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Job No.: S150308

Tallawolladah Pty Ltd
C/o Altus Group
Email: nick.marston@altusgroup.com

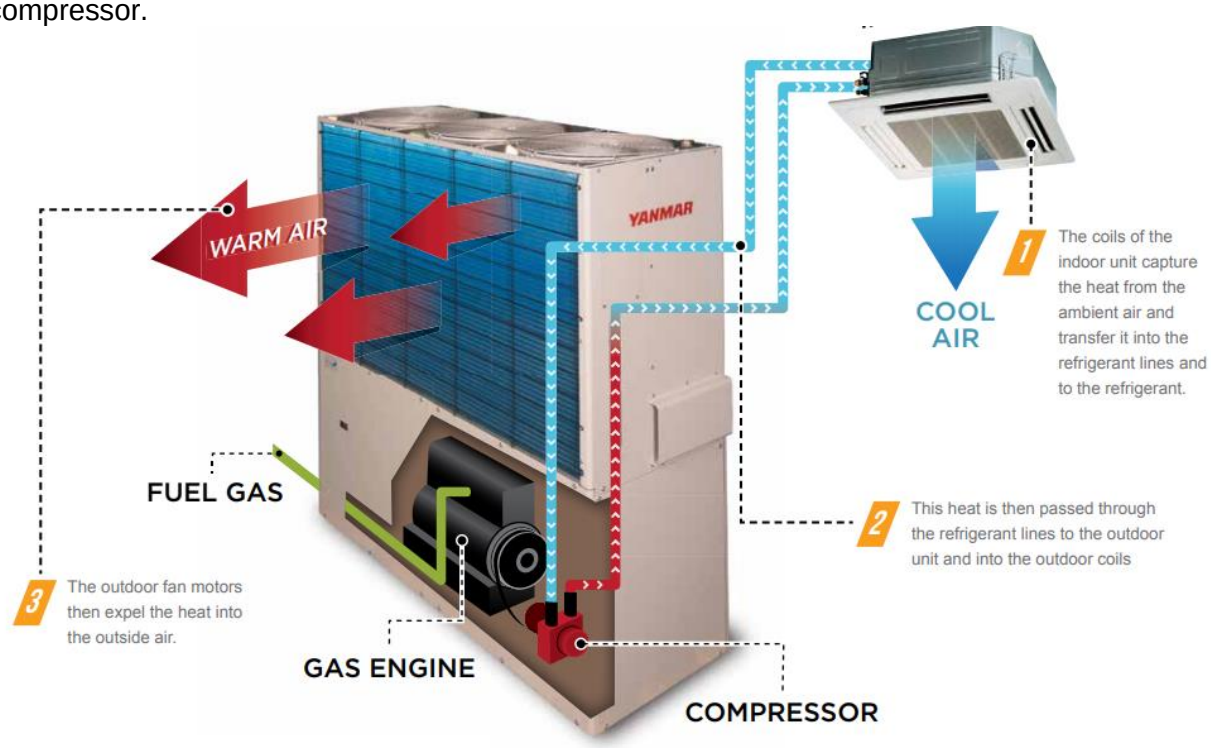
Dear Nick,

RE: Campbells Store Bay 11 & S96MOD

Summary of Changes on Bay 11 plantroom

Air conditioning System

The air conditioning system previously consists of 5 off reverse cycle electric Variable Refrigerant Flow (VRF) condenser. This system is now replaced with Yanmar Gas Driven VRF due to lack sufficient amount of electrical power at site and to prevent the installation of new substation. These reverse cycle air-conditioning systems use a gas engine to drive the compressor rather than an electric motor. The condensers are a three pipe Gas Heat Pump, often simply referred to as a GHP. The heat pump transfers large amounts of heat energy between the building and the outside air; this heat transfer is done between indoor units fitted in the building and an outdoor unit installed outside the building. Heat transfer with the outside air is done using heat exchangers built into the outdoor unit. The engine speed varies to regulate the refrigerant volume in a similar fashion to an inverter compressor.



Following are the advantages of Yanmar Gas Driven VRF systems

- **Electrical load slashed**: The electrical load from condensers is reduced by around 90% and they don't require three phase power. A Yanmar 85 kW condenser has a running current of only 8 amps, single phase.

- **Efficiency:** A Gas Powered VRF system can provide up to 50% lower running costs than similar electric air conditioning systems.

- **Environmental** - Reduced green house gas emissions. Electric air conditioning systems are significantly more greenhouse intense than gas powered air conditioning systems in Australia. This difference is not simply because natural gas is a lower greenhouse energy source compared with electricity generation in Australia; it is more a matter of recognising the inefficiency of the electricity generation process where approximately 2/3 of the energy in the primary fuel is lost at the power station and through transmission.

- The Gas fired VRF condenser installed in this project comes with factory fitted Catalytic converter. A catalytic converter is an exhaust emission control device that converts toxic gases and pollutants in exhaust gas from an internal combustion engine into less-toxic pollutants by catalysing a redox reaction (an oxidation and a reduction reaction)

- **Low noise:** A key advantage of these gas powered models is their quiet operation, which certainly helps to keep neighbours on side. A Yanmar 85 kW condenser operates at 62 dBA. Note, these units are quieter than the electric VRF condensers.

- **Peak Demand** - Reduced peak demand charges. The demand for air-conditioning in Australia is growing at a rapid rate and is expected to continue growing over the coming years. This growth is creating a substantial rise in the demand for power to run air conditioning; there are concerns about a shortage of power generation and transmission capacity during peak periods which is leading to new regulations to manage peak demand and significant investment in transmission infrastructure. In some regions, peak demand charges can account for up to 50% of the electricity bill penalising all electrical consumption. Gas Powered VRF systems help avoid peak demand charges, thereby reducing operating costs. Flattening their demand profile in this way can also help customers to negotiate a more competitive tariff structure from their electricity supplier.

Kitchen Exhaust

The Plantroom in Bay 11 also houses the kitchen exhaust fan and discharge was located in Bay 11, as all other bays were forbidden from having a kitchen exhaust discharge by the Conservation Management Plan (CMP).

Centralising the kitchen exhaust at Bay 11 makes it possible to install an ozone odour treatment system, which is a system that is reliant upon relatively long duct runs that allows increased contact time for the ozone injected into the ducting.

Treatment of Kitchen Exhaust

Cooking Apparatus used within the Kitchens and food preparation areas required to be served by an exhaust hood in accordance with AS 1668.2-2012 shall be provided with a kitchen exhaust hood.

The kitchen exhaust system will consist of two filtration stages to remove odours, with the first stage consisting of electrostatic filtration (fitted integral to the exhaust hoods), capable of removing at least

99% of grease from the exhaust air stream. The second stage will consist of an ozone generation and odour management system, which shall release ozone into the exhaust air stream that will eliminate cooking odours at the point of exhaust discharge.

Refer BCA, AS1668.2-2012, Part J5, Protection of the Environment Operations Act 1997

Note: There is no changes to the Kitchen exhaust system or design as approved by SSD 7056.

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