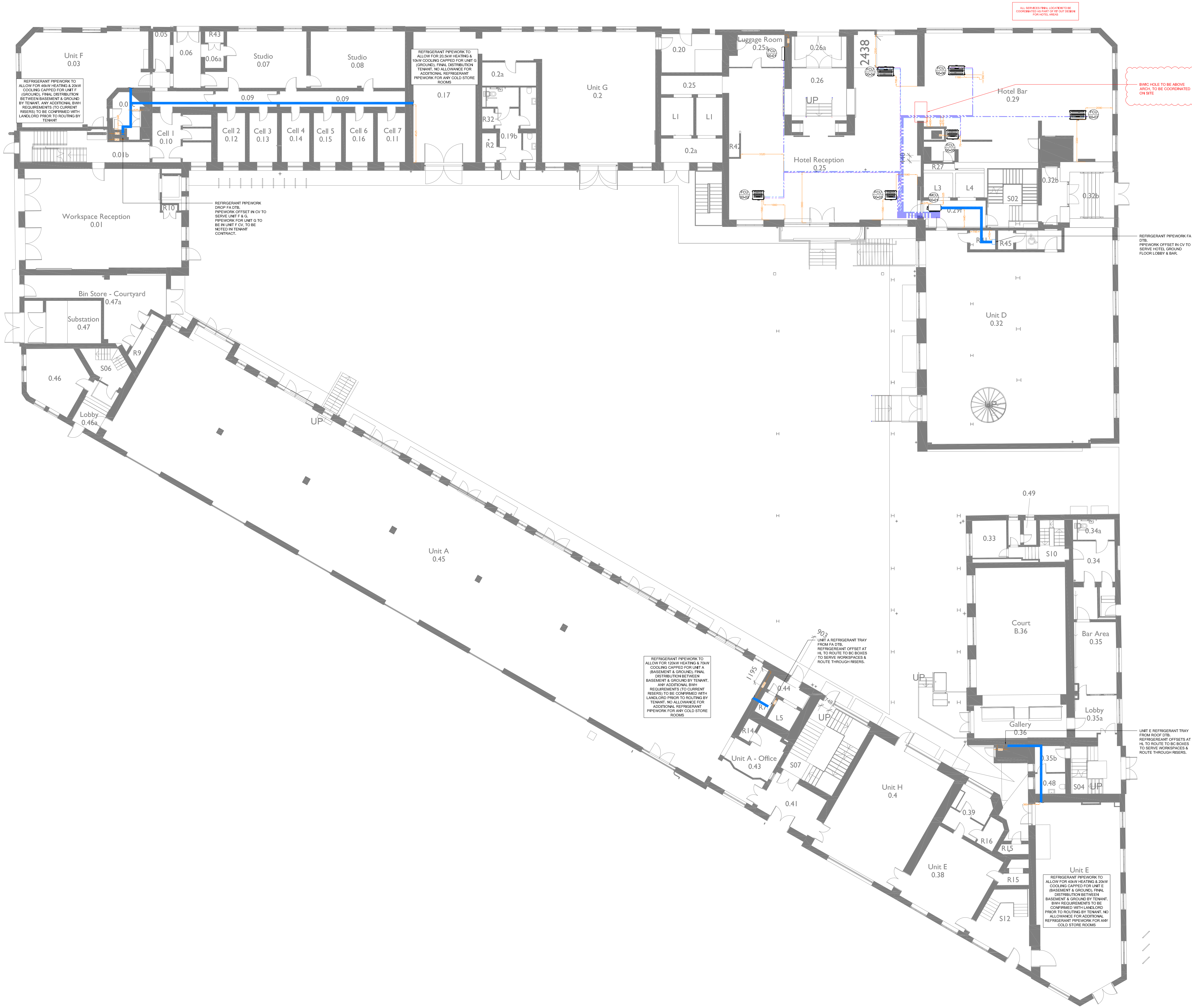


10
0
10
Millimetres



NOTES

- DO NOT SCALE FROM THIS DRAWING.
- ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARATION OF SHOP DRAWINGS, FABRICATION OF PARTS, ORDERING MATERIALS OR COMMENCING WORKS.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS, SPECIFICATIONS AND SCHEDULES.
- ANY PENETRATION THROUGH FLOOR, SEEK STRUCTURAL ENGINEERS APPROVAL BEFORE COMMENCEMENT.
- ALL PLANT AND EQUIPMENT SHALL BE INSTALLED FULLY IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

REFRIGERATION INSTALLATION

- THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE VRF SYSTEMS IN ACCORDANCE WITH BS EN 378. THE SYSTEM SHOWN IS INDICATIVE TO DEMONSTRATE DESIGN INTENT ONLY. THE SYSTEM SIZES AND PIPEWORK ROUTES ARE SUBJECT TO THE CONTRACTORS DETAILED DESIGN.
- MECHANICAL CONTRACTORS AIR CONDITIONING SPECIALIST TO SUPPLY, INSTALL, TEST AND COMMISSION ALL INTERCONNECTING REFRIGERATION PIPEWORK BETWEEN THE OUTDOOR AND INDOOR UNITS.
- ALL PIPEWORK TO BE CARRIED OUT IN REFRIGERATION QUALITY SOST MECHANICAL DRAWING COPPER TUBING TO BS21 PART 2: 1972 COMPLETE WITH THE APPROPRIATE JOINT PIPES FOR TWIN AND TRIPLE SYSTEMS.
- PIPEWORK SHOULD BE CARRIED OUT BY AN APPROVED CERTIFICATE APPROVAL MUST BE SUBMITTED PRIOR TO INSTALLATION (COMMENCEMENT) REFRIGERANT ENGINEER AND IN ACCORDANCE TO BS EN 378 2006 SPECIFICATION. R410A TUBES REQUIRED FOR ALL PIPEWORK. TORQUE SPANNERS, FLARING BLOCKS ETC.
- LONGEST POSSIBLE LENGTHS OF COPPER PIPE SHOULD BE UTILISED TO MINIMIZE JOINTS ON SITE.
- APPROPRIATE REFRIGERATION INSTALLATION TOOLS MUST BE UTILISED. DRY NITROGEN MUST BE UTILISED AT ALL TIMES IN THE SYSTEM DURING BRAZING.
- ALL PIPEWORK (SUCTION AND LIQUID LINES) TO BE INSULATED WITH SUP-ON CLOSE CELL ELASTOMERIC PIPE INSULATION (AS MANUFACTURED BY ARMAFLEX OR EQUAL AND APPROVED WITH A FIRE PERFORMANCE CLASS 0 OF THE 1985 BUILDING REGULATIONS, HAVING A WALL THICKNESS OF NOT LESS THAN 13mm.

AFTER INSTALLATION OF PIPEWORK, AND PRIOR TO SEALING OF INSULATION, JOINTS AND STARTING OF EQUIPMENT, PIPEWORK SHOULD BE PRESSURE STRENGTH TESTED TO 42 BAR, CHECKED FOR DEFORMATION, AND THEN LEAK TESTED AT 33 BAR AND HELD FOR 24 HOURS AND CHECKED FOR LEAKS. THEN VACUUMED/DEHYDRATED TO (-750MM HG) 2 TONN, AND HELD AT THAT SETTING FOR 24 HOURS (MINIMUM). HSE DOCUMENT GSA SHOULD BE FOLLOWED DURING PRESSURE TESTING PERIOD.

- REFRIGERANT (R32) CHARGE WEIGHT MUST BE CALCULATED, TO THE ACTUAL INSTALLED LENGTHS OF PIPEWORK IN ACCORDANCE TO MANUFACTURERS RECOMMENDATIONS.
- THE CHARGING SHOULD BE CARRIED OUT WITH AN APPROPRIATE CHARGING STATION.
- PIPEWORK TO BE PROPERLY FIXED AND SUPPORTED AT A MINIMUM OF 1.5 METRE CENTRES AND WHERE REQUIRED SHOULD BE RUN ON GALVANISED TRAYS. ALL PIPEWORK TO BE LABELLED WITH ID NUMBER (CONDENSING UNITS REF.) AT 3 METRE INTERVALS.
- JOINTS IN COPPER PIPE SHALL BE BRAZED. BRAZING SHALL BE CARRIED OUT TO THE REQUIREMENTS OF THE IWCA CODE OF PRACTICE - BRAZING AND BRONZE WELDING OF COPPER PIPE AND SHEET.
- WHERE VRF AND VENTILATION PLANT IS INSTALLED ABOVE SOLID CEILINGS I.E. PLASTERBOARD SUITABLY SIZED ACCESS HATCHES ARE TO BE INSTALLED TO ALLOW ACCESS FOR INSTALLATION, COMMISSIONING, MAINTENANCE, CLEANING AND REMOVAL.
- DUCTED VRF UNITS SHALL BE SUPPLIED WITH AN EXTENDED RETURN AIR TEMPERATURE SENSOR WHICH SHALL EXTEND FROM THE UNIT TO PROTRUDE SLIGHTLY FROM THE FACE OF THE ROOM RETURN AIR GRILLE.
- A CONDENSATE LINE SHALL BE INSTALLED TO EACH FAN COIL UNIT. THIS SHALL BE INSTALLED AND INSULATED ALL AS PER THE STANDARD SPECIFICATION. MINIMUM SIZE OF CONDENSATE PIPES TO BE 25mm COPPER OR PLASTIC, INSULATED AND PUMPED OR BY GRAVITY FROM EACH FAN COIL / CASSETTE, DRAINS TO RUN 1:80 MIN FALLS.
- CONDENSATE PIPEWORK FROM VRF UNITS SHALL RUN WITHIN THE CEILING VOID TO THE NEAREST BELOW GROUND DRAINAGE POINT AND SHALL BE COMPLETE WITH IN LINE SELF SEALING TRAP.
- THE MECHANICAL CONTRACTORS AIR CONDITIONING SPECIALIST SHALL BE RESPONSIBLE FOR THE INTERCONNECTING CONTROL WIRING BETWEEN THE INDOOR AND OUTDOOR UNITS AND CONTRA WIRING BETWEEN REMOTE CONTROLLERS AND RELEVANT COMPONENTS. THIS WORK SHALL BE CO-ORDINATED WITH THE ELECTRICAL SUB CONTRACTOR FOR THE ROUTING AND TRUNNING OF THE CABLES.
- CONTROL WIRING SHALL NOT BE RUN NEXT TO POWER WIRING, A MINIMUM SPACE OF 100mm BETWEEN BOTH CONTROL AND POWER CABLES SHALL APPLY.

COMFORT COOLING LEGEND

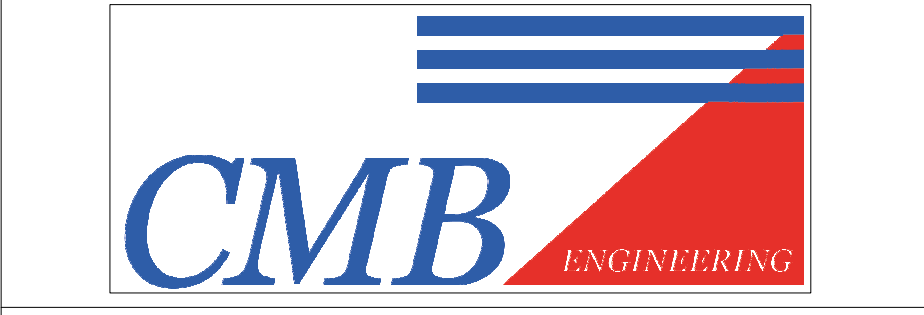
- REFRIGERANT PIPEWORK
- REFRIGERANT PIPEWORK RETURN
- REFRIGERANT PIPEWORK TRAY
- PIPEWORK IN CEILING VOID
- PIPEWORK AT LOW LEVEL
- PIPEWORK IN FLOOR VOID
- CIRCULAR SUPPLY DUCTWORK
- CIRCULAR SUPPLY AIR VALVE
- AIR SOURCE HEAT PUMP/OUTDOOR AIR SOURCE
- FAN COIL UNIT
- CEILING MOUNTED FAN COIL UNIT
- WALL MOUNTED FAN COIL UNIT
- MODE CONTROLLER UNIT BRANCH CONTROLLER BOX
- ACCESS HATCH
- HOTEL - ITEM ABBREVIATION REFERENCE NUMBER
- WORKSPACE - ITEM ABBREVIATION REFERENCE NUMBER

ABBREVIATIONS

- LL - LOW LEVEL
- HL - HIGH LEVEL
- FV - FLOOR VOID
- CV - CEILING VOID
- FB - FROM BELOW
- FA - FROM ABOVE
- DTB - DROP TO BELOW
- RTA - RISE TO ABOVE
- AH - ACCESS HATCH
- BC - BC CONTROLLER UNIT
- FCU - FAN COIL UNIT
- MCU - MODE CONTROLLER UNIT
- ODU - OUTDOOR CONDENSING UNIT
- VRF - VARIABLE REFRIGERANT FLOW

Rev.	Date	Description	By	Chk'd	App'd
P04	03.03.25	GA's UPDATED	CMB	CW	LM
P03	29.01.25	REVISED PER COMMENTS	CC	CW	LM
P02	06.08.24	REVISED GA AND INCORPORATE COMMENTS	KD	CC	LM
P01	18.04.24	REISSUED AT (P) STAGE 5 PREVIOUS DRAWINGS SUPERCEDED	KD	CC	LM

Rev.	Date	Description	By	Chk'd	App'd
P04	03.03.25	GA's UPDATED	CMB	CW	LM
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P02	06.08.24	REVISED GA AND INCORPORATE COMMENTS	KD	CC	LM
P01	18.04.24	REISSUED AT (P) STAGE 5 PREVIOUS DRAWINGS SUPERCEDED	KD	CC	LM



Client

ALLIED LONDON

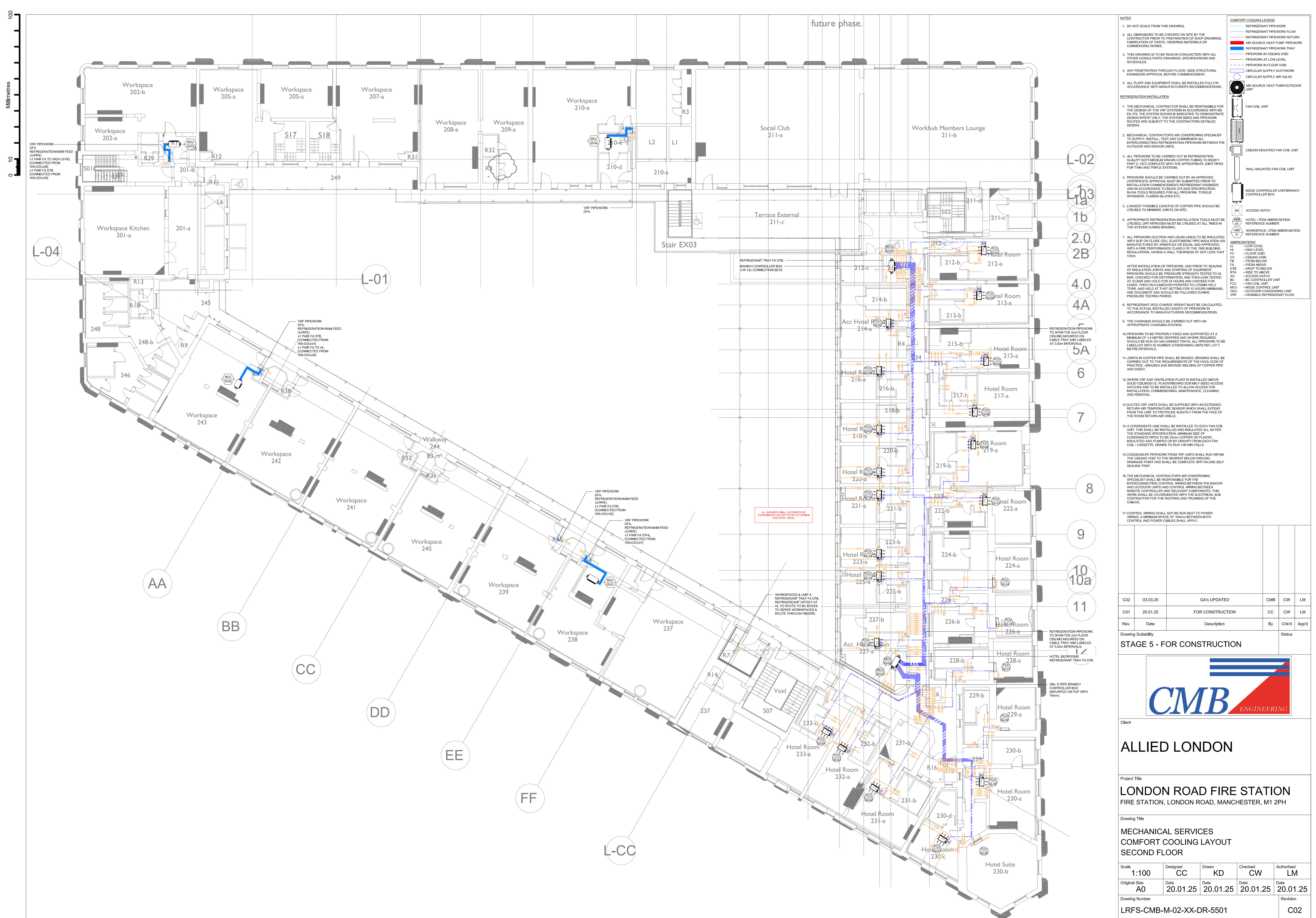
Project Title

LONDON ROAD FIRE STATION
FIRE STATION, LONDON ROAD, MANCHESTER, M1 2PH

Drawing Title

**MECHANICAL SERVICES
COMFORT COOLING LAYOUT
GROUND FLOOR**

Scale 1:100	Designed CC	Drawn KD	Checked CC	Authorised LM
Original Size -	Date 18.04.24	Date 18.04.24	Date 18.04.24	Date 18.04.24
Drawing Number LRFS-CMB-M-00-XX-DR-5501				Revision P04



COMFORT COOLING LEGEND

- REFRIGERANT PIPEWORK
- REFRIGERANT PIPEWORK RETURN
- PIPEWORK IN FLOOR VOID
- PIPEWORK IN CEILING VOID
- PIPEWORK IN LOW LEVEL
- PIPEWORK IN FLOOR VOID
- CIRCULAR SUPPLY DUCTWORK
- CIRCULAR SUPPLY AIR VALVE
- AIR SOURCE HEAT PUMP/OUTDOOR UNIT
- FAN COIL UNIT
- CEILING MOUNTED FAN COIL UNIT
- WALL MOUNTED FAN COIL UNIT
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- HOTEL - ITEM ABBREVIATION REFERENCE NUMBER
- WORKSPACE - ITEM ABBREVIATION REFERENCE NUMBER

ABBREVIATIONS

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- ODU - OUTDOOR CONDENSING UNIT
- VRF - VARIABLE REFRIGERANT FLOW

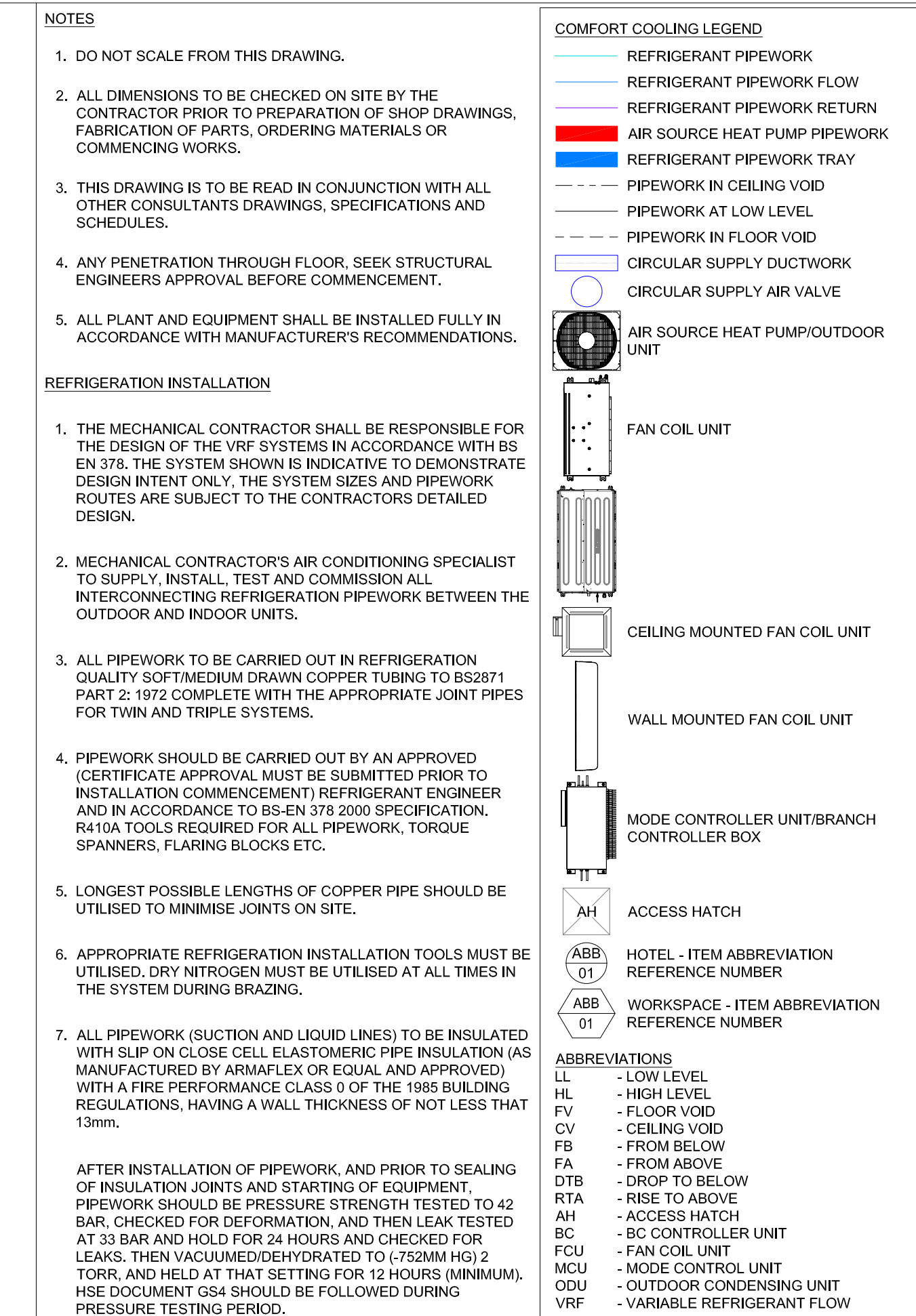
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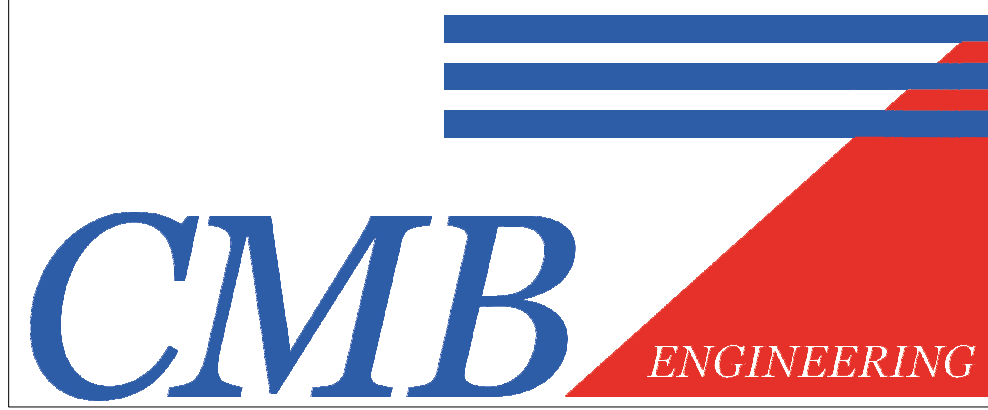
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REFRIGERATION INSTALLATION

- THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE VRF SYSTEMS IN ACCORDANCE WITH BS EN 378. THE SYSTEM SHOWN IS INDICATIVE TO DEMONSTRATE DESIGN INTENT ONLY. THE SYSTEM SIZES AND PIPEWORK ROUTES ARE SUBJECT TO THE CONTRACTORS DETAILED DESIGN.
- MECHANICAL CONTRACTORS AIR CONDITIONING SPECIALIST TO SUPPLY, INSTALL, TEST AND COMMISSION ALL INTERCONNECTING REFRIGERATION PIPEWORK BETWEEN THE OUTDOOR AND INDOOR UNITS.
- ALL PIPEWORK TO BE CARRIED OUT IN REFRIGERATION QUALITY 80/20 METAL DRAWN COPPER TUBING TO BS31 PART 2: 1972 COMPLETE WITH THE APPROPRIATE JOINT PIPES FOR TWIN AND TRIPLE SYSTEMS.
- PIPEWORK SHOULD BE CARRIED OUT BY AN APPROVED CERTIFICATE APPROVAL MUST BE SUBMITTED PRIOR TO INSTALLATION (COMMENCEMENT) REFRIGERANT ENGINEER AND IN ACCORDANCE TO BS EN 378 2006 SPECIFICATION. R410A TOOLS REQUIRED FOR ALL PIPEWORK, TORQUE SPANNERS, FLARING BLOCKS ETC.
- LONGEST POSSIBLE LENGTHS OF COPPER PIPE SHOULD BE UTILISED TO MINIMIZE JOINTS ON SITE.
- APPROPRIATE REFRIGERATION INSTALLATION TOOLS MUST BE UTILISED. DRY NITROGEN MUST BE UTILISED AT ALL TIMES IN THE SYSTEM DURING BRAZING.
- ALL PIPEWORK (SUCTION AND LIQUID LINES) TO BE INSULATED WITH SUP ON CLOSE CELL ELASTOMERIC PIPE INSULATION (AS MANUFACTURED BY ARMAFLEX OR EQUAL AND APPROVED) AT 33 BAR AND HELD FOR 24 HOURS AND CHECKED FOR LEAKS. THEN VACUUMED/DEHYDRATED TO (-750MM HG) 2. TORN AND HELD AT THAT SETTING FOR 4 HOURS (MINIMUM). HSE DOCUMENT GSA SHOULD BE FOLLOWED DURING PRESSURE TESTING PERIOD.
- REFRIGERANT (R32) CHARGE WEIGHT MUST BE CALCULATED, TO THE ACTUAL INSTALLED LENGTHS OF PIPEWORK IN ACCORDANCE TO MANUFACTURERS RECOMMENDATIONS.
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- JOINTS IN COPPER PIPE SHALL BE BRAZED. BRAZING SHALL BE CARRIED OUT TO THE REQUIREMENTS OF THE HVCA CODE OF PRACTICE - BRAZING AND BRONZE WELDING OF COPPER PIPE AND SHEET.
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- DUCTED VRF UNITS SHALL BE SUPPLIED WITH AN EXTENDED RETURN AIR TEMPERATURE SENSOR WHICH SHALL EXTEND FROM THE UNIT TO PROTRUDE SLIGHTLY FROM THE FACE OF THE ROOM RETURN AIR GRILLE.
- A CONDENSATE LINE SHALL BE INSTALLED TO EACH FAN COIL UNIT. THIS SHALL BE INSTALLED AND INSULATED ALL AS PER THE STANDARD SPECIFICATION. MINIMUM SIZE OF CONDENSATE PIPES TO BE 20mm COPPER OR PLASTIC. INSULATED AND PUMPED OR BY GRAVITY FROM EACH FAN COIL / CASSETTE, DRAINS TO RUN 1:80 MIN FALLS.
- CONDENSATE PIPEWORK FROM VRF UNITS SHALL RUN WITHIN THE CEILING VOID TO THE NEAREST BELOW GROUND DRAINAGE POINT AND SHALL BE COMPLETE WITH IN LINE SELF SEALING TRAP.
- THE MECHANICAL CONTRACTORS AIR CONDITIONING SPECIALIST SHALL BE RESPONSIBLE FOR THE INTERCONNECTING CONTROL WIRING BETWEEN THE INDOOR AND OUTDOOR UNITS AND CONTRA. WIRING BETWEEN REMOTE CONTROLLERS AND RELEVANT COMPONENTS. THIS WORK SHALL BE CO-ORDINATED WITH THE ELECTRICAL SUB CONTRACTOR FOR THE ROUTING AND TRIMMING OF THE CABLES.
- CONTROL WIRING SHALL NOT BE RUN NEXT TO POWER WIRING. A MINIMUM SPACE OF 100mm BETWEEN BOTH CONTROL AND POWER CABLES SHALL APPLY.

C02	03.03.25	GA's UPDATED	CMB	CW	LM
C01	20.01.25	FOR CONSTRUCTION	CC	CW	LM
Rev.	Date	Description	By	Chk'd	App'd
Drawing Suitability					
STAGE 5 - FOR CONSTRUCTION					
Client					
ALLIED LONDON					
Project Title					
LONDON ROAD FIRE STATION					
FIRE STATION, LONDON ROAD, MANCHESTER, M1 2PH					
Drawing Title					
MECHANICAL SERVICES					
COMFORT COOLING LAYOUT					
SECOND FLOOR					
Scale	1:100	Designed	CC	Drawn	KD
Original Size	A0	Date	20.01.25	Date	20.01.25
Checked	CW	Date	20.01.25	Authorised	LM
Date	20.01.25	Revision			
Drawing Number	LRFS-CMB-M-02-XX-DR-5501				
	C02				



STAGE 5 - FOR CONSTRUCTION			
			
Client			
ALLIED LONDON			
Project Title			
LONDON ROAD FIRE STATION			
FIRE STATION, LONDON ROAD, MANCHESTER, M1 2PH			
Drawing Title			
MECHANICAL SERVICES			
COMFORT COOLING LAYOUT			
THIRD FLOOR			
Scale	Designed	Drawn	Checked
1:100	CC	KD	CW
Original Size	Date	Date	Date
A0	20.01.25	20.01.25	20.01.25
Drawing Number	Revision		
LRFS-CMB-M-03-XX-DR-5501	C03		

