



## 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

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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).

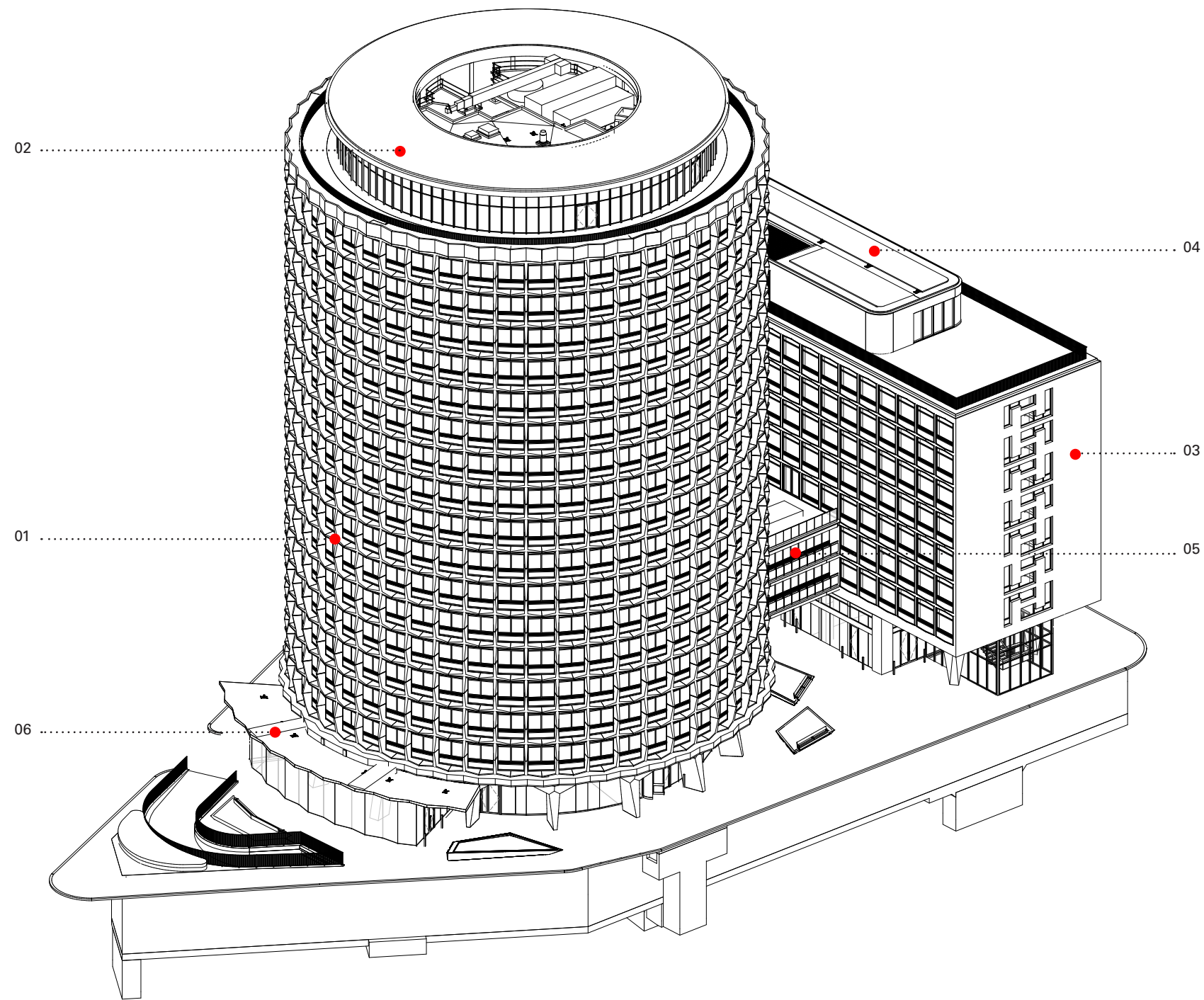


Fig. 1.0.1 Space House Axonometric

- 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.

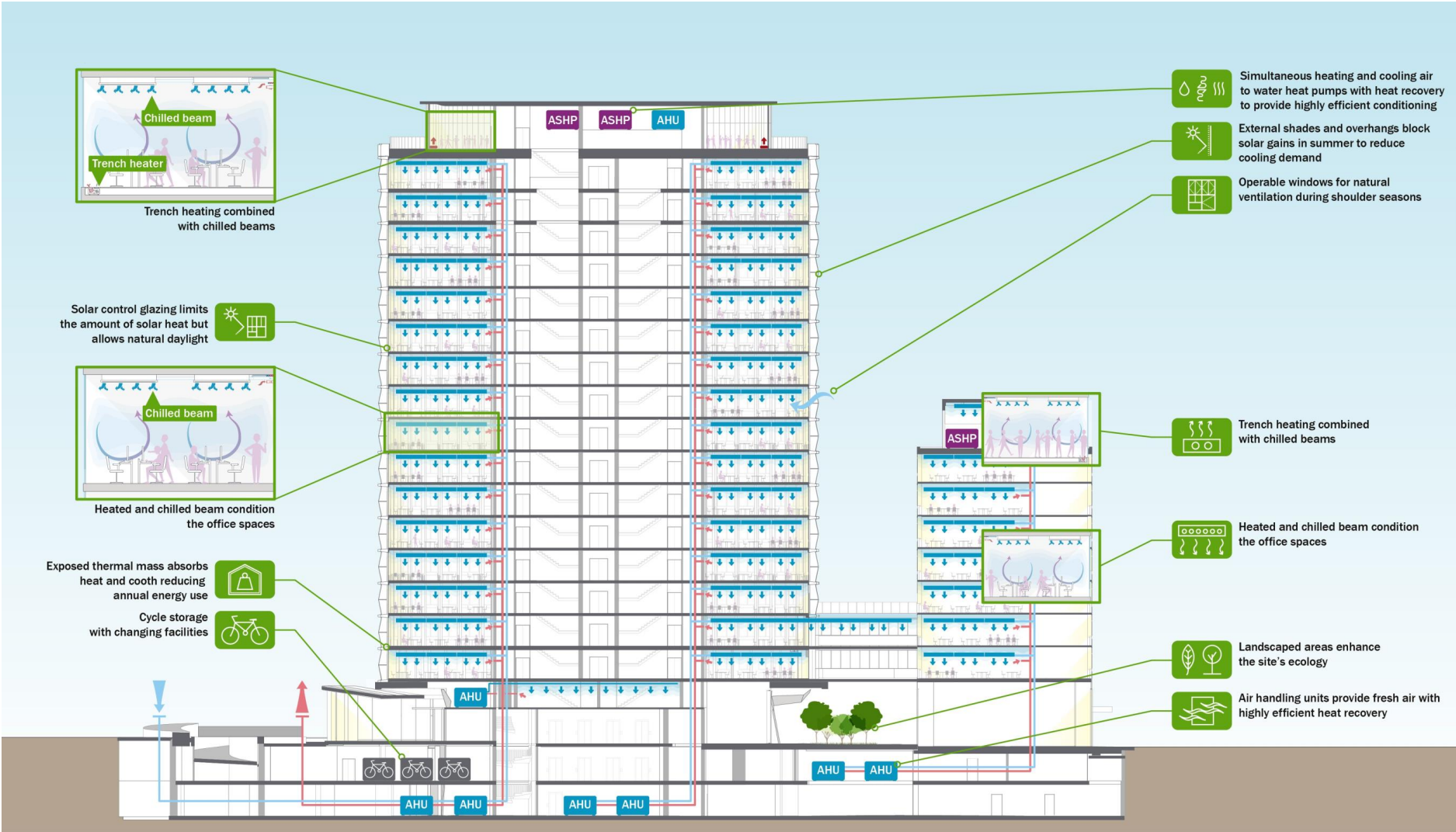


Fig 2.1.1 Summary of environment strategy

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.

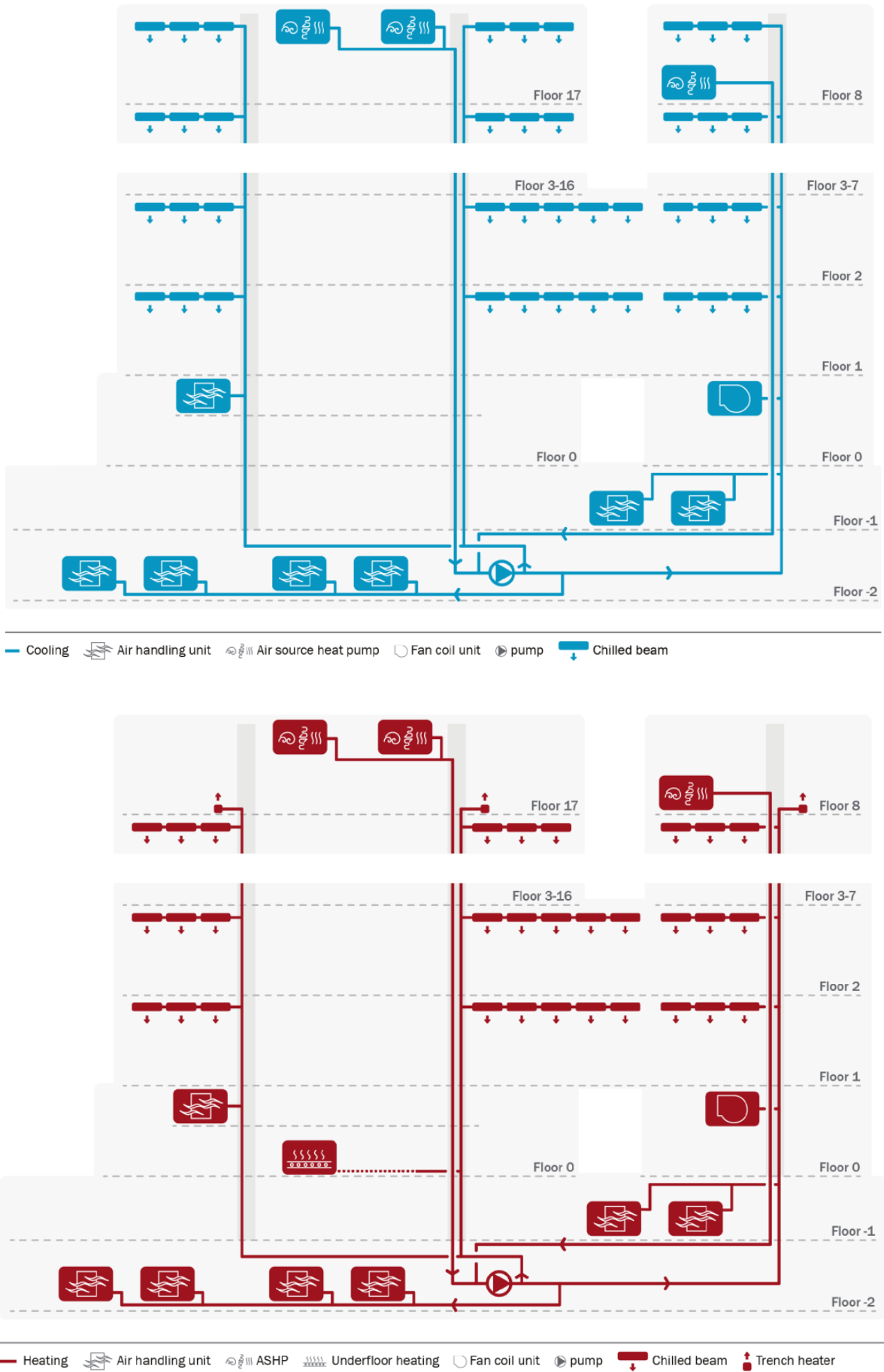


Fig 2.1.2 – Heating (red) & cooling (blue) strategy

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.

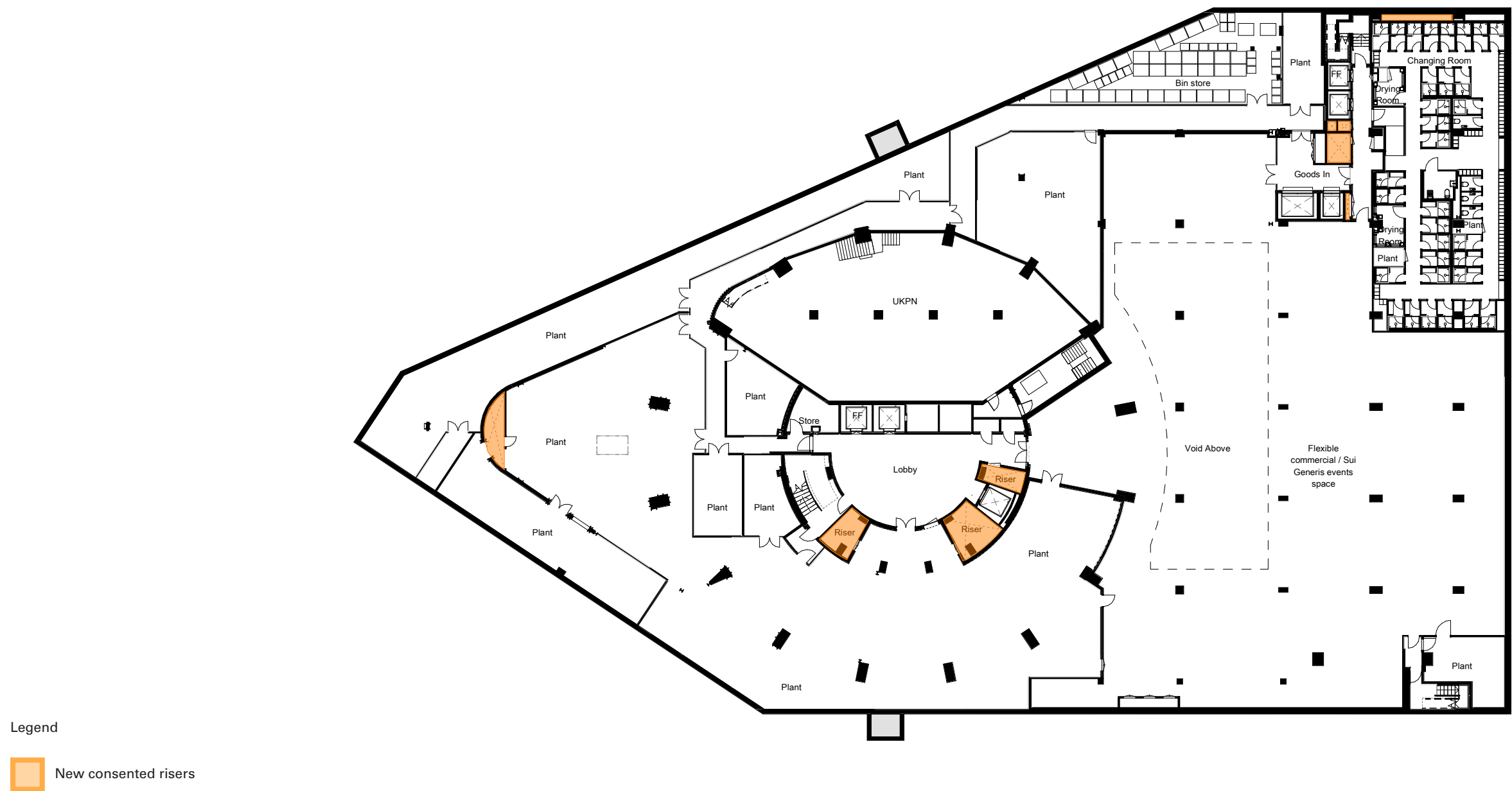
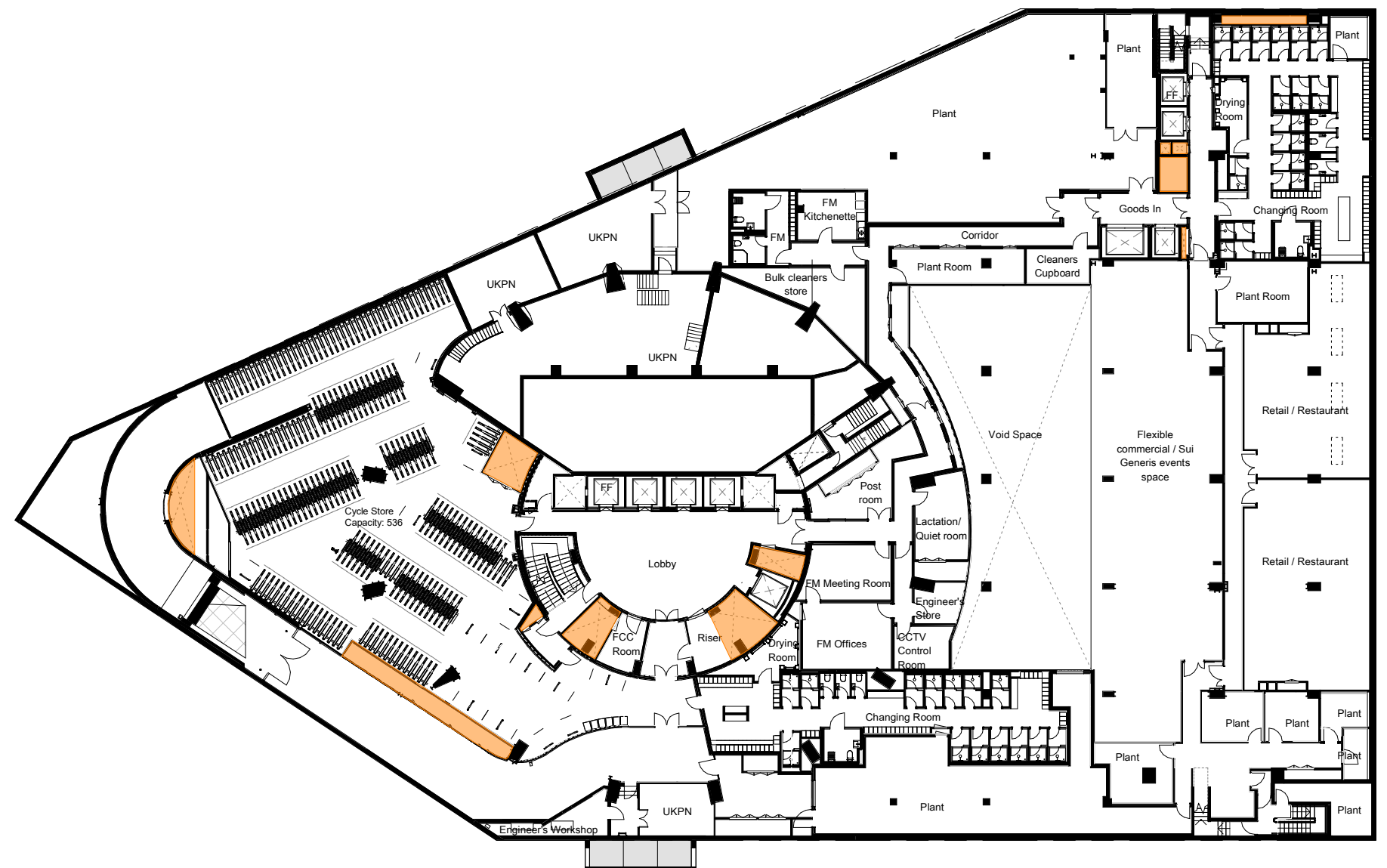


Fig. 2.2.1 Basement level 02 consented plan - risers location




Legend

New consented risers

Fig. 2.2.2 Basement level 01 consented plan - risers location



Legend

 New consented risers

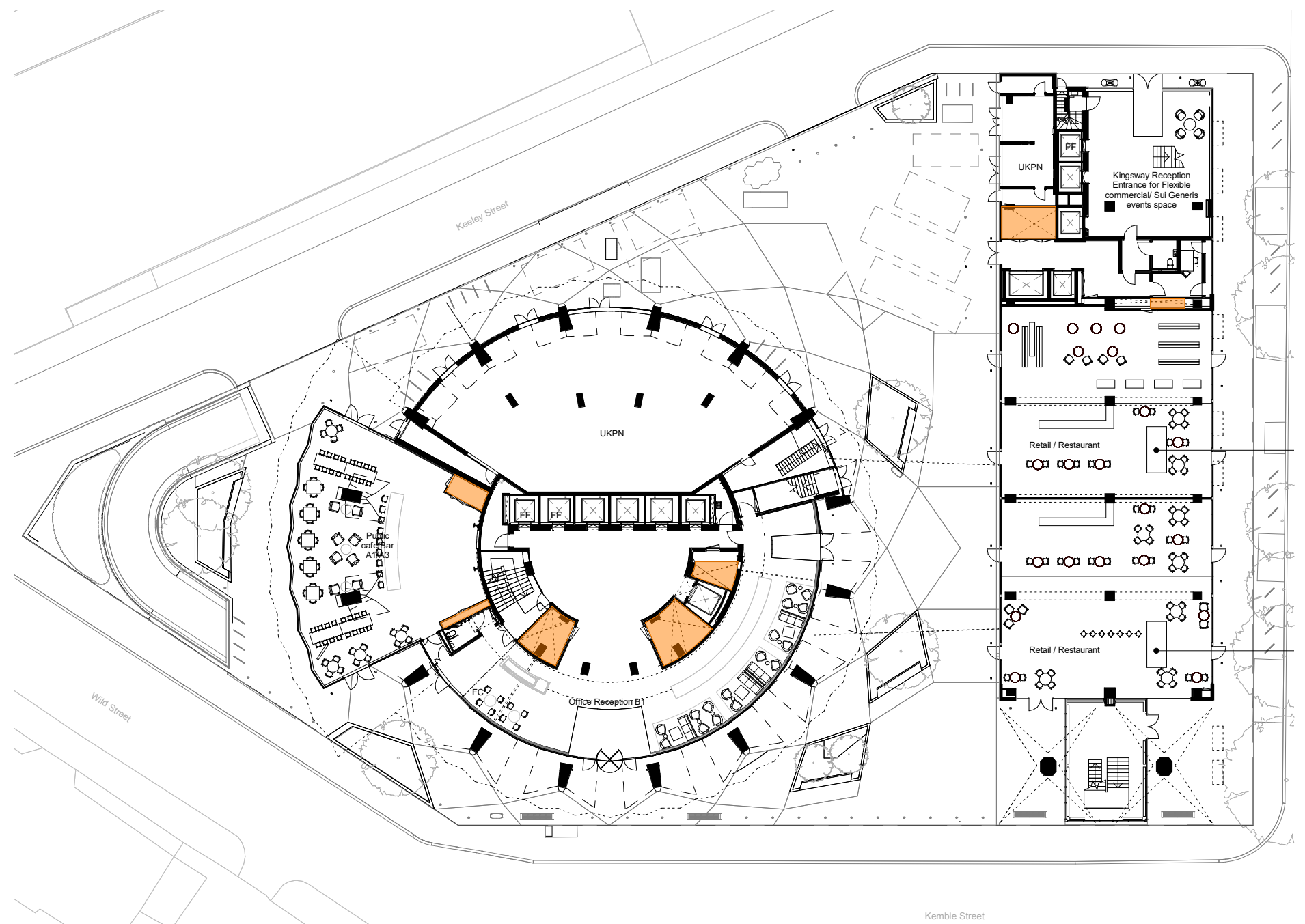


Fig. 2.2.3 Ground floor consented plan - risers location

Legend

- New consented risers
- Existing risers (reused)

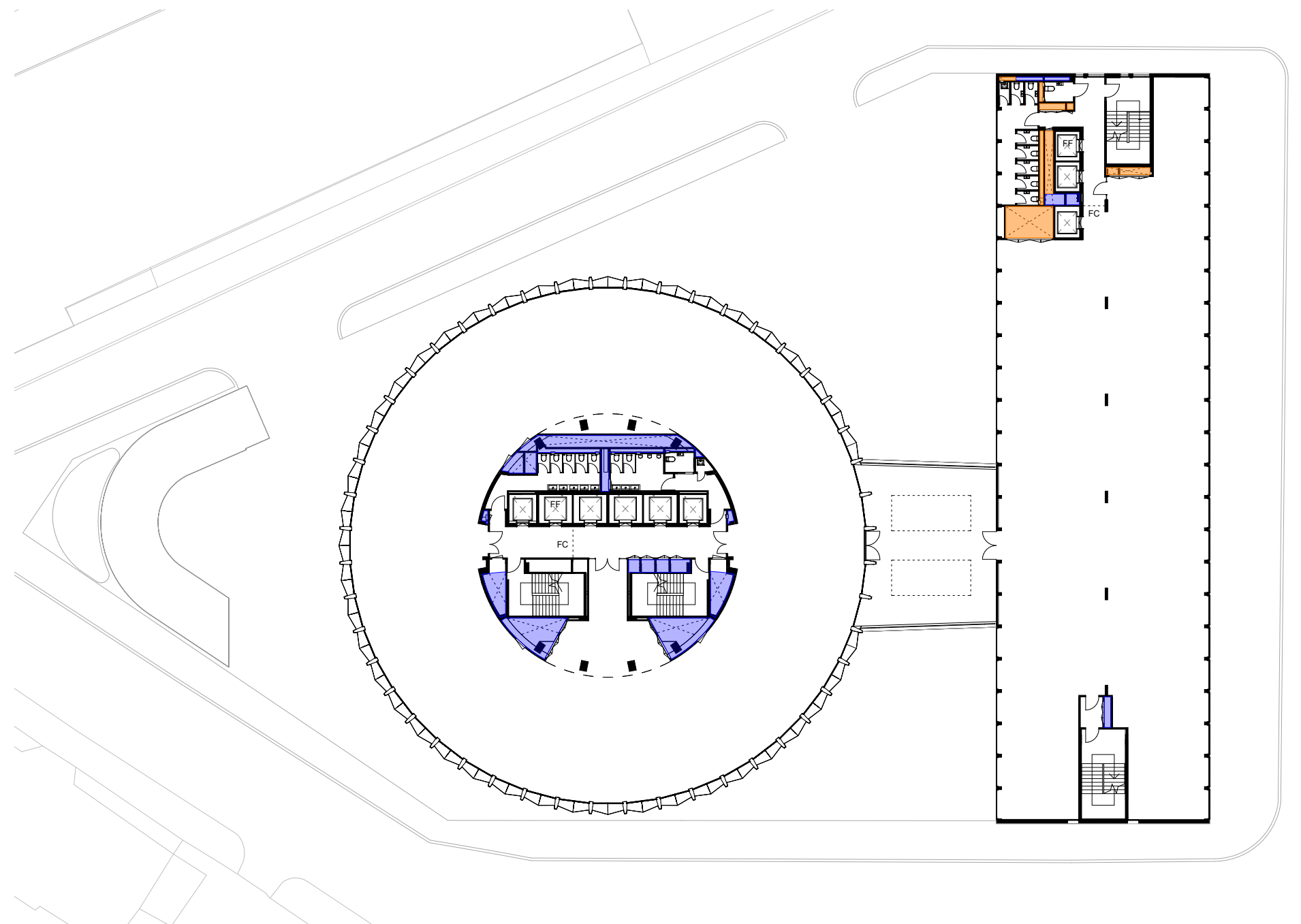


Fig. 2.2.4 Typical office floor consented plan - risers location

### 2.3 Details of services

Fig 2.3.1 & 2.3.2 show typical riser layout details for in Tower and Kingsway buildings.

Drawings that shows the location and services for external spaces and typical fixing drawings are included in the Appendix 01 (pages 15-21).

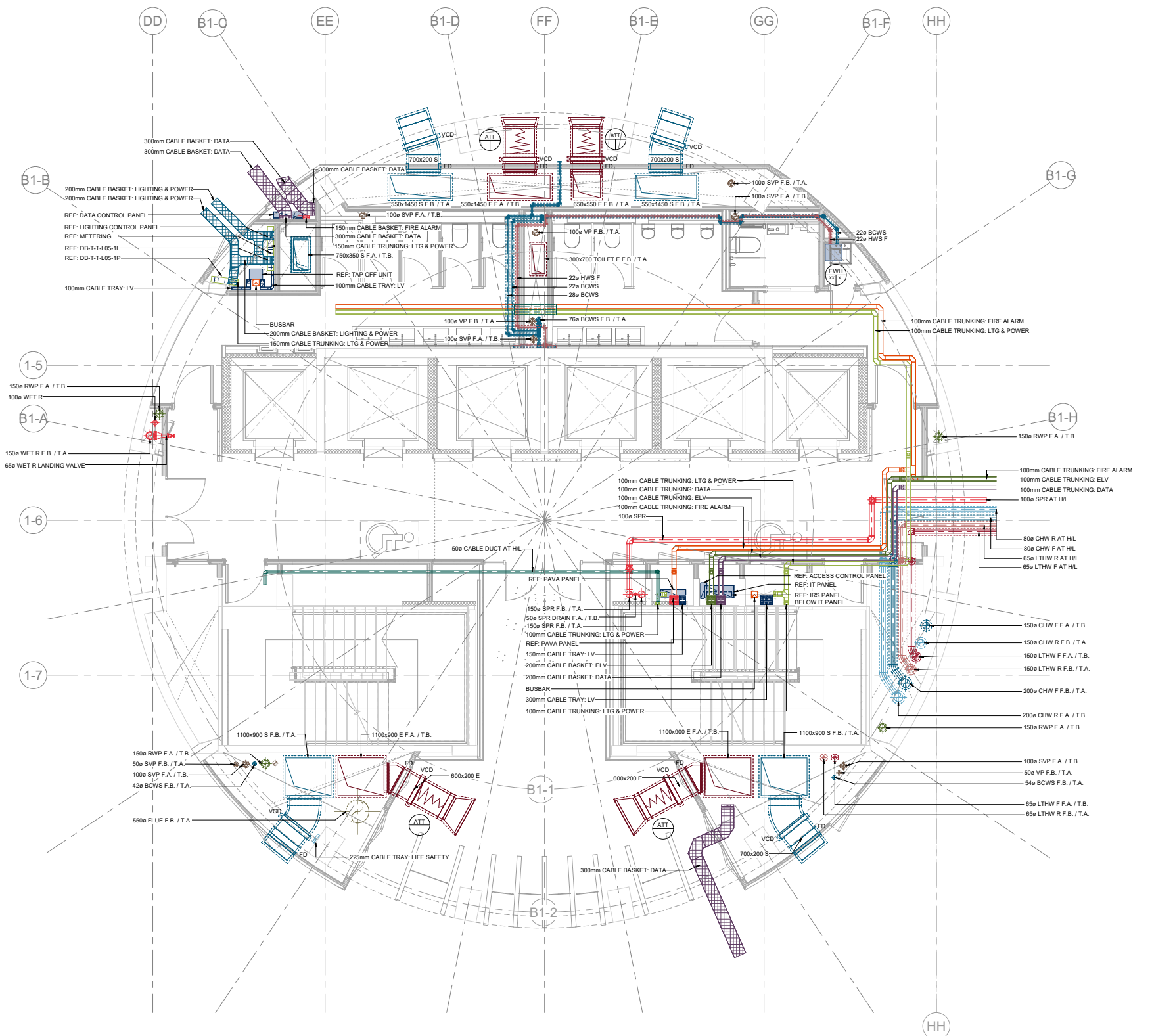


Fig 2.3.1 Tower riser layout

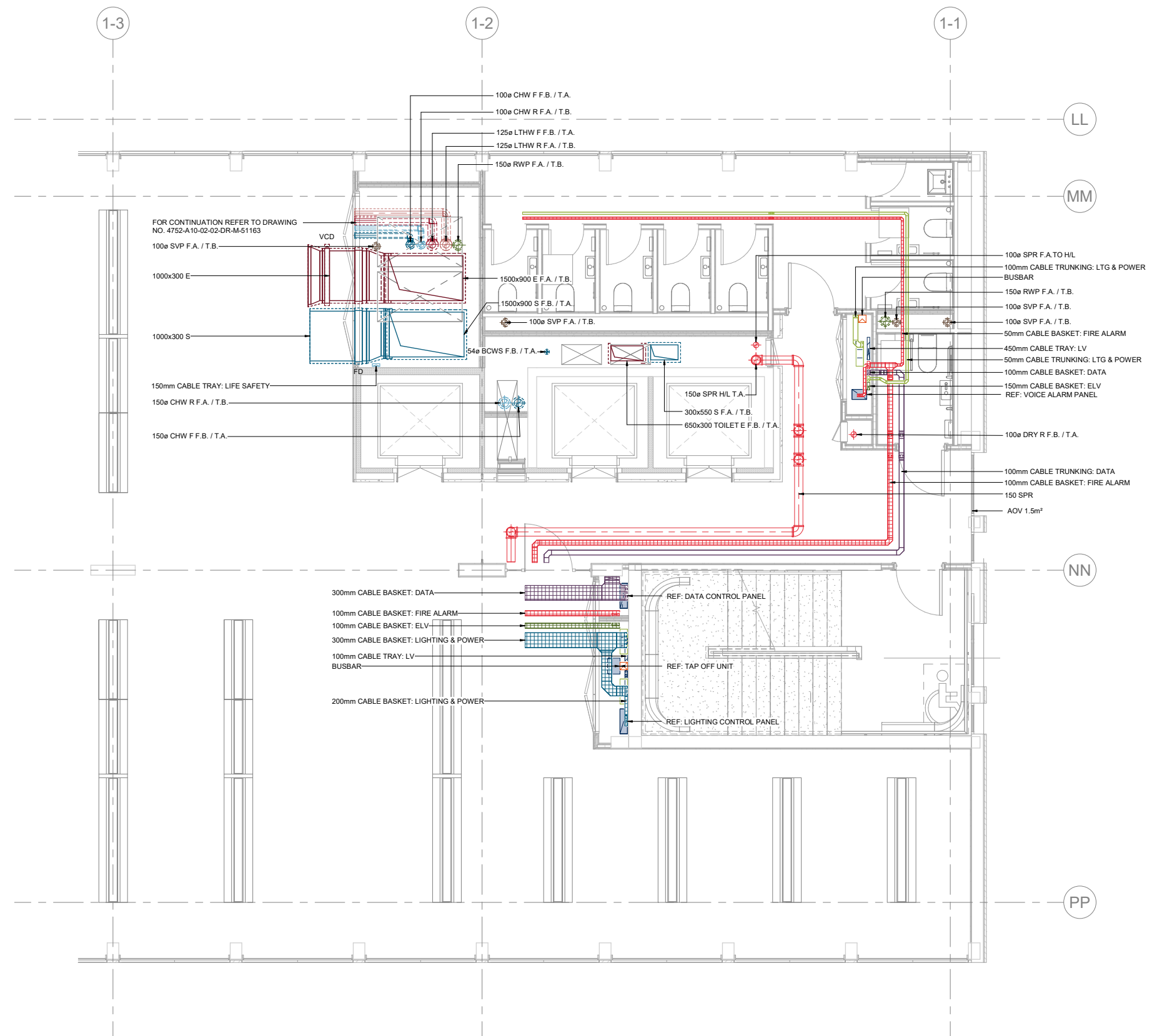


Fig 2.3.2 Kingsway riser layout



## 2.4 Equipment specifications

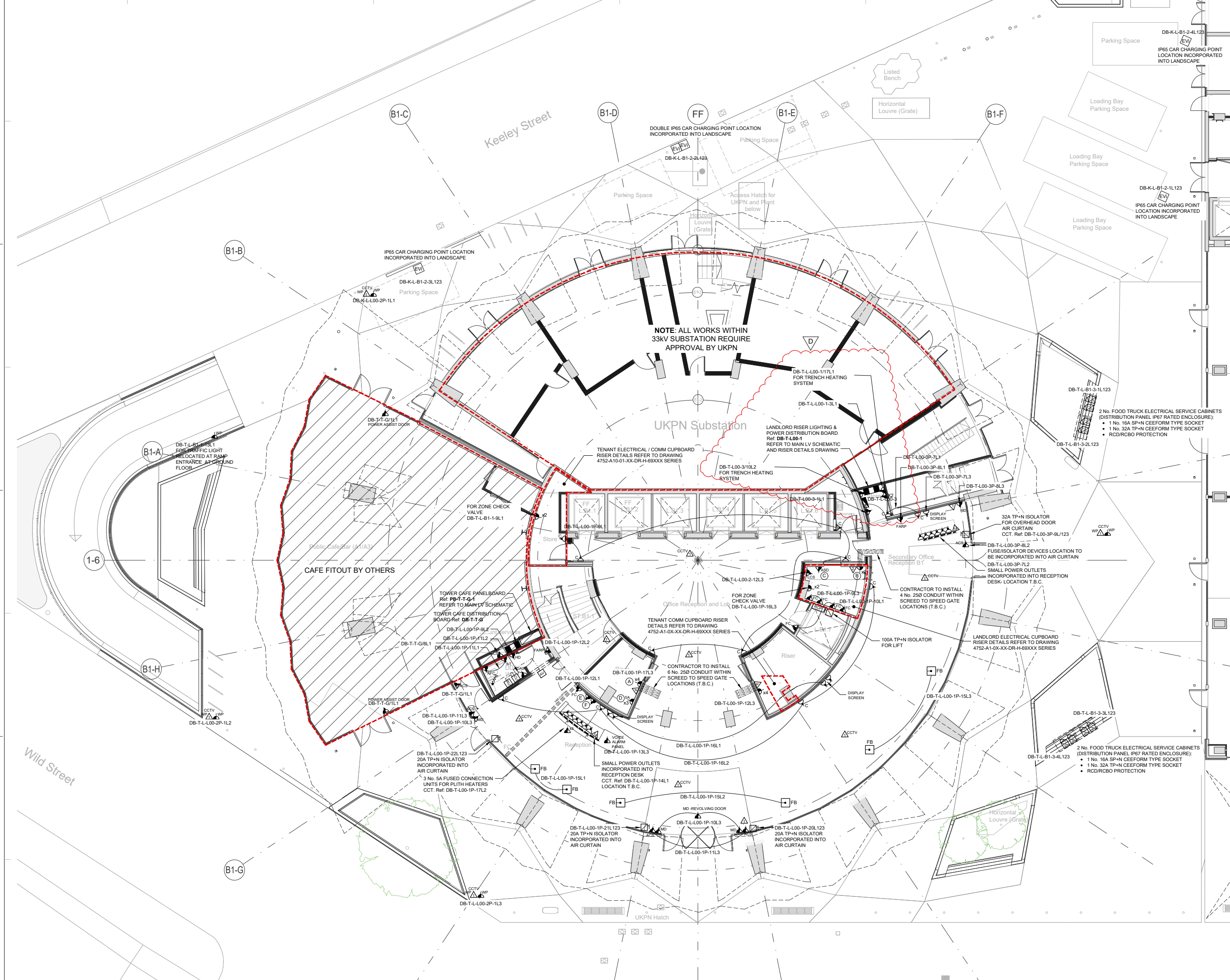
Please refer to Appendix 02 (pages 22-24) for central mechanical equipment schedules.

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



# 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.
4. This drawing is to be read in conjunction with the technical specification and associated equipment schedules as prepared by Atelier Ten.
5. This drawing is to be read in conjunction with all architectural and structural engineer's drawings and associated Atelier Ten drawings.
6. FOR ELECTRICAL SERVICES LEGEND OF SYMBOLS REFER TO DRAWING No. 4752-A10-ZZ-XX-DR-E-60001
7. FOR MAIN LV SCHEMATIC REFER TO DRAWING 4752-A10-ZZ-XX-DR-E-600XX SERIES
8. FOR ELECTRICAL RISER DETAILS REFER TO DRAWING 4752-A10-01-XX-DR-H-690XX SERIES & 4752-A10-02-XX-DR-H-690XX SERIES
9. I.T. & SECURITY CONSULTANTS TO ADVISE ON POWER SUPPLY REQUIREMENTS FOR ASSOCIATED EQUIPMENT

4 No. UNSWITCHED FUSED CONNECTION UNITS FOR SPEED GATE CCT. Ref: DB-T-L00-1P-17L2 + 4 No. RJ45 DATA OUTLETS

2 No. UNSWITCHED FUSED CONNECTION UNITS FOR SPEED GATE CCT. Ref: DB-T-L00-3P-10L1 + 2 No. RJ45 DATA OUTLETS

SWITCHED FUSED CONNECTION UNIT FOR AIR SAMPLING DETECTION PANEL CCT. Ref: DB-T-L00-1P-10L2

3 No. 5A UNSWITCHED FUSED CONNECTION UNITS FOR RECEPTION DESK PLINTH HEATERS CCT. Ref: DB-T-L00-1P-17L2

SWITCHED FUSED CONNECTION UNIT FOR FIRE ALARM REPEATER PANEL CCT. Ref: DB-T-L00-1P-13L1

SWITCHED FUSED CONNECTION UNIT FOR DISABLED REFUGE PANEL CCT. Ref: DB-T-L00-1P-13L2

2 No. FOOD TRUCK ELECTRICAL SERVICE CABINETS (DISTRIBUTION PANEL IP67 RATED ENCLOSURE):

- 1 No. 16A SP+N CEEFORM TYPE SOCKET
- 1 No. 32A TP+N CEEFORM TYPE SOCKET
- RCD/RBDO PROTECTION

2 No. FOOD TRUCK ELECTRICAL SERVICE CABINETS (DISTRIBUTION PANEL IP67 RATED ENCLOSURE):

- 1 No. 16A SP+N CEEFORM TYPE SOCKET
- 1 No. 32A TP+N CEEFORM TYPE SOCKET
- RCD/RBDO PROTECTION

32A TP+N ISOLATOR FOR OVERHEAD DOOR AIR CURTAIN CCT. Ref: DB-T-L00-3P-9L/123

DB-T-L00-3P-8L2 FUSE/ISOLATOR DEVICES LOCATION TO BE INCORPORATED INTO AIR CURTAIN

DB-T-L00-3P-7L2 SMALL POWER OUTLETS INCORPORATED INTO RECEPTION DESK- LOCATION T.B.C.

CONTRACTOR TO INSTALL 4 No. 250 CONDUIT WITHIN SCREED TO SPEED GATE LOCATIONS (T.B.C.)

100A TP+N ISOLATOR FOR LIFT

LANDLORD ELECTRICAL CUPBOARD RISER DETAILS REFER TO DRAWING 4752-A10-XX-DR-H-690XX SERIES

DB-T-L00-1P-12L3

DB-T-L00-1P-12L1

DB-T-L00-1P-12L2

DB-T-L00-1P-12L4

DB-T-L00-1P-12L5

DB-T-L00-1P-12L6

DB-T-L00-1P-12L7

DB-T-L00-1P-12L8

DB-T-L00-1P-12L9

DB-T-L00-1P-12L10

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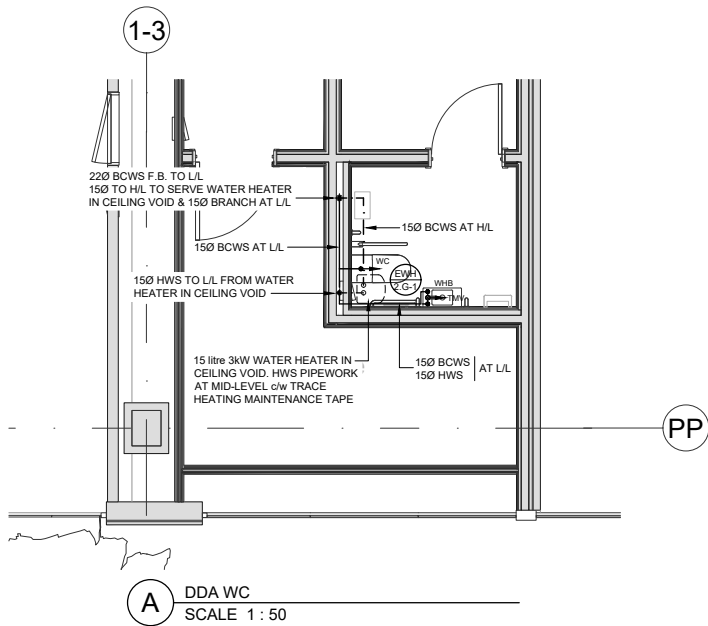
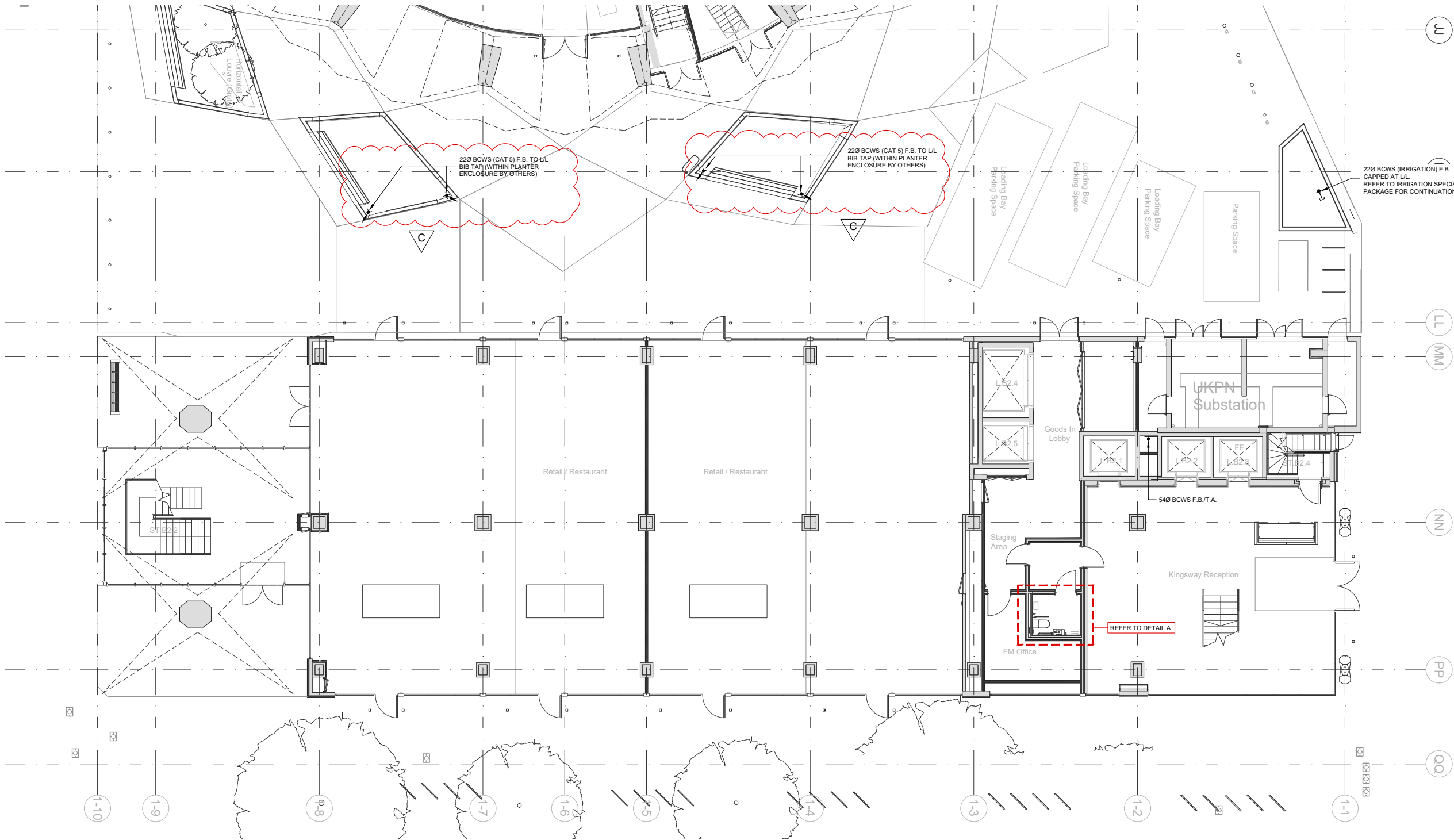
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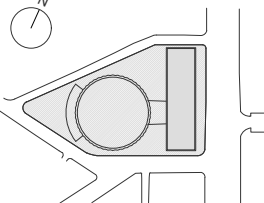


## NOTES

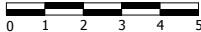
1. This drawing must not be used for construction or installation purposes unless expressly stated.
2. Do NOT scale off this drawing. Always work to noted dimensions.
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4. This drawing is to be read in conjunction with the technical specification and associated equipment schedules as prepared by Atelier Ten.
5. This drawing is to be read in conjunction with all architectural and structural engineer's drawings and associated Atelier Ten drawings.
6. FOR PUBLIC HEALTH SERVICES LEGEND OF SYMBOLS REFER TO DRAWING No. 4752-A10-ZZ-XX-DR-P-55001
7. TO BE READ IN CONJUNCTION WITH DOMESTIC WATER SERVICES SCHEMATIC DRAWING No. 4752-A10-ZZ-XX-P-56010
8. FLOW REGULATING SERVICE VALVES TO BE INSTALLED 300mm Min. FROM EACH DRAW OFF (COMPLETE WITH ACCESS). ACCESS PANELS REQUIRED TO ARCHITECTS DETAILS. PANEL SIZE(S) AND SETTING OUT TO BE CONFIRMED BY ARCHITECT AND MAIN CONTRACTOR
9. CAT 5 SERVICE TO SERVE EXTERNAL BIB TAPS & IRRIGATION POINTS FROM LEVEL B1 BELOW. FINAL POSITIONS TO BE CONFIRMED. WATERPROOFING DETAILS BY ARCHITECT

### DOMESTIC SERVICE NOTES:

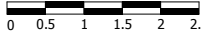
WHB	WASH HAND BASIN: 150 BCWS + 150 HWS INCL. THERMOSTATIC MIXING VALVE
CSI	CLEANER'S SINK: 150 BCWS + 150 HWS
Ur	WATERLESS
WC	TOILET PAN: 150 BCWS TO CISTERN



Scale 1:100



Scale 1:50



## CONTRACT ISSUE

Rev.	Description	Date	Chkd.	Apprvd.
D	CONTRACT ISSUE	29.10.21	RE	PWJ
C	STAGE 4 ADDENDUM ISSUE	14.05.21	RE	PWJ
B	STAGE 4 ISSUE	02.10.20	RE	PWJ
A	STAGE 3 ISSUE	07.02.20	MM	PWJ

PROJECT Space House Renovation

ARCHITECT Squire & Partners

JOB NUMBER 4752

**atelier ten**  
Environmental Design Consultants + Building Services Engineers

TITLE **KINGSWAY**  
**GROUND FLOOR**  
**DOMESTIC SERVICES**

DRAWN GC	DESIGNED AA	CHECKED RE	APPROVED PWJ
DATE February 2020	SCALE 1:100(A1)	Rev.	D

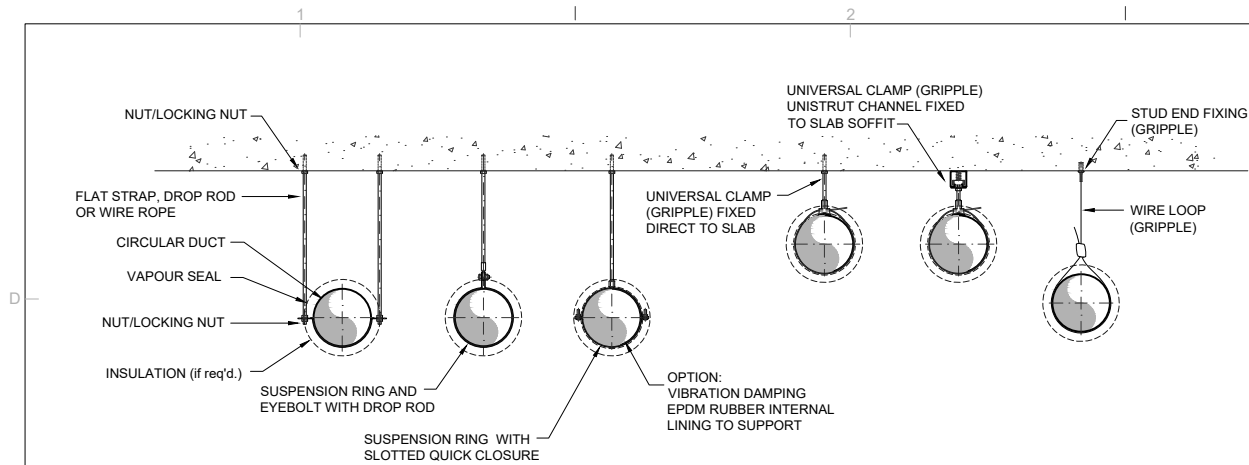
DRAWING No.

17

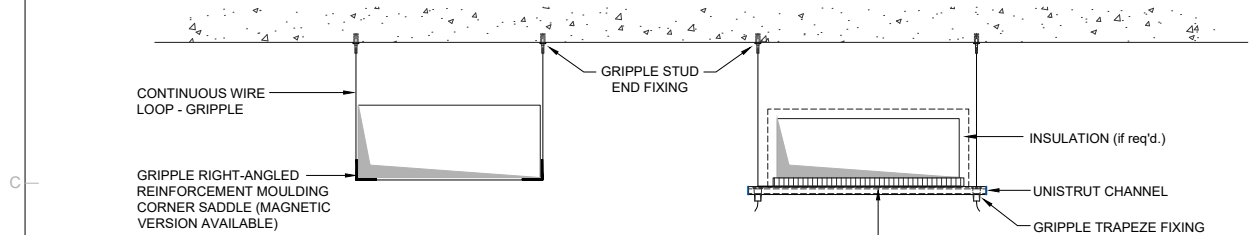
4752-A10-02-00-DR-P-56160

Atelier Ten Ltd 19 Persimmon Works 38 Kingland Road London E2 8DU  
T: +44 (020) 7749 5950 e-mail: a10@atelier-ten.com www.atelier-ten.com

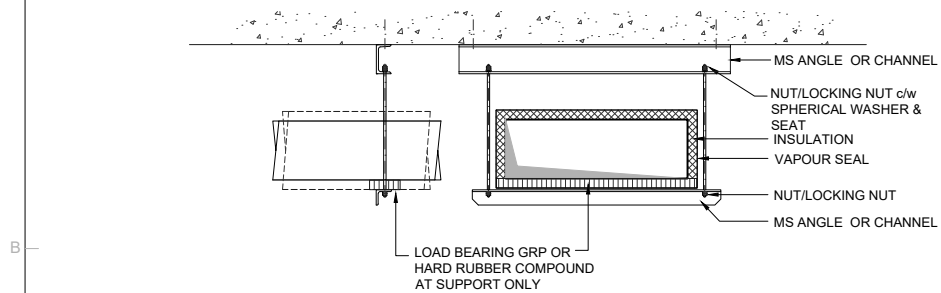
© Atelier Ten Ltd



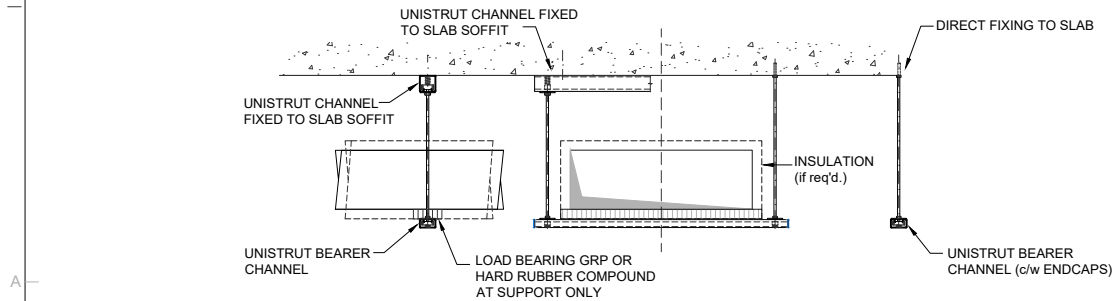
**A** CIRCULAR DUCTWORK - HANGERS DIRECT TO SLAB  
SCALE 1 : 10



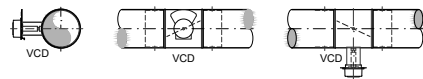
**B** RECTANGULAR DUCTWORK - WIRE HANGERS DIRECT TO SLAB  
SCALE 1 : 10



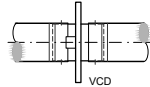
**C** RECTANGULAR DUCTWORK - HANGERS DIRECT TO SLAB  
SCALE 1 : 10



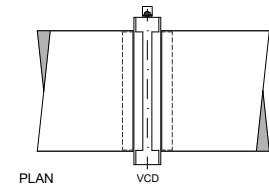
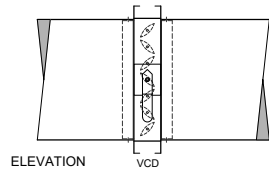
**D** RECTANGULAR DUCTWORK - HANGERS DIRECT TO SLAB  
SCALE 1 : 10



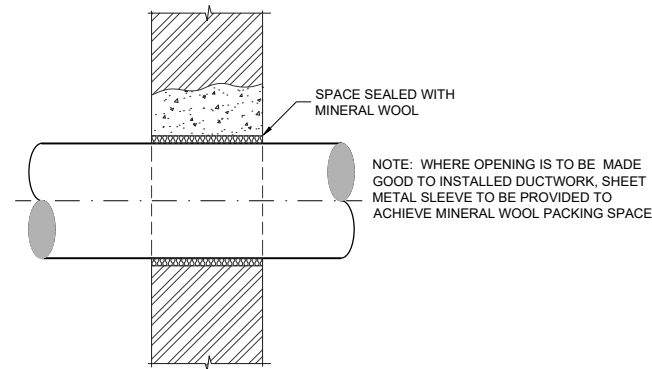
**E** VOLUME CONTROL DAMPER - FLAP TYPE, CIRCULAR  
SCALE 1 : 10



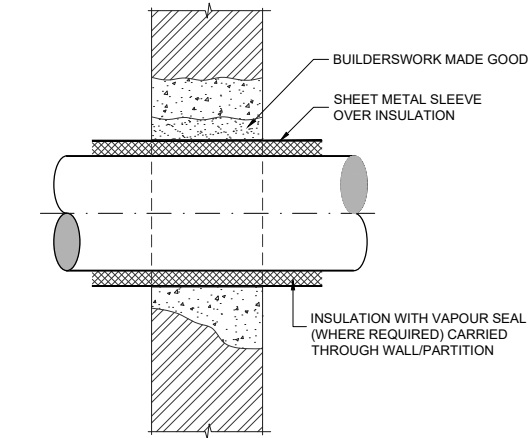
**F** VOLUME CONTROL DAMPER - IRIS TYPE, CIRCULAR  
SCALE 1 : 10



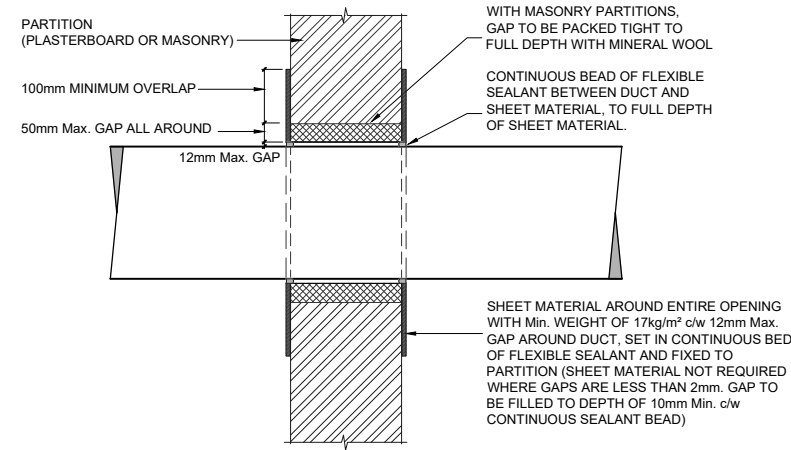
**G** VOLUME CONTROL DAMPER - BLADE TYPE, RECTANGULAR  
SCALE 1 : 10



**H** UNINSULATED DUCTWORK -PASSING THRU' INTERNAL WALL  
SCALE 1 : 10



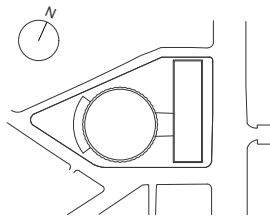
**J** INSULATED DUCTWORK -PASSING THRU' INTERNAL WALL  
SCALE 1 : 10



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

## NOTES

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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.



Scale 1:10  
0 100 200 300 400 500

## CONTRACT ISSUE

B	CONTRACT ISSUE	29.10.20	FQ	PWJ
A	STAGE 4 ISSUE	02.10.20	FQ	PWJ
Rev.	Description	Date	Chd.	Approv.

PROJECT Space House Renovation  
ARCHITECT Squire & Partners  
JOB NUMBER 4752

**atelier ten**  
Environmental Design Consultants + Building Services Engineers

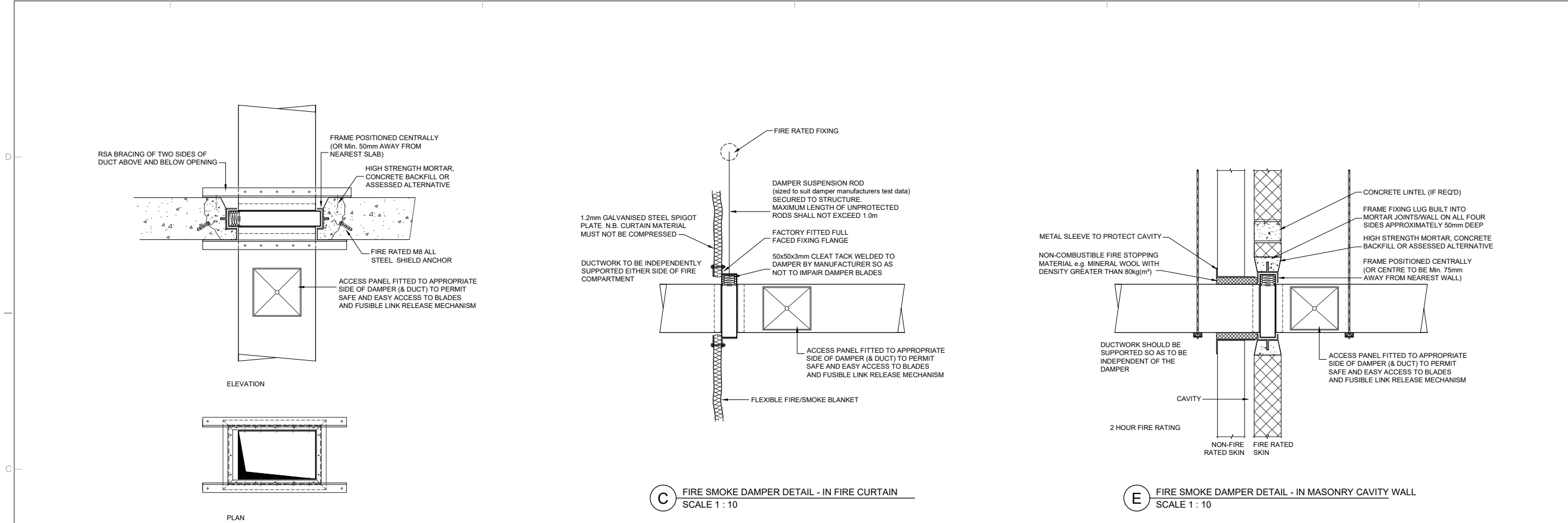
TITLE DUCTWORK  
SUPPORT DETAILS

DRAWN GC DESIGNED NW CHECKED FQ APPROVED PWJ  
DATE October 2020 SCALE As Shown (A1) Rev. B

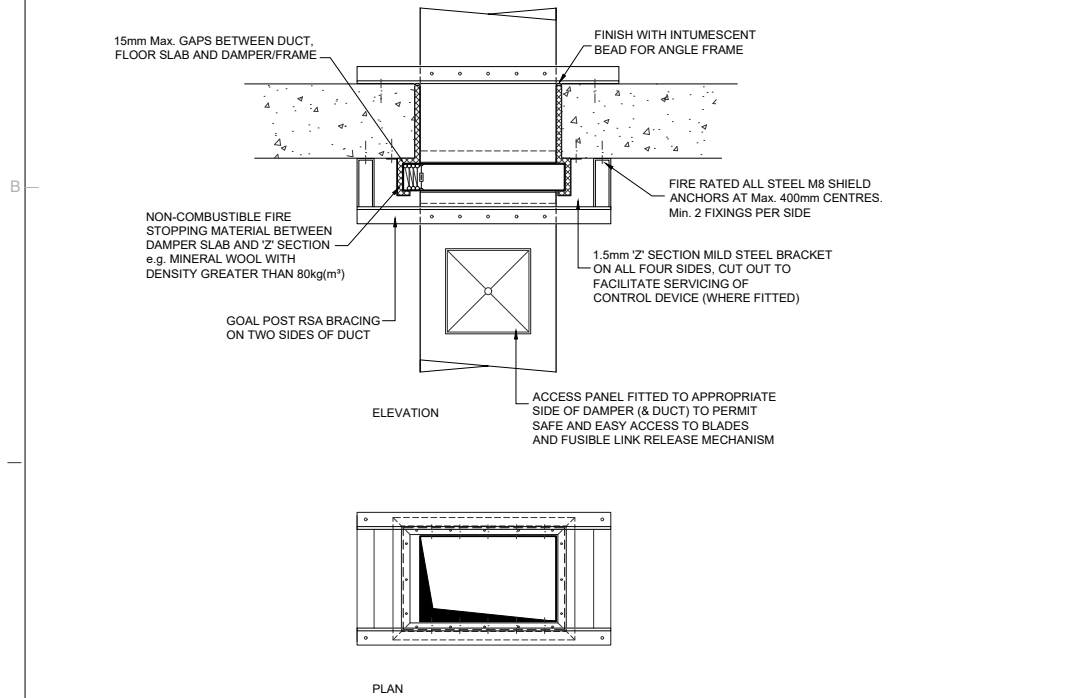
DRAWING No. **18**  
**4752-A10-ZZ-XX-DR-M-50002**

Atelier Ten Ltd 19 Persuasive Works 38 Kingland Road London E2 8DD  
T: +44 (020) 7749 5550 e-mail: a10@atelier-ten.com www.atelier-ten.com

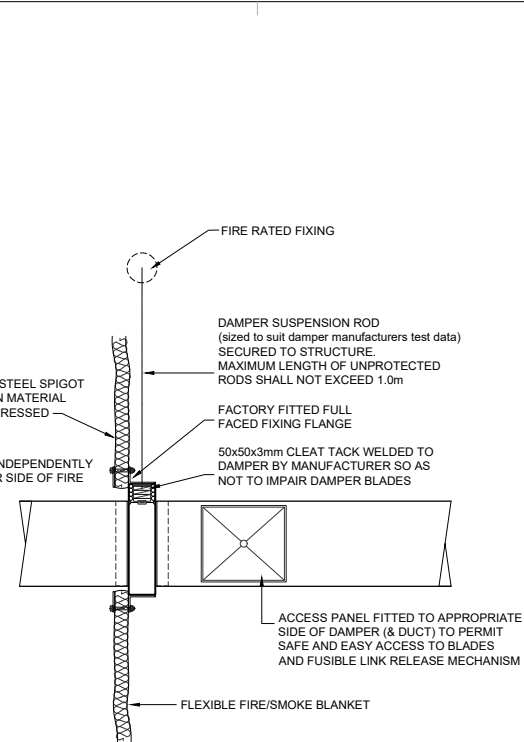
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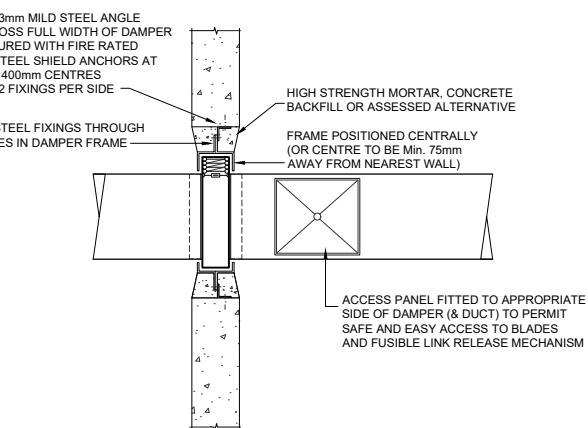
A FIRE SMOKE DAMPER DETAIL - IN CONCRETE SLAB  
SCALE 1 : 10



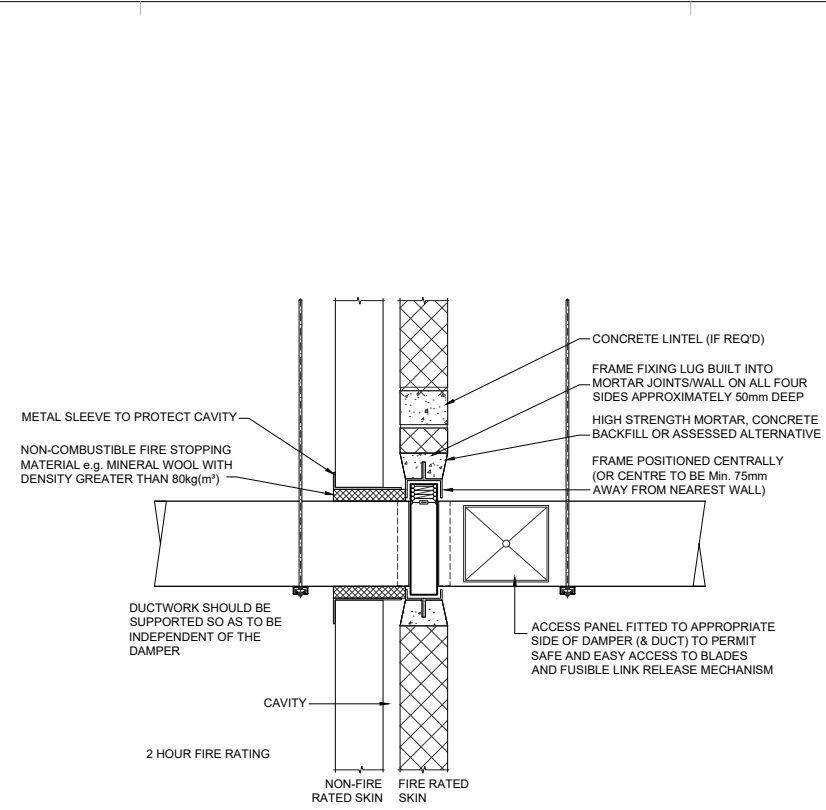
B FIRE SMOKE DAMPER DETAIL - BELOW CONCRETE SLAB  
SCALE 1 : 10



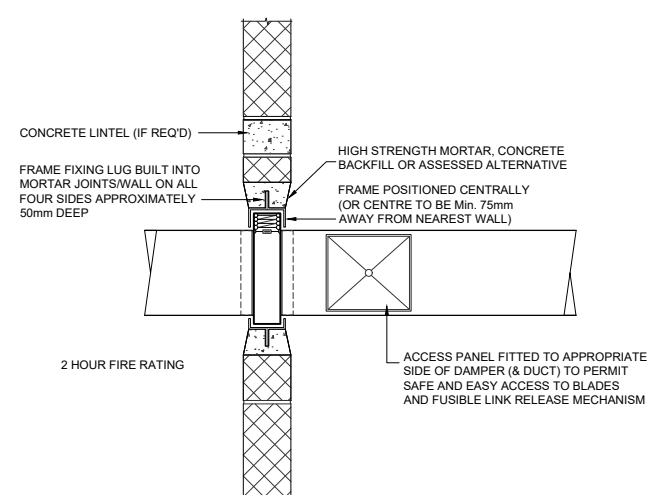
C FIRE SMOKE DAMPER DETAIL - IN FIRE CURTAIN  
SCALE 1 : 10



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

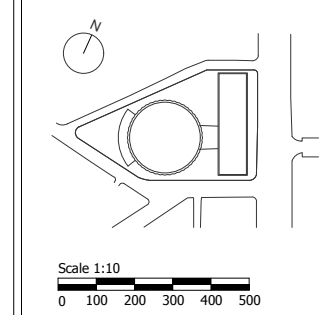


E FIRE SMOKE DAMPER DETAIL - IN MASONRY CAVITY WALL  
SCALE 1 : 10



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

- ### NOTES
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  - Do NOT scale off this drawing. Always work to noted dimensions.
  - All dimensions must be verified on site before completing shop drawings or setting out the work.
  - This drawing is to be read in conjunction with the technical specification and associated equipment schedules as prepared by Atelier Ten.
  - This drawing is to be read in conjunction with all architectural and structural engineer's drawings and associated Atelier Ten drawings.
- ### NOTES:
- 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.



## CONTRACT ISSUE

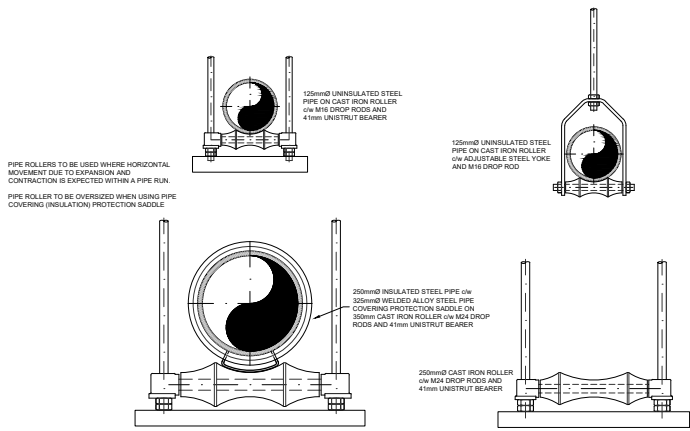
B	CONTRACT ISSUE	25.10.20	FQ	PWJ	
A	STAGE 4 ISSUE	02.10.20	FQ	PWJ	
Rev.	Description	Date	Chd.	Appov.	

PROJECT Space House Renovation  
ARCHITECT Squire & Partners  
JOB NUMBER 4752  
**atelier ten**  
Environmental Design Consultants + Building Services Engineers

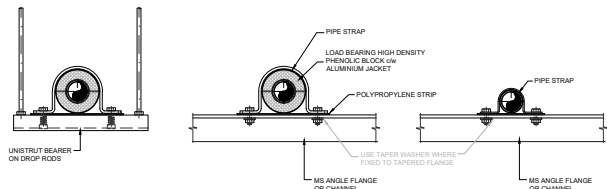
TITLE DUCTWORK  
SUPPORT DETAILS  
FIRE DAMPER ARRANGEMENTS

DRAWN	GC	DESIGNED	NW	CHECKED	FQ	APPROVED	PWJ
DATE	October 2020	SCALE	As Shown (A1)	Rev.	B		

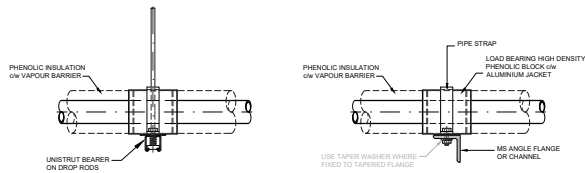
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**4752-A10-ZZ-XX-DR-M-50003**



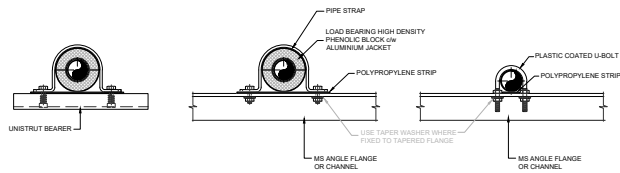
**A** TYPICAL PIPE ROLLERS  
SCALE 1 : 5



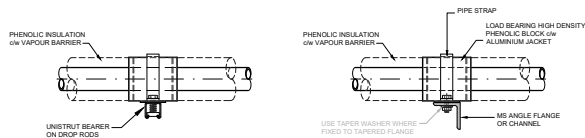
**B** SUSPENDED PIPE SUPPORTS  
SCALE 1 : 5



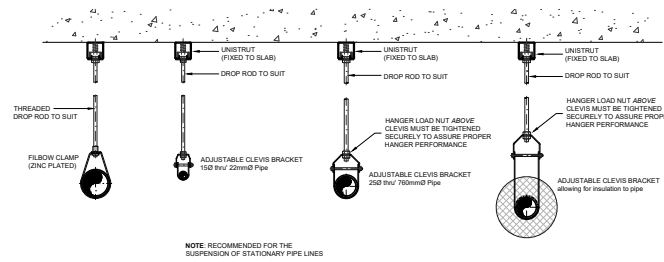
**C** SUSPENDED PIPE SUPPORTS  
SCALE 1 : 5



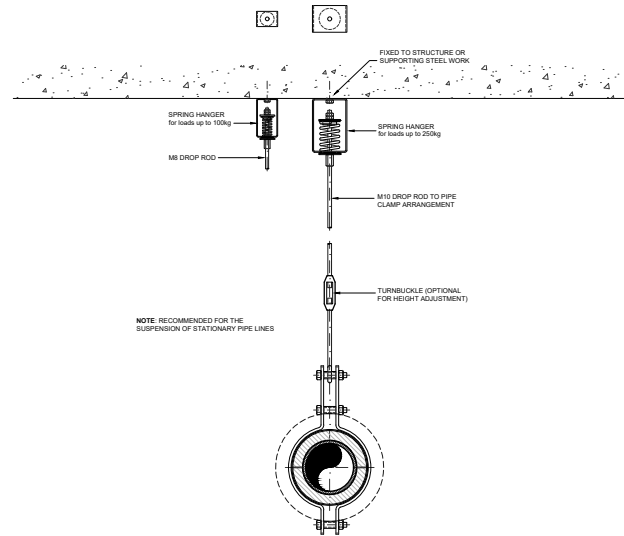
**D** PIPE SUPPORTS WITHIN TRENCH  
SCALE 1 : 5



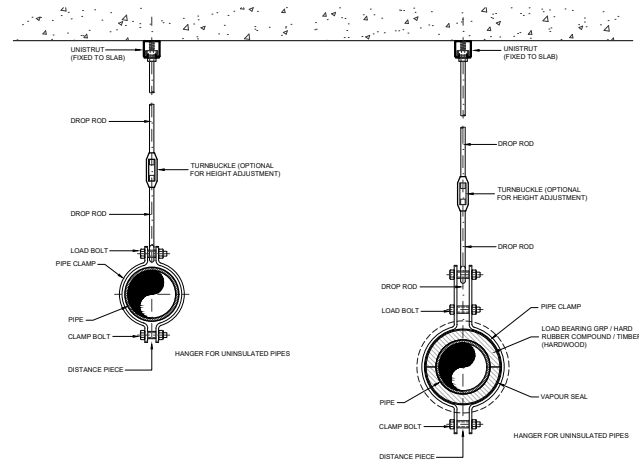
**E** PIPE SUPPORTS WITHIN TRENCH  
SCALE 1 : 5



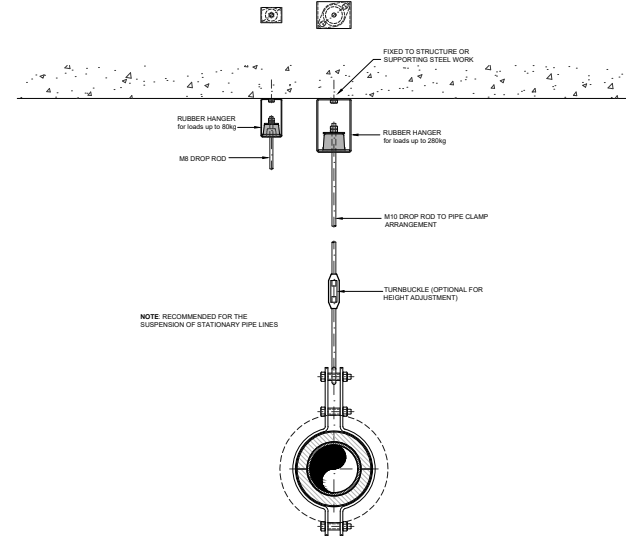
**F** ADJUSTABLE CLEVIS TYPE PIPE HANGERS  
SCALE 1 : 5



**G** TYPICAL SPRING HANGER  
SCALE 1 : 5



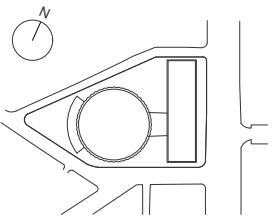
**H** TYPICAL ARRANGMENT OF PIPE HANGERS  
SCALE 1 : 5



**J** TYPICAL RUBBER HANGER  
SCALE 1 : 5

## 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.
4. This drawing is to be read in conjunction with the technical specification and associated equipment schedules as prepared by Atelier Ten.
5. This drawing is to be read in conjunction with all architectural and structural engineer's drawings and associated Atelier Ten drawings.



Scale 1:5  
0 50 100 150 200 250

## CONTRACT ISSUE

B	CONTRACT ISSUE	29.10.20	FQ	PWJ
A	STAGE 4 ISSUE	02.10.20	FQ	PWJ
Rev.	Description	Date	Chd.	Approv.

PROJECT Space House Renovation  
ARCHITECT Squire & Partners  
JOB NUMBER 4752

**atelier ten**  
Environmental Design Consultants + Building Services Engineers

TITLE PIPEWORK  
SUPPORT DETAILS  
Sheet 1

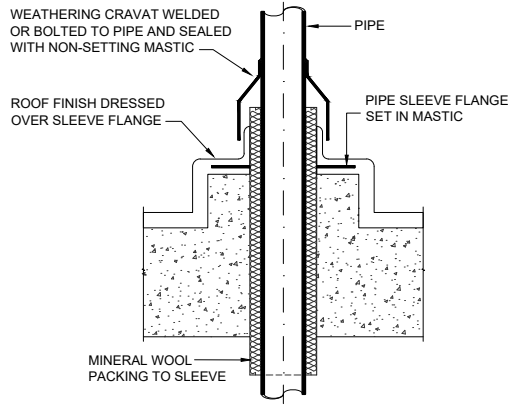
DRAWN GC DESIGNED NW CHECKED FQ APPROVED PWJ  
DATE October 2020 SCALE As Shown (A1) Rev. B

DRAWING No. **20**  
**4752-A10-ZZ-XX-DR-M-50004**

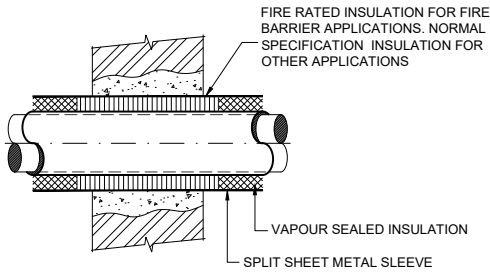
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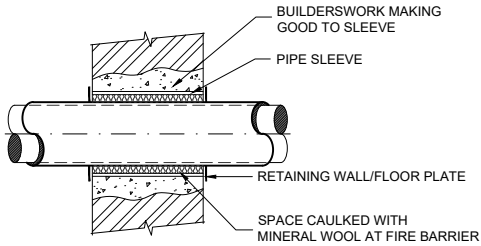




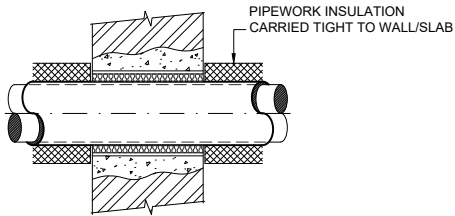
**K** PIPE PENETRATION THRU' ROOF SLAB  
SCALE 1 : 10



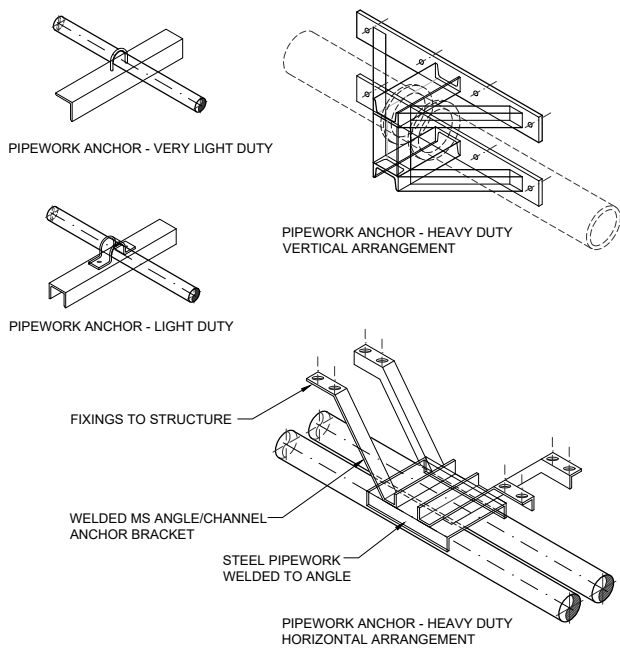
**L** PIPE SLEEVES THRU' WALLS / FLOOR SLABS  
SCALE 1 : 10



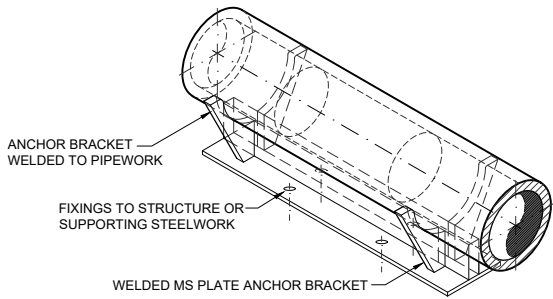
**M** PIPE SLEEVES THRU' WALLS / FLOOR SLABS  
SCALE 1 : 10



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



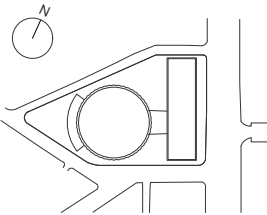
**O** PIPEWORK ANCHOR DETAILS  
SCALE 1 : 10



**P** SINGLE PIPE ANCHOR BRACKET  
SCALE 1 : 10

## NOTES

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Scale 1:10  
0 100 200 300 400 500

## CONTRACT ISSUE

Rev.	Description	Date	Chd.	Approv.
B	CONTRACT ISSUE	29.10.20	FQ	PWJ
A	STAGE 4 ISSUE	02.10.20	FQ	PWJ

PROJECT Space House Renovation  
ARCHITECT Squire & Partners  
JOB NUMBER 4752

**atelier ten**  
Environmental Design Consultants • Building Services Engineers

TITLE PIPEWORK  
SUPPORT DETAILS  
Sheet 2

DRAWN GC DESIGNED NW CHECKED FQ APPROVED PWJ  
DATE October 2020 SCALE As Shown (A1) Rev. B

DRAWING No. **21**  
**4752-A10-ZZ-XX-DR-M-50005**

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## **Appendix 02**

- Central mechanical equipment schedules

MECHANICAL EQUIPMENT SCHEDULEAIR 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													
Max. Sound Power Level Lwa (dB(A)) - Octave Band		FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust	FAI	Supply	Extract	Exhaust
	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 SCHEDULEAIR 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 nozzles &				All Attenuation duct mounted Base height: 100mm. Complete with removable nozzles &			

MECHANICAL EQUIPMENT SCHEDULEAIR 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 <sup>3</sup> /s)		8.35				N/A							
Supply External Static Press. (Pa)		745				N/A							
Extract Air Volume (m <sup>3</sup> /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 SCHEDULEAIR 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
	8k (Hz)	74.5	73.9	72
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	1.2m sides, 1.0m ends	1.2m sides, 1.0m ends	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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