

**MACQUARIE VILLAGE, 110-114 HERRING ROAD, MACQUARIE PARK.**

**MECHANICAL SERVICES - DESIGN PRINCIPLES**

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**Overview:**

The mechanical services design principles proposed for the above project will be to provide energy efficient operation of the building and ensure the comfort and safety of building occupants.

**Apartment Air Conditioning:**

The apartments will be air conditioned via day/night zoned systems to maintain comfort conditions during summer and winter peaks. The air conditioning systems shall be high efficiency, reverse cycle, inverter driven, air-cooled, split, multisplit, or Variable Refrigerant Volume (VRV/VRF) systems.

Air conditioning indoor unit configuration shall either be ducted or wall mounted units.

Condensing units will be located in the basement and on roofs, for buildings under 10 storeys, and in screened plant enclosures on each level or on roofs in buildings over 10 storeys.

The air conditioning systems shall utilise non-ozone depleting refrigerants.

The air conditioning equipment shall have a minimum MEPS rating of 3.5 stars.

The building shall incorporate thermally resistive materials to minimise heat gains and losses. Thermal mass shall be provided via the building fabric and structure to maintain stable conditions and offset fabric load peaks. The extent and performance of glass shall be optimised to minimise heat gains and losses.

**Apartment Ventilation:**

Apartments shall be naturally ventilated in accordance with the Building Code of Australia (BCA)

Bathrooms and Laundries shall be mechanically ventilated via central risers discharging at roof level.

Kitchens rangehoods shall discharge to outside.

Apartments shall include acoustic treated external air intakes (trickle ventilators) to provide make up air for bathroom, laundry and rangehood exhaust systems.

Apartments shall include operable windows and doors wherever possible to maximise crossflow ventilation and reduce reliance on air conditioning.

Ceiling fans shall be installed in all bedrooms.

**Base Building Ventilation:**

The typical floor lift lobbies shall be naturally ventilated via operable windows where acoustically appropriate. Where external noise levels are likely to create a nuisance, lift lobbies shall be mechanically ventilated.

Ground floor entrance and lift lobbies will be air conditioned via high efficiency, inverter driven, reverse cycle, air-cooled conditioning systems.

In buildings over 25 metres in effective height, the stairs will be served by stair pressurisation and lobby relief systems.

**Basement Ventilation:**

The carpark levels shall be mechanically ventilated via supply and exhaust systems. The ventilation systems shall be controlled via carbon monoxide (CO) sensors and variable speed fans to minimise energy consumption and ensure adequate air quality.

Plant, utility, garbage rooms, etc, will be mechanically ventilated to relevant code requirements.

**Regulations and Compliance:**

Generally the mechanical services will be designed to comply with relevant codes and standards, including the following:

- Australian Standards AS1668.1:1998, AS1668.2:1991 and AS3666.1.
- Building Code of Australia, Parts E2.2, NSW F4.5(b) and Section J Clause J3.5, Part J5 and NSW Clause J8.2.
- BASIX
- Greenstar

Smoke control and stair pressurisation systems, will be designed in accordance with AS1668–1:1998 “Fire and smoke control in multi–compartment buildings”.

Mechanical ventilation systems will be designed in accordance with AS1668.2–1991 “Mechanical ventilation for acceptable indoor air quality”.