VICTORIAN BUILDING AUTHORITY

Practitioner Education Series

Mechanical Services
Common Industry Enquiries

This webinar will start shortly to allow participants to join.

VICTORIA State Government

The VBA respectfully acknowledges the Traditional Owners and custodians of the land and water upon which we rely. We pay our respects to their Elders past and present. We recognise and value the ongoing contribution of Aboriginal people and communities to Victorian life.

We embrace the spirit of reconciliation, working towards equality of outcomes and an equal voice.

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Welcome

Today you will hear from:

Practitioner Education Series

John Pham

Senior Technical Advisor (Plumbing)

Technical and Regulation

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What we do

As a regulator we provide ***general advice*** in relation to the application of ***building and plumbing standards*** and the regulation of building and plumbing work. We publish material ***to assist persons*** carrying out functions under the Building Act 1993 and the relevant regulations ***where regulations are unclear or ambiguous***

What we don't do

We ***do not*** publish material to ***reproduce*** the regulatory requirements, including the National Construction Code, referenced standards, or provide specific ***compliance solutions***. Our role is not to set policy, but to support industry to understand and comply with the rules

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What's in scope

Guidance and interpretation of the:

- Building Act 1993;
- Plumbing Regulations 2018;
- Building Regulations 2018;
- National Construction Code (NCC); and
- Australian Standards

What's out of scope

- Policy related issues;
- Legislation that has not yet been implemented;
- Education resources that ***are not*** for the purposes of providing ***technical content***

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The Victorian Building Authority (VBA) works to ensure the **safety and compliance of building and plumbing work in Victoria** by regulating practitioners under the Building Act 1993.

Our focus is on:

- **enhancing practitioner capability and conduct**;
- **ensuring compliance with standards** and
- **protecting consumer interests**.

Through **education**, **oversight** and **enforcement**, the VBA aims to **maintain the integrity of the built environment and contribute to Victoria's economic prosperity**.

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Housekeeping

Today's session will be recorded and will be available on the VBA website.

Questions can be submitted via the Q&A function. For any questions that we don't have time to answer during the session, the questions and answers will be emailed to you after the webinar.

We will be conducting live polls today. These will appear on your screen.

This webinar is scheduled to run for 60 minutes, however in some cases we may run over time in order to cover all content.

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Webinar questions

We will do our best to answer as many of your questions as we can during the webinar.

However, due to the high volume of questions that we receive, we may not be able to answer your question during the webinar time.

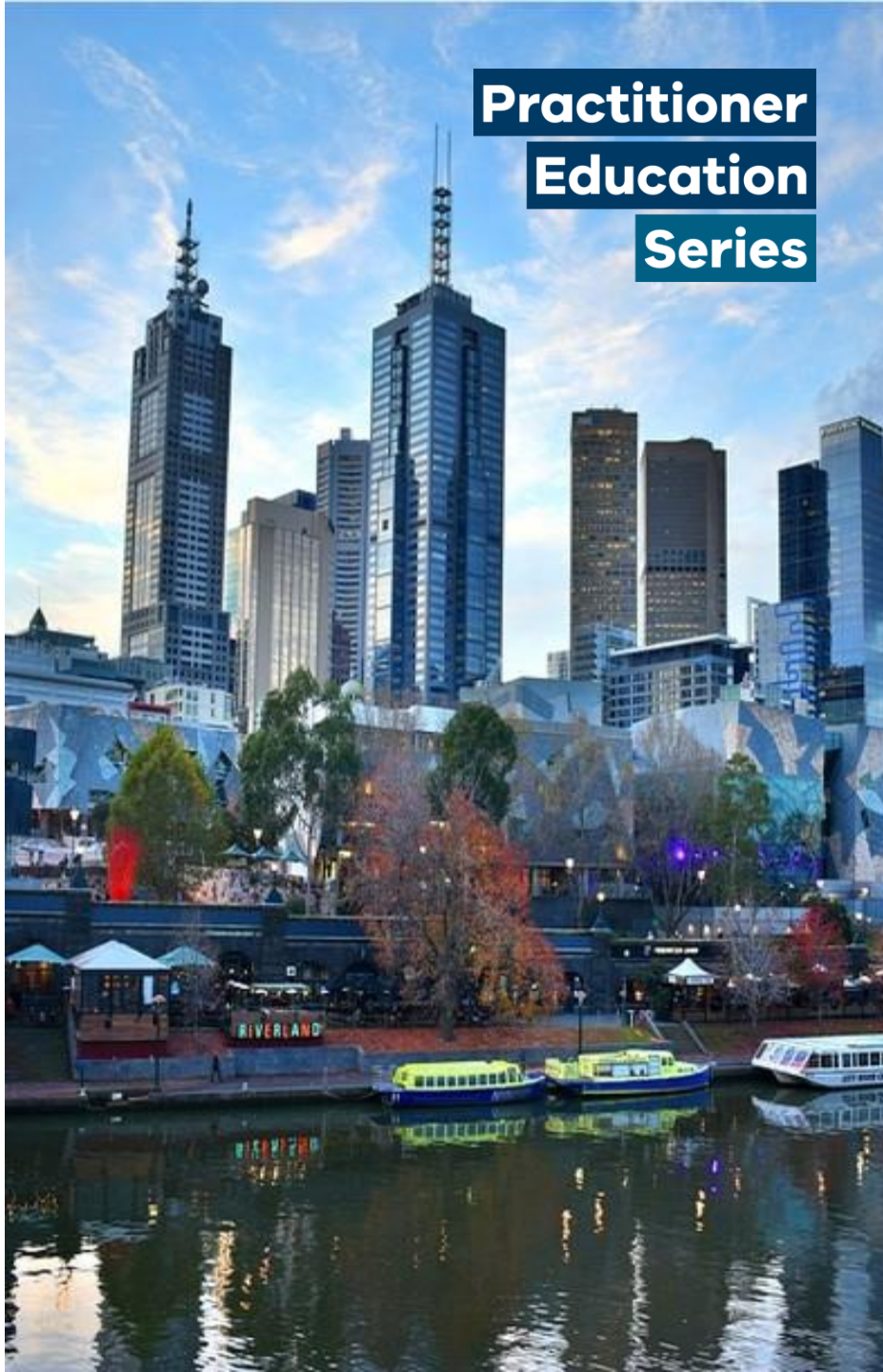
Approximately two weeks after this webinar, you will receive an email with answers to all of the questions that were asked in this webinar.

We thank you for your patience.

Purpose of the webinar

Why is this webinar important?

This webinar will address common industry enquiries the Plumbing Technical team regularly receive regarding Mechanical services work



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Learning goals

After this webinar, you should be able to:

Increase practitioner and relevant stakeholder knowledge of common mechanical service enquiries across the industry, raise awareness of VBA and other relevant resources to assist in ensuring the fundamental requirements are met.

☒ This webinar will not be covering all of the restricted classes of mechanical services scope of works and licensing requirements

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Topics we will cover in this webinar

- Flexible ductwork
- Ventilation
- Solid fuel heaters
- Evaporative coolers
- Split system and airconditioning systems

Flexible ductwork

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Flexible ductwork

Labelling of flexible duct

The label on the outer jacket of all insulated flexible ductwork must state the following information:

- Name of manufacturer
- Conformance to AS 4254.1:2021
- The insulation R-Value of the flexible duct

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Flexible ductwork

Insulation R-Value of Flexible duct

The Victorian variation E2D2 of the Plumbing Code of Australia 2022 (PCA) requires compliance with the relevant parts of the National Construction Code 2022 Vol 2

Clause 13.7.4 of the ABCB Housing Provisions Standard 2022 sets out the R-Value requirements based on:

- The type of system
- The climate zone
- The situation in which the ducts are installed

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Minimum R-Values in Class 1 and 10 dwellings

Minimum insulation R-value for heating and cooling duct in Class 1 and 10 Buildings			
System type	**Climate zone(s)**	**R-value**	**Notes**
Heating-only system or cooling-only system (incl. evaporative cooling)	1 to 7	R1.0	
	8	R1.5	
Combined heating and refrigerated cooling system	1, 3, 4, 6, & 7	R1.5	
	1, 3, 4, 6, & 7	R1.0	Under a suspended floor with an enclosed perimeter; or in a roof space that has an insulation of greater than or equal to R0.5 directly beneath the roofing
	2 & 5	R1.0	
	8	R1.5	
Fittings in all systems			R0.4
The R-values set out above do not apply to heating and cooling ductwork and fittings located within the insulated building envelope including a surface riser within the conditioned space, internal floors between storeys and the like. In some climate zones, condensation may create problems with uninsulated ductwork. Refrigerated cooling ductwork incorporate a vapor barrier to prevent possible damage			

This table should be read in conjunction with **clause 13.7.4 of the ABCB Housing Provisions Standard** which is available via the QR Code.

ABCB Housing Provisions Standard 13.7.4

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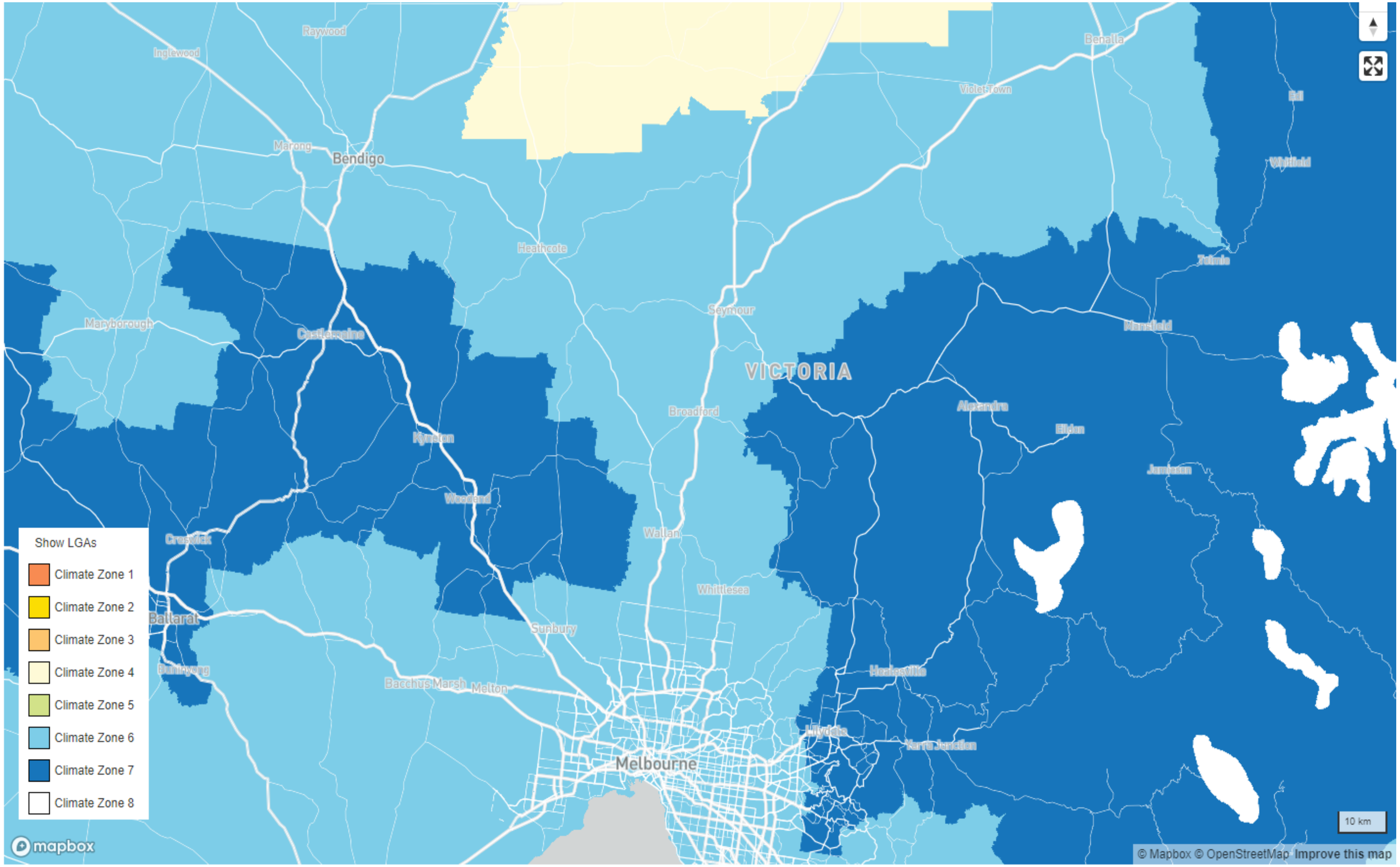
Climate zone

The Australia Building Codes Board (ABCB) have an interactive online map which allows users to zoom in to street level to find accurate Climate Zone boundaries

Climate zone 1 – High humidity summer, warm winter
Climate zone 2 – Warm humid summer, mild winter
Climate zone 3 – Hot dry summer, warm winter
Climate zone 4 – Hot dry summer, cool winter
Climate zone 5 – Warm temperate
Climate zone 6 – Mild temperate
Climate zone 7 – Cool temperate
Climate zone 8 – Alpine

ABCB Climate zone map



[ABCB Climate zone map]

Quick quiz

Insulated Flexible duct must have labelling including what information?

A) Name of manufacturer

B) Conformance to AS 4254

C) Insulation R-Value

D) All of the above

Quick quiz

Insulated Flexible duct must have labelling including what information?

A) Name of manufacturer

B) Conformance to AS 4254

C) Insulation R-Value

D) All of the above

The answer is D. All of the above

Flexible duct

Flexible ductwork must be supported as follows:

At intervals of not more than 1500mm and a sag of not more than 120mm between hangers

Flexible duct connecting to an air terminal device, must extend straight for 100mm from the device before changing direction

A load distribution system with a minimum width of 75mm must be used to support the ductwork. The load distributor must be in contact with the duct for at least 25% of the duct circumference to prevent distortion of the duct, formation of condensation, and excessive compression of the insulation layer.

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Flexible duct

Flexible ductwork must be supported as follows:

At intervals of not more than 1500mm and a sag of not more than 120mm between hangers

Flexible duct shall extend straight for a minimum of 100mm from a connection to an air terminal device before any change of direction

A load distribution system with a minimum width of 75mm must be used to support the ductwork. The load distributor must be in contact with the duct for at least 25% of the duct circumference to prevent distortion of the duct, formation of condensation, and excessive compression of the insulation layer.

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Flexible duct

In Class 1 to 3, and Class 10 buildings (as defined by the NCC) each duct run must not use more than two lengths of up to 6m each of any one duct diameter in any single duct run

All connections of flexible ducts of the same diameter must be made using a joiner

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Flexible duct

Hangers must be securely attached to the building structure to support the weight of the duct for the life of the duct system

Branch take-offs and terminal devices must be supported independently of flexible duct

Duct work installed in subfloor locations must be supported so that no part of the duct work is in contact with the ground

Bends in flexible duct must maintain a throat radius of not less than the duct outside diameter

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Is the disconnection and reconnection of flexible ductwork to a heater mechanical services work?

Yes. The Plumbing Regulations of 2018 define any duct connection used in a mechanical heating, cooling or ventilation system in a building as Mechanical services work

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In a heater changeover installation am I responsible to changeover the existing ductwork?

You are only responsible for the work you carry out, however should report the state of the ductwork to the property owner and advise if any ductwork requires replacing

Ensure the new system is sized accordingly for the existing heating load and ducting requirements

! **NOTE** - Ensure attention is made to correctly sized Return Air vents for the new system for filtered/non-filtered grilles, follow manufacturer's specifications

Quick quiz

Is the disconnection and reconnection of flexible ductwork to a heater mechanical services work?

A) Yes
B) No
C) Maybe
D) Unsure

Quick quiz

Is the disconnection and reconnection of flexible ductwork to a heater mechanical services work?

A) Yes
B) No
C) Maybe
D) Unsure

The answer is A. Yes

Ventilation

Ventilation Performance requirements

NCC2022 Volume Two – H4P5 prescribes the performance requirements for ventilation with the following

A space in a building used by occupants must be provided with means of ventilation with outdoor air which will maintain adequate air quality

A mechanical air-handling system installed in a building must control:

- The circulation of objectionable odours
- The accumulation of harmful contamination by micro-organisms, pathogens and toxins

Contaminated air must be disposed of in a manner which does not unduly create a nuisance or hazard to people in the building or other property

Discussion with relevant stakeholders

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Discussion with relevant stakeholders

Is the installation of rangehood exhaust ventilation mechanical services work?

The Plumbing Regulations 2018 defines Mechanical services work to include duct fixing and any roof sheeting and roof flashing that is necessary for the purpose of the work

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Siting of outdoor unit

AS/NZS 5141 requires consideration to be given to the adequate ventilation, condensate drainage, and refrigerant charge limits of any outdoor unit that is installed in an enclosed location

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Does my kitchen rangehood, bathroom, laundry exhaust have to discharge to outdoor air?

For class 1 buildings, the requirements for rangehood exhaust to terminate to outdoor air via shaft or duct is dependent on the applicable NCC (National Construction Code) requirements applied at the time of the approved construction.

2022 NCC states that all exhaust from a kitchen, kitchen rangehood, bathroom, sanitary compartment or laundry must discharge directly or via a shaft or duct to outdoor air.

ABCB webpage
NCC Volumes

Solid Fuel Heaters

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What type of VBA accreditation do I need to install a Solid Fuel Heater?

Plumbing Regulations 2018 defines the installation of a solid fuel heater as mechanical services work therefore it must be carried out by a Plumber with Mechanical Services accreditation

Solid Fuel heaters can also be a restricted class of Mechanical services

NOTE - Serious penalties apply for carrying out work without appropriate accreditation or supervision

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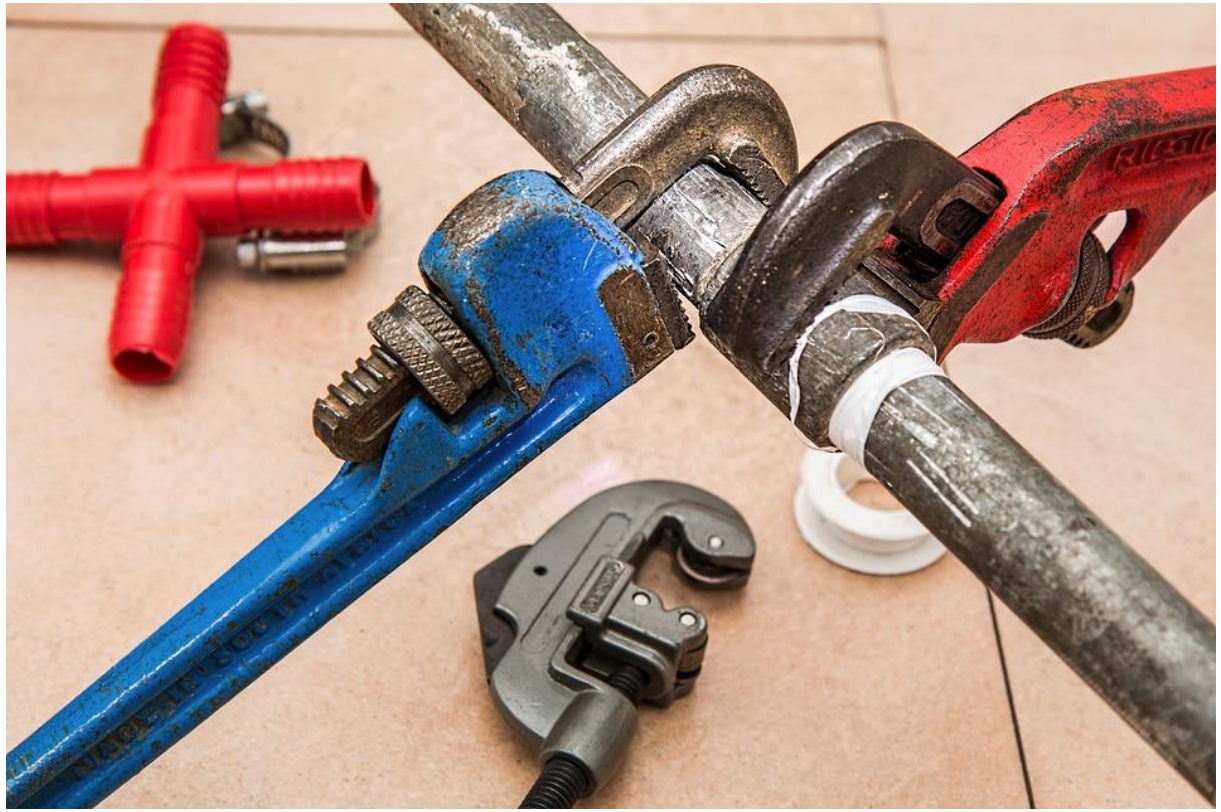
Can a gasfitter install a solid fuel heater flue?

Plumbing Regulations 2018 defines the installation of a solid fuel heater and the associated flue as mechanical services work



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Is the disassembly and reassembly of the solid fuel heater flue for cleaning purposes plumbing work?

Plumbing Regulations 2018 Division 5 Clause (2) states that Mechanical services work does not include – disassembly or reassembly of a flue terminal for the purposes of cleaning a solid fuel heater as regulated plumbing work

Solid Fuel Heater general flue external requirements

The flue must terminate outside of the building in which the appliance is installed

The flue pipe must extend at least 4.6m above the top of the floor protector

Flues that terminate within 3m from the highest point of the roof must be at least 600mm above that point

Flues that terminate more than 3m from the highest point of the roof must terminate at least 1000mm above roof penetrations

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Solid Fuel Heater general flue external requirements

Flues must terminate in a location where no part of any building is within, or directly above, a 6m horizontal radius from the terminal

Flue systems, including terminals, must not pose a risk of fire to heat-sensitive materials

Flues must terminate such that there is no foreseen risk of flue gases entering the building through windows, natural ventilation, mechanical ventilation, exhausts or the like

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Solid Fuel Heater general flue external requirements

No part of any building lies in or above a circular area described by a horizontal radius of 6m about the flue system exit

Termination of the flue system does not constitute a risk of fire to heat-sensitive materials

Flues must terminate such that there is no foreseen risk of flue gases entering the building through windows, natural ventilation, mechanical ventilation, exhausts or the like

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Solid fuel heater installation requirements

Installations must comply with the requirements of AS/NZS 2918 Domestic solid fuel burning appliances – Installation

Solid fuel heater clearances

Flue terminals

Flue clearances from combustible surfaces

Fresh air ventilation requirements

Adhere to all manufacturer’s installation instructions

Solid fuel heater – Important information

Modifying or substituting any components on a solid fuel heater before, during or after installation can result in an unsafe appliance and one that does not conform to Australian standards.

DO NOT -

Modify an appliance to burn fuels that it was not designed to burn

Tamper with controls that regulate the air intake of an appliance

Modify an appliance by adding-on components such as catalytic combustor, water jackets or draught regulator

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Solid Fuel Heater – Important information warnings

Warnings are outlined in AS/NZS 2918

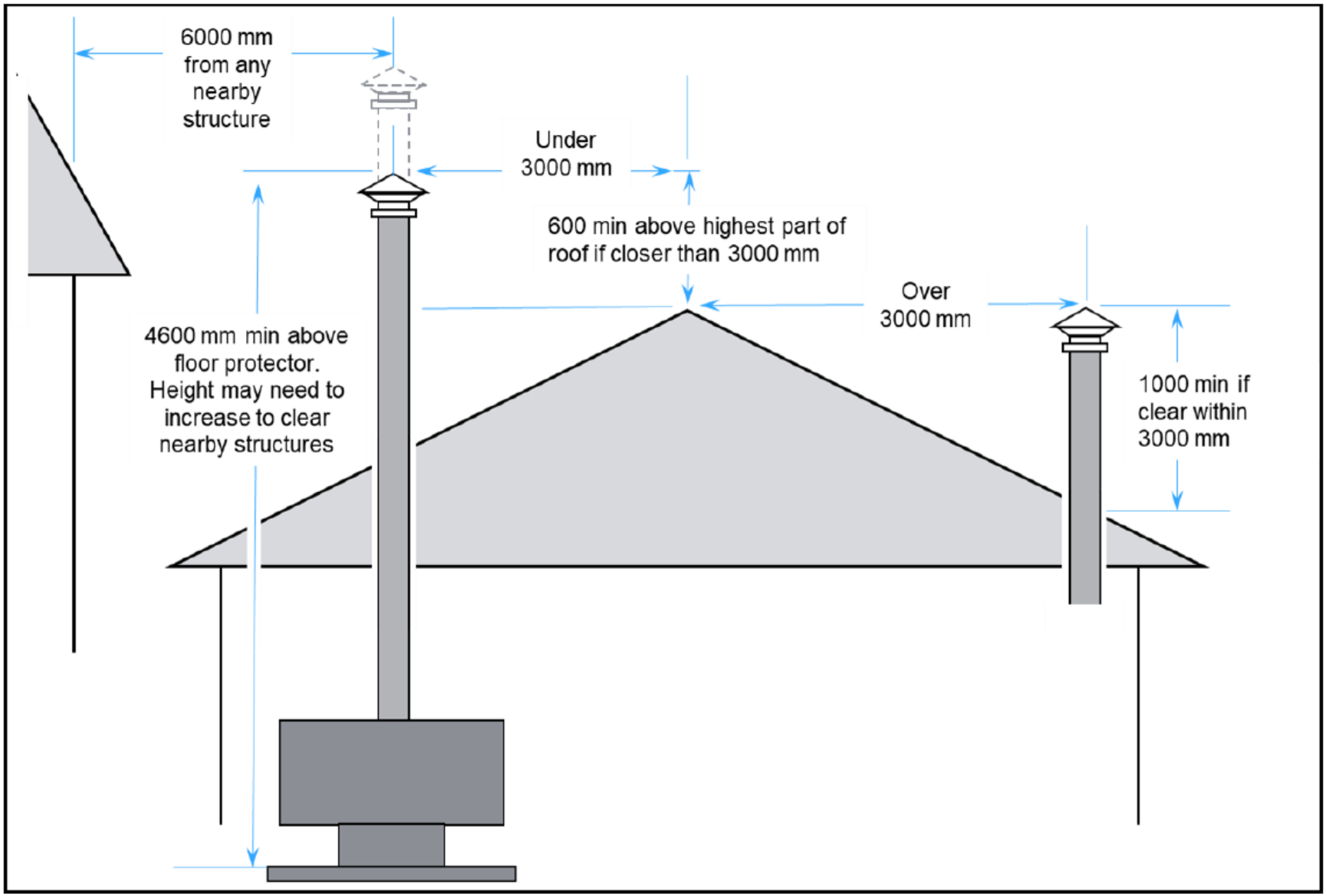
Warning: Any modification of the appliance that has not been approved in writing by the testing authority is considered to be in breach of the approval granted for conformance to AS/NZS 4013

Caution: Mixing of appliance or flue system components from different sources or modifying the dimensional specification of components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted in the first instance

Caution: Cracked and broken components, for example glass panels or ceramic tiles, may render the installation unsafe

Recommendations for installation and operating instructions should be included with the appliance

Solid Fuel Heater



Available in VBA Practice Note MS01 – Solid Fuel Heaters

Quick quiz

Which VBA accreditation is required to install a Solid Fuel Heater?

A) Gasfitting
B) Mechanical service
C) Roofing
D) Sanitary

Quick quiz

Which VBA accreditation is required to install a Solid Fuel Heater?

A) Gasfitting
B) Mechanical service
C) Roofing
D) Sanitary

The answer is B. Mechanical service

Evaporative Coolers

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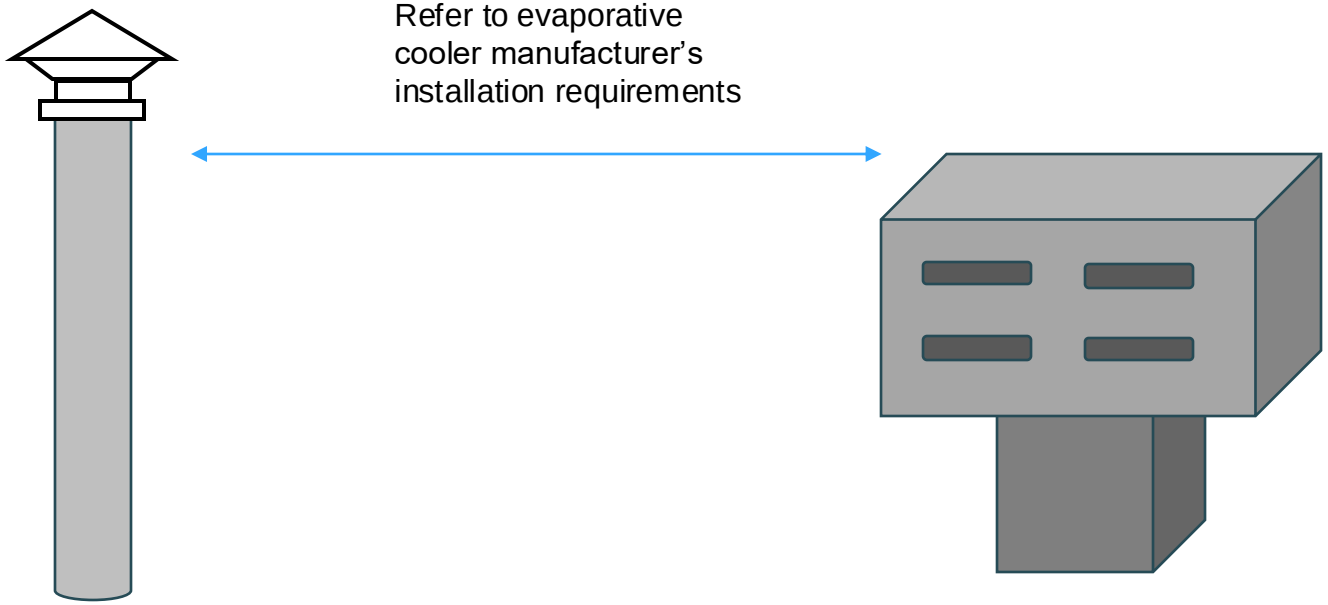
Evaporative cooler locations

- Ensure evaporative coolers are installed in suitable locations
- Practical service access around the evaporative cooler
- Proximity to other services on the roof (solar panels, antennas, sewer vents)
- Ensure unit is installed as far as practical from the ridge to avoid wind draft

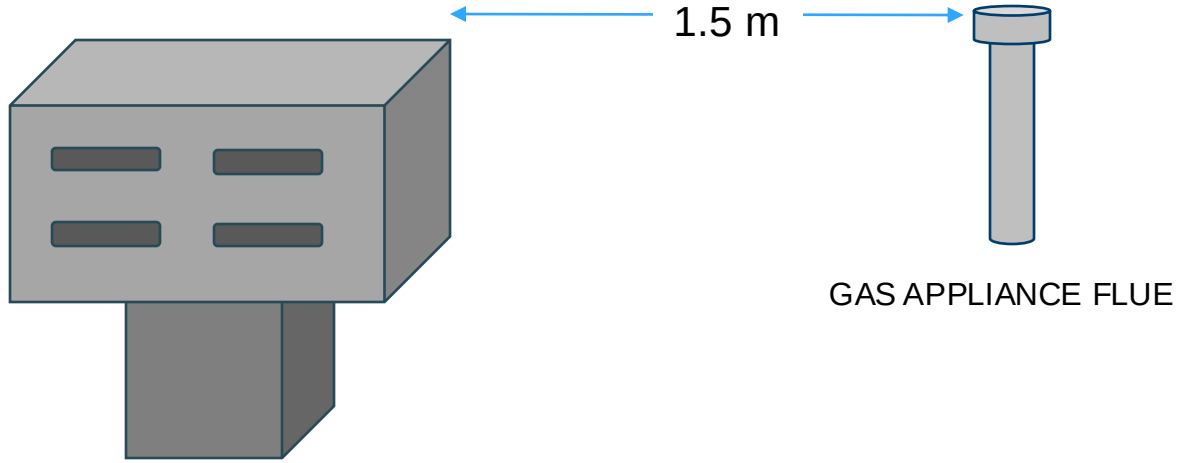
Check if any BAL requirements are applicable

Evaporative Cooler Technical Specifications 2024

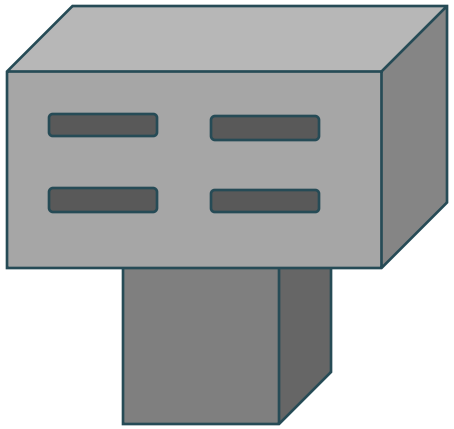


Evaporative Cooler Technical Specifications 2024

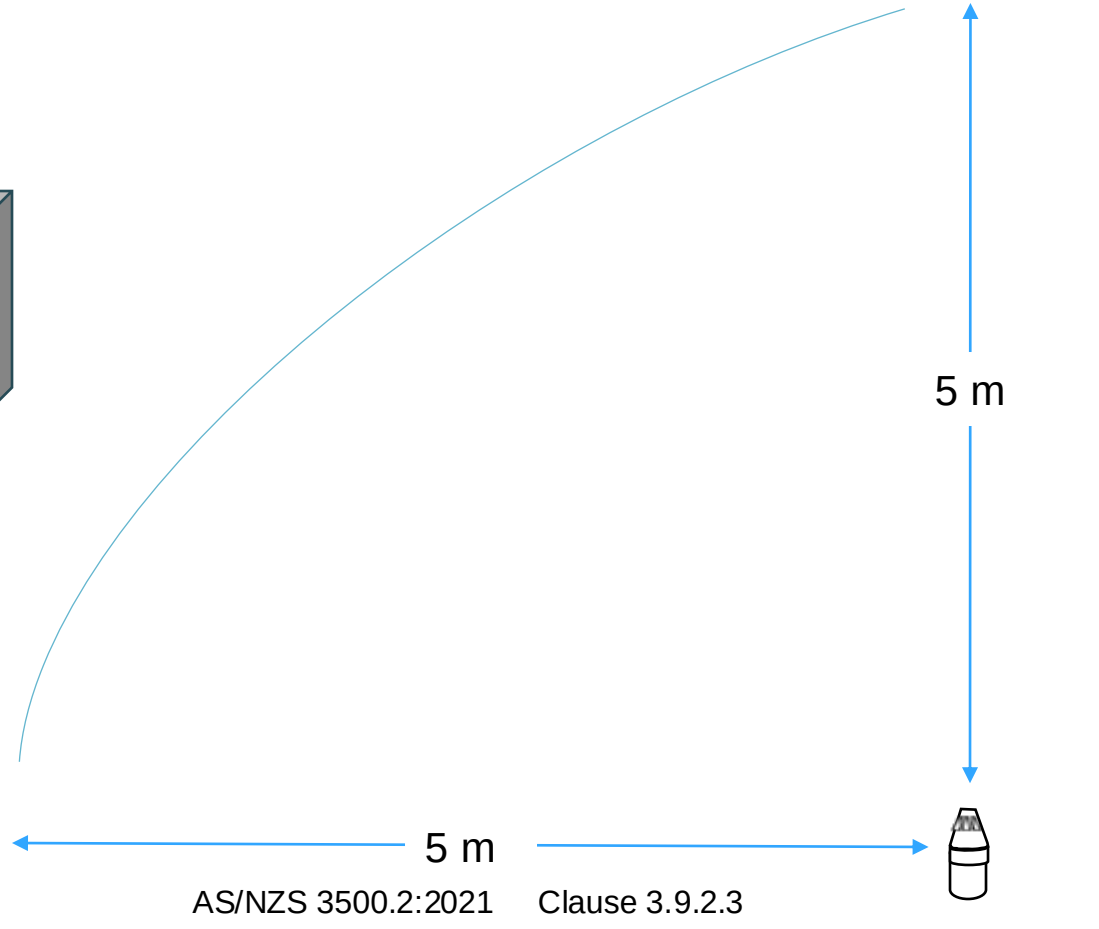
AS/NZS 5601.1:2022 Table 6.9.3



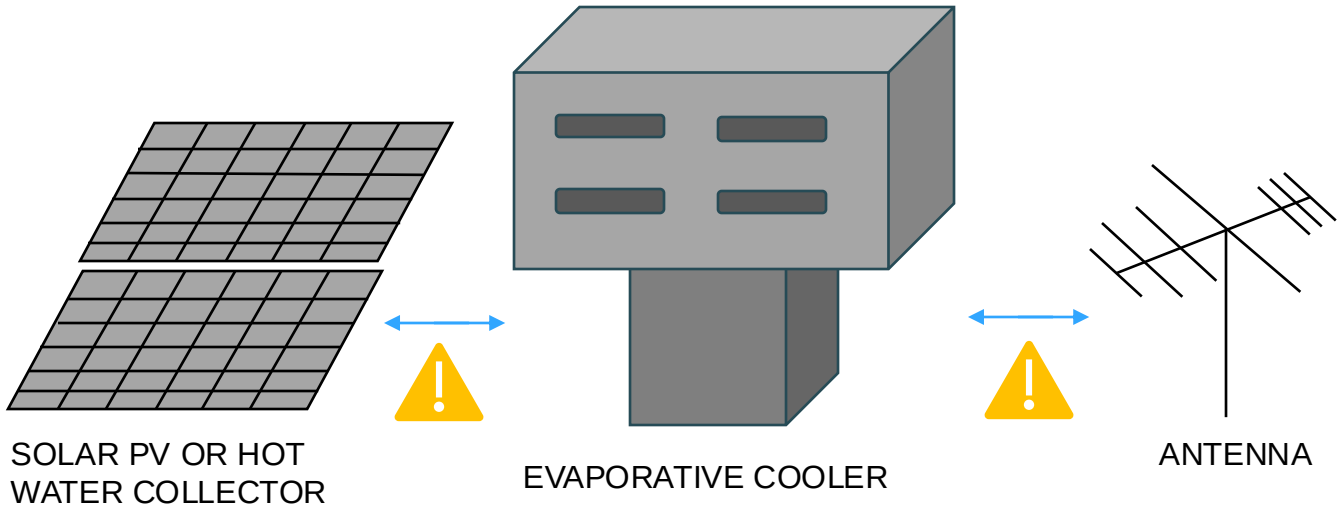
Evaporative Cooler Technical Specifications 2024



EVAPORATIVE COOLER

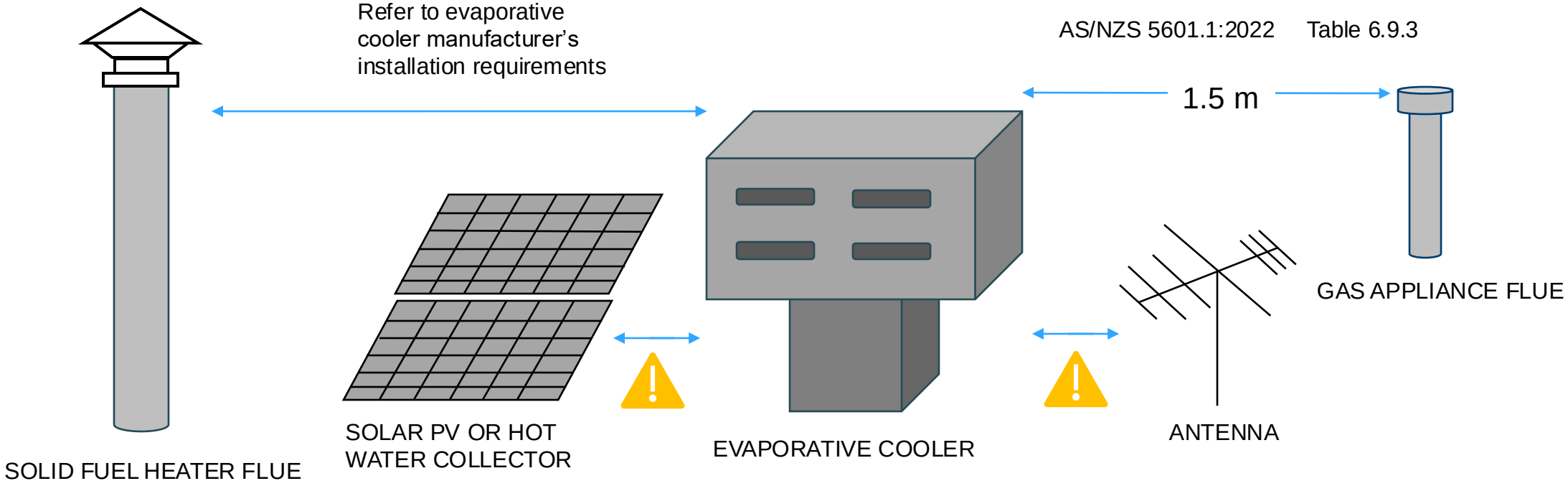


Evaporative Cooler Technical Specifications 2024



Ensure practical service space is clear from obstructions

Evaporative Cooler Technical Specifications 2024



Ensure practical service space is clear from obstructions

Evaporative cooler drainage provisions

HB276 and VIC Part E2 of the PCA prescribes the DtS requirements for evaporative cooler drainage

Drainage discharge to a roof gutter pop outlet

The use of a spreader to be used for discharge onto a tile roof

The spreader is to be in the direction of the flow of water, be secured and appropriately sized and discharge evenly over the roof tiles. It should be clear of roof tile joints and any roof flashings; the end should be capped and (top half open) allow for overflow provision

VBA Practice Note MS05 available as a resource online

NOTE: As the evaporation process causes minerals to be left behind, drains **must not terminate** into a system that uses that collection of water for potable use. (example: a rainwater tank for potable use)

Evaporative cooler drainage provisions

VBA Plumbing Practice Note MS05

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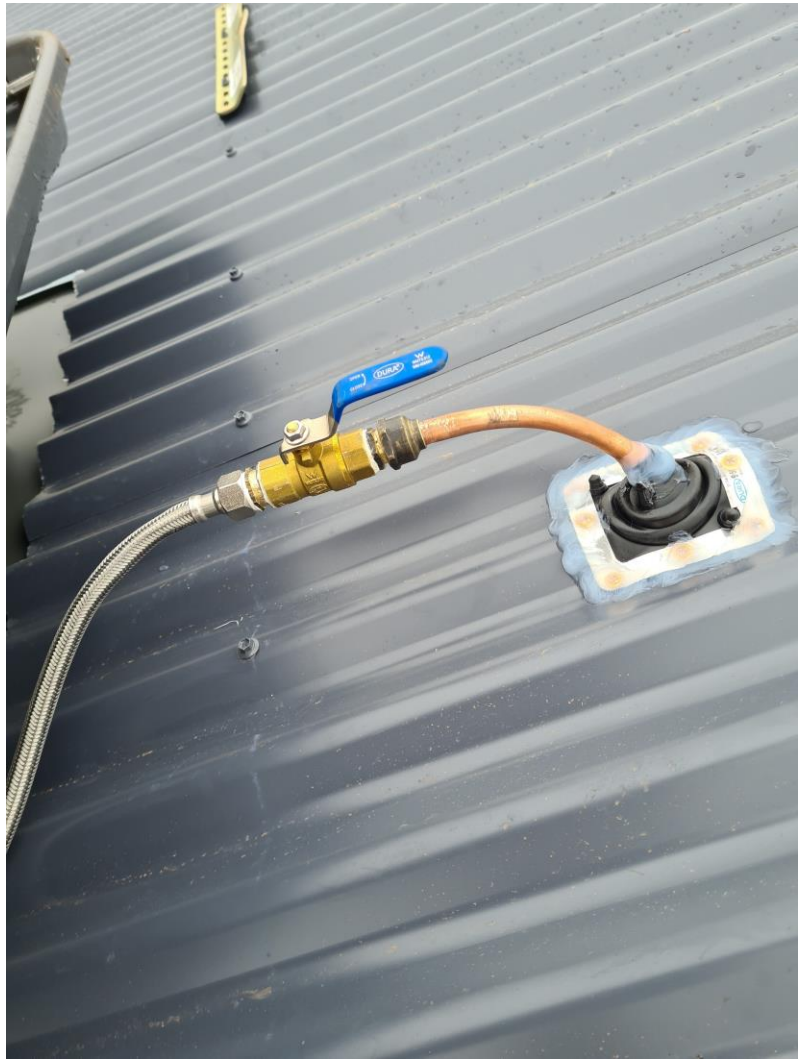
Evaporative cooler water connections

Ensure water pipes and its connections to the evaporative cooler are fit for purpose

Plastic pipes to not be used and exposed to direct or indirect UV conditions. If installed under conditions where subject to mechanical damage it shall be protected (sleeve and jackets)

Alternatively use appropriate pipe material externally and reconnect back to plastic pipe inside the roof



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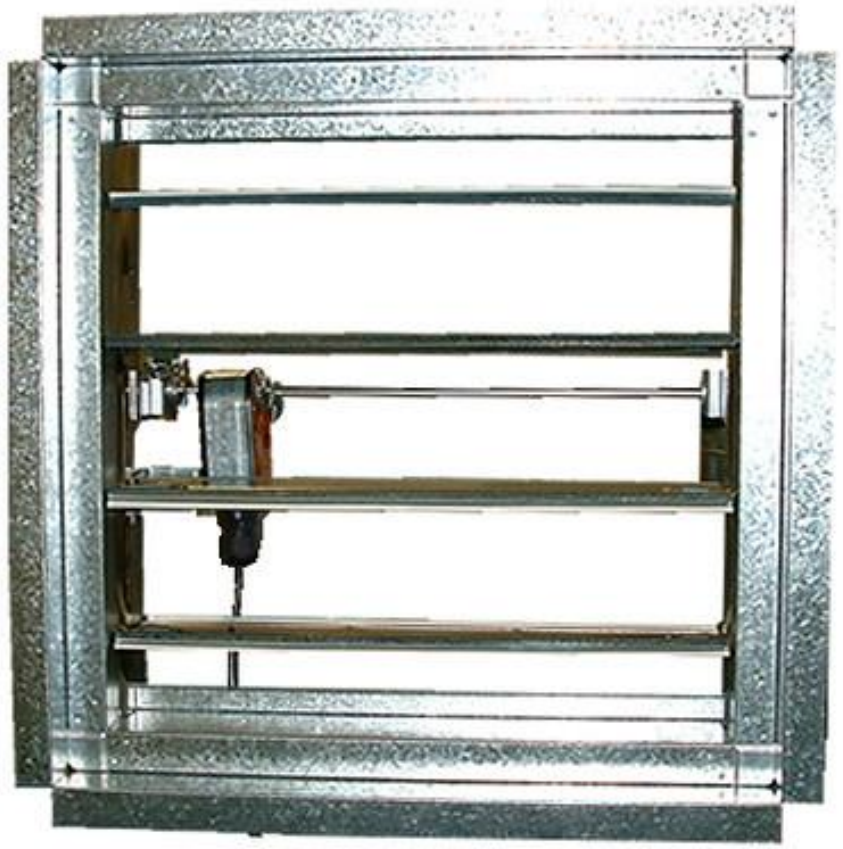
Evaporative cooler self-closing damper

ABCB Housing Provisions Standard 2022 requires that an evaporative cooler must be fitted with a self-closing damper or the like when serving –

A heated space or;

A habitable room in climate zones 4,5,6,7, or 8

The self-closing damper should create an effective seal against air infiltration



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What type of Evaporative cooler is required for BAL areas?

NCC2022 Volume Two – Building Code of Australia

Part H7F4 requires some buildings “constructed in a designated bushfire prone area is to provide resistance to bushfires in order to reduce the danger to life and reduce the risk of loss of the building”.

BAL (Bushfire attack level) is the assessed rating of risk that a building has based on consideration of a number of factors. (Fire danger index, slope of land, types of surrounding vegetation).

VBA Bushfire and overlays

VBA Bushfire protection

Victorian government siting and general design considerations

The installation of an appropriate BAL rated evaporative cooler by design and construction must be installed to adhere the strict requirements of AS 3959:2018 standards - Construction of buildings in bushfire prone areas.

Quick quiz

Which of these places can an evaporative cooler drain discharge?

A) Onto the metal roof
B) Potable water storage tank
C) Stormwater downpipe outlet
D) Neighbour’s backyard

Quick quiz

Where should the evaporative cooler drain to?

A) Onto the metal roof
B) Potable water storage tank
C) Stormwater downpipe outlet
D) Neighbour’s backyard

The answer is C. A Stormwater downpipe outlet

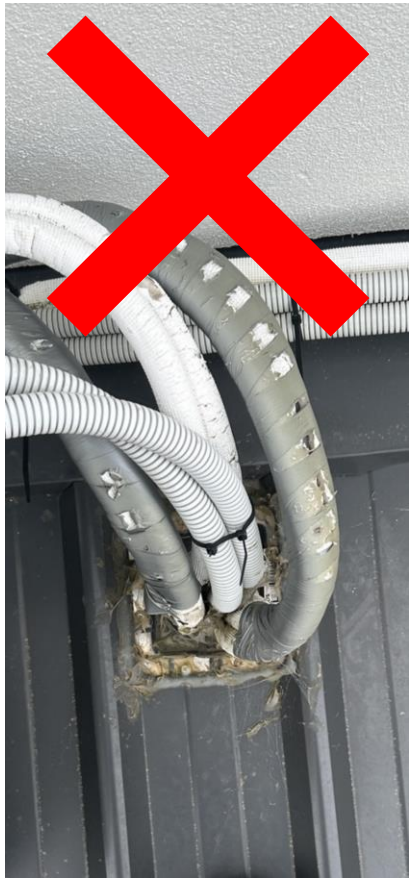
Split system & Air Conditioning systems

Split system & airconditioning pipework – roof and wall penetrations

Where a pipe or duct penetrates any part of the roof surface, the penetration must be flashed to prevent entry of rainwater

Flashing of penetrations must be collar, apron or other purpose made flashings. Synthetic rubber collars must be installed in accordance with manufacturer's specifications and must not block the flow path of water

The same principles must apply for wall penetrations to prevent water ingress and damage to the building



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Split system & airconditioning pipework – roof and wall penetrations

Mechanical services, equipment for heating/cooling must avoid damage to property and loss of amenity to occupants

Part A5G1 of the NCC Volume Three, requires that plumbing installations “must be constructed using materials, products, plumbing products, forms of construction and designs fit for their intended purpose”

Rubber collar type flashings for wall penetrations are to be installed appropriately to prevent ingress of water back into the building, be appropriately fixed and sealed for weatherproofing

Where pipe insulation is exposed to the weather, the insulation must be weather resistant or protected by a weather resistant enclosure or coating

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Split system & airconditioning condensate drainage termination

Split system condensate drainage to discharge and be terminated as per HB276 Guide to good practice

Drain onto a garden bed

Drain onto concrete or paving graded away from building

Discharge directly over downpipe outlet

Connection to a downpipe must be a minimum of 300mm below the drain outlet of the indoor unit

VBA MS07 Practice Note available as a resource online

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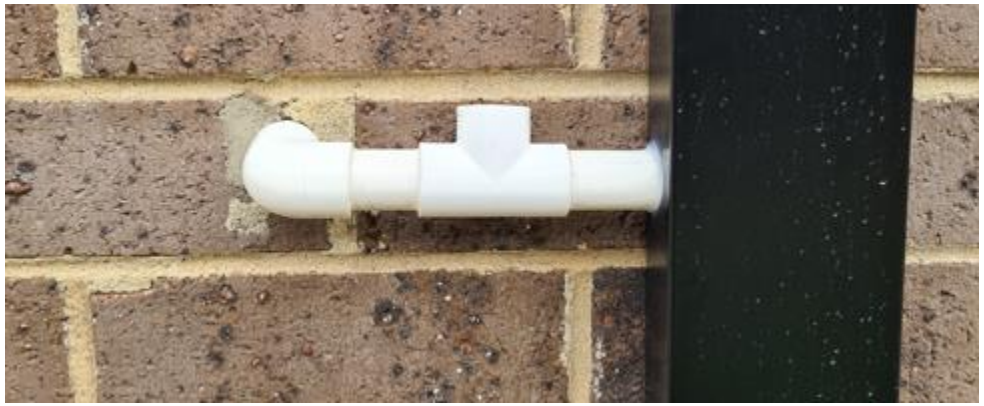
Split system & airconditioning condensate drainage termination

Drains which connect to a downpipe must be provided with a form of disconnection to ensure that blocked downpipes cannot overflow through the indoor unit

This can be achieved by a providing an overflow tee before termination into the downpipe or an angle cut on the final bend, then sealing to the downpipe

Over a tundish, with a 25mm air gap and spill level equal to the fixture, and connected above the water seal of a fixture trap or FWG



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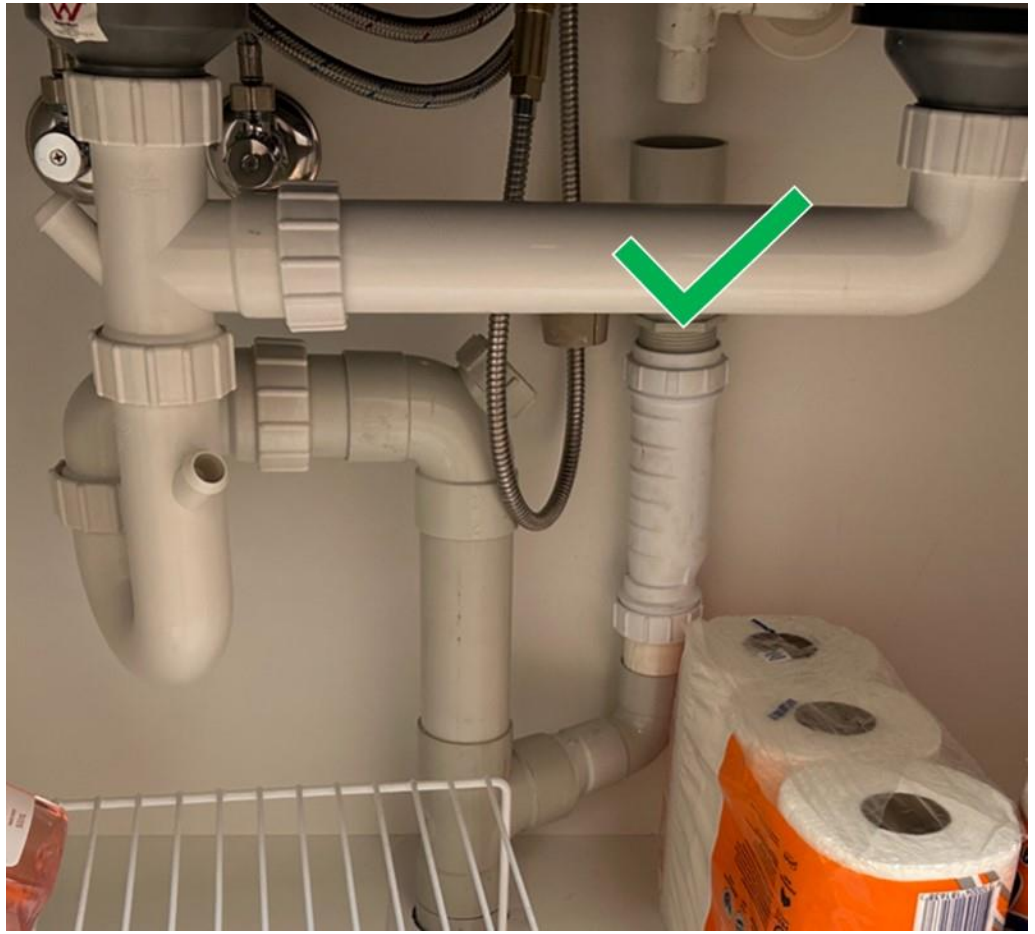
Split system & airconditioning condensate drainage using a self-sealing device (SSD)

SSDs are when there is no waste discharge to prevent foul air entering the building

SSDs have an advantage over a conventional water trap seal as they are not prone to evaporation when not used for long periods of time

Ensure consultation with relevant trades during construction to determine correct heights and location

This work must be carried out by a plumber with the class of Sanitary as per AS3500.2



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Split system & airconditioning condensate drainage using a self-sealing device

Waste or vent in roof/ceiling space

The condensate drainage from a heating or cooling appliance may be discharged to a vent pipe in the ceiling via a self-sealing device (SSD)

If not practical to install in the vertical position, the SSD can be installed on grade if it incorporates a tundish with an air gap

The junction and device must be installed by a sanitary plumber in accordance with AS3500.2

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Pumped condensate

Where limitations on the installation due to physical restrictions and internal indoor unit locations exist, in some situations condensate may need to be pumped to an appropriate location

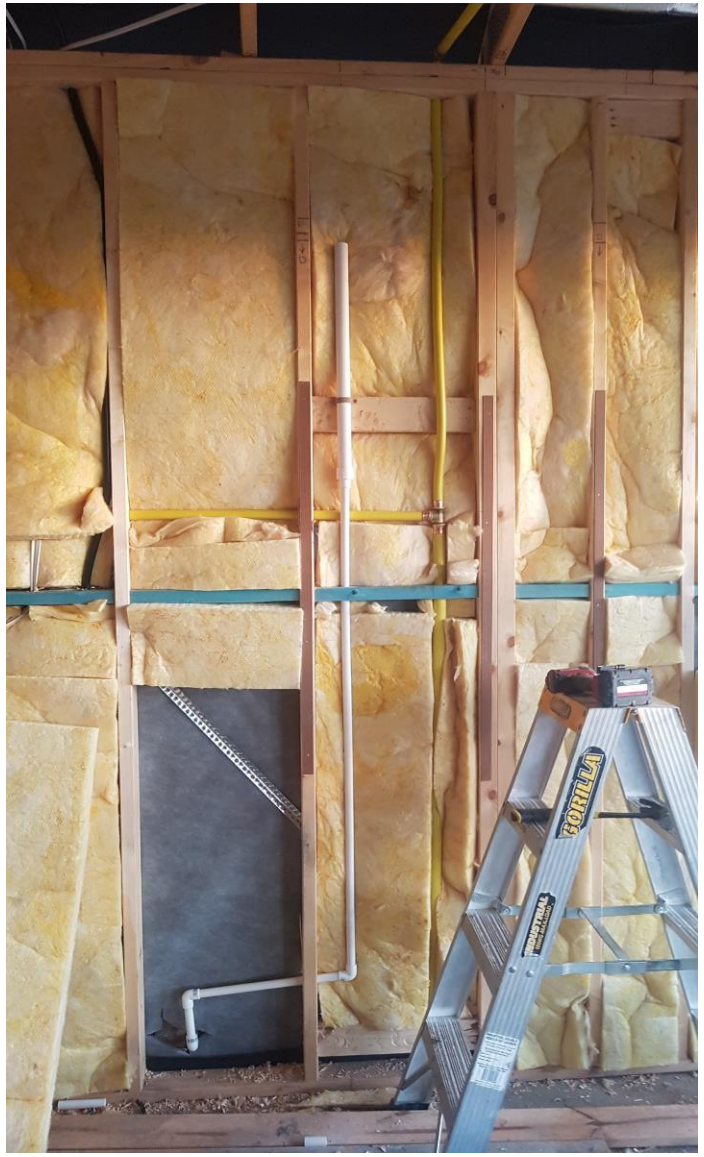
If it is necessary to pump condensate from an indoor unit to its drainage termination point, the pump must be installed in an accessible position for service/maintenance purposes

Drain material

The material used for the drain must be suitable for the purpose and if a plastics material is used it must be of a type suitable for installation in direct sunlight

Ensure flexible drains terminate into PVC prior to being discharged externally as the product is not UV rated

National Construction Code Volume Three – Plumbing Code of Australia A5G1 Suitability



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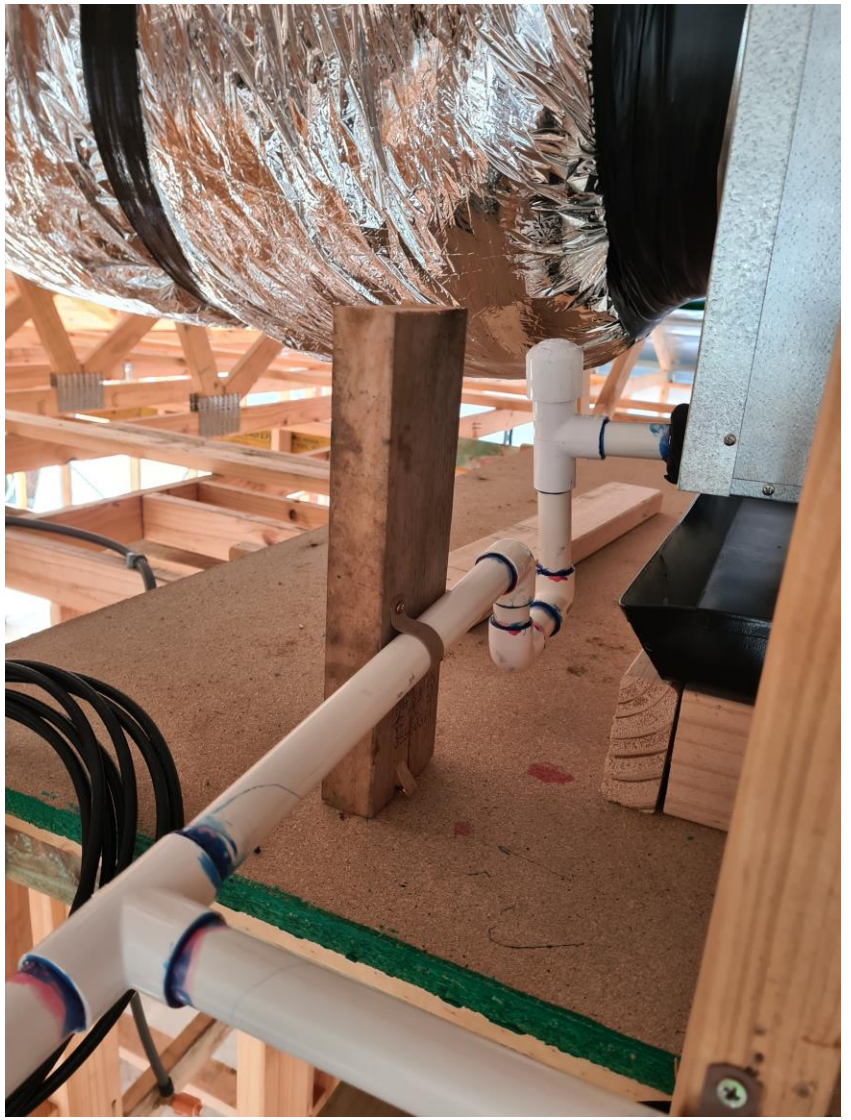
Condensate drains

Condensate drains are to be connected to all condensate drain outlets from fan coils and airconditioning systems

Condensate drains from air-conditioning can be prone to condensation on the outside of the pipe, in these situations, the first meter of drain must be insulated.

Where required, a ‘P-Trap’ must be fitted to the condensate collection tray under the cooling coil to assist in the draining of the condensate collection tray



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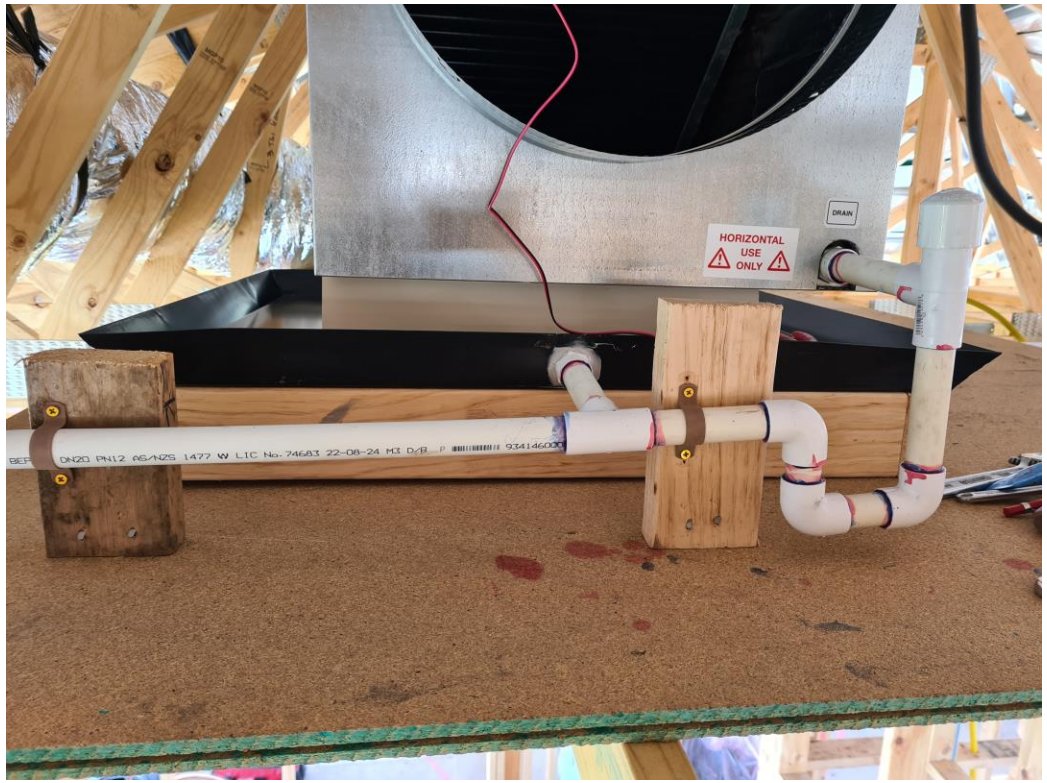
Safe tray requirements for condensate drainage

Where an outdoor unit is mounted on the balcony of an apartment building, or where the condensate or defrost discharge may cause a hazard or nuisance, a drained safe tray must be provided

Where an add-on coil requires the use of a safe tray, ensure the unit sits within the safe tray to avoid any likelihood of uncontrolled condensation leaking onto the ceiling and causing damage



Quick quiz

Who can install a self-sealing device (waterless trap)?

A) Builder
B) Electrician
C) Sanitary plumber
D) Painter

Quick quiz

Who can install a self-sealing device (waterless trap)?

A) Builder
B) Electrician
C) Sanitary plumber
D) Painter

The answer is C. A Sanitary plumber

Access for maintenance

AS/NZS 5141 requires heating and cooling equipment to be installed in locations that permit efficient and safe access and, where necessary, lighting for maintenance.

The location must provide the required clearance for removal of parts and access to internal components for servicing.

This applies for heaters, add-coils and ducted reverse cycle systems

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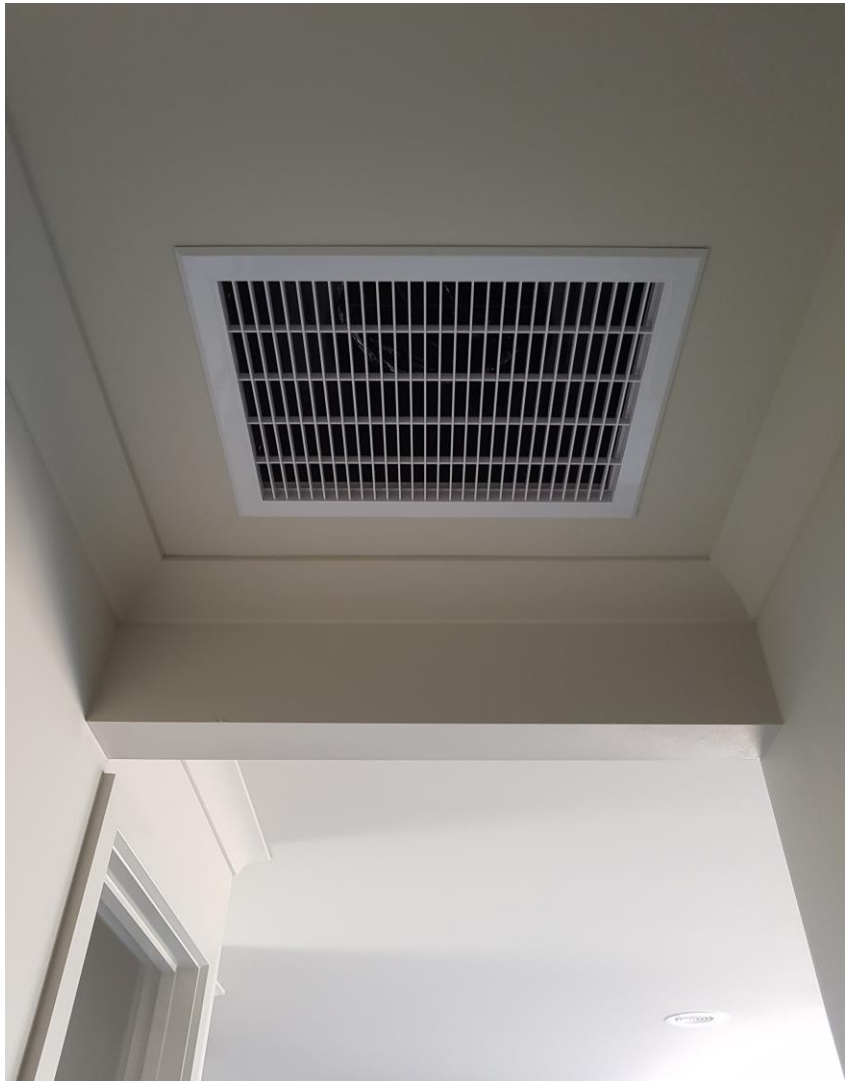
Return air positioning

The return air must be located:

- In a position not directly adjacent to supply air terminals to minimize **short circuiting** between supply and return air
- Not near a kitchen and toilet to reduce the immediate recirculation of odours
- Where return air noise will not cause a nuisance
- For a zoned system, in a common area



Return air positioning continued

- Closer to the floor than the ceiling if the system is used mainly for heating
- Closer to the ceiling than the floor, if the system is used mainly for cooling, except where the ceiling is significantly higher than occupied zone e.g., cathedral ceilings
- In an accessible position, particularly where the return air grille includes a filter
- In a position that will not affect the operation of smoke detectors

Outdoor unit safety

AS/NZS 5141 prescribes the following requirements for outdoor unit safety

"Where the outdoor unit is installed on a balcony or deck that is more than 4m above a surface below, the outdoor unit location shall not facilitate climbing over the balustrades or railings"

"Any screen around the outdoor unit shall not facilitate climbing and shall not include toe holes"

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Outdoor unit location and support

Ensure that all outdoor locations are suitable and that the roof or wall structure can take the weight of the condensing unit

Engineered equipment platforms may be required to safely site larger

Where timber is used to support equipment, the timber should be Redgum or Cyprus pine, and appropriately treated to prevent degradation or staining of the roof surface

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Outdoor unit location and support

Ensure that all outdoor locations are suitable and that the roof or wall structure can take the weight of the condensing unit

Engineered equipment platforms may be required to safely site larger units

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Outdoor unit location and support

Ensure that all outdoor locations are suitable and that the roof or wall structure can take the weight of the condensing unit

Larger units may require to be installed on engineered equipment platforms

Where timber is used to support equipment, the timber should be Redgum or Cyprus pine, and appropriately treated to prevent degradation or staining of the roof surface

Securing an outdoor unit

Zip ties such as this are not considered an effective means of securing an outdoor unit

Outdoor unit location and support

Timber bearers must not be installed in the tray section of metal deck roofing as this impedes the flow of water

Ensure timber/plastic or metal supports are placed on the top of the ribs with rubber waffle pads to insulate the metal to prevent corrosion and absorb vibration.

Outdoor units at ground level should be installed to prevent the transmission of vibration to the building structure and secured by the mounting feet on a suitable base

Ensure wall, roof brackets and ground slabs are by design suitable for the proposed weight to be mounted

Refer to all manufacturer's installation instructions for clearances

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Refer to all manufacturer's installation instructions for clearances

Series

Outdoor unit location and support

- Timber bearers must not be installed in the tray section of metal deck roofing as this impedes the flow of water
- If timber bearers are to be used as a support, ensure they are placed on tops off the ribs and are insulated from the metal (e.g. rubber waffle pads) to prevent corrosion
- Condensing units mounted at ground level should be installed to prevent the transmission of vibration to the adjacent building structure and secured by the mounting feet on a suitable base
- Ensure wall, roof brackets and ground slabs are by design suitable for the proposed weight to be mounted

Refer to all manufacturer's installation instructions for clearances

Outdoor unit clearances 2024

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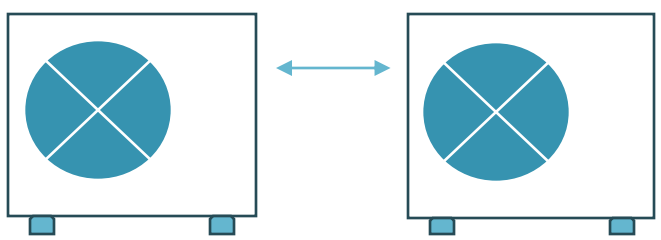
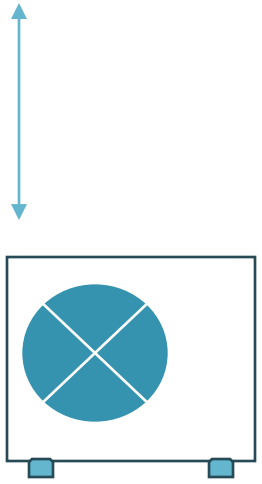
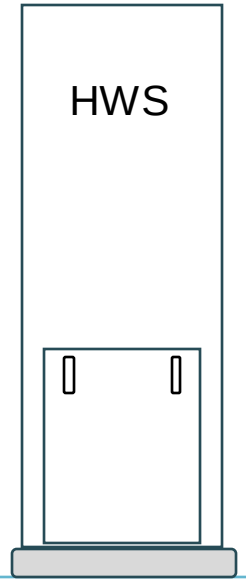


Refer to all manufacturer's specifications for requirements for access and servicing/replacement of components

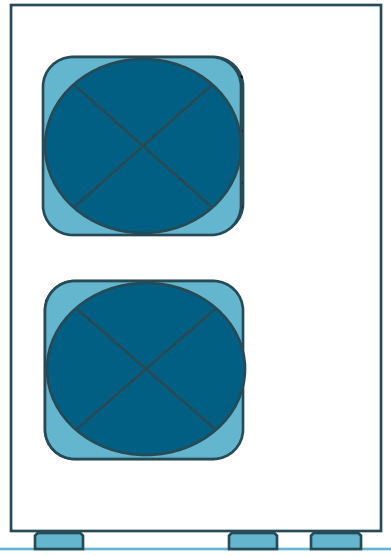
Australia & New Zealand Refrigerant Handling Code of Practice 2007 Part 2 Section 5 – Installation procedures

AS/NZS 5601.1:2022
Figure & Table 6.9.3

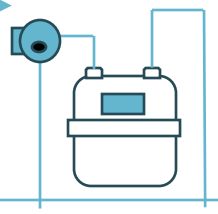




Outdoor unit



AS/NZS 5601.1:2022,
Cl 5.11.5.9



Gas meter

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Outdoor unit drainage provisions

It is the responsibility of the practitioner to ensure that all adequate outdoor unit drainage have provisions to discharge in the approved termination points as per HB276

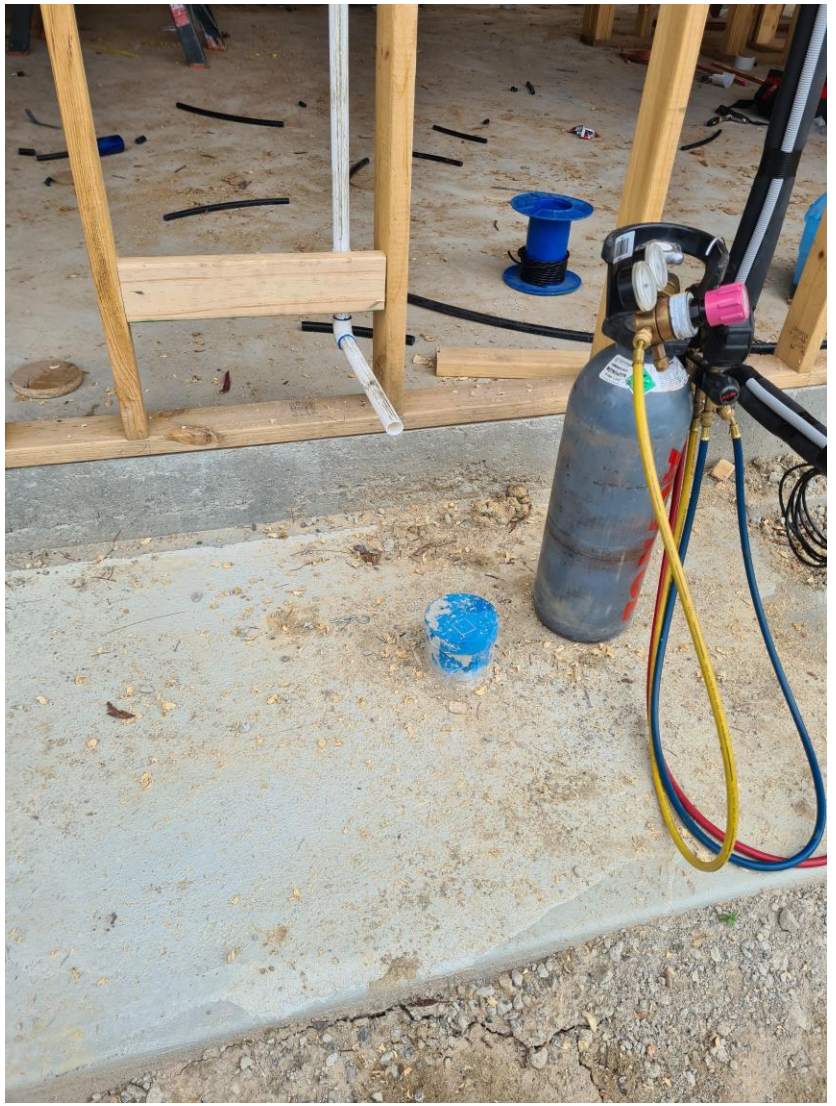
Outdoor units on roofs, ground level and wall brackets must have provision for drainage of condensate discharge

This can be connected in conjunction with the indoor unit drain to service both drainage requirements

Victorian Variation E2D2 NCC Volume 3 – PCA lists the requirements for drainage of heating, cooling and air-conditioning equipment

Outdoor unit drainage provisions continued

Outdoor units on dedicated concrete slabs must have provision for drainage. This may require consultation with the builder during construction phase to allow for a drainage point to be provided at the slab location



Victorian Variation E2D2 NCC Volume 3 – PCA lists the requirements for drainage of heating, cooling and air-conditioning equipment

Important installation requirements

The **Australian and New Zealand Refrigerant handling code of practice 2007 Part 1 and 2** details important installation requirements and procedures that must be carried out to ensure the efficient performance and operation of airconditioning systems, these include;

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Important installation requirements

It is a requirement of the code that manufacturer's instructions for installations **must** be followed

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Important installation requirements

It is the plumber’s obligation to ensure that all tools and equipment used during the installation process are in good working order and appropriately **rated for the refrigerant** being used, this includes but is not limited to vacuum pumps, tools and gauges

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Important installation requirements

It is a requirement of the **Australian and New Zealand Refrigerant handling code of practice 2007** that **all systems must** be designed so that they are able to be:

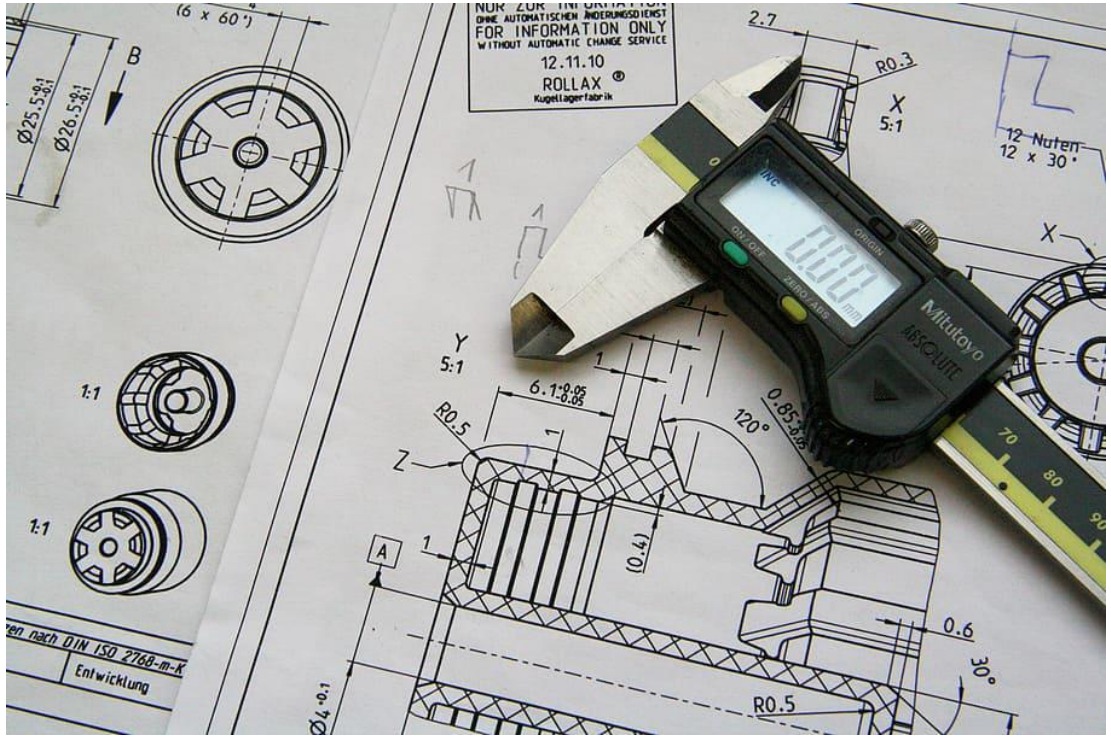
- installed

- operated

- serviced

- decommissioned

without the avoidable loss of **refrigerant**



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Important installation requirements

Horizontal runs of copper tubbing **must** be fixed at appropriate intervals for the tube diameter.

The **Australian and New Zealand Refrigerant handling code of practice 2007** states the following:

(a) 6.5mm diameter tube or less: 1m spacing

(b) 6.5mm to 20mm diameter tube: 1.5 m spacing

(c) 25mm diameter tube: 2m spacing

(d) 32mm to 40mm diameter tube: 2.5m spacing

(e) larger than 50mm diameter tube: 3m spacing

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Important installation requirements

Properly supporting pipework throughout the system has several advantages, including:

Proper oil-handling characteristics

- Less noise transmission from vibration
- less chance of damage from liquid hammer
- Less sagging which can lead to pipe fracture
- And generally, ensures that the service life of the pipework will outlast the appliance

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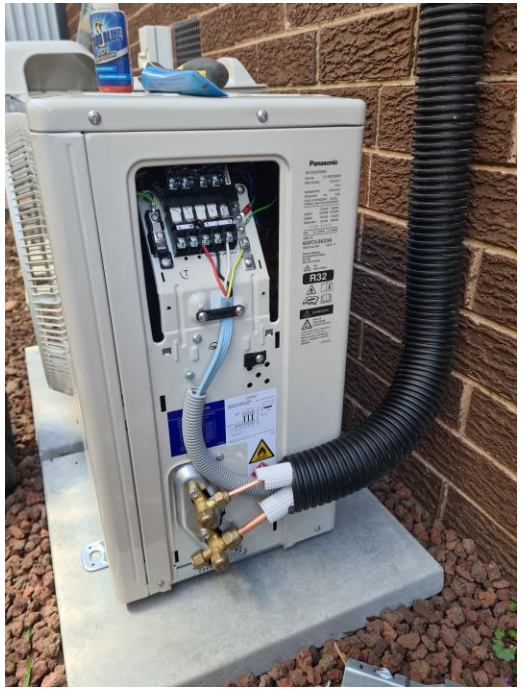
Important installation requirements

It is a good practice to keep Refrigerant pipework as short and direct as possible, but long enough reduce vibration transmission

Pipework installed in areas of direct sunlight **should** be minimised

Pipework that may be subject to possible damage **must** be mechanically protected with a protective covering



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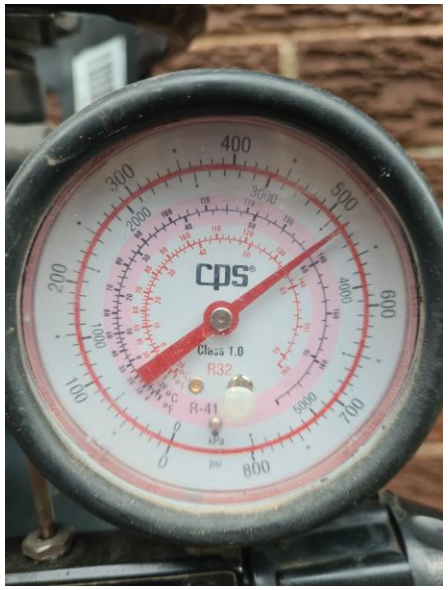
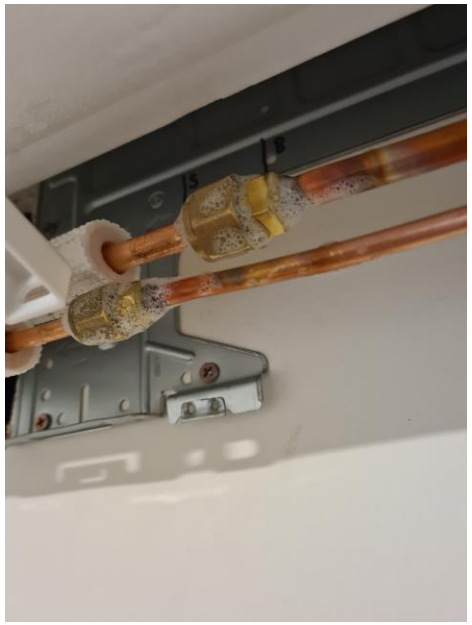
Important installation requirements

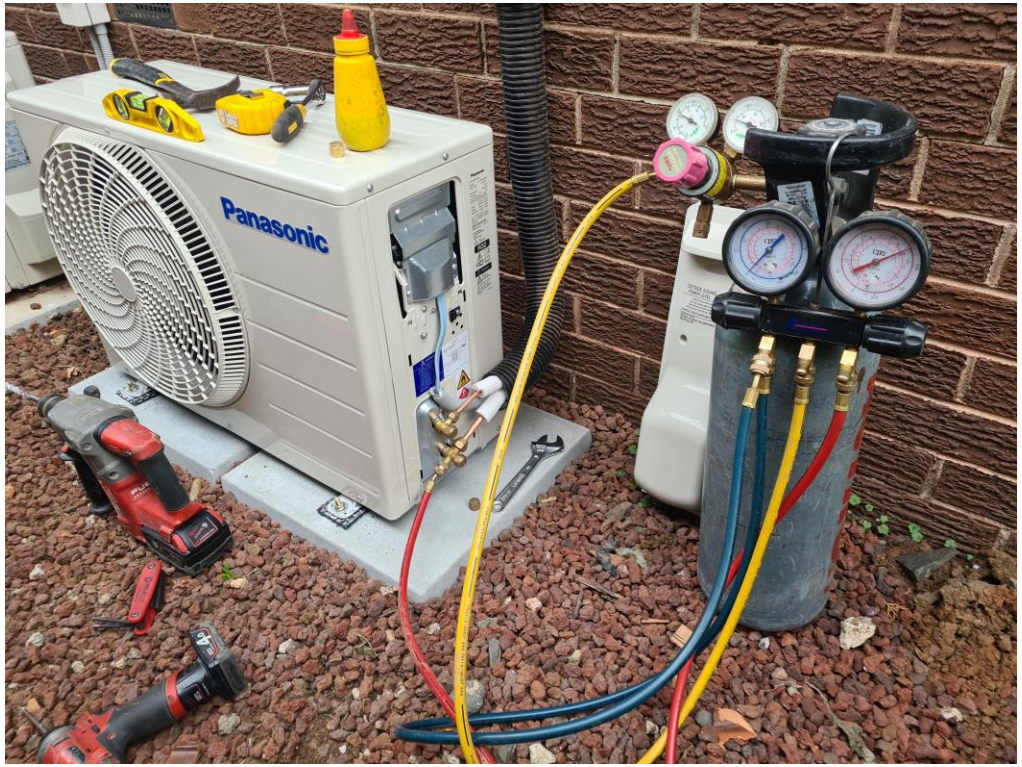
The system **must** be pressure tested at an appropriate test pressure to ensure there are no leaks

Mechanical joints must be checked and double checked for tightness

The test **must** be observed over a period that is relative to the size of the system, be mindful that temperature variation throughout the system can cause variations in pressure, ensure that no pressure drop occurs over the test period







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Important installation requirements

After confirming that there are no leaks in the system, the pipework **must be evacuated before refrigerant charging**

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Important installation requirements

The manufacturer’s instructions for evacuation **must** be followed

Except where the instructions specify a practice that will lead to emission of refrigerant

Important installation requirements

Evacuation **should** be carried out with dedicated evacuation hoses to avoid contamination

Hoses should be of a large diameter and as short as practical

Proper gauges should be used in lieu of service manifolds / gauges

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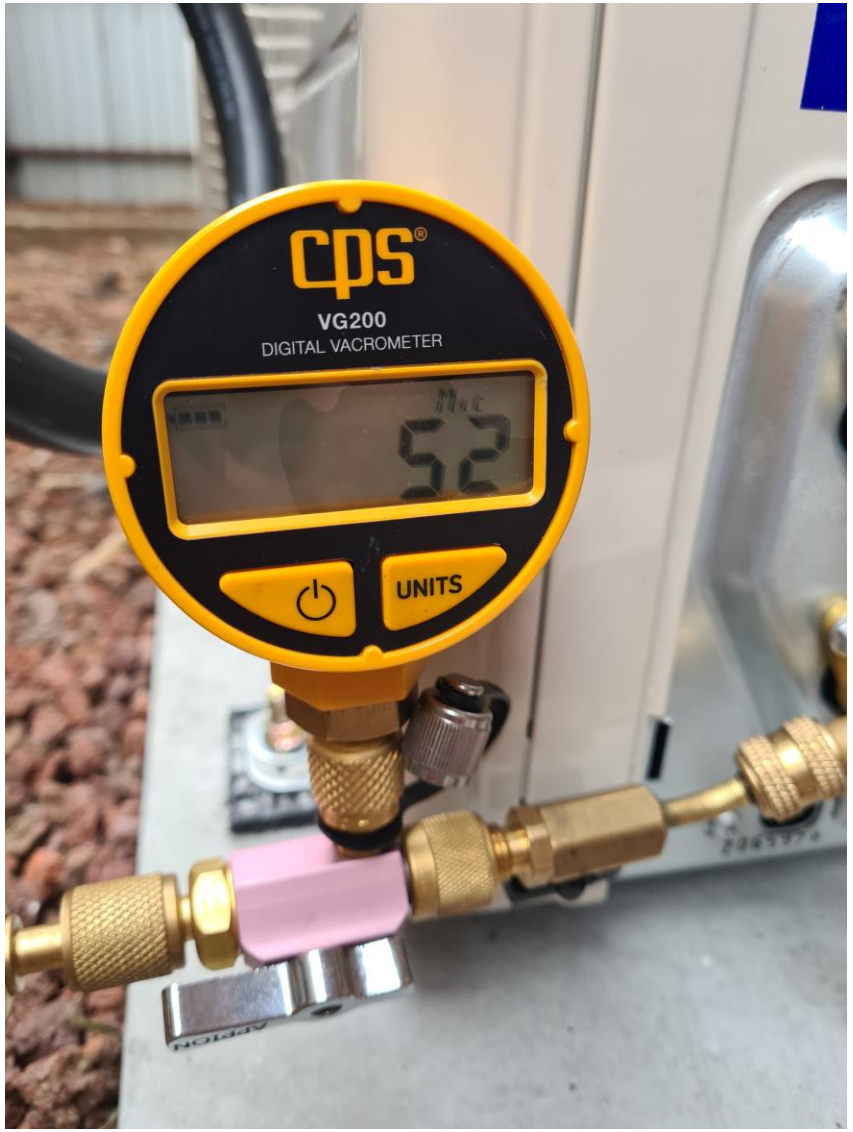
Important installation requirements

After confirming that there are no leaks in the system, the pipework must be evacuated to remove all moisture and non-condensables before refrigerant charging

Evacuation **must** be either the deep evacuation method, or triple evacuation using dry nitrogen only as the moisture absorber



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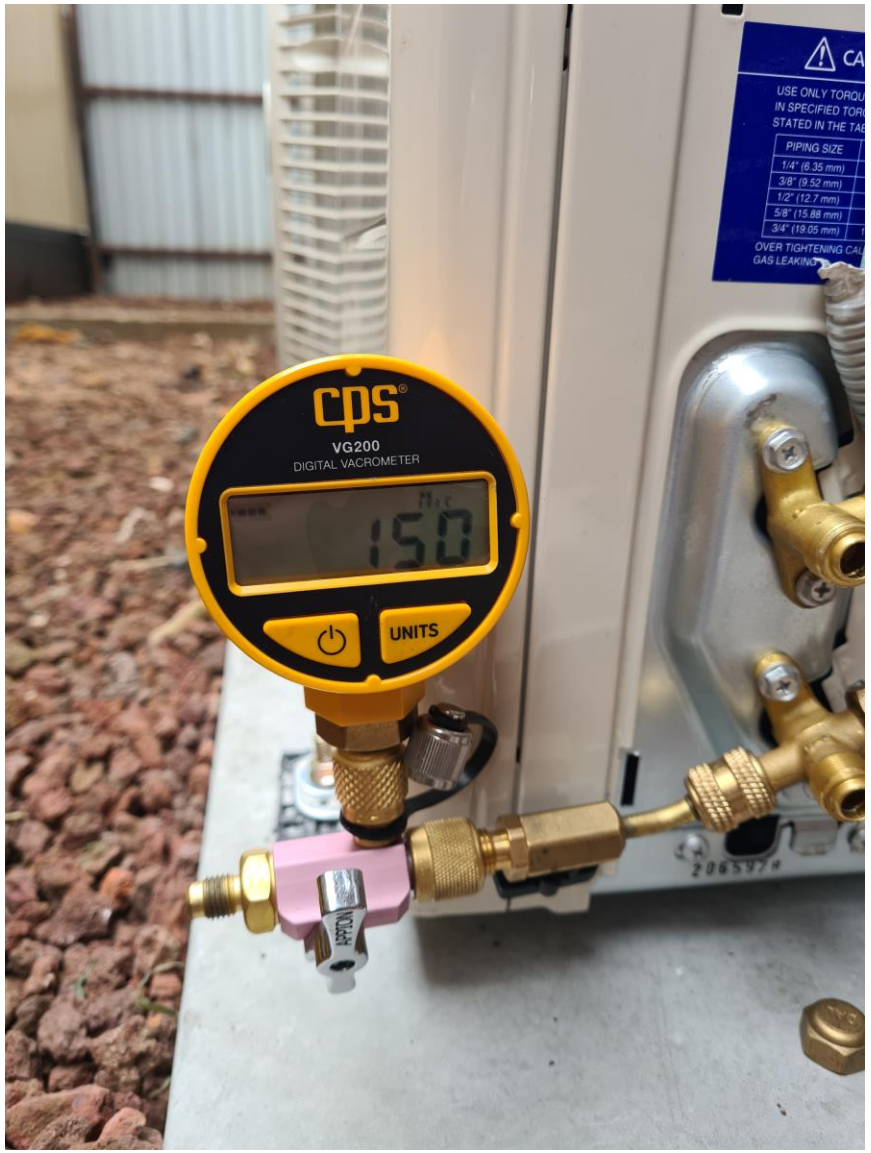
Important installation requirements

After the system has been evacuated the vacuum pump **should** be isolated from the system.

Absolute vacuums **must** be measured with accurate measuring equipment designed for the specific application



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Important decommissioning requirements

All **refrigerants must be recovered** and either recycled, **reclaimed** or held for **destruction** in an approved manner

All **refrigerant must be reclaimed** from all parts of the system at the time of **decommissioning,** unless the system is being **decommissioned temporarily** for service or immediate recommissioning, and provided such work will not lead to avoidable refrigerant emission

Refrigerant must not be willfully discharged to atmosphere under any circumstances

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Important installation requirements

Following these important installation requirements will ensure that the system will operate at the performance level and service life that it was designed for

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Conclusion

Today we have looked at:

Some of the common enquiries and issues that the VBA Plumbing Technical team receives

We hope that this webinar has increased your knowledge of the Deemed-to-Satisfy requirements of Mechanical services plumbing work and raised your awareness of VBA and other resources in addressing these fundamental requirements.

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Q & A

How do I terminate a condensate drain from an air conditioning system, heating and cooling?

Where can I find information on the current requirements?

How to gain access to standards?

Safe access to equipment – Will there be any requirement (like those for gas ducted heating systems) for attic walkways/lights/etc?

What are some common design mistakes or non-compliant designs that are made?

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Thank you!

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After this webinar:

Later today

We'd love your feedback!
You'll receive an email with a quick survey
You'll receive your attendance certificate via email

In approximately 2 weeks

You'll receive an email with the answers to all of today's questions that we didn't get to, as well as those that we did