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PROPOSED NEW PLANT AND ASSOCIATED WORKS INCLUDING NEW AIR HANDLING UNIT, PROPOSED RE-ROUTED QUENCH PIPES AND PROPOSED TEMPORARY RELOCATION OF EXTERNAL CHILLER UNITS

DESIGN AND ACCESS STATEMENT

Royal Free Hospital

Pond Street

London NM3 2QG

Royal Free London NHS Foundation Trust

Oct 2024

Rev 03

NHS
Royal Free London
NHS Foundation Trust

Contents

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1 DESCRIPTION OF THE PROJECT

1.1 Overview

There is a need to install modern, fit-for-purpose equipment to support essential refurbishment works at the Hospital, particularly for its Clinical Research Facility (CRF) operations. Additionally, some equipment currently located on the 1st floor above the MRI-4 suite will need to be temporarily relocated to make space for a planned new Hybrid Theatre extension (the planning application for this extension will be submitted in due course). The space freed up by relocating the equipment will be used to house the CRF unit.

The project involves 2no. different work phases:

Phase 1 - **Temporary works**:

- **Temporary relocation of two chillers** currently serving the MRI units in the Imaging department. These chillers, currently situated on the 1st roof floor above MRI-4, are proposed to be temporarily moved to the 5th roof floor, northwest corner of the Royal Free Hospital (main building). The chillers will be displaced or made redundant following the installation and commissioning of air source heat pumps (ASHPs) as part of the Hybrid Theatres planning application, which will be submitted in the coming months.
- **Temporary relocation of 7no. condensers**. These condensers are also currently placed on 1st Roof floor, over MRI-4 suite. These 7no. condensers, serving MRIs ancillary rooms such as control and equipment rooms, will be installed on north-west corner of the Royal Free Hospital (main building) ground level.

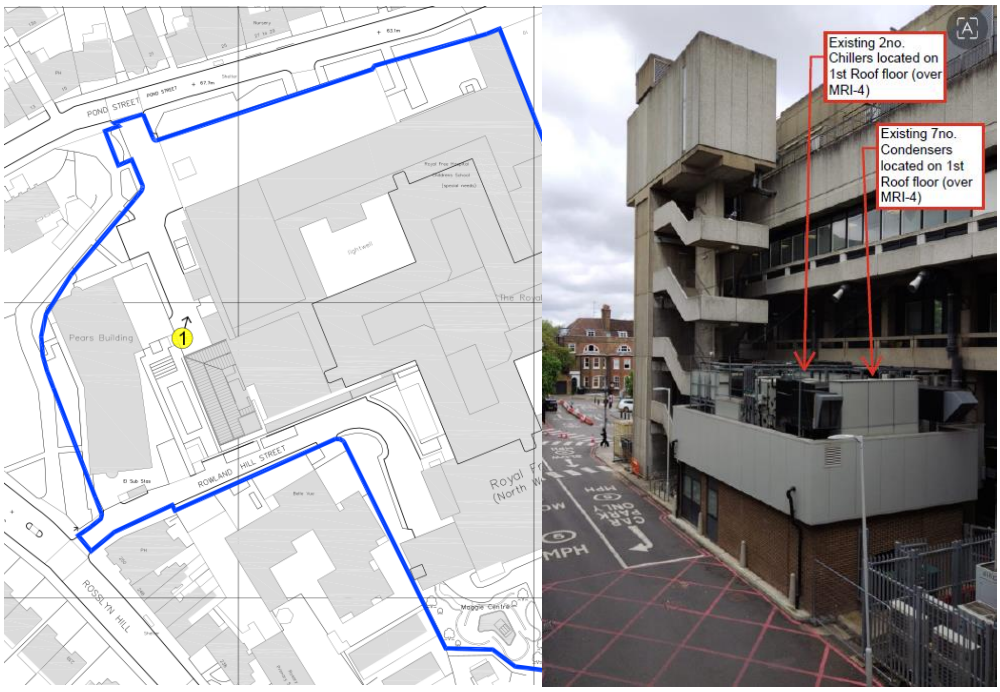

Image 1. Temporary relocation of 2no. Chillers & 7no. condensers. Current location of these units

Phase 2 - **Permanent works**:

- **Installation of a new CRF Air Handling Unit** to serve the Clinical Research Facility (CRF) clean room located on 2nd floor. This AHU will be placed on the 1st Roof floor vacant space left by the 2no. Chillers relocated as part of the temporary works. The new CRF AHU will be placed in a discrete roof-level location at 1st roof floor level on the main Royal Free Hospital building's

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western elevation, between an existing AHU unit and the façade of the main building. This location is essential as it allows for easier and shorter routing of new CRF AHU's supply and extract ducts from the first-level roof (directly beneath the CRF clean room façade) to the 2nd floor ceiling void. The ducts will be routed through the available vertical space between the existing external concrete staircase and the main building balconies.

- **Installation of new 3no. condensers** to provide cooling for New CRF AHU. These 3no. condensing units, DX with additional VRV units, is associated with the unclassified admin/staff spaces. These condensers would be located inside a 4th roof floor enclosure, currently vacant.
- **Permanent relocation of 3 existing condensers,** placed currently on MRI-4 roof (1st roof floor) and serving existing 3no.MRI AHU's. These condensers will be also permanently relocated inside the same 4th roof floor enclosure, currently vacant.
- **Diversion of existing 4no. quench pipes** serving existing MRI accommodation within the Hospital, running from 1st Roof floor to 2nd floor ceiling void level. These pipes currently discharge at the level of the second-floor ceiling void. The new routing will direct them to discharge points on the 5th roof floor, ensuring compliance with safety standards if helium is released. This will involve modifying the pipe layout and securing the new routes to the structural framework.

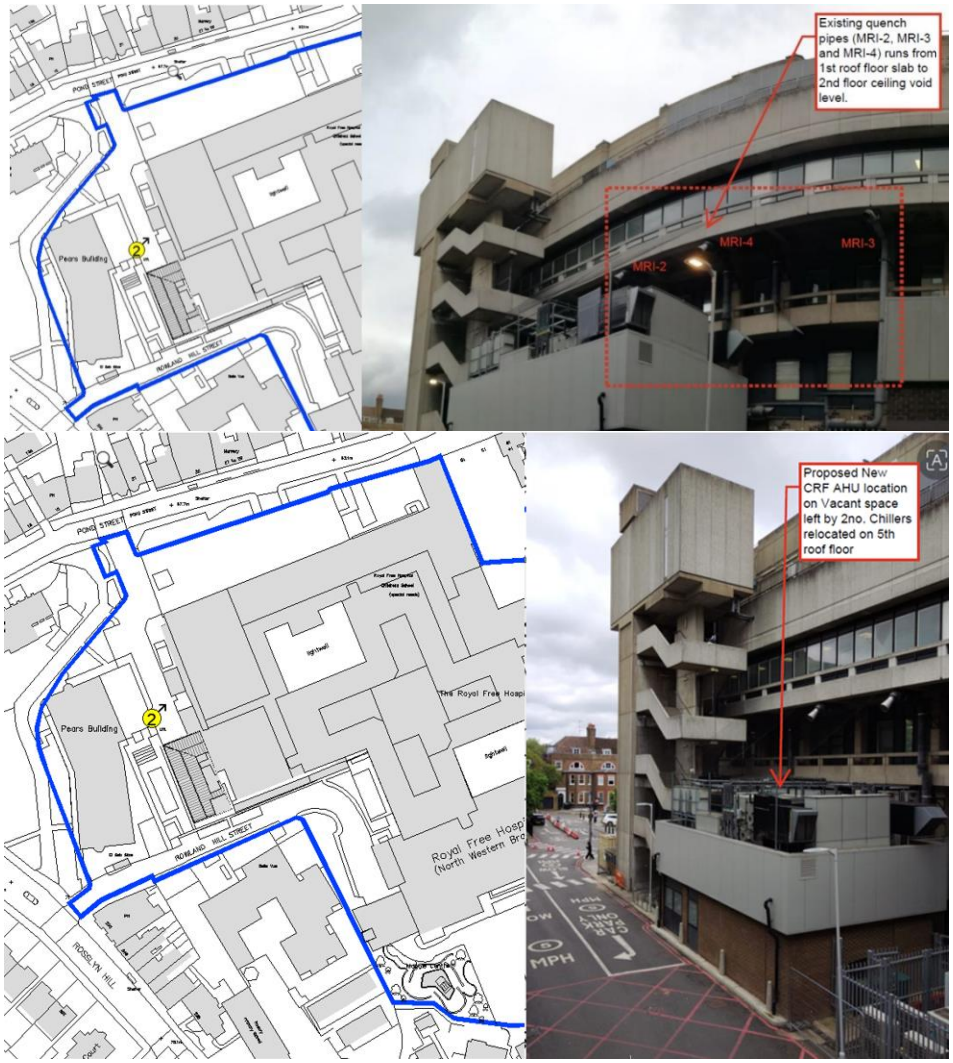

Image 2. Existing quench pipes to be re-routed & Proposed location for New CRF AHU

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Image 3. MRI-1 Quench pipe. View from Pond Street facade

The temporary relocation of existing 2no. chillers and 7no. condensers as well as the proposed permanent re-routing of the quench pipes and relocation of MRI AHU's condensers at this stage will importantly enable delivery of the proposed Hybrid Theatre Extension (and a further planning application, proposing this extension on-site will be submitted to the Council in due course).

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2 PROJECT CONTEXT & CRF RESEARCH NEED

The new Clinical Research Facility (CRF) is a key part of the Royal Free's expansion plan, designed to support its research and development mission. This expansion is crucial for meeting the growing demands of the CRF and promoting ongoing innovation within the institution.

A central element of the CRF is the clean room, which will be located in the currently vacant 2nd floor Laboratory, room number 2-108. The new AHU, serving this space, will be dedicated solely to the clean room, ensuring a separate and controlled supply of filtered air that meets the stringent environmental requirements of such a facility.

Clean rooms require precise air quality control to prevent contamination during sensitive operations. The air supply must undergo careful filtration, temperature regulation, and pressurization to maintain particulate levels within strict limits. Continuous air filtration is necessary to remove airborne particles, contaminants, and microorganisms that could compromise operations.

The existing HVAC ("Heating, Ventilation, and Air Conditioning") systems are not capable of providing the high air change frequency or advanced filtration required for a clean room. This space requires a minimum of 30 ACH (air changes per hour) to maintain the appropriate environment. The new AHU will be equipped with high-efficiency HEPA filters to trap small particles, meeting the required cleanliness standards. It will also maintain positive pressure to prevent contaminated air from entering the space.

In summary, the installation of the new AHU, and its ancillary 3no. condensers for air supply cooling, is vital for establishing the clean room, as it will deliver the filtered air necessary for effective contamination control and support the airflow requirements for the space's conversion.

Prior to installing the new CRF AHU, the existing 1st Roof floor 2no. chillers and 10no. condensers, (7no. serving MRI ancillary rooms and 3no. serving MRI AHU's) currently placed above MRI-4 must be relocated to create space on the 1st roof floor above the MRI-4 unit to allocate the CRF AHU:

- 2no. chillers will be temporary relocated on 5th roof floor; The MRI process chillers will become redundant once the hybrid theatres plant has been installed and commissioned. This is due to the advantage of including a year-round process load on the proposed air-source heat pump system which maximises energy efficiency when there is simultaneous heating and cooling.
- 7no. condensers, serving MRI ancillary spaces will be relocated on the ground floor temporarily; The relocated MRI split AC condensing units are to be raised onto a new platform at 1st floor

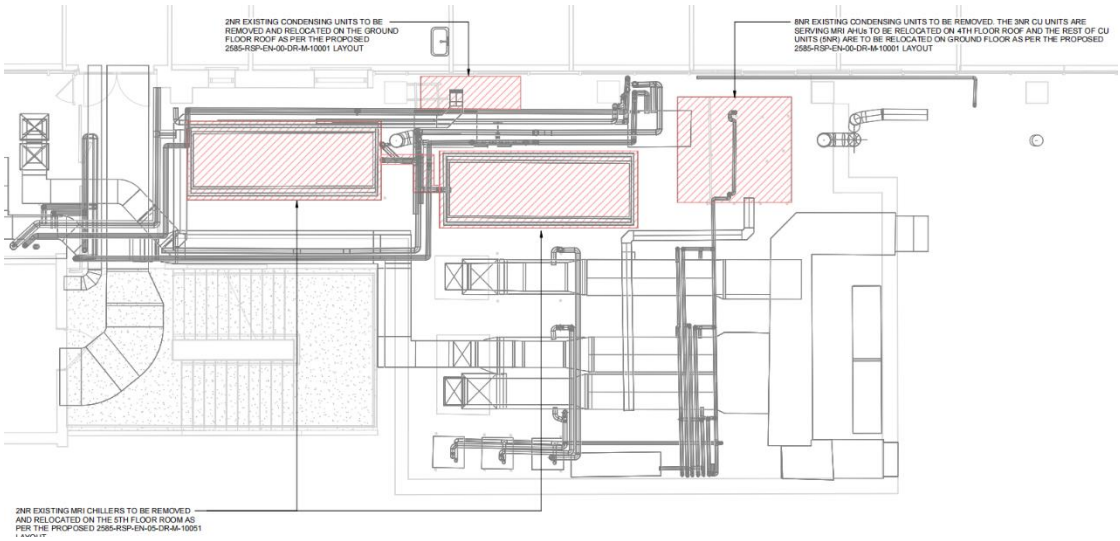

Image 4. Relocation of existing 2no. chillers & 10no. condensing units currently placed on 1st Roof floor (over MRI-4 suite). The 2no. chillers will be temporarily relocated on the 5th Roof floor; 7no. condensing units, serving MRI ancillary spaces, will be relocated temporarily on the ground floor; 3no. condensers, serving MRI AHU's will be permanently allocated on 4th roof floor, inside a vacant enclosure.

level, not the 4th floor roof/plant areas as part of the extension and another future planning application.

- 3no. condensers, serving MRI AHU's, will be relocated on 4th roof floor permanently.

These relocations serve 2 purposes: make space for CRF AHU unit and remove the equipment and quench pipes, from MRI-4 roof to clear the area for Hybrid Theatre Extension (a separate Hybrid Theatre Extension planning application for this extension will be submitted to the Council in due course).

The 2no. chillers may be displaced or make redundant following installation and commissioning of ASHP's as part of Hybrid application.

In addition, the project includes rerouting the existing quench pipes for MRI-1, MRI-2, MRI-3, and MRI-4. This rerouting is also necessary due to the planned Hybrid Theatre Extension, which will occupy the current discharge area for these quench pipes.

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3 PROJECT DESCRIPTION

This project has to different phases:

3.1 Phase 1 - **Temporary Works**: temporary relocation of 2no. Chillers and 7no. condensers, serving MRI ancillary spaces.

The first phase of the project involves the temporary relocation of 2no. chillers, presently located on the 1st roof floor above the MRI-4 unit. They will be temporarily moved to the 5th roof floor, in the northwest corner of the Royal Free Hospital's main building.

Additionally, 7.no condensers serving MRI ancillary rooms, also situated on the 1st Roof floor above the MRI-4 unit and in the vicinity of the chillers, will also be relocated. These seven condensers will be temporarily installed at ground level in the same northwest corner of the main building.

This temporary equipment relocation is essential to facilitate the construction of new Hybrid theatre extension and additionally make space to install CRF AHU unit.

Image 5. Relocation of existing 2no. chillers & 7no. condensing units currently placed on 1st Roof floor (over MRI-4 suite). The 2no. chillers will be temporarily relocated on the 5th Roof floor; 7no. condensing units, serving MRI ancillary spaces, will be relocated temporarily on the ground floor.

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3.2 Phase 2 - **Permanent works**: New CRF unit, new 3no. condensing units serving CRF AHU, permanent relocation of 3no. condensing units serving MRI AHU's and Quench pipes re-routing

3.2.1 New CRF AHU, ancillary condensers & ducting installation

As previously mentioned, the installation of a new Air Handling Unit (AHU) for the Clinical Research Facility ("CRF") is essential for providing the necessary filtered air to the new clean room in Laboratory 2-108. This process will involve setting up new supply and exhaust ducting for the AHU, as well as ductwork to direct airflow between the AHU and the clean room ceiling void.

The AHU will be located at 1st Roof floor on the main Hospital's western elevation - above an existing MRI-4 service room at this location- positioned between the existing MRIs AHU and the west façade of the main building. This placement will ensure that the unit is screened from the Ground Floor "Heart Attack Service access ("HAS" entrance) view. Fresh air will be drawn in from the north façade via a duct running along the existing external staircase, while exhaust air will be discharged directly onto the MRI-4 roof. CRF AHU air supply is treated by 3no. DX condensing units for the AHU heating/cooling, and VRV condensing units for unclassified spaces heating/cooling that will be placed on 4th Roof floor vacant enclosure.

For the ducting that connects the AHU to the 2nd floor ceiling void, two ducts, each measuring 350x550 mm, will be routed vertically through the space between the external staircase and the main building balcony, also screened by the concrete staircase.

3.2.2 Diversion of existing quench pipes

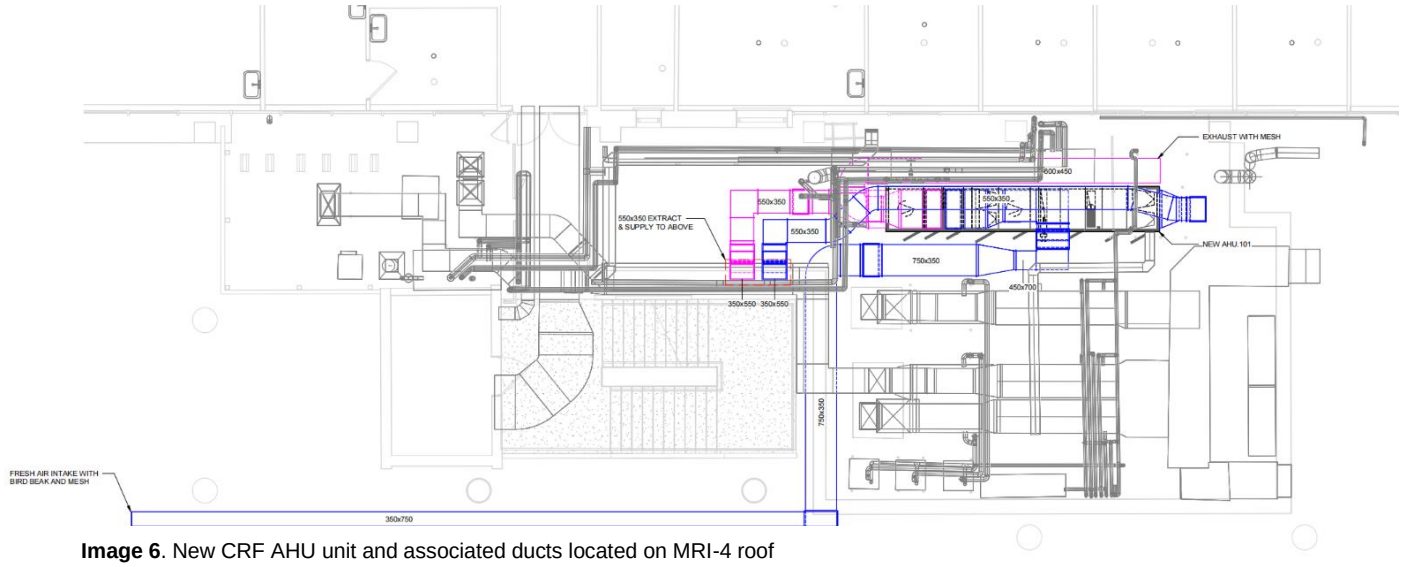

Image 6. New CRF AHU unit and associated ducts located on MRI-4 roof

The project includes the re-routing of four existing quench pipes 4no. existing MRI facilities within the Hospital. This re-routing is necessary to free up external space on 2nd floor for a future hospital extension: Hybrid Theatre Extension planned to be situated above the HAS entrance (the extension would have 3 levels aligned with existing 2nd floor, 3rd floor and 4th floor of the Hospital main building).

The current quench pipes routes and discharge locations would clash with the future extension. The quench pipe relocations to new discharge points on 5th roof floor will not only facilitate the future expansion but also will ensure compliance with safety and operational standards facilitating helium discharge out of any occupied area.

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The rerouting process will involve modifying the existing pipe layout and securing the new routes to the building's structural framework.

3.2.3 Permanent relocation of 3no. condensing units serving MRI AHU's

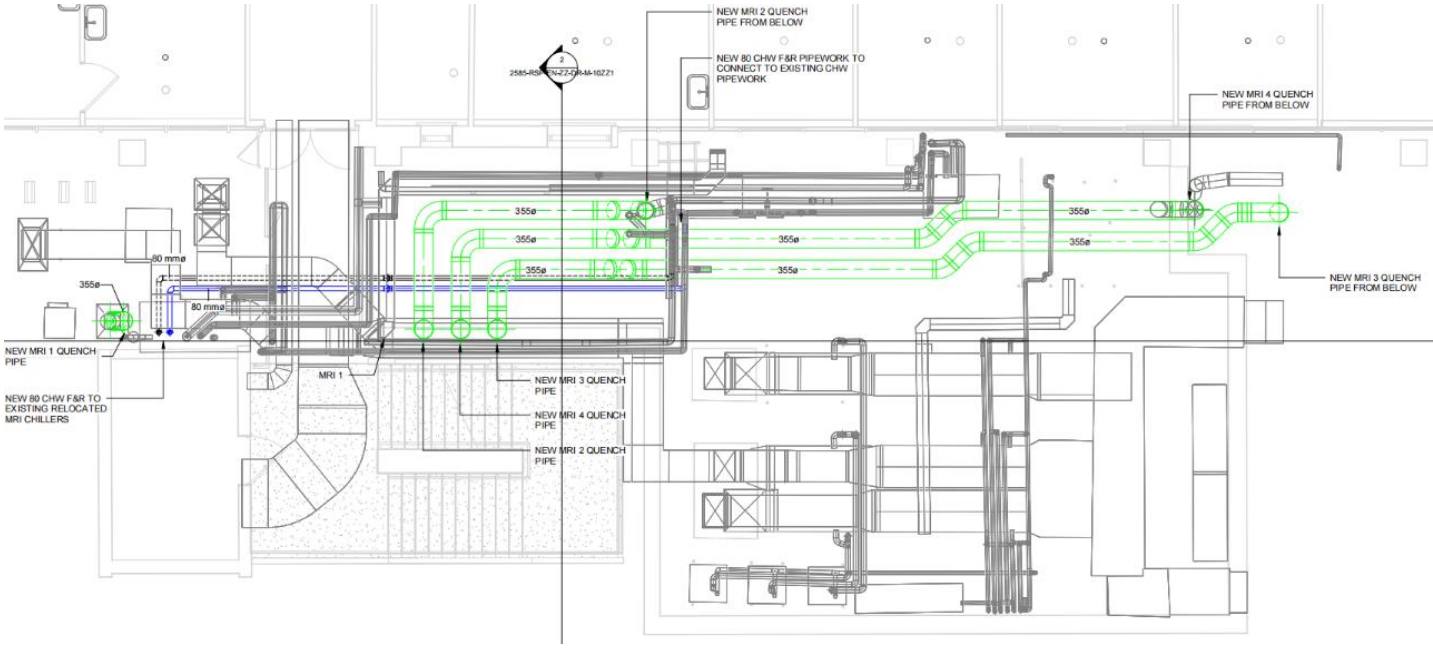

Image 7. Re-routing of quench pipes. New layouts.

Three existing condensers currently placed on 1st roof floor above MRI-4 suite, serving existing MRI AHU's also located on 1st roof floor, above MRI-4 unit will be relocated, permanently, on 4th roof floor, inside an existing and vacant enclosure.

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4 HAMPSTEAD CONSERVATION AREA, PROJECT IMPACT ON VIEWS

The wider RFL Hospital site abuts the boundary of the Hampstead Conservation Area. This Conservation Area, known for its architectural heritage and historical significance, includes several buildings situated on Pond Street. These buildings, located directly across from the Royal Free Hospital, play a vital role in maintaining the character and aesthetic value of the area and this particular Street.

4.1 Temporary works

The temporary works involves:

- 2no. chillers to the 5th roof floor.
- 7no. condensers: relocated to the ground level in the northwest corner.

This new location of 2no. chillers and 7no. condensers will have a temporary impact on the Hampstead conservation area. Once the new Hybrid Theatre extension is completed, this equipment will be permanently relocated to a new concrete platform at Roof 1st level (north-west corner, main building-plinth) that will be part of a future planning application.

Image 8. Hampstead conservation area.

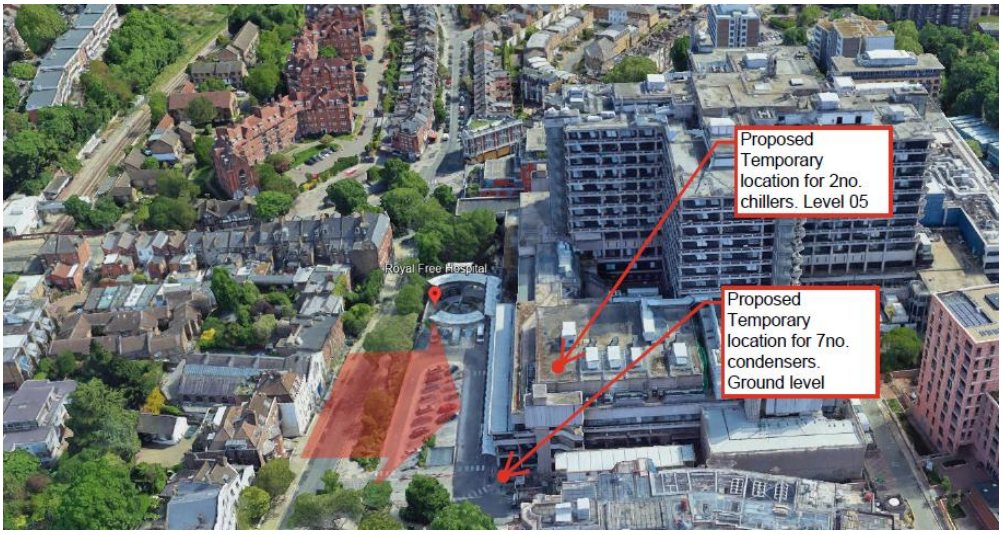

Image 9. Temporary works. Proposed temporary locations.

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4.2 Permanent works

The placement of the new CRF AHU unit does not have any adverse visual impact on the setting of the conservation area. The proposed AHU will be strategically positioned behind the existing concrete external staircase. The railing on the existing roof slab that covers the corner of the Ground Floor Voluntary Services office offers further visual screening. This ensures that the unit remains almost out of view from Pond Street.

Similarly, the rerouted quench pipes for existing MRI services / facilities within the Hospital, as well as the ducts supplying and extracting air to the clean room from the AHU, are concealed between the existing concrete stair and its access platforms and the west façade of the main building. The protruding staircase casts a shadow over these areas, making the pipes and ducts almost unseen from Pond Street. The only component visible from Pond Street is the rerouted quench pipe for MRI-1. This pipe

Image 10. View of CRF AHU, ducts and MRI-2, MRI-3 and MRI-4 quench pipes almost hidden behind the external staircase.

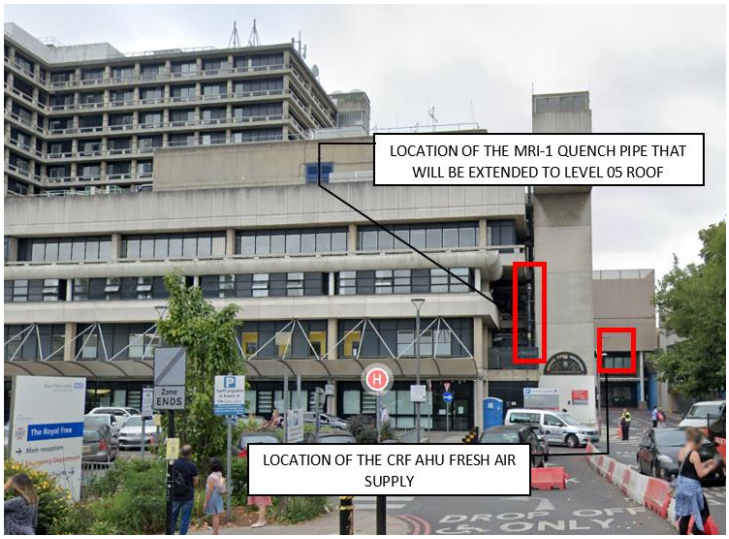

Image 11. View of existing MRI-1quench pipe and the proposed location of air supply for new CRF AHU unit

currently runs from 1st floor to the ceiling void on 2nd floor. The rerouting involves extending the pipe up to the 5th roof floor to prevent any interference with the future extension above the HAS entrance but

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this extension will be placed behind the stair platforms and railing once the pipe achieve 2nd level. That route means that the MRI-1 quench pipe length visible remains almost the same compared to the existing.

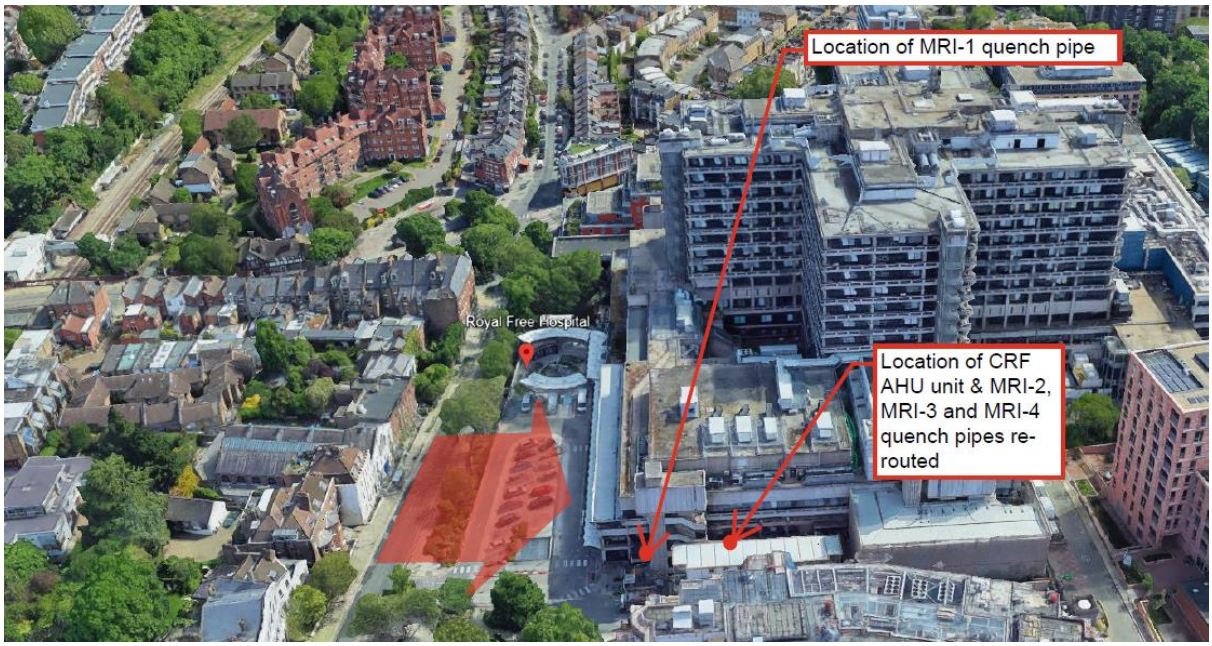

Image 12. The buildings on Pond Street within the conservation area do not have direct views of the new CRF AHU unit or re-routed MRI-2, MRI-3 & MRI-4.

The placement of the permanent works components in this project ensures that historical views and sightlines from the conservation area remain largely uninterrupted and unchanged, with only minimal modifications to the MRI-1 quench pipe. This approach preserves the visual integrity that defines Hampstead.

3no. 1st roof floor condensers, serving MRI AHU's, will be permanently relocated inside the existing, currently vacant enclosure on the 4th floor, so they won't be visible.

3no. new condensers, serving CRF AHU, will be also permanently located inside the existing, currently vacant enclosure on the 4th floor, so they won't be visible from Pond street.

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5 VISUAL IMPACT OF TEMPORARY RELOCATED CHILLERS (5TH ROOF FLOOR) & 7no. CONDENSERS (GROUND FLOOOR)

5.1 2no. Chillers

The temporary relocated 2no.chillers on the 5th roof floor will be partially visible from street level as they are positioned slightly recessed from the building's façade, minimizing their visual impact. Additionally, this arrangement is only temporary, displaced by proposed air-source heat pumps once the Hybrid Theatre extension planned construction is completed. This temporary measure ensures that any potential disruption to the surrounding area, including the view from street level, is kept to a minimum.

5.2 7no. Condensers

The 7no. condensers, serving MRI ancillary rooms, will be temporary relocated on ground level so they will have some impact on street-level views. This impact is temporary, and once the new Hybrid theatre extension is complete, the condensers will be removed from this location and reinstated to a new concrete platform, placed on 1st roof floor, that will be part of the new Hybrid Theatre extension planning application.

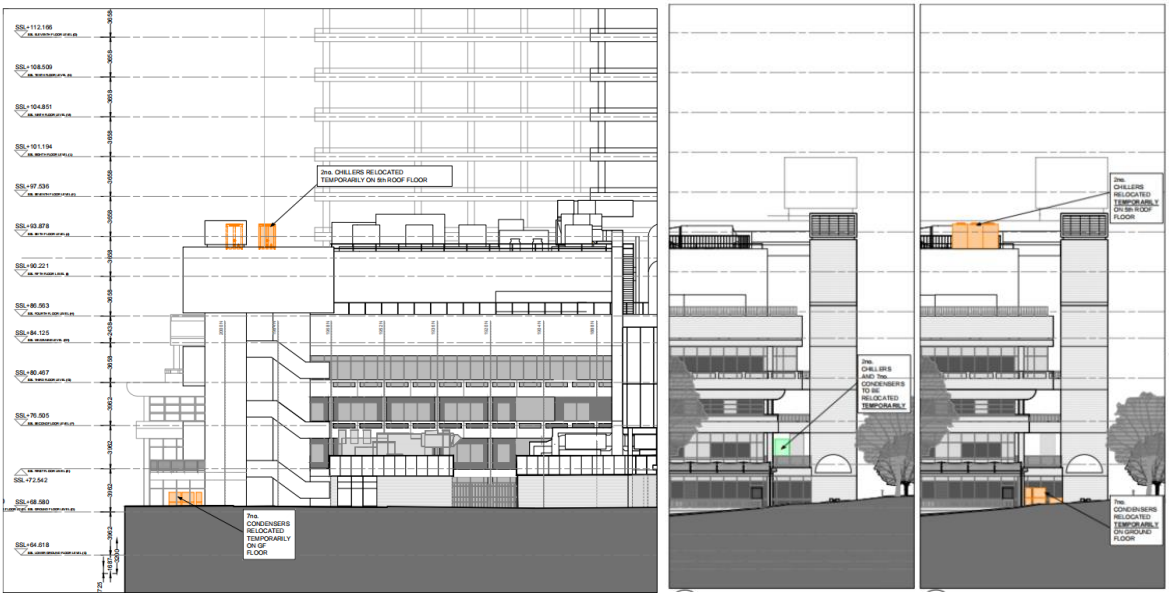

Image 13. Temporary works (in orange): equipment , relocated temporarily, visible from Pond Street and HAS entrance

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6 VISUAL IMPACT OF THE NEW CRF AHU, THE 3NO. NEW ANCILLARY CONDENSERS SERVING THE CRF AHU, THE RELOCATED 3NO. EXISTING CONDENSERS SERVING THE MRI ANCILLARY ROOMS, AND THE REROUTED QUENCH PIPES IN THE AREA.

The design of these components is primarily driven by functional requirements, with both the new CRF AHU unit and the rerouted quench pipes tailored to meet specific operational needs while maintaining a sensible cost impact.

The visual impact of the new CRF unit is minimal due to both AHUs, existing MRI AHUs and new CRF AHU, have similar heights. The new CRF AHU unit strategic placement behind the existing AHU units serving MRI-2, MRI-3, and MRI-4 at approximately the same height makes this equipment almost invisible from HAS entrance or any other spot around the hospital. This positioning ensures that the new unit is largely obscured, minimizing its visibility and preserving the surrounding aesthetic integrity.

Similarly, the new routes for the quench pipes are designed to have minimal visual impact. These routes:

- Run horizontally behind the existing AHU units for MRI-2, MRI-3, and MRI-4.
- Transition to a vertical route to allow discharge on the Level 5 roof, where they are placed behind the concrete screen supporting the external staircase at the northwest corner of the staircase.

The only exception is the rerouting of MRI-1 quench pipe. This pipe is currently visible from Pond Street along 1st floor and 2nd floor. The current route includes the discharge termination directed North at 2nd floor high level externally. The re-routing involves extending the pipe from the 2nd floor ceiling void level to the 5th roof level. Although the pipe will be still visible along 1st floor and 2nd floor, half of its vertical section, along 3rd and 4th floors will be hidden behind the staircase platforms, making it less noticeable due to the shadow cast by the staircase.

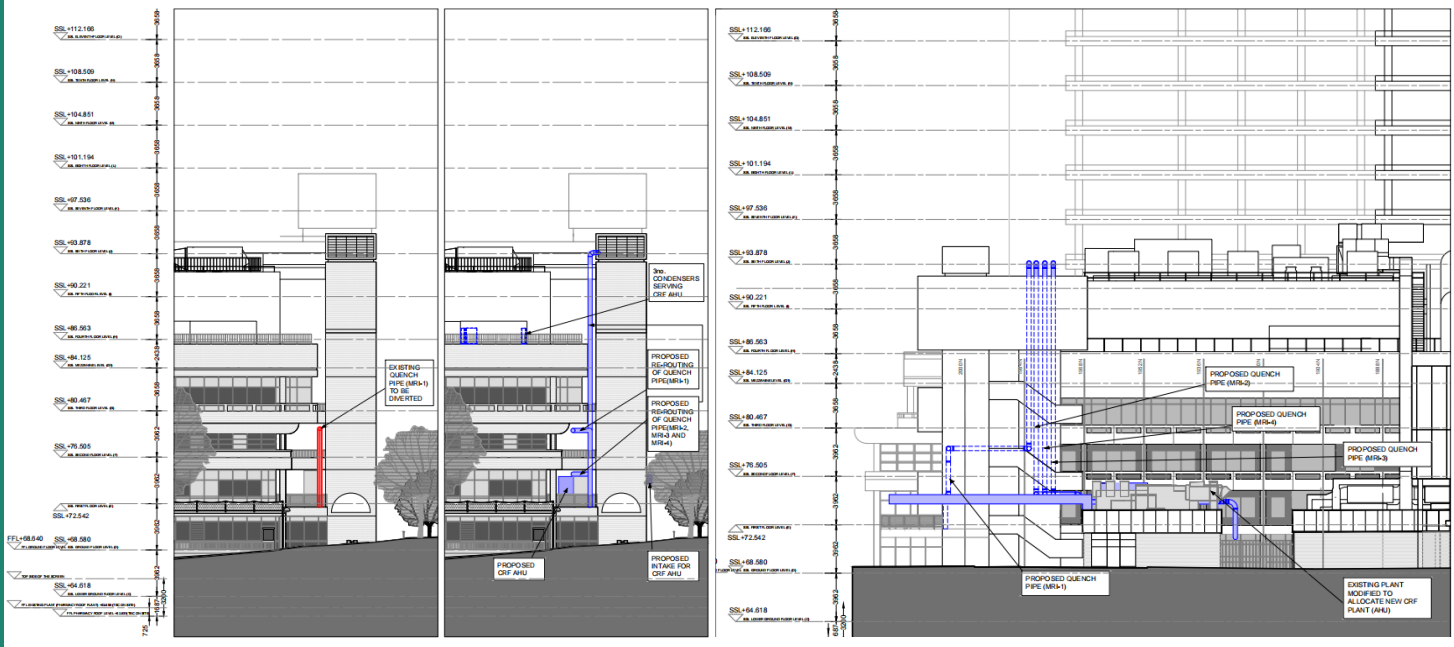

Image 14. Permanent works (in blue) visible from Pond Street and HAS entrance

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7 ACCESS CONSIDERATIONS

The proposed project involves:

- Plant alterations related to the temporary relocation of 2no. chillers and 7no. condensing units.
- Permanent addition of a new AHU for the CRF, 3no ancillary CRF AHU condensers, permanent relocation of 3no. MRI AHU's existing condensers and the rerouting of four existing quench pipes.

These modifications do not impact the existing building access points or routes because all components, but 7no. condensers temporary relocated on ground floor, are located on MRI-4 roof, 4th and 5th roof floor and west façade level 01 to 05, out of the building accesses.

The 7no. temporary condensers relocated to the ground floor will be placed in a corner with no access into the building. This proposed temporary location is outside both pedestrian and vehicle access pathways.

The project will not affect the number of parking spaces or bike racks currently available as the alterations are limited to roof plant areas and facades (quench pipes and ducts).

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8 CONCLUSION

- Temporary Works:

The temporary works outlined in this planning application have two primary objectives:

- The temporary relocation of the 2no chillers and 7no. condensers serving MRI ancillary rooms provides space for the installation of a temporary CRF AHU unit.
- The temporary relocation of the 2no. chillers and 7no. condensers serving MRI ancillary rooms prepares the external area that will eventually be occupied by the Hybrid Theatre extension by relocating the ventilation and cooling equipment. This equipment cannot remain beneath the new extension as it would obstruct the circulation of air supply and extraction.

- Permanent Works:

The permanent works proposed in this application aim to achieve two main goals:

- Provide adequately filtered fresh air to the new clean room, part of the Clinical Research Facility (CRF). The installation of a new CRF AHU unit & along with its three ancillary condensers, is essential to the Royal Free Hospital's development, supporting its expanding research capabilities and providing vital infrastructure for the CRF. The positioning of the CRF AHU unit has been carefully planned to minimize visual impact, situated between existing structures and the west façade, making it nearly imperceptible from Pond Street and ensuring no significant change to the building's appearance or surroundings.
- The rerouting of the quench pipes and their discharges, currently located in the space designated for the new Hybrid theatre extension, is crucial for enabling the construction of this new extension while keeping the MRI units operational. Similarly, the temporary relocation of 7 condensers serving MRI ancillary rooms, and the permanent relocation of 3 condensers serving MRI AHUs, are necessary to clear equipment from areas affected by the new Hybrid theatre extension.
- The three existing MRI AHU condensers will be permanently relocated from the 1st roof floor above the MRI-4 suite to a vacant enclosure on the 4th roof floor as part of the enabling works necessary to facilitate the construction of the Hybrid Theatre extension.

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