



Aboriginal
Housing
Office

Aboriginal Housing Office

Technical Specification

Air Conditioning Supply and Install

29 June 2026



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Glossary of Abbreviations

AIRAH	Australian Institute of Refrigeration, Air Conditioning and Heating
AS	Australian Standards
BOS	Balance of Systems
CEC	Clean Energy Council
CHP	Community Housing Provider
DB	Distribution Board
kW	kilowatt
kWh	kilowatt-hour
MEPS	Minimum Energy Performance Standards
MSB	Main Switch Board
NCC	National Construction Code

1 Introduction

This Specification has been prepared by the Aboriginal Housing Office (AHO). AHO is an NSW Government agency focused on delivering better housing choices for Aboriginal and Torres Strait Islander people in NSW.

This Specification covers:

- Scoping of required measures
- Decommissioning of existing heating and cooling systems
- The supply and installation of split system air-conditioners
- The supply and installation of ceiling fans
- Simple draught proofing measures
- The supply and installation of LED lamps
- Servicing of existing heating and cooling systems.

These works are to be undertaken by licensed contractors. A comprehensive risk assessment and SWMS are required prior to undertaking any work.

2 General Requirements

2.1 Intent

It is intended the works undertaken by the Contractor shall include everything required to complete the works to the satisfaction of the AHO, including the provision of all materials and labour to completely install all equipment as required by this Specification.

All elements of the installation shall be in accordance with the manufacturer's recommendations unless otherwise specifically varied by this Specification.

2.2 Safety and Risk Management

The Contractor must provide a copy of their company's WHS Management Plan in relation to the works. The Contractor must have safe working procedures for each site, which includes the completion of a Safe Work Method Statement (SWMS) for all tasks covering each site, with a copy of each to be supplied to the AHO. The Contractor must identify and mitigate hazards through site hazard assessment prior to and during works including the induction and signing in of all personnel on site.

Prior to the commencement of any installation work, the Contractor shall be deemed to have acquainted themselves with all conditions affecting the works including the:

- Structural integrity of the building
- Presence of hazardous materials (i.e., asbestos and others)
- Safety hazards
- Noise issues for neighbouring properties
- Tenant engagement.

The following safety requirements are mandatory:

- (a) Appropriate safety procedures and training in place before the start of each job and to create a workplace where anyone can raise a workplace safety issue or speak up if they have a safety concern (as it's the best way to ensure your worker's health and safety is everyone's number one priority).

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- (b) Ensure only fully licensed tradesmen (who have been inducted into the Contractors safety system and work under the Contract) will be undertaking licensed work.
- (c) Participate in a risk assessment of possible hazards at the start of each installation.
- (d) For high-risk activities use the SWMS to record this information.
- (e) Make sure that your workers only carry out work they are qualified and competent to do any electrical work is undertaken by an appropriately licensed and competent person.
- (f) A person without an electrical work license is unauthorised to make or terminate electrical connections to the equipment or install supply conductors that will connect equipment to the supply of electricity.
- (g) Before starting any work, turn off and isolate all electricity to the property at the main switchboard. Take steps to prevent the electricity from being turned back on while work is in progress include safety tags and locks.
- (h) The risks of working at heights need to be minimised by having fall prevention controls in place, such as edge protection and / or harnesses. Refer to NSW Codes of Practice and guidelines.

Note: Evidence of the safe practices of work for high-risk contraction work must be provided to the AHO for every installation.

- (i) All relevant safety considerations and regulatory requirements have been thoroughly considered with safe work practices implemented to manage hazardous / contaminated materials (i.e., asbestos) on site.

Note: The AHO will be conducting a desktop review on all installations including a health and safety site inspection on selected sites throughout the duration of the project.

2.3 Quality Assurance

2.3.1 General

Quality assurance checks will be undertaken by the AHO. This will include checks of scoping undertaken by Contractors, as well as safe work practices and quality of works implemented.

The AHO representative will be available to provide advice during the scoping and implementation phase. It is strongly recommended that the Contractor contact the AHO to seek clarification regarding any technical issues. This will reduce the amount of re-work required following QA inspections.

Issues with non-conforming installations are to be addressed by the contractor at their expense.

2.3.2 Desktop Reviews

Desktop reviews will be undertaken by the AHO. The Contractor is required to provide a Quality Assurance document containing the following geotagged photos for each dwelling to AHO via preferred portal (NGAMURU). AHO will provide folders and portal to upload all relevant photos and information for each property. The information required to be collected and uploaded includes:

Scoping:

- As per Section 3.

Works:

- CoC – Certificate of Conformity.
- Commissioning
- Switchboard internals, clearly showing labels and breakers (electrical load calculations)
- Indoor unit of split system air-conditioner

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- Wall controller of split system air-conditioner
- Outdoor unit of split system air-conditioner showing at least 1m of space on each side
- Outdoor unit of split system air-conditioner, close up showing model number
- All wall penetrations must be completely sealed
- Ceiling fan, as installed (all individual fans installed where installed)
- External door seal, as installed (one for each door seal installed)
- Wall vent cover, as installed/or required by AHO (for each wall vent installed)
- LED lights, one of each type showing brand / model
- A panoramic photo showing all LED lights installed (if multiple)
- Issue Certificate of Compliance for Electrical Work (CCEW).

2.3.3 Site Inspections by AHO

During the commencement of works, the AHO will work closely with the Contractor to inspect most properties to ensure the works are delivered in accordance with the specification. Once the AHO and the Contractor are satisfied with the works, a minimum of 25% of installations by the Contractor will be randomly inspected. AHO may choose to audit more properties if they deem fit.

If non-conforming works are identified the number of quality assurance checks will be increased. Any invoices raised without clearing these defects will not be paid until the defects are resolved and accepted by AHO representative.

Accredited Certificate Provider (ACP) approval before AHO payments

Evidence required to be submitted to the ACP for certificate creation for the replacement or installation of air conditioning units includes, but is not limited to:

- 1) **Training** - The Site Assessor and Installer must have completed ACP's Authorised Representative Training prior to implementation.
- 2) **Nomination of Energy Savings** - The Energy Saver must nominate selected ACP to create Energy Savings Certificates by completing and signing the Nomination form prior to implementation of the upgrade.
- 3) **Site Assessor Declaration** – Mandatory declaration signed by an authorised representative prior to the installation.
- 4) **Photographs** – All photos must be 'date stamped' and 'geo tagged'. Photographs must include both pre-installation and post installation.

Pre-Installation:

- o The existing equipment at the site including the nameplate or energy label; or
- o Area photo demonstrating no existing equipment at the site.

Post-Installation:

- o The new equipment installed at the site including the nameplate or energy label
 - o Decommissioned existing unit with power supply terminated.
- 5) **Post-Implementation Declaration** - Mandatory declaration signed by the installer after the installation, co-signed by the purchaser.
 - 6) **Post-Implementation Declaration Appendix A:** Customer Satisfaction Verification – A series of yes or no questions asked of the customer, by the installer to ensure that the customer is satisfied with the service provided.
 - 7) **Product Eligibility** – In order to be an eligible energy saving activity:
 - 1) The new air conditioner must be on NCBA's List of Approved Air Conditioners
 - 2) Manufacturers Specifications must be provided.

8) **Tax Invoice** – The Tax Invoice must clearly show:

- o The date the work was conducted

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- Address where work took place
 - Amount paid for the installation
 - Name of purchaser
 - ABN of purchaser (if applicable)
 - The goods or services purchased, and
 - Date of purchase.
- 9) **Sales Ledger** – Must clearly show the amount paid for the installation, when the payment was made and who made the payment
- 10) **Refrigerant Disposal** – Itemised Recycling and/or Disposal certificate demonstrating that the refrigerants were handled and disposed of in an appropriate manner (as per the conditions of the refrigerants handling license). The certificate must be issued by a licensed refrigerant destruction facility
- 11) To provide National Meter Identifier (NMI)
- 12) Any other requirements required by the ACP

2.4 Tenant Communication and Property Access

The following process must be followed to initiate the works:

- The Contractor and the AHO will agree on a schedule for the installation of the air conditioning systems and other energy efficiency measures.
- In accordance with the Residential Tenancies Act 2010 (NSW). Special attention needs to be given to Section 55 – Access generally by landlord to residential premises without consent:
 - "A landlord, landlord's agent or authorised person must not enter residential premises under this section—
 - (a) on a Sunday or public holiday, unless the tenant otherwise agrees, or
 - (b) before 8.00 am or after 8.00 pm, unless the tenant otherwise agrees, or
 - (c) for a longer period than is necessary to achieve the purpose of the entry."
 - Section 55(2)(b) also provides that entry to:
 - "carry out or assess the need for necessary repairs or maintenance"
 - requires at least 2 days' notice. This would encompass installations such as air conditioners or other approved modifications.
- The AHO will write to tenants advising them of the program and introduce the Contractor. The Contractor must contact the tenants (either by phone or visiting site) to arrange scoping and installation dates.
- The Contractor will call or visit the tenant to organise a time (for a specific day, am or pm, within the scheduled timeframe) to undertake the works with at least 48 hours' notice.
- The Contractor will attend site and undertake the works.

Issues with property access:

- If the tenant is not home at the agreed time or the house is inaccessible the Contractor is to make one further attempt to reschedule the works.
- If on a second site visit the tenant is not home at the agreed time or the house is inaccessible the matter is to be referred to the AHO for resolution.

2.5 Non-Technical Deliverables

2.5.1 Training and Information

The Contractor is to provide training to the tenant in the efficient operation and maintenance of the equipment installed. This should be included in the Quality Assurance document under Tenant Engagement,

2.5.2 Tenant Works Signoff Form

The Contractor is to assist the tenant to complete and sign Tenant Works Signoff Form at each property. The document will be provided by AHO as part of installation checklist.

2.6 Waste

The Contractor shall allow to remove all building material, packaging, and rubbish from site each day. Waste should be recycled or reused, where possible. If waste is required to be disposed it must be done through an appropriate licenced facility.

3 Scoping

The Contractor is required to undertake an initial visit to each dwelling to scope the work requirements and quantities, property conditions, safe work practices and any additional work requirements, required. The Contractor is to take full responsibility for the sizing, design and installation of each split system. An AHO scoping template must be used and uploaded through the. Refer to each subsequent section for the details of the works.

General:

- Photo of front of house (including letterbox and house number).

Split system air-conditioners:

- Number of systems to be supplied and installed
- Room dimensions to enable volume calculation
- Size and model of split system(s) to be supplied and installed
- Proposed location of indoor and outdoor units (with proposed heights).

Decommissioning of existing heating and cooling systems:

- Number and type of existing heating and / or cooling units to be decommissioned
- Location
- Photographs of existing heating and / or cooling units to be decommissioned
- Details of repair work, as required.

Ceiling fans:

- Number and location of ceiling fans to be installed
- Photographs of existing ceiling fans (if any).

Simple draught proofing measures:

- Number of external door seals to be installed
- Number of wall vents to be patched (when instructed by AHO).
- Photographs of the above.

The supply and installation of LED lamps:

- The number and type of LED lamps to be installed
- Recording of the current lamps (including Wattage) that will be removed.

Property Condition Photos:

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- While the Contractor is on site, the Contractor may should identify existing defects on the property which may or may not relate to the work area of the Contractor.

4 Split System Air Conditioning Requirements

4.1 Design

Any of the dwellings without existing split system or ducted refrigerate air-conditioning systems in living areas are to have reverse cycle non-ducted split systems installed:

- Properties with 3 bedrooms and below allow for one split system in the main living area
- Properties with 4 bedrooms and above allow for one split system in the main living area and one split system in second living / master bedroom.

The Contractor is to take full responsibility for the sizing, design, and installation of each split system air-conditioner.

All split system air conditioners to be sized appropriately for the room size. Systems are not to be oversized. Use [Daikin sizing](#) calculator to calculate the sizing of the system.

For all properties that have an adequate existing cooling system (split system or whole of house evaporative) in the living area – the Contractor must complete a full asset inspection of the system. If the existing system is deemed to have an estimated useful life of more than two (2) years, the system will require a full service to ensure efficient cooling / heating is maintained.

If the estimated useful life of the system is deemed to be less than two (2) years, the Contractor must provide an asset condition report to AHO. The Contractor will be paid a scoping fee to create this asset condition report. Based on this report, the AHO representative will decide if the system should be serviced, repaired, or replaced.

If the systems are being decommissioned, the Contractor will follow instructions mentioned in table 3 to complete de-commissioning works. No new Air Conditioning unit/s shall be installed unless the tenant agrees to decommission existing heating and cooling systems.

4.2 Equipment

The AHO will require a conforming tender with Daikin as the brand of air conditioning to be supplied and installed. However, the AHO is aiming to achieve value for money and will consider alternative offers that submit a model of air-conditioning other than Daikin as long as the specifications are manufactured to an equivalent minimum standard, as specified below:

- Factory assembled, fully automatic, split, refrigerated air cooled, heat pump with one condensing unit connected to one fan coil unit
- Inverter type, capable of continually adjust its cooling and heating capacity to suit the temperature in the room
- Easy filter removal for cleaning
- Compressor delay start protection
- Inbuilt safety controls
- Thermostatic controls
- Able to meet acoustic requirements
- Able to provide cooling and heating.

The systems are to provide and maintain comfort conditions within the rooms to scheduled parameters.

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The split systems selected will be of high quality, suitable for remote regions, widely available and high efficiency.

The split systems will be installed with a wall mounted control. No remote control will be provided. This is in response to concerns from housing providers regarding remote controls being lost. For people with mobility issues consideration will be given to providing a remote control.

The split systems will be installed with a restricted range of thermostat settings to assist with preventing energy poverty. This is to be achieved through the provision of a wired control panel to control the air conditioning units. All proprietary control panels are to be lockable and disabled except for temperature adjustment 20 to 24°C. The restricted range of thermostat settings will enable the systems to provide comfort while minimising energy consumption and costs for tenants.

The split systems condensing units will be installed high up on an outside wall mounted on a wall bracket to minimise accidental / intentional damage and reduce dust/insect intrusion. Outdoor units are to be at least 1200 mm above ground level but below 1800 mm.

2.6.1 Warranty

A manufacturer's warranty of at least five years is required.

4.3 Installation Works and Types

Split systems must be designed, installed, and maintained to the relevant provisions of AS 1677 including pipework, fittings, wiring and accessories necessary for the proper functioning of the installation.

A standard installation is based on:

- 3 metres of pipework and 2 metres of capping
- 15 metres of electrical cable between main switchboard and outdoor unit.

The actual length of pipework, capping and electrical cable required for each dwelling will vary considerably. The standard installation allowances above are generous and will average out over the contract in the favour of the installer. Therefore, no variations for additional lengths will be accepted on individual dwellings.

It is the responsibility of the installer to choose the most appropriate location for the indoor and outdoor units while ensuring the guidelines below are applied.

4.3.1 General

- Preference is for back-to-back installation (vs internal wall installation), where possible
- In all cases, make sure the manufacturers installation guidelines and required clearance around the units are applied appropriately.

4.3.2 Indoor unit

- When open kitchen to lounge configuration, install indoor unit towards the dining / lounge part of the room
- Unit to be installed on the longest wall of the room served, where possible
- Installation on the wall away from windows preferred (as opposed to above windows)
- Ensure that indoor unit is not installed directly above electrical fittings (to prevent hazard, in case of leakage)
- The indoor units are to be located as close as practical to the relevant outdoor units while providing effective cooling to the living area(s).

Back-to-back installation: The indoor unit and outdoor unit are mounted back-to-back unless this would introduce WHS issues both inside and outside the house

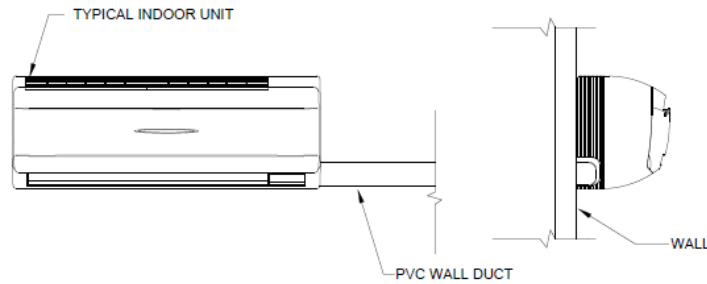
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TECHNICAL SPECIFICATION

Internal wall: The indoor unit is mounted on an internal wall. Where necessary internal pipework and capping may be required to reach the outdoor unit. Direct connection of pipework into the back of the indoor unit is preferred. Where this is not possible, PVC wall duct shall be utilised, refer Figure 1.

The details and requirements of an internal wall installation are shown in Figure 1.

Figure 1: Internal wall installation



4.3.3 Outdoor unit

- Wall mount installation is preferred, where possible
- Ground mount unit, when outdoor unit is visible from the street
- Outdoor unit to be installed in a safe, dry, shaded, and well-ventilated area
- Provide appropriate shading to outdoor unit, when unit installed on North facing wall
- Install outdoor unit with minimum clearances as defined by the Manufacturer. Select outdoor unit location, where air recirculation is maximized
- For all installations, permanent fixings (bolts) through the outdoor unit feet and the mounting structure to the slab / roof / mounting rails is required
- Vibration isolation for outdoor units shall be via neoprene double deflection mounts or waffle pad in compliance with Manufacturer's recommendations.

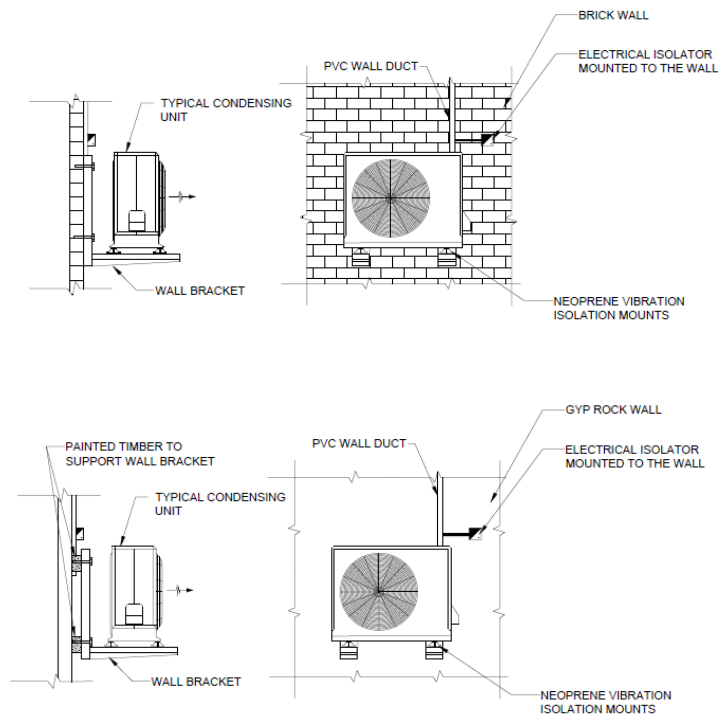
Wall mount installation: The outdoor unit is mounted on a bracket on the wall to minimise accidental / intentional damage and reduce dust / insect intrusion. All penetrations must be completely sealed an hour after installations, and this is photo geo-tagged to be included in the Quality Assurance Documentation.

Outdoor units are to be at least 1200 mm above ground level but below 1800 mm. Locate the outdoor unit such that it does not block access to external walkways / footpaths. Select a height that enables maintenance from ground level.

TECHNICAL SPECIFICATION

The details and requirements of a wall mount installation for a masonry and lightweight wall are shown in Figure 2.

Figure 2: Wall mount installation (masonry and lightweight)

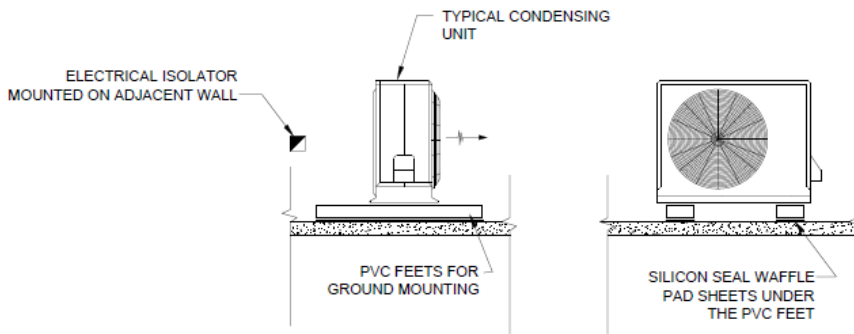


Ground mount installation: The outdoor unit is mounted on the ground either on an existing slab or pad, or on a pre-cast pad to be supplied by the Contractor.

TECHNICAL SPECIFICATION

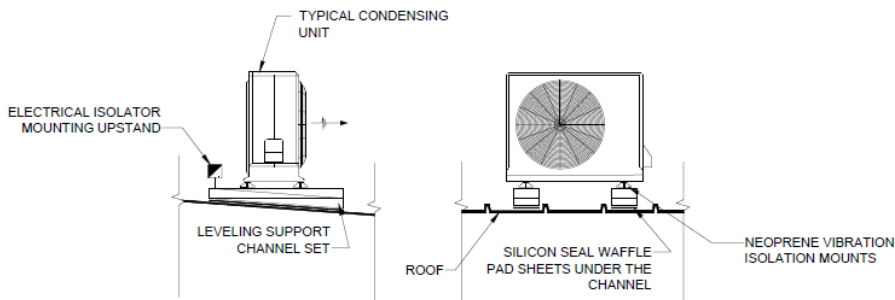
The details and requirements of a ground mount installation are shown in Figure 3.

Figure 3: Ground mount installation (When required and Approved by AHO)



Roof mount installation: The outdoor unit is mounted on the roof, due to inaccessibility of external walls. The details and requirements of a roof mount installation are shown in Figure 4.

Figure 4: Roof mount installation



4.4 Mechanical / Building Works

4.4.1 General Requirements

The Contractor is to undertake the following works as specified and scheduled and in accordance with the manufacturer's recommendations:

- Installation of indoor and outdoor units according to requirements in Section 4.3.
- Supply of all required equipment including but not limited to:
 - o Split system
 - o Hard-wired, wall mounted control panel
 - o Capping, pipework, and fixings

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- Drainage connections
- Appropriate flexible connections
- Trim and sealing around openings
- Anti-vibration mountings.
- Seal all penetrations to prevent insect infestations. ACP endorsement required before payment can be made by AHO
- The provision of all hoisting and scaffolding required for the installation of the above systems.

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The following guidelines are to be adhered to:

- All outdoor units are to be fastened securely with anti-vibration mounts.
- Connection of dissimilar metals is to be avoided. Securing of pipework with metallic clamps shall have separation via pipework insulation and / or polyethylene tape. Provide separation between roof sheeting and condensing unit mounting structure via waffle pad or similar for entire extent of mounting frame.
- The strength and rigidity of all structures and fastenings throughout shall be adequate to prevent failure, significant movement, or deflection throughout the life of the installation during operation, traffic, or maintenance.

4.4.2 Pipework, insulation, and capping

All pipework shall be run parallel to walls and grids and grouped together. There are to be no kinks.

All flares are to be deburred. Every precaution shall be taken to clean out all piping before, during and after erection, and to prevent foreign material being left in the pipe. The Contractor will be responsible for any damage caused by debris in pipes.

It is the Contractor's responsibility to ensure that stresses in pipework are kept within allowable limits and that forces due to expansion are not transferred to equipment. All pipework is to be installed such that it shall not be subject to undue stresses and strains.

All pipework is to be adequately supported. The Contractor is to supply and install all necessary pipe supports and hangers required for the installation to ensure proper support to provide for gradients and anchorage. Components shall be designed to meet all possible operating conditions to which components and piping may be subjected.

Pipe materials as follows:

- Refrigerant Supply: Copper to AS1571
- For Waste: PVC to AS1415 (internal)
- For Waste: Copper to AS1432 (external)

Pressure test all pipework to all relevant standards. All pipework to be pressure tested to 1.5 times the maximum working pressure.

Pipework insulation is to be 13 mm fire rated pair-coil. All pair-coil when run through penetrations is to be protected so as not to damage insulation. All pipework is to be fully insulated to unit connections – no bare copper.

Pipework penetrations are to be sealed utilizing fire-proof sealant to maintain fire rating of wall.

Where roof mounted condensing units are utilized, penetrations of roof sheeting shall utilise suitably sized Dektite fittings. Dektite fittings are to be located as close as practical to peak in the roof to minimize water run-off over the fitting.

Waste / waste pipework shall be solid lengths of pipework with glued fittings. No flexible pipework to be utilised for drainage.

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Capping requirements:

- All wall penetrations fully covered by wall entry caps
- All capping level vertically and with minimal horizontal fall
- No joints made in capping unless greater than full lengths.

4.4.3 Drainage

Refer to the installation drawings for specific requirements (Section 4.3). In general condensate is to be delivered to garden beds or sewer. Indoor units can drain to basin of outdoor units as required.

4.4.4 Electrical works

The Contractor is to undertake the following works as specified and scheduled and in accordance with the manufacturer's recommendations:

- Supply and installation of all necessary interconnecting wiring and the electrical supply from the main switchboard to the air-conditioning unit, including an isolator at the outdoor unit and separate combined RCD / MCB in the main switchboard.
- The use of external conduit is to be minimised where possible however where wiring cannot be concealed external conduit may be used. In particular the excessive use of exposed flexible conduit is to be avoided.
- All interconnecting electrical neatly and permanently fixed to interconnecting pipework.
- Supply and installation of hard-wired wall controller. Connection of unit to the wall controller making adjustment for proper operation.

The Contractor is required to seal all penetrations to prevent insect infestations.

4.4.5 Labelling

The RCD / MCB in the main switchboard is to be permanently labelled. Labels shall last the equivalent period of time as the design life of the equipment. Permanent marker is **not** acceptable.

4.5 Control

With each split system install a hard-wired wall controller.

No remote control is to be provided unless the resident requires a remote control due to disability or age. The Contractor is to determine if a remote control is required and seek approval from the AHO.

Each control panel shall incorporate an adjustable fan speed, temperature set point parameters and an LCD display. To assist with energy poverty, each control panel is required to be lockable and disabled except for temperature adjustment between 20 to 24°C and fan speed.

A split system with an integral sensor to detect movement in the room and reduce output after a pre-set interval is preferred.

4.6 Warranty

A workmanship warranty of at least two years is required.

4.7 Commissioning

The Contractor is to test and commission all installed systems.

5 Decommissioning

Existing heating and cooling units are to be decommissioned as shown in Table 1.

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Table 1: Decommissioning works

Works	Requirement
Decommission window rattler / RAC	In rooms where a new split system is installed. Electrically isolate window rattler at main switchboard. Remove unit from dwelling and leave with tenant or recycle if not wanted. Make good, patch and paint wall.
Decommission electrical heater	In rooms where a new split system is installed. Electrically isolate electrical heater at main switchboard. Remove unit from dwelling and recycle. Make good, patch and paint wall.
Decommission gas heater	In rooms where a new split system is installed. Isolate gas and electricity supply to heater. Remove unit from dwelling and recycle. Make good, patch and paint wall.
Evaporative air-conditioner	Decommission evaporative air-conditioners: - Remove and recycle evaporative air-conditioning unit - Cap water supply and isolate electrical supply - Remove ductwork from ceiling and dispose of - Cover ceiling vents in all rooms, and any other penetrations If tenants have an issue with the existing evaporative unit being removed, this needs to be referred to the AHO to resolve on case-by-case basis. A new split system cannot be installed if an existing evaporative system is not decommissioned / removed first.
Wood fire / slow combustion heaters	Existing wood fires / slow combustion heaters are to be retained unless the dwelling is vacant. In vacant dwellings: - Remove and recycle wood fires - Isolate electrical supply (where relevant) - Remove flue and recycle - Make good ceiling and roof penetrations, ensuring external seal is waterproof.
Ducted Air-conditioning systems	A condition report will be done on the system and AHO representative will decide the scope whether the system should be replaced, repaired, or serviced if the system.

Note: Existing wood fires / slow combustion heaters are to be retained unless they are clearly unsafe and not functioning. For these cases refer to the AHO.

All items to be decommissioned are to be included on Tenant Sign Off form.

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6 Servicing

The servicing of air-conditioning systems must include:

- Running the system to check performance and confirm correct operation of fans, pumps (evaporative only), lights and controller
- Checking for water and refrigerant line leaks, particularly into the roof space or through roof flashing
- Checking that the ducts are not leaking or broken, including flexible duct insulation
- Check correct operation of valves and clear all debris as necessary - clean air filter of indoor unit (split units only)
- Clean the louvres and filter pads and replace if necessary (evaporative only)
- An overall assessment of the system as per AHO recommended template
- All servicing will be done in accordance with the manufacturer's servicing guidelines.

Where significant servicing work beyond the above scope is required due to the poor condition of the existing system AHO representative will decide if the system will be replaced.

7 Ceiling Fans

7.1 Design

- Ceiling fans are to be installed in place of existing lights in all bedrooms which will typically be a simple 'batton holder - bayonet fitting' arrangement
- Ceiling fans are to be installed in living areas, but not kitchen / dining rooms
- Ceiling fans are not to be installed in rooms with bunk beds
- Ceiling fans only to be installed in rooms with a minimum ceiling height of 2.4m
- Ceiling fans should be at least 2.1 metres from the floor and at least 300 mm from the ceiling
- Ceiling fans are not to be installed in rooms where existing ceiling fans are installed.

7.2 Performance and Construction Criteria

Ceiling fans must be in accordance with the following performance and construction criteria.

Fan characteristics:

- Four bladed fan
- Fan blades are to have a length of no less than 1200 mm (fan sizes are measured as the overall diameter)
- Height profile of ceiling fan (top of canopy to bottom of fan) to be no more than 300 mm
- Blades to be metal.

Motor:

- Motor with copper windings
- Bearings to be sealed for longevity and quiet operation.

Light:

- Proprietary light attachment capable of being fitted with either a bespoke LED luminaire or bayonet / ES to suit LED GLS lamps

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- Refer to Section 8 Lighting for lamp specification.

Control:

- Hard-wired wall controller with on / off switch for light and fan controller (not remote control)
- 3 fan speeds (minimum) with reversible fan rotation option.

Performance criteria:

- High air flow capacity: at least 12,000 m³/hour.

Suitable brands:

- Clipsal Airflow ceiling fan with 4 metal blades (white), 3-year motor warranty plus another 3 years on other parts, 1200 mm for bedrooms and 1400 mm for living areas; or equivalent.

7.3 Warranty

Equipment warranty of at least three years is required.

7.4 Installation Works

The following items are expected as a minimum requirement for the installation.

- Ceiling fans to be installed with a neat finish flush to the existing ceiling
- Electrical and control wires are to be hidden in walls and under no circumstance are to be visible
- New wall controller to be finished flush to the existing wall.

7.5 Commissioning

The Contractor is to test and commission all installed systems.

8 Draught Proofing

8.1 External Door Seals

Permanently fixed (with screws) door seals provide a good barrier to draughts. Draught proof up to two external doors per dwelling.

Requirements:

- Must automatically seal on closure to provide a good barrier to draughts
- Suitable for standard door widths and sealing gaps to 15 mm
- For hinged single doors
- Must be permanently fixed (with screws). Adhesive door seals are not acceptable
- Installation as per manufacturer's instructions.

Suitable brands / models:

- Raven RP3 self-activating door seals; or equivalent.

TECHNICAL SPECIFICATION

8.2 Wall Vents

Cover up wall vents in all living and bedrooms (when instructed by AHO). Install a blanking cover plate over the internal wall vents to reduce draughts. The installation of the cover plate should be neat and tidy. It should be permanently fixed.

9 Lighting

9.1 Lamp Specifications

High quality LED lamps are to be installed in all suitable GLS fittings (indoor and outdoor) for each dwelling.

Each lamp supplied is to have the following specifications:

- Colour temperature: warm white 2700 K or 3000 K
- Edison screw and bayonet options to be available (for "A Shape")
- Life at least 10,000 hours (longer life products will be viewed favourably)
- Manufactured by a well-respected company with proven long-term performance.

Table 2 shows the range of lamps required.

Table 2: Lamps required

Lamp power (W) Max	Light output (lumens) Min	Description: "A Shape" LED Globe
5 W	350	"A Shape" LED Globe, Equiv 40 W incan – suit ceiling fan
9 W	800	"A Shape" LED Globe, Equiv 60 W incan – suit bedroom, utility
13 W	1,300	"A Shape" LED Globe, Equiv 100 W incan – suit living room
12 W	1,050	"PAR38" LED Globe, Equiv 150 W incan – suit PAR external spotlight

Suitable brands / models:

- Osram; or
- Phillips.

9.2 Installation details

All suitable lamps (internal and external) are to be replaced, this includes compact fluorescent (energy saver) and incandescent.

Lamps on dimmer circuits or not suitable for replacement with the lamps supplied are to be left as is.

Installation of the lamps is required unless specifically requested otherwise by the tenant. A record is to be kept of how many lamps installed and in what rooms in each dwelling.

Installing the lamps requires working on a ladder. A comprehensive risk assessment and SWMS are required prior to undertaking any work.

Where existing fittings are in poor condition or if any issues with the luminaire are observed DO NOT proceed with installation. The AHO is to be notified.

TECHNICAL SPECIFICATION

Lamps removed are to be taken away from site and recycled (NOT disposed of in landfill).

10 Licences and Standards

Contractors shall have as a minimum:

- Arctick licence
- Electrical licence.

Compliance with the latest edition of the following is required:

- National Construction Code (formerly Building Code of Australia)
- Australian and New Zealand Refrigerant handling code of practice
- Service and Installation Rules for New South Wales
- Work Health and Safety acts.

Compliance with the latest edition of the following Standards is required:

- AS1055: Acoustics - Description and measurement of environment noise
- AS1571: Copper - Seamless tubes for air-conditioning and refrigeration
- AS1668.2: The use of mechanical ventilation and air conditioning in buildings
- AS1677: Refrigerating systems
 - o Part 1 Refrigerant Classification
 - o Part 2 Safety Requirements for Fixed Applications
- AS3000: SAA Wiring Rules
- AS3008: Electrical Installations – Selection of cables
- AS3100: Approval and test specification – general requirements for electrical equipment.
- AS/NZS3350: Safety of household and similar electrical appliances, Part 2.40 - Electrical heat pumps air conditioners and dehumidifiers
- AS3823: Performance of electrical appliances – Air conditioners and heat pumps
- AS4269: Complaints handling
- AS4426: Thermal insulation of pipework, ductwork and equipment - Selection, installation and finish.

Installers should also be familiar with the latest version of the Air Conditioning Residential Best Practice Guideline” published by the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH).