THE ROYAL FREE HOSPITAL
AIR HANDLING UPGRADE PROJRECT
DESIGN & ACESSS STATEMENT **6th February 2024**

1. Proposals Summary

The air conditioning systems had a maximum anticipated lifespan of 7-9 years and as such is now 6 years beyond its serviceable use. Following recent maintenance visits and a series of persistent failures it has become increasingly difficult to secure spare parts and unaffordable to continue to maintain. Existing equipment is also unable to cope with hotter summers where temperatures can exceed 35°C.

The location of external condenser units is now in a heavily populated area with restricted air flow caused by the addition of other cooling units added to this area. Additional maintenance procedures have been put into place over the past two years to ensure cleaning and concurrent maintainability can be achieved whilst a suitable new location was identified. In extreme heat conditions, condensers have occasionally required cooling with common garden sprinklers to prevent damage and ensure continued operation.

To mitigate these issues and meet the future needs of the organisation, plans have been drawn up to replace both internal and external cooling units. A site survey carried out by FlaktGroup engineers to identify the most suitable location for the new condenser area recommended the proposed area on the 4th Floor balcony to ensure sufficient space to accommodate the Condenser Units for cooling. This location has good air movement, thereby ensuring the cooling systems are working at their maximum efficiency to minimise the environmental impact.

The new units will ensure that the Trust's commitment to sustainable energy efficient improvements and low residential noise condenser units purchased will ensure considerable energy savings to the Trust.

Sufficient space is available for maintenance to be carried out within this area and the associated pipe run survey has been completed by the site survey.

- Location of the new Condensers, it is proposed that these are moved to the raised flat area identified in the images below. This will ensure that the hot air is dispelled into the atmosphere correctly and not recirculating with the other existing condensers in the current location.

- The current condenser location is not satisfactory due to the large number of other existing condenser in the area. This is currently causing air flow problems and failure to existing systems.

- The new area will be ideal for housing both condensers if they are to be upgraded in the future. The location is generally less obtrusive, higher and therefore less overlooked.

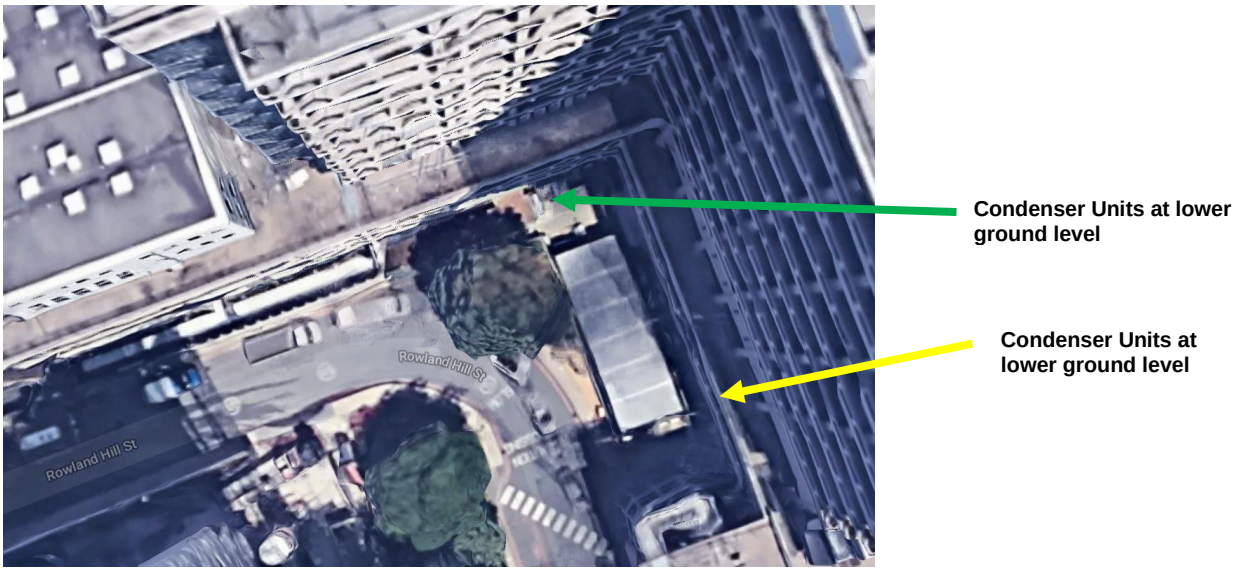
- The windows behind the location are non-functional and the areas behind these are plant rooms and not used for Hospital services.

- Greater security as can only accessed from within the hospital building.

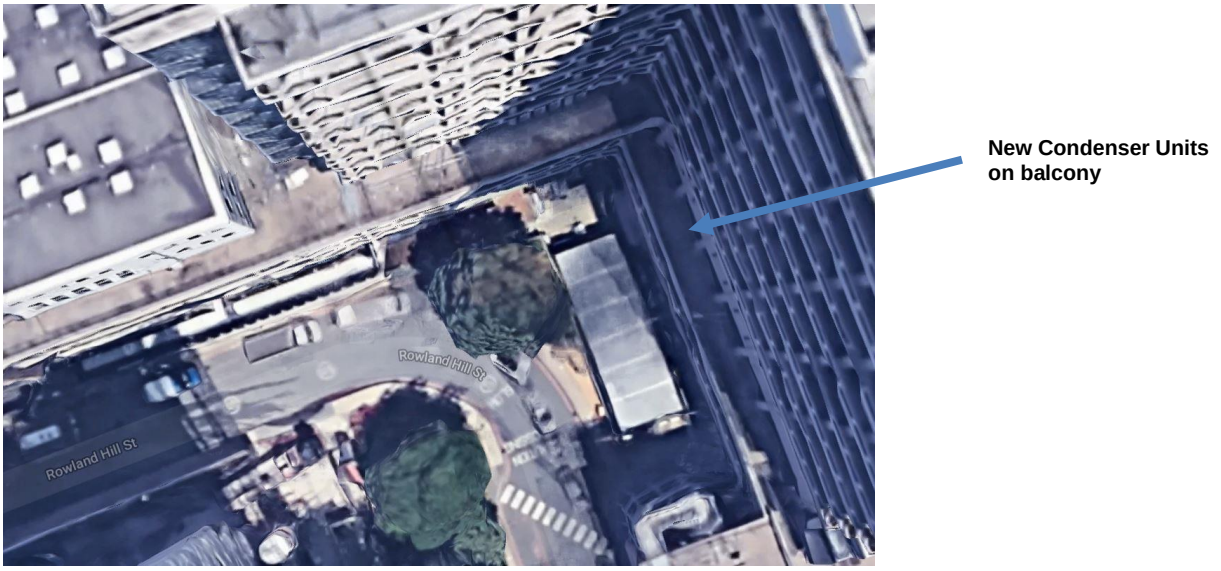
- An Acoustic survey has been completed which is now recommending that acoustic screening is no longer a necessity. Noise is moved away from pedestrians and occupies hospital space.

Please see below photographs outlining their location and our recommended area to reposition the Condensers.

Current location of condensers



Proposed New Location of Condensers



Proposed area for relocation of the horizontally mounted condenser units (vertical discharge)

2. Plant Summary

Proposed new Units

Four GEA 18D Multi-DENCO® down flow close control direct expansion air handling systems
Four DENCO ambient air-cooled condensers Units.

4 off Indoor Units DMA018DPSIN4PN1
4 off Outdoor Units DMOUCD026E
4 off Basestand 25mm DMAC018BAS
4 off Condensate Pump DMAC018PUM

An acoustic survey was carried out in accordance with BS 4142: 2014 to determine the background noise levels in the vicinity. The cooling plant was deemed to have a NOEL effect on adjacent properties. The full report is included in the application.

3. Critical Timescales for installation

Installation of the proposed new equipment is recommended to be carried out as soon as possible before the weather starts heating up and before the availability of air cooling specialists become a challenge to book.

Risk management against infrastructure failure

The best way to manage the risk of Air Handling Unit (AHU) failure is to make sure they are working appropriately and well maintained.

The AHU was commissioned in 2009 and has since been maintained on regular basis. However, there has been increase in failed parts which are being replaced. Also following recent maintenance visits and a continuation of problems with the existing units due to its age (approaching end of life), it was recommended by our maintenance contractor that the units be changed and a new location sort for the condensers. They are currently located back to back with other AHU resulting in recycling of hot air between AHU. It is imperative that this replacement of AHU is commenced immediately before the onset of summer temperatures.

4. Trust approach to cooling requirements

Trust cooling needs must be met with an N+1 duty and standby arrangement to ensure business continuity. Year-round process cooling requires dedicated plant and in order to ensure effective heat rejection an air-cooled system has been selected and the positioning of the outdoor unit is key to prevent short cycling. The unit's location also allows safe access for regular maintenance without the further need for supplementary access equipment or scaffolds.

There are no existing plant systems on site that would be suitable to meet this cooling need, existing systems onsite are designed for comfort cooling, and are therefore have seasonal variation in temperature output.