



Space House

Planning Condition Discharge Report

Conditions 3LBC m)

For Seaforth Land

November 2022

Document History

Rev	Date	Purpose of Issue	Author	Reviewer
A	04/11/22	Planning Condition Discharge	MPa	CW

Contents

1.0 Introduction

1.1 Purpose of the Report

2.0 Planning Condition 3LBC m)

2.1 Summary of services general strategy

2.2 Existing and proposed risers

2.3 Details of services

2.4 Equipment specifications

3.0 Appendices

1.0 Introduction

1.1 Purpose of the Report

This document has been prepared by Squire and Partners to provide support information for the discharge of Condition 3LBC m) pursuant to listed building consent ref: 2022/3271/L, dated 8 September 2022 in relation to the approved development at Space House (refs: 2021/1058/P and 2022/3271/L).

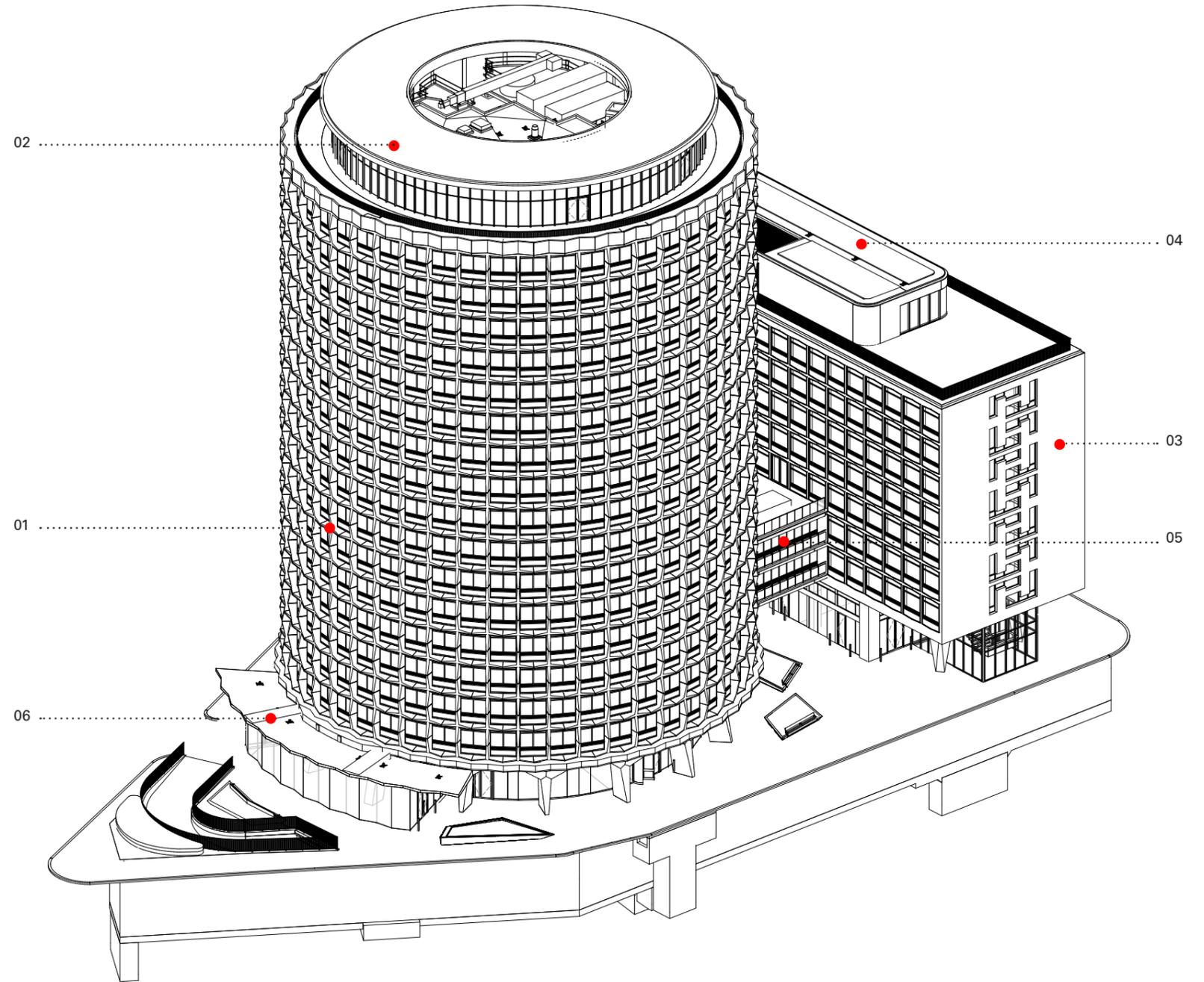


Fig. 1.0.1 Space House Axonometric

- Key:
- 01. Tower building
 - 02. Tower extension
 - 03. Kingsway building
 - 04. Kingsway extension
 - 05. Bridge-Link
 - 06. Western Canopy (Filling Station)

2.0 Planning Condition 3LBC m)

“Detailed drawings, or samples of materials as appropriate, in respect of the following, shall be submitted to and approved in writing by the local planning authority before the relevant part of the work is begun:

m) All new services, including BWIC, risers, pipework, cabling, air handling equipment, extracts, louvres, sprinklers, health and safety equipment, and communications technology equipment.

The relevant part of the works shall be carried out in accordance with the details thus approved and all approved samples shall be retained on site during the course of the works.”

2.1 Summary of services general strategy

The services detailed here are landlord services that form the base-build. The retail tenants will need to provide their own ventilation units connected to the provided louvres and their own terminal units for heating, cooling connected to the landlord central plant. The office tenants may undertake additional fit out related to meeting or server rooms.

Fig 2.1.1 shows the strategy overview for the Mechanical, Electrical and Public Health (MEP) services and environment strategy within Space House. Below is a brief description of the MEP design strategy for the various areas.

1. Heating, comfort cooling and ventilation will be provided to all occupied areas.

2. Four air source heat pumps (ASHP) are the heating & cooling energy sources to provide 1.74 Mega Watts (MW) heating and 2.2 MW cooling for Space House. Each ASHP comprises of 2 refrigeration circuits and each circuit can operate individually, which means if one of the circuits are faulty, the other circuits can still be operational.

3. Low Temperature Hot Water (LTHW) and Chilled Water (CHW) generated by the heat pumps will be circulated to the low loss headers in the basement, then distributed to each area to provide space heating and comfort cooling.

4. Office areas are scheduled to be open plan, with significant amounts of glazing. Active chilled beam are employed throughout the office areas to serve comfort cooling and heating, with the exception of the top floors in Tower and Kingsway where perimeter trench heating shall be used to provide heating and active chilled beams to provide comfort cooling. This solution provides high thermal comfort level within the occupied space whilst reducing energy usage.

5. The Tower & Kingsway receptions will be heated via underfloor heating and cooled via Fan Coil units at high level.

The service strategy described here aligns with the ‘Retail Units Ventilation Strategy Statement’ Rev 01 dated 23.02.2021.

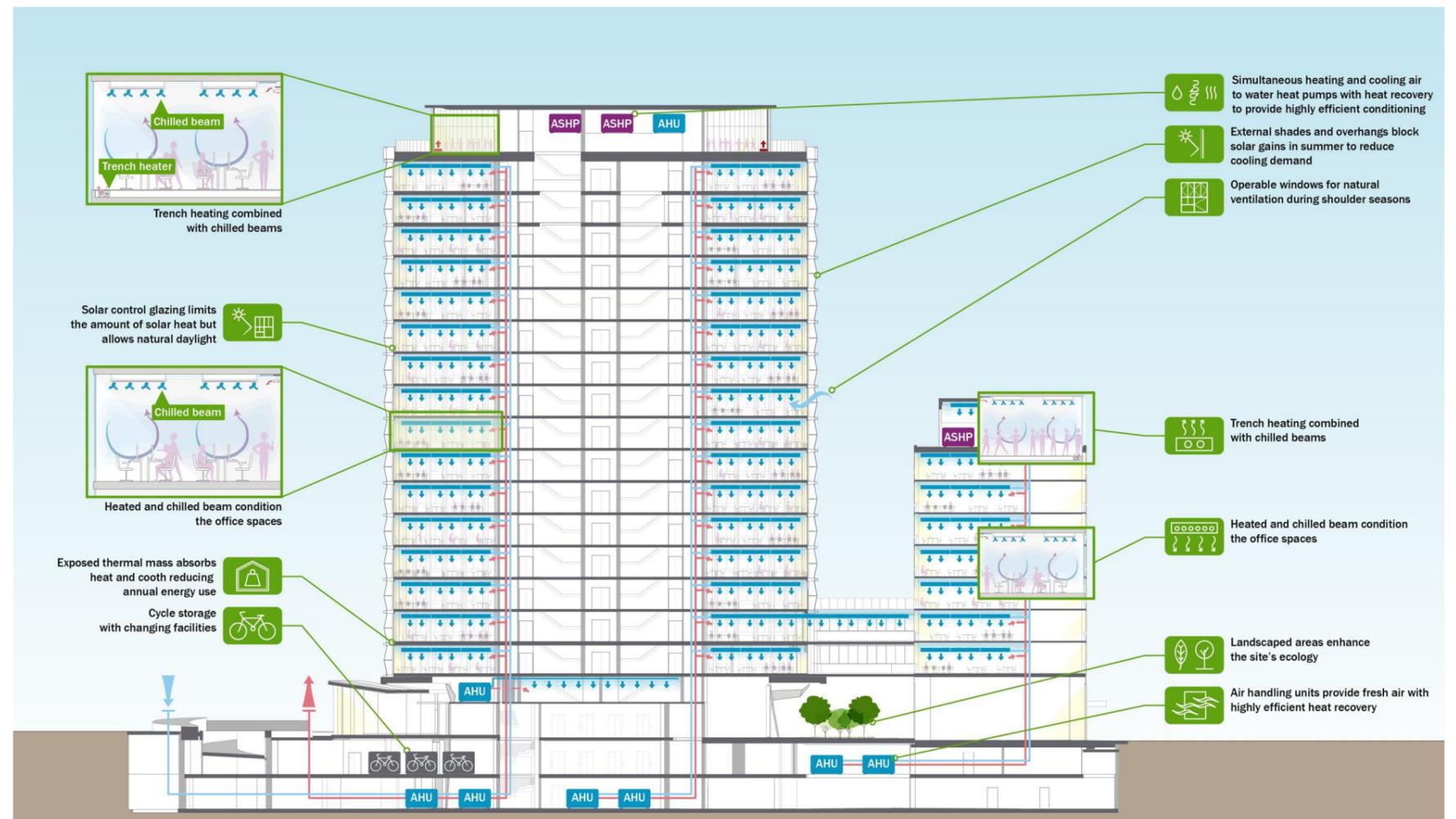


Fig 2.1.1 Summary of environment strategy

Figure 2.1.2 illustrates the heating & cooling outline strategy. Multiple air handling units (AHU) have been selected to provide ventilation to the offices and receptions. EU7 level filters and heat recovery will be provided to all AHUs to maintain the indoor air quality and minimise the heat loss.

As shown in Figure 2.1.2 , AHUs that serves the office areas and Kingsway reception will be located on basement level 1, basement level 2 and Tower roof top. Fresh air will be distributed through the mechanical risers and to the floor via chilled beam, whilst stale air will be extract via a bellmouth located on each floor.

The generator flue will discharge at the highest point of the building, so the Generator flue will be installed from the Generator room located within Basement 2 and rise to the roof level of the Tower, where the flue will discharge to the atmosphere. The existing riser has been used for the generator flue to rise up to roof level.

In Tower, ventilation ducts have re-used existing risers to rise through the building. New risers have been introduced in Kingsway to accommodate ventilation ductworks due to increased ventilation rate in the office to comply with modern building standards.

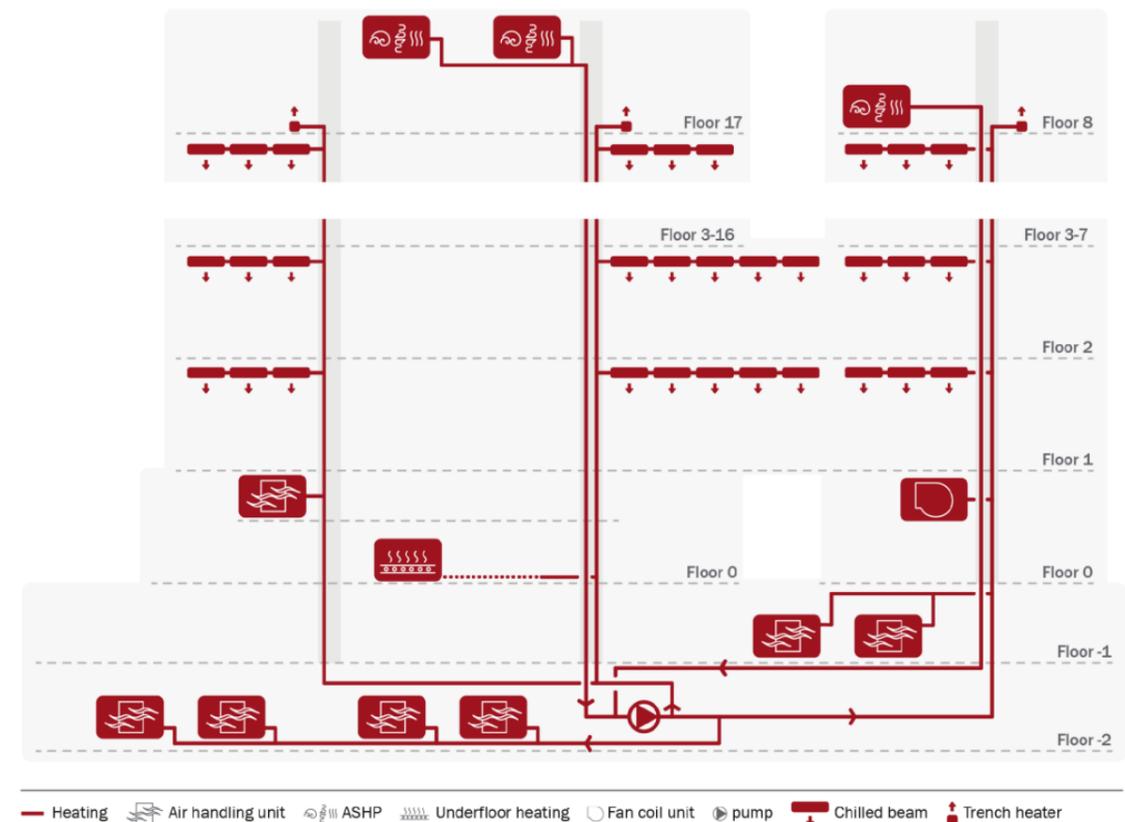
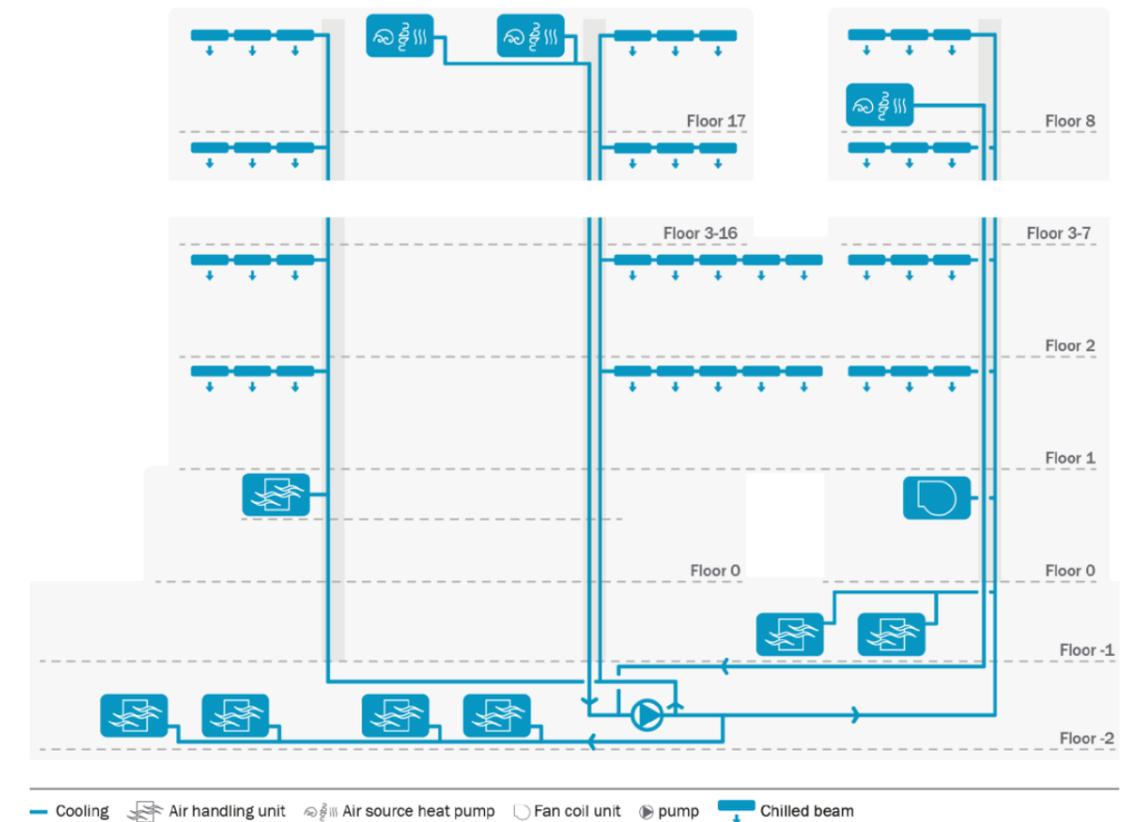


Fig 2.1.2 – Heating (red) & cooling (blue) strategy

2.2 Existing and proposed risers

The following diagrams highlight the risers being used as part of the overall services distribution strategy. The aim was to reuse as much of the existing risers to avoid removing further listed fabric to create new risers openings.

New risers openings were consented under listed building consent ref 2021/1106/L granted 30/09/2021 and planning permission ref 2021/1058/P dated 30/09/2021.

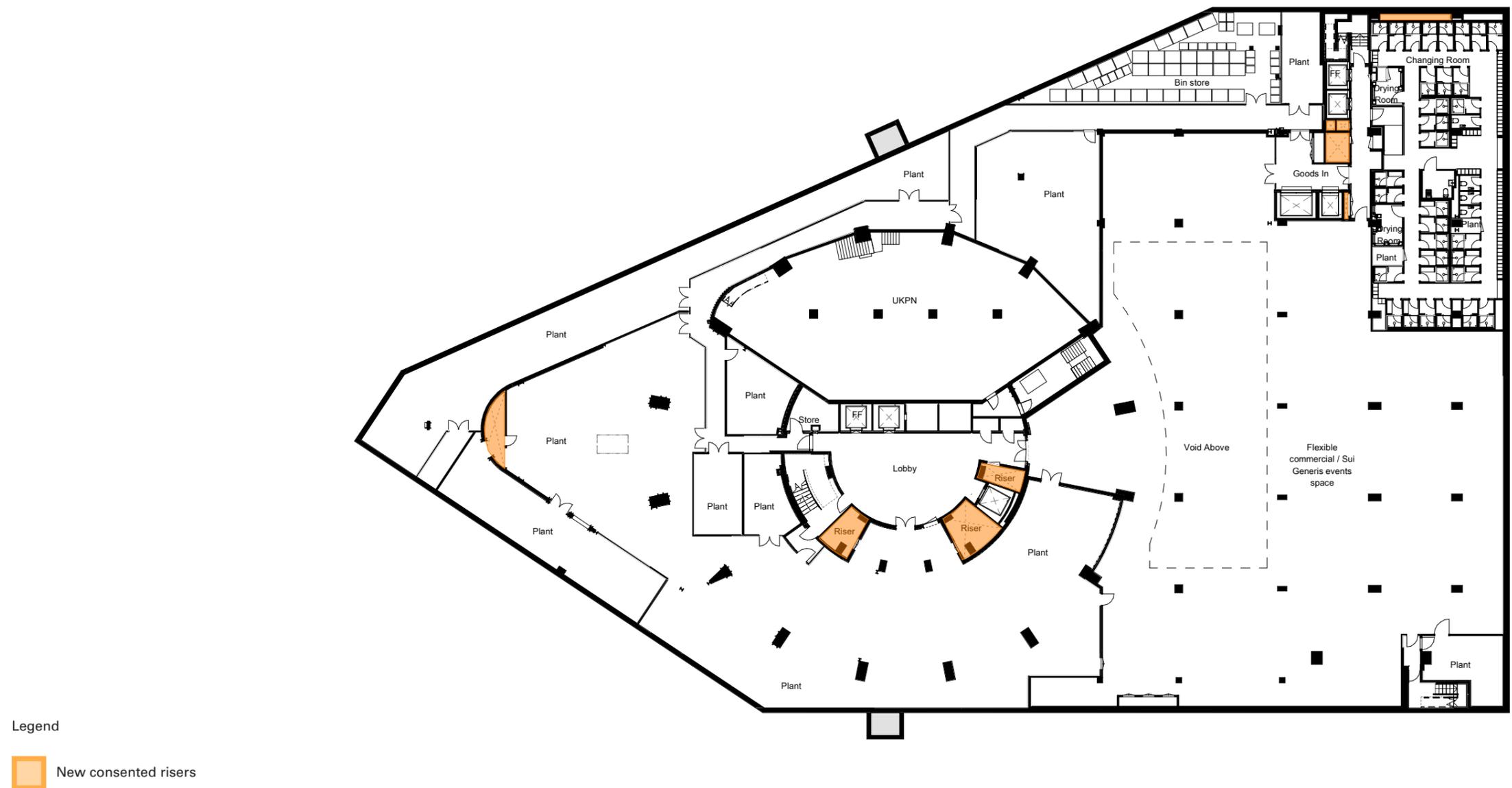
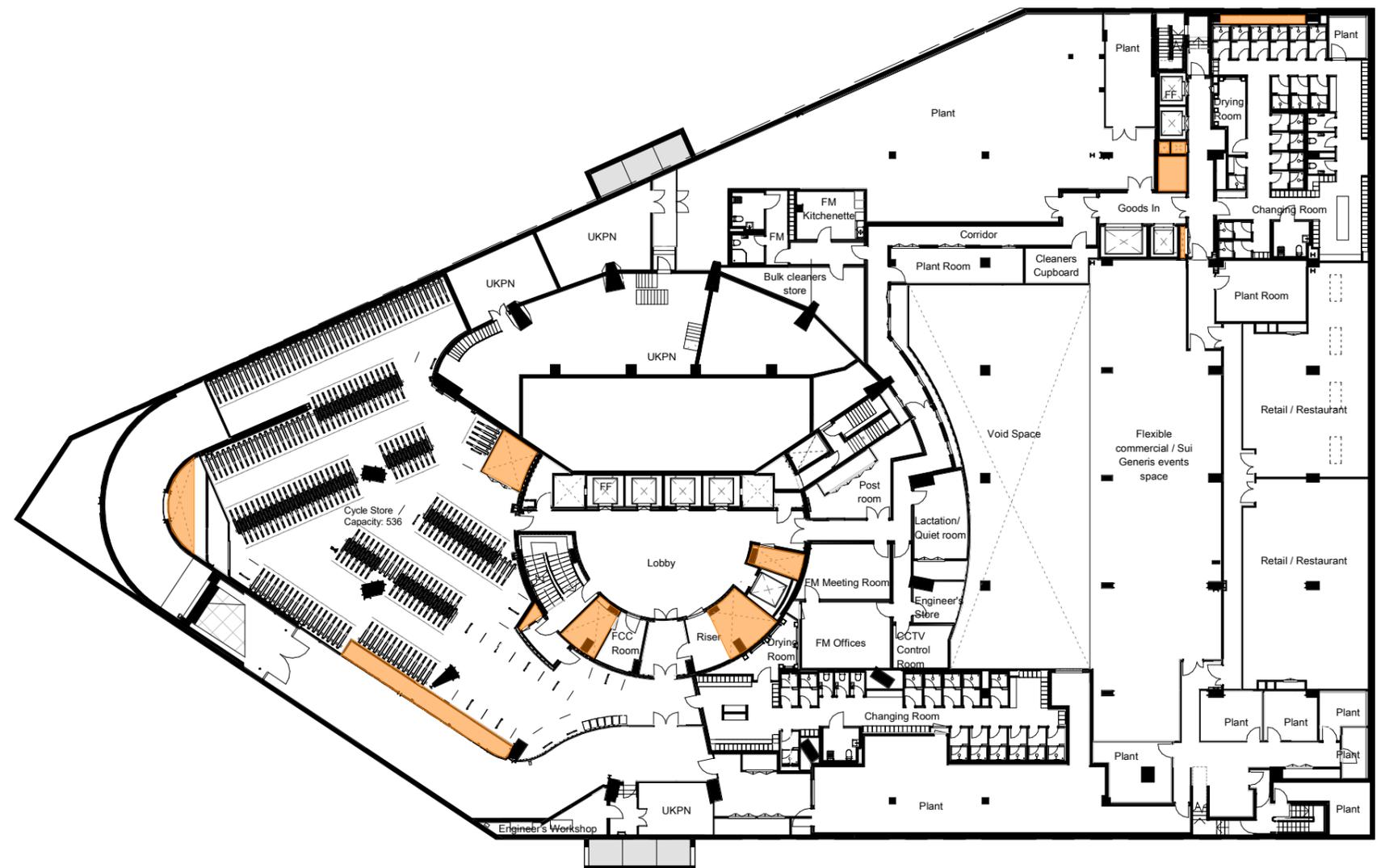


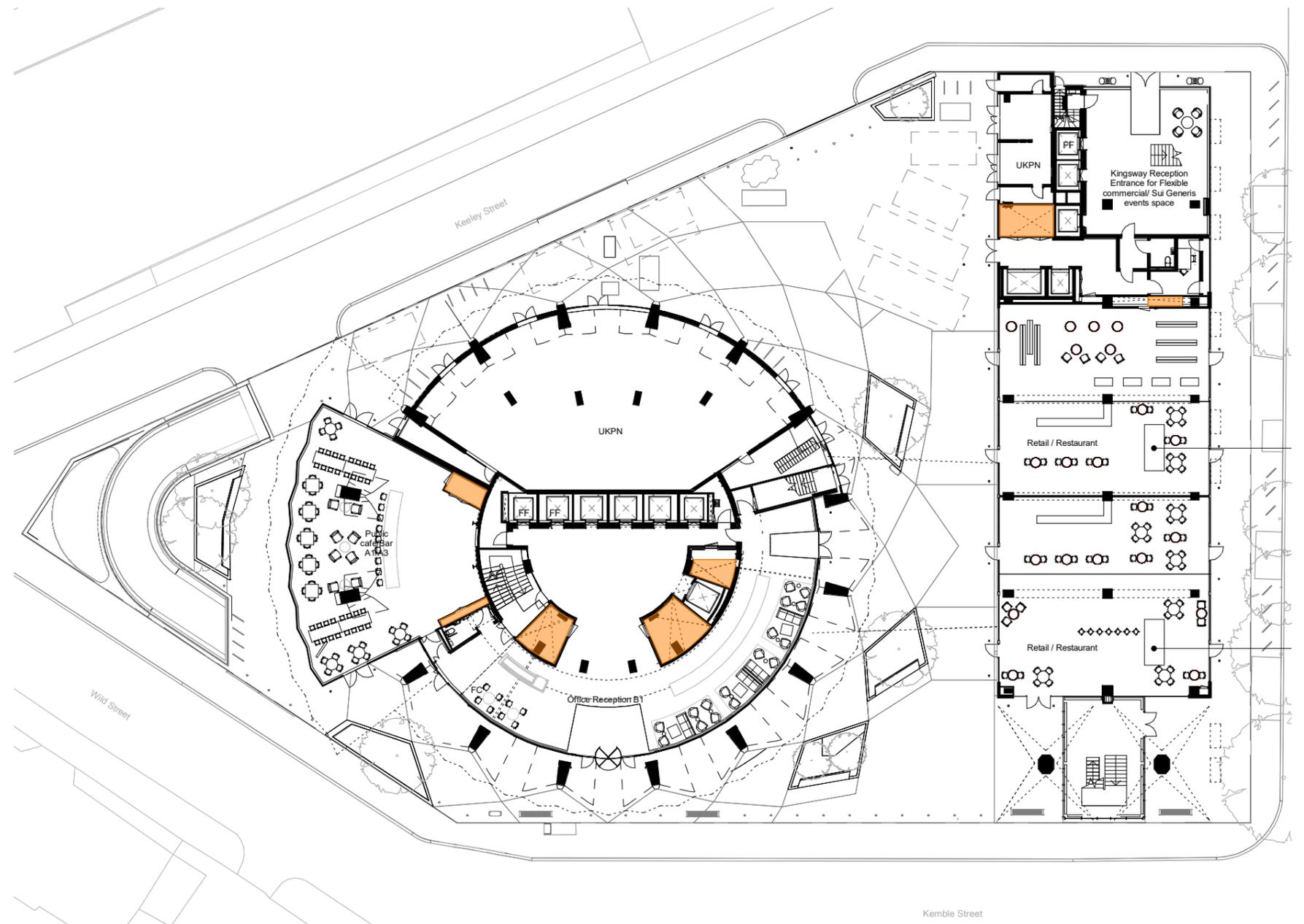
Fig. 2.2.1 Basement level 02 consented plan - risers location



Legend

 New consented risers

Fig. 2.2.2 Basement level 01 consented plan - risers location



Legend
 New consented risers

Fig. 2.2.3 Ground floor consented plan - risers location

Legend

-  New consented risers
-  Existing risers (reused)

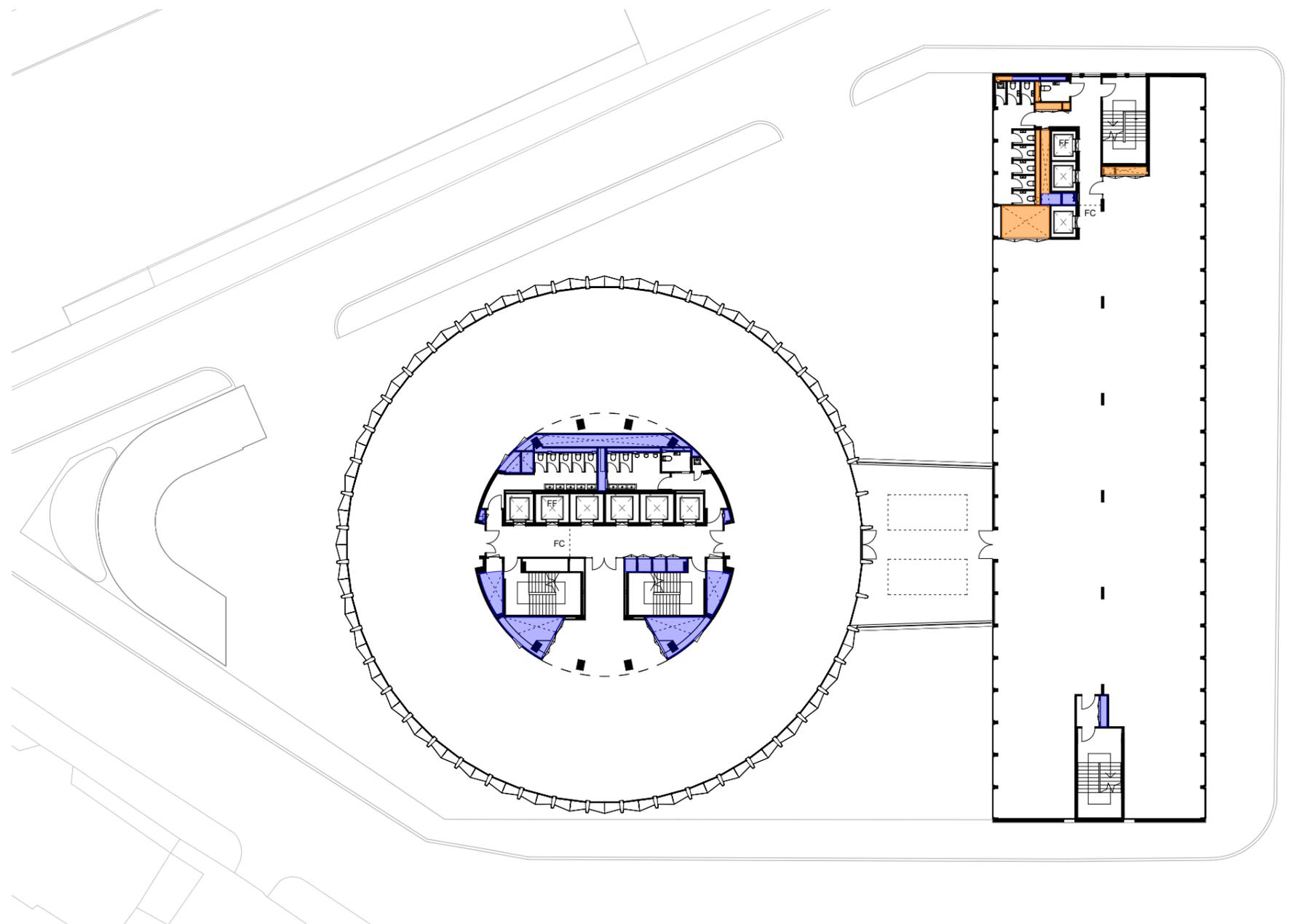


Fig. 2.2.4 Typical office floor consented plan - risers location

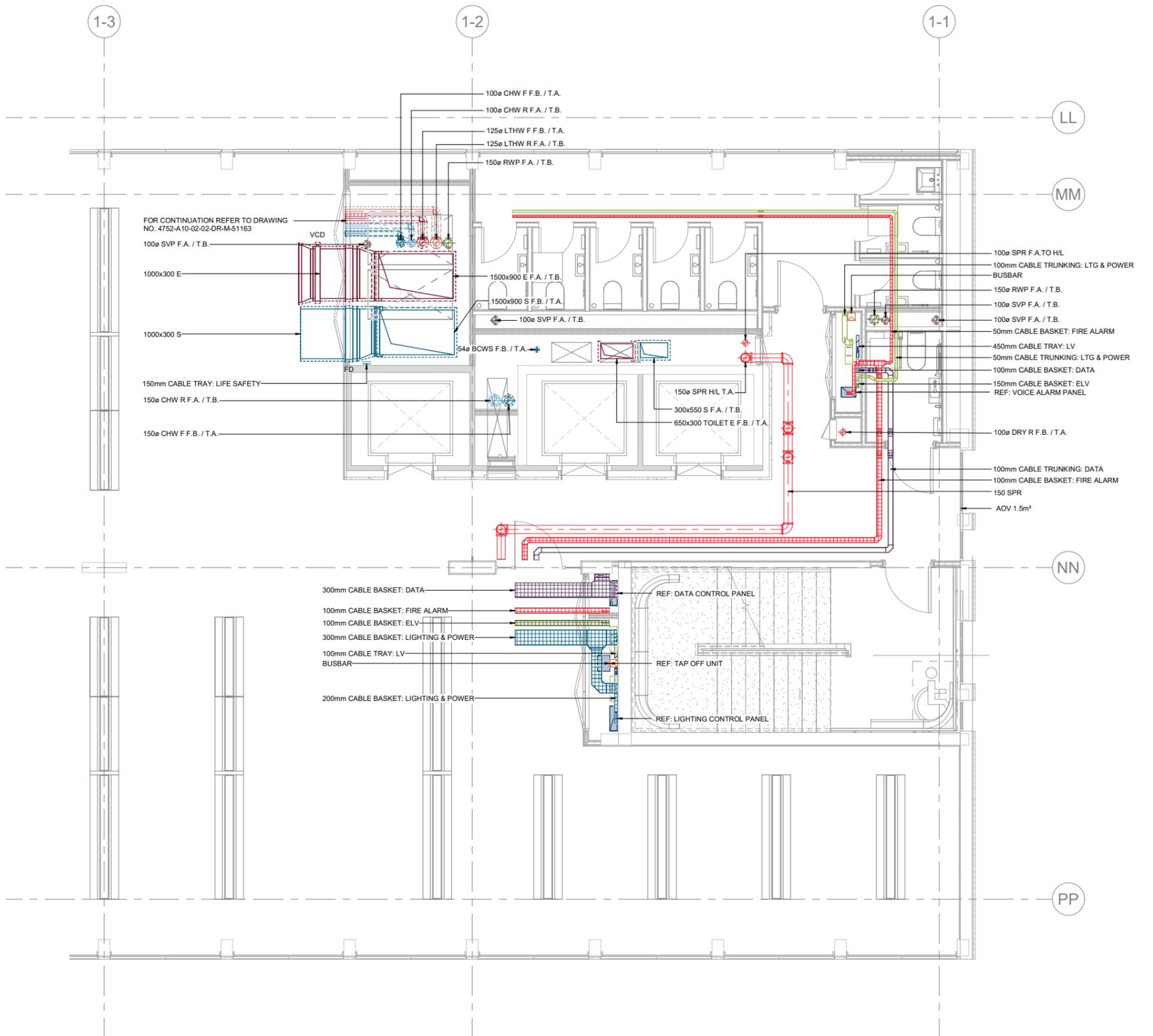


Fig 2.3.2 Kingsway riser layout

2.4 Equipment specifications

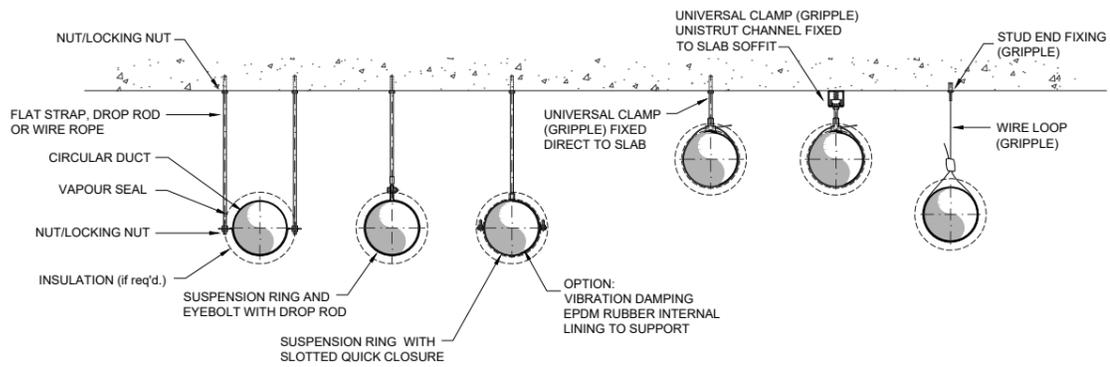
Please refer to Appendix 02 (pages 22-24) for central mechanical equipment schedules.

The equipment schedule has been provided for the air handling units (AHUs) and Air Source Heat Pumps (ASHPs).

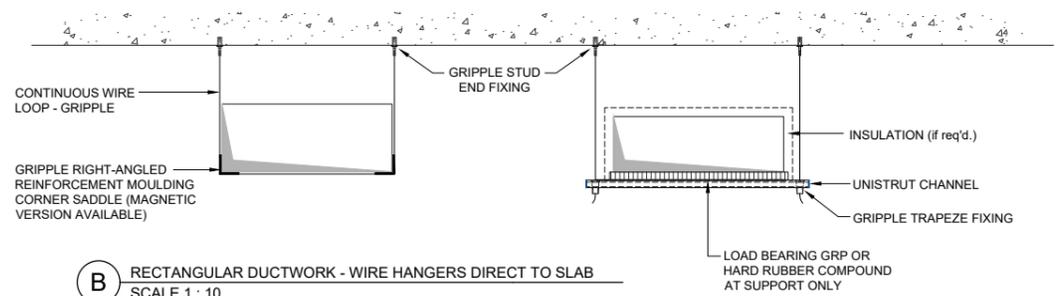
3.0 Appendices

Appendix 01

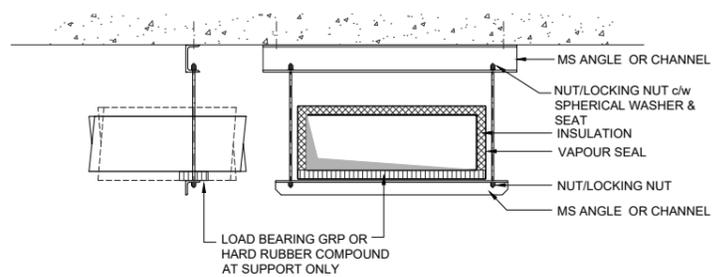
- Services for external spaces (Electrical vehicle charging and bib tap locations for landscape maintenance)
- Typical equipment fixing details



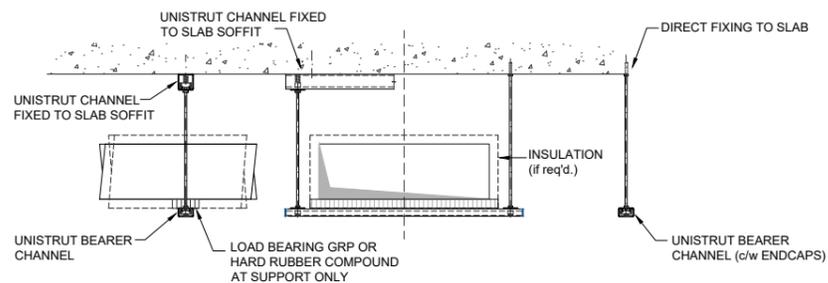
A CIRCULAR DUCTWORK - HANGERS DIRECT TO SLAB
SCALE 1 : 10



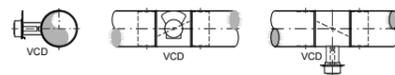
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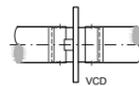
C RECTANGULAR DUCTWORK - HANGERS DIRECT TO SLAB
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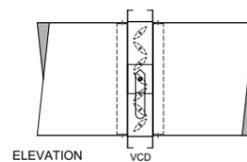
D RECTANGULAR DUCTWORK - HANGERS DIRECT TO SLAB
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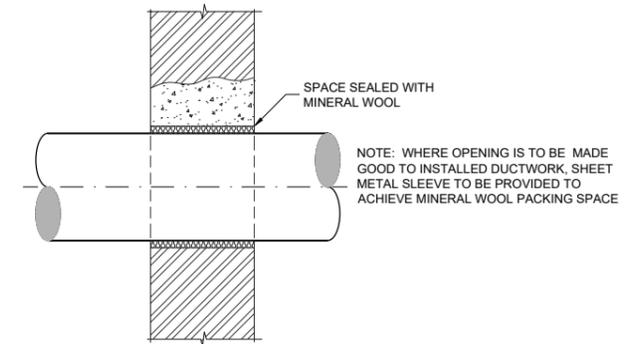
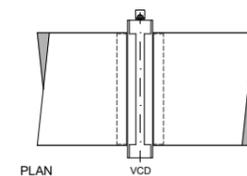
E VOLUME CONTROL DAMPER - FLAP TYPE, CIRCULAR
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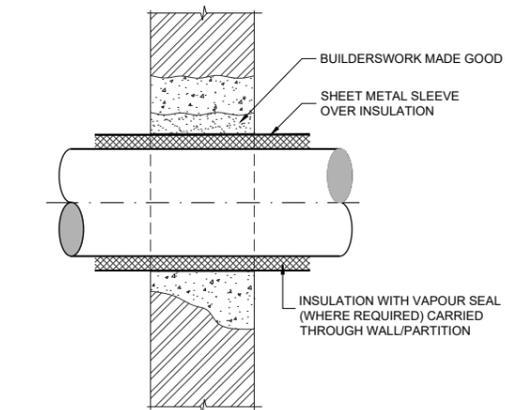
F VOLUME CONTROL DAMPER - IRIS TYPE, CIRCULAR
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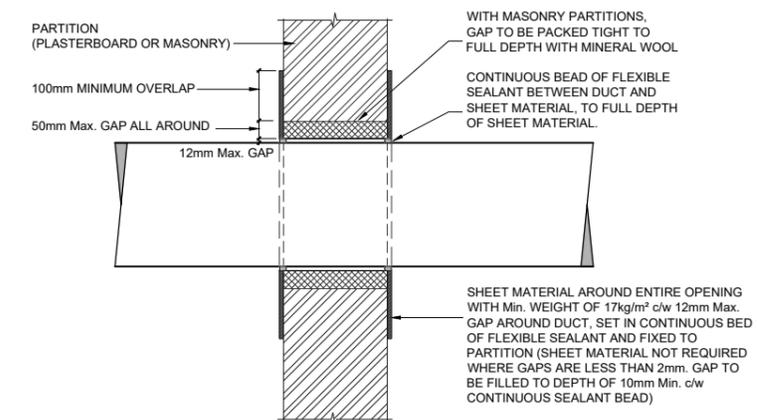
G VOLUME CONTROL DAMPER - BLADE TYPE, RECTANGULAR
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H UNINSULATED DUCTWORK -PASSING THRU' INTERNAL WALL
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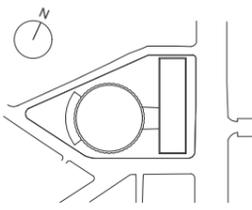
J INSULATED DUCTWORK -PASSING THRU' INTERNAL WALL
SCALE 1 : 10



K DUCTWORK - WALL/PARTITION PENETRATION DETAIL
SCALE 1 : 10

NOTES

1. This drawing must not be used for construction or installation purposes unless expressly stated.
2. Do NOT scale off this drawing. Always work to noted dimensions.
3. All dimensions must be verified on site before completing shop drawings or setting out the work.
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5. This drawing is to be read in conjunction with all architectural and structural engineer's drawings and associated Atelier Ten drawings.



CONTRACT ISSUE

B	CONTRACT ISSUE	29.10.20	FQ	PWJ
A	STAGE 4 ISSUE	02.10.20	FQ	PWJ
Rev.	Description	Date	Chkd.	Apprv.

PROJECT Space House Renovation
ARCHITECT Squire & Partners
JOB NUMBER 4752



TITLE DUCTWORK SUPPORT DETAILS

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DATE October 2020 SCALE As Shown (A1) Rev. B

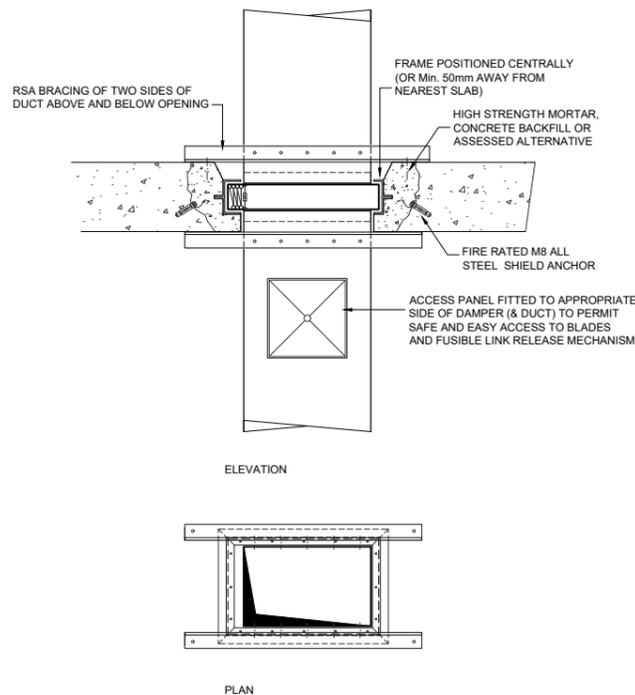
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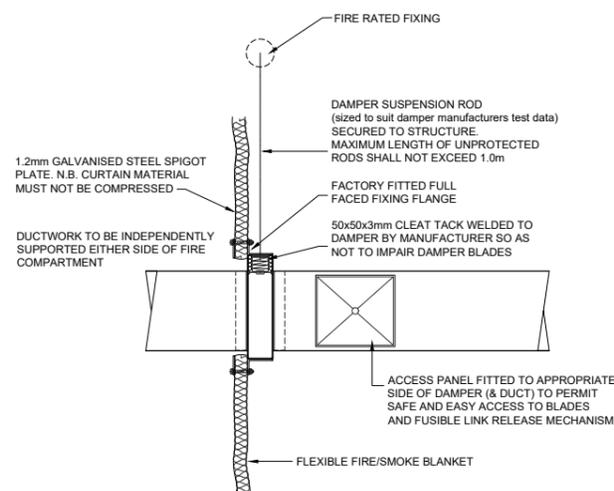
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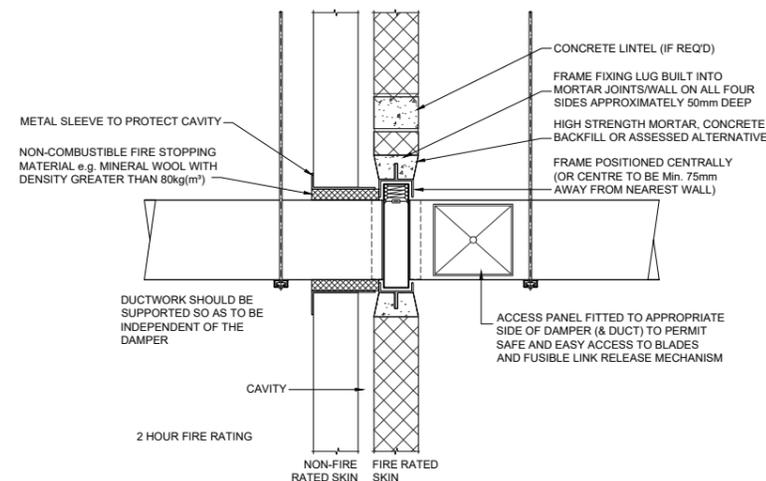
- WHERE DAMPER IS LOCATED IN REINFORCED CONCRETE WALL, THE TABS SHALL BE BENT OUT AND TIED TO REINFORCING BARS WHICH WILL BE DELIBERATELY LEFT PROTRUDING INTO OPENING.
- IN THE ABSENCE OF REINFORCING BARS, STEEL FIXINGS WILL BE FITTED TO SLAB ADJACENT TO BUILDERS TIES (e.g. M8 STUD ANCHORS) AND THE BUILDERS TIES TIED BACK TO STEEL FIXINGS (OR WIRED Min. 1.5mmØ STEEL WIRE).
- THE GAP BETWEEN THE INSTALLATION FRAME AND BUILDERSWORK SHALL BE FILLED WITH HIGH STRENGTH MORTAR OR CONCRETE AROUND THE DAMPER.
- IN NO CASE SHALL THE DAMPER AND FRAME ASSEMBLY BE HELD IN POSITION MERELY BY THE ADJACENT DUCTWORK. DUCTWORK TO BE INDEPENDENTLY SUPPORTED EITHER SIDE OF FIRE COMPARTMENT.
- ACCESS PROVISION MUST BE ALLOWED TO PERMIT JOINTING OF DUCTS TO FIRE DAMPER. IT MAY BE NECESSARY TO INSTALL ACCESS DOORS ON BOTH SIDES OF THE PARTITION SO THAT THE DUCTS CAN BE FITTED FROM INSIDE THE DAMPER.



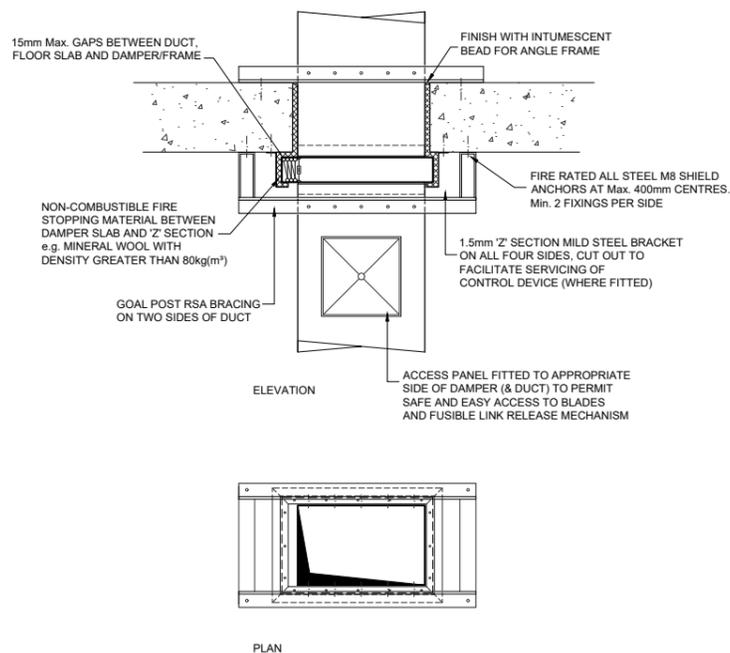
A FIRE SMOKE DAMPER DETAIL - IN CONCRETE SLAB
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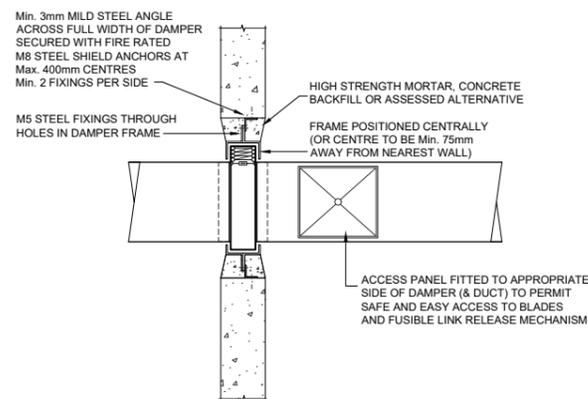
C FIRE SMOKE DAMPER DETAIL - IN FIRE CURTAIN
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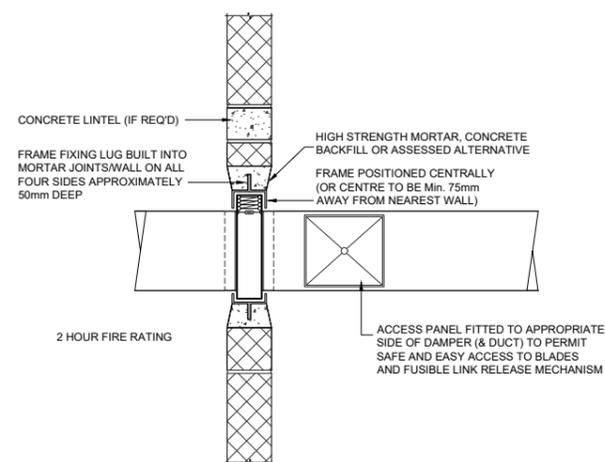
E FIRE SMOKE DAMPER DETAIL - IN MASONRY CAVITY WALL
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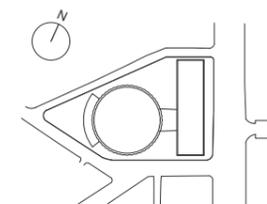
B FIRE SMOKE DAMPER DETAIL - BELOW CONCRETE SLAB
SCALE 1 : 10



D FIRE SMOKE DAMPER DETAIL - IN CONCRETE WALL
SCALE 1 : 10



F FIRE SMOKE DAMPER DETAIL - IN MASONRY WALL
SCALE 1 : 10



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CONTRACT ISSUE

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Rev.	Description	Date	Chkd.	Apprv.

PROJECT Space House Renovation
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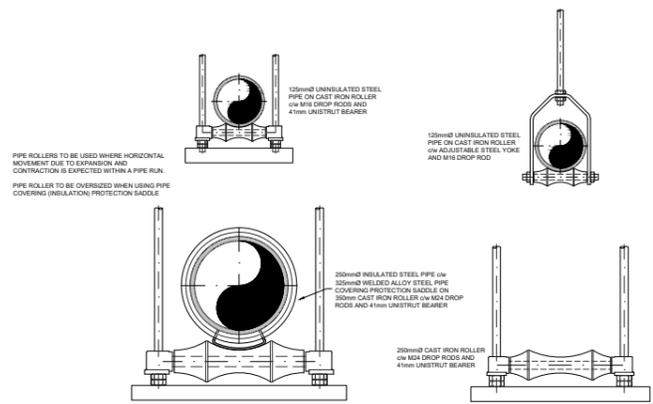
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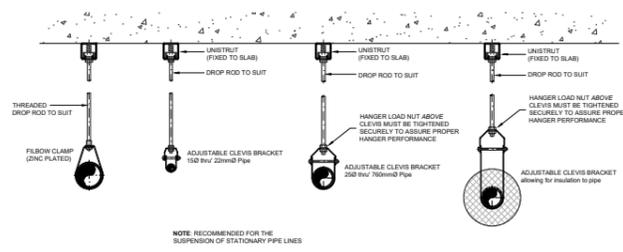
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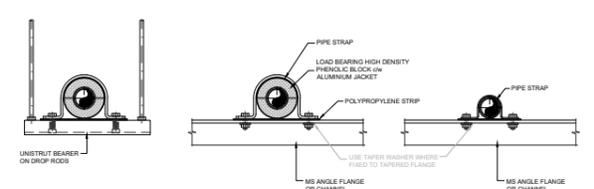
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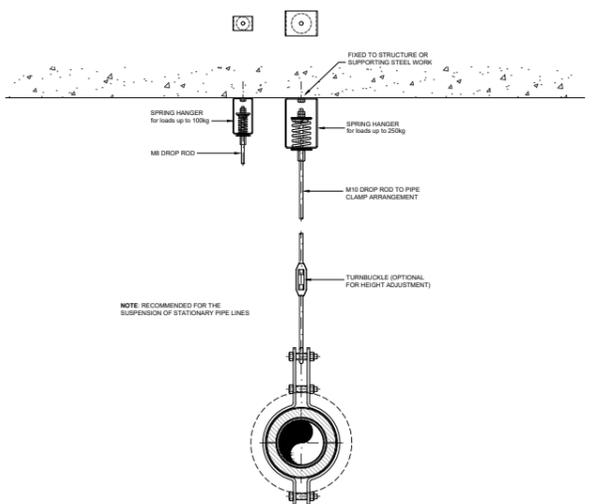
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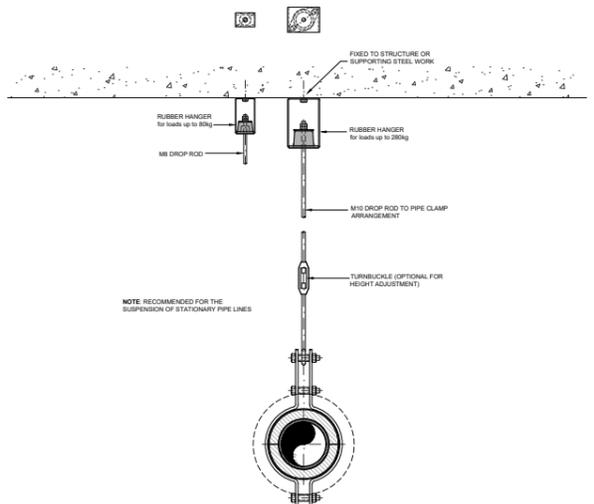
F ADJUSTABLE CLEVIS TYPE PIPE HANGERS
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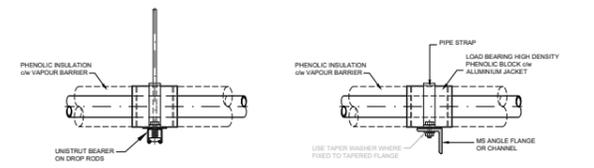
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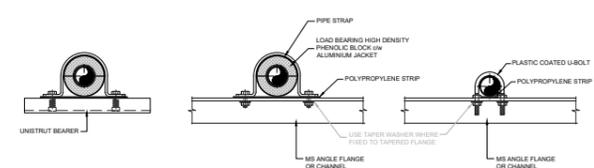
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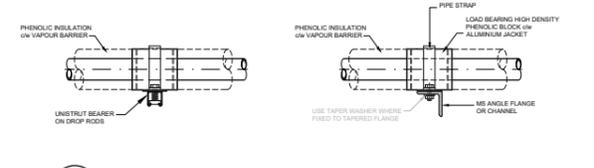
J TYPICAL RUBBER HANGER
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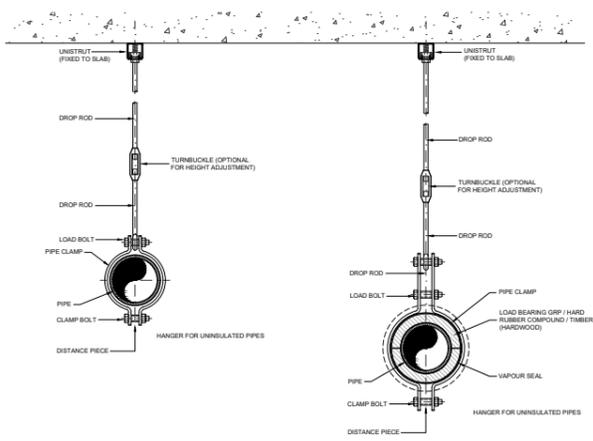
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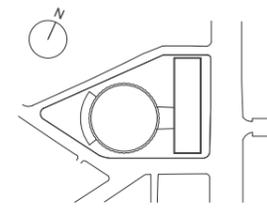
D PIPE SUPPORTS WITHIN TRENCH
SCALE 1 : 5



E PIPE SUPPORTS WITHIN TRENCH
SCALE 1 : 5



H TYPICAL ARRANGEMENT OF PIPE HANGERS
SCALE 1 : 5



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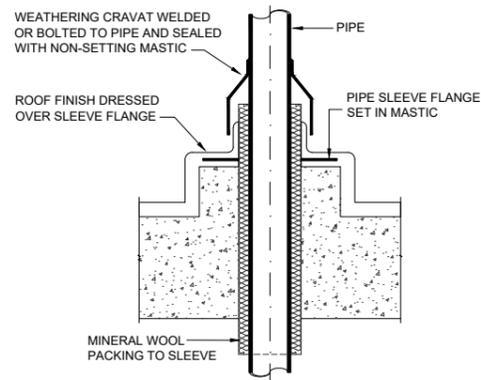
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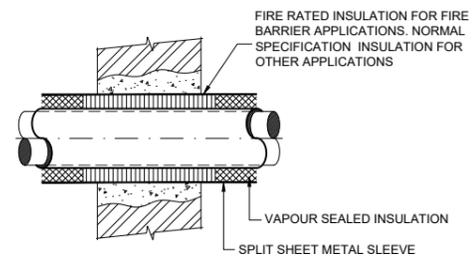
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Sheet 1

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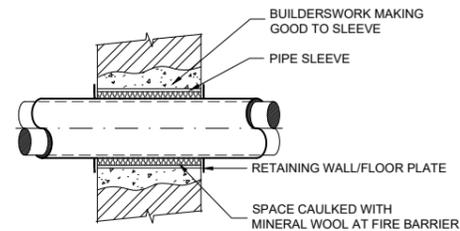
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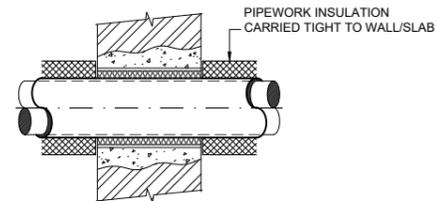
K PIPE PENETRATION THRU' ROOF SLAB
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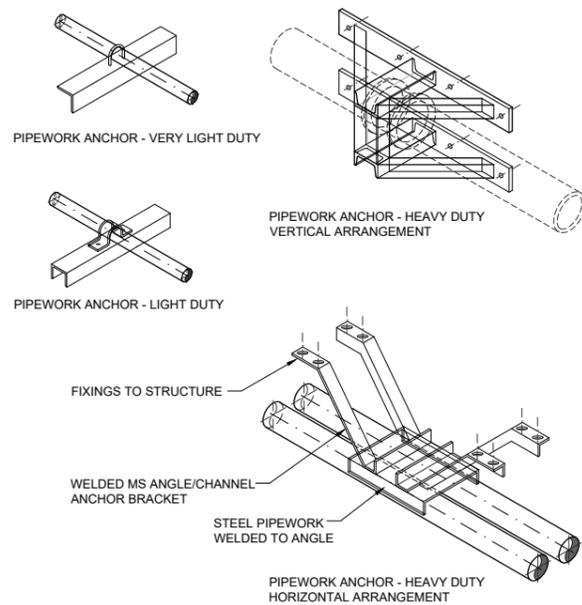
L PIPE SLEEVES THRU' WALLS / FLOOR SLABS
SCALE 1 : 10



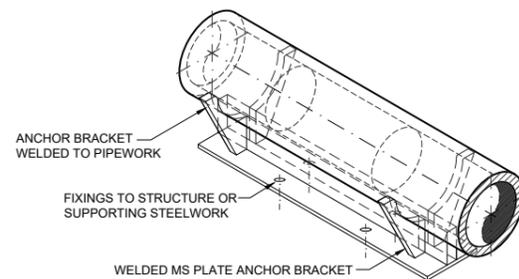
M PIPE SLEEVES THRU' WALLS / FLOOR SLABS
SCALE 1 : 10



N PIPE SLEEVES THRU' WALLS / FLOOR SLABS
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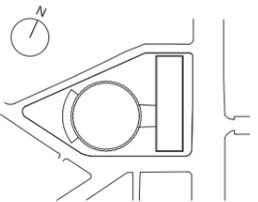
O PIPEWORK ANCHOR DETAILS
SCALE 1 : 10



P SINGLE PIPE ANCHOR BRACKET
SCALE 1 : 10

NOTES

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PROJECT Space House Renovation
ARCHITECT Squire & Partners
JOB NUMBER 4752



TITLE PIPEWORK SUPPORT DETAILS
Sheet 2

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DATE	October 2020	SCALE	As Shown (A1)	Rev.	B		

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Appendix 02

- Central mechanical equipment schedules

MECHANICAL EQUIPMENT SCHEDULE AIR HANDLING UNITS

REFERENCE	AHU-B1-1	AHU-B1-2	AHU-B1-3										
GENERAL DETAILS													
Location	Basement 1	Basement 1	Basement 1 shower plantroom										
Maximum component size (mm)	Cooling coil (2550x1350x650)	Cooling coil (2550x1350x650)											
Area(s) served	Block 2 office	Block 2 office	Basement 1 Block 2 showers										
PERFORMANCE DETAILS													
Supply Air volume (m³/s)	5.5	5.5	0.95										
Supply External Static Press. (Pa)	475	453	300										
Extract Air Volume (m³/s)	5.5	5.5	1.2										
Extract External Static Press. (Pa)	266	277	300										
SFPv (W/l/s)	1.91	1.9	1.89										
ErP compliant?	Y	Y	Y										
Humidification (Y/N)	N	N	N										
Filter Grade	G4 / F9	G4 / F9	F7										
OUTDOOR AIR DETAILS													
Winter wet bulb temperature (°C)	-4	-4	-4										
Winter dry bulb temperature (°C)	-4	-4	-4										
Winter Relative Humidity (%)	100	100	100										
Summer wet bulb temperature (°C)	20	20	20										
Summer dry bulb temperature (°C)	30	30	30										
Summer Relative Humidity (%)	40	40	40										
HEAT EXCHANGER DETAILS													
Heat Exchanger Type	Thermal Wheel (Hygroscopic)	Thermal Wheel (Hygroscopic)	Plate heat exchanger										
Heat Recovery Efficiency (%)	73.6	73.6	85										
Heating Coil Type	LTHW	LTHW	LTHW										
Heating Coil Material	Cu/Al	Cu/Al	Cu/Al										
Heating Coil Duty (kW)	26.7	26.7	5.5										
LTHW F/R Temperatures (°C)	45/38	45/38	45/38										
LTHW Pressure Drop (kPa)	6	6	6										
Heating Air On (°C)	12	12	12										
Heating Air Off (°C)	16	16	16										
Cooling Coil Type	CHW	CHW	N/A										
Cooling Coil Material	Cu/Al	Cu/Al	N/A										
Cooling Coil Duty (kW)	122.9	122.9	N/A										
CHW F/R Temperatures (°C)	6/12	6/12	N/A										
CHW Pressure Drop (kPa)	18	18	N/A										
Cooling Air On (°C) (dry/wet bulb)	25.6/18.3	25.6/18.3	N/A										
Cooling Air Off (°C) (dry/wet bulb)	12/11.6	12/11.6	N/A										
Frost Protection/Preheat coil (Y/N)	N	N	N/A										
Preheat Coil Air On (°C)	N/A	N/A	N/A										
Preheat Coil Air Off (°C)	N/A	N/A	N/A										
NOISE DETAILS													
	FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust	
Max. Sound Power Level Lwa (dB(A)) - Octave Band	63 (Hz)	72	82	75	83	72	82	75	83	64	70	72	81
	125 (Hz)	69	77	74	79	69	77	74	79	61	71	68	64
	250 (Hz)	79	85	81	85	79	85	81	85	65	76	73	63
	500 (Hz)	62	74	64	75	62	74	64	75	61	74	71	51
	1k (Hz)	56	68	57	68	56	68	57	68	53	74	62	41
	2k (Hz)	49	58	52	58	49	58	52	58	49	73	57	44
	4k (Hz)	47	59	54	60	47	59	54	60	45	70	52	39
	8k (Hz)	64	72	72	73	64	72	72	73	46	69	52	31
Breakout dBA @ 1m	72				72				56				
ELECTRICAL DETAILS													
Electrical Supply (V/ph/Hz)	400/3/50				400/3/50				400/3/50				
Supply Power (kW)	11				11								
Extract Power (kW)	7.5				7.5								
Supply Full Load Current (A)	21.4				21.4								
Extract Full Load Current (A)	14.9				14.9								
SUPPLIER DETAILS (DESIGN BASIS)													
Manufacturer	Dalair				Dalair				Flaktwoods				
Model Reference	HSF/11/S				HSF/11/S				eQ Prime 011				
Dimensions L x W x H (mm)	5500 x 2400 x 2700				5500 x 2400 x 2700				2750x1450x1352				
Weight (kg)	4844				4844								
Controls	Refer to Volume 6 BMS				Refer to Volume 6 BMS				Refer to Volume 6 BMS				
Accessories	Condensate pump				Condensate pump								
Notes	All Attenuation duct mounted. Base height: 100mm. Complete with removable posts & sectorised rotor for plant				All Attenuation duct mounted. Base height: 100mm. Complete with removable posts & sectorised rotor for plant				Supply air in bottom				

MECHANICAL EQUIPMENT SCHEDULE AIR HANDLING UNITS

REFERENCE	AHU-B2-1	AHU-B2-2	AHU-B2-3										
GENERAL DETAILS													
Location	Basement 2	Basement 2	Basement 2										
Maximum component size (mm)	Cooling coil (2150x1350x1050)	Cooling coil (2150x1350x1050)	Cooling coil (2150x1350x1050)										
Area(s) served	Block 1 office	Block 1 office	Block 1 office										
PERFORMANCE DETAILS													
Supply Air volume (m³/s)	7.83	7.83	7.83										
Supply External Static Press. (Pa)	548	670	560										
Extract Air Volume (m³/s)	7.83	7.83	7.83										
Extract External Static Press. (Pa)	414	428	490										
SFPv (W/l/s)	2.45	2.49	2.42										
ErP compliant?	Y	Y	Y										
Humidification (Y/N)	N	N	N										
Filter Grade	G4 / F9	G4 / F9	G4 / F9										
OUTDOOR AIR DETAILS													
Winter wet bulb temperature (°C)	-4	-4	-4										
Winter dry bulb temperature (°C)	-4	-4	-4										
Winter Relative Humidity (%)	100	100	100										
Summer wet bulb temperature (°C)	20	20	20										
Summer dry bulb temperature (°C)	30	30	30										
Summer Relative Humidity (%)	40	40	40										
HEAT EXCHANGER DETAILS													
Heat Exchanger Type	Thermal Wheel (Hygroscopic)	Thermal Wheel (Hygroscopic)	Thermal Wheel (Hygroscopic)										
Heat Recovery Efficiency (%)	73.4	73.4	73.4										
Heating Coil Type	LTHW	LTHW	LTHW										
Heating Coil Material	Cu/Al	Cu/Al	Cu/Al										
Heating Coil Duty (kW)	37.8	37.8	37.8										
LTHW F/R Temperatures (°C)	45/38	45/38	45/38										
LTHW Pressure Drop (kPa)	12	12	12										
Heating Air On (°C)	12	12	12										
Heating Air Off (°C)	16	16	16										
Cooling Coil Type	CHW	CHW	CHW										
Cooling Coil Material	Cu/Al	Cu/Al	Cu/Al										
Cooling Coil Duty (kW)	178.1	178.1	178.1										
CHW F/R Temperatures (°C)	6/12	6/12	6/12										
CHW Pressure Drop (kPa)	28	28	28										
Cooling Air On (°C) (dry/wet bulb)	25.6/18.4	25.6/18.4	25.6/18.4										
Cooling Air Off (°C) (dry/wet bulb)	12/11.5	12/11.5	12/11.5										
Frost Protection/Preheat coil (Y/N)	N	N	N										
Preheat Coil Air On (°C)	N/A	N/A	N/A										
Preheat Coil Air Off (°C)	N/A	N/A	N/A										
NOISE DETAILS													
	FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust	
Max. Sound Power Level Lwa (dB(A)) - Octave Band	63 (Hz)	72	82	75	83	77	87	79	86	76	86	79	86
	125 (Hz)	69	77	74	79	77	85	84	87	77	84	83	86
	250 (Hz)	79	85	81	85	93	98	93	97	93	98	94	97
	500 (Hz)	62	74	64	75	83	95	86	95	83	96	86	95
	1k (Hz)	56	68	57	68	81	94	83	93	81	94	83	93
	2k (Hz)	49	58	52	58	76	87	81	85	76	86	81	85
	4k (Hz)	47	59	54	60	72	83	79	83	71	83	79	83
	8k (Hz)	64	72	72	73	77	85	86	86	78	86	86	85
Breakout dBA @ 1m	72				72				73				
ELECTRICAL DETAILS													
Electrical Supply (V/ph/Hz)	400/3/50				400/3/50				400/3/50				
Supply Power (kW)	11 x 2				11 x 2				11 x 2				
Extract Power (kW)	7.5 x 2				7.5 x 2				7.5 x 2				
Supply Full Load Current (A)	21.4 x 2				21.4 x 2				21.4 x 2				
Extract Full Load Current (A)	14.9 x 2				14.9 x 2				14.9 x 2				
SUPPLIER DETAILS (DESIGN BASIS)													
Manufacturer	Dalair				Dalair				Dalair				
Model Reference	HSF/32/S				HSF/32/S				HSF/32/S				
Dimensions L x W x H (mm)	8600 x 4100 x 2600				6150 x 4100 x 2600				6150 x 4100 x 2600				
Weight (kg)	11422				7669				7669				
Controls	Refer to Volume 6 BMS				Refer to Volume 6 BMS				Refer to Volume 6 BMS				
Accessories	Condensate pump				Condensate pump				Condensate pump				
Notes	600mm long atmospheric and roomside attenuators AHU mounted on intake, exhaust, supply and extract side.				All Attenuation duct mounted. Base height: 100mm. Complete with removable posts &				All Attenuation duct mounted. Base height: 100mm. Complete with removable posts &				

MECHANICAL EQUIPMENT SCHEDULE AIR HANDLING UNITS

REFERENCE	AHU-B2-4				AHU-1.17-1								
GENERAL DETAILS													
Location	Basement 2				Tower roof								
Maximum component size (mm)	Heat Recovery Coil (2155x2185x620)				Heat Recovery Coil (1425x2785x620)								
Area(s) served	Block 1 office				Block 1 office								
PERFORMANCE DETAILS													
Supply Air volume (m ³ /s)	8.35				N/A								
Supply External Static Press. (Pa)	745				N/A								
Extract Air Volume (m ³ /s)	N/A				8.35								
Extract External Static Press. (Pa)	N/A				196								
SFPv (W/l/s)	1.53				0.85								
ErP compliant?	Y				Y								
Humidification (Y/N)	N				N								
Filter Grade	G4 / F9				M5								
OUTDOOR AIR DETAILS													
Winter wet bulb temperature (°C)	-4				-4								
Winter dry bulb temperature (°C)	-4				-4								
Winter Relative Humidity (%)	100				100								
Summer wet bulb temperature (°C)	20				20								
Summer dry bulb temperature (°C)	30				30								
Summer Relative Humidity (%)	40				40								
HEAT EXCHANGER DETAILS													
Heat Exchanger Type	Heat Recovery Coil				Heat Recovery Coil								
Heat Recovery Efficiency (%)	68				68								
Heating Coil Type	LTHW				N/A								
Heating Coil Material	Cu/Al				N/A								
Heating Coil Duty (kW)	40.5				N/A								
LTHW F/R Temperatures (°C)	45/38				N/A								
LTHW Pressure Drop (kPa)	12				N/A								
Heating Air On (°C)	12				N/A								
Heating Air Off (°C)	16				N/A								
Cooling Coil Type	CHW				N/A								
Cooling Coil Material	Cu/Al				N/A								
Cooling Coil Duty (kW)	201.1				N/A								
CHW F/R Temperatures (°C)	6/12				N/A								
CHW Pressure Drop (kPa)	26				N/A								
Cooling Air On (°C) (dry/wet bulb)	26/18.8				N/A								
Cooling Air Off (°C) (dry/wet bulb)	12/11.6				N/A								
Frost Protection/Preheat coil (Y/N)	N				N/A								
Preheat Coil Air On (°C)	N/A				N/A								
Preheat Coil Air Off (°C)	N/A				N/A								
NOISE DETAILS													
		FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust
Max. Sound Power Level Lwa (dB(A)) - Octave Band	63 (Hz)	80	76	N/A	N/A	N/A	N/A	90	83				
	125 (Hz)	88	79	N/A	N/A	N/A	N/A	86	69				
	250 (Hz)	88	68	N/A	N/A	N/A	N/A	81	57				
	500 (Hz)	84	55	N/A	N/A	N/A	N/A	82	56				
	1k (Hz)	81	50	N/A	N/A	N/A	N/A	78	54				
	2k (Hz)	76	45	N/A	N/A	N/A	N/A	77	49				
	4k (Hz)	70	46	N/A	N/A	N/A	N/A	74	40				
8k (Hz)	68	53	N/A	N/A	N/A	N/A	74	44					
Breakout dBA @ 1m		66				64							
ELECTRICAL DETAILS													
Electrical Supply (V/ph/Hz)	400/3/50				400/3/50								
Supply Power (kW)	18.5				N/A								
Extract Power (kW)	N/A				11								
Supply Full Load Current (A)	28.7				N/A								
Extract Full Load Current (A)	N/A				90.3								
SUPPLIER DETAILS (DESIGN BASIS)													
Manufacturer	Dalair				Dalair								
Model Reference	HSF/23				HSF/17/S								
Dimensions L x W x H (mm)	7400 x 2300 x 2550				6400 x 2900 x 1800								
Weight (kg)	4823				4237								
Controls	Refer to Volume 6 BMS				Refer to Volume 6 BMS								
Accessories	Condensate pump												
Notes	1200mm long roomside attenuator fitted. Base height: 100mm. Complete with removable posts &				1800mm long atmospheric side attenuator fitted. Outside unit. Complete with removable posts &								

MECHANICAL EQUIPMENT SCHEDULE AIR SOURCE HEAT PUMP

REFERENCE	ASHP 1.18-1	ASHP 1.18-2	ASHP 2.8-1	ASHP 2.8-2
GENERAL DETAILS				
Location	Tower roof plant	Tower roof plant	Kingsway 8th floor	Kingsway 8th floor
Type	4 pipe	4 pipe	4 pipe	4 pipe
Refrigerant Type	R32	R32	R32	R32
COOLING PERFORMANCE DETAILS				
Required Cooling Capacity (kW)	726	625.3	416.2	416.2
CHW Flow/Return Temperatures (°C)	6/12	6/12	6/12	6/12
CHW Flow Rate (kg/s)	28.8	24.8	16.56	16.56
CHW Heat Exchanger Pressure Drop (kPa)	32	31	24	24
Glycol Mix (%)	0%	0%	0%	0%
Cooling Air Flow Rate (l/s)	77.77	66.6	44.44	44.44
Air Temperature (°C)	35	35	35	35
EER/ESEER (kW/kW)	2.76/4.33	2.77/4.42	2.77/4.46	2.77/4.47
HEATING PERFORMANCE DETAILS				
Required Heating Capacity (kW)	581	496.9	332.4	333.4
LTHW Flow/Return Temperatures (°C)	45/38	45/38	45/38	45/38
LTHW Flow Rate (kg/s)	20.06	17.16	11.3	11.3
LTHW Heat Exchanger Pressure Drop (kPa)	29	28	24	24
Heating Air Flow Rate (l/s)	77.77	66.6	44.44	44.44
Dry Bulb Air Temperature (°C)	-4	-4	-4	-4
Wet Bulb Air Temperature (°C)	-5	-5	-5	-5
Glycol Mix (%)	0%	0%	0%	0%
COP/SCOP (kW/kW)	2.37	2.35/3.21	2.4/3.34	2.4/3.35
NOISE DETAILS				
Max. Sound Power Level Lwa (dB(A)) - Octave Band	63 (Hz)	-	-	-
	125 (Hz)	90	89.7	87
	250 (Hz)	87	86.2	84
	500 (Hz)	86.5	87.7	86
	1k (Hz)	89.5	88.7	87
	2k (Hz)	87	86.3	84
	4k (Hz)	81	80.3	78
Max. Sound Pressure Level @1m Lwa (dB(A)) - Octave Band	63 (Hz)	-	-	-
	125 (Hz)	69	69	68
	250 (Hz)	65	65	64
	500 (Hz)	67	67	66
	1k (Hz)	68	68	67
	2k (Hz)	65	65	64
	4k (Hz)	59	59	59
8k (Hz)	53	53	52	
ELECTRICAL DETAILS				
Electricity Supply (V/ph/Hz)	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz	400V/3/50Hz
Full Load Power (kW)	265	226	151	151
Starting Current (A)	957	875	704	704
Full Load Current (A)	623	542	371	371
SUPPLIER DETAILS (DESIGN BASIS)				
Manufacturer	Aermec	Aermec	Aermec	Aermec
Model Reference	NRP-2806 A	NRP-2406 A	NRP - 1604 A	NRP - 1604 A
Dimensions L x W x H (mm)	8330 x 2200 x 2450	7140 x 2200 x 2450	4760 x 2200 x 2450	4760 x 2200 x 2450
Operating Weight (kg)	8330	7610	5350	5350
Access Requirements	1.2m sides, 1.0m ends			
Controls	Chiller sequencer	Chiller sequencer	Chiller sequencer	Chiller sequencer
Accessories	Coated coils, EC Fans, Run and standby pumps, soft start, leak detection	Coated coils, EC Fans, Run and standby pumps, soft start, leak detection	Coated coils, EC Fans, Run and standby pumps, soft start, leak detection	Coated coils, EC Fans, Run and standby pumps, soft start, leak detection
Notes	Run and standby Pumps to cooling and heating side	Run and standby Pumps to cooling and heating side	Run and standby Pumps to cooling and heating side	Run and standby Pumps to cooling and heating side

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