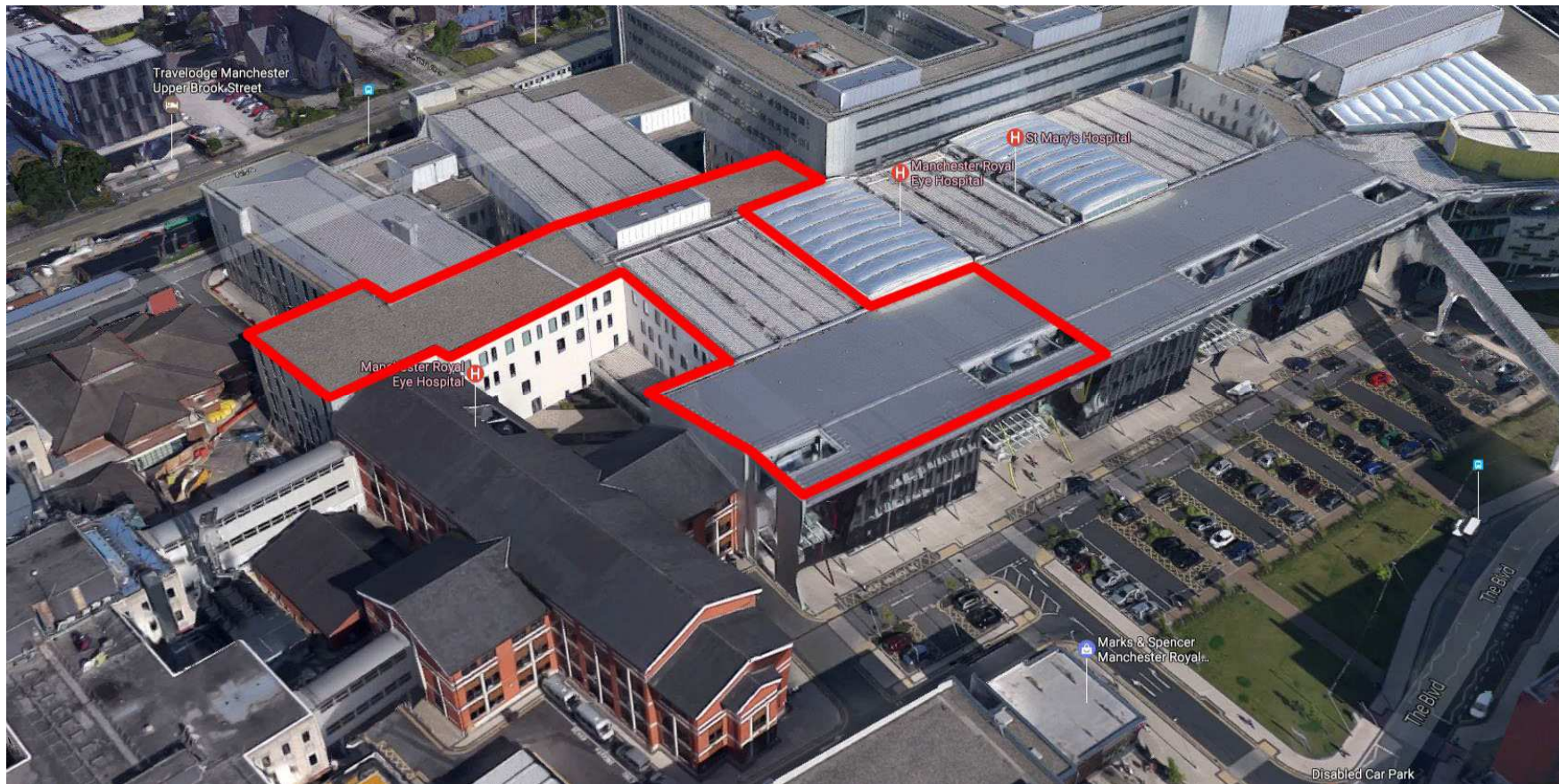




Central Manchester University Hospitals NHS Foundation Trust

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P1	13/06/2017	NP	Issued for Planning
P2	21/01/2022	AS	Planning Variation. Additional AHU added to roof.

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Project Definition

This design and access statement has been prepared by AFL Architects on behalf of Central Manchester University Hospitals NHS Foundation Trust in support of a full planning application being made to Manchester City Planning Department for Mechanical and Electrical plant extension to the existing hospital facilities on the roof level (4th floor), and a new duplicate window within an existing internal courtyard on the 3rd floor.

The purpose of this document is to provide supportive information for new Air Handling units, chiller units, associated ductwork and access walkway, at roof level, and new patient bedroom window.

It is intended that the following document will support the rationale, design principles and access strategy for this planning application and has been prepared in accordance with CABE's 'Design and Access Statements: How to Write, Read and Use them' (2006). It is to be read in conjunction with all other information supplied with this application.

Brief

The existing Bone Marrow Transplant Unit (BMTU) currently located on ward 44 needs to expand into the neighbouring ward space (Haematology daycase). This is due to an increase in patient numbers who are all very high risk in terms of infection control. The expansion will also permit the Hospital to increase the numbers of patients being treated in this facility. The neighbouring Haematology daycase unit will be relocated to ward 5, leaving the vacant space ready for BMTU to expand into with new specialist bedrooms, many of which include an ante-chamber for increased infection prevention. The internal layout will be subject to a separate building regulation application in due course. Because of the highly sensitive nature of the patients from an increased infection risk (temporary loss, limited or no immune system as a result of treatment), the design requires improved filtered airflow and pressurised system. Consequently, the existing air handling units and associated plant equipment do not have the capacity for this increased demand, therefore new roof mounted equipment is required by means of 2no. Chiller units, [5no. supply & extract AHU's](#).

A new air handling system is to be installed as part of these works; the existing system falls short of current HTM 03-01 and HBN4 performance requirements.

It is common knowledge that there is a strong relationship between patient health outcomes and the quality and cleanliness of indoor air. These improvements are intrinsic to the success of the hospital and are needed to protect both patients and staff from avoidable harm caused by environmental contamination. The net result of these works will be a marked improvement in levels of patient safety and comfort.

A 5th Air Handling Unit (AHU) has been added to the scheme following the original application. The internal plan developed to require all patient bedrooms to be accessed via an antechamber, this provides additional protection against infection to the vulnerable patients treated within this facility. The additional antechambers require a significant increase in clean air supply to achieve the performance values set out in the HTM guidance documents and therefore a 5th AHU has been proposed to support this.

Site Analysis

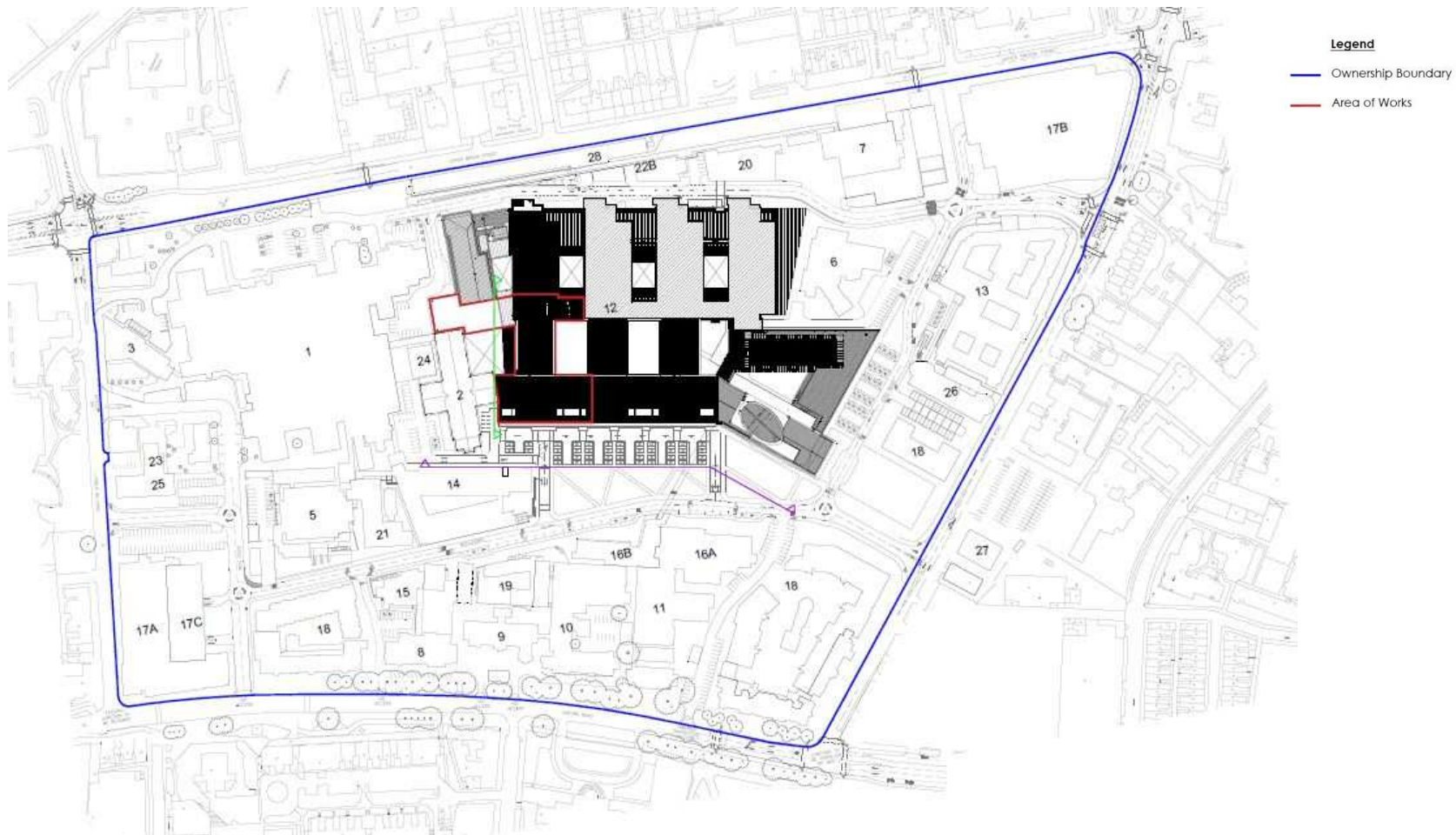
The hospital site is located 3Km south of the City centre and has been subject to substantial redevelopment over recent years. The net result is a fully accessible site which is split into clearly definable zones.

Phase 1 & 2 (MR Building) was constructed during the 1980's as a 3 storey purpose built medical facility providing A&E, Wards, Theatres, ICU and radiology facilities. The development addressed in this application sits with a utilitarian / buffer zone on the Upper Brook Street (A34) Boundary.



Site Location Plan

Whilst the AHU, Chiller, associated ducts and walkway are relatively small, the expanse on which they are sited is across a large portion of the roof, hence the larger red line location.



Site Appraisal

It is desirable for the existing ward 44 BMTU to be kept live during the construction programme, however due to challenging spatial constraints and a fundamental need to minimise disruption within the facility, the strategy for upgrading AHU services is to place new air handling equipment at roof level and route supply and extract ducts across the roof expanse and drop directly into the ward area. This will assist with buildability, logistics and project phasing to maintain the much needed BMTU service as best possible.

Whilst the additional services are in a prominent location, they are set back away from the frontage of the hospital building and are sited at what would be the 4th floor. The newly proposed external window is sited within an existing courtyard, and is to serve a newly created patient bedroom which otherwise would not have any natural daylight. This cannot be permitted as many of the patients may be receiving complex treatment, and will reside within the BMTU for several months and in some cases half a year. The morphology of the new window is to match the existing surrounding windows, so as not to look out of place.

Existing Buildings

The existing buildings are part of the PFI complex, characterised by the existing built-up cladding system, render and blockwork to various locations. A neighbouring building (MRI Outpatients building), is characterised by the use of red brick, brown cladding and white concrete constructional polychromy.

CMU Hospitals NHS Foundation Trust
Proposed Rooftop Plant Equipment & New Window.

Below: View looking up towards the MRI entrance, with the redbrick outpatients building to the left. The plant equipment will be situated on the roof of the tall MRI building on the right, set back far from the roof edge.



Design Principles

Use	The primary purpose of the new AHU, chiller, ducting and new window, is to facilitate servicing to wards 44 (BMTU). The use of the expanded ward area will be in keeping with existing facilities on those floors, i.e. typical in-patient wards rooms: patient bedrooms, en-suites, treatment areas, staff arming, utility rooms etc.
Amount	The proposed equipment extends over an area approximately 2284m ² . However it is important to recognise that this is the spread of ducts, access walkways etc. across the roof in different directions and not the actual size of the equipment or ducts themselves, which is much less.
Layout	The new equipment is concentrated either side of the existing roof access core, with various supply and extract ducts sat on the roof extending out from it, and running down to the ward 44 roof area. Set either side of the ducting are access walkways, required for health and safety in order to provide safe access for maintenance to the equipment. The walkways are flat, with a clip on system suitable for low pitch standing seam roofs, or flat roofs. These are the 2 existing roof types in the vicinity. The equipment is set behind existing parapet walls, which also helps obscure the units from view.

Scale Relatively low level equipment compared to the scale of the building and site:

Chiller units:

- CH1 & CH2 = 1204mm (Width) x 3180mm (Length) x 1801mm (Height) approx. weight: 996Kg.

Air Handling Units:

- AHU1 = 1650mm(Width) x 8350mm(max. Length) x 2200mm(max. height) Approx. weight: 3866Kg
- AHU2 = 1500mm(Width) x 8000mm(max. Length) x 2080mm(max. height) Approx. weight: 3924Kg
- AHU3 = 1950mm(Width) x 8100mm(max. Length) x 2440mm(max. Height) Approx. weight: 4301Kg
- AHU4 = 1800mm(Width) x 8000mm(max. Length) x 2320mm(max. Height) Approx. weight: 3950Kg
- AHU5 = 1500mm(Width) x 8000mm(max. Length) x 2080mm(max. height) Approx. weight: 3141Kg

Ducting sizes varies and reduces further from the AHU units. Typical duct sizes include but no limited to 700mm x 500mm, 800mm x 500mm and 600x600mm.

Note: Changes in sizes of the AHU units from the original application are a result of several factors including the finalisation of the manufacturers specification, combining the extract & supply into a single stacked unit, and the change in design requirements of the proposed scheme,

Landscaping No new or modified external landscaping is proposed.

Appearance The new equipment is set back as far possible from the edge of the building. The AHU's have an external finish of grey, whilst the chiller unit is ivory white. The associated ductwork will be in a silver finish. The colours are sympathetic to the surrounding cladding, roof colours and other existing finishes, so that they do not look out of place. Every effort has been made to minimise the visual impact of the proposed equipment and handrail, and are positioned as far away from the

building edge as possible. Given the density and height of surrounding buildings, it would be difficult to see much or any of the ducting from ground level, and would also be limited from looking out of other buildings windows.

The rooftop plant will be visible from 4th, 5th & 6th floors of a different part of the same building. The function of these areas is mainly Plant and back of house Offices, and is owned by the Trust.

Access to and within the development site

Sustainable Access

The hospital development being so close to the city centre benefits from a full range of public transport links. Onsite parking, cycle provisions, DDA compliant accessibility have all been catered for and future proofed via the recent major developments within the wider hospital estate (PFI).

Vehicular Access

The hospital site is accessed off Grafton Street and Hathersage Road, leading into The Boulevard road that is within the hospital site. There are multi-storey car park facilities at the North West and South Eastern extremities of the site providing extensive parking for both staff and visitors around the site, allowing for easy access to all the departments. From the car parks pedestrian access is allowed via dedicated routes and the internal street.

The proposed footprint of the new window and plant equipment results in the loss of 0 parking spaces. There is no intention to increase staff or patient number spaces in respect to this additional floor space.

External Access – Pedestrian

There are no new or altered external access points provided in this proposal.

Internal Horizontal Access

All public and staff areas of the proposed extension are at levels to match the existing. Circulation corridors within the existing building vary in width, proposed corridors shall be approximately 2.1m wide with 1800mm wide cross corridor doors with the required vision panels (compliant to BS8300) Disabled users will therefore have clear unobstructed routes throughout the building.

Lighting to corridors will comply with BS 8300 with lighting evenly diffused without glare, reflections or shadow.

No works to the existing hospital streets are proposed, with minor modification within the ward to satisfy the reconfigured layout for bed access. This will form part of a separate building regulation application.

Internal Vertical Access

The proposed roof plant will be accessed via the existing stairway core up to Roof level. Alternative and emergency means of escape are provided via several alternate access cores located at various points of the roof which link to other parts of the hospital. The new roof walkway will also connect to one of these existing walkways to provide alternate egress in the event of an emergency. Emergency lighting will also be provided along this access walkway.

There is no public or general staff access to the roof or plant areas.

Access to the ward area will remain unchanged and is via the existing lift core and stairwell accessed a few metres from the ward main doors.

Access Surfaces

There is no internal plant space to fit out; all of the equipment is mounted on the existing roof surface on steel footing frames or pads. Internally where the new window will be located and internal reconfiguration; the floor, wall and ceiling surfaces shall be designed to comply with B.S 8300:2009, HTM's and HBN's creating visually contrasting and tactile surfaces. These will be subject to the separate building regulation application.

At detail design and construction stages the latest legislation and good practice guidance on accessibility available will be referred to. These will include, document examples include (but not exhaustive list): BS8300:2009 (Design of buildings and their approaches to meet the needs of disabled people), the Building Regulations Approved Document Part B (fire safety), Part M (Access to and use of buildings), Part K (Protection from falling, collision and impact)

The existing roof surfaces (flat roof gravel and concrete paving slabs) will not be altered, however some additional concrete paving slabs may be added to facilitate ease of access to the AHU's. They are typical grey slabs measuring circa: 600mm x 600mm. Some parts of the existing roof are also sloped standing seam (Kalzip or similar), and new compatible metal grill walkways will be added to allow duct access passing over these parts.

No new roof is proposed – either flat or pitched, although it will be locally modified with typical robust waterproofing details where the new ducts puncture through to the BMTU below.



Above Left: View looking over ward 44 area, and the pitched standing seam roof. Right: View over ward 44 area showing existing large plant ducts.

Mechanical Plant Operation.

Both the supply & extract to the air handling unit shall operate 24 hours a day, 7 days a week. The chiller will operate to suit the cooling requirements of the internal space and will predominantly be during the daytime and summer period.

Manufacturer Details:

Chiller Units – Supplied by DAIKIN - specification EWAT175B-SSA1

AHU – Supplied by Air Handling Systems Limited (ahs) – specification to suit performance requirements

Description of Roof Plant

Items of plant located on the roof.

- Air Handling Units – Supply & Extract
- Chiller units.
- Associated ducts from above equipment.
- Suitable access walkway with balustrade to safely access the above equipment, with associated emergency lighting.

It is proposed to install 5 new supply & extract AHU's, and 2 air cooled chillers on the roof of the MRI PFI building. The supply and extract AHU's shall provide conditioned fresh air and extract to various isolation suites that are to be located on level 3 whilst the 2 air cooled chillers shall provide cooling to the supply air. This is due to a Trust requirement as part of the brief that all isolation suites shall be split over 5 AHU's. (This is a derogation to the current HTM's as it should have been 1 AHU per isolation suite).

New ductwork shall be located on the roof and shall penetrate the existing roof at various locations to serve ward 44's isolation suites. Due to the lack of existing ceiling void space there is no alternative but to service the area via the roof. Where possible ductwork shall be double stacked to ease congestion on the roof.

Regular maintenance shall be required for the new plant due to PPM and if any faults occur, filter changes etc. Access is required to all roof penetrations due to the presence of new smoke fire dampers. Access will be required to these twice a year for testing as a minimum.

The BMTU and associated plant will operate 24 hours per day, 7 days per week, 365 days per year. New plant is required due to the existing not having capacity.

The location for the new air handling unit was dictated by the constraints for getting ductwork from the roof level and into the third floor area. All existing service risers are congested with existing services and there is no space available for creating new risers to pass through to the ward area from other locations.

The new chillers are required to serve the air handling unit providing temperature control. The chillers are located adjacent to the air handling unit to minimise the requirements for pipework.

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CMU Hospitals NHS Foundation Trust
Proposed Rooftop Plant Equipment & New Window.

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