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# Airport City Manchester Premier Inn – Plot H5

H5PI-CPW-XX-XX-RP-ME-00003

## Ventilation, Extraction & Odour Control Strategy

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| Document Revision History |             |                 | Ref        | H5PI-CPW-XX-XX-RP-ME-00003 |                                   |
|---------------------------|-------------|-----------------|------------|----------------------------|-----------------------------------|
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# H5 Premier Inn – Manchester Airport Group

## Ventilation, Extraction and Odour Control Strategy



### 1.0 Introduction

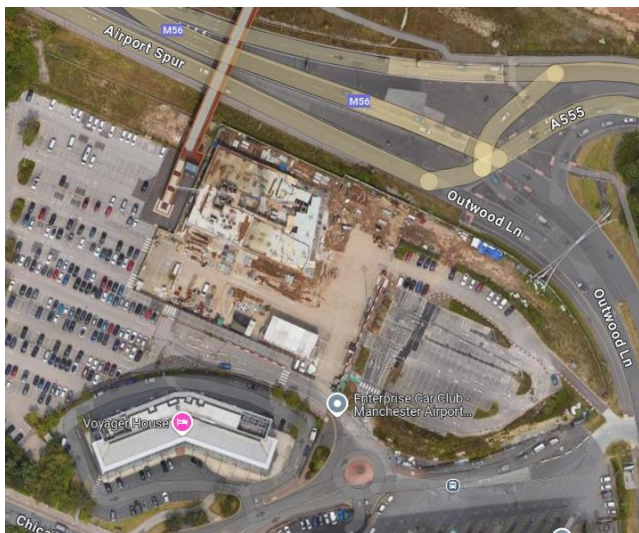
#### 1.1 General

This document has been compiled by CPW to provide the outline proposals for the Mechanical ventilation services for the development of Plot H5 as the new multistorey Premier Inn hotel for the on behalf of Manchester Airport Group (MAG). The site is located immediately next to the entrance to Manchester Airport, accessed via the M56 Airport Spur and Outwood Lane.



*Architect's Impression of the Development*

The project comprises a of nine story hotel, with restaurant, front of hour and back of house amenity spaces to the ground floor and 8 no. floors of bedrooms with ensuites, and linen rooms. There is proposed to be new access and service roads, as well as pedestrian walkways throughout the site.



*Aerial view of the site*



*Plot H5 Location*

The services will be designed in accordance with all relevant standards, Premier Inns own specification requirements (as per Whitbread specification), current building regulations and will recognise established benchmarking in respect to good engineering practice.

The quality of the built environment can make a major contribution to a building user's comfort and wellbeing. Evidence of links between the design of the physical environment, and users' well-being, adds impetus to the quality of design in buildings.

### 1.2 Design Standards

As the design progresses, the following standards will be incorporated within the mechanical, electrical, and sustainable building services solutions for the proposed development. These standards and guidance notes will also be applicable to be incorporated in the installation of the building services elements during the construction stages of the project.

- Developer's Specifications inc. Whitbread Specification
- Developer's Room Data Sheets
- Building Regulations
- The requirements of Building Control (including Fire Officer)
- Local Authority rules and regulations
- Health and Safety Executive (HSE) Guidance
- Construction Design and Management (CDM) Regulations
- Statutory undertakings regulations
- All current CIBSE Guides, Application Manuals, Commissioning Codes and Codes of Practice
- All relevant British & European Standards related to building services.
- BSRIA Guides
- BESA maintenance guides
- The Clean Air Act (including the memorandum on chimney heights)
- The Equality Act requirements

### 1.3 Building Compliance

The design requirements for this project are listed below and summarised in the following clauses:

- 1) Building Control Officer's requirements.
- 2) Client : Whitbread Specification Document
- 3) Energy Performance Certificate.
- 4) Compliance with all relevant Building Regulations current at the time of tender and declared start on site date, including but not limited to:
  - a) Approved Part F - Ventilation
  - b) Approved Part L – Conservation of fuel and power
  - c) Approved Part O – Overheating – Overheating Mitigation 'Dynamic thermal modelling method' specifically CIBSE TM59 overheating assessment, report and compliance.
  - d) Approved Part P – Electrical safety
- 5) BREEAM Rating.
- 6) Compliance with BS 7671 IET Wiring Regulations – Requirements for Electrical Installations, all supporting IET documentation, and all British Standards / Statutory Regulations referenced within these documents.

## 2.0 Mechanical Ventilation

The building is predominantly mechanically ventilated via local and zonal MVHR (MVHR in longhand) units and extract fans, as well as specialist air handling plant to serve the commercial kitchen and glass wash.

MVHR units and extract fans will be located local to the space they serve within the ceiling voids (fitted with suitable access for access and maintenance). These will be acoustically treated via attenuators being fitted at both atmosphere and room side in order to reduce the breakout or ingress of noise. Where required between private spaces such as offices there shall also be cross talk attenuators installed.

The specialist kitchen extract and supply ventilation will be served via a roof mounted air handling unit (see Appendix A) which will provide fresh air and discharge stale air from and into the atmosphere above the height of the occupied spaces and bedrooms and omit the requirement for external flues or discharge ductwork up the external of the building due to the dedicated kitchen ventilation riser formed within the right-hand stair core. The kitchen extract airpath complete with ESP and UV filtration will break down and remove the odours and grease from the air flow before being discharged into atmosphere above roof level (near to the centre of the roof plan) which will be far in excess of >1m from any openable window. The roof mounted specialist kitchen AHU will be installed complete with attenuators on both the room side and atmosphere sides to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location (bedroom window or bedroom below roof slab). All roof mounted plant will also be mounted on anti-vibration mounts in order to mitigate any movement or noise through the structure of the roof into the rooms below. Discharge of kitchen extracted air will be at a suitable velocity so to disperse any odours with the stale air.



***Example of a Roof Level Kitchen Air Handling Unit***

All extract fans serving WCs, stores, linen rooms and cellar ventilation systems will be terminate via localised louvres. These will all be formed within the southern façade as detailed on the architectural elevations. These are all discharged near to the external plant area at >1.7m/s.

Where background Mechanical ventilation is required for fresh air purposes (such as landlocked rooms or densely populated offices and meetings rooms) then there will be a requirement to provide individual room MVHRUs in order to achieve the elevated purge ventilation requirements and minimum fresh air rates without use of windows.

Where dirty extract via mechanical ventilation is required to operate, twin extract fan systems with an auto-changeover function will be provided.

Where Mechanical ventilation alone is required for air hygiene purposes then it may be required to provide individual room MVHRUs to achieve the elevated purge ventilation requirements without use of windows.

# H5 Premier Inn – Manchester Airport Group

## Ventilation, Extraction and Odour Control Strategy



### 2.1.1 Design Criteria

| Area                                    | Natural Infiltration Rate<br>(ACH) | Mechanical Ventilation Rate<br>(ACH / l/s)                                                                                                          |
|-----------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Delivery Bay</b>                     | N/A                                | As Required By Building Control – Min 40 AC/Hr                                                                                                      |
| <b>GF Linen Stores</b>                  | 0.5                                | 15 Ac/Hr<br>– Extract Only Via Wall / Inline / Central Fan                                                                                          |
| <b>Entrance Lobby</b>                   | 2.0                                | N/A                                                                                                                                                 |
| <b>Main Reception / Foyer</b>           | 1.0                                | 12 l/s/person (S/E - Heat Recovery Unit)                                                                                                            |
| <b>Bedrooms</b>                         | 0.5                                | 8 / 24 l/s (Stand Alone HRU)<br>16 l/s (Supply & Extract) – Central Vent – DOUBLE / TRIPLE<br>24 l/s (Supply & Extract) – Central Vent – QUAD ROOMS |
| <b>Meeting Rooms</b>                    | 0.5                                | 12 l/s/person (S/E – Void Mounted Heat Recovery Unit)                                                                                               |
| <b>Bottle Stores &amp; Linen Stores</b> | 0.5                                | 4 Ac/Hr - Extract Only Via Wall / Inline / Central Fan                                                                                              |
| <b>Restaurant</b>                       | 0.5                                | 10 l/s/person (S/E – Void Mounted Heat Recovery Unit)                                                                                               |
| <b>Bar</b>                              | 0.5                                | 10 l/s/person (S/E – Void Mounted Heat Recovery Unit)                                                                                               |
| <b>Kitchen</b>                          | 0.5                                | As Per Kitchen Installer Requirements (Circa 40 AC/.Hr)<br>Glasswash – 20 AC / Hr<br>Refrigerator Area – 20 AC/Hr                                   |
| <b>FOH Toilets</b>                      | 0.5                                | 10 AC/Hr (HRU Extract From WC Make up air outside)                                                                                                  |
| <b>BOH Offices</b>                      | 0.5                                | 12 l/s/person (S/E – Void Mounted Heat Recovery Unit)                                                                                               |
| <b>BOH Staff Areas / Team Rooms</b>     | 0.5                                | 12 l/s/person (S/E – Void Mounted Heat Recovery Unit)                                                                                               |
| <b>BOH Toilets &amp; Showers</b>        | 0.5                                | 10 AC/Hr (HRU Extract From WC Make up air outside)                                                                                                  |
| <b>Plant Areas</b>                      | 0.5                                | Natural                                                                                                                                             |
| <b>Emergency Stairs</b>                 | 0.5                                | N/A                                                                                                                                                 |
| <b>Comms Rooms</b>                      | 0.5                                | N/A                                                                                                                                                 |



### 2.2 Bedroom MVHR Systems

Local MVHR units shall be installed as per Premier Inn typical services layout to provide fresh air to the bedrooms while extracting from the en-suites. The minimum and boost ventilation rates can be achieved while recovering heat from the stale air. Louvres shall be provided at high and low level on the bedroom façade (ductwork between the MVHR unit and the external louvres runs behind/within the wall on the bed head side of each room), these louvres shall alternate as they go up the building so not to “short circuit” with discharge being located next to the adjoining floor’s fresh air intake.

### 2.3 Zonal MVHR Systems

Front of House, Back of House offices and team rooms, and public WCs will be serviced via ceiling mounted MVHR units. These will provide the ventilation rates required while recovering the heat from the stale air. All units and ductwork will connect into louvres local to the zone’s façade and be complete with atmosphere and room side attention to mitigate noise breakout. Local wall mounted zone/room temperature and CO2 sensors to be provided.

### 2.4 Local Dirty Extract Systems

Back of house areas such as write COSSH in longhand (COSSH) stores, linen rooms, and cleaners’ cupboards shall be served via local in line twin extract fans at high level within the ceiling void to operate with an auto-changeover function will be provided. All units and ductwork will connect into louvres local to the zone’s façade and be complete with atmosphere and room side attention to mitigate noise breakout.

### 2.5 Zonal Extract Only Systems

Back of house areas such as Staff WC & Staff Shower, and the Cellar & Bottle Store shall be served via zonal twin extract fan at high level within the ceiling void to operate with an auto-changeover function will be provided. All units and ductwork will connect into louvres local to the zone’s façade and be complete with atmosphere and room side attention to mitigate noise breakout.

### 2.6 Specialist Kitchen Extract System

The specialist kitchen extract and supply ventilation will be served via a roof mounted air handling plant which will provide fresh air and discharge stale air from and into the atmosphere above the height of the occupied spaces and bedrooms and omit the requirement for external flues or discharge ductwork up the external of the building due to the dedicated kitchen ventilation riser formed within the right hand stair core which forms a straight run of ducting with no obstructions and access at the top and base. The location of this riser allows for unobstructed safe access for the regular manual cleaning and ensures that noise and odours from the systems shall not affect any other areas of the building. The kitchen supply air is to provide filtered fresh air into the kitchen and canopy in accordance with DW172 Section 6. The supply ductwork has been located within the same riser as the kitchen extract ductwork, but neither obstruct the other for access requirements. The supply is to be pre-heated via integral DX heat pump serving a preheat coil in the ventilation unit in order to provide a minimum ambient air temperature of 17°C. The extract will be specified and fitted with the ‘ESP’ (electrostatic precipitator) range from *Purified Air Ltd* which are specifically designed for kitchen extract systems and have integral sumps to collect the oil, grease and smoke particles filtered out of the exhaust to simplify servicing and maintenance while omitting the potential for dangerous spillage from the bottom of the units and reduces the buildup of grease within the ductwork. And for odour control the extract system will be specified and fitted with the ‘UV-C’ (short-wavelength ultraviolet radiation) range from *Purified Air Ltd* which will be located directly in the air stream of the kitchen extract duct and has integral high output UV-C lamps (specified by the specialist to align with the cooking type or processes expected within the commercial kitchen). The ozone combined with hydroxyl free radicals, oxidise odours and grease, removing and altering the molecular structure of the compounds.

The kitchen canopy will be specified to include grease filters for local grease capture. A suitably sized stainless-steel canopy complete with grease filters and condensation drip channel will be supplied and installed above the main

## H5 Premier Inn – Manchester Airport Group

### Ventilation, Extraction and Odour Control Strategy



cook-line. The extract rate from the canopy shall achieve air volumes to serve the Integrated Restaurant Kitchen with 1.8m<sup>3</sup>/s (Extract) and 1.5m<sup>3</sup>/s (Supply). The kitchen ventilation (supply and extract systems) and ducting system from the canopy designed in accordance with DW/172, DW144, TR/19 and DEFRA guidelines. The kitchen ventilation shall be designed to maintain a negative pressure within the kitchen at all times of operation.

The kitchen extract airpath complete with ESP and UV filtration will break down and remove the odours and grease from the air flow before being discharged into atmosphere above roof level (near to the centre of the roof plan) which will be far in excess of >1m from any openable window. The roof mounted plant will be installed complete with attenuators on both the room side and atmosphere sides to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location (bedroom window or bedroom below roof slab). The AHU will also be mounted on anti-vibration mounts in order to mitigate any movement or noise through the structure of the roof into the rooms below. Discharge of kitchen extracted air will be at a suitable velocity so to disperse any odours with the stale air. Suitable attenuation will be required for all plant, with special attention to those at roof level.

Odour control equipment will be manufactured and supplied by:

*Purified Air Limited*

*Lyon House*

*Lyon Road*

*Romford*

*Essex RM1 2BG*

*Tel: 01708 755 414*

*Email: [enq@purifiedair.com](mailto:enq@purifiedair.com)*

### 3.0 Ventilation Strategy Summary

| Room Type                          | Ventilation                                                            |
|------------------------------------|------------------------------------------------------------------------|
| <b>Bedrooms</b>                    | Local MVHR (Supply Only)                                               |
| <b>Ensuites</b>                    | Local MVHR (Extract Only)                                              |
| <b>Front of House</b>              | Supply and extract ventilation via MVHR unit.                          |
| <b>Restaurant</b>                  | Supply and extract ventilation via MVHR unit.                          |
| <b>Commercial Kitchen</b>          | Specialist Extract with makeup air via roof AHU                        |
| <b>Glass wash</b>                  | Specialist extract system                                              |
| <b>Cellar &amp; Bottle Store</b>   | Extract Only                                                           |
| <b>Office</b>                      | Supply and extract ventilation via MVHR unit.                          |
| <b>Linen Stores &amp; Stores</b>   | Extract Only                                                           |
| <b>Team Room with Tea point</b>    | Supply and extract ventilation via MVHR unit.                          |
| <b>Staff WC &amp; Shower Rooms</b> | Extract only via single extract fan.                                   |
| <b>DWC</b>                         | Extract only to cleaners stores via single extract fan.                |
| <b>Public WCs</b>                  | Supply and extract ventilation via MVHR unit.                          |
| <b>Server Room / Comms</b>         | N/A                                                                    |
| <b>Circulation</b>                 | Natural ventilation or mechanically ventilated at a rate of 0.5l/s/m2. |

## **4.0 Testing & Commissioning of the M&E Services**

The mechanical services installation, during installation and on completion before being put into service, will be inspected, and tested to verify functionality, commissioned status and BMS/controls strategy in line with the fire strategy and building control requirements have been met and the installation meets with the design.

The electrical services installation, during installation and on completion before being put into service, will be inspected, and tested to verify that the Regulations of BS 7671 18th Edition IET Wiring Regulations have been met and the installation meets with the design.

A commissioning strategy shall be produced, this will detail the extent of commissioning and the process to ensure that full commissioning aligns to manufacturer's installation and commissioning requirements.

The commissioning strategy will include involvement and representation by the Client's Representative for witnessing commissioning and being informed throughout the process.

## **5.0 Maintenance & Access To M&E Services, Plant, Equipment & Installations**

Adequate unobstructed maintenance access for regular inspection and replacement of parts and plant to all plant and equipment installed shall be allowed for within the space planning and developed design with consideration of suitable access/maintenance clearances to all installations, not that just of the building services.

All proposed plant and equipment locations both internally and externally, are to be complete with dimensions of all access routes and maintenance access areas detailed issued to Whitbread for comment prior to construction.

Generally, as a minimum all access and maintenance access shall be as required by the manufacturers of the individual item of plant and equipment. Also, as a minimum all access routes shall be as required by CDM, H&S, British Standards and Building Regulations requirements. Ultimately the responsibility for the provision of suitable access for maintenance shall remain with the developer.

Access hatches to service risers for maintenance shall not be located within the hotel's bedrooms or bedroom bathrooms under any circumstances. Where required, access to all service risers in corridors shall be subject to approval of Whitbread. (Access to these hatches shall be clear from obstruction and easily accessible).

Access hatches within bedroom corridors shall be designed out but in circumstances where this is not possible all access hatches must be sent for approved by Whitbread prior to construction.



## **6.0 Appendices**



**6.1      Appendix A      Roof Plant Layout Plan**

THIS DRAWING IS AN INDICATIVE LAYOUT ONLY, DEMONSTRATING THE CONCEPTUAL REQUIREMENTS CORRELATING WITH THE AGREED SCHEMATIC SOLUTIONS. THE PURPOSE OF THIS DRAWING IS TO DEMONSTRATE DESIGN INTENT, FOR FURTHER DEVELOPMENT BY THE RELEVANT SERVICES DESIGNER ONLY.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE MECHANICAL PERFORMANCE SPECIFICATION & ALL RELEVANT ARCHITECTURAL & ENGINEERING DRAWINGS, DETAILED & FULLY COORDINATED INSTALLATION DRAWINGS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATION.

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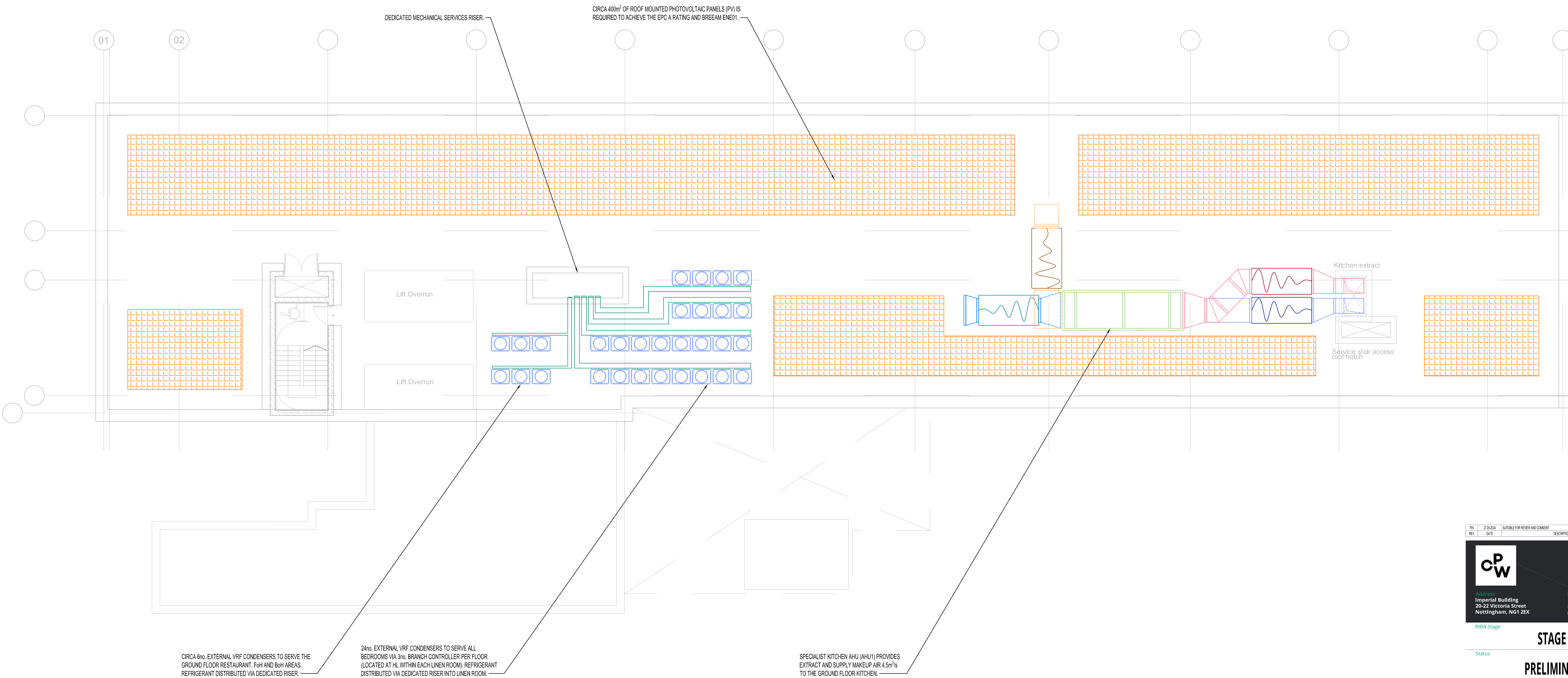
|       |            |
|-------|------------|
| ----- | BELOW      |
| ===== | LOW LEVEL  |
| ----- | HIGH LEVEL |
| ----- | VOID       |

## MECHANICAL VENTILATION, HEATING & COOLING

|                                                                                     |                           |
|-------------------------------------------------------------------------------------|---------------------------|
|  | DISCHARGE AIR             |
|  | DISCHARGE AIR ACCESSORIES |
|  | EXTRACT AIR               |
|  | EXTRACT AIR ACCESSORIES   |
|  | INTAKE AIR                |
|  | INTAKE AIR ACCESSORIES    |
|  | SUPPLY AIR                |
|  | SUPPLY AIR ACCESSORIES    |
|  | REFRIGERANT TRAY          |

NOTES:

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### RIBA Stage

## STAGE 2

Status

## PRELIMINARY

Client



## Project

**PREMIER INN  
PLOT 5  
MANCHESTER AIRPORT**

Drawing Title  
**PLANT LAYOUT  
ROOF LEVEL**

Scale (A1)

Date \_\_\_\_\_

By v

CS L

| ProjID | Originator | Functional | Spatial | Form | Discipline | Number | Suitability | Revision |
|--------|------------|------------|---------|------|------------|--------|-------------|----------|
| H5PI   | CPW        | PI         | RF      | DR   | M          | 50002  | S3          | P01      |

H5PI-CPW-PI-RF-DR-M-50002 S3 P01

### Linked Files

H5PI.5PA.PI.RE.DR.4.022209 Ver2

100 90 80 70 60 50 40 30 20 10 0

N/A



**6.2      Appendix B      Ground Floor Plant Layout Plan**

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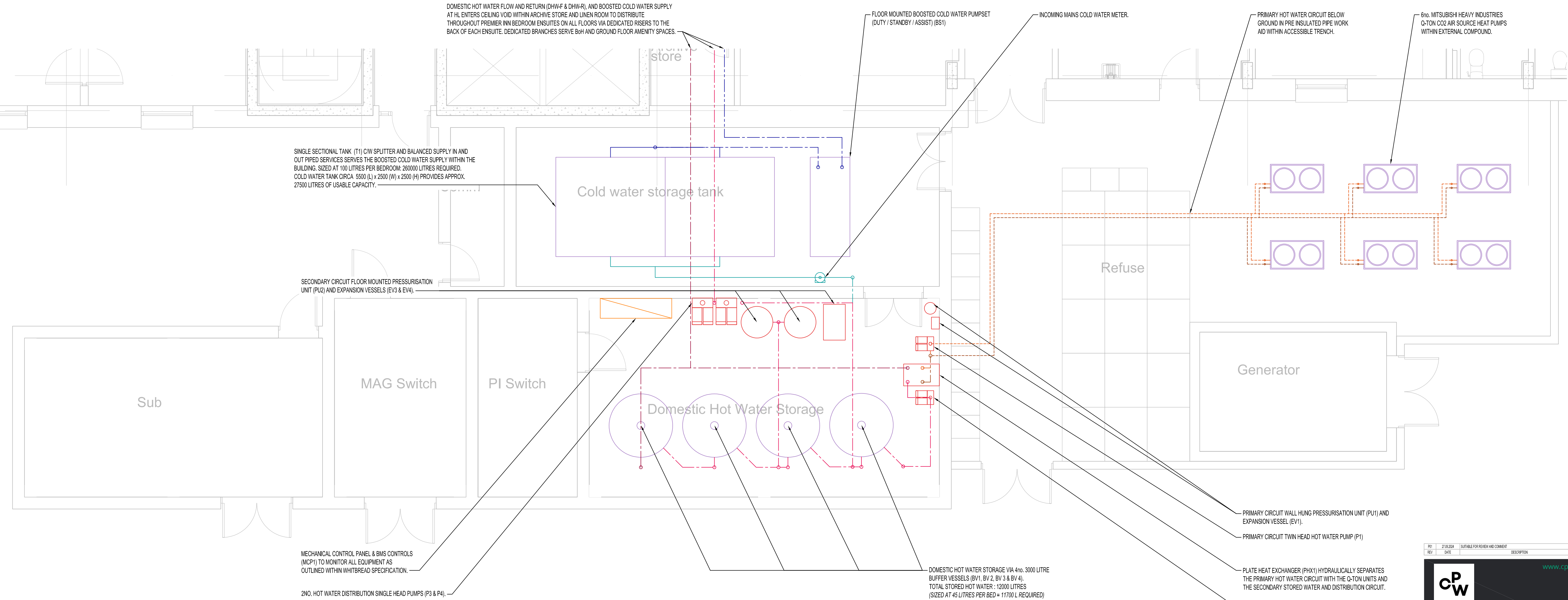
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----- LOW LEVEL  
----- HIGH LEVEL  
----- VOID

PIPEWORK

----- MAINS COLD WATER  
----- BOOSTED COLD WATER  
----- TANKED COLD WATER  
----- CAT5 COLD WATER  
----- HOT WATER FLOW  
----- HOT WATER RETURN  
----- LOW TEMPERATURE HOT WATER FLOW  
----- LOW TEMPERATURE HOT WATER RETURN

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RIBA Stage

STAGE 2

Status

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Project  
**PREMIER INN  
PLOT 5  
MANCHESTER AIRPORT**

Drawing Title  
**PLANTROOM LAYOUT  
GROUND FLOOR**

Scale (A1) 1:50 Date SEP' 2024 By CS Ve LP

| ProjID | Original | Revised | Scale | Form | Discipline | Number | Subsity | Revised |
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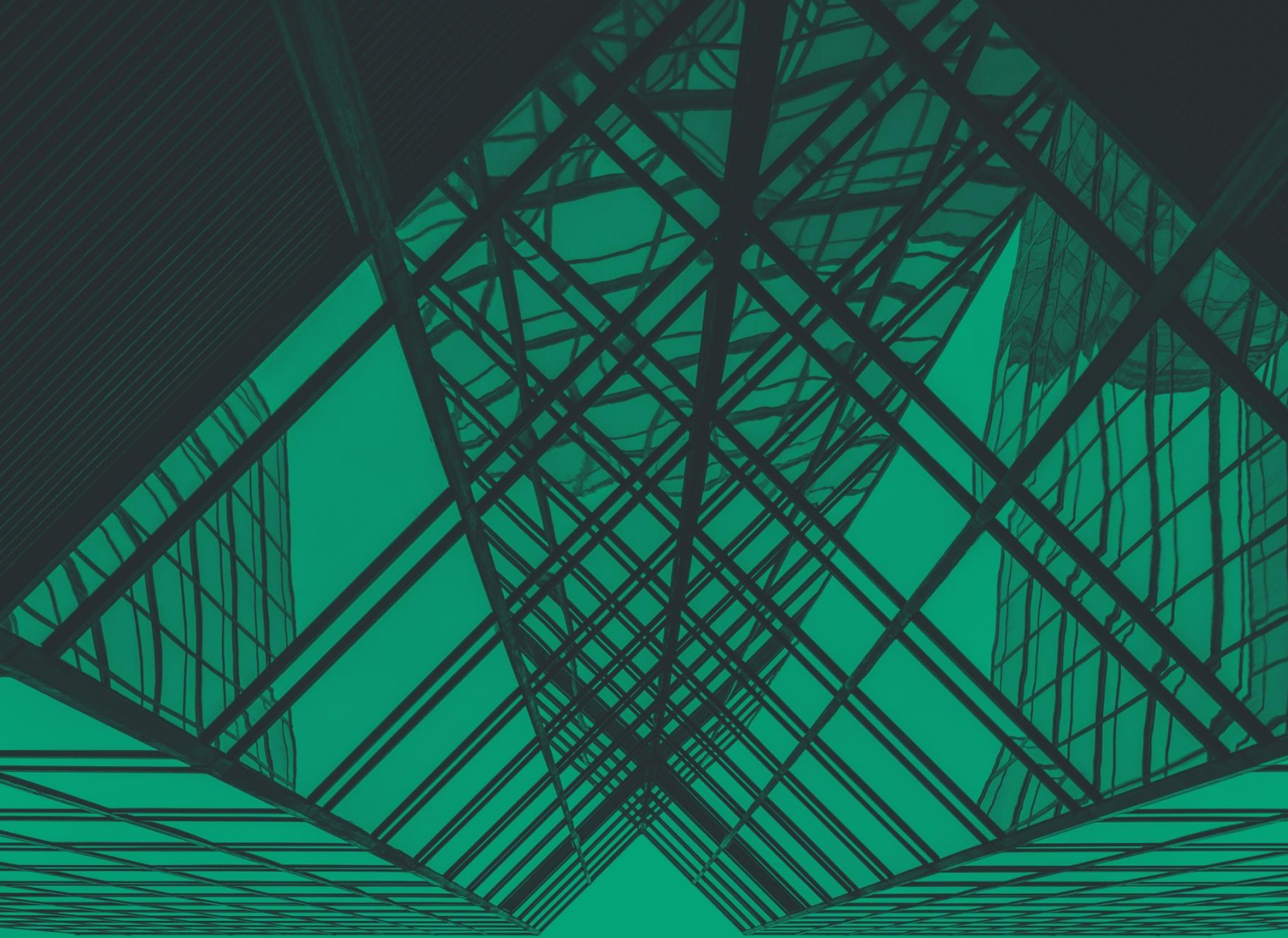
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