HE ROYAL FREE HOSPITAL
IMAGING DEPARTMENT REPLACEMENT **JOB NO. 21030 & 21031**
DESIGN & ACCESS STATEMENT **18TH MARCH 2024**

1. Proposals Summary

The Royal Free Hospital – Imaging department replacement project involves refurbishment of some of the treatment rooms, control rooms and ancillary spaces that are part of the Imaging department (Ground floor). Mainly the works include:

Internal works:

- Replacement of 3 units of X-ray, 1 unit of MRI and 3 units of CTs.
- Complete renovation of all finishes in treatment rooms, control rooms and ancillary areas adjacent to those treatment rooms.
- Replacement of furniture, IPS panels and doors.
- Replacement of sanitaryware with new units that comply with the current HBN and HTM regulations and are aligned with the hospital Infection Control and Prevention guidelines.
- Upgrade to M&E services in these areas (replacement of the lighting with more efficient units and upgrading the pipework and ventilation system to a more efficient and sustainable equivalent).

Various new plants located externally on different levels of the roof:

- **Plant 1st level:** 4 new AHUs units: AHU-1.01, AHU-1.02, AHU-1.03 and AHU-1.04.
- **Plant 4th level.** 2 new MRI chillers: CH-5.01 and CH-5.02. Including acoustic screen. **The acoustic screens have been expanded (from 7.0Lx2.0Wx2.4H to 12.0Lx4.0Wx3.2H) compared to the proposal included in the previous planning application.**
- **Plant 5th level.** 3 new Condenser units: CON-5.01, CON-5.02 and CON-5.03. Including acoustic screen. **The acoustic screen for these condensers has been modified changing from a 'C' shape (dims 4.0Lx2.0Wx4.0H approx.) to a 'L' shape (dimensions, 6.3Lx4.5Wx2.5H) compared to the proposal included in the previous planning application.**
- **Plant 5th level. 3 new Chiller units: CH-5.01, CH-5.02 and CH-5.03 and GRP enclosure. Including acoustic screen and supporting structure. The acoustic screen has undergone modifications. Initially proposed with dimensions of 5.9Lx9.8Wx4.0H and not affixed to a GRP enclosure, it has now been adjusted to dimensions of 9.8Lx6.3Wx3.1H and securely fastened to the adjacent GRP enclosure to enhance stability.**
- **Plant 5th level.** 1 new AHU units: AHU-5.01.
- **Plant 5th level.** 2 units x Maternity Condensers relocated.

The refurbishment requires one work on the building facade: the vertical ducting joining AHU on 5th level roof with the 4 AHU units seat on first level roof including structural fixing to the façade.

2. Access

The refurbishment of the Ground floor has no significant impact on the public access within or around the hospital. Any construction works will be within the boundaries of the relevant floor with proper contractor's hoarding and protection.

The AHU, chillers condensers and associated structure have been installed and lifted onto the site via deliveries, then hoisted over the roof using a crane. The lift of acoustic screens will be carefully coordinated with the Hospital and the Trust Resilience team to ensure it does not affect patient access and minimally impacts traffic flow around the hospital.

Future maintenance access to the new roof plant is from within the existing hospital via existing restricted-access routes and will be available only to maintenance personnel or authorized visitors.

3. Plant Summary

The works include the creation of a new plant room, and provision of AHU and air source heat pump equipment, located on the 5th floor roof above H West plantroom, along with the replacement of 2 No AHUs located at first floor level currently serving the Imaging department at Ground Floor. The plant room would house the heating and cooling infrastructure, buffer vessel, pumps, pipework associated with providing the Air tempering.

The new centralised AHU will be provided at roof level to serve 4 No air tempering sub-AHU units at first floor level. The fog and reheat coils to the AHUs shall be served via Steam-to-LTHW new plate heat exchangers within the plant room with the steam distribution extending from the existing infrastructure within H West plant room below. The sub-AHU cooling coils shall be served by new packaged chiller units located outside of the new plant roof. The chillers shall be provided with acoustic screening, in line with the atmospheric plant noise report undertaken and issued by RSK Acoustics.

The fresh air intake and extract air discharge from the new centralised air handling unit ventilation system shall discharge to atmosphere via new external louvres. Each of the fresh air and extracted air discharge systems shall be installed with new duct mounted acoustic attenuators, in line with the atmospheric plant noise report undertaken and issued by RSK Acoustics.

The MRI 3 scanner shall be provided with chilled water from 2 No new packaged air-cooled chillers located externally to the H West plant room at 4th floor level. The MRI chillers shall run in a duty/standby configuration to provide ‘N+1’ resilience to the MRI service. The chillers shall be provided with an acoustic enclosure, in line with the atmospheric plant noise report undertaken and issued by RSK Acoustics. In order to maintain the existing roof access walkway, due to the clearances recommended by the chiller manufacturer for airflow, the acoustic enclosure shall extend out further towards the edge of the roof (Pond Street elevation) and include access doors at each end, such that roof access is maintained through, rather than in front of the acoustic screen/enclosure.

It is also proposed to install variable refrigerant flow (VRF) systems to serve the space heating and cooling to ancillary spaces, and technical/equipment rooms. There shall be 2 No VRF systems serving technical/equipment rooms which shall run in a duty/standby configuration to provide ‘N+1’ resilience, without the need to pepper the roof spaces with heat rejection equipment.

The external condensers shall be provided with acoustic screen, in line with the atmospheric plant noise report undertaken and issued by RSK Acoustics.

The proposed external plant is to be supported via a purpose designed roof support frame raised above the existing roof finish.

4. Modifications to granted application ref: 2022/1857/P

The ventilation/cooling equipment described on the previous planning application has been currently installed as per previous planning application. The only modifications that would be undertaken are related to acoustic screens as follows:

Level 4th Acoustic screens (Chillers CH-4.01 and CH-4.02):
Acoustic screen for this chiller has been enlarged (from 7.0Lx2.0Wx2.4H to 12.0Lx4.0Wx3.2H).

In the proposed redesign, modifications have been made to enhance safety and functionality.

Firstly, we have integrated the existing walkway, positioned in front of the acoustic screen, into the acoustic enclosure. This critical adjustment mitigates the risk of individuals traversing the narrow space between a low parapet w/guardrail (approximately 100-200mm-balaustrade 1m-mm) and the acoustic screens. Given the regular access required for maintenance or other activities, particularly to certain plants on this level, and considering the potential fall height of around 5m, this arrangement significantly improves safety, eliminating the necessity of navigating along a narrow walkway between a guardrail (approximately 1m-0.9m) and a tall acoustic screen.

Secondly, increased coordination during the construction phase between the acoustic screens and the maintenance areas for the chillers has prompted an expansion of the proposed screens. This expansion now encompasses the chiller maintenance access areas within the acoustic enclosure, ensuring seamless integration and operational efficiency.

Finally, upon consultation with the Acoustic provider (Conabeare), it has been advised to raise the screen height to achieve the necessary acoustic attenuation as per the requirements outlined in the acoustic report.

These modifications collectively enhance safety, functionality, and compliance with acoustic standards, ensuring the success of the project.

Level 5th Acoustic screens (Chillers CH-5.01, CH-5.02 and CH-5.03):
Original proposed acoustic screen 9.8Lx5.9Wx4.0H, not fixed to GRP enclosure, has been re-arranged to 9.8Lx6.3Wx3.1H and fixed to GRP enclosure.

The decision to modify the original proposal stems from two primary reasons aimed at enhancing the overall effectiveness and structural integrity of the project. Firstly, to bolster the structural stability of the acoustic screens, they will now be securely affixed to the GRP enclosure. This adjustment ensures greater durability and reliability, mitigating any potential risks associated with instability or displacement. Additionally, following advice from the Acoustic provider, the height of the screens will be reduced while still maintaining the required level of attenuation as documented in the attenuation record

Level 5th Acoustic screens for condensers (Chillers CON-5.01, CON-5.02 7 CON-5.03):
The acoustic screen for these condensers has been modified changing from a ‘C’ shape (dims 4.0Lx2.0Wx4.0H approx.) to a ‘L’ shape (dimensions, 6.3Lx4.5Wx2.5H).

The reorganization of the plant, which includes three new condensers alongside two existing ones, has been undertaken to accommodate the available space surveyed on-site. This reconfiguration prioritizes the provision of ample maintenance access around all condensers, ensuring efficient servicing and upkeep. Consequently, with this new arrangement in place, the design of the screen has been revisited to align with the specified attenuation requirements. This revision ensures that the acoustic enclosure effectively mitigates noise while also facilitating necessary maintenance activities, thereby enhancing the overall functionality and performance of the plant.