

MAX FORDHAM

University College
School, Hampstead
Ventilation Statement
15th December 2023

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ISSUE HISTORY

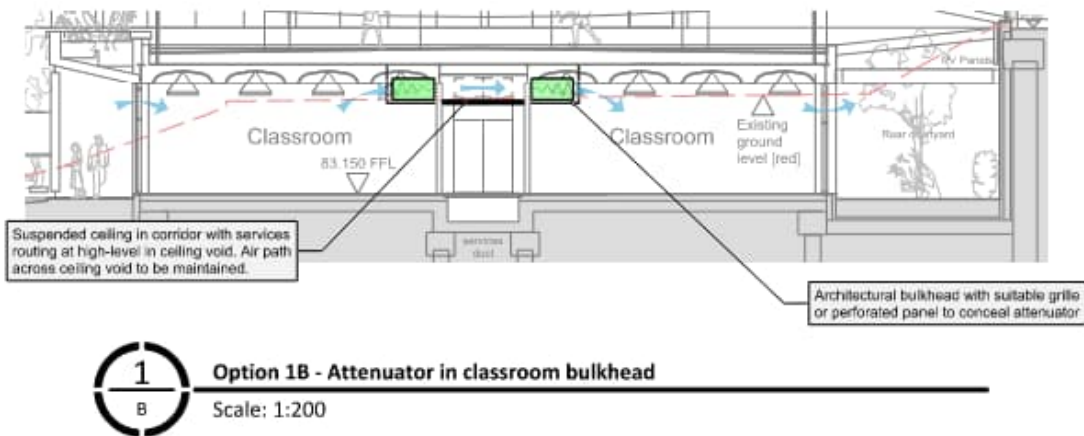
Issue	Date	Description
P01	08/12/2023	Planning Draft
P02	15/12/2023	Planning Issue

CONTENTS

1.0	Classrooms & common room	4
2.0	Offices & Wellbeing Rooms	4
	2.1 Staff Offices	4
	2.2 Contemplation Room	5
	2.3 Other Wellbeing Rooms	5
3.0	Music & Practice Rooms	5
	3.1 Music Rooms	5
	3.2 Practice Rooms	5
	3.3 Recording Studio	5
4.0	Recital Room & Lecture Theatre	6
5.0	Cafeteria & Food Prep	6
6.0	Drama Studios	6
7.0	Toilets	7
8.0	Plant Rooms & Stores	7
9.0	Circulation	7
10.0	Appendices	7
	10.1 Appendix I – HVAC Strategy Ground Floor Plan	7
	10.2 Appendix II – HVAC Strategy First Floor Plan	7

1.0 CLASSROOMS & COMMON ROOM

All classrooms and the common room will be naturally ventilated utilising a cross-vent approach to enhance the outdoor air rates and diffusion within the spaces. These rooms are located along a central corridor with each room having one external side incorporating a large area of glazing and louvred sections. The glazing is being designed with predominantly openable windows to balance daylight and peak ventilation requirements with solar gains and fabric heat losses. The louvred panels will enable background ventilation and secure night cooling, while helping to manage solar gains and glare. The louvres themselves will be backed by openable panels / doors to allow for sealing of the vents when not in use to minimise unwanted heat loss.



Large attenuator units will be located in a bulkhead at the corridor side of each room. These will provide a passive air path for cross vent between classrooms (from East to West, or vice versa) while managing noise transfer between the spaces. The corridor ceiling void will allow for a direct air path at high-level. The air path between classrooms will generally remain always open.

Each room will have at least one temperature and CO₂ (or IEQ) sensor monitoring the indoor environment conditions and linked to the BMS for controlling any automated vent openings and / or alerting the facilities manager when set points are failed or exceeded. Refer to the Energy & Overheating report and TM 52 modelling results which demonstrate the effective performance of this strategy of control and night cooling in ensuring the scheme passes the TM 52 criteria.

2.0 OFFICES & WELLBEING ROOMS

2.1 Staff Offices

Where staff offices are located on the perimeter of the building, these will be naturally ventilated via openable windows. This accords with the Client's general preference for simple and intuitive user control. Openable windows are to be reliable and secure, with facilities management carrying out rounds of all rooms at the beginning and end of each day to open / close windows, as necessary. Manual blinds will allow the occupants of these spaces to manage privacy, natural light, and solar glare.

Internal staff offices (no windows or external wall) will be mechanically ventilated via a centralised AHU (air handling unit) / MVHR (mechanical ventilation unit with heat recovery) system. The AHU / MVHR will have air intake and exhaust louvred openings spaced out on the East façade in line with BREEAM (HEA 02) requirements.

In general, mechanical ventilation to smaller and low-occupancy rooms will have minimal control (to avoid introducing a lot of extra components and unnecessary complexity). It is proposed that these systems will operate with a constant air volume to each space during occupied hours, combined with some temperature control at the central plant. CO₂ and temperature sensors will be fitted in each room and connected to the BMS to monitor the indoor conditions.

2.2 Contemplation Room

The Contemplation Room will be mechanically ventilated via the centralised MVHR unit located in the adjacent North Plant Room. This MVHR unit will have air intake and exhaust cowls / louvres spaced out on the plant room roof in line with BREEAM (HEA 02) requirements.

2.3 Other Wellbeing Rooms

The other rooms associated with pupil and staff wellbeing facilities will generally be naturally ventilated via opening windows where they are located on the building perimeter. The exception to this rule is where rooms are located on the East façade close to the external plant area. These spaces will be provided with mechanical ventilation via the centralised MVHR to prevent excessive noise pollution from the outdoor heat pumps and condensing unit.

As per the school's preference, it will be the responsibility of the staff occupants to manage privacy (sound and visual) and comfort via passive measures (windows, blinds, etc.) to suit each situation.

3.0 MUSIC & PRACTICE ROOMS

3.1 Music Rooms

The larger Music Rooms which are used for teaching and / or ensemble rehearsals will be mechanically ventilated via a centralised MVHR system and ceiling mounted fan coil units (FCUs). Even though these rooms are located on the perimeter, mechanical ventilation and air conditioning is necessary to meet the acoustic requirements of the spaces (and adjacent spaces) and to manage higher solar gains through the South-West facing façade.

These larger rooms will incorporate variable air volume (VAV) ventilation control linked via the BMS to CO₂ sensors. Constant air volume (CAV) boxes will be used on systems that include VAV boxes to maintain design air flow rates to every space.

3.2 Practice Rooms

The Practice Rooms are generally considered internal spaces within the building and have relatively stringent acoustic performance requirements. Therefore, these rooms will all be mechanically ventilated via a central MVHR unit and incorporating local attenuators to manage sound transmission from the fan and between adjoining spaces.

3.3 Recording Studio

The Recording Studio will be constructed as a box-in-box room with very particular acoustic performance requirements. It will be mechanically ventilated via a dedicated MVHR unit located in a separate room and ducted into the studio ceiling using flexible duct connections and attenuators to maintain the acoustic

separation. This dedicated MVHR unit will incorporate heating and cooling coils and be controlled using temperature and CO₂ sensors in the studio (and in the return air path). It will share common air intake and exhaust headers / openings with the larger MVHR / AHU in the same plant room.

4.0 RECITAL ROOM & LECTURE THEATRE

The Recital Room and Lecture Theatre are both mechanically ventilated and conditioned via a common AHU. The spaces will rarely be used simultaneously so this AHU is intended primarily to serve one space or the other. It will be capable of serving both spaces at partial occupancy / load but this will necessarily entail a reduction in control and responsiveness. This approach has been reviewed and agreed with the Client as acceptable.

The Recital Room and Lecture Theatre AHU will be located in the South Plant Room and have air intake and exhaust via cowls / louvres at roof level above the plant room. The spacing between the intake and exhaust will be in line with BREEAM (HEA 02) requirements.

Temperature and CO₂ sensors in each space (and at suitable height intervals within the Recital Room) will monitor the internal conditions and control the AHU and dampers during the normal school day. There will be an override option to allow primarily for evening events and performances in the Recital Room.

5.0 CAFETERIA & FOOD PREP

The Cafeteria will feature mixed-mode ventilation to allow for its differing usage scenarios at different times of the day and year.

Natural ventilation will be via openable doors and windows on the cafeteria's north façade in combination with roof vent openings to the South end of the space. This will enable a mixture of one-sided, cross, and stack vent principles to be employed, as necessary. The intention is for the Cafeteria to be naturally ventilated during normal operation for the majority of the year (while indoor air temperatures can remain sufficiently comfortable e.g. 16°C or above). When appropriate, the cafeteria will open out onto the 'Café Terrace', allowing unimpeded movement of pupils, staff, and visitors between the indoor and outdoor spaces.

Mechanical ventilation via a central AHU in the South Plant Room will be used during colder times of the year and evening events (e.g. concerts in the Recital Room where occupant comfort may be a higher priority) and to provide supplementary ventilation during hot summer weather. As the Cafeteria is unlikely to be used for prolonged periods of time, the mechanical ventilation is based on a diversified occupancy and can be overridden or supplemented by natural ventilation, when required.

The Food Prep and Servery room and associated Store will incorporate an extract ventilation system based on the equipment and activities within the space. The extract fan will be ceiling-mounted at high level within the space. Exhaust will be via a weatherproof opening to the green roof above. This will not be a full kitchen and cooking activities will be limited to reheating, toasting, hot drinks, etc. so a commercial-scale kitchen extract system is not required.

6.0 DRAMA STUDIOS

The larger Drama Studio 1 will be fully mechanically ventilated to allow for closer control of its acoustics, lighting, and internal temperatures. Ventilation will be via a central AHU located in the South Plant Room at ground floor. The two air handling units in this plant room will share common intake / exhaust risers (potential bespoke fabrication or builderswork construction) to roof level above where weather-proof louvred openings will be spaced out in line with BREEAM (HEA 02) requirements.

Drama Studio 2 is smaller with lower occupancy and less exacting internal environment requirements so this room will be naturally ventilated via opening windows / vents on its West and North facades. Exposed thermal mass to assist with temperature management will be balanced with acoustic treatment.

7.0 TOILETS

There are several small blocks of toilets / WCs for pupils and staff proposed as part of this scheme. Where the WCs are in the vicinity of other mechanically ventilated spaces, these will generally be served from the same central MVHR / AHU – extract from the cubicles and supply to the lobbies / WHB area.

Other WCs will be provided with local toilet extract fans ducted to atmosphere with a make-up air path from adjacent naturally or mechanically ventilated spaces via undercut doors / transfer grilles.

Toilet ventilation systems will generally be controlled on a timer for constant air flow rates during occupied school hours. As required, an override function will be included for evening and weekend events, etc.

8.0 PLANT ROOMS & STORES

Plant and Store Rooms will have constant background ventilation to satisfy any specific ventilation requirements associated with the equipment and products located in these rooms, and also to deal with any internal heat gains.

The two main plant rooms at either end of the building will incorporate louvred openings for natural background ventilation. The small Server Room will also incorporate a transfer grille for background ventilation via the adjoining North Plant Room.

9.0 CIRCULATION

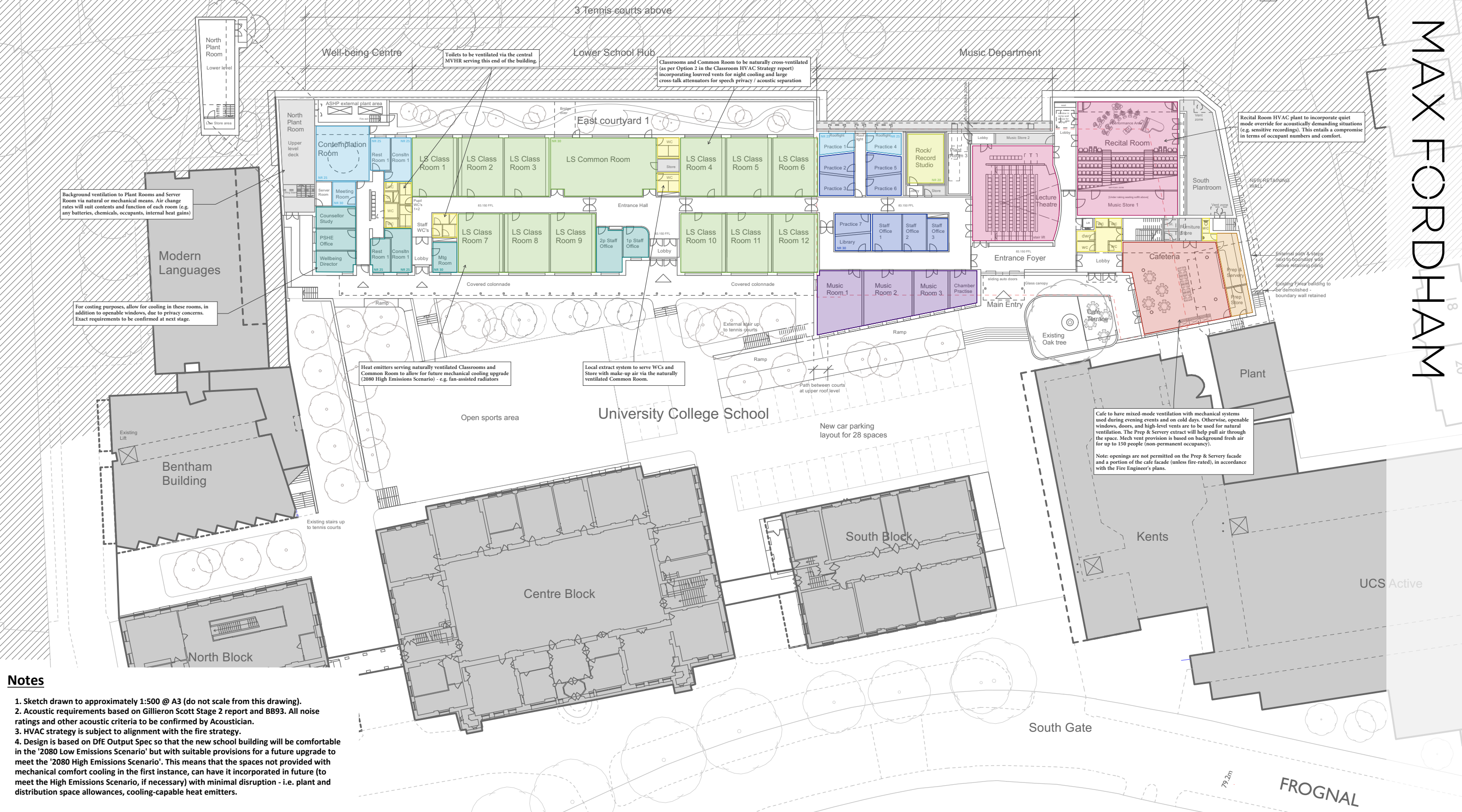
Corridors, lobbies, foyers, and any other circulation spaces are intended to be transitory spaces (no permanent occupants). Ventilation to these spaces will mostly be indirect via neighbouring naturally or mechanically ventilated rooms, and also via the regular movement of people through the spaces and associated opening / closing of doors.

The majority of circulation is internal so heat gains and losses should not be significant (any heating pipework routing via circulation ceiling voids will be low temperature, e.g. 45°C, and well insulated, with voids also not sealed - utilised for cross vent and return air paths).

10.0 APPENDICES

10.1 Appendix I – HVAC Strategy Ground Floor Plan

10.2 Appendix II – HVAC Strategy First Floor Plan

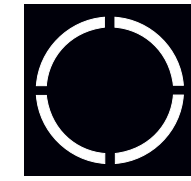


Notes

1. Sketch drawn to approximately 1:500 @ A3 (do not scale from this drawing).
2. Acoustic requirements based on Gillieron Scott Stage 2 report and BB93. All noise ratings and other acoustic criteria to be confirmed by Acoustician.
3. HVAC strategy is subject to alignment with the fire strategy.
4. Design is based on DfE Output Spec so that the new school building will be comfortable in the '2080 Low Emissions Scenario' but with suitable provisions for a future upgrade to meet the '2080 High Emissions Scenario'. This means that the spaces not provided with mechanical comfort cooling in the first instance, can have it incorporated in future (to meet the High Emissions Scenario, if necessary) with minimal disruption - i.e. plant and distribution space allowances, cooling-capable heat emitters.

Area Key

<ul style="list-style-type: none"> Naturally cross-ventilated NR 25 (unless stated otherwise) Fan-assisted radiators, exposed thermal mass Mechanically ventilated (central AHU / MVHR) NR 25-30 (as noted on drawing) Radiators / chilled beams / in-duct trim coils Mechanically ventilated (central AHU / MVHR) NR 25 (unless stated otherwise) No space heating or cooling Natural ventilation - openable windows NR 35 (unless stated otherwise) Fan-assisted radiators 	<ul style="list-style-type: none"> Mechanically ventilated (dedicated MVHR) NR 20 Air-side heating & cooling (via MVHR) Mechanically ventilated (dedicated AHU) NR 20-25 Air-side heating & cooling (via AHU) Mixed mode ventilation - background mechanical + openable windows and doors (warm weather, purge) NR 35 Radiators / underfloor heating Circulation spaces are to be naturally and indirectly ventilated via opening doors and windows, and the movement of people through the building. NR 40 	<ul style="list-style-type: none"> Dedicated kitchen extract ventilation Noise criteria to BB93 In-duct trim coils Toilet extract fan / central AHU / MVHR NR 40 Radiators / indirect tempering via neighbouring rooms Store and Plant Room vent to suit any particular storage and equipment requirements Noise criteria to BB93 Temp control to suit requirements Mechanically ventilated (central AHU) NR 25 Heating & cooling via FCUs
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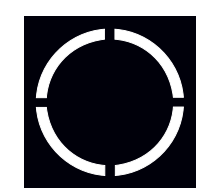
project UCS Project 200			sketch title HVAC Strategy Ground Floor Plan		
job number 7271	project leader TB	issue date 15/12/2023	project code J7271	originator - MXF -	volume XX - 00
status code S2	revision P02	status description For Planning	level - SK	type - M	number 00100



Area Key

- Mechanically ventilated (dedicated AHU)
NR 20 (reduced to 15 for recording)
Air-side heating & cooling (via AHU)
- Naturally ventilated via openable windows & louvred vents
NR 25
Fan-assisted radiators, thermal mass for heat rejection & night cooling
- Mechanically ventilated (central AHU)
NR 25
Heating & cooling via FCUs

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