

chapmanbdsp

**1 Cavendish Square
OSEL Architecture
MEPH Services Strategy Report**

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Date: 28th June 2021

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0	Draft/Comment	16/02/2018	Darren Wright	Phil Nicholson
1	Client Issue	28/02/2018	Darren Wright	Anthony White
2	Revised Client Issue	01/03/2018	Darren Wright	Anthony White
3	Revised Client Issue	02/03/2018	Darren Wright	Phil Nicholson
4	Variation Client Issue	16/07/2018	Darren Wright	Phil Nicholson
5	Draft/Comment	28/06/2021	Bongai Muyambo	Darren Wright

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1 Introduction

1.1 Document Description

This document has been produced by chapmanbdsp with the aim of supporting a planning application regarding the proposed change of use at 1 Cavendish Square, London. It is anticipated that the existing empty bank be fitted out as a high-end restaurant with dining set out across three floors from the ground floor to a new mezzanine level and first floor, with cooking and back of house facilities at basement level alongside bar and lounge areas.

The proposed restaurant will be overlooked by residential and mixed-use premises from the south, commercial offices to the north/east corner and by an adjoining embassy to the north/west corner. The building has direct access to a private courtyard to the east end of the building overlooked by the commercial offices which do not have openable windows.

This document and the supporting drawings describe the main mechanical services plant necessary to enable the property to successfully function under its new use. This report also addresses the design and location of services which may also have a direct consequence on the surrounding buildings and the mitigation taken to negate the effects, more specifically the reduction of odour and pollutants from the kitchen extract ventilation system.

The drawing information sets out the indicative location of the designed mechanical plant at all levels including the courtyard and the interconnecting service routes required for the operation of the restaurant. It is important to note that the plant locations are subject to the agreement/approval of a structural engineer and the production of structural solutions.

1.2 Guidance And Advice

The requirements in the document, *'Guidelines for the control of odour from commercial kitchen extract ventilation systems'* produced by Westminster City Council, have been taken in to consideration in the selection and space planning of the proposed mechanical services.

The proposed kitchen extract plant shall comply with both *'Standards for Approved Recirculation Schemes; Section 3'* within the above document and Building Engineering Services Association document, *'Specification for: Kitchen Ventilation Systems; DW/172; Second Edition 2018; Section 25'*.

2 Description Of Services

2.1 Kitchen Ventilation

The indicative general arrangements propose 1No kitchen at basement level which will primarily be made-up of electric cooking equipment under an extract canopy of 5m x 1.2m in dimension. Therefore, using 'DW172 Section 5.5, Method 2 - Face Velocity', the maximum extract volume flow rate would be 3m³/s, calculated from the canopy area multiplied by the face velocity of 0.5m/s for heavy loading. It is proposed that a recirculation type ventilation unit will be installed, as approved by City of Westminster, providing a flow rate 2.25m³/s to recirculate and filter the exhaust products from the cooking processes removing the need to extract to atmosphere. Further consideration will be required regarding the size of the canopy should charrilling type cooking processes be required, a dimension of 5m x 1.5m will be more suitable.

The kitchen will be provided with additional ventilation for occupant comfort consisting of extract to provide an air change rate of 10ACH with make-up supply air at 85% to keep the kitchen under negative pressure. Additionally, extract will be required from the kitchen ancillary areas e.g. separate dishwash and food preparation areas, and the estimated extract rates have been calculated on air change rates of 30 & 20ACH respectively taken from 'DW172 2018 Section 3.15' and again make-up supply air will be provided at 85% to keep these areas under negative pressure.

It is anticipated that the required canopy and ancillary areas shall be served by 1No extract recirculation system, 1No general extract system and 1No supply make-up air system providing 85% of extract and shall consist of the following:

Kitchen Extract Recirculation System

- * Extract canopy c/w baffle filters
- * Purified Air/Reco-Air recirculating kitchen extract unit, as approved by the City of Westminster.

Extract System Incorporating:

- * High efficiency direct drive extract fan and filters
- * Atmospheric side attenuation to reduce noise levels created by and within the extract system
- * Discharge plenum & louvre

Supply System Incorporating:

- * High efficiency direct drive supply fan and filters
- * Low temperature hot water heating coil to temper the incoming air, LTHW circuit to be provided by boiler plant at basement level
- * DX cooling coil to cool incoming air
- * Atmospheric side attenuation to reduce noise levels created by and within the supply system
- * Intake plenum & louvre

During the detailed design stage consideration will be given to the opportunity for heat recovery by either air-to-air or air-to-water, with due consideration given to maintenance, operational aspects and practicality of the installation.

2.2 General Supply & Extract Ventilation

The supply of fresh air and extraction of stale air will be provided in the form of mechanical supply and extract ventilation systems. The estimated occupancy levels and subsequent volume flow rates have been calculated based on 10 litres a second per person taken from 'CIBSE Guide A; Environmental Design; Table 1.5 - Recommended Comfort Criteria; General Building Areas - Restaurants' and a maximum of 3m² floor area per person taken from 'CIBSE Guide A; Environmental Design; Table 6.2 - Benchmark allowances for internal heat gains in typical buildings; Leisure - Restaurants & Bars', therefore the resultant volume flow rates have been calculated:

Table 1: Occupancy Levels

Level	Room	Room Area	Occupancy (Covers/People)
Basement	Bar	55m ²	20
Basement	Vault Lounge Bar	42m ²	14
Basement	Seating	12m ²	4
Basement	Seating	30m ²	10
Ground Floor	Restaurant & Bar	200m ²	70
Mezzanine	Restaurant	60m ²	25
First Floor	Restaurant	60m ²	25

The main ground floor restaurant will be served by separate supply and extract air handling units, located in the basement ventilation plant room and pitched roof void respectively, the system will utilise displacement ventilation with fresh air introduced at low level and stale air removed at high level. During the detailed design stage consideration will be given to the opportunity for heat recovery between the air flows, with due consideration given to maintenance, operational aspects and practicality of the installation.

The basement bars & seating areas will be served by an AHU located within the basement ventilation plant room, providing both supply and extract ventilation, whilst a small heat recovery unit will serve the mezzanine & first floor restaurants located at first floor level in a purpose-built service void. All systems will have atmospheric and room side duct mounted attenuators to reduce break-out and duct generated noise.

2.3 Toilet Extract

The extraction of stale air from WC's will be provided by local twin fan extract units and ducted to the external. The estimated extract flow rates have been calculated based on the recommended >5 air changes per hour taken from 'CIBSE Guide A; Environmental Design; Table 1.5 - Recommended Comfort Criteria; General Building Areas - Toilets', therefore the resultant extract rates have been calculated:

Table 2: WC Extract Rates

Level	Room Volume	Extract Rate
Basement	45m ³	100 l/s
Basement	30m ³	70 l/s
Basement	45m ³	100 l/s
Ground Floor	21m ³	50 l/s
Ground Floor	26m ³	60 l/s
First Floor	15m ³	35 l/s

2.4 Space Heating & Cooling

Heating and cooling for the restaurant and bar areas will be provided by a refrigerant based VRF system with the outdoor units situated within the external courtyard and local indoor fan coil units. Estimated cooling loads have been based on the information from '*CIBSE Guide A; Environmental Design; Table 6.2 - Benchmark allowances for internal heat gains in typical buildings; Leisure - Restaurants & Bars*', therefore the estimated cooling load for the occupied areas is 61kW.

Supplementary background heating to welfare facilities and circulation spaces will be provided by electric panel heaters. The gas fired boiler(s) will provide low temperature hot water to heating coils within the air handling plant to temper incoming fresh air.

2.5 Domestic Hot Water

The generation of domestic hot water will be provided by a direct gas fired water heater located at basement level, this will serve the kitchen, bars and WC's at basement level, bar and WC's at ground floor level and WC at first floor level.

The estimated hot water requirement has been calculated based on the recommended 6 litres per cover taken from '*BSRIA Rules of Thumb 5th Edition; Table 22 - Maximum daily hot water demand - Restaurants*', with a recovery period of 1 hour and takes in to consideration the number of occupants using the bar areas and the hot water demand of the WC's. Using Table 1 the estimated peak demand of water is 1200 litres per hour.

2.6 Cold Stores

There will be 2No packaged cold stores at basement level, 1No for the storage of meat & fish and 1No for the storage of fruit & veg. Each store will be served by an external condensing unit situated within the courtyard. The interconnecting refrigeration pipework shall drop from the courtyard within the external lightwell to the basement level.

2.7 Acoustics

At this stage acoustic surveys have not been undertaken at the site, however, as part of the detailed design process a full external noise survey will be carried out and all final equipment will be selected to comply with local planning restrictions and requirements, typically 10dB below existing ambient levels. It is also expected that the acoustic strategy will be conditioned as part of the planning proposal.

Atmospheric side attenuators will be installed on the supply and extract systems as a minimum to reduce ductwork generated and breakout noise from the fans during operation.

If additional noise reduction is required low noise strategies such as night-time set-back will be utilised where possible to reduce noise out of operating hours and the use of increased acoustic performance plant with regards to the construction of fan and AHU casings will be specified.

3 Supporting Documents

The following documents have been produced to support this strategy:

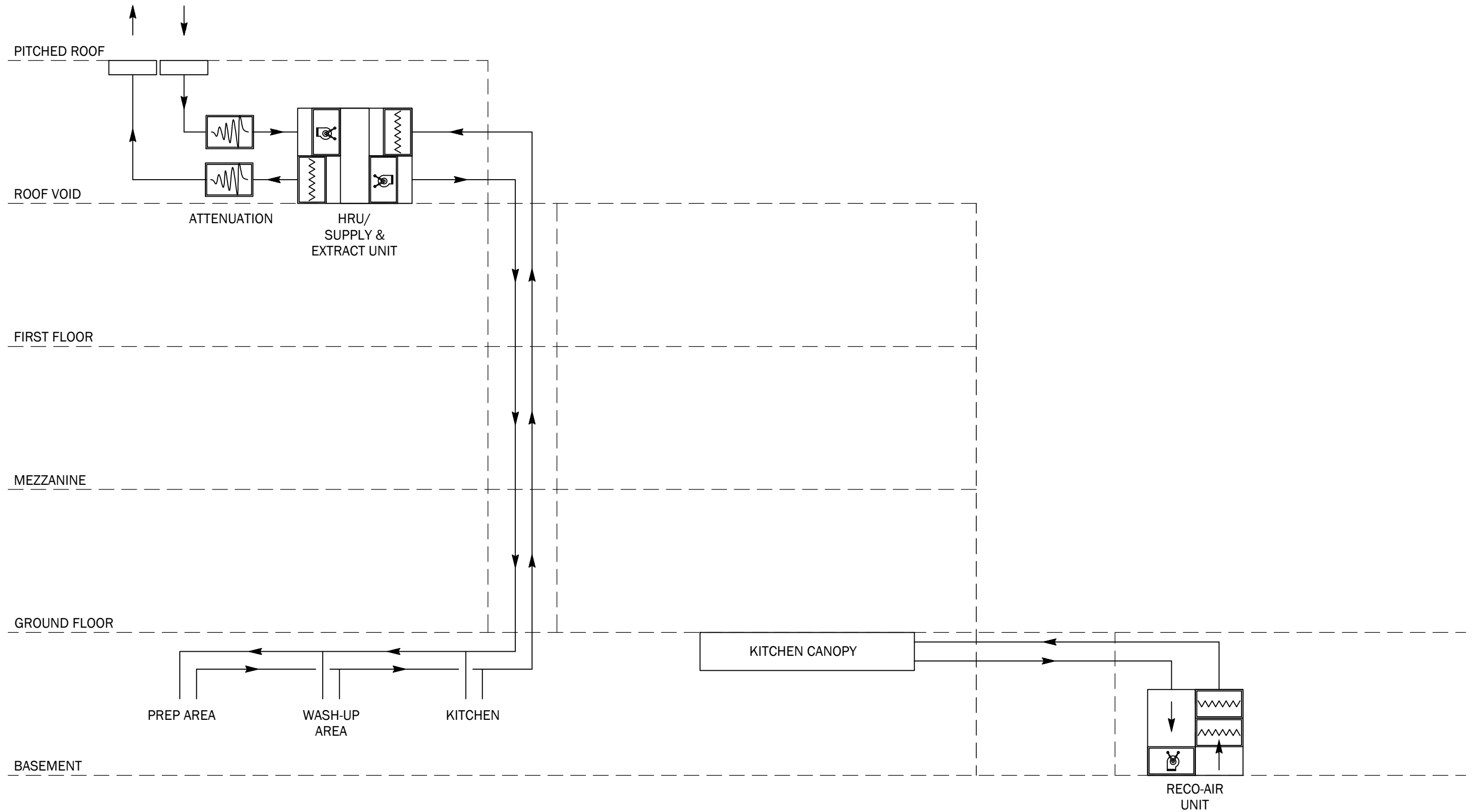
- * Indicative Plant Selections
- * Proposed Plant Location & Service Routing Layouts and Schematics

4 Appendix

4.1 Appendix 1 - Indicative Plant Selections

Plant Item	Manufacturer	Model Reference
Kitchen Recirculation Unit	Reco-Air	RA 2.5
Kitchen Heat Recovery Unit	VES	Ecovent
General Ventilation Main Hall	AHS	Bespoke
General Ventilation Basement	AHS	Bespoke
General Ventilation FF	VES	Ecovent
Toilet Extract GF & FF	Nuaire	Opus 100 - 2M
Toilet Extract Basement	Nuaire	AVT3
VRF Outdoor Unit	Mitsubishi Electric	PURY-P600YSLM-A1
Boilers	Remeha	Quinta Pro
Water Heater	Andrews Water Heaters	MAXXflo
Cold Room Condenser 1	Specialist	TBC
Cold Room Condenser 2	Specialist	TBC

4.2 Appendix 2 - Accompanying Drawing Information



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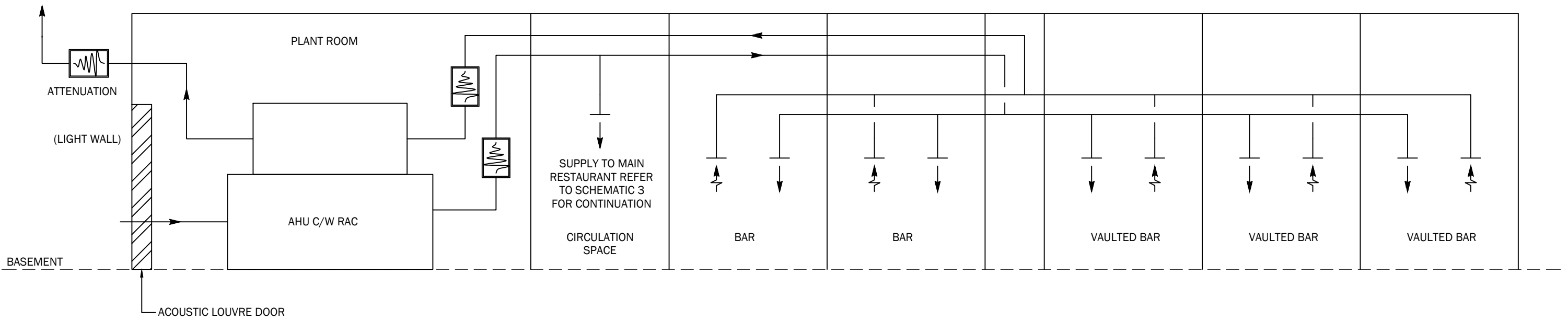
Notes:

2	28/06/21	Variation Client Issue
1	Jul '18	Kitchen Extract Strategy Revised

Client	OSEL Architecture
Project	1 Cavendish Square

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 Status **Information Only**

Drawing title Schematic 1/A; Kitchen Ventilation			
Drawn CAD	Engineer BM	Approved DW	Date origin FEB '18
Scale @ A3 NTS	File/BIM ref -		
Drawing number XXX			Revision 2



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Notes:

2 28/06/21 Variant Client Issue

Client
 OSEL Architecture

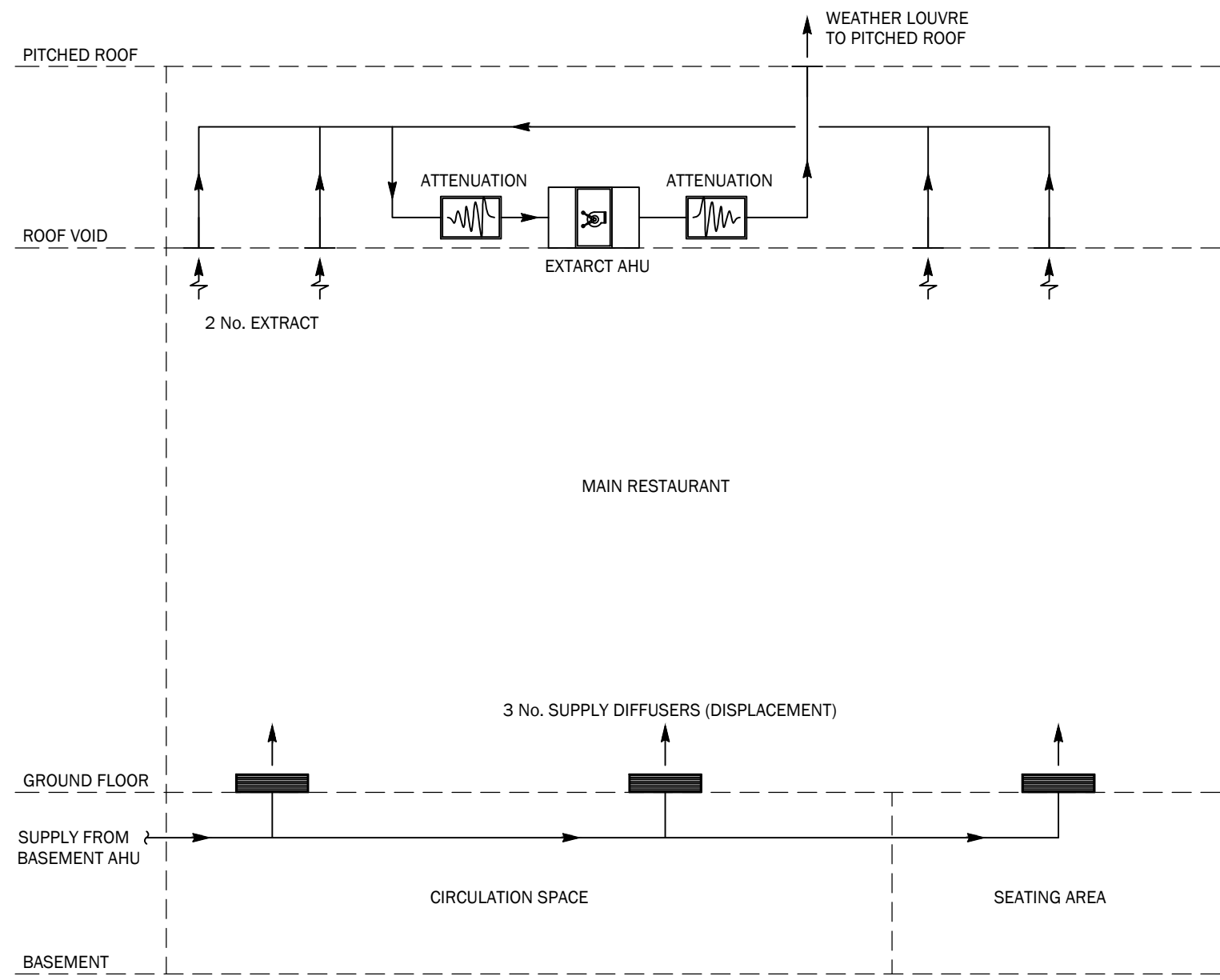
Project
 1 Cavendish Square

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Status
 Information Only

Drawing title
 Schematic 2/A;
 Basement Ventilation

Drawn CAD	Engineer BM	Approved DW	Date origin June'21
Scale @ A3 NTS	File/BIM ref -		
Drawing number XXX	Revision		2



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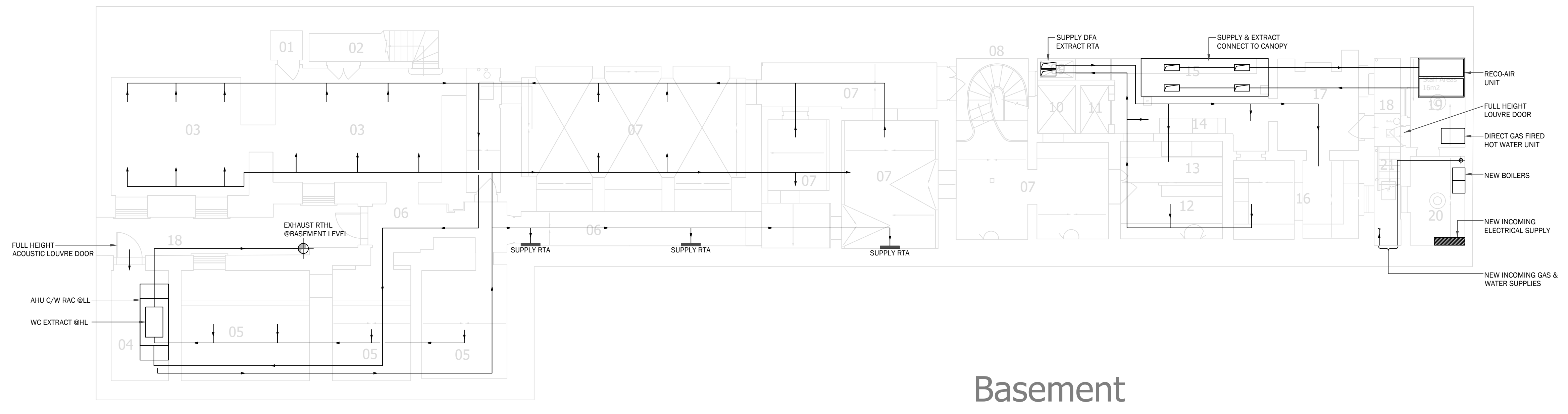
2	28/06/21	Variant Client Issue
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Client	OSEL Architecture
Project	1 Cavendish Square

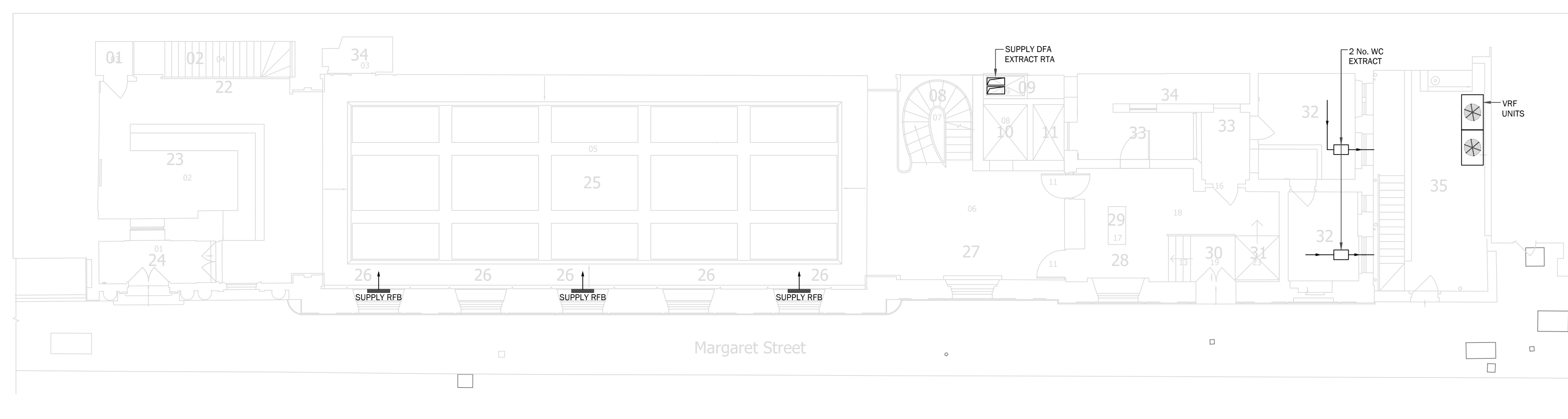
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Drawing title: Schematic 3/A; Main Restaurant Ventilation			
Drawn: CAD	Engineer: BM	Approved: DW	Date origin: June'21
Scale @ A3: NTS	File/BIM ref: -		
Drawing number: XXX	Revision: 2		

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Basement



Ground

Ground

2	28/06/21	Variation Client Issue	BM	BM
1	Jul '18	Kitchen Extract Strategy Revised	-	-
Rev	Date	Description	Drn	Chkd

Status: Information Only

Client: OSEL Architecture

Project: 1 Cavendish Square

Drawing Title: MEPH Services Strategy Basement & Ground Floor Layout

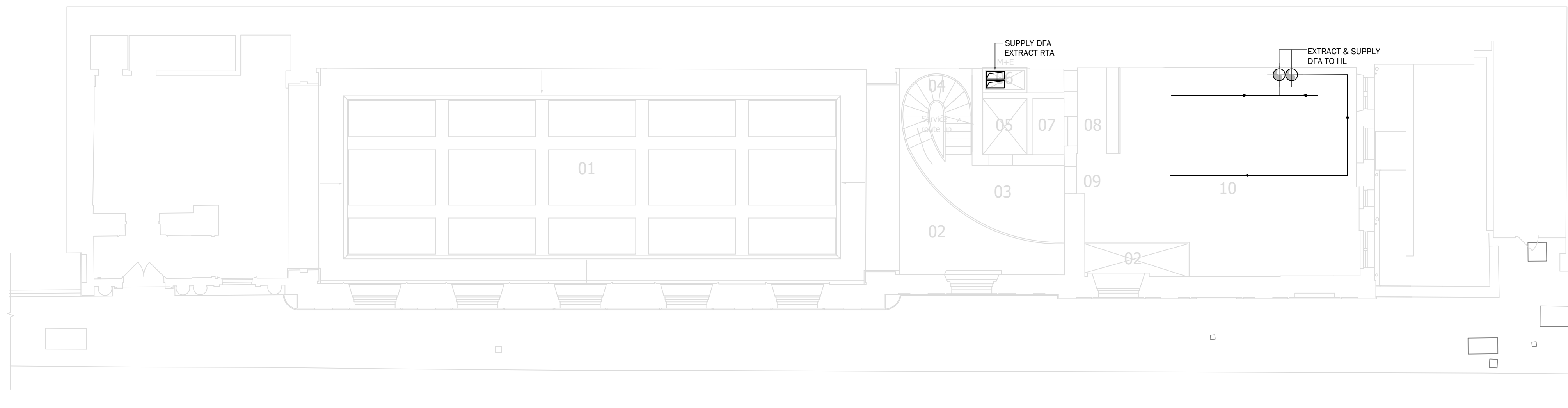
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Drawn	Engineer	Checked	Date origin
CAD	BM	DW	Feb '18

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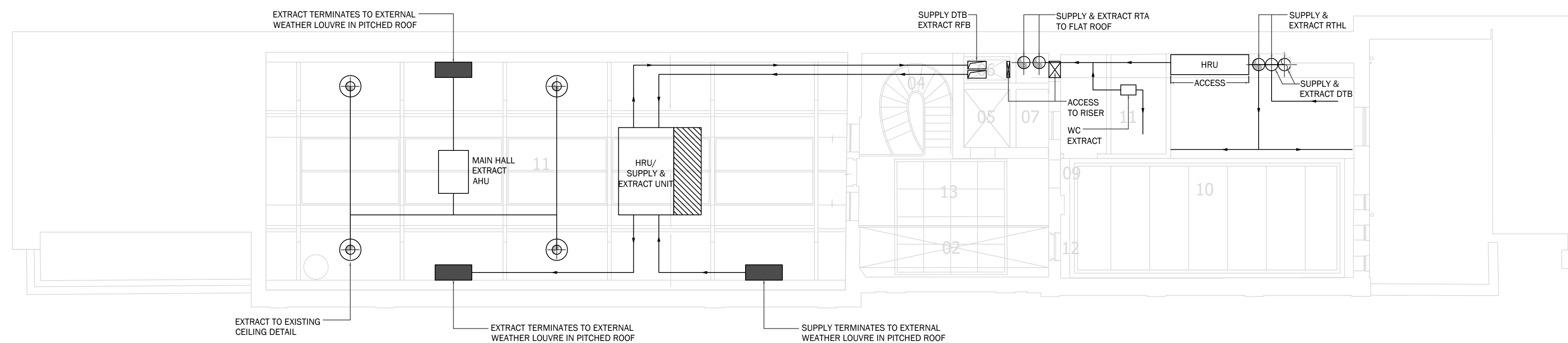
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 Notes:



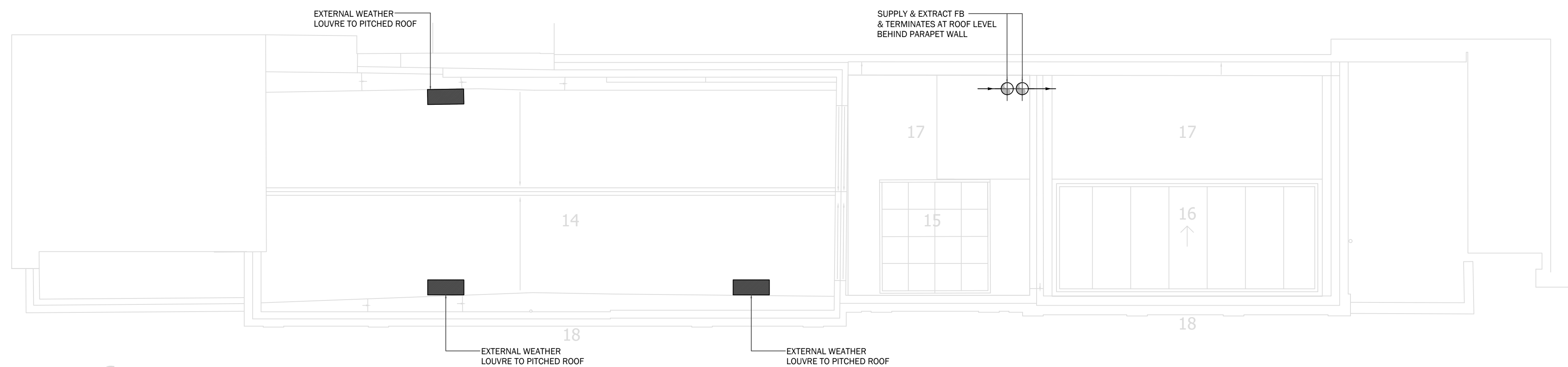
Mezzanine

Mezzanine



First

First



Roof

Roof

Rev	Date	Description	Drn	Chkd
2	28/06/21	Variation Client Issue	BM	BM
1	Jul '18	Kitchen Extract Strategy Revised	-	-

Status	Information Only
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Client	OSEL Architecture
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Drawing Title	MEPH Services Strategy Mezzanine, First Floor & Roof Layout
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CAD	BM	DW	Feb '18

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Sheet number	Revision
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