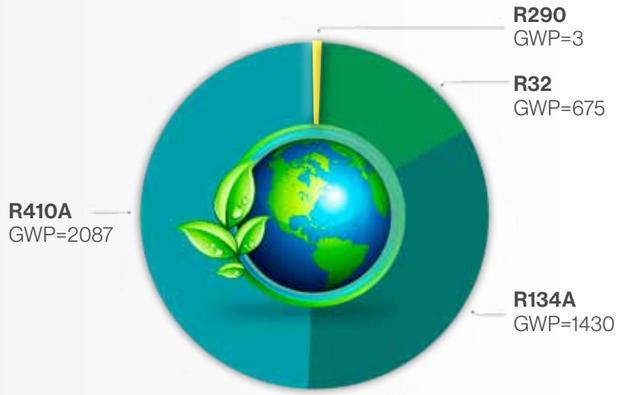
1. Compressor
The compressor is the central hub of the heating cycle which distributes the refrigerant between two heat exchange coils to facilitate efficient heat transfer.

2. Dual Protection Heat Exchanger
The highly efficient design of the heat exchanger safely transfers thermal heat from the refrigerant to the stored hot water.

3. Intelligent Controller
This clever controller continually monitors and adjusts system parameters ensuring optimum performance and system reliability.

4. Integrated DC Fan and Evaporator
40% more efficient and smaller than conventional AC fans when coupled with the evaporator means reduced materials during construct and a lighter assembled weight.

5. R290 Refrigerant
This sustainable and non-toxic refrigerant has a zero Ozone Depletion Potential (ODP) and a Global Warming Potential (GWP) of just 3. As such, it easily outperforms other hot water heat pumps that typically use refrigerants with high GWP values.



Warranty

		Cylinder*	Refrigeration Components (1)	Other Components (2)
Domestic Use	Parts	7 Years	3 Years	1 Year
	Labour	3 Years		
Commercial Use	Parts	1 Year	1 Year	
	Labour			

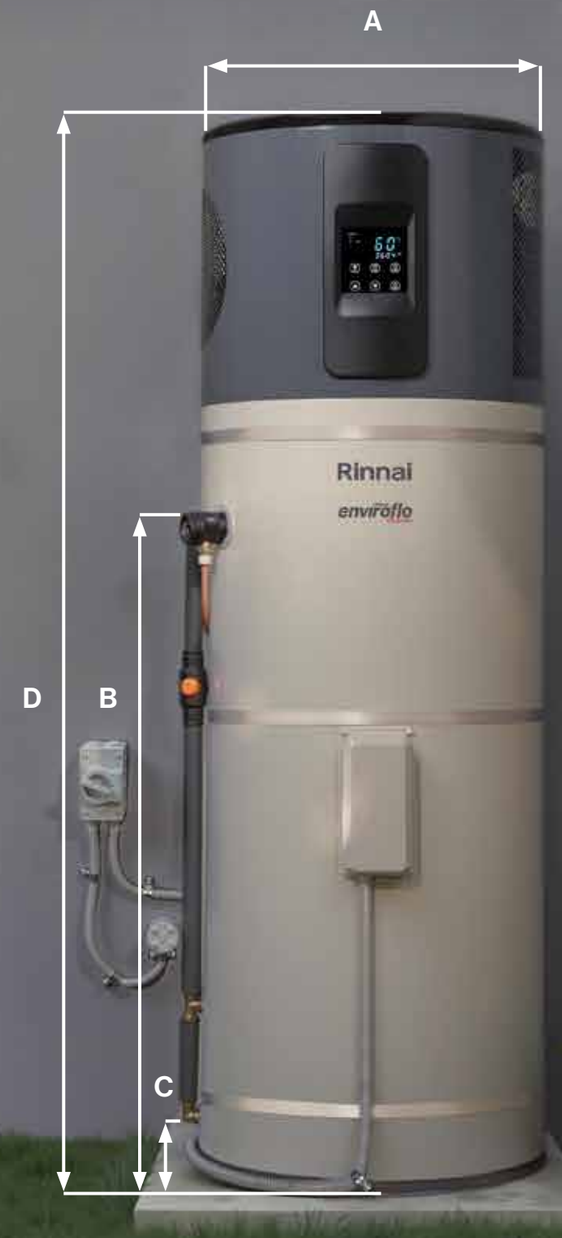
(1) Refrigeration components include but are not limited to: compressor, condenser, expansion valve, heat exchanger, evaporator and associated pipe work.
(2) Other components include but are not limited to: sensors, thermostats, valves, electric heating elements, anodes.

GR Series Technical Information

Model	Description	A Diameter (mm)	B Hot Outlet (mm)	C Cold Inlet (mm)	D Height (mm)	Empty Weight (Kgs)	Sizing Guide
EHPG215VM	215L Enviroflo GR Series Hot Water Heat Pump	640	1227	129	1875	109	2-4 Person Household
EHP265VM10	265L Enviroflo GR Series Hot Water Heat Pump	640	1210	112	1933	118	2-5 Person Household
EHPG280VM	280L Enviroflo GR Series Hot Water Heat Pump	640	1252	112	1975	120	2-5 Person Household

Technical Information	EHPG215VM	EHPG265VM10	EHPG280VM
Net Weight/Filled Weight (kg)	109/324	118/383	120/400
Tank Volume (L)	215	265	280
Sound Level	46 dB(A)		
Ambient Temperature Limits (for heat pump operation - element will operate beyond these limits) (°C)	-7°C to 45°C		
Ingress Protection	IP24		
Storage Cylinder - Hot Outlet and Cold Inlet Connections	ISO 7.1¾" RP		
Storage Cylinder - TPR valve connection	ISO 7.1½" RP		
Pressure and Temperature Relief (TPR) supplied valve settings/ratings	1000 kPa / 10kW		
Pressure limiting valve	500 kPa approx.		
Cold water pressure expansion valve	700 kPa approx		
Refrigerant Type / Mass	R290/355g	R290/395g	
Rated Input Electric Element (Factory Wired)	2.4kW	1.0kW	2.4kW
Rated Input Refrigeration Module (Factory Wired)	1.1kW		
Total Rated Input (To be wired by installer)	3.3kW	2.1kW	3.3kW
Maximum Energy Output (Use to size PTR)	7.0kW	5.6kW	7.0kW
Power Supply	220-240V AC/50 Hz		
Rated Current	13.5 Amp (15 Amp plug fitted)	9.2 Amp (10 Amp plug fitted)	13.5 Amp (15 Amp plug fitted)
Refrigerant Circuit Maximum Pressure	3091 kPa		
Coefficient Of Performance (COP)** (19°C ambient 19 °C inlet water 55 °C outlet water temp)	4.0	4.1	
Heat Output (19°C ambient 19 °C inlet water 55 °C outlet water temp)	2.00 kW	2.40 kW	2.75 kW
Package Size	725x725x2055	725x725x2113	725x725x2155

Note: Enviroflo GR Series Heat Pump is supplied with a 10 or 15 amp plug, or can be hard wired.
** Performance when tested to AS/NZS 5125:2014.



ZFLYENVIROGR26

Rinnai is constantly improving its products, and as such, information and specifications are subject to change without notice. For the most up-to-date information, go to **rinnai.co.nz**

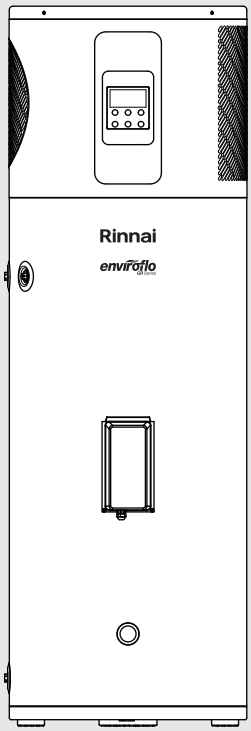
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MODELS

EHPG215VM
EHPG265VM
EHPG280VM
EHPG300VM



Enviroflo GR Series - Heat Pump Hot Water System

Operation & Installation Manual

Rinnai

This appliance must be installed in accordance with:

- Manufacturer's Installation Instructions
- Current AS/NZS 3500
- Plumbing Code of Australia (PCA)
- Local regulations, including local OH&S requirements, and Municipal Building Codes, including the National Construction Code (NCC).
- AS/NZS 5149

These products comply with the lead-free requirements of the National Construction Code- Volume 3.

This appliance must be installed, maintained and removed **ONLY** by an Authorised Person. Rinnai recommends that this appliance be serviced every 2 years.

NOT SUITABLE AS A POOL OR SPA HEATER

For continued safety of this appliance it must be installed and maintained in accordance with the manufacturer's instructions.





R-NZ



Lead Free

This Appliance complies with current AS 3498
LIC.WMK26915



Australian Standard

Standard: AS/NZS 2712
Licence Number: SMK41460
SAI Global

INSTALLER: PLEASE DISPOSE OF EXPANDED POLYSTYRENE (EPS) AND OTHER PACKAGING MATERIAL IN ACCORDANCE WITH REQUIREMENTS AND PROVISIONS IN YOUR LOCALAREA. AVAILABLE OPTIONS MAY INCLUDE RECYCLING OR LANDFILL. DO NOT PLACE EPS IN THE HOUSEHOLD WASTE OR RECYCLING BIN.

EHPG265VM and EHPG300VM are not available in New Zealand.

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WARNINGS AND IMPORTANT INFORMATION

SAFETY AND REGULATORY INFORMATION



DO NOT operate this system before reading the manufacturers instructions.

This appliance must be installed, commissioned and serviced by an authorised person in accordance with all applicable local rules and regulations.

Access covers of water heating system components will expose 240V wiring and MUST only be removed by an authorised person.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

For continued safety of this appliance it must be installed, operated and maintained in accordance with the manufacturer's instructions.

Children should be supervised to ensure they **DO NOT** play with the appliance.

The Heat Pump is fitted with a power cord and 15 Amp plug. It **MUST** connect to an isolating switch with dedicated circuit as per the wiring rules. The supply terminals **MUST** be connected to an independent AC 240V 50Hz power supply with a safety switch. The isolator **MUST** effectively isolate all active supply conductors from the circuit. A method for disconnection **MUST** be incorporated into the fixed wiring in accordance with the relevant wiring rules and regulations. If the power supply cord is damaged, it **MUST** BE replaced by an authorised person in order to avoid a hazard. Take care not to touch the power connections or plugs with wet hands.

Care should be taken not to touch the pipe work as it may be HOT!

DO NOT place articles on or against this appliance.

DO NOT store chemicals or flammable materials near this appliance.

DO NOT operate with collectors or covers removed from this appliance.

DO NOT activate heat pump unless cylinder is full of water.

NEVER use a flammable spray such as hair spray, paint, etc near this unit as this may cause a fire.



This appliance uses R290 (propane) refrigerant, which is a flammable gas class 3 according to AS/NZS 5149 and **MUST** be handled by a refrigeration mechanic with appropriate Australian/New Zealand refrigerant handling licence. Refer to AS/NZS 60335.2.40 for flammable refrigerant handling requirements.

WARNING Risk of fire / flammable material. If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.



MANDATORY INSPECTION PRIOR TO INSTALLATION

Immediately report any damage or discrepancies to the Supplier of the appliance. This appliance was inspected and tested at the time of manufacture and packaging, and released for transportation without known damage. Upon receipt, inspect the exterior for evidence of rough handling in shipment. Ensure that the appliance is labelled correctly for the refrigerant and electrical supply, and/or other services it is intended to be connected to.

For safety and warranty purposes, appliances that may be damaged or incorrect **MUST NOT** be installed or operated under any circumstances. Installation of damaged or incorrect appliances may contravene local government regulations. Rinnai disclaims any liability or responsibility whatsoever in relation to the installation or operation of damaged or incorrect appliances.

NOTICE TO VICTORIAN CONSUMERS

This appliance must be installed by a person licensed with the Victorian Building Authority.

Only a licensed person will have insurance protecting their workmanship.

So make sure you use a licensed person to install this appliance and ask for your Compliance Certificate.

For further information contact the Victorian Building Authority on 1300 815 127

TRANSPORT AND STORAGE OF APPLIANCE

RISK OF FIRE

The refrigerant used in the heat pump (R290 Propane) is a flammable gas.

The appliance(s) shall be stored and transported in an area without ignition sources (for example: open flames, an operating gas appliance or an operating electric heater)

DO NOT pierce or burn the appliance.

Be aware that refrigerants may not contain an odour.

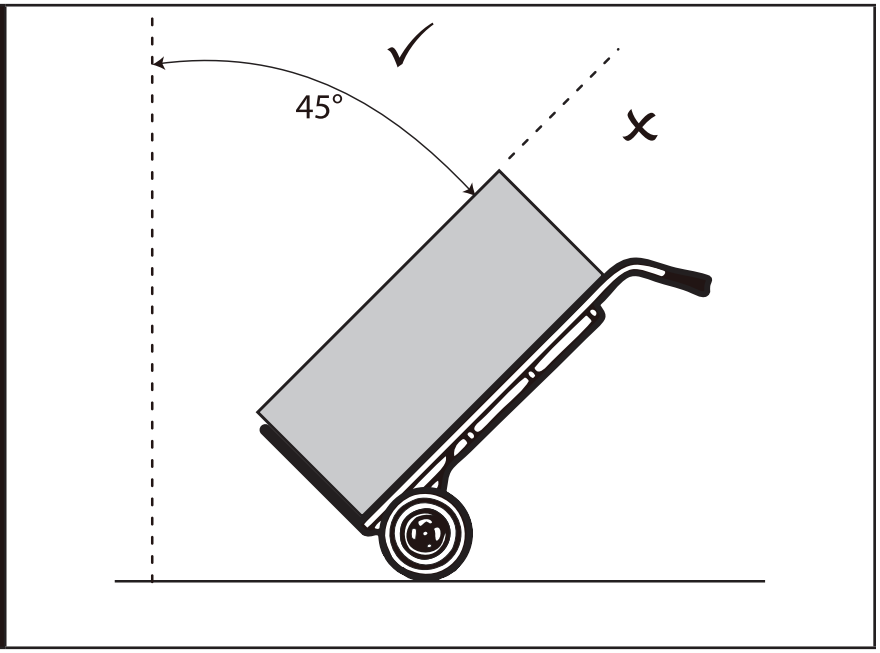
Compliance with AS/NZS 5149 MUST be observed while storing the appliance.

IMPORTANT

National and state regulations exist for storage, handling and transport of hazardous goods including flammable gasses. The maximum number of pieces of equipment or the configuration of the equipment, permitted to be transported or stored together will be determined by the applicable regulations.

IMPORTANT

DO NOT TILT MORE THAN 45° FROM VERTICAL



The Rinnai Electric Heat Pump must be transported at an angle no greater that 45º from vertical. As the compressor unit is located at the top of the electric heat pump, should the heat pump be tilted at a greater angle than 45º from vertical, the lubrication oil within the compressor can run down into the mufflers. This will leave the compressor motor without sufficient lubrication and lead to premature failure of the compressor unit.

As a general good practice it is better to keep the compressor upright as much as possible to avoid any risks. Returning the Rinnai Electric Heat Pump to a vertical position will not allow the oil to properly flow back into the compressor motor.

Tilting the system beyond 45º from vertical will also place undue strain on compressor motor mounts and associated piping.

WARNING

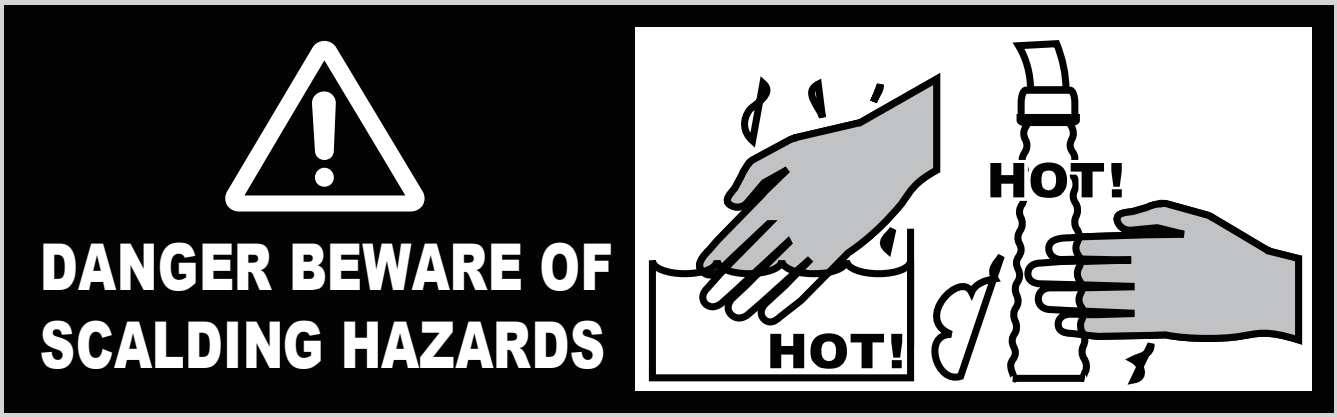
Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources. For example, open flames, an operating gas appliance or an operating electric heater.

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

SCALD HAZARDS



HOT WATER CAN CAUSE SCALDS.

CHILDREN, DISABLED, ELDERLY AND THE INFIRM ARE AT THE HIGHEST RISK OF BEING SCALDED.

FEEL WATER TEMPERATURE BEFORE BATHING OR SHOWERING.

SCALDS FROM HOT WATER TAPS CAN RESULT IN SEVERE INJURIES TO YOUNG CHILDREN.

SCALDS OCCUR WHEN CHILDREN ARE EXPOSED DIRECTLY TO HOT WATER WHEN THEY ARE PLACED INTO A BATH WHICH IS TOO HOT.

ALWAYS.....

Test the temperature of the water with your elbow before placing your child in the bath, also carefully feel water before bathing or showering yourself.

Supervise children whenever they are in the bathroom.

Make sure that the hot water tap is turned off tightly.

CONSIDER.....

Installing child proof tap covers or child resistant taps (both approaches will prevent a small hand being able to turn on the tap).

Installing tempering valves or thermostatic mixing valves which reduce the hot water temperature delivered to the taps. Your local plumbing authority may already require that these be fitted. Contact your installer or local plumbing authority if in doubt.

NEVER....

Leave a toddler in the care of another child. They may not understand the need to have the water temperature set at a safe level.

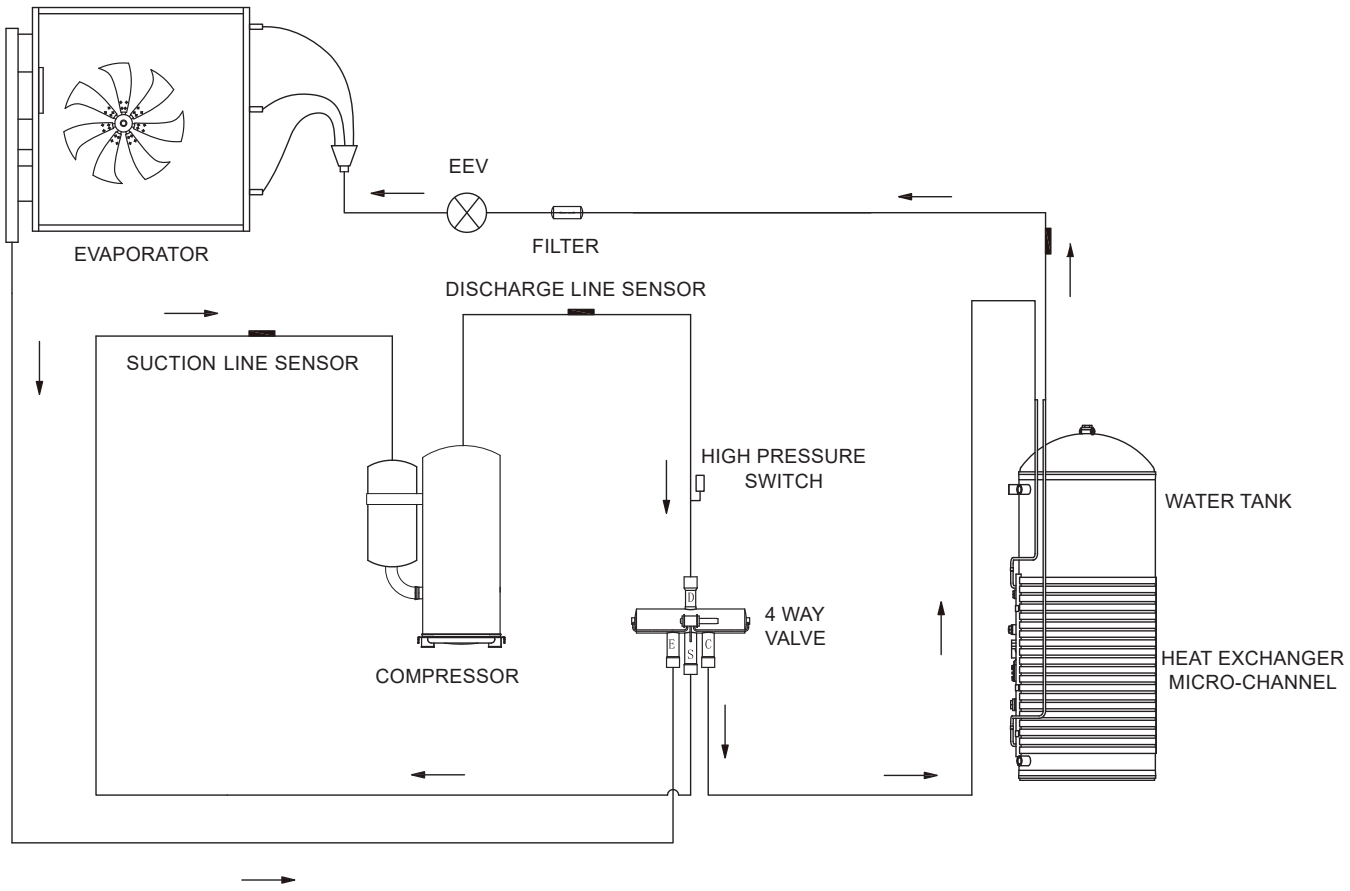
OPERATING PRINCIPLE

The operation of an electric heat pump is very similar to a refrigerator, but in reverse. A heat pump operates by transferring heat from the ambient outside air into the water. Electricity is just used to operate the system, but not to directly heat the water. Because of this energy consumption is significantly reduced as compared to an electric element hot water system. The warmer the climate in which the heat pump is installed, the more efficient the heat pump system will be at heating water.

The heat pump unit includes a highly efficient micro-channel heat exchanger wrapped around the inner cylinder for thermal conductivity. A temperature sensor in the tank is used to control the heat pump operation to achieve suitable tank temperature.

During the occasional times when the ambient weather conditions are not suitable for the heat pump to operate, the electric element will provide heating to ensure a supply of hot water.

SYSTEM SCHEMATIC



ACCESSORIES

Please check that the following items are included in the heat pump unit. The installer needs to provide other parts for installation.

Item	Quantity	Item	Quantity
Heat pump unit	1	Hose clamp	1
PTR valve	1	Operation & Installation manual	1
Condensate drain pipe	1	Warranty booklet	1
Elbow hose drain	1	PV connection cable (optional)	1

SAFETY DEVICES

The water heating system is supplied with various safety devices including temperature sensors, overheat sensors and switches and a Pressure & Temperature Relief (PTR) valve. These devices must not be tampered with or removed. The water heating system must not be operated unless each of these devices is fitted and is in working order.

WARNING

DO NOT tamper with or remove safety devices.

DO NOT operate the water heater unless all safety devices are fitted and in working order.

DO NOT block or seal the PTR Valve and drain pipe.

Pressure & Temperature Relief (PTR) Valve

This valve is located near the top of the water heater and is essential for safe operation. It is normal for the valve to release a small quantity of water through the drain line during heating.

However, continuous leakage of water from the valve and its drain line may indicate a problem with the water heater.



Lift lever until water flows from drain line (Lower lever gently!)

WARNING

NEVER block the outlet of the PTR valve or it's drain line for any reason. The easing gear MUST be operated at least every 6 months to remove lime deposits and verify that it is not blocked. Failure to do this may result in the water heater failing.

If the valve does not discharge water when the easing gear lever is opened, or does not seal again when the easing gear is closed, attendance by an authorised person MUST be arranged without delay. The PTR valve is not serviceable.

EXCESSIVE DISCHARGE FROM SAFETY DEVICES

Pressure & Temperature Relief (PTR) Valve

It is normal and desirable that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem.

If the valve dribbles continuously, try easing the valve gear for a few seconds as described above. This may dislodge any foreign matter and alleviate the problem.

If the valve discharges at high flows, especially at night, it may be as a result of the water pressure exceeding the design pressure of the water heater. Ask your installer to fit a Pressure Limiting Valve (PLV).

WARNING

NEVER replace the PTR valve with one which has a higher pressure rating than is specified for your water heater.

Expansion Control Valve (ECV) - if required

It is normal that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem.

If the valve leaks continuously, try easing the valve gear for a few seconds. This may dislodge any foreign matter which may be causing the problem. If this does not fix the issue, contact Rinnai.

Operate the easing gear regularly to remove any lime deposits and to verify that it is not blocked.

HYDROGEN GAS

If the hot water unit is not used for two weeks or more, a quantity of hydrogen gas, which is highly flammable, may accumulate in the water heater. To dissipate this safely, it is recommended that a non electrically operated hot tap be turned on for two minutes at a sink, basin, or bath, but not a dishwasher or other appliance. During this procedure there must be no smoking, open flame or any electrical appliance operating nearby. If hydrogen is discharged through the tap, it will probably make a sound like air escaping.

ANODES

The water heater is fitted with sacrificial anodes to extend it's life. They will slowly dissipate whilst protecting the cylinder. The life of the water heater may be extended by arranging for an authorised person to inspect the anodes and replace them as required. it is recommended that the anodes be inspected (and replaced if there is any sign of depletion) at least every 5 years. The factory fitted Rinnai anodes are Magnesium based. These anodes are suited to conditions where the total dissolved solids(TDS) content in the water supply does not exceed 600 mg/L, (which is the case in most areas). in areas where the total dissolved solids (TDS) content in the water supply exceeds 600 mg/L Rinnai aluminium based anodes are required (only available for Rinnai AR series heat pump hot water system).

TURNING OFF THE WATER HEATING SYSTEM

If you plan to be away for only a few nights, we suggest you leave the water heating system switched on. If it is necessary to switch off the water heater, do so as outlined below:



DO NOT turn power off to the heat pump unit if snow or frost conditions are expected as components in the system may be damaged by freezing. If power needs to be turned off or power failure occurs and freezing conditions are expected, the water needs to be drained from the heat pump unit. Follow the procedure described below in the section 'Draining and Filling'.

TURNING ON THE WATER HEATING SYSTEM

Switch on the electric supply to the heat pump unit. Water heating will now occur as required. It may take a number of hours before hot water is available.

DRAINING AND FILLING

Draining or filling of the complete system normally only occurs during installation or servicing and must be carried out by an authorised person.

Draining water from the heat pump unit is necessary if the power will be shut off to the unit and snow or frost conditions are expected. **Arrange for an authorised person to carry out this task.**

To drain the heat pump:

1. Turn off power to the heat pump
2. Close the cold water mains supply stop cock
3. Open a hot tap to relieve pressure
4. Disconnect the hot outlet near the top of the storage cylinder
5. Disconnect the cold inlet near the bottom of the storage cylinder.
6. The system will now drain completely.

MAINTENANCE AND REGULAR CARE

Operate the easing gear of the PTR and the ECV if fitted as described in the section 'Safety Devices' on page 8.

The overflow tray (supplied by installer) and drain underneath the storage cylinder (if fitted) should be periodically checked to ensure there are no blockages.



DO NOT screw into the tank with a screw longer than 16mm. This product is fitted with a high efficiency heat exchanger attached to the inner cylinder, anything penetrating the outer skin of the tank may damage the heat exchanger. Rinnai's warranty will not cover any resultant faults.

SAVE A SERVICE CALL

Rinnai's servicing network personnel are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance needs service, ring one of the service contact numbers on the back of this booklet.

The pressure and temperature relief valve and expansion control valve (if fitted) must be replaced by an authorised person at intervals not exceeding 5 years or more frequently in areas where the water is classified as scaling water.

If the power supply cord to the heat pump unit is damaged, they must be replaced by an authorised person in order to avoid a hazard.

Use the following guide to avoid the need for an unnecessary service call.

INSUFFICIENT OR NO HOT WATER	
Heat Pump Unit Not Powered	Check to ensure the electric isolating switch at the switchboard (usually marked "Hot water" or "Water heater" is turned on. (note that the compressor will not start up for 2 minutes after power is turned on).
Excessive hot water consumption	Often end users are surprised at the amount of hot water used, especially when showering. If the amount of hot water used during the day exceeds the storage capacity of the cylinder, it is likely there will be insufficient hot water.
Pressure & Temperature Relief (PTR) Valve continually discharging water	It is normal and desirable that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem. If the valve dribbles continuously, try easing the valve gear for a few seconds as described in the section 'Excessive Discharge from Safety Devices' on page 8. This may dislodge any foreign matter and alleviate the problem. If the valve discharges at high flows, especially at night, it may be as a result of the water pressure exceeding the design pressure of the water heater. Ask your installer to fit a Pressure Limiting Valve (PLV).
Expansion Control Valve (ECV) continually discharging water	It is normal and desirable that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem. If the valve leaks continuously, try easing the valve gear for a few seconds as described in the section 'Excessive Discharge from Safety Devices' on page 8. This may dislodge any foreign matter and alleviate the problem. If this does not alleviate the problem contact Rinnai.
Ambient conditions too hot	To protect the components of the heat pump unit it may not operate when the ambient temperature is higher than 45°C. The heating element will operate if water heating is required, but may take longer to heat the water.
Ambient conditions too cold	To protect the components of the heat pump unit it may not operate when the ambient temperature is less than -7°C. The heating element will operate if water heating is required.

NO WATER FROM THE TAP	
Restriction in the hot tap or failure of the cold water supply to the water heater	Check for water flow at the other taps and that the cold water isolation valve is fully open.
HIGH ELECTRICITY BILLS	
Excessive hot water consumption	See entry under the heading 'Insufficient or no hot water'
High Electricity Tariffs	The electricity tariff will determine the running costs of the system. It is important the end user is aware of the applicable tariffs. Contact your electricity supplier to confirm what these tariffs are.
Higher Element Usage	In extremely cold conditions the element may be operating more than normal.
WATER FLOW FLUCTUATIONS	
One or more hot taps opened at the same time	More than one or two hot taps in use at the same time may cause a decrease in the hot water flow from the taps. Is there more than one or two hot taps open, or are appliances such as a dishwasher or washing machine, in use at the same time? Ensure only one or two hot taps are on at one time.
WATER HAMMER	
Hot and cold water plumbing in the premises	Have a plumber check clipping of hot and cold water pipe work and install a pressure limiting valve and water hammer arrestor as required.
HEAT PUMP ICES UP	
Defrosting function	The heat pump has a built in hot bypass defrosting function which may operate and remove any ice.

HEAT PUMP ERROR INDICATOR*

Error code	Error Description	Possible Causes
E01	**Ambient temperature sensor fault**	Sensor fault/Connection is loose
E02	**Upper tank temperature sensor fault**	Sensor fault/Connection is loose
E03	**Discharge temperature sensor fault**	Sensor fault/Connection is loose
E04	**Evaporator temperature sensor fault**	Sensor fault/Connection is loose
E05	**Suction temperature sensor fault**	Sensor fault/Connection is loose
E06	**Lower tank temperature sensor fault**	Sensor fault/Connection is loose
E07	**High pressure switch protection**	Pressure switch is open circuit/Connection is loose/EEV fault/Refrigeration system is blocked
E08	**Discharge temperature too high**	Lack of refrigerant/system leak
E09	**Low supply voltage**	Mains power voltage is too low
E10	**High supply voltage**	Mains power voltage is too high
E11	**DC fan motor fault**	DC fan motor is broken / Connection is loose
EE9	**Communication / WIFI module fault**	Communication cable damage / WIFI module failure

SPECIFICATIONS

SYSTEM SPECIFICATIONS

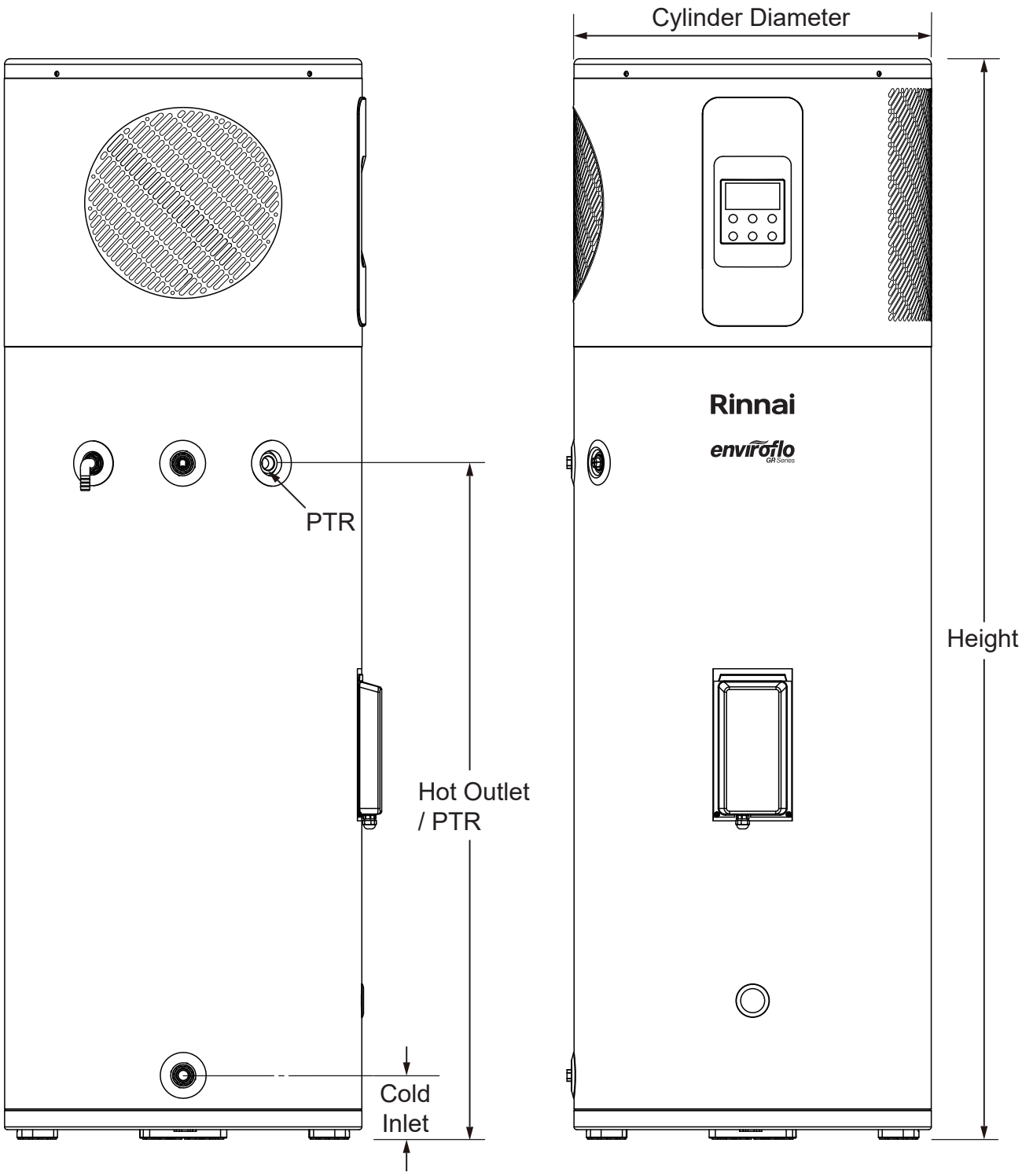
Model		EHPG215VM	EHPG265VM	EHPG280VM	EHPG300VM
Net Weight / Filled Weight (kg)		109 / 324	118 / 383	120 / 400	124 / 424
Tank Volume (L)		215	265	280	300
Sound Pressure Level (Note 1)		46 dB(A)			
Ambient Temperature Limits (for heat pump operation - element will operate beyond these limits)		-7°C to 45°C			
Ingress Protection		IP24			
Storage Cylinder - Hot Outlet and Cold Inlet Connections		ISO 7.1 ¾" RP			
Storage Cylinder - PTR Valve Connection		ISO 7.1 ½" RP			
Pressure & Temperature Relief (PTR) Valve (Supplied) Setting / Rating		1000 kPa / 10kW			
ECV Pressure Rating		850 kPa			
ECV Fitted	Fit PLV if mains pressure exceeds	680 kPa			
	Recommended PLV pressure rating	500 kPa			
ECV Not Fitted	Fit PLV if mains pressure exceeds	800 kPa			
	Recommended PLV pressure rating	500 kPa			
Rated Input Electric Element (Factory Wired)		2.4 kW			
Maximum Input Refrigeration Module (Factory Wired)		1.1 kW			
Total Maximum Input		3.3 kW			
Maximum Energy Output (Use to size PTR)		7.0 kW			
Power Supply		220V-240V AC/50 Hz			
Maximum Current		13.5 Amps (15 Amp plug fitted)			
Refrigerant Type / Mass		R290 / 0.355 kg	R290 / 0.395 kg	R290 / 0.395 kg	R290 / 0.395 kg
Refrigerant Circuit Maximum Pressure		3091 kPa			
COP (Note 2)	32.6°C Ambient 21.1°C cold water inlet	7.6	8.5		
Heat Output (Note 2)	32.6°C Ambient 21.1°C cold water inlet	3.8 kW	4.0 kW		
Switchboard Power Circuit		In accordance with AS/NZS 3000 and local regulations			

Note 1: Sound Pressure Level @1.5m. Sound Levels on installations can be higher due to noise reflections from nearby surfaces and structures.

Note 2: It is tested to Australian standard.

DIMENSIONS

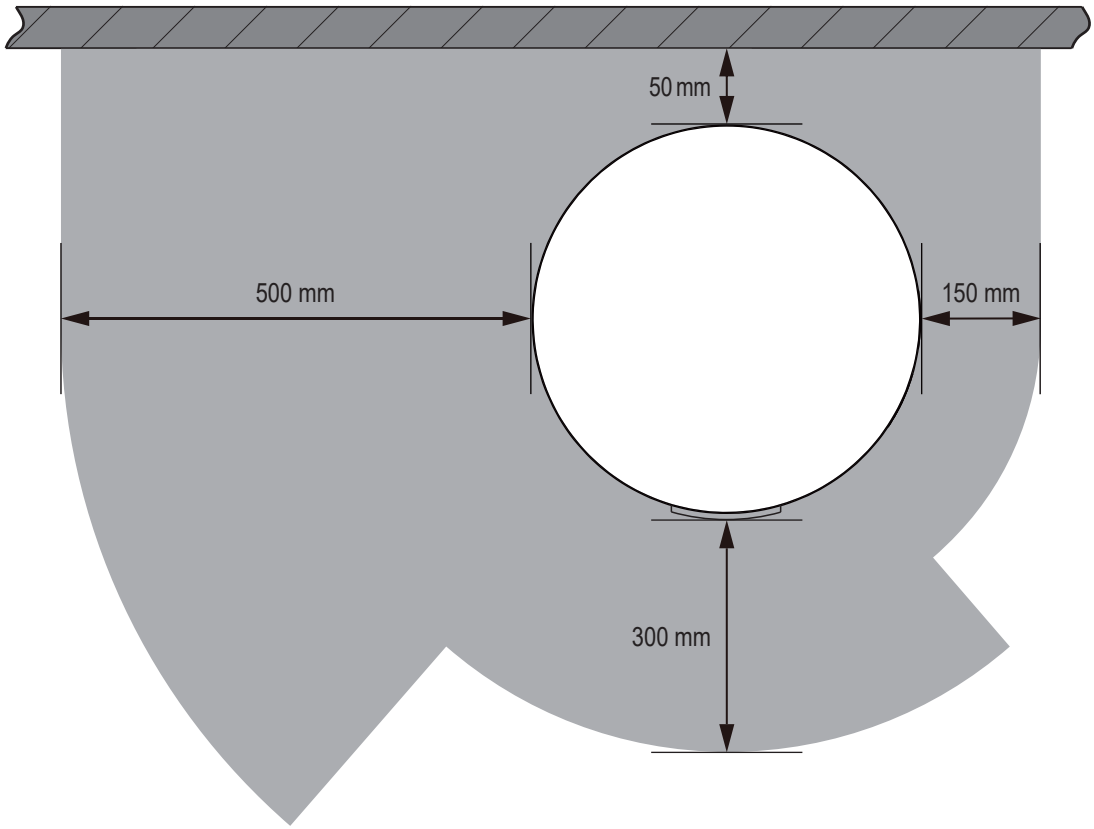
Model	EHPG215VM	EHPG265VM	EHPG280VM	EHPG300VM
Cylinder height	1875 mm	1933 mm	1975 mm	2055 mm
Hot water outlet / PTR height	1132 mm	1210 mm	1252 mm	1322 mm
Cold water inlet height	112 mm	112 mm	112 mm	112 mm
Cylinder diameter	640 mm			

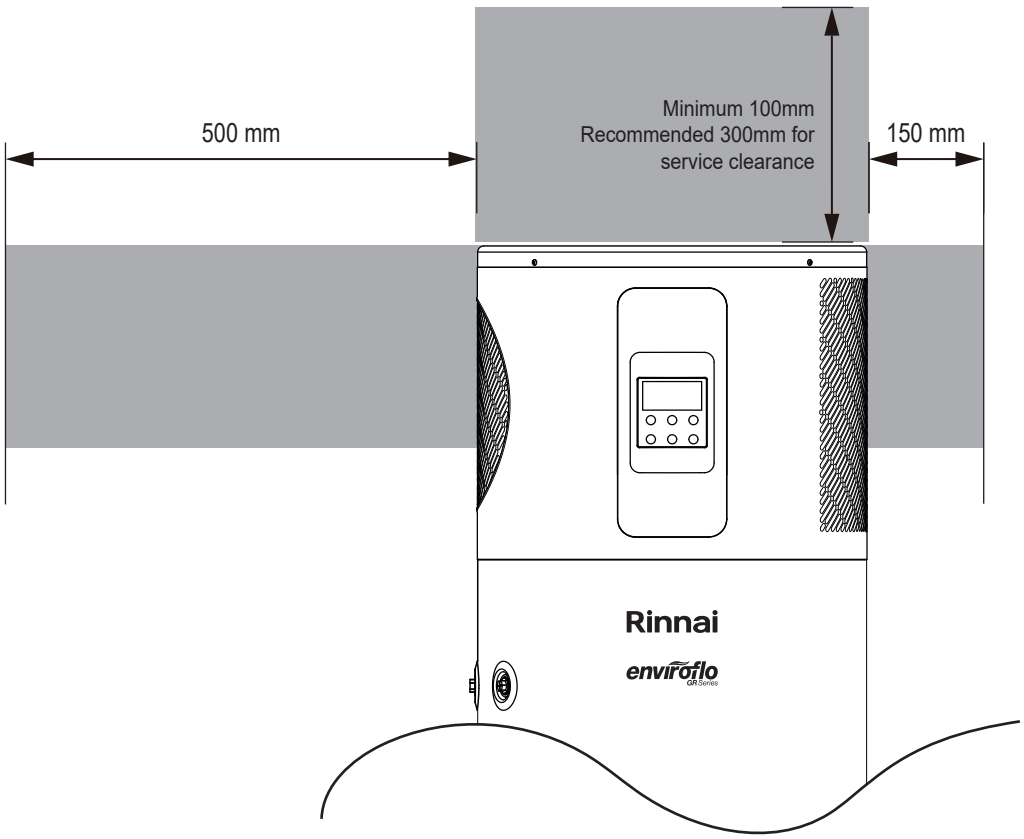


CLEARANCES

Always allow 500 mm minimum clearance on the fan discharge side and 150 mm minimum clearance on the fan suction side to allow for sufficient air flow through the fan.

Allow 100 mm minimum vertical clearance for service access; 300 mm is recommended.





REGULATIONS AND OCCUPATION HEALTH AND SAFETY (OH&S)

WARNING

Installation and commissioning MUST be performed by authorised persons.

The heat pump MUST be installed in accordance with these instructions and all regulatory requirements which exist in your area including those in relation to manual lifting.

Applicable publications and regulations may include:

- **AS/NZS 3500 National Plumbing and Drainage**
- **AS/NZS 3000 Wiring Rules**
- **Building Codes of Australia (BCA)**
- **Local Occupational Health and Safety (OH&S) regulations**
- **NZ Building code**

This appliance is not suitable for use as a domestic spa pool or swimming pool heater.

Electric Heat pumps are heavy and bulky items. Australian States and Territories have a Principal Occupational Health and Safety (OH&S) Act which contains requirements relating to the handling of large, bulky or awkward items. Persons installing heat pump systems MUST be aware of their responsibilities and be adequately trained and qualified, in accordance with local OH&S requirements.

LOCATION

The electric heat pump can be installed externally or internally.

The electric heat pump should be placed as close as practicable to the most frequently used hot water outlet point or points to minimise the delay time for hot water delivery. This will usually be the kitchen tap. For installations where the distance between the heat pump and the outlets is considerable, a flow and return system can be used which minimise the waiting time for hot water delivery.

It is recommended that all components are installed at ground or floor level with consideration for easy service, repair or replacement access.. The heat pump **MUST** be installed in a vertically upright position. All components **MUST** be accessible without the use of a ladder or scaffold. The unit **MUST NOT** be installed in roof spaces.

WARNING

Ensure the location complies with the requirements of AS/NZS 60335.2.40 & AS/NZS 5149.

The air inlet and outlet of the heat pump module **MUST** be away from areas with strong wind and **MUST** be provided with sufficient clearances as per those shown in the section 'Clearances' on page 14.

The heat pump **MUST** be connected to an independent AC 240V, 50Hz power supply, Dedicated Safety Switch Circuit Breaker and Weatherproof Isolating Switch.

Ensure the pressure and temperature pressure relief (PTR) valve and any access covers have sufficient clearances and are accessible for service and removal. The information on the rating plates **MUST** also be readable.

The heat pump **MUST** be installed free-standing on a level and stable base. The cylinder should be mounted on a concrete base at least 50mm (Australia/New Zealand) thick or on well-seasoned, evenly spread hardwood slats with a thickness of at least 25mm (Australia only). Where property damage can occur as a result of water leakage, the storage cylinder **MUST** be installed with a safe tray (overflow tray) and drain in accordance with AS 3500.4. Ensure the storage cylinder **DOES NOT** stand on wet surfaces.

Internal Installation

For internal installations the area **MUST** meet the following requirements:

- Minimum room volume of 55m^3 per unit.
- Good Ventilation (i.e minimum 280 L/s per unit)
- Away from any ignition sources or corrosive environments.

If the heat pump is installed internally careful consideration should be taken in regards to positioning and limiting the effect of unit noise and reverberation during operation.

Condensation

As this heat pump is highly efficient, the surrounding air temperature could be cooled by up to 4°C and condensate formed, the condensate outlet will need to be plumbed to a suitable drain.

Drainage

Where property damage can occur as a result of water leakage, the water heater **MUST** be installed with a safe tray (overflow tray) and drain. Construction, installation and draining of the safe tray **MUST** comply with local regulatory requirements and. AS/NZS 3500.4 also requires the use of a safe tray for particular situations.

WATER SUPPLY

This appliance is intended to be permanently connected to the water mains and not to be connected by a hose set.

The maximum water pressure is listed on page 12. An approved pressure limiting valve may be required if the maximum rated water supply pressure is exceeded.

Water chemistry and impurity limits are detailed in the separate warranty document. Most metropolitan water supplies fall within these requirements. If you are unsure about water quality and suitability, contact your water authority.

If sludge or foreign matter is present in the water supply, a suitable strainer filter should be incorporated in the water supply to the system.

In a scaling water supply, calcium carbonate and possibly other compounds are deposited out of the water onto any hot metallic surface and form a scale. Scaling water may cause scale deposits to form onto the metallic surfaces of the PTR valve and may prevent it from operating properly. To prevent this, an expansion control valve (ECV) **MUST** be fitted on the cold water line after the non-return valve in areas of scaling water. ECVs' **MUST** be fitted in South Australia and Western Australia to comply with local regulations. For New Zealand, it needs to be installed as per per guidance in G12AS1 table 6.

STORAGE TEMPERATURE

To meet regulatory requirements, the thermostat control on the heat pump water heater is factory preset to heat all the water in the tank to 60°C once a week, if temperature setting is less than 60°C. This setting cannot be altered.

HOT WATER DELIVERY TEMPERATURE

This appliance may deliver water at high temperature. Refer to the Plumbing Code of Australia (PCA), local requirements and installation instructions to determine if additional delivery temperature control is required.

The PCA, local regulations and the requirements of AS/NZS 3500.4 **MUST** be considered regarding the temperature limitations of hot water supplied to areas used primarily for personal hygiene.

The temperature of water to certain areas is limited to different temperatures according to purpose, for e.g. early childhood centres, primary and secondary schools and nursing homes or similar facilities for young, aged, sick or people with disabilities and for all other buildings. To comply with these requirements, a temperature limiting device, such as a thermostatic mixing or tempering valve, will be required on hot water systems.

VALVES AND FITTINGS

IMPORTANT

A 10 kW capacity, combined Pressure and Temperature Relief (PTR) valve is supplied with the Heat Pump hot water system. This valve is fitted at the top of the storage cylinder. The PTR valve is a safety device and it is mandatory that it is fitted by the installer in all installations..

The following valves & fittings are to be supplied by the installer:

- A cold water expansion control valve (ECV). An ECV **MUST** be fitted in Western Australia and South Australia to the cold water supply to the storage cylinder to comply with local regulations. An ECV is recommended in all other geographical areas where the water supply has a tendency to cause scaling. This will reduce hot water discharge from the pressure and temperature relief (PTR) valve which minimises wear on this valve.

  For New Zealand, it needs to be installed as per per guidance in G12AS1 table 6.
- A stop cock, non return valve and combination valves incorporating two or more of these functions (such as 'Trio' valves) are suitable. These are fitted to the cold water supply to the storage cylindef by the installer.
- Cold water supply and hot water discharge pipework to and from the storage cylinder. This pipework **MUST** be insulated as specified in AS/NZS 3500.4
- An approved pressure limiting valve (supplied with some systems) is required if the maximum rated water supply pressure on page 12 is exceeded.
- Tempering valve(s) or thermostatic mixing valve

TRANSPORT AND HANDLING

IMPORTANT

When moving the unit, it MUST be close to vertical at all times.

When using a trolley to move the unit, ensure it is not tilted more than 45° from the vertical.

Non compliance will void warranty and severely affect product performance and operation

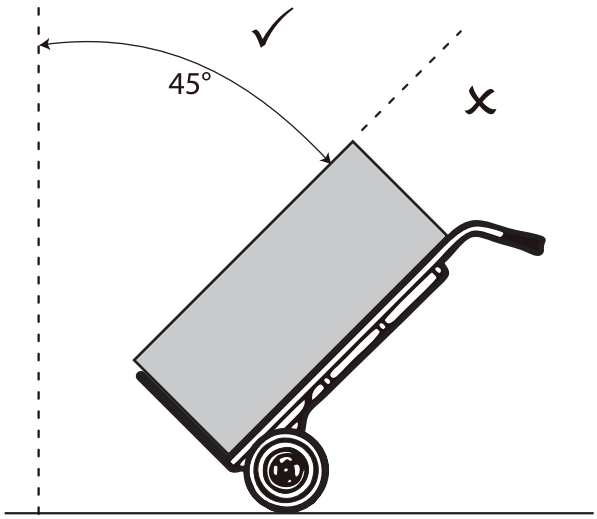
The Rinnai Electric Heat Pump **MUST** be transported at an angle no greater that 45º from vertical.

As the compressor unit is located at the top of the electric heat pump, should the heat pump be tilted at a greater angle than 45º from vertical, the lubrication oil within the compressor can run down into the mufflers.

This will leave the compressor motor without sufficient lubrication and lead to premature failure of the compressor unit.

As a general good practice it is better to keep the compressor upright as much as possible. Returning the Rinnai Electric Heat Pump to a vertical position will allow the oil to properly flow back into the compressor motor.

Tilting the heat pump beyond 45º from vertical will also place undue strain on compressor motor mounts and associated piping.



Never tilt unit more than 45˚ from vertical

POSITIONING THE HEAT PUMP

Arrive at site and conduct a safety audit. Safety audits can also be known as Work Method Statements (WMS) or Job Site Analysis (JSA).

Park your vehicle as close as allowable to your installation. Unload all materials in a safe manner.

Position all materials in a convenient position near the work area.

Where the requirements for internal installation can't be met, the heat pump **MUST** be installed outdoors.

The location **MUST** consider noise impact on living areas. Avoid positioning near bedrooms or neighbours' bedrooms. Although the running noise level is very low it can be expected that the heat pump will run during the night.

Adequate access **MUST** be available to the relief valve and anodes.

Safely position the new unit on a level surface in accordance with all plumbing and building regulations.

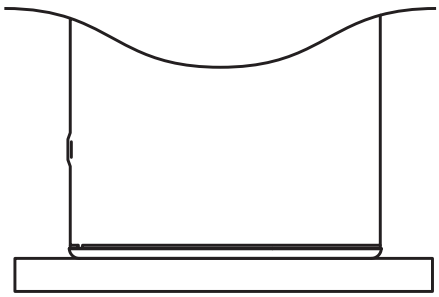
A properly drained overflow tray **MUST** be used where property damage could occur from water spillage. (See AS/NZS 3500.4.2 for further details.)

NOTE

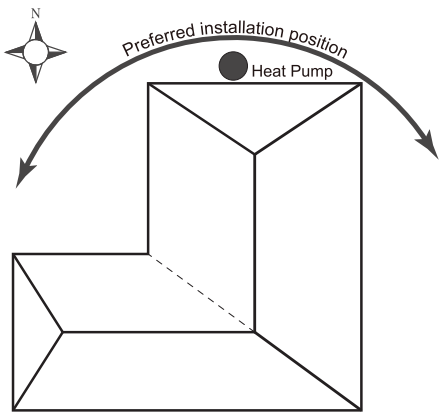
DO NOT drain on to grass or garden beds.

DO NOT commence a job where the risks cannot be controlled.

Allow 200m³ of free space surrounding the unit. This provides clear ambient airflow assisting the product's performance. Ensure the clearance requirements specified in the section 'Dimensions' on page 13. are complied with. The area **MUST** also be clear of debris such as leaves and tree branches.



Install a plinth under the heat pump where it is subjected to wet conditions



Optimum installation location is on the warmest side of house.

CONNECT THE PTR VALVE

Connect the PTR valve to the uppermost fitting of the storage cylinder. See the diagram in the section 'Dimensions' on page 13.

The PTR pressure rating **MUST** be suited for the cylinder and adequate for the thermal loading applied to the storage cylinder, as specified in the table on page 12. The supplied PTR valve input rating is 10 kW. The PTR valve rating **MUST EXCEED** the total input from the heat pump (see the table on page 12). As this is less than 10 kW, the supplied PTR valve is of sufficient capacity.

Use PTFE (Teflon) thread tape on the valve, never use hemp or other sealing materials. Ensure the tape does not protrude past the end of the thread, which could result in it hanging over the end of the thread and blocking the water passage through the valve.

Connect the supplied PTR valve into the top socket marked "Relief Valve" Leave the valve outlet pointing down. Tighten the valve using the spanner flats - never use the valve. Discharge according to plumbing regulations. PTR Valves for the unit are rated at 1000 kpa.

The drain line from this valve **MUST** run in a continuously downward direction with the discharge end left permanently open to atmosphere.

PLUMBING CONNECTIONS

Refer to the diagram on page 13 for detailed information on position of plumbing.

An approved isolating valve, non return valve and union **MUST** be fitted between the supply main and the RP ¾ socket in the water heater. All fittings **MUST** be approved by the relevant installation Authority.

An ECV **MUST** be fitted in Western Australia and South Australia to the cold water supply to the storage cylinder to comply with local regulations. For New Zealand, it needs to be installed as per per guidance in G12 AS1 table 6.

An ECV is recommended in all other geographical areas where the water supply has a tendency to cause scaling.

This will reduce hot water discharge from the Pressure and Temperature Relief (PTR) valve which minimises wear on this valve.

This water heater is designed for direct connection to water supply pressures of no greater than those specified on page 12. Where the mains pressure can exceed or fluctuate beyond this, a pressure limiting (PLV) device (complying with AS1357) **MUST** be fitted. For New Zealand, it needs to be installed as per per guidance in G12 AS1 table 6.

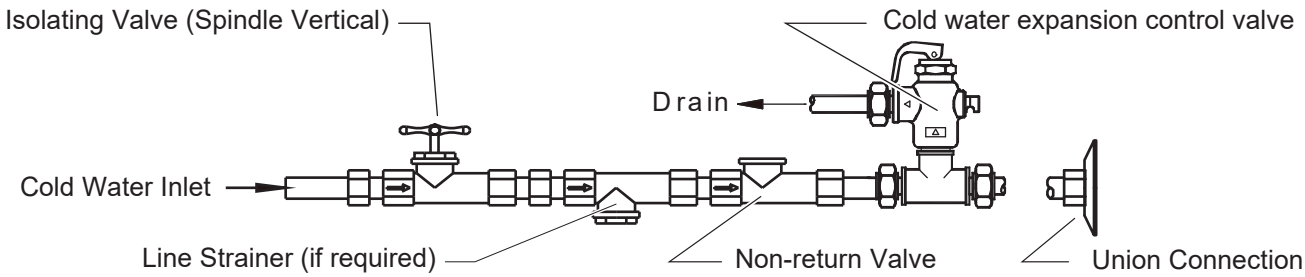
CONNECT COLD / HOT WATER SUPPLY

Connect cold water supply, Pressure Limiting Valve (PLV) and or Expansion Control Valve (ECV).

Connect cold water supply to the storage tank (refer to Diagram BELOW).

A stop cock and non return valve **MUST** be fitted.

If sludge or foreign matter is present in the water supply, a suitable strainer filter should be incorporated in the water supply to the system.



Connect the pipe work supplying hot water to the premises to the hot water outlet on the tank.

A temperature limiting device may be required as detailed in the section the section 'Hot Water Delivery Temperature' on page 16

The cold water supply line to the water heater and the hot water outlet line must be insulated in accordance with AS/NZS 3500.4 requirements. It is recommended that all hot water lines are insulated using weatherproof and UV resistant 13 mm closed cell insulation in Climate Region A, and 25 mm insulation in Climate Regions B and C.

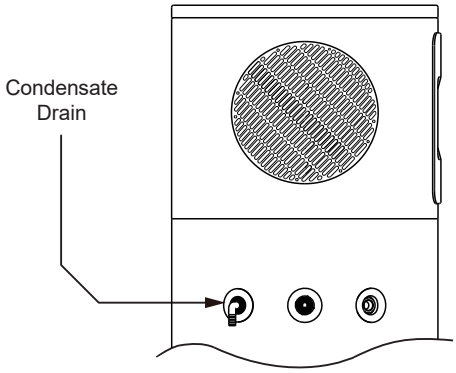
CONNECT CONDENSATE DRAIN LINE

A condensate drain line is required to be fitted to carry discharge clear of the water heater.

The condensate drain line should not be connected to the PTR drain line but can exit to the same point.

The diagram shows the condensate drain location on the heat pump. Use the supplied PVC pipe (inner diameter 17mm, UV resistant) and clamp to connect to the condensate outlet.

Independent 15mm copper pipes **MUST** be fitted to the drain outlets of the PTR and ECV.



Each pipe **MUST** be open to atmosphere and run with a continual downward grade in a frost free environment to a visible discharge point.

Drain lines **MUST** not exceed 9 meters in length.

Valves or other restrictions **MUST NOT** be placed in the relief valve drain outlet line.

ELECTRICAL TESTS

DO NOT turn on the power supply to the appliance until it has been filled with water and a satisfactory insulation (Megger) test has been performed.

Conducting Insulation (Megger) Tests

When conducting an insulation test using a Megger on this appliance, observe the following:

WARNING

This appliance contains electronic components, when performing insulation tests (500 Volts) this MUST ONLY be conducted the across active terminal to earth and then across the neutral terminal to earth.

Tests between the active to neutral terminals MUST NOT be performed as this WILL damage the electronic components.

Insulation test results of between **100 kΩ** and **660 kΩ** are normal for this appliance.

In accordance with AS/NZS 3000 an insulation test with a result less than **1 MΩ** is permitted where the appliance is approved to a Standard applicable to that class of appliance.

This appliance is categorised and certified as a 'stationary Class 1 motor operated appliance' and therefore satisfies the requirements of AS/NZS 60335.2.40 for leakage current and electric strength. As such, this appliance complies with the insulation resistance requirements of AS/NZS 3000.

ELECTRICAL CONNECTIONS

WARNING

The power supply to the heat pump module MUST NOT be activated until the system is filled with water.

The premises wiring to the heater MUST be capable of withstanding the appliance load. Refer to specification table for load details.

All electrical connections and wiring MUST be installed, maintained and removed by authorised persons in accordance with AS/NZS 3000, and all other relevant local regulations and municipal building codes including OH&S requirements.

IMPORTANT

The Heat Pump is fitted with a power cord and 15 Amp plug. It MUST connect to an isolating switch with dedicated circuit as per the wiring rules. The supply terminals MUST be connected to an independent AC 240V 50Hz power supply with a safety switch. The isolator MUST effectively isolate all active supply conductors from the circuit. A method for disconnection MUST be incorporated into the fixed wiring in accordance with the relevant wiring rules and regulations.

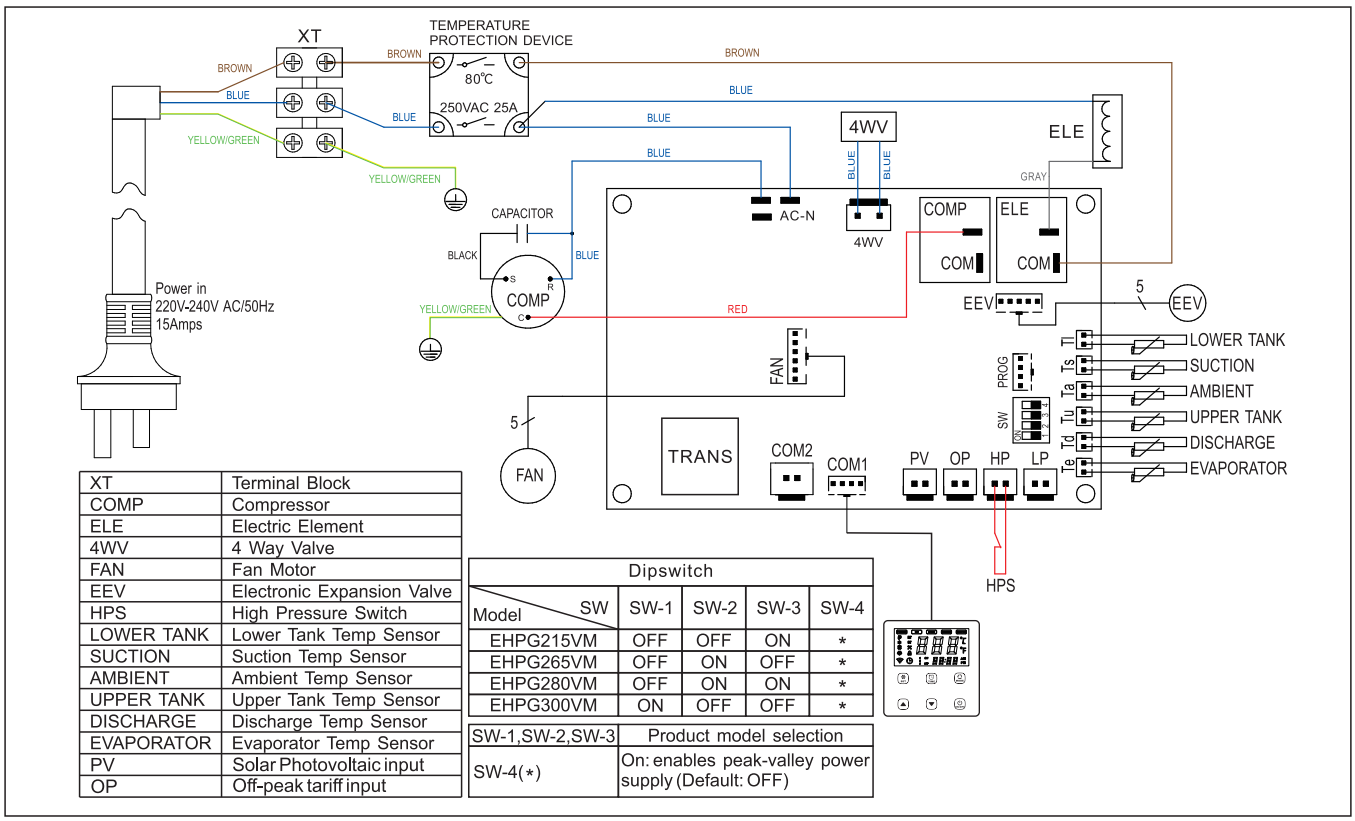
In Australia, a Residual Current Circuit Breaker (RCD) must be installed to the power supply for this appliance.

IMPORTANT

Disconnect all power prior to installation and commissioning.

This appliance is designed for single phase 240 Volts, AC mains electrical operation.

WIRING DIAGRAM



XT	Terminal Block
COMP	Compressor
ELE	Electric Element
4WV	4 Way Valve
FAN	Fan Motor
EEV	Electronic Expansion Valve
HPS	High Pressure Switch
LOWER TANK	Lower Tank Temp Sensor
SUCTION	Suction Temp Sensor
AMBIENT	Ambient Temp Sensor
UPPER TANK	Upper Tank Temp Sensor
DISCHARGE	Discharge Temp Sensor
EVAPORATOR	Evaporator Temp Sensor
PV	Solar Photovoltaic input
OP	Off-peak tariff input

Dipswitch				
Model \ SW	SW-1	SW-2	SW-3	SW-4
EHPG215VM	OFF	OFF	ON	*
EHPG265VM	OFF	ON	OFF	*
EHPG280VM	OFF	ON	ON	*
EHPG300VM	ON	OFF	OFF	*

SW-1,SW-2,SW-3	Product model selection
SW-4(*)	On: enables peak-valley power supply (Default: OFF)

FILLING THE SYSTEM

Open hot water tap at sink.

Open the stop cock in the cold water main supply line. Allow the system to fill and the air to bleed through the tap.

Turn off the hot tap at the sink when water flows freely without any air bubbles or air bursts. If leaks are detected, repair any leaks and repeat the filling process to remove any air.

If no leaks are detected water heating can commence.

COMMISSIONING AND FINISHING THE INSTALLATION

IMPORTANT

Please confirm the followings before commissioning:

- **Piping and electrical wiring are all correct**
- **Earthing wire is installed properly**
- **Pipe insulation is completed**
- **Tank is filled**
- **Supply Voltage complies with rated voltage**
- **Air intake and discharge are not obstructed**

Turn on the heat pump unit and wait a few seconds for the system to start. Change operation mode or water temperature setting if required (it is recommended to retain default setting).

After testing is completed explain to the householder the functions and operation of heat pump water heater components. Explain to the householder the need to drain the heat pump if freezing conditions are likely and power is likely to be shut off for an extended time.

Also explain to the householder the importance of carrying out maintenance in accordance with this manual. Leave the manual with the householder.

WARNING

DO NOT screw into the tank with a screw longer than 16mm. This product is fitted with a high efficiency heat exchanger attached to the inner cylinder, anything penetrating the outer skin of the tank may damage the heat exchanger. Rinnai's warranty will not cover any resultant faults.

OPERATION OF CONTROLLER

When the heat pump turns on, the control system initiates and will check the unit's operating parameters. The controller will check on all sensors and pressure switches. If conditions are suitable (i.e all reading within the reasonable range) and there is enough energy available in the surrounding air, the fan and compressor will turn on. If not enough energy is detected in ambient air then the controller calls for the booster heating element to run.

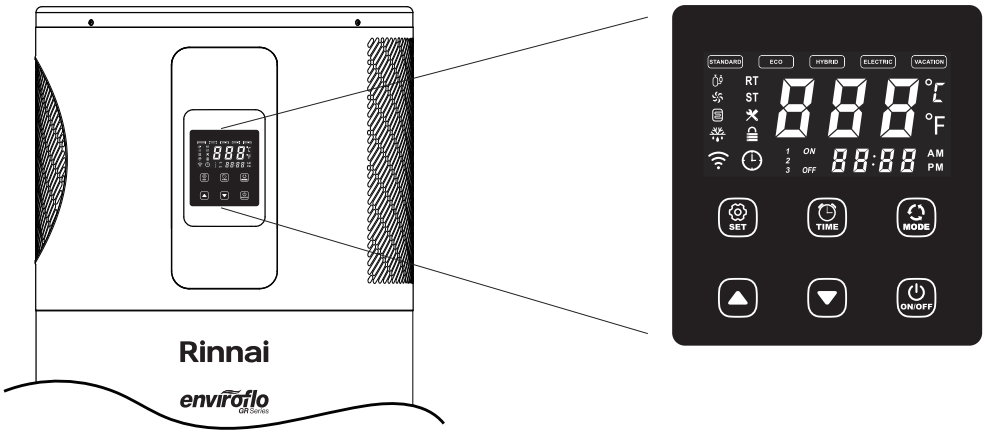
There will be a delay from the time the heat pump is switched on before the fan and compressor begin operating.

The unit is self regulating so there are no internal adjustments to be made during commissioning. When the unit is operated for the first time, it runs through an initial heat up cycle, allow time for the initial heat up cycle. Depending on the ambient conditions this can take several hours.

If for any reason the unit does not start, the water is cold and the controller unit is not displaying any LED lights, an electrician should test that power is available to the heat pump.

CONTROLLER LAYOUT AND KEYS

All major functions are controlled by the Control Panel situated on the front of the unit.



The following table describes the primary function of each key on the controller

Key	Icon	Primary Functions
SET	SET	1. Enter value setting or saves changes 2. Operation data query (press and hold the key for 3s)
TIMER	TIME	1. Sets the clock 2. Sets the timer (press and hold the key for 3s)
MODE	MODE	1. Switches operating modes
ON/OFF	ON/OFF	1. Unlocks the screen 2. Turns unit on or off (press and hold for 3s) 3. Used as a return button in parameter setting
UP	▲	1. Increases set temperature 2. Navigates parameter setting
DOWN	▼	1. Decreases set temperature 2. Navigates parameter setting

IMPORTANT **Ensure the controller unit is not displaying Error code once unit has been switched on. If it is refer to the section 'Save a Service Call' on page 10.**

Key Combinations

The keys can also be used in specific combinations to provide additional functions:

Keys	Function
▲ + ▼	Press and hold for 3 s to enter WiFi connection mode
SET + ▲	Press and hold for 3s to activate manual defrost function
SET + ▼	Press and hold for 3s to activate manual disinfection function
MODE + ▲	Press and hold for 3s to restore factory setting

LED ICONS

Symbol	Function	Meaning when lit	Meaning when flashing
STANDARD	Standard heating mode	Mode active	-
ECO	Economy heating mode	Mode active	-
HYBRID	Hybrid heating mode	Mode active	-
ELECTRIC	Electric heating mode	Mode active	-
VACATION	Vacation mode	Mode active	-
RT	Real water temperature	Display current water temperature	-
ST	Set water temperature	Display set water temperature	-
	Maintenance reminder	Maintenance required	-
	Screen lock	Screen locked	Still locked (2Hz flashing)
	Compressor	Compressor active	-
	Fan	Fan active	-
	Element	Element active	Disinfection operation (1Hz flashing)
	Defrosting	Defrosting active	-
	WiFi	WiFi connected	Searching for network (1Hz flashing)
	Timer	Timer active (number 1,2,3 will be lit accordingly)	-

CONTROLLER FUNCTIONS AND OPERATION

1. Turn ON/OFF the heat pump:

In normal display status, press the "ON/OFF" key for 3 seconds to turn on or turn off the unit. The unit will enter the mode and setting it was in prior to shutdown (or factory default setting if it is the first time powering on).

When turning off the unit, the unit will not function and the display will lock and show OFF.

2. Lock and unlock:

If there is no key operation for 90 seconds, the screen will lock and go blank automatically. Press any key to light the screen. The "🔒" icon will be lit indicating it is locked. Press the "ON/OFF" key for 3 seconds to unlock.

3. Operation Mode selection

Press the "MODE" key to cycle modes in the sequence: STANDARD → ECO → HYBRID → ELECTRIC → VACATION.

NOTE

The system default mode is ECO. When the unit is switched on for the first time, the system will operate under ECO mode. Subsequently however, the unit will start in the mode setting it was in prior to shutdown.

Operation in the factory default ECO mode is assumed for energy saving calculations and is recommended for normal domestic hot water demand. Operation in Standard, Hybrid or Electric mode is recommended during periods of higher than normal hot water demand and will increase purchased energy consumption.

No.	Model	Product Model	Set Point - Factory Default (°C)	Restart Differential (°C)	Set Point Range (°C)
1	STANDARD	All models	60.5*	5	15~61
2	ECO (Factory default)	EHPG215VM	60.5*	12	15~61
		EHPG265VM	60.5*	11	15~61
		EHPG280VM	61	11	15~61
		EHPG300VM	61	10.8	15~61
3	HYBRID	All models	65	10	15~70
4	ELECTRIC	All models	70	8	15~70
5	VACATION	All models	20	12	15~61

* Shows as 61℃ in user interface.

STANDARD Mode:

The user should select this mode if used in any commercial application. In this mode, the water heating is done by the compression system except when the ambient temperature is below -7℃ or above 45℃.

ECO Mode:

This is the default mode as the heat pumps leave the factory. In this mode, the water heating is done by the compression system except when the ambient temperature is below-7°C or above 45°C, in which case the water heating is carried out by resistive heating element.

HYBRID Mode:

In this mode, when the water temperature is below 40℃, water heating is carried out by the compression system and the heating element simultaneously. When the water temperature is between 40℃ and 60℃, the water heating is carried out by the compression system. When the water is greater than 61℃, water heating is carried out by the resistive heating element.

ELECTRIC Mode:

In this mode, water heating is done by the resistive heating element.

VACATION Mode:

In this mode, water heating is done by the compression system. This mode is to be used when there is no need for hot water for an extended period of water.

4. Water temperature setting

Unlock the controller in the main interface then press the "▲" or "▼" key to increase or decrease the water temperature setting value. The value changes by 1℃. It is not recommend to alter factory default temperature setting.

5. Clock setting

In the main interface, press the " TIME " key to enter the clock setting interface. The hour part of the clock will flash, press the "▲" or "▼" key to cycle the hour value. When the hour is set, press the"SET" key to confirm. The minute part of the clock will now flash. Press the "▲" or "▼" key to cycle the minute value. After the minute is set, press the " SET " key to confirm the real-time clock setting and return to the main interface.

In the real-time clock setting interface, if there is no key operation for 10 seconds, the current clock setting value will be confirmed and will return to the main interface.

If the unit is connected to Internet (WiFi), the real-time clock will automatically update to local time.

6. Operation Timer Setting

It is possible to set three different timers. Press and hold the "TIME" key for 3 seconds in the main interface to enter timer setting.

The timer No.1 symbol will flash, press the "▲" or "▼" key to turn on or turn off timer No.1 and the display will show OFF or on accordingly.

When the timer No.1 is turned on, the symbol "🕒" will light. Press the " SET " key to set the start time, the symbol'1' will light and the hour section of the timer flashes, press the "▲" or "▼" key to cycle the hour value. When the hour is set, press the " SET " key to confirm. The minute section of the timer will now flash. Press the " ▲ " or " ▼ " key to cycle the minute value, After the minute is set, press the "SET" key to confirm and begin setting the end time. The hour section of end time flashes, follow the same procedures to set the end time.

After the timer No.1 is set, switch to the next timer setting (No.2 and No.3), the setting method is the same as above. Press the "ON/OFF" key to exit and return to the main interface.

If the start time of a certain working period is greater than the end time, the end time is considered to be of the next day.

When the start time and end time of a setting are the same, it will not be set.

In the timer setting interface, if there is no key operation for 30 seconds, the current timer setting value will be confirmed and will return to the main interface.

7. WiFi connection Setting

In normal display status, press and hold the "▲" and "▼" keys for 3 seconds to enter the Wi-Fi network connection mode. The Wi-Fi icon will flash. When connected successfully, the Wi-Fi symbol will remain lit.

NOTE **Please refer to "Wi-Fi Connection" on page 26 for Wi-Fi Function setup instructions.**

8. Disinfection:

Manual Disinfection:

In normal display status, press the "SET" and "▼" keys and hold for 3 seconds to activate manual disinfection function. All tank water will be heated up to 60°C. The symbol 'element' will flash during disinfection.

Auto Disinfection:

If the setting temp < 60°C, the heat pump will start disinfection automatically over a 7-day period. The disinfection can operate outside of the timer. All tank water will be heated up to 60°C, then it will exit disinfection.

9. Manual Defrosting

When the heat pump (compressor) is running, press the "SET" and "▲" keys and hold for 3 seconds to activate manual defrosting function. The symbol "defrost" will light when defrosting is operating.

10. Operation Data Query

In normal display status, press and hold the "SET" key for 3 seconds to enter the unit operation data query. Press the "▼" or "▲" key to query each code and value. Press the "ON/OFF" key to exit and return to the main interface. See the following table for data query.

This function is mainly intended for use by qualified installation and maintenance personnel.

Code	Description	Unit	Note
d01	Ambient temperature	°C	Measured value
d02	Upper tank temperature	°C	Measured value
d03	Discharge temperature	°C	Measured value
d04	Evaporator temperature	°C	Measured value
d05	Suction temperature	°C	Measured value
d06	Lower tank temperature	°C	Measured value
d07	High pressure switch status	-	0N=Closed; OFF=Open
d08	Mains voltage	V	Measured value (reference only)
d09	EEV opening	step	Real value
d10	Fan speed	RPM	Real-time speed
d11	Compressor	-	ON=Running; OFF=Stop
d12	4-way valve status	-	ON (defrosting); OFF
d13	Defrosting status	-	ON (defrosting); OFF
d14	Electric element	-	ON (activated); OFF
d15	PV signal status	-	ON; OFF
d16	Off-peak tariff status	-	ON; OFF
d17	Disinfection status	-	ON; OFF
d18	Mains voltage protection	-	ON(enabled); OFF(disabled)
d19	One-shot boost	-	ON(enabled); OFF(disabled)
d20	Compressor working time	h	*100 as reading
d21	Unit power on time	h	*100 as reading
d22	Software version	-	
d23	Product model	-	
d31	First error code	-	
d32	Second error code	-	
d33	Third error code	-	
d34	Fourth error code	-	
d35	Fifth error code	-	
d36	Sixth error code	-	
d37	Seventh error code	-	
d38	Eighth error code	-	
d39	Ninth error code	-	
d40	Tenth error code	-	

WI-FI CONNECTION

Please follow below steps to set up and operate Wi-Fi functions.

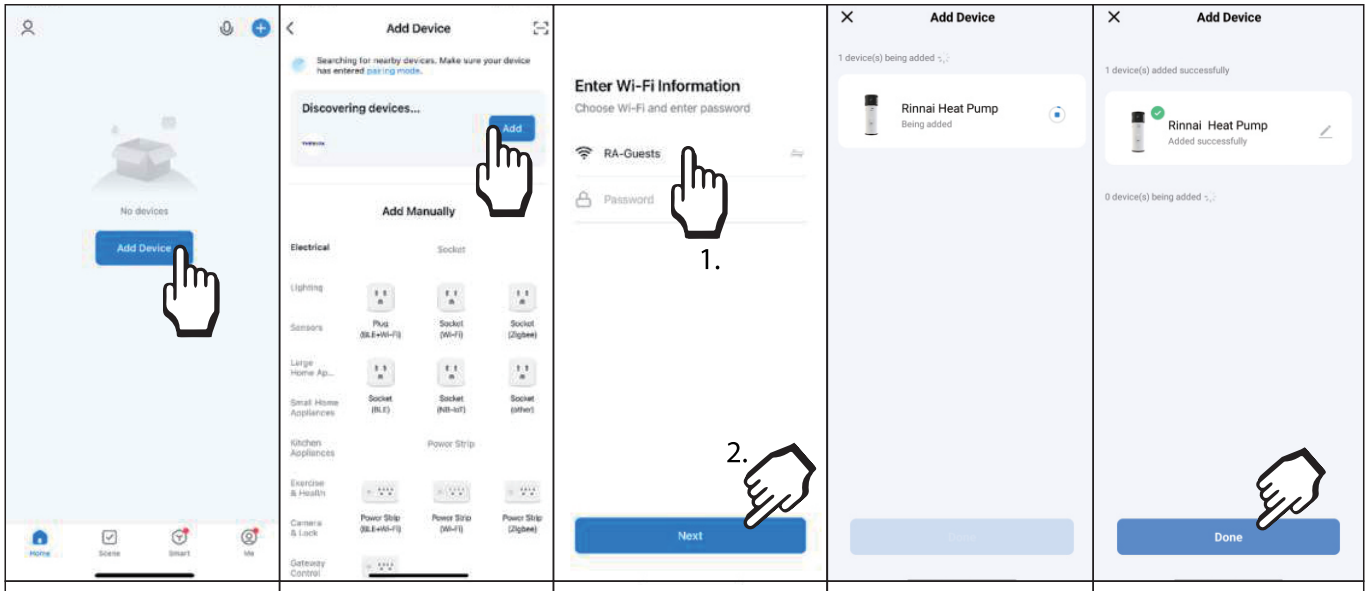
1. Prepare a Wi-Fi wireless router that can access the Internet, The Wi-Fi frequency band is required to be 2.4 Ghz and it should be placed within 10 meters of the water heater to ensure that a strong Wi-Fi signal is available.
2. Turn on Wi-Fi and Bluetooth on your device. After the connection is successful, you can turn off Bluetooth and operation will not be affected.
3. Scan the QR code below or search in the app market to download and install the 'Smart Life' App.
   - iOS users – please download from App Store
   - Android users – please download from Google Play



4. After completing the installation, open the App, register an account and log in according to the App prompt.
5. To connect the controller to your network Press and hold the UP and DOWN(▲+▼)keys together for 3s, to enter into manual network connection mode. When the controller is available for connecting to a Wi-Fi network, the symbol " " will flash. When connected successfully, the symbol " " will remain continously lit up.

NOTE **You will need to repeat step 5 if the icon stops flashing during the connection.**

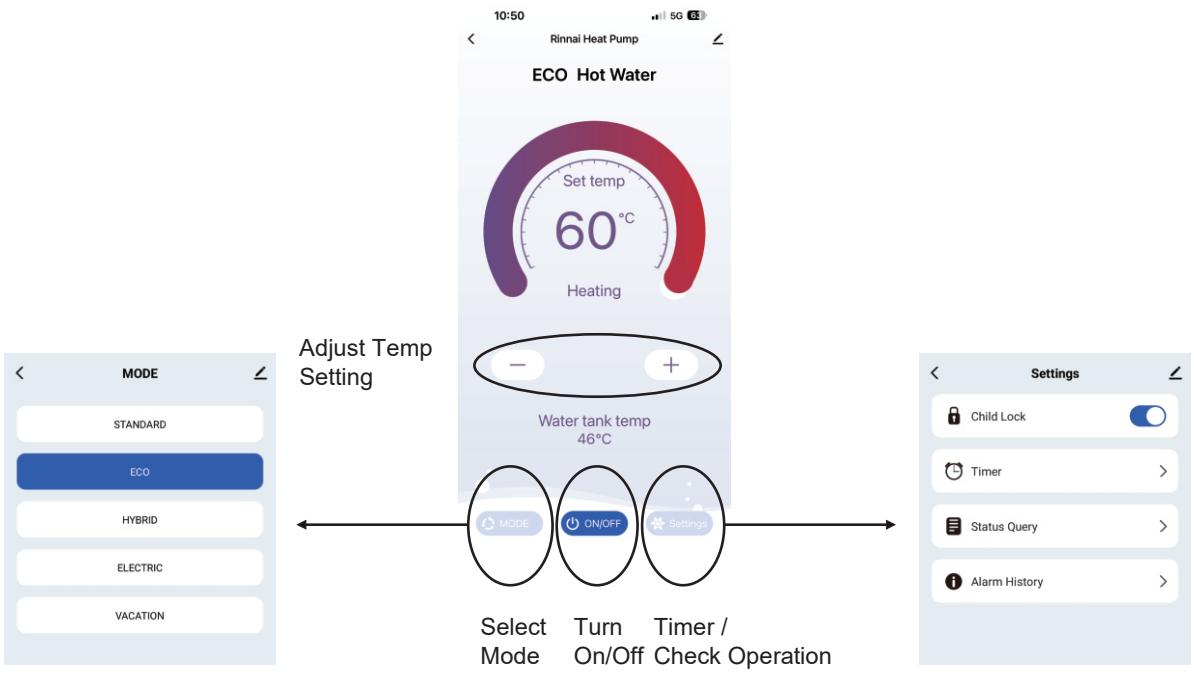
6. Connect to the SmartLife App as follows:



i) Search for Device	ii) Add Found Device	iii) Connect to Wi-Fi	iv) Wait for Connection	v) Complete

7. Control the Heat Pump with the App

The main controls for the App are laid out as follows on the App.



WI-FI - TROUBLESHOOTING

Issue	Potential Cause
Configuration cannot be completed.	Check that you are only connected to the 2.4 GHz Wi-Fi frequency. You may be required to temporarily turn off your 5.0 GHz Wi-Fi frequency at the modem during the configuration process.
	Check your WIFI signal strength at the hot water unit. You will require a minimum of 3 bars WIFI signal to be connected.
	Check you have the correct app downloaded.
	Check you have the minimum requirements as stated at the beginning of this manual.

CONNECTION OF EXTERNAL SIGNALS

WARNING **This type of connection MUST only be carried out by a qualified electrician.**

Solar photovoltaic system

Solar photovoltaic signal can be integrated via the built-in dry contact input 'PV' on the main controller. When the heat pump receives 'closed' signal from the solar PV system and the signal lasts for 30 seconds, the restart differential will temporarily change to 2°C for at least 10 minutes to take advantage of electricity generated on site to produce more hot water.

Off-peak electricity

Off-peak tariff signal can be integrated via the built-in dry contact input 'OP' on the main controller. This feature shall be configured through dip switch SW-4 on the main controller. When SW-4 is switched to ON, the heat pump only operates at receiving 'closed' signal. This feature accesses the heat pump to utilize off-peak electricity. Please note that if timer is activated, the off-peak setting will be overridden by the timer.

NOTE

The unit can not be connected to OFF PEAK meters.

In this case the system will be OFF (No power when connected to this meter) causing, the disinfection timer to stop counting down.

If the water temperature drops below the required level for an extended period, there is a risk of legionella developing in the hot water system.

Rinnai Australia Pty Ltd

ABN 74 005 138 769 | AU45204

82-88 Mills Road, Braeside, Victoria, 3195
P.O. Box 460, Braeside, Victoria 3195
Tel: (03) 9271 6625

Customer Support
Tel: 1300 555 545*
Monday to Friday, 8.00 am to 5.00 pm EST.

After Hours Hot Water Service Line
Tel: 1800 000 340*

**Cost of a local call may be higher from a mobile phone. (National calls from public phones in Australia are free.)*

For further information visit **www.rinnai.com.au**
or email **enquiry@rinnai.com.au**

Rinnai New Zealand Ltd

105 Pavilion Drive, Mangere, Auckland
PO Box 53177, Auckland Airport, Auckland 2150
Tel: (09) 257-3800
Toll Free: 0800 746-624

For further information visit:
www.rinnai.co.nz
youtube.com/rinnainz
facebook.com/rinnainz
or email **info@rinnai.co.nz**

Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires service, please call Customer Support. Rinnai recommends that this appliance be serviced every 2 years.

With our policy of continuous improvement, we reserve the right to change, or discontinue at any time, specifications or designs without notice.

DAIKIN

Perfecting the Air

- INDOOR ENVIRONMENTAL QUALITY
- SUPERIOR ENERGY EFFICIENCY
- BUILT-IN WI-FI



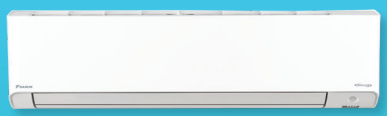
HEATING AND COOLING SOLUTIONS



FTXM20-35YVMA



FTXM46WVMA



FTXM50-71WVMA

STREAMER



FTXM85-95WVMA

ALIRA

MULTI PURPOSE DESIGN

REVERSE CYCLE

2.7kW -TO- **10.3kW** RATED HEATING CAPACITIES

9 MODELS



Alira is a step ahead of the rest, delivering a perfect fusion of whisper quiet comfort, industry-leading energy efficiency and indoor environmental quality technology.

SENSITIVE CHOICE APPROVED

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DAIKIN MOBILE CONTROLLER INCLUDED

19 dBA* DURING SUPER QUIET OPERATION

R32

PERFECT FUSION

Alira is a perfect blend of progressive design aesthetic, superior energy performance & indoor environmental quality technology.

ADVANCED PURIFICATION

Fitted with three layers of filtration; prefilter for large particulates, enzyme blue deodorising filter for odours and Daikin's Streamer Technology for powerful oxidative decomposition of pollutants.

MOULD-PROOF OPERATION

Activates after cooling or dry operation to prevent the build up of mould and odour.**

BUILT-IN WI-FI

Connection to Daikin's Mobile Controller smartphone interface is now included.

INTELLIGENT COMFORT

The Intelligent Eye helps prevent cold draughts and enables energy saving operations when the room is unoccupied.

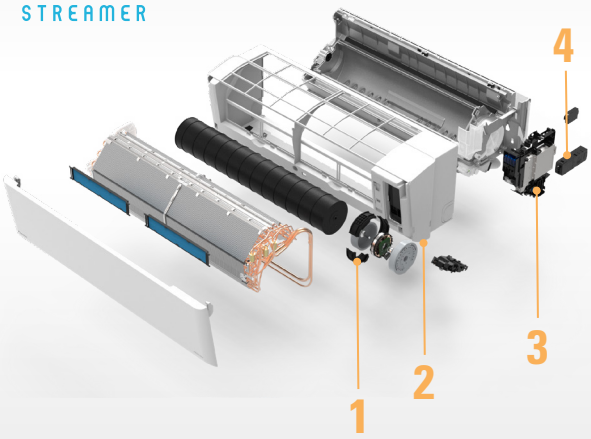
COANDA AIRFLOW

Discharge louvres are designed to stream air upwards along the ceiling for rapid cooling and uniform temperature distribution.



*Refers to 2.0kW, 2.5kW & 3.5kW models.
**Mould-proof operation function can be toggled (On/Off) via the wireless controller.
Note: Sensitive Choice is only applicable for 20-71 Classes only.

STREAMER



TECHNOLOGY

1. IMPROVED ODM MOTOR

Improved compact 14 pole DC outer diameter rotor motor encased in rubber vibration dampeners delivers higher torque more efficiently than before while ensuring whisper quiet operations.

2. REDESIGNED DUAL LOUVRES

Large dual louvres with aerodynamic end vanes help reduce turbulence for draught free comfort with longer throw distances of up to 10m (50-71 Class).

3. HUMIDITY SENSOR

Monitors humidity to accurately control supply air temperature for comfortable and effective dehumidification of the room during Program Dry Function operation.

4. STREAMER TECHNOLOGY

Discharges high speed electrons generating powerful oxidative decomposition that continuously removes odours, bacteria and indoor air pollutants such as formaldehyde.

SPECIFICATIONS

INDOOR UNIT		FTXM20YVMA	FTXM25YVMA	FTXM35YVMA	FTXM46WVMA	FTXM50WVMA	FTXM60WVMA	FTXM71WVMA	FTXM85WVMA	FTXM95WVMA
OUTDOOR UNIT		RXM20YVMA	RXM25YVMA	RXM35YVMA	RXM46WVMA	RXM50WVMA	RXM60WVMA	RXM71WVMA	RXM85WVMA	RXM95WVMA
Rated Capacity	Cool (kW)	2.2	2.5	3.5	4.6	5.0	6.0	7.1	8.5	9.5
	Heat (kW)	2.7	3.2	3.7	4.7	6.0	7.2	8.0	9.0	10.3
Capacity Range	Cool (kW)	1.0-2.8	1.0-3.7	1.0-4.2	0.9-5.5	1.1-6.7	1.1-7.5	2.0-8.9	2.0-10.5	2.0-11.2
	Heat (kW)	1.0-4.4	1.0-5.4	1.0-5.5	1.0-6.7	1.0-8.0	1.0-9.8	2.0-10.8	1.9-11.6	1.9-12.0
Indoor Airflow Rate (H)	Cool (l/s)	203	215	225	253	342	395	410	380	410
	Heat (l/s)	198	213	225	250	342	395	410	403	425
Indoor Fan Speeds		5 steps, quiet and automatic								
Star Rating (Hot/Avg/Cold) ZERL (Residential)	Cool	6/5/5	6/5.5/5.5	5/4.5/5	4.5/4/4.5	5.5/5/5	4.5/4.5/5	4/3/3.5	3.5/3/3.5	3.5/3/3
	Heat	3.5/3.5/3	4/3.5/3	3.5/3.5/3	4/3.5/3	4/3.5/3	4/3/2.5	3.5/3/2.5	2.5/2/2	2.5/2/1.5
Front Panel Colour		White								
Power Supply		1 phase, 220-240V, 50Hz								
Power Input (Rated)	Cool (kW)	0.42	0.47	0.80	1.17	1.13	1.48	2.00	2.35	2.80
	Heat (kW)	0.50	0.64	0.76	1.04	1.23	1.61	1.96	2.66	3.10
E.E.R/C.O.P	Cool/Heat	5.29/5.4	5.38/5.0	4.38/4.89	3.95/4.52	4.42/4.88	4.05/4.47	3.55/4.08	3.62/3.38	3.39/3.32
TCSPF (Residential)	Hot/Avg/Cold	7.80/6.85/6.99	7.99/7.13/7.28	6.96/6.48/6.77	6.09/5.71/6.06	7.00/6.56/6.99	6.49/6.11/6.55	5.50/4.87/5.07	5.28/4.91/5.15	5.01/4.69/4.94
HSPF (Residential)	Hot/Avg/Cold	5.34/5.13/4.76	5.50/5.12/4.71	5.44/5.02/4.50	5.61/5.03/4.52	5.84/5.25/4.60	5.50/4.90/4.26	5.10/4.54/4.00	4.47/3.93/3.50	4.29/3.74/3.24
A.E.E.R/A.C.O.P	Cool/Heat	5.20/5.33	5.30/4.95	4.34/4.84	3.94/4.50	4.41/4.86	4.04/4.46	3.54/4.07	3.59/3.36	3.37/3.31
Dimensions (HxWxD)	Indoor (mm)	299x838x275			299x920x275	299x1100x275			329x1240x278	
	Outdoor (mm)	550x675x284			695x930x350				990x940x320	
Weight	Indoor (kg)	13	13	13	13	15	15	15	19	19
	Outdoor (kg)	28	30	30	51	54	54	60	77	77
Compressor Type		Hermetically Sealed Swing Type								
Refrigerant Type		R-32								
Max Pipe Length	(m)	20	20	20	30	30	30	30	30	30
Max Level Difference	(m)	15	15	15	20	20	20	20	20	20
Pipe Sizes	Liquid (mm)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
	Gas (mm)	9.5	9.5	9.5	12.7	12.7	12.7	15.9	15.9	15.9
Outdoor Operating Range (min.~max.)	Cool (°CDB)	-10 ~ 46								
	Heat (°CWB)	-15 ~ 18								
Indoor Sound Pressure (H/SL)	Cool (dBA)	39/19	41/19	42/19	43/26	45/28	48/29	49/30	49/35	51/36
	Heat (dBA)	39/20	40/20	42/20	43/26	45/28	48/29	49/30	49/33	51/33
Outdoor Sound Pressure (H/SL)	Cool (dBA)	46/43	47/43	49/44	47/44	47/44	49/45	53/49	54/51	54/51
	Heat (dBA)	47/44	48/44	49/45	48/45	48/45	52/45	54/49	55/51	55/51
Outdoor EPA Sound Power Level (H)	Cool (dBA)	58	59	61	59	59	61	66	66	66
	Heat (dBA)	59	60	61	60	60	64	66	67	67

ZERL (Residential) refers to 'Zoned Energy Rating Label' residential star rating as outlined in the Energy Efficiency (Energy Using Products) Amendment Regulations 2020.

Notes:
1. The rated capacity is measured in accordance with AS/NZS 3823.1.1
2. The cooling (or heating) output capacity will be reduced below the rated value as the outdoor temperature approaches the maximum (or minimum) outdoor temperature operating range limit.
3. The specifications, designs & information in this flyer are subject to change without notice. Unit colours shown are as close as possible to actual unit colours. Colours depicted in this flyer may vary slightly.

Your Local Daikin Specialist Dealer:

DAIKIN

daikin.co.nz

RESAL20032024

ARDEX WPM 300

Water-Based Epoxy Moisture Barrier

(HydrEpoxy)

Compliant to AS/NZS4020.2018 - Potable Drinking Water

Excellent adhesion to most substrates including damp surfaces and green concrete

Water resistant, prevents rising damp, efflorescence and withstands hydrostatic pressure

ARDEX New Zealand Ltd
15 Alfred Street
Onehunga, Auckland 1061
0800 227 339
info@ardexnz.com
ardex.co.nz

ARDEX WPM 300

Water-Based Epoxy Moisture Barrier

PRODUCT DESCRIPTION

ARDEX WPM 300 (HydrEpoxy) is a two component water-based epoxy primer/barrier coating. ARDEX WPM 300 (HydrEpoxy) is extremely versitile and can be used within a variety of applications.

FEATURES

- Compatible with damp surfaces and green concrete
- Potable drinking water compliant - AS4020.2018 and SS375-2001
- Can be overcoated with a variety of decorative or industrial finishing coatings
- Can withstand 250kPa of hydrostatic pressure - equivalent to a 25 metre head of water
- Prevents rising damp and the formation of efflorescence when used as a single coat barrier

COMMON SUBSTRATES

- Brick
- Stone
- Screed
- Timber
- Masonry
- Concrete
- Concrete Block

For further substrate types please contact ARDEX Technical Services (technicalservices@ardexaustralia.com).

TYPICAL APPLICATIONS

- As a low water vapour transmission coating and as a barrier/seal coating over freshly laid or damp concrete.
- As a hydrostatic pressure resistant waterproofing coating to prevent water seepage or dampness penetration through to the interior of walls and floors.
- As a waterproofing moisture barrier or barrier coating over freshly laid hardened (green) concrete, prior to the application of conventional levelling compounds, carpet and tile adhesives.
- As a waterproofing coating in tanking applications, including potable water containment.
- As a barrier seal coating over damp, green or efflorescence producing concrete prior to overcoating with conventional building coatings.
- As a primer for ARDEX Liquid Applied Waterproofing Membranes and ARDEX Tile Adhesives in specific applications.
- When masonry or concrete substrate moisture content is measured at greater than 80% relative humidity (ASTM F2170) or exceeds 15g/m^2/24hrs (ASTM F1869) when tested in accordance with AS1884 or AS3740, ARDEX WPM 300 (HydrEpoxy) shall be considered as the nominated primer/coating.

SUBSTRATE PREPARATION

By way of mechanical method and vacuum cleaning as necessary, remove all dirt, dust, curing compounds, oils, grease, surface sealers, and any other contaminants prior to application. Prepare surface to leave sound, clean, free from sharp edges, loose or other materials which may damage the subsequent coating, membrane, or levelling compound.

Surface defects such as holes, non-structural cracks or other minor surface deformities should be filled accordingly with an ARDEX WPM 405 sand/cement mortar or ARDEX WPM 300 epoxy mortar.

ARDEX WPM 300 epoxy mortar mix ratio:

- 1 x part mixed ARDEX WPM 300 (HydrEpoxy)
- 1 x part Portland cement
- 3 x part ARDEX Primer Sand

Spalling concrete must be treated accordingly with the ARDEX Concrete Repair range such as ARDEX BR 345, please review the respective product data sheets on treating spalling concrete.

MIXING

Each component must be individually mixed to form a homogenous state. Do not use the same mixing paddle for each component. Combine the two components and thoroughly mix in the ratio of 1:1 by volume until a homogeneous blend is obtained. Only mix as much as may be used within the pot life and avoid excessive aeration during mixing.

APPLICATION METHOD

When the product is to be applied to dry or highly porous surfaces, spray the surface with a fine mist of water prior to application. Any free standing water must be removed prior to application.

Floors – Spread the material using a squeegee or stiff nylon broom to ensure the material is worked into the prepared surface. Finish application using a medium to long nap roller to achieve required coverage.

Walls – Apply the product by roller ensuring the material is worked into the prepared surface and to achieve required coverage.

When spraying ARDEX WPM 300 (HydrEpoxy), the addition of 10% water during the first coat will assist surface penetration and spray application.

A one coat application is generally used for efflorescence and rising damp requirements, or as a primer for subsequent ARDEX Liquid Applied Membranes.

A two coat application is generally used for general waterproofing requirements as a moisture barrier or when waterproofing negative side walls is required.

ARDEX WPM 300

Water-Based Epoxy Moisture Barrier

TILING APPLICATIONS

Substrates such as screeds and renders should be normally allowed to dry for 7 days prior to the fixing of ceramic tiles. Alternatively, two coats of ARDEX WPM 300 (HydrEpoxy) are applied at 3.0m²/L per coat. Where ceramic tiles are to be installed, the second coat can be sand seeded. Whilst the second coat is wet, ARDEX Primer Sand or clean dry sand of 0.5mm diameter shall be broadcast over the surface at a rate of 700g/m² to achieve at least 90% coverage. After 24 hours minimum cure the excess sand shall be swept and vacuumed from the surface prior to tiling application. Curing times will vary depending on substrate temperatures and ambient air conditions.

FLOORING APPLICATIONS

ARDEX WPM 300 (HydrEpoxy) is an effective moisture barrier for damp concrete subfloors prior to the installation of floor coverings or waterproof membranes. The relevant standards criteria which apply are;

- Where concrete surfaces are damp defined in AS1884-2021 and also AS3740-2021, as exceeding 80% relative humidity when measured using the ASTM F2170 methodology, or exceeds 15gm/sqm/24hrs when measured using the ASTM F1869 methodology. A two coat application of ARDEX WPM 300 (HydrEpoxy) with a dry film thickness of 0.3mm meets the AS1884-2021 requirement for moisture barriers and has a WVTR of less than 10gms/sqm/24hrs when tested to ASTM E96.
- Where concrete surfaces are damp, defined in AS2455-2019 as exceeding 75% relative humidity when measured using inslab testing methodology, or exceeds 70% relative humidity when measured on the slab surface.

Two coats are applied at 3.0m²/L per coat. Where smoothing cements are to be installed, the second coat can be sand seeded. Whilst the second coat is wet, ARDEX Primer Sand or clean dry sand of 0.5mm diameter shall be broadcast over the surface at a rate of 700g/m² to achieve at least 90% coverage. After 24 hours minimum cure the excess sand shall be swept and vacuumed from the surface prior to sub-flooring application. Curing times will vary depending on substrate temperatures and ambient air conditions.

Alternatively the surface of ARDEX WPM 300 (HydrEpoxy) can be coated with ARDEX P82 or ARDEX P9 primers prior to the application of smoothing cements. A single coat of ARDEX WPM 300 (HydrEpoxy) applied at 2.5m²/L acts a moisture stop ('green slab seal') for 'green concrete' not subject to rising damp or permanent moisture.

CURING

Allow final coat to cure for 24 hours minimum before applying water based adhesives, mortars, levelling compounds, decorative coatings or other surface treatments. Care is necessary to ensure the coating is not damaged in any way during subsequent treatments.

Curing times will vary depending on substrate moisture content, substrate temperatures and ambient air conditions.

TECHNICAL DATA

CHARACTERISTICS	NOMINAL VALUE
Colour	Grey or Black
Finish	Semi-gloss (matt with aging)
Volume solids	44%
Mixing ratio	1:1 (Part A:Part B) by volume
Coverage	Must be applied at a rate of 1.5m²/L in total (equivalent to two coats at 3.0m²/L per coat) to achieve an effective moisture barrier
Wet film thickness	300 micrometers (0.3mm) per coat
Recoat time	4 hours @ 25˚C & 50% R.H.
Full cure	7 days @ 25˚C & 50% R.H.
Pot life	2 hours @ 25˚C 1 hour @ 35˚C
VOC content	26g/L
Moisture Vapour Transmission	<10g/m²/24hrs

PRODUCT THINNING

The first coat may be thinned with water as required depending on the porosity of the prepared surface to be coated to ensure optimum penetration. Up to 5% for dense surface, and up to 20% for more porous surfaces.

Thinning of the second coat is to be avoided since this increases the difficulty in achieving the required dry film thickness. A third coat can be applied as required.

COVERAGE

3.0m²/L per coat (undiluted).

The recommended wet film thickness specified produces a nominal dry film thickness of 150 microns per coat or 300 microns for two coats on the surface. The apparent dry film thickness may reduce depending on the porosity of the substrate, however the product absorbed by the substrate still forms part of the waterproofing function.

PACKAGING

4L kit (2L Part A & 2L Part B)

20L kit (10L Part A & 10L Part B)

CLEANING

Wash all equipment in water or water/detergent immediately on completion.

ARDEX WPM 300

Water-Based Epoxy Moisture Barrier

SHELF LIFE

ARDEX WPM 300 (HydrEpoxy) has a shelf life of 24 months when stored in the original, unopened packaging in a dry place at 23ºC and 50% relative humidity.

SAFETY DATA

This product may cause irritation and an allergic reaction to the skin. It may cause serious eye injury and irritation to the respiratory system. Toxic to aquatic life with long lasting effects. In case of contact with the eyes rinse with running water until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Wear protective gloves, clothing, eye and face protection. Avoid inhaling fumes/vapours. Ensure adequate ventilation during mixing and application. Store locked up. Check with your local Council regarding the disposal of contents, dispose of packaging thoughtfully and recycle where possible. Keep out of the reach of children. Call the Poisons Information Centre on 0800 764 766 (NZ) or call a doctor if you feel unwell. Additional information is in the Safety Data Sheet (SDS) at ardex.co.nz

LIMITATIONS

Tiling can commence after 24 hours cure of ARDEX WPM 300 (HydrEpoxy) although should not exceed a maximum of five days. Installer is to ensure that there is no surface contamination during this period. Sand blinding of the wet ARDEX WPM 300 (HydrEpoxy) surface with ARDEX Primer Sand eliminates these timing issues and is best practice for external tiling jobs.

The product should be applied whilst the surface temperature and ambient temperature is between 10˚C–35˚C. The product will cease to cure below 10˚C. Curing time will also be adversely affected in situations where relative humidity is >85%.

In enclosed areas, ventilation must be provided during curing cycle to enable adequate evaporation of the water. Care should be taken when sandwiching adhesives between ARDEX WPM 300 (HydrEpoxy) and floor coverings to ensure the water vapour transmission of the covering is sufficient to allow the solvent to escape from flooring adhesives.

ARDEX WPM 300 (HydrEpoxy 300) is not classified as a trafficable coating.

Before any substrate preparation, installation or finishing methods relating to ARDEX product are undertaken, please be aware of any potential risks and use appropriate PPE (personal protective equipment). This may involve contacting substrate manufacturers for Safety Data Sheets.

GUARANTEE

ARDEX New Zealand Ltd (“we” or “us”) guarantees this product (“our goods”) is free from manufacturing defects and will perform to any applicable specification published by us for 10 years from the date of purchase. Our liability under this guarantee is limited at our option to replacement of the product, repair of any damage to the immediate surface or area of application of the product, or compensation, in each case if we are satisfied loss or damage was due to a breach of this guarantee. This guarantee does not apply if damage or loss is due to failure to follow published instructions or any act or circumstance beyond our control, including shade variations and efflorescence. If you wish to make a claim under this guarantee you must notify us (ARDEX New Zealand Ltd, 15 Alfred Street, Onehunga, Auckland 1061; Toll Free: 0800 227 339; Email: info@ardexnz.com) and provide evidence of your purchase of the product within 14 days of any alleged loss or damage occurring. We reserve the right to ask you for satisfactory evidence of any alleged loss or damage. Any claim under this guarantee is at your cost. This guarantee is in addition to any rights or remedies you may have as a “consumer” under the New Zealand Consumer Law and to that extent you need to be aware that: “Our goods come with guarantees that cannot be excluded under the New Zealand Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss of damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure”. For a copy of the full guarantee/warranty details, please contact ARDEX New Zealand.

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 New Zealand and Australian Standards, our instructions and recommendations, and only for the uses they are intended. We also reserve the right to update information without prior notice 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.

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Manrose Contour Inline Fan Systems



Fans designed to meet G4 and Healthy Home Standards.

The G4 Building Code now covers the mandatory extract ventilation requirements for bathrooms and kitchens and the updated AS/NZS standards provide the latest guidelines for internal wet area zones in general. In addition, the Healthy Homes Standard makes it a requirement to fit extract fans in rental properties.

Manrose Contour fans keep things simple with fans named for purpose and designed to more than meet the requirements of specific room applications as defined as acceptable solutions to G4 and as prescribed in NZS and other leading standards in ventilation.





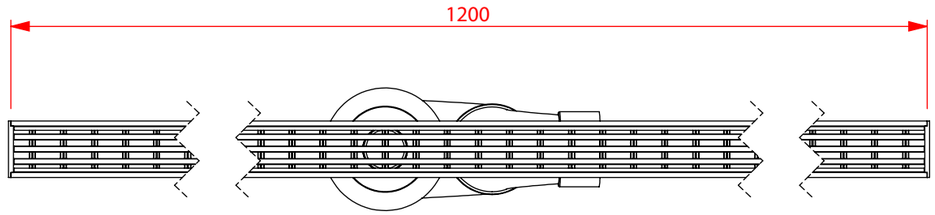
Fans with Fascia Options
CONTOUR TOILET FAN – 100mm
CONTOUR BATHROOM FAN – 150mm
CONTOUR KITCHEN AND LAUNDRY FAN – 150mm

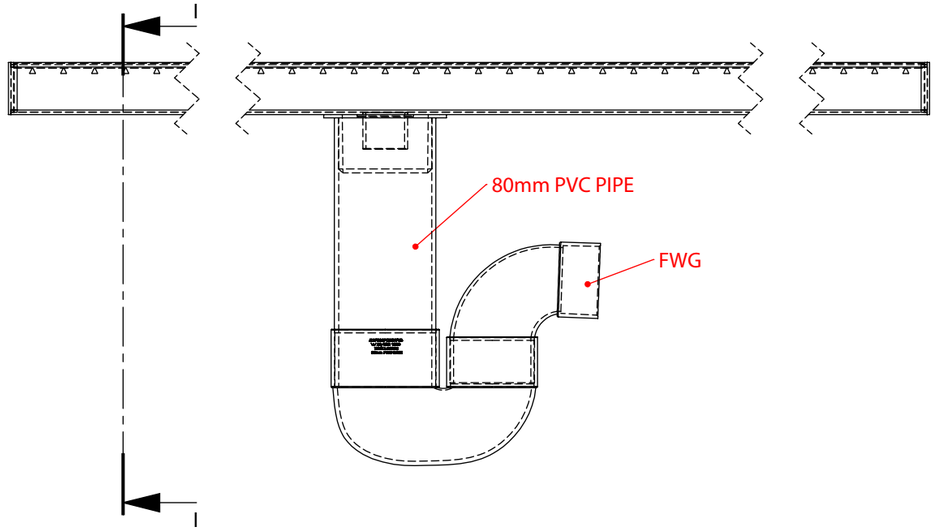
Fans with Round or Square Fascia Fitted
CONTOUR HIGH STEAM AREA FAN – 150mm

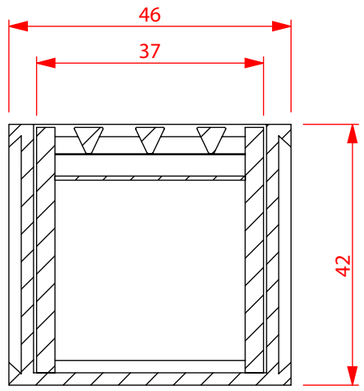
Fan Fascia Options
Round White
Round White with LED
Round Black
Round Black with LED
Square White
Square White with LED
Square Black
Square Black with LED

ALLPROOF INDUSTRIES

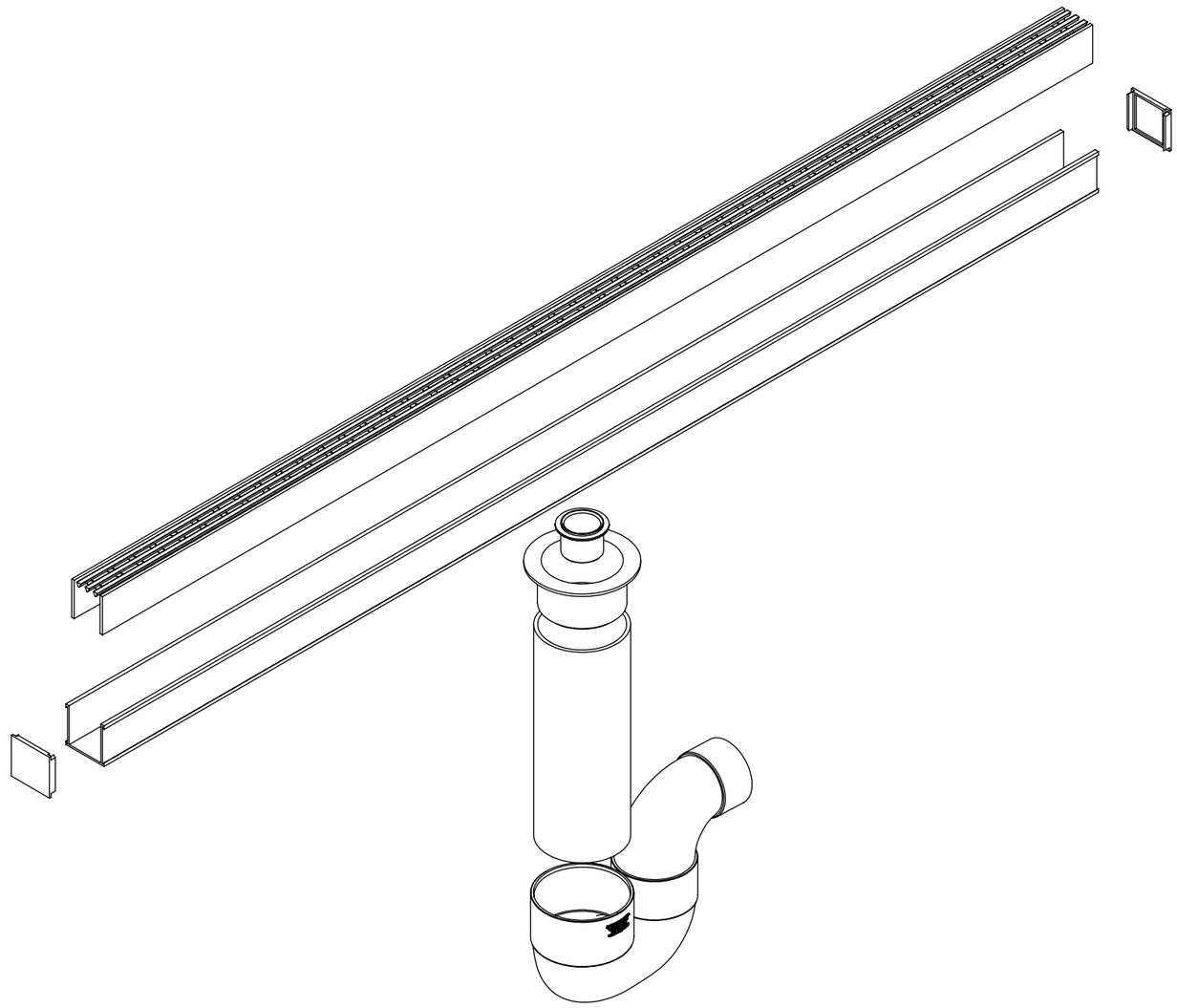
DESCRIPTION	
CODE	FINISH
38AGKIT.12	GRATE : STAINLESS STEEL
	CHANNEL : PVC







SECTION I-I
SCALE 1 : 1



XXX	XXX	XXX	SL	XXX
REVISION	CHANGE	DESCRIPTION	DRAWN	DATE

DO NOT SCALE DRAWING		TITLE: 38mm X 1200mm ARCHITECTURAL BATHROOM KIT
REQUESTED: XXX	DATE: XXX	
DRAWN: S.L.	DATE: XXX	
APPROVED	DATE	APPLICABLE STANDARD(S):
MATERIAL: PVC/SS		DRAWING REF NUMBER: 38AGKIT.12
TOOL NUMBER: 0.0		
PART WEIGHT(GRAMS): 0.0		
FILE: S/CAD FILES/2017/DIVERSE/SLIMLINE		
A3	UNITS = MM	SCALE (UOS) 1 :5 & 1 — SHEET 1 OF 1

DISCLAIMER : THE DESIGN SUGGESTION IS PROVIDED FOR EVALUATION PURPOSES ONLY.

IT IS NOT TO BE CONSIDERED A FULL DESIGN AS WE ARE NOT THE CONSULTING ENGINEERS; WE ARE MANUFACTURERS. WE ARE NOT PRIVY TO ALL THE INFORMATION PERTAINING TO THIS MATTER AND WE HAVE NO CONTROL OVER THE PROJECT INSTALLATION OF THE PRODUCT. THE DESIGN SUGGESTION IS PROVIDED WITHOUT OBLIGATION. DESIGN IS TO BE CONFIRMED AND APPROVED BY THE ARCHITECT, HYDRAULICS ENGINEER, OR PROJECT MANAGER. ACCURATE MEASUREMENTS SHOULD BE CONFIRMED BY THE PERSON APPROVING THE DESIGN. ALLPROOF ACCEPTS NO LIABILITY FOR THE IMPROPER USE OF THE DESIGN SUGGESTION.

SLIMLINE

STAINLESS STEEL GRATE & PVC CHANNEL SYSTEM

ALLPROOF INDUSTRIES



allproof.com

Slimline Stainless Steel Channel Drainage by Allproof

The perfect solution for those wanting a stylish linear look when draining wet areas. The Slimline system offers the flexibility to choose the desired channel lengths, widths and angles you need to achieve the finish you are looking for.

The Allproof Slimline system provides unique and elegant options for applications such as bathrooms, balconies, courtyards, pool areas, car parks, kitchens and driveways. It utilizes high quality materials including 316 or 304 stainless steel grating and PVC channel options.

The Slimline linear drainage channel means that cross cutting tiles into a central floor waste is no longer required. The system enables the use of a single plane of fall in a tile floor, providing a subtle and visually appealing finish where large tiles can be successfully integrated. This significantly reduces the set up time required to create the floor levels and install the tiles.

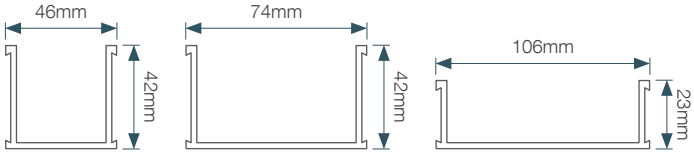


A Grate - 316 Wedge Wire. 38mm, 65mm & 100mm



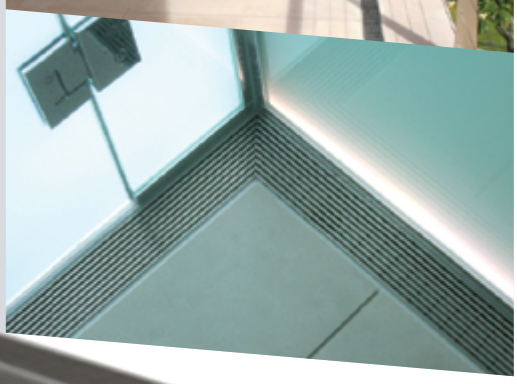
LAS Grate - 304 Laser Perforated. 38mm, 65mm & 100mm

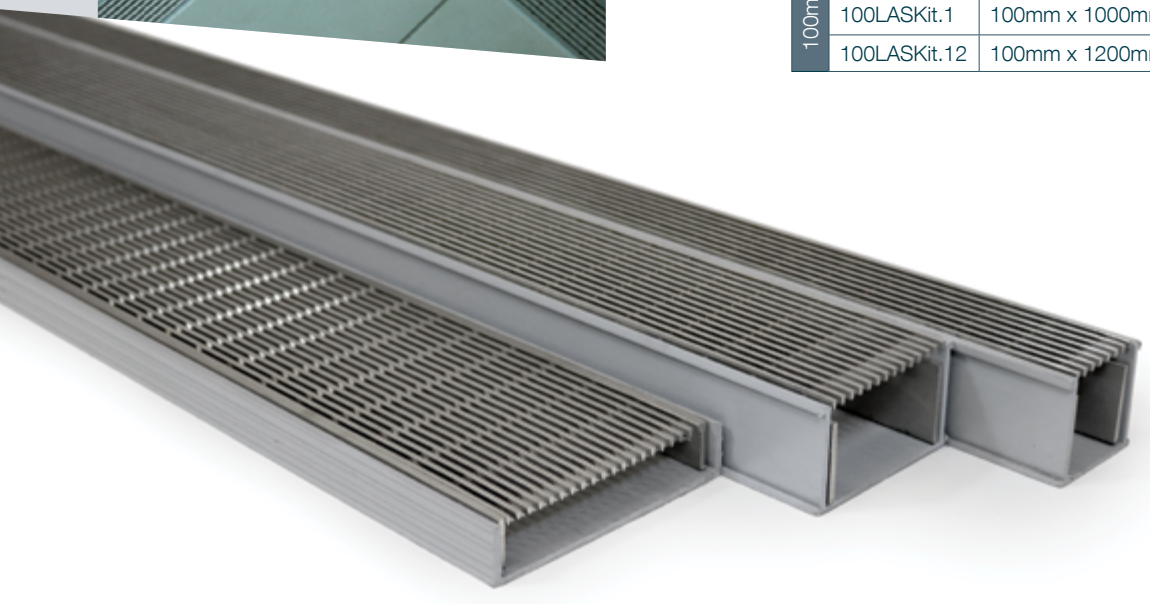
PVC Channel Options:



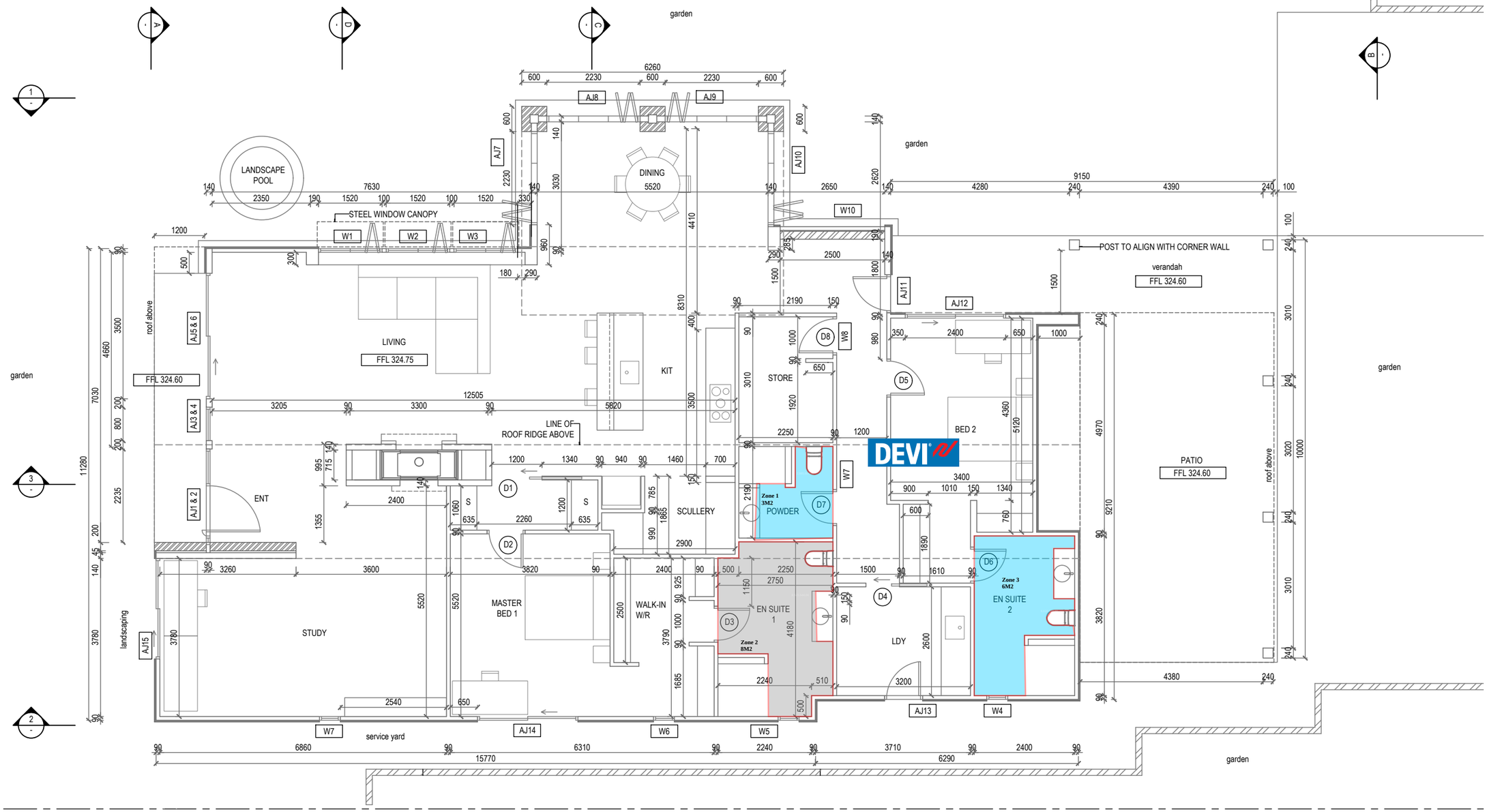
38G 65G 100G







	Code	Description
38mm	38AGKit.12	38mm x 1200mm Architectural Bathroom Kit
	38LASKit.1	38mm x 1000mm Laser Perforated Bathroom Kit
	38LASKit.12	38mm x 1200mm Laser Perforated Bathroom Kit
65mm	65AGKit.9	65mm x 900mm Architectural Bathroom Kit
	65AGKit.12	65mm x 1200mm Architectural Bathroom Kit
	65LASKit.1	65mm x 1000mm Laser Blank End Bathroom Kit
	65LASKit.12	65mm x 1200mm Laser Blank End Bathroom Kit
100mm	100AGKit.12	100mm x 1200mm Architectural Bathroom Kit
	100LASKit.1	100mm x 1000mm Laser Blank End Bathroom Kit
	100LASKit.12	100mm x 1200mm Laser Blank End Bathroom Kit



NOTE

1. CONFIRM ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION

2. ALL WALL & ROOF TIMBER FRAMING IS GENERALLY H1.2 TREATED PINUS RADIATA UNLESS OTHERWISE NOTED.

SN LOW RESIDENCE

5 WALTER PLACE
GLENORCHY

andesite
ARCHITECTS LTD

GROUND FLOOR PLAN

DRAWN	CHECKED	DATE	JOB NUMBER	A3 SCALE	DRAWING NO.	REVISION
S.N.L		JULY 2026	179	1:100	A2-1	

CONTRACTORS MUST VERIFY ALL DIMENSIONS ON THE JOB BEFORE COMMENCING ANY WORK, DO NOT SCALE, COPYRIGHT ON THIS DRAWING IS RESERVED.

DEVImat™ 150S



DEVImat™ is an high-quality, braided screen, self-adhesive all-in-one mat with FEP insulated conductors and a red PVDF outer sheath (non UV stable). The round profile, very low height (only 2.8 mm) and robust construction ensures a fast, simple and safe installation perfect for renovating existing floors.

The two cold leads have clearly visible To ensure a long life-time, all cables are minutely inspected including tests for Ohmic resistance, high voltage and material controls to ensure the quality. This means that we are proud to supply our full floor extended DEVIwarranty™.

Benefits:

- Fast and easy to install
- Self-adhesive mesh
- Very low height - only 2.8 mm
- Long life-time

Standard compliance:

- IEC 60335-1: 2012 (with amendments)
- IEC 60335-2-96: 2021 (with amendments)

Compliance symbols:

Intertek UA.TR.089

20 YEAR WARRANTY — Product, Installation, Floor/Surface

Type	Value
Nominal voltage	230 V~
Construction	Round, single conductor with screen, two cold leads
Output	150 W/m² @ 230 V~
Max. permissible use temperature, powered	110 °C
Max. permissible use temperature, unpowered	120 °C
Cable thickness	2.8 mm
Deformation strength	600 N
Pulling strength	120 N
Conductor insulation	FEP
Outer sheath	PVDF
Screen	10 x CU threads
Cold lead	2 x 3 m DSWB, 1 x 1,0 mm², with screen
Min. installation temperature	-5 °C
Bending Ø, min.	5 cm
IP Class	IPX7
Set with flexpipe	Flexpipe, inner ø6,7 mm, outer ø10 mm, 2,5 m, Black

Types:

Product Code .	Heated area	Dimensions (W x L)	Output @ 230V~	Resistance
01-140F0328	0,5 m²	0,5 x 1 m	75 W	706,9 Ω
01-140F0329	1,0 m²	0,5 x 2 m	150 W	352,8 Ω
01-140F0330	1,5 m²	0,5 x 3 m	225 W	234,4 Ω
01-140F0331	2,0 m²	0,5 x 4 m	300 W	176,4 Ω
01-140F0332	2,5 m²	0,5 x 5 m	375 W	141,1 Ω
01-140F0333	3,0 m²	0,5 x 6 m	450 W	117,4 Ω
01-140F0334	3,5 m²	0,5 x 7 m	525 W	100,6 Ω
01-140F0335	4,0 m²	0,5 x 8 m	600 W	88,0 Ω
01-140F0336	5,0 m²	0,5 x 10 m	750 W	70,6 Ω
01-140F0338	6,0 m²	0,5 x 12 m	900 W	58,7 Ω
01-140F0339	7,0 m²	0,5 x 14 m	1050 W	50,0 Ω
01-140F0340	8,0 m²	0,5 x 16 m	1200 W	44,0 Ω
01-140F0337	9,0 m²	0,5 x 18 m	1350 W	39,1 Ω
01-140F0341	10,0 m²	0,5 x 20 m	1500 W	35,3 Ω

DEVI Heating Systems Ltd (Head Office)
36B Sonter Road, Wigram, Christchurch 8042
PO Box 8582 Riccarton, Christchurch 8440
Ph 0800 468 356 / (03) 348 0070

www.devi.co.nz

DEVI Heating Systems Ltd
6C Dallan Place, Albany, Auckland 0632
PO Box 101-274 North Shore, Auckland 0745
Ph 0800 927 635 / 09 415 7250

Installing F-Board onto an existing Concrete/Tiled floor

F-board is a thermal insulation board that comes either as a 6mm or 10mm wafer that is affixed to the floor prior to the laying of the tiles, either in conjunction with or without under-tile heating.

- Floor surface is to be prepared clean, dry, dust free and smooth prior to laying **F-Board**.

- Plan and lay out the **F board** to cover the floor as required. Where the board requires cutting in or around objects, use a box cutter, Slanley knife or similar.



- For best practice, the **F-Board** should be staggered when laid.

- **F-Board** must be adhered to the concrete using a tile adhesive product which will fill the imperfections of the floor and provide a strong bond. This should be applied for a full coverage of the floor area on which the **F-Board** panels are to be laid.

  When laying the **F-Board** to the floor adhesive, gently press each panel to the floor to ensure all air voids are eliminated and you finish with a flat even surface on which the Devimat floor heating and tiling is to be laid.

  (When adhering the **F-Board** to the floor, be sure to follow the adhesive manufacturers instructions).

- Where required, water-proofing membrane may be applied either to the surface beneath the **F-Board** before it is laid, or over top of the **F-Board** after it is laid. Where the waterproof membrane is applied after the **F-Board** is fitted, a cold-tail grove to the skirting board is to be cut into the F-Board before applying the waterproofing. The grove shall be a minimum of 25mm wide and 300mm in length and will accommodate the cold-tails and the sensor tube. Where the F-Board is to be laid after waterproofing, the grove should be cut before laying the panel.

- **Devimat 150** undertile heating elements is the preferred heating element to use in conjunction with **F-Board**.

- For further assistance or advice, please call **Devi Heating Systems**, 0800 468 356

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