THE REPLACEMENT OF CHILLERS in St GEORGES COURT

The background circumstances relating to this operation is due to chiller No 1 having failed, and chiller No 2 not able to work to its maximum capacity. A number of companies were contacted, and surveys were undertaken with condition reports and various solutions proposed.

One solution of repairing the existing chiller was considered, but as the supplier was unable to provide a warranty that was acceptable to us, other options were sort.

The option that provided us with the solution we required was to remove the failed chiller, and some of its associated sound attenuation housing. Then to install a new chiller, and new acoustic housing in place of the failed unit in the first phase, with a second chiller and acoustic housing being replaced in phase 2 later in the year

The chiller chosen was a McQuay chiller type ALS 358.3. This chiller has a smaller foot print on the roof, it is lighter by 610 Kgs, and also the proposed chiller is 200 mm lower in height, creating a slightly lower profile. The sound output is less by 3 dBa at 10 meters. The proposed chillers noise output is 46 dBa at 10 meters. The background noise level on the roof in the middle of the day is 49 dBa, The failed chiller was rated as producing 49dBa..

A further advantage is that the proposed chiller has a greater cooling capacity, the failed unit's cooling capacity was 1144Kw's, the proposed units cooling capacity is 1262 Kw's, providing an additional cooling capacity of 118Kw's. This unit is able to operate over a wider ambient temperature range from $+35^{\circ}$ C to -12° C. The failed unit was only able to operate up to $+30^{\circ}$ C ambient.

Power consumption will be lower, the total amperage is lower by 3 amps and new electronic controls mean that the operating power consumption will be lower than the failed chiller consumption was, when operating.

The refrigerant to be used in the proposed chiller is R134a, which is a more efficient refrigerant, and a "Greener" gas, it has a lower ODP when compared to the present R407c gas installed in the failed chiller.

The chiller and its associated sound attenuation housing will be painted in the same RAL colour as the present chillers and their housing.

Our method of undertaking this work will be as follows;

A full survey of the roof and chiller has taken place; this included a survey of Bloomsbury Way by the Crane Hire Company and their Traffic Management Company who arrange road closures for them. The Crane Hire company are providing their own certified slings, and qualified banksman.

ITS have been appointed as our subcontractor, who will be responsible for the isolation and disconnection of the chiller, from its power supply, the chilled water pipe work, and its acoustic housing. Having dismantled the old acoustic housing and failed chiller, which will be craned off the roof, ITS will crane on the new steel work required to support the new chiller, (2 x 7mtr lengths x 200mm "I" joists), and later the new chiller itself, finally the new acoustic housing panels. It is anticipated that this part of the work will take two days over a weekend.

The failed chiller will first have its R407c refrigerant decanted into approved storage cylinders, for proper disposal by the refrigerant manufactures disposal department, a record of the amounts of refrigerant taken away will be provided for inclusion in the "F" Gas Records for the building. The refrigerant oil will be drained for approved disposal by the oil manufacturer.

The power supply cabling will be disconnected to the failed chiller having first checked that the appropriate isolator has been locked off and the fuses removed.

The chilled water pipe work will be valved off from the chilled water circuit, allowing the other chiller to remain operational to provide chilled water to the building.

The existing acoustic housing surrounding the failed chiller will be removed and stored safely beside the failed chiller to wait craning off.

On the appointed weekend the crane will take up its position in Bloomsbury Way, large sections of acoustic housing will be craned off of the roof onto waiting transport for approved disposal by the acoustic housing installer. The isolated and disconnected chiller will be craned off onto waiting transport to be disposed of in a proper manner by our subcontractor ITS.

The new steel supports will be craned onto the roof and placed in position for bolting to the existing steel work. When this work is complete, the new chiller will be craned into position onto the new steels. The sound attenuation supports will be installed before the chiller is in its final position. These are to eliminate any sound vibration through the buildings steel frame work.

A new additional H V isolator will be fitted adjacent to the new chiller, this will provide for lockable local isolation on the roof as well as in the basement plant room. When the electrical supply is connected to the chiller a full test will take place with the appropriate certificates being issued for recording by the buildings service manager.

The chilled water pipe work will be connected, to the existing circuits, and pressure tests undertaken to ensure the soundness of all connections.

The new acoustic housing will be installed around the new chiller, the ambient air to be drawn into the top of the housing to pass through the condensers, to be ejected via the chiller fans up through the top of the chiller. This will ensure that there will be no recirculation of warm air from the nearby dry coolers that expel warm air from the basement air conditioning system. This configuration will also ensure that what little noise is emitted will tend to rise rather than be spread outward each side. The new chiller will be charged to the proper level with R134a refrigerant, the power will be turned on and all the pressure and temperature valves will be adjusted to set the unit to operate to its optimum designed performance.

The chilled water pumps have already been surveyed, and they are of sufficient capacity to cope with the new chillers output, and are bale to distribute chilled water throughout the building.

When the commissioning period is complete the unit will be handed over to the building services manager along with the appropriate electrical and refrigerant certification to add to the O & M manuals for the building.

The equipment will carry a full one year's warranty.

It is anticipated that chiller No 2 will be changed later in 2009.

The work is to be undertaken in this manner to ensure that the building does not suffer a total loss of the chilled water supply to the building thus maintaining a level of comfort for the occupants.

Dimensions and Operating Parameters

OLD CHILLER NEW CHILLER

Length	9450 mm	9200 mm
Width	2360 mm	2065 mm
Height	2700 mm	2520 mm
Weight	10,000 Kg's	9390 Kg's
Full Load Currant	860 amps	857 amps
Cooling Capacity	1144Kw's	1262Kw's
Refrigerant	R407c	R134a
Ambient Op Temp	+30°C	+35°C
	-12°C	-12°C
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Colour

Same RAL Colour