

6 August 2015

Australand Property Group
Level 3, 1C Homebush Bay Drive
Rhodes NSW 2138

Attention Mr. Paul Solomon
Development Manager, Infrastructure & Approvals

Dear Paul ,

Re: Proposed Office/Warehouse facility for Martin Brower at Horsley Park – Letter outlining Cooling and Heating Systems for DOP for SEARS requirements

Further to your request please outlined a description of the cooling and heating systems proposed for the above mentioned project.

Cooling and heating systems are proposed for the Office areas for this Office / Warehouse facility. The installed systems shall comply with the requirements of the National Construction Code (NCC) and relevant Australian standards and the required Minimum Energy Performance Standards (MEPS). Warehouse areas shall be ventilated to meet the requirements of the NCC as no cooling and heating or cooling systems are required.

The systems proposed are categorised as of the geothermal type. Geothermal refers to the method of heat rejection. The a/c systems proposed for this development comprise of the following components:

- Refrigerant Pipework is run underground for heat rejection.
- Compressor is enclosed in a box with all the relevant refrigeration components required for cooling and heating modes.
- The indoor units (fan coil unit) are of the conventional type that shall be connected to air distribution ductwork and air diffusion systems.
- Controls shall be of the Direct Digital Control type to allow all systems to be controlled centrally.
- Heating shall be achieved by reversing the refrigeration effect (initiated via a reversing valve in the compressor unit).
- Co-efficient of performance (cooling/heating output divided by electrical input) is approximately at 5. This is higher than the conventional air cooled splits systems at an average of 3.2 that results in a lower carbon footprint for this site.

Each thermal zone shall have a separate indoor unit for simultaneous cooling and heating requirements as required. Thermal zones shall include office perimeter, office centre, lunchrooms, meeting rooms, boardrooms, training rooms, and Comms Rooms.

HEAD OFFICE:

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Ref: Y:\PES\Mechanical Services - Letter for DOP - Sears.doc

If you have any further queries please do not hesitate to contact the undersigned on 0411 473 518.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'P. Souflis', with a stylized flourish at the end.

Peter Souflis BE, Fellow IEAust
Director and National Engineering Manager
For Grosvenor Engineering Group

GROSVENOR



Tri Tech Refrigeration Contracting &
Engineering Pty Ltd
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SEARS Statement – Refrigeration System

Project Details		Tri Tech Refrigeration Contracting & Engineering P/L
Client	Martin Brower, Horsley Park Facility C/O Australand Suite 59, Jones Bay Wharf. 26-32 Pirrama Rd. Pyrmont NSW 2009	
Location	Horsley Park Business Park, Horsley Park, NSW	
No. Q5264	Description:	Warehouse Facility Refrigeration System
Reference Documentation: N/A		
Tri Tech Authorised Representative: Andrew Howe		

To whomever it may concern,

The refrigeration utility for the Martin Brower Horsley Park Facility incorporates three (3) temperature zones in five dedicated areas: The Freezer (-20°C), The Chiller (2°C), The Receiving Dock (2°C), The Dispatch Dock (2°C) and the Tomato Room (10°C).

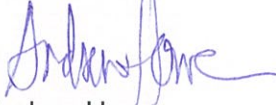
Cooling to the Freezer chamber is provided by dual heat-exchanger, penthouse-type, induced draught fan-coil assemblies (Penthouses). The Freezer consists of two (2) penthouse assemblies to deliver the required refrigeration capacity. Temperature in the space is maintained by the continual circulation of air through the Penthouses where the air is subsequently cooled and then dispersed into the space. The cooling effect in the Freezer Penthouses is achieved via the evaporation of low temperature ammonia (-27°C) in Penthouses' heat exchange coil.

Cooling to the 4 chilled areas is provided by a series of single heat-exchanger, ceiling-hung, induced draught fan-coil assemblies (FCUs). To provide the required refrigeration capacity The Dispatch Dock houses four (4) FCUs and The Receiving Dock, The Chiller and the Tomato Room each house two (2) FCUs. Temperature in the space is maintained by the continual circulation of air through the FCUs which cools and disperses the air into the space. The cooling effect in FCUs is achieved via the pumping of chilled glycol (-6°C) through the FCUs' heat exchange coil.

Both the low temperature ammonia and glycol circuits are reticulated from a centralised refrigeration plant. The centralised plant is a conventional two-stage, cascade vapour-compression cycle using ammonia as the working refrigerant. The first stage (Low Stage) of the plant provides duty for the low temperature, reticulated ammonia system. The second stage (High Stage) provides duty for the secondary, reticulated glycol refrigerant. Heat

absorbed by the plant from the five refrigerated chambers is in turn cooled by ambient air using an evaporative air-cooled condenser.

Kind Regards,



Andrew Howe

B.Com, B.Eng (Hons) (Chem), MEngSci (Mech)
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RPEQ 8864
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Project Manager

Tri Tech Refrigeration
Contracting & Engineering
06/08/15