

RIDGE

PROPERTY & CONSTRUCTION CONSULTANTS

VENTILATION STRATEGY REPORT

to

SUPPORT PLANNING APPLICATION

for

FORMER BAUER MILLETT CENTRAL SITE

for

ASK DEVELOPMENTS

24th February 2017

Prepared for

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1. INTRODUCTION

This report has been prepared by Ridge in support of an application to vary the planning permission for Viadux as approved by the LPA on 27 July 2017 (Application Reference: 115871/FO/2017) in light of minor amendments proposed by the Applicant. These are explained in full within the application documentation but principally consist of: alterations to a phasing plan, rationalisation of the building's massing, footprint, and layout, alteration to the structural strategy, reduction in number of car parking spaces, alterations to the elevations, and refinement of the energy strategy.

Version 3 of this report includes for the implications of these amendments on the ventilation report, specifically for the reduced number of car parking spaces with the following sections amended:-

- Section 3 – Minor amendment to Residential building height and massing.
- Section 3 - Areas Schedule for Residential updated.
- Appendix 1 – Ventilation Schematics added

The approach to office element remains as per the original planning permission and has not been updated

This report should be read in conjunction with the Covering Letter prepared by Deloitte and its enclosures submitted as part of this application.

2. SITE DESCRIPTION

The Site is located in Manchester City centre and extends to approximately 0.72 hectares. It is bound by the former Manchester Grade II central Railway Station (now Manchester central) to the north, Albion Street to the east, the rear service courtyard to Beetham Tower to the west, and Castlefield Deansgate Tramstop and Deansgate Locks to the south.

The Site comprises the eastern –most section of Castlefield Viaduct. At street level it comprises railway arches underneath the viaduct accommodating the former Bauer Millett car showroom and forecourt fronting onto Albion Street, now in temporary use as a multi-arts venue, and public car parking accessed via Trafford Street. On top of the viaduct is a car park and service deck serving the adjacent Manchester Central conference and vehicular and pedestrian access routes across the site.

Vehicular access to the site is via Trafford Street, which incorporates a ramp up to the deck on top of the viaduct, and via the car showroom forecourt on Albion Street. Pedestrian access to the viaduct deck is taken via the Metrolink Station or Great Northern Warehouse.

3. THE PROPOSAL

The proposed Development comprises one residential building across 39 storeys accommodating 375 no. 1, and 2 bed apartments; On top of the viaduct, the proposed development incorporates a rationalised and modernised, enclosed service yard for the conference centre with new landscaped area on top. Significant new and enhanced areas of public realm will be provided within the development, including new pedestrian connections linking the Metrolink Station down to street level on Great Bridgewater Street and Albion Street.

Please refer to the accompanying Planning and Tall Building Statement for further information on the site description and proposals.

Current Schedule of Areas		
	NIA m ²	GIA m ²
Residential	24,976	35,558
Retail		527
Offices	23,570	32,242

4. VENTILATION COMPLIANCE

All ventilation systems shall comply with the requirements of:

- Approved Documents F & B
- CIBSE Guides
- Relevant British Standards
- DEFRA Guidance Document “Guidance on the Control of odour and Noise for Commercial Exhaust Systems”

A further dictating approach in the design of the ventilation system is the criteria for overheating with adoption of CIBSE TM59 for naturally ventilated buildings.

Overall the ventilation strategy shall support the overall “well-being” and safety of the occupants and enhance the environment of the spaces, support low energy and carbon solutions.

When deemed appropriate the design shall attract relevant credits for BREEAM for offices and promote good practice ventilation strategies throughout the development.

5. DEVELOPMENT AREAS / DEMISES

The development can be split into principle Areas/Demises being:

- Residential
- Commercial Office
- Service Yard / 2No Car Park Spaces
- Retail

These areas and demises can also be split down into different functions being:

- **Residential**

- Habitable rooms – living rooms/kitchens/bathrooms
 - Communal spaces – corridors/lobbies/staircases
 - Reception
 - Back of House Facilities
 - Plant & equipment spaces
 - Bicycle Storage
- **Commercial Offices**
 - Office space
 - Communal spaces – corridors/lobbies/staircases/toilet facilities
 - Reception
 - Back of house facilities
 - Meeting rooms
 - Bicycle store & changing facilities
- **Retail**
 - General retail demise (potentially food & beverage)
 - Back of house facilities
 - Plant & equipment
- **Service Yard**
 - General services/parking/offloading area
 - Storage area
 - Plant & equipment
- **2No Car Parking Spaces**
 - Parking area

All these different types of spaces require specific ventilation strategies to meet the requirement for the health and wellbeing of the occupants and functionality of the spaces to meet the requirements and criteria set out in section 4 of this report.

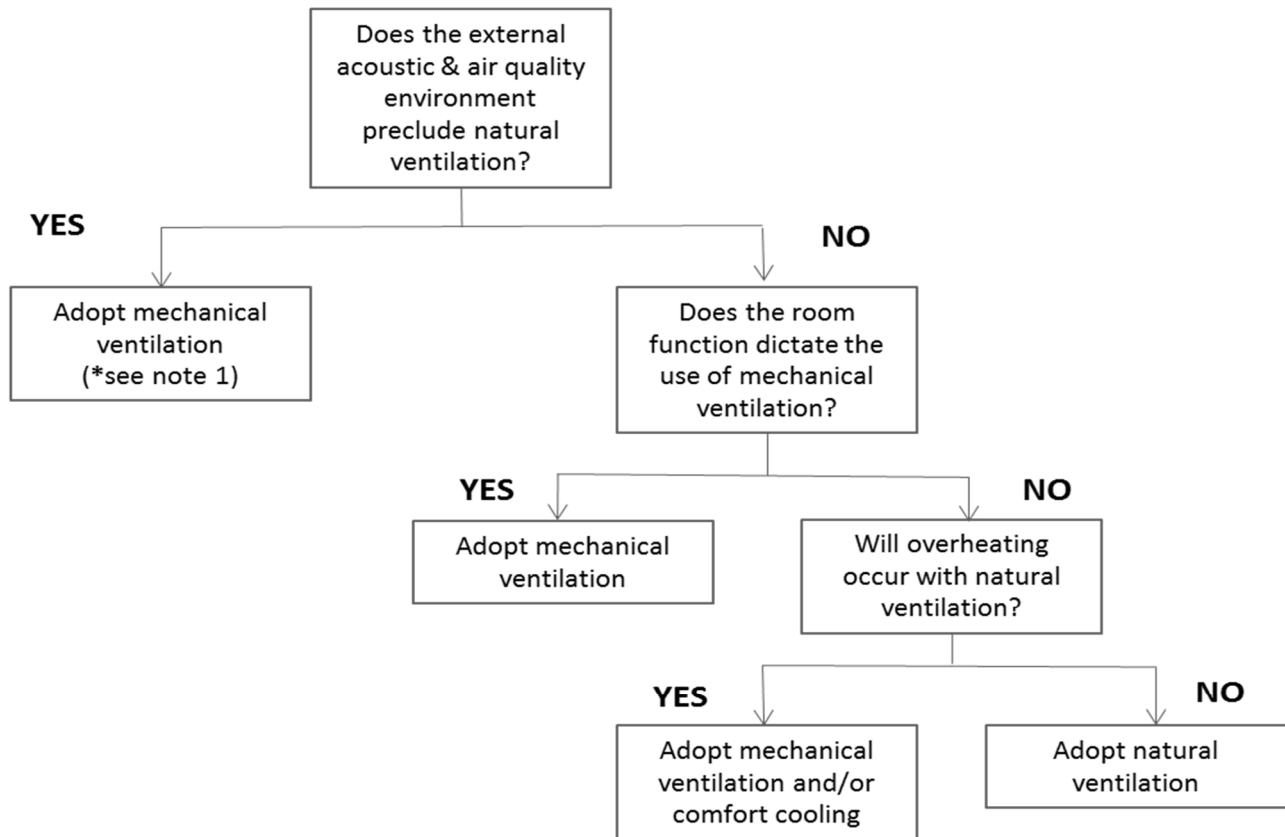
6. VENTILATION PROPOSALS

6.1 The Overall Ventilation Strategy Approach

The overall ventilation strategy is driven by the requirements set out as in Section 4 of this report with each of the different demises and room functions demanding different approaches. On the whole the primary objective will be to naturally ventilate the spaces however where this cannot be achieved mechanical ventilation and/or comfort cooling will be adopted.

The design methodology taken to establish the ventilation type has followed a strategic route:

OVERALL STRATEGIC DESIGN APPROACH



*Note 1: Utilise comfort cooling where overheating occurs and/or appropriate mechanical ventilation systems

6.2 Residential Apartments

The primary requirement for the apartments is to provide a naturally ventilated solution, this being the most desirable for residential use. To achieve this requirement the design of the façade has to provide sufficient “free area” opening, to offer the extent of air movement and offset summertime overheating and purge ventilation to satisfy part F of the Building regulations. The extent of glass and the specification of the glass are also important factors to balance the extent of natural daylight whilst at the same time reducing unwanted solar gain to avoid overheating.

Initial thermal modelling has been undertaken in accordance with CIBSE TM52 which sets out three criteria for thermal comfort, being:

Criterion 1 - Hours of Exceedance (He): sets a limit for the number of hours that the operative temperature can exceed the threshold comfort temperature (upper limit of the range of comfort temperature) by one degree or more during the occupied hours of a typical non-heating season (01 May to 30 September).

Definition: The number of hours (He) during which DeltaT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3% of occupied hours. If data are not available for the whole period (or if occupancy is only for a part of the period) then 3% of available hours should be used.

Criterion 2 – Daily Weighting Exceedance (We): deals with the severity of overheating, which can be as important as its frequency, the level of which is a function of both temperature rise and its duration. The criterion sets a daily limit for acceptability

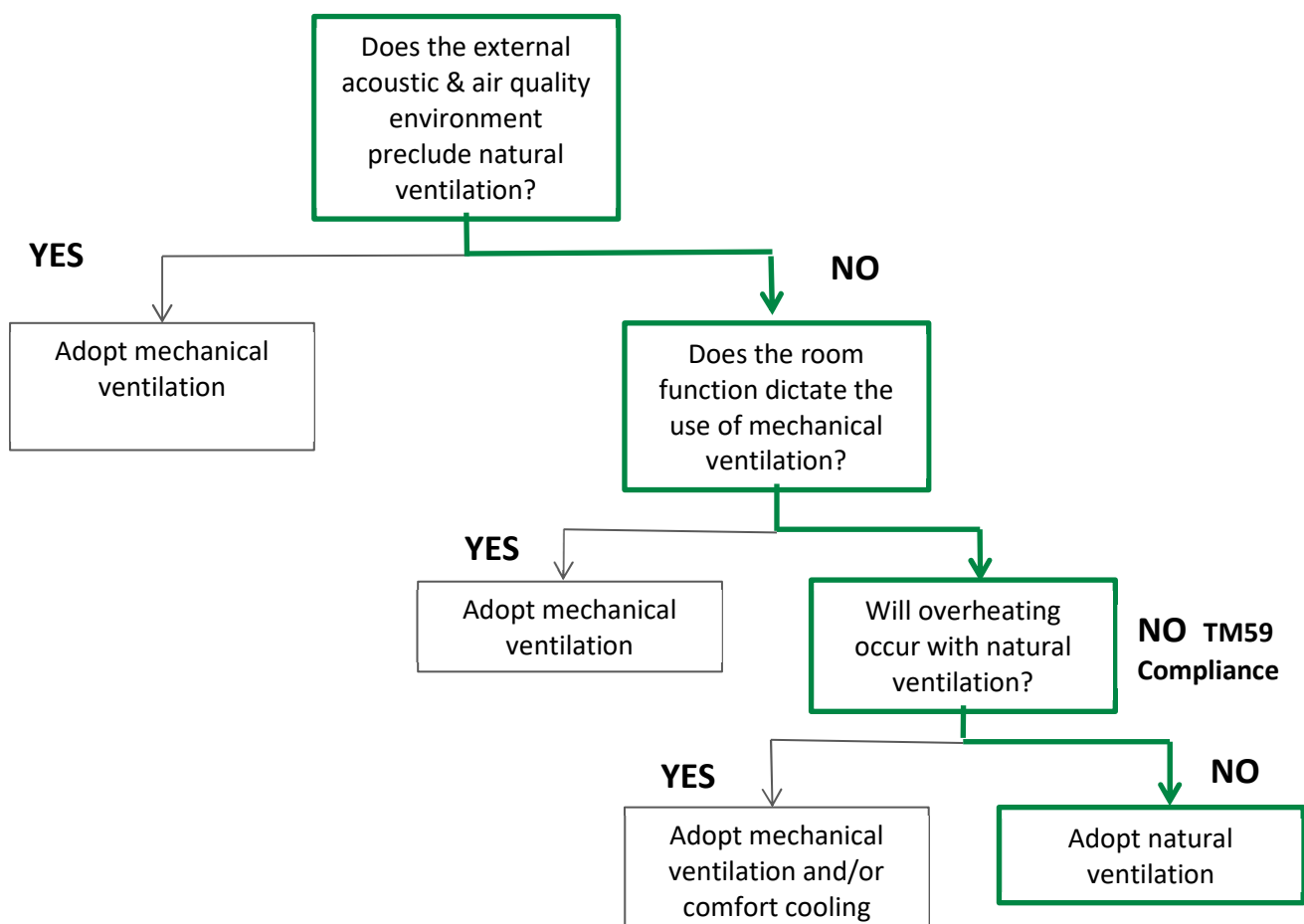
Definition: To allow for the severity of overheating the weighted Exceedance (We) shall be less than or equal to 6 in any one day

Criterion 3 – Upper Limit Temperature: sets an absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable.

Definition: To set an absolute maximum value for the indoor operative temperature the value of DeltaT shall not exceed 4k.

Thermal model calculations have been undertaken using dynamic thermal modelling which refer to Appendix 2.0 demonstrate the compliance of TM52 for the selected residential units by the use of natural ventilation that will be operated by manual means by the occupant.

STRATEGIC DESIGN APPROACH FOR RESIDENTIAL BEDROOMS & LIVING ROOMS



*Note 1:

Although natural ventilation will be adopted as the primary method of ventilation, the living spaces including the bedrooms will also be ventilated by supply air system utilising a mechanical ventilation heat recovery

system (MVHR). Each apartment will have a MVHR system located in the utility cupboard with the ductwork system within the void between the ceiling and the underside of the slab. Fresh air intake and exhaust points will be contained within the demise of each apartment but designed to mitigate cross contamination.

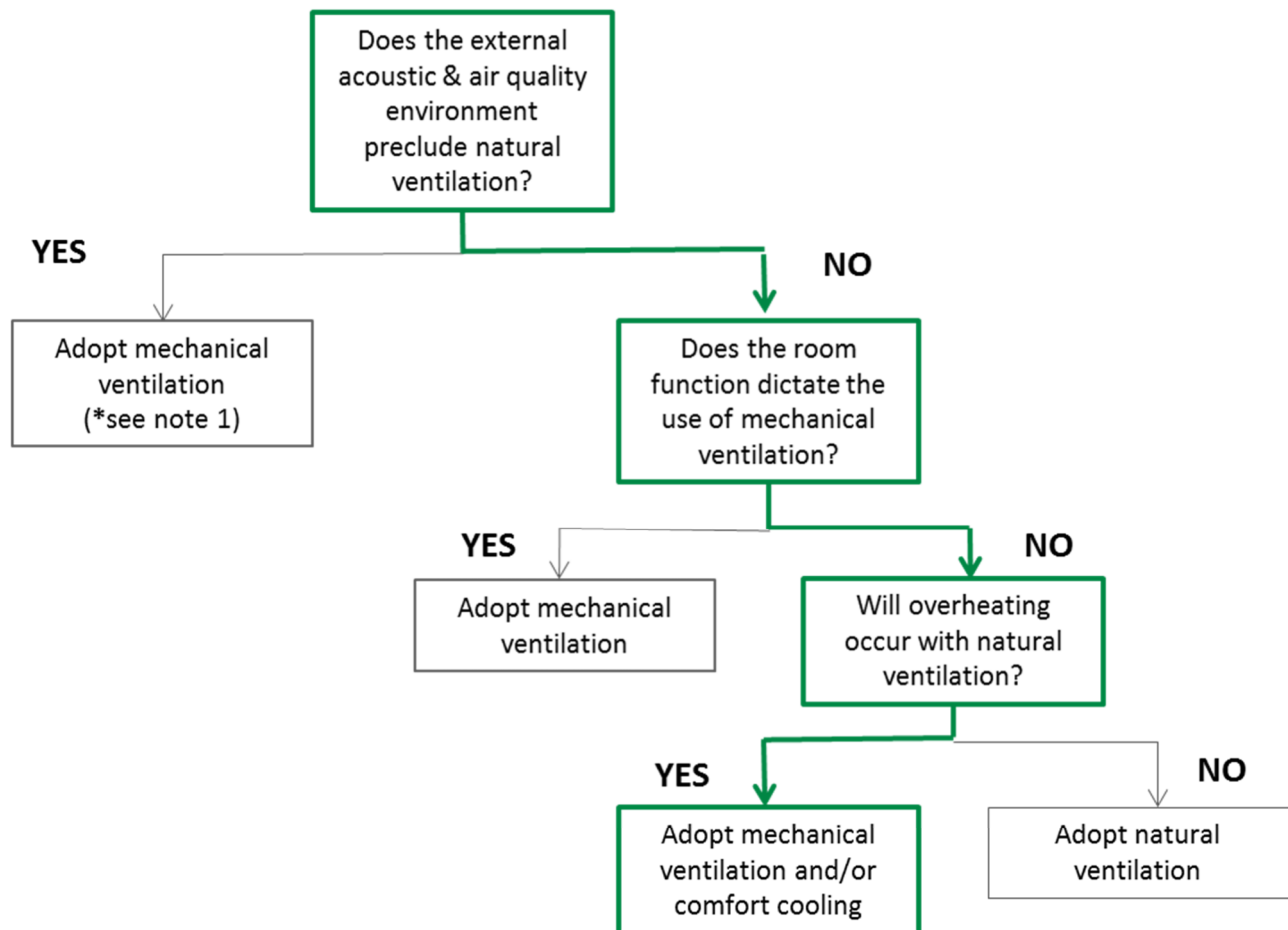
*Note 2:-

Bathroom and kitchen areas will be mechanically ventilated to comply with Part F of the Building regulations.

6.3 Commercial Offices

Although the functionality of the offices does alone not dictate the use of mechanical ventilation, the office “depth of plan”, extent of internal heat gains dictate the requirement for comfort cooling and hence associated mechanical ventilation.

STRATEGIC DESIGN APPROACH FOR OFFICE



* Note 1: utilise comfort cooling where overheating occurs

The mechanical ventilation air handling plant will be located at roof level in a plant enclosure with mechanical ductwork dropping vertically within the central core risers. From the risers horizontal ductwork will serve each floor with supply and extract ventilation for the defined occupancy levels.

The air handling plant at roof level will draw fresh air a minimum 10 meters from sources of pollution such as extract points (BREEAM Compliance).

The central core toilets will be ventilated by a dedicated toilet system with run and standby motors on the extract fan system.

All ventilation systems to the office will be in accordance with the BCO Guide for Offices

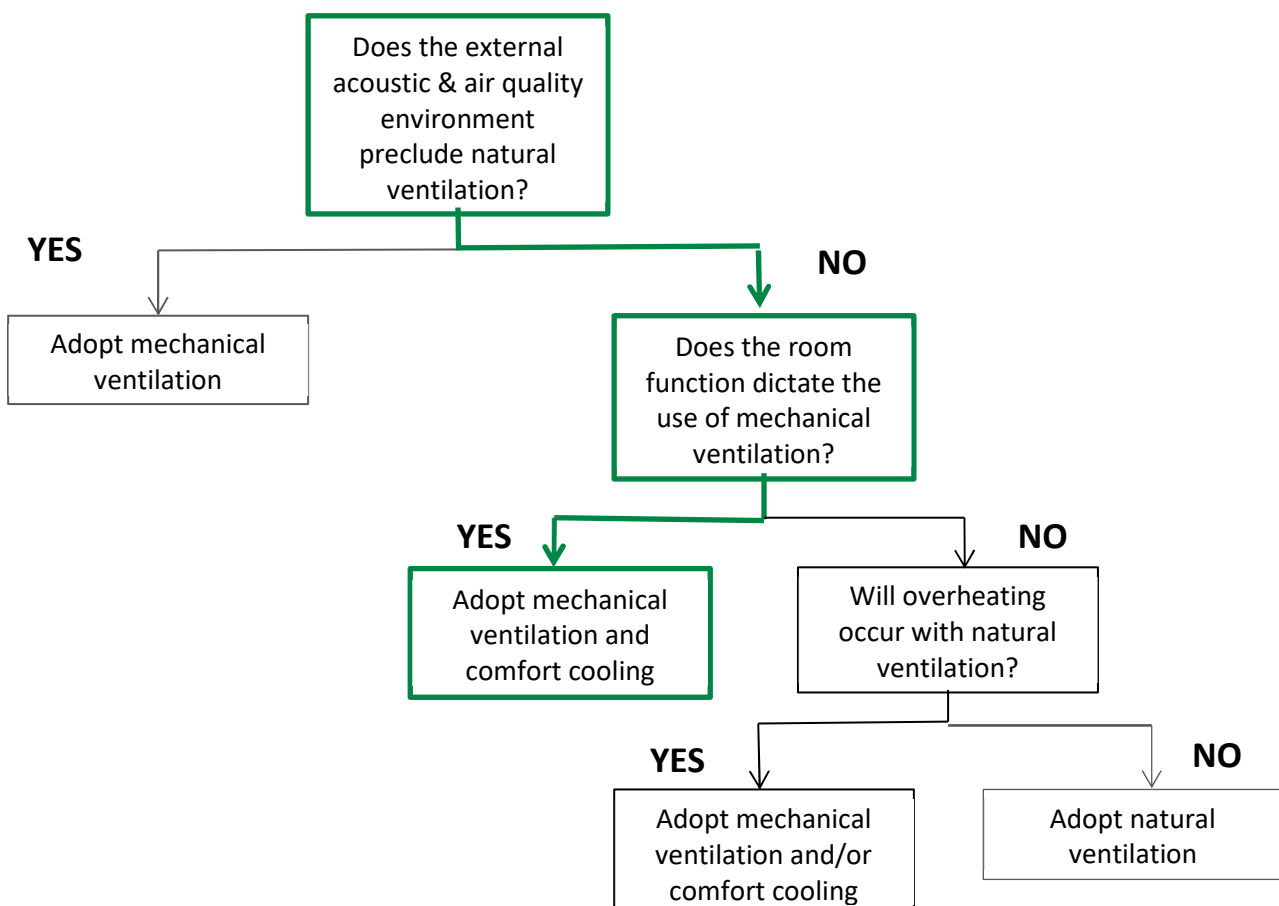
6.4 Retail Units

The location of the Retail units does not offer the ability to provide sufficient natural ventilation and with the functional requirements of these spaces then mechanical ventilation and comfort cooling is proposed.

Although those spaces are “shell only” at this stage louvres to the front of the elevations, plant spaces and risers will be provided to allow the future tenant to fit out accordingly.

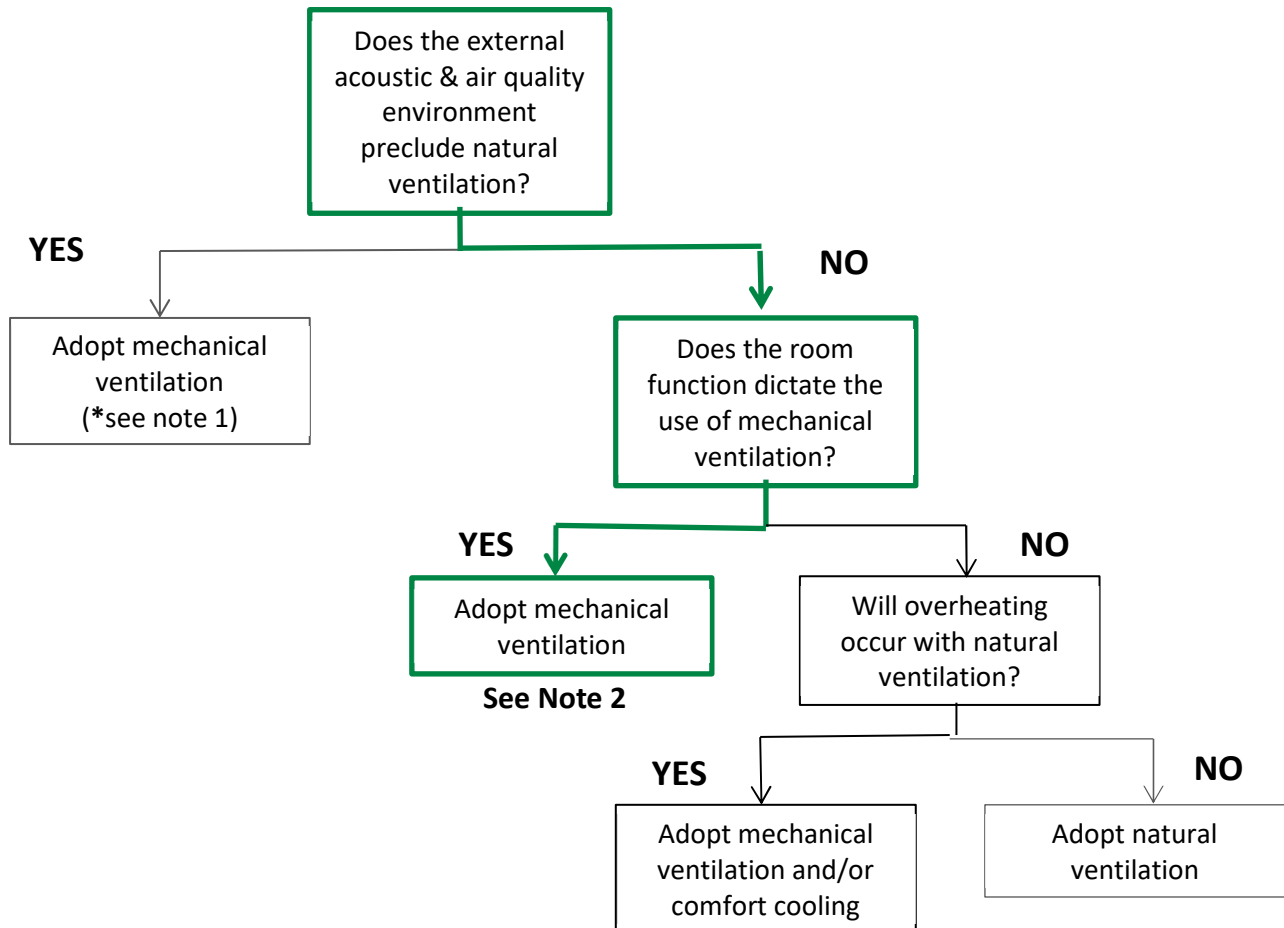
“Grease Destruction” odour control systems shall be imposed on future tenants installing kitchen ventilation systems.

STRATEGIC DESIGN APPROACH FOR RETAIL UNIT



6.5 Car Park & Service Yard

STRATEGIC DESIGN APPROACH FOR 2No CAR PARK SPACES & SERVICE YARD



Note 1:
Utilise comfort cooling where overheating occurs

Note 2:

The ventilation strategy can be split into two strategies being:-

Ground Floor Car Park Spaces

Mechanical ventilation system will be adopted using a centralised Car Park Extract fan housing at ground floor level with impulse fans at high level that act on CO pollution levels for general ventilation being in the region of 3/5 air changes per hour.

On fire condition the extract fans will operate on full speed increasing the air flow to 10 air changes per hour.

Service Yard Level

A different approach can be adopted at the service yard level as natural ventilation can be accommodated in accordance with Part B & F of the Building Regulations and relevant British Standards:-

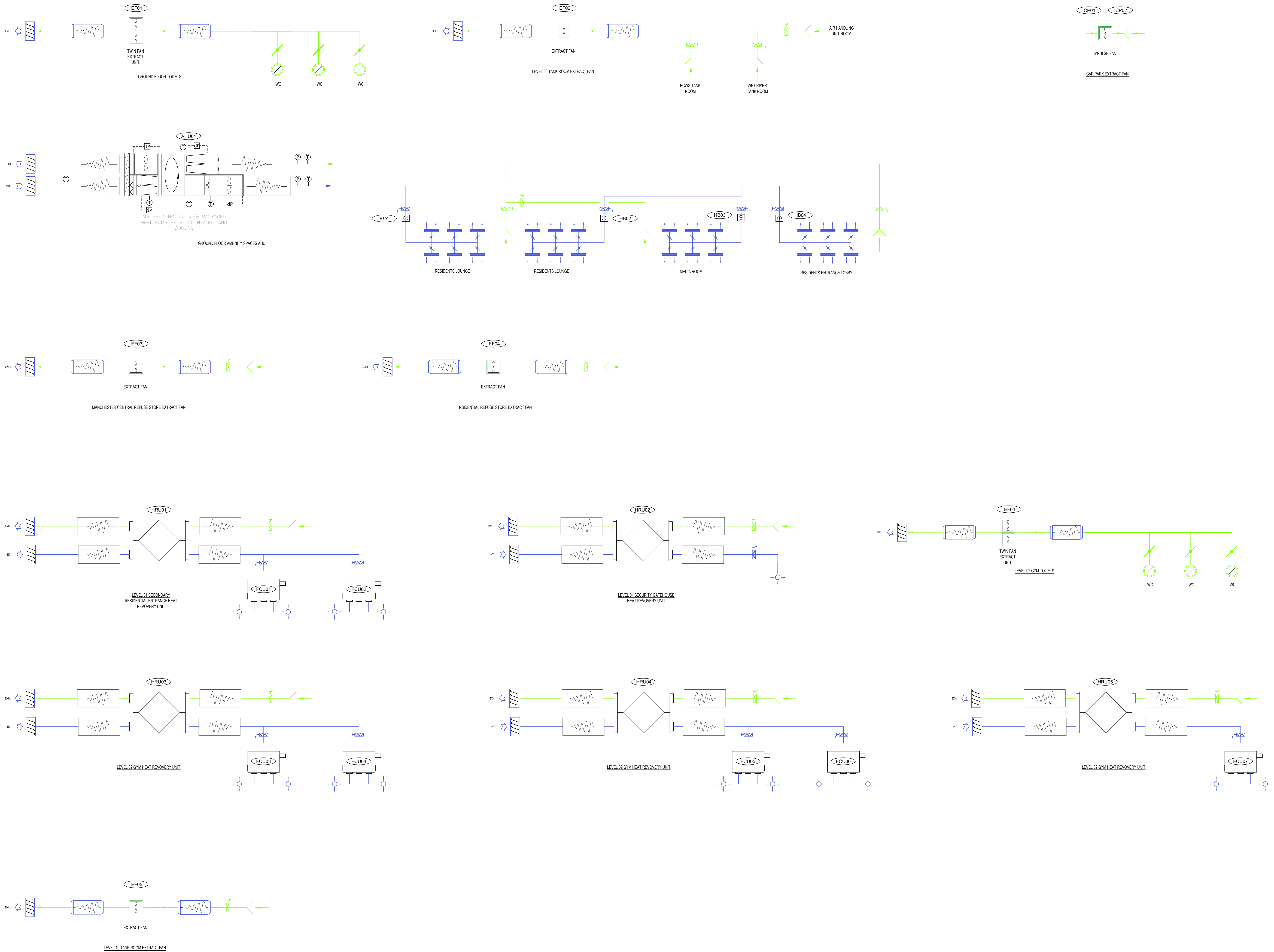
Part F – Opening with an aggregate equivalent area to at least $1/20^{\text{th}}$ of the area of which at least 25% & should be of two opposing walls

Part B

On the whole natural ventilation can be accommodated on opposing walls however in areas defined as “dead zones” then impulse fans will be provided.

7. APPENDIX 1

7.1 Ventilation Schematics



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- NOTES**
- ALL OUTWORK SHALL BE INSTALLED IN ACCORDANCE WITH DM144.
 - FLEXIBLE DUCTWORK SHALL BE ACoustically LINED AND INSTALLED IN LENGTHS OF 300MM MAX.
 - ALL CHANGES IN DIRECTION SHALL INCLUDE TURNING VANES.
 - SMOKE DAMPERS IN CEILING CAVITY BARRIERS TO BE INDEPENDENTLY SUPPORTED FROM DUCTS.
 - WC DOORS TO BE UNDERCUT TO ALLOW PATH FOR MAKE UP AIR.
 - DUCTWORK ACCESS PANELS TO BE INSTALLED TO SERVE FIRE DAMPERS.
 - ALL OUTWORK TO BE PRESSURE TESTED TO DN143, BEFORE ANY INSULATION IS APPLIED. 7 DAYS NOTICE REQUIRED FOR WITNESSING.
 - VOLUME CONTROL DAMPERS OF THE SINGLE BLADE TYPE CAN BE USED ON CIRCULAR DUCTWORK UP TO 300 MM AND RECTANGULAR DUCTWORK WITH THE LONGEST SIDE NOT EXCEEDING 300MM. ON CIRCULAR AND RECTANGULAR DUCTWORK ABOVE THE 300MM CRITERIA MULTI BLADE VOLUME CONTROL DAMPERS MUST BE USED. ACCESS DOORS REQUIRED SUPPLY SIDES TO ALLOW CLEANING OF DUCTWORK SYSTEMS AND VCD AND FID ACCESS.
 - SMOKE DAMPER ARE TO BE FITTED TO ALL FIRE BARRIER WALLS & FLOORING SMOKE DAMPER ARE TO BE FITTED TO ALL DUCT WALL SYSTEMS IN SMOKE CONTROL AREAS.
 - COMMISSIONING
INSTALL, TEST AND COMMISSION THE FRESH AIR EXHAUST AIR SYSTEM AND THE FAN COIL UNITS SO THAT THEY COMPLY WITH THE REQUIREMENTS OF THIS SECTION. MANUFACTURERS RECOMMENDATIONS, CSEB CODES AND IS-9000 FROM EXCESSIVE NOISE AND VIBRATION. ALL RESULT TO BE INCLUDED IN THE OPERATING AND MAINTENANCE MANUALS.
 - THE MECHANICAL CONTRACTOR SHALL INSTALL ALL SYSTEMS TO THE CURRENT AND RELEVANT CODES OF PRACTICE, INDUSTRY STANDARDS, BUILDING REGULATION APPROVED DOCUMENTS, BSRA GUIDE LINES, CSEB GUIDES, HAC PUBLICATIONS, THIS USE GUIDES, DN144 COMMISSIONING CODES, BRITISH STANDARDS, STANDARD SPECIFICATIONS. THE INSTALLATION MUST HAVE LIFE EXPECTANCY TO USE STANDARDS.
 - ALL SERVICES REFRIGERATION PIPING SHALL ENTER DUCT THROUGH BIG FOOT BURN NICKS.
 - ALL OUTWORK PASSING THROUGH FLAT ROOFS SHALL HAVE WEATHERING SKIRTS & APRONS SEALED WITH MASTIC.

- LEGEND**
- SUPPLY VENTILATION
 - EXTRACT VENTILATION
 - DAMPER
 - SD SMOKE DAMPER
 - OPPOSED BLADE DAMPER
 - ATTENUATOR
 - FAN COIL UNIT
 - DUCT MOUNTED ELECTRIC HEATING COIL
 - PRESSURE SENSOR LINKED TO BMS
 - TEMPERATURE SENSOR LINKED TO BMS
 - DIFFERENTIAL PRESSURE SWITCH LINKED TO BMS

ALL SIZES INDICATED ARE INDICATIVE ONLY TO RIBA DESIGN STAGE 3, AND ARE SUBJECT TO CONTRACTORS DESIGN AND VERIFICATION TO BE CARRIED OUT DURING THE TENDER PERIOD. THE CONTRACTOR SHALL INCLUDE WITHIN THEIR TENDER FOR SUFFICIENT SIZES AND EQUIPMENT AS REQUIRED TO MEET THE BUILDING REGULATIONS, ALL RELEVANT INDUSTRY STANDARDS AND THE EMPLOYERS REQUIREMENTS.

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PROJECT
VIADUX

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PLANT LEVEL

VENTILATION LAYOUT
AS TYPICAL LEVEL

VENTILATION LAYOUT
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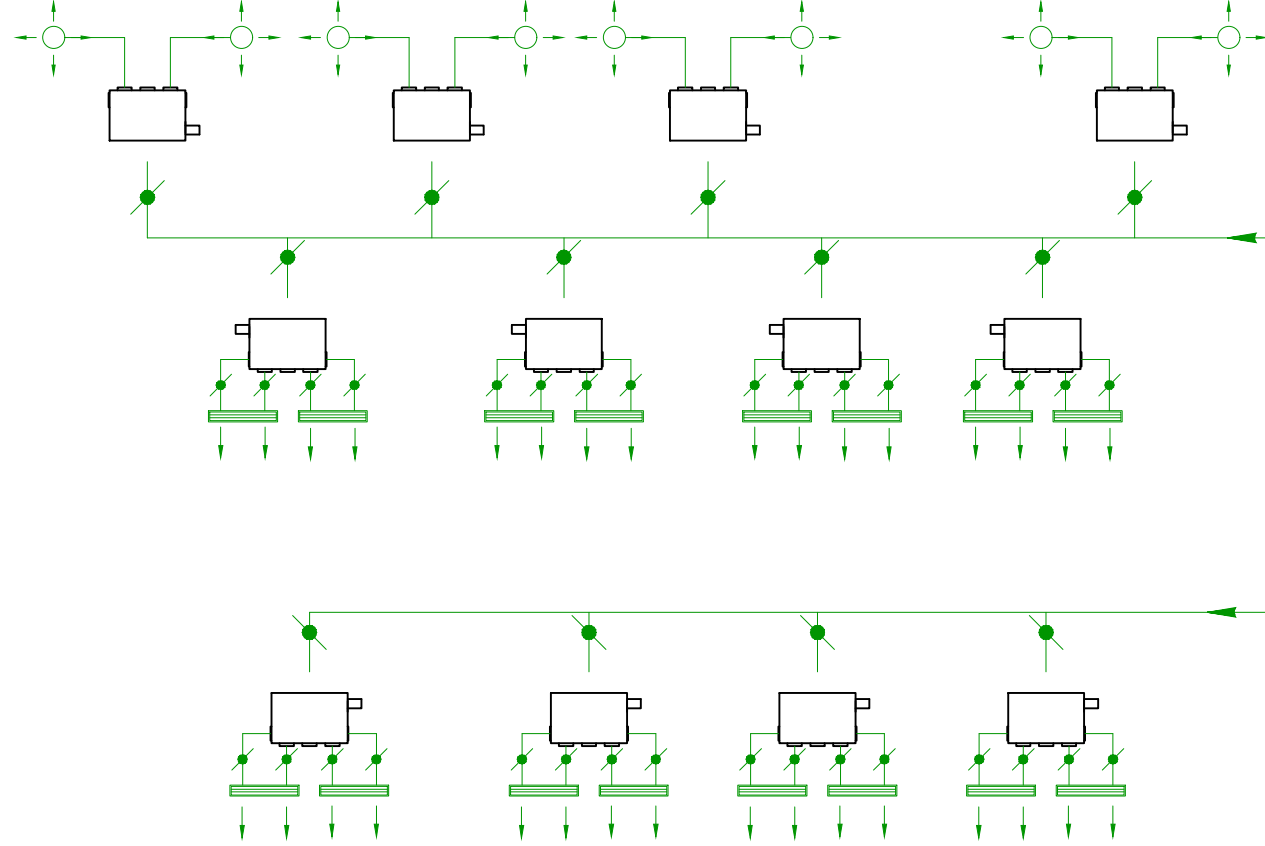
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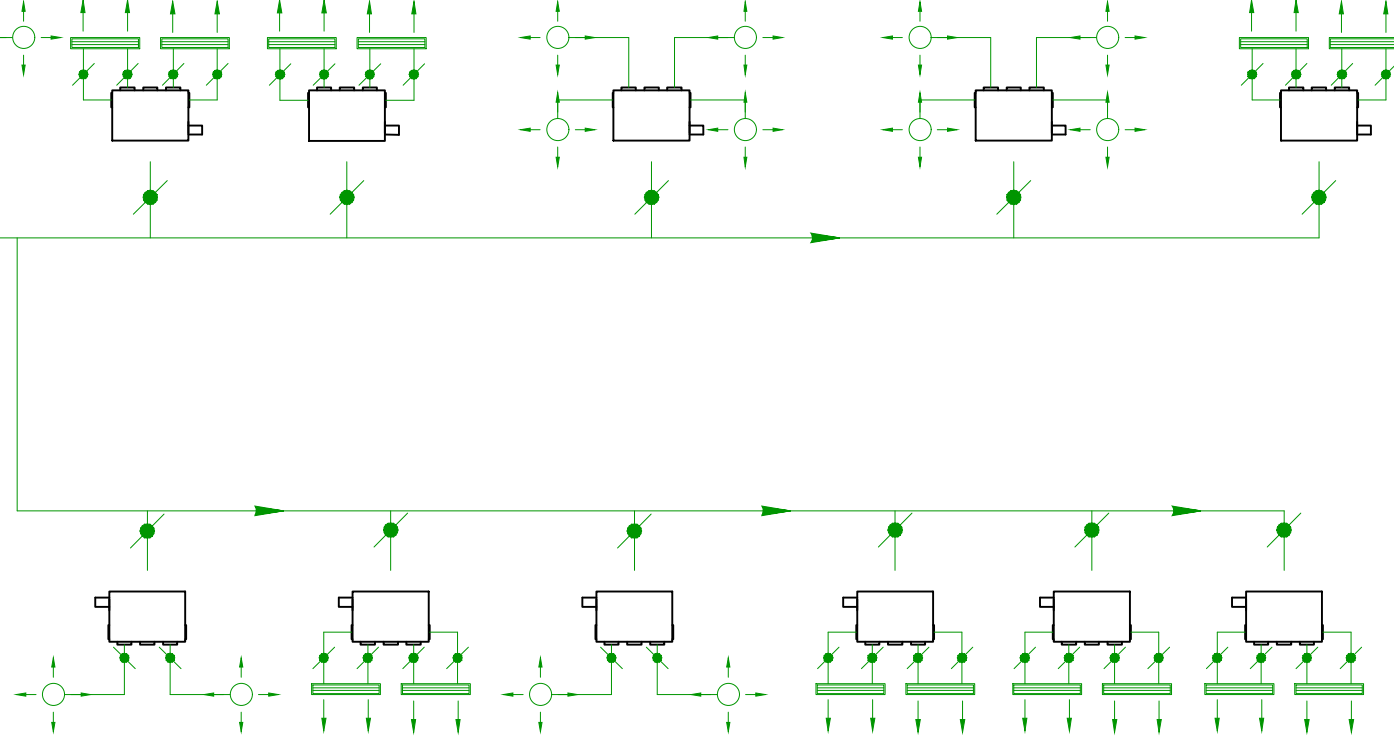
VENTILATION LAYOUT
AS TYPICAL LEVEL

VENTILATION LAYOUT
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VENTILATION LAYOUT
AS TYPICAL LEVEL



TYPICAL FLOOR



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LEGEND	
	SUPPLY VENTILATION
	EXTRACT VENTILATION
	DAMPER
	SMOKE DAMPER
	CONSTANT AIR VOLUME DAMPER
	ATTENUATOR
	FAN COIL UNIT

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VIADUX PHASE 2

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VENTILATION SCHEMATIC

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