

CARDINAL FREEMAN VILLAGE

Supporting Documentation

Appendix BC

Mechanical Services Report

Prepared by **Engineering Partners**

Cardinal Freeman Village Care Precinct

Residential Aged Care Facility, Independent Living Units & Services Self Care Units

Mechanical Services

DA Report

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Issue:
14th July 2009
Issue B

1.0 SUMMARY OF PROPOSED MECHANICAL SERVICES

The following mechanical services are proposed to be incorporated into the development.

1.1 Basement

- a) The carpark and loading dock areas will be provided with a mechanical exhaust and supply air system, comprising sheetmetal ducting, exhaust and supply fans mounted in the basement plantrooms and discharge ducting rising to above the roof.

These systems will be designed in accordance with AS1668.2 to ensure contaminant levels within the carpark and loading dock due to vehicle movements are maintained within acceptable limits.

- b) Kitchen Air Conditioning: Tempering air conditioning to be provided via a ducted type fan/coil unit and remote air cooled condenser.
- c) Kitchen Cooking Hood Exhaust System: In accordance with AS1668.2, comprising exhaust hood(s) over any cooking equipment and dishwashers required to have such hoods, exhaust fan with ducting to discharge above roof level.
- d) Kitchen Makeup Air Supply System: To provide filtered outside air to the kitchen as makeup air when the kitchen exhaust system is operating. Comprising intake filters, supply air fan and ducting.
- e) Laundry Ventilation: Exhaust and makeup air ventilation systems in accordance with AS1668.2 and laundry equipment requirements.
- f) Miscellaneous Ventilation: Exhaust or supply ventilation systems to miscellaneous areas in accordance with AS1668.2, including Waste, Electrical/comms room etc.

1.2 Residential Aged Care Facility (RACF)

- a) Air Conditioning General: The system will be an air cooled variable refrigerant volume (VRV) type system. Condensers will be centrally mounted above the roof and will incorporate "night quiet mode" for reduced noise levels at night. Fan coil units will be various types as detailed below.
- b) Air Conditioning – Corridor, Living and Dining Areas: These will generally be air conditioned using ducted type units, sheetmetal and flexible ducting, and ceiling or wall mounted grilles as appropriate. These systems will provide makeup air for the bathroom exhaust systems.
- c) Air Conditioning Bedrooms and Suites: Each bedroom in the RACF will be provided with an individual fan/coil unit providing individual on/off and temperature control. Typically these would comprise either exposed wall mounted type or concealed bulkhead or ducted type units.
- d) Air Conditioning Office Areas: These would comprise ducted type units, sheetmetal and flexible ducting, and ceiling or wall mounted grilles as appropriate.
- e) Bathroom Ventilation: All bathrooms will be mechanically ventilated. Typically this will comprise ducting and fans located above corridor ceilings, ducting above bathroom ceilings to ceiling grilles and vertical risers to discharge above roof level. Makeup air will be via air conditioning units serving the corridors and common areas.

- f) Outside Air Ventilation: It is assumed that all rooms will have openable windows complying with the natural ventilation requirements of BCA being min. 5% of floor area as openable windows or doors. Therefore there will be no mechanical outside air systems for these areas.
- g) Miscellaneous Ventilation: Miscellaneous areas including dirty utilities, cleaners rooms, kitchen/servery etc. will be mechanically ventilated with supply or exhaust systems as appropriate, in accordance with AS1668.2.
- h) Stair Pressurisation: The 2-off enclosed fire isolated exit stairs will be provided with pressurisation systems in accordance with AS1668.1. These will generally comprise a roof mounted fan, associated ducting, provision for relief air from each floor and related controls.

1.3 Independent Living Unit (ILU) and Serviced Self Care (SSC) Buildings

- a) Air Conditioning General: Provision will be made to install air conditioning to each self contained unit. The final installation of the air conditioning to individual units may occur either during construction or some time after completion of construction on an as needed basis.

The air conditioning to each unit will typically comprise an air cooled split type system with fan/coils located in the unit served, connected via refrigerant pipework to roof mounted condensers.

- b) Mechanical Ventilation: All internal bathrooms and laundries will be mechanically ventilated in accordance with AS1668.2. Individual systems will be provided for each unit comprising ventilation fan(s), ducting and grilles. These will discharge horizontally through the building fascade.

Bathrooms and laundries which have openable windows complying with the natural ventilation requirements of the BCA may also be provided with mechanical ventilation subject to the clients preference. Such systems would typically comprise ceiling or wall mounted ventilation fans discharging horizontally through the building fascade.

1.4 General

All mechanical services will be designed in accordance with the requirements of the BCA, the ventilation codes AS1668.1 and AS1668.2 and related codes and standards. In addition, mechanical services to the ILU and SSC buildings will comply with the BASIX commitments.

2.0 PROPOSED ENERGY EFFICIENCY MEASURES

The mechanical services design will be carried out based on energy saving concepts including the following:

2.1 Air Conditioning - RACF

The air conditioning will comprise air cooled VRV type systems incorporating:

- Reverse cycle type condensers providing both cooling and heating functions ie. no electric heating.
- Compressors are electronically inverter speed controlled to accurately match the system capacity to the cooling or heating load. This provides significant energy savings.
- Each individual bedroom and living/dining area will be served by individual fan/coil units. This allows the air conditioning to be switched off in rooms and areas not in use.
- Air conditioning will be operated via electronic controllers to provide comfort conditions without over cooling or heating.
- Air conditioning ductwork and pipework will be insulated to reduce heat loss/gain.

2.2 Air Conditioning – ILU and SSC

The air conditioning will comprise air cooled systems incorporating:

- Reverse cycle type condensers providing both cooling and heating functions ie. no electric heating.
- Each individual unit will be served by individual fan/coil units. This allows the air conditioning to be independently controlled by the residents.
- Air conditioning will be operated via electronic controllers to provide comfort conditions without over cooling or heating.
- Air conditioning ductwork and pipework will be insulated to reduce heat loss/gain.

2.3 Carpark Ventilation

- The carpark ventilation fans and motors will be selected based on high energy efficiency.
- The systems will be controlled by a CO monitoring system in accordance with BCA Section J requirements. This system will monitor the CO concentration in the carpark and vary the fan speeds accordingly.

2.3 Passive Measures

- All windows will be provided with internal blinds or drapes. This will significantly reduce the direct solar load into the building in summer and reduce the loss of heat through windows in winter, thereby minimising the air conditioning load.
- All exposed roof areas and walls will be insulated in accordance with BCA Section J requirements.

- Windows will be sized and treated as required in accordance with BCA Section J requirements.

2.4 General

- All mechanical services systems to the RACF will be designed in accordance with the requirements of BCA Section J.
- All mechanical services to the ILU and SSC buildings will be designed in accordance with the requirements of BCA Section J and the BASIX commitments.