



7 Bedford Row

Performance Specification and
Employers Requirements in connection
with Building Services at Bedford Row
and Jockeys Field

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1. INTRODUCTION

This document sets out the high-level design principles and construction standards for the building services installation at Bedford Row and Jockeys field.

This document is written in an instructive voice to the contractor and uses the term “provide” to mean “set out, supply, install, test, commission and undertake all works necessary for a complete working system”

This is a design and build contract and a proactive interface with the client team is critical to the design process.

Develop the design intent and requirements herein into options, detailed design proposals and provide technical submittals, samples and calculations to an agreed programme and actively liaise and seek solutions and highlight issues to the client team.

Refer to the Rockstone documents for details of contacts on the client team, contractual matters and Prelims

This document defines requirements for standards of workmanship, design requirements, processes associated with building services and the key objectives of the building services. The contractor must include for a high standard of design and communication, attendance at design meetings, technical submissions, calculations, landlord submission compliance statements and the paperwork and liaison with the client team expected from a quality designer.

Adherence with the detailed requirements of the tenants fit out guides is required, and the contractor should thoroughly familiarise himself with the guide and include for all requirements as appropriate. The tenants guide requirements have not been repeated herein.

Although this document sets out requirements, the contractor is to discuss these with the client team and offer alternatives and options and develop the design within the programme, actively suggesting solutions and value engineering and identifying dates when information is required.

Refer in detail to the architectural drawings, the base design and associated document these impart a lot of information about the building and landlord requirements WHICH MAY NOT BE FULLY DESCRIBED WITHIN THIS DOCUMENT AND YOU NEED TO INCLUDE WITHIN TENDER AND ACTION ONN SITE.

1.1 Building control

Discuss solutions to achieve the design proposals with building control, fire officer and other statutory authorities to create a compliant scheme. Include for fire alarm interfaces, fire barriers and other passive systems including magnetic door hold open devices.

Note the openable windows for smoke control and include solutions to facilitate their function if these are within a cellular space

Examine the requirements for hose reel and the fire shutter and determine if these can be safely removed by discussion with building control and seeking approval of landlord, and confirm these will not be a dilapidation item

Provide flashing beacons for fire alarm, induction loops and all other items required to comply with DDA and part M requirements to satisfy building control. Engage DDA compliance advice as required. Induction loops in all meeting rooms 8 person or larger will be satisfied by kiosk type. The large LG floor meeting suite will require an installed induction loop – liaise with AV team.

Provide a smoke detector / sounder in each cellular space or as required to achieve sound level. Also, provide interfaces with AV systems to mute the AV system in event of a fire.

Develop these proposals and agree them with building control at the earliest stage during design phase.

1.1 Services tender price

Note the requirement for a compliant bid and refer to the Rockstone documents for the compliant bid layout and design services to suit this. For any alternative scheme, presented as an option the services must also comply with the requirements of this document, but a different design and cost is likely and should be identified.

The price for the required services in any scheme must include all items required for a complete, fully commissioned working system and the required attendance and design input to develop the design with the client. The baseline price should include the works needed to allow spaces to function as meeting rooms, break out and other spaces, with due consideration to the aesthetics, maintainability and cost

Give consideration always to the future occupation scenarios development of break out spaces and possible future use as desks and conversion of space to additional offices.

Any proposals or alternatives should be described and priced as separate options or below the line prices using the Contract Sum agreement document provided by project manager or QS

Provide a detailed breakdown of costs and schedule of rates for all typical services items as part of the tender submission, in particular the number of fan coil should be highlighted.

NOTA BENE

The cad drawings and existing drawings may not be accurate in regards precise locations. Where overlays in this document or links to existing information indicate fan coils, ducts or other services are very close to where a wall is proposed - visit site and take accurate measurements and coordinate on site prior to order of equipment – do not assume the existing information is accurate. Provide accurate final drawings, commissioning data in the O&M including accurate architectural background.

1.2 Existing information

Refer to site and undertake surveys. There are few existing drawings and any found should be considered for guidance only – a detailed site survey is required to be undertaken at tender to minimise risk of variations / claims later.

It is your responsibility to seek additional information as required and make reasonable assumptions and to understand that investigations may take some time and involvement of English Heritage may be required. Seek any required information from the landlord directly at the earliest stage and track the information requested with date asked and supplied. Actively progress the requests for information and check for progress updates. Report any issues identified which may impact costs or programme.

1.3 Tenancy splits

There are no tenancy arrangements at Bedford Row or Jockeys field, however each floor should generally be fed by its own distribution board

The following services will be shared between Jockeys Field and Bedford Row

- Fire alarms
- Comms and data
- Water
- Gas supplies (though redundant)

VRF system will not be shared between the buildings

2.0 KEY DECISIONS AND AGREEMENTS

2.1 Key notes – Bedford Row

- The heating system of Bedford Row does not perform, and generally electric oil filled portable heaters are used. There is no cooling at Bedford Row. Provide a refrigerant based system which provides both heating and cooling. This will be installed as sympathetically as practicable.
- To provide new cooling, electrical supplies, lighting and data the contractor will provide to routes for services in the floors. It is unknown how English heritage will respond to these proposal
- Water services, Electrical submains and LV panel and some final circuits are expected to remain and be kept. Subject to budget constraints it might be prudent to replace some of the final circuits with new whilst works are ongoing and floor boards are up and the works are being undertaken.

2.2 Key Notes - Jockeys' Field

- The new seminar and meeting suite requires a great deal more fresh air than the previous building. There is no information available on the existing air handling units or ductwork routes. These have been surveyed on site and generally they are in poor condition, as is the equipment the provides heat and cold to the air handling unit and the pipe and valve systems for this. An AHU has been sizes initially but duct arrangements from this need detailed design.
- The building has many condensers located on terraces, in lightwell, on roof etc and some of these are no longer function, where internal units have failed a new unit has been provided and the old system not removed. These should be fully stripped out with all pipework
- A new fresh air, heating and cooling system is proposed throughout Jockeys' Field, re-using ductwork where suitable but otherwise new.
- Electrically the main panel and submain cables are proposed to be re-used

2.3 Key services decisions

The following key services decisions have been made during the design process since initial surveys

1. It is acknowledged that the existing heating and cooling systems at both Bedford Row and Jockeys' Field are beyond their useful life and need to be replaced
2. No fresh air is to be provided for Bedford Row
3. No changes to fire strategy are anticipated.
4. Generally, if existing services can practically be used and offer a serviceable life for the next 15 years they should be re-used.
5. Cooling units in Bedford Row need to by sympathetically arranged and joinery bookcase system discussed
6. Provide a platform lift at the route between Bedford Row and Jockeys Field at ground floor as per architects drawings.
7. Lightning protection system are not included at this time

8. Redundant floor boxes will be repaired and left in situ for future flexibility and to avoid further works to floor board. Similarly sockets and data within surface mounted boxes will be removed and a local floor box provided.
9. Generally, grommets will be used for the new desks in Bedford row and Jockeys Field, using desk cable managements to distribute socket bocks and data outlet boxes
10. The client will provide floor standing lamps to use the existing and new 5A lamp sockets via existing light switches. These will be bought under the furniture contract?

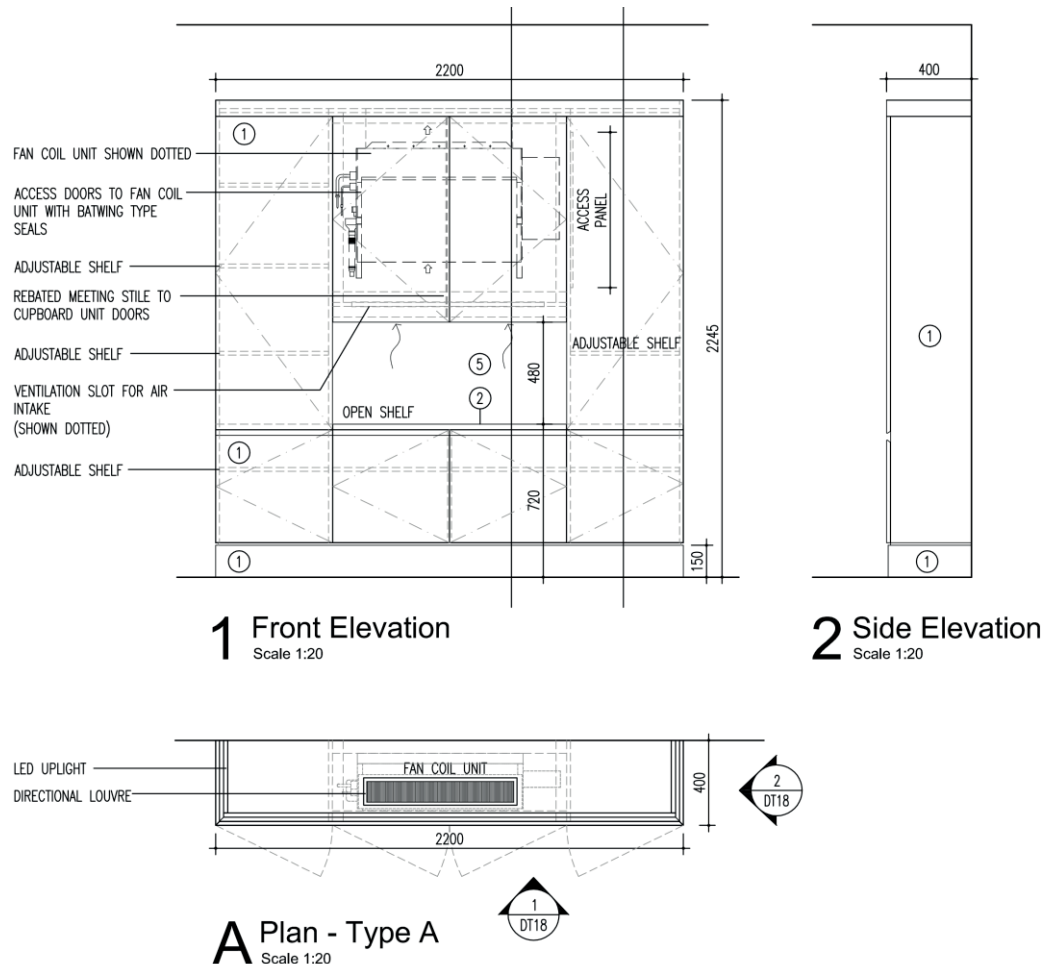


Figure 1 Fan coil joinery unit proposal with return air slot tucked under first shelf for Bedford Row

3.0 DESIGN REQUIREMENTS

Develop the clients' requirements for services by attendance at meetings, clear communications provision of options and reports and demonstrate the technical merits of these to the client team upon request to allow fuller comparison of advantages and disadvantages.

Liaise with the client team including project manager and engineering representative and statutory authorities including to develop the building services including, but not limited to;

- Meeting room fresh air, all hands meeting fresh air, cooling and heating proposals
- Control systems and interface with AV for rooms with sliding folding partitions including HVAC and lighting considerations.
- Review and survey of existing furniture and technology which is nominated by the client to be used on the new project.
- Security and CCTV systems
- Incoming data
- Containment routes
- Power and data presentation methods to desks and underfloor
- Seating and storage arrangements
- Acoustic separation between rooms,
- Acoustic separation of meeting rooms
- Equipment at every tea point / pantry / breakout and avoiding any pumped drainage
- Identifying coffee machines and other tea points which do not have drainage connections
- Discuss any client requirement for well ness rooms, WC, Shower, cleaners' facilities or Multi faith rooms or similar ancillary function and whether these can be integrated into other space or multi use spaces
- Discuss and identify DDA requirements including induction systems and other requirements
- AV requirements and the power, cooling and data to support them
- Controls
- Leak detection and alarm
- Comms rooms layouts
- Comms room resilience of power and cooling systems
- Feature lighting and Lighting design details and luminaire choice
- Look and feel as relating to services – matching sockets, set point adjusters
- Busbar arrangements to cover floor area, including sub let

3.1 Codes, Guides & Regulations

Design and install the works to comply with all current and relevant statutory instruments and regulations, and best practice, the requirements and regulations of all relevant local authorities, fire brigades, water and electricity authorities.

Any such portion of the works requiring the inspection and approval of such authorities shall not be built in, covered or otherwise obscured until such approval has been obtained, and should be discussed and agreed with the appropriate authorities by the contractor prior to order or construction to reduce programme risks and abortive costs. Submitting information to the client team will not absolve the contractor of his responsibilities to liaise directly with all appropriate authorities.

Any additional costs incurred by the contractor for non-compliance with this clause shall be borne by the contractor. Any client monitoring team additional fees will also need to be paid by the contractor if the quantity of additional works imposed on the clients' representatives exceeds £1000 for each relevant person.

Ensure all the equipment included in the tender and used on the site is manufactured and installed in full compliance with all British, European Standards and EEC Directives.

Unless otherwise specified, the whole of the works shall comply with the requirements of all relevant British and European Standard Codes of Practice.

The design and installation of systems and materials shall conform to the requirements of the latest edition of the all applicable guides and codes of practice, including but not limited to:

British Standard BS7671 - IEE Wiring Regulations

Electrical Safety Council

The Clean Air Acts

Regulations under the Factories Act

The Control of Pollution

CIBSE Codes of Practice and Guides

CIBSE Commissioning Codes

CIBSE lighting guides, code for interior lighting, External lighting guides

Water By Laws

Loss Prevention Standards

Fire Precautions Regulations

The Building Regulations

Health and Safety Regulations

Electricity at Work Regulations 1989

Electricity Supply Regulations

CE Mark

Workplace Regulations

Noise Regulations

Construction (Design and Management) Regulations

Disability Discrimination Act (DDA)

Environment Agency requirements

Environmental Health Officer

DEFRA requirements

NJUG

Control of substances hazardous to health (COSHH)

Insurer's Requirements (contractor to discuss with client)

The Electromagnetic Compatibility Regulations 2005 (SI 2005/281).

British Standards

BS EN 61000-6-1 Electromagnetic Compatibility (EMC). Generic standards. Immunity for residential, commercial and light industrial environments

BS EN 61000-6-2 Generic standards. Immunity standard for industrial environments.

BS EN 61000-6-3 Electromagnetic Compatibility (EMC). Generic emission standards. Emission standard for residential, commercial and light industrial environments.

The Machinery Directive 2006/42/EC

EN 12464-1:2001 and EN 12464-1 (Lighting of Indoor Workplaces)

Earthing standards including EN 50522, EN 50310: 2010, EN 50174-2: 2001, IEC 60050-195

Authorities shall be notified as necessary about the connection of electricity.

Any such portion of the works requiring the inspection and approval of such authorities shall not be built in, covered or otherwise obscured until such approval has been obtained. Any additional costs incurred by the contractor for non-compliance with this clause shall be borne by the contractor.

3.2 EPC

Provide an EPC for each building and submit to building control or the local Authorities

State the cost for this at the time of tender

3.3 Contractors Drawings

CAD drawings of existing services, structure and architecture are not available as part of the tender. All contractor drawings shall be produced using AutoCAD version 2008 or later, this includes working drawings, and O&M information.

Architectural CAD drawings of the prior layouts are available but the accuracy of these cannot be guaranteed and the contractor should measure and investigate actual dimensions on site

Provide the following information is as a minimum requirement: -

- General arrangement drawings including plans, elevations and sections detailing the layout of the equipment described in this works package
- All connection points and incoming services with location of manhole / direction of utility feed if available.
- Drawings showing clearly the arrangement of data and power at the desk
- Detailed comms room elevations
- A description of operations describing all control interfaces both new and existing, including boiler arrangements, fire alarm cause and effect, solenoid valve, air handling unit scheduling, lighting controls, fan coil system arrangements and set points
- Full electrical characteristics (where applicable) including power, voltage, current and power factor
- Schematic drawings for all equipment associated with the works package described herein, including new air schematics and pipework schematic

Produce drawings that contain sufficient detail as defined in the BSRIA guide BG6 and to enable the client and landlord team to review them and for sub-contractors to utilise them as the basis of the Working and Installation Drawings. The drawings shall be sufficiently coordinated and detailed so that clashes between differing mechanical systems and the various electrical systems are avoided. The drawings shall be suitably annotated so that the method of installation can be determined.

Prior to the commencement of the drawing package, produce a schedule of drawings, technical submittals, calculations indicating dates for their proposed issue to suit the commencement of the construction programme. As appropriate highlight an issues or possible impacts on programme

Drawings and technical submittals are to be issued to the client team for comment, although any comments made do not alleviate the Contractors responsibility for the accuracy of information provided.

A two-week period shall be allowed within the programme for return of comments from the client team and statutory authorities.

The Contractor is responsible for any error, discrepancy or omission in any drawing prepared by him or on his behalf by subcontractors, manufacturers, or the like regardless of whether the client's team has commented or given approval.

Ensure sufficient information is provided in the O&M to ease future requirements including changes to the office layouts or adapting to day 2 scenarios and sublet arrangements. The O&M should contain calculations, and detailed drawings to explain the design, commissioning rates for air demonstrating flow rate per meter square, cooling allowance per square meter, locations of plant space for future comms room cooling equipment.

3.4 Submissions and samples

At the commencement of the project;

- identify plant to be purchased and provide a programme for orders and a long lead schedule showing sign off date and periods for client team approval
- Provide a schedule of the proposed technical submissions for each piece of plant proposed allowing the design team two weeks to comment on the document this will include calculations.
- Provide a schedule detailing every drawing that will be produced with a date assigned to it

Provide a tracker sheet and submit WEEKLY listing the status of each submission including date submitted and date required and current approval status A, B or C.

Provide samples of any item visible to client, particularly luminaires and accessories

Provide long lead schedule showing the procurement of all plant and show dates for orders on programme

Provide technical submissions and compliance statements for all plant and equipment. The compliance statement will be relevant sections of the specification / drawings and accompanying calculations attached to the submission so that it the single document demonstrates compliance

Provide CAD drawings to the level of detail outline in BSRIA guide BG 6 as a minimum and higher where defined in this document

Provide a commissioning programme showing key witnessing dates and phased completion showing early handover of node and server rooms

Provide a document defining the procedures and programme for full testing and demonstration of all systems including an integrated services test.

Provide full operating and maintenance manuals, test certificates, CAD drawings, manufacturers' data. Organise into a legible and simple electronic system

At an early stage produce coordinated RCP drawings in liaison with architect. These drawings will include dimensions for key items.

Provide design drawings and working drawings. Keep a clear organised system and issue sheet and make a full current set at A0 available on site at all times. Keep the site set up to date.

Provide schematics for electrical and mechanical plant areas, water proof as necessary.

Provide risk assessment and design checklists.

Provide a detailed cause and effect schedule for the fire alarm schedule – this will need to be developed from the existing system

Provide a calculation for the lighting demonstrating compliance with part L requirements of energy efficiency – this will include the circuit watts and quantities of all lights – liaise with building control / approved inspector to his satisfaction.

Provide a set of drawings indicating the emergency lighting lux level in each area / room, every 5m along centre line of corridors and for each 20m² on open plan areas/ larger rooms.

3.5 Calculations

Provide full calculations and assessment of final points lists for all sections of the design. Accompany these with brief simple explanations of keys strategies and decisions and statements for issues like DDA, legionella, standby power, leak detection and other common items where a simple explanation is required.

Arrange as a clearly organised pack of information before seeking approval. Submitting a pack of information for a whole system vs for individual plant items is highly recommended so that the services requirements can be understood

For heat loss calculations use Hevacomp or similar– full IES type calculation is not required but is also satisfactory. Submit the calculations in electronic format with the O&M manual. Liaise with the landlord team, architects and demonstrate that reasonable endeavours have been made to find U-values and other information like G value for glazing.

Provide calculations for fresh air, ductwork sizing and acoustics at grilles for both new and existing systems. Accepting that some assumptions must be made at the time of tender, for the site process and post site occupation It MUST NOT be assumed that the existing design and load capability and commissioning set up is correct – undertake validations and calculations from first principles and calculate heat loss and gain and generally ensure that the final system function correctly. Provide a full calculation pack to demonstrate that the systems function correctly and are suitable for the new proposal and variations of the layout such as future breakout or arrangements where sliding folding doors change the occupational density and heat loads within the space.

For ductwork calculations, key examples of each duct are required, and the schematic should show;

- pressure drop,
- Air flow flowrate,
- duct dimensions
- loss factors for each bend

Provide a specific fan power calculation and statement in regards meeting requirements / legislation.

Provide pipework calculations produce a spreadsheet showing the pressure drop calculations, index runs

Provide schematics of the comms room cooling systems showing pipework distances from condensers

Provide electrical design calculations in Amtech format or similar and include the distribution system from incoming electrical mains through the transformer to final circuit, and feeds to roof plant. The calculations/schematic should include cable sizes and installed lengths even for existing sub mains.

For lighting calculations provide dialux calculations, and emergency lighting calculations

For cooling and heating and Ventilation provide hevacomp or similar for all rooms and open plan areas.

THE CONTRACTORS ATTENTION IS DRAWN TO THE FOLLOWING PROCESS WHICH MUST BE FOLLOWED – key to this is that calculations get approved before drawings are undertaken and equipment is ordered.

- FIRST -CLIENT BREIF TAKING MEETINGS
- SECOND -DESIGN AND CALCULATIONS
- THIRD -SUBMISSIONS FOR EQUIPMENT APPROVAL
- FOURTH- DESIGN DRAWINGS
- FIFTH -WORKING DRAWINGS
- After the above – installations can commence.

3.6 Contractors Deliverables

Actively seek information on the existing installation undertaking investigations into existing services on site and liaising with manufacturers. Keep the client team representative apprised of the progress on these matters

Engage suitably qualified designers and specialists as required and seek advice from the client team representative for clarifications

Provide the following as a minimum

- Meeting room fresh air and heat gain assessments
- Lighting calculation for each different room type in dialux – where similar room types are different sizes and shapes submit individual calculations
- Lighting calculation to show 500 Lux on face of the cabinet within comms room.
- Distribution board chart in NICEIC format – (to be in O&M and fitted at each board)
- Grille acoustic nonagram / calculation sheet and grille clip technical page.
- Heat gain calculation
- Fresh air calculation showing air per room, speed in ducts for acoustic checking, grille air speed and noise level
- Resultant noise level in each room
- Cross talk attenuators tech sub
- Calculation showing cooling of any break out spaces which have several fridges and will need extract ventilation to provide cooling even outside working hours to prevent heat build-up in the space
- Tea point / break out area boosted extract fans sizing calculation and attenuator tech sub and calculation for duct and negative pressure of tea point. Boosted extract required at break out and tea point areas especially near microwaves
- Clip sheet for each light type showing manufacture, exact part number, colour temperature, dimmable / control gear detail and any emergency pack
- Emergency lighting calculation using dialux or similar calculation programme to show the lighting level for new and existing lighting.
- Measured fire alarm noise level annotated onto plans of the building and witnessed by building control
- Fan coil selection tech sub including static pressure and acoustic calc
- Attenuator selections calculations where ducts cross partition walls
- Lighting scene set arrangements, with proposals showing how lighting will be commissioned to lux levels on the working plane rather than fixed % of light output
- Cold water pressure calculation demonstrating the pressure available at the boiling water tap / each tea point (new and existing)
- Physical samples of sockets, switches, grille and other visible accessories. Provide physical samples of socket blocks with, conduits, data, grid outlet box, grommet and desk top power module to demonstrate desk arrangements

Provide the following drawings in CAD format as a minimum

- Electrical schematic
- Small power and data layout
- Small power and data layout for lectern arrangement and open meeting rooms and gather space arrangement
- Desk layout or mock up showing grommet, umbilical, data, desktop power
- Mock up or high quality visualisation example of client meeting room with wall mounted screen and layout of sockets, data, tv wall mounting kit, AV containment
- Lighting drawing showing controls, lighting circuits, LCM switches and control zones
- Ductwork drawing
- Detail of return air / section through meeting room wall to show attenuators
- Pipework drawing showing solenoids and pipework sizes and soil pipes
- Comms room drawing - including elevations showing cooling, leak detection
- Roof plant layout drawing
- Detailed submission and RAMS for statutory authorities for any new plant at roof.
- RCP showing access panel requirements and including equipment such as smoke head/sounder positions, lighting, grilles, lighting controls, CCTV point and AV equipment
- Low level data and small power
- High level data and small power
- Schematic of fan coil pipework and fan coil system
- Schematic of air systems (noting meeting room air quantities and seats and indicating air speed on ducts to this area)
- Tea point/drainage elevations showing power, ventilation of heat, access for maintenance and pipework including feed from riser, pump locations
- Fire compartment drawings for accommodation stair showing interfaces with fire dampers etc. as required by building control
- Provide a drawing showing grommet and any floor box positions with the desk and furniture layout – and a 3d view showing the arrangements this does not need circuits, circuits or manufacturer details etc. – the drawings purpose is purely to focus on coordination with furniture and to allow a neat appearance.

3.7 CDM

Provide risk assessment and design checklists.

Demonstrate competence of your design team including CVs and qualifications and experience of similar DESIGN work.

A technical services manager or similar services biased professional shall attend project meetings at least monthly in to represent the role of services designer.

Provide risk assessments as required. In particular, roof plant maintenance, installation, DDA requirements, power changeover system operation and reinstatement avoiding paralleling of supplies for comms room via UPS

3.8 Drawings level of detail

The contractor will need investigate, test and supplement the existing information to provide the level of detail required by the final installation which is intended to ease future maintenance. Generally, refer to BSRIA guide BG6 for further detail and examples of drawings content at design and working drawing stage.

3.8.1 Mechanical Services Schematics Minimum Level of Detail

Drawing Content	
Reference Numbers of main plant items/components	
System configuration complete with all system components	
All pipe work and ductwork sizes	
All plant references	
Component references such as commissioning sets, supply air grilles, extract grilles	
Directional flow arrows on all pipe work and ductwork	
Controls sensors	
Flow rates at all balancing devices and in main risers and each final connection	

3.8.2 Electrical Services Schematics Minimum Level of Detail

Drawing Content	Detail
System configuration complete with all system components	✓
All protective and control relays	✓
All panel lamps	✓
All current transformers and metering requirements	✓
All interlocks/key interlocks	✓
Cable references for all cables, cable lengths, cable sizes, cable type, installation method	✓
All plant/panel/breaker references etc.	✓
Breaker/switch/fuse frame sizes	✓
No. of poles and presence of motor operators	✓
Breaker fault ratings	✓
Breaker types (draw-out/plug-in/fixed)	✓
Breaker normal positions	✓
Protection settings for all protective devices, relays etc.	✓
Settings of time delay control devices	✓
Prospective short circuit currents at all panels	✓
Earth fault and impedance level at all points	✓
Maximum demand values at each panel	✓
Nominal and fault ratings of all busbar systems	✓

Drawing Content	Detail
Earth bars and arrangements	✓
Neutral sizing and neutral earth links	✓
Surge protective devices	✓
Spare devices/capacity	✓
Interfaces to other panels and systems (BMS/SCADA)	✓
Ancillary equipment (PFC/AHF etc.)	✓

3.8.3 Mechanical Services General Layouts Minimum Requirements

Drawing Content	Detail
Main plant locations	✓
Main service distribution routes	✓
Riser locations	✓
Weights and dimensions of major plant items	✓
All pipe work and ductwork sizes	✓
All plant references	✓
System components such as valves, dampers, grilles, etc.	✓
Component References such as commissioning sets, supply air grilles, extract grilles, etc.	✓
Directional flow arrows on pipe work and ductwork	✓

3.8.4 Electrical Services General Layouts Minimum Requirements

Drawing Content	Detail
Main plant locations & Critical setting out dimensions	✓
Main service distribution routes & sizes	✓
Riser locations & details	✓
Weights and dimensions of major plant items	✓
All cable tray, trunking, etc. size	✓
All plant references	✓
All circuit references	✓
Cable details on containment (i.e. cable numbers to ensure separate routing of A & B system cabling)	✓
Cable references	✓
Light fittings with references, lamp orientation & emergency lighting	✓
Lighting control details with circuit references	✓
Smoke detectors indicating type of detector	✓
Fire alarm sounders, beacons & ancillary devices	✓
HSSD Detection systems	✓
Small power layouts with circuit references	✓
Public Address speakers, microphones & wiring details	✓
SCADA/EMS system equipment locations & wiring details	✓
Sections & details to illustrate coordination	✓
Lightning protection system tape routing, bonding & earth points	✓
Builderswork in connection with services	✓

3.8.5 Plant Room Layout & Sections Minimum Requirements

Drawing Content	Detail
All Plant Positions	✓
All Valves, Dampers, etc.	✓
All Pipe work and Ductwork Sizes	✓
All Plant References	✓
Directional Flow Arrows on Pipe work and Ductwork	✓
Maintenance Access Requirements	✓
Standard Drawing Notes	✓
All Cable References	✓

Drawing Content	Detail
Sections through Cable Ladders showing Cable Details and Phase Rotation	✓
Switch Panel Elevations	✓

3.8.6 Services General Layouts Minimum Requirements

Drawing Content	Detail
Plant weights and dimensions	✓
All plant references	✓
All circuit references	✓
Sections & details to illustrate coordination	✓
Builderswork requirements	✓

3.9 Approvals

All information associated with the services shall be submitted to the Employers Agent and team for approval prior to any works on the respective systems commencing. At least two weeks for approval should be granted to allow the teams comments to be incorporated and discussed.

Authorities shall be notified as necessary about the connection of electricity / changes to metering arrangements to facilitate back up power as soon as possible to avoid delay to the project.

Any such portion of the works requiring the inspection and approval of such authorities shall not be built in, covered or otherwise obscured until such approval has been obtained. Any additional costs incurred by the contractor for non-compliance with this clause shall be borne by the contractor.

4.0 TENDER DOCUMENTATION

4.1 Other Documents and Requirements to be met

Refer in detail to

- Rockstone information detailing compliant scheme
- Architectural drawings
- Architectural schedules
- IT /AV information direct from client

these impart a lot of information about the building and requirements and include services items WHICH MAY NOT BE FULLY DESCRIBED WITHIN THIS DOCUMENT AND NEED TO BE INCLUDED

Undertake the works in line with the following hierarchy of

1. Statutory requirements
2. British standards
3. Requirements specifically detailed in this document
4. industry best practice guides, including BCO guide, CIBSE technical memoranda, NICEIC guidance

Actively discuss the works with the landlord team and refer to the landlord documentation including the tenants fit out guide to understand landlord requirements relating to BMS, metering, shutdowns and isolations and the contractor will be deemed to be familiar and included for these requirements.

4.2 Drawings

Refer existing architectural drawings and draft proposed layout included with the employers' requirements

Refer to the initial services concept design drawing as listed in the contract documentation.

4.3 Authorised Engineer/Permit to Work System

Employ an authorised person to carry out electrical switching on site. This person shall be solely responsible for the switching and safe operation of the electrical systems.

Operate a permit to work system within all electrical switch rooms and plant rooms.

Submit the authorised person's certificate, which must be fully up-to-date, together with curriculum vitae of the persons' experience to the Engineer for approval.

The Client team reserves the right to reject this person without prejudice, if he considers this person inexperienced. The Contractor shall submit an alternative authorised person for approval at no extra cost to the contract. This shall continue until the Engineer is satisfied.

All works into and/or affecting live buildings will be carried out under a permit to work system. The Contractor will be responsible for preparing detailed method statements and associated risk assessments for the works.

The Contractor shall allow a 14-day period to obtain approval of all method statements prior to commencing the associated works.

We suggest that a permit to work system is operated for all risers and plant rooms.

4.4 Design Considerations

No materials shall be proposed which are deleterious or harmful to human health or the environment, during either their installation or during long-term disposal or degradation.

All materials and equipment used shall generally have an expected life as appropriate for the system and acceptable International Standards, as detailed in the previous section.

The installations are to take account of the overall appearance of the building in as much as the colour and location of all external components are to be co-ordinated with the external fabric and features.

Services are to be laid out in a neat and logical manner using designated zones and are to be concealed from normal view generally except in plant areas.

All plant and equipment is to be located for safe and proper maintenance.

At an early stage indicate access requirements in key front of house areas – provide visualisation to the client team indicating proposals and showing consideration has been given to services to minimise access panels and site the equipment in a maintainable location where practicable.

Routine maintenance is to be possible without the removal or dismantling of other plant and equipment. The contractor shall allow for the demonstration of all equipment to the Client's Facilities Management team.

All new cable containment is to include spare capacity of at least 20% space. All cables must be fixed onto the cable containment.

Distribution or connection boxes must be accessible for maintenance.

New switchboards and panels must include a 20% minimum spare capacity in regards spare after design current and spare ways across a variety of sizes. Distribution boards for comms server rooms and node rooms will be fully equipped spare to minimise shutdowns for future works - use typical MCB sizes for equipped spares

The Contractor shall ensure that all plant and equipment is installed such that it is fully maintainable. The electrical installation must cater for concurrent maintenance of all equipment and components without affecting the load.

The MEP services installations shall be such to provide a service, which will have a minimum life expectancy of twenty-five years generally – except those components rated less in the CIBSE guide outlining plant life when a planned maintenance programme is in place

The installations shall be such that the equipment shall be easily maintainable using standard tools and equipment. The need to use specialist tools and equipment to carry out maintenance shall be avoided if possible. If special tools and/or equipment are required, the contractor/supplier must highlight this in his tender submission.

All sections of the MEP Services installation shall achieve a standard, which as a minimum provides the following: -

- Conformance with the levels of finish and quality required
- Can be maintained
- Operational safety and hygiene.
- First Class materials which are durable and of proven reliability and performance.
- Systems that maintain their integrity during their operational lives.
- Systems that fully meet the needs and constraints that the property is intended for.

Provide fully detailed setting out drawings on an RCP and elevations of AV walls with setting out dimensions for approval

4.5 Enhanced Capital Allowances

Where practicable all components or systems associated with the products in this specification that qualify for the Enhanced Capital Allowance (ECA) scheme shall be specifically highlighted as such within the supplier proposal. This shall comprise of a separate schedule of qualifying components/systems accompanied by certificates of compliance.

4.6 Services Consulting Engineers Role

The Services Consulting Engineer is appointed on a Performance Brief basis. The successful services contractors shall be responsible for all design beyond the initial information provided which is understood to still be early stage design and subject to % degree of accuracy. The client's services consultant will not be providing design drawing or calculations, and the contractor should propose solutions and options.

It is important to understand that issues caused by the contractor through error or negligence may result in further time being required by the clients' agents including the Services consulting engineer, and that costs relating to this will be charged to the client but the client may elect to re-charge these costs back to the main contractor.

The services consultant's duties are limited but include the following:

- Providing Employers Requirements document
- Review and comment on M&E Sub-contractor submissions calculations, drawings
- Site inspections during the contract and attendance at some workshops
- site inspection / witnessing at end of project – after the contractor has provided his detailed snagging sheets the services consulting engineer will review them – it is not the role of the services consulting engineer to provide quality control or snagging services for the contractor.
- Review of "As Fitted" record drawings and O&M manuals.
- Attendance to witness testing 2 visits (additional or abortive visits will be chargeable to the contractor at a rate of £140 per hour plus travelling time to central London – 1 hour each way) – if for instance the site is not ready for witnessing or if the system fails a test and needs to be repeated

5.0 PROGRAMME CONSIDERATIONS

A key item for contractors which may be a risk to programme is the approvals processes of proposals and sign off from the landlord or client team.

We emphasise the need for the contractor to organise and attend regular meetings with the landlord and client team, representatives and statutory authorities, as required, but including as examples the following;

- Impacts of services to visual appearance
- Clear head heights
- Sign off of samples for lighting, grilles, sockets, controls, and other visible services
- Selection of equipment on long lead and confirmation of order dates and any handling charges
- Impacts from validations and reporting
- Approval of proposals and drawings and some acknowledgement that not every light fitting (for example) will be accepted and a second round of approvals may be required
- New connections or interface with building control / approved inspector
- Air flow measurement, cooling / heating commissioning results and recommendations
- Connection back into landlord water systems and laboratory test result duration
- Fan coil maintenance procedures – confirmation that fan coils may be maintained by from the future maintenance team
- Air systems and cleanliness – protecting extract ducts during work and
- Commissioning and witnessing
- Documentation and O&M manuals including EPC and other mandatory requirements
- The hand over process including client training

Follow good practice, and allow for a procedure typically as below

- Submit proposals
 - Review by client team
 - Forwarding to statutory authorities/approved inspector
 - Incorporate comments
 - Revise and resubmittal for approval
- Target key items such as the air systems and new plant for early submission to landlord and client team.

Take note of the following when developing a programme for the works

- Validations
- Submittals, including drawings, long lead schedules, samples and calculations
- Design reviews
- Use of incumbent contractors
- Method statement for water treatment regime
- Noisy works outside hours
- Testing, commissioning and witnessing
- Early hand over of comms room systems – contractor to agree with client

5.1 Noisy Works

Highlight any noisy works at an early stage and agree a time with the client

Fixings for fan coils and services should use non drilled type fixings as far as practicable and unistrut or similar used to allow some flexibility to move drop rod positions / allow for future fixings.

5.2 Existing / Incumbent contractors

Investigate using existing contractors familiar with the existing systems on site where they are being retained and include for costs and attendances

Thoroughly investigate the incumbent contractors' ability and resources to meet programme and quality requirements and report to the client team any issues. Actively manage these subcontractors.

Identify any costs for ongoing maintenance of systems for the client but do not include in the tender sum

During the tender period, liaise with the client and confirm any incumbent contractors who you propose to use, typically

- Fire Alarm –
- Access Control –

6.0 SITE PHASE

6.1 Temporary fire alarm

Provide a temporary fire alarm, fire watch and other measures as directed by building control.

6.2 Strip Out Works

Strip out any equipment made redundant by the work including pipes, data cables, flues, ducts

6.3 Fire alarms and Security

Carefully isolate the security and fire alarms panels and protect any smoke heads from dust during the works so these can be re-used

6.4 Validation and testing at start of contract

Undertake the following validations of services at the start of the contract and provide a single page report, reporting any issues and the proposed solution.

- Photographic survey and record of front of house areas key parts of the Bedford Row demise in particular, entrance core areas noting damage before protection applied.
- Test that the fire alarm cause and effect is working, and fire alarm panel has no faults
- Check impact of all services in Jockeys field and the comms room being removed upon Bedford Row

Highlight any issues or works you propose to undertake during the jockeys field part of the works

7.0 INCOMING SERVICES

The property is currently served by gas, electricity, comms, water and drainage.

7.1 Drainage

Locations of existing below ground drainage are not available in a survey drawing, but generally the above ground arrangements for wet services are not being changed so no new below ground drainage or alterations to the drainage stacks is anticipated

Rainwater connections and system will be as existing

7.2 Incoming Comms

There are existing comms intakes which will be reused, and a new fibre connection provided to the new comms room location. Dual redundant incoming comms cables are not anticipated – refer to the IT specialists' documentation.

Generally, the contractor will provide a tray from the existing ducts entering the external wall at the street, routed through to the new comms room position in Jockeys' Field

7.3 Electrical Intake

There is no electrical substation on site – the site is served by two existing LV supplies

An existing 200A TP&N services head and HRC fuse LV panel in Bedford Row vault and a 315A TP&N supply and HRC fuse LV panel in Jockeys' Field

The existing electrical supplies are adequate and the change to more efficient lighting and a VRF heating system vs oil filled plug in electric radiators is likely to reduce electrical consumption.

7.4 Services metering

Generally, the existing electricity meters will be kept and re-used. The existing meters should be protected and kept during the strip out and the availability / standing charges paid.

If the bills are not paid or service suspended the utility provider might say that they have now allotted the buildings electrical power or gas to another local property or ask the client to re-apply with associated costs.

Because there is not Gas being used the existing gas meters should be stripped out and removed to avoid standing charge and safety issues.

A complex energy monitoring system measuring all the energy use is not anticipated for this project. The control system refrigerant based fan coils systems and digital electricity check meters at each fuse board will be used to comply with requirements of part L and CIBSE TM39

The existing meter numbers and MPANs should be recorded by the contractor so that the bills can be tracked and paid during ongoing construction.



Figure 2 Electrical meter and LV panel at Bedford Row to be re-used



Figure 3 Gas meters at Bedford Row to be stripped

7.5 Gas intake

There is a gas intake in the vaults at Bedford Row and it is believed that this also feeds the soon to be redundant boilers at Jockeys' Field – which will be replaced by VRF for heating and a megaflow unit or point of use electric heaters for domestic hot water.

The contractor will check the hot water provisions at Bedford Row when isolating and stripping out the gas connections. If it is more convenient to strip out gas pipes early to form the comms room (which is required to be in the phase 1 works) then the contractor will provide electric point of use heaters to Bedford Row so that there is hot water available at all locations in Bedford Row whilst the Jockeys Field works commence.

There is natural ventilation in the gas meter room and no ventilation works would be necessary should we decide to keep the gas meters in situ. Liaise with British Gas and strip out the gas meters when redundant.

Removing the gas supply will also make the works safer. The picture below shows the jockeys field boiler room which can be stripped out – it is believed that this is fed from the Bedford Row gas meter. Contractor to confirm



Figure 4 Existing Gas supply to boilers in Jockeys' Fields enters from west of plant area.

8.0 ELECTRICAL SERVICES

8.1 Tenancy arrangements

There are no separate tenancies or sub-letting being considered as part of this work – the plant and services will be arranged to suit the clients use of the building only.

8.2 Mains power

From the Electrical intakes and existing HRC fused LV panels described in the Incoming Services section the existing sub main cables will be re-used. Provide new distribution boards and new submain cables the new VRF plant. Generally re use existing sub main cables and small power circuits.

In some instances, there are two small distribution boards as shown in the pictures below, but most floors only have a single tenant distribution board. Provide a single distribution board and joint / relocate existing circuits to suite

The existing Jockeys' Field distribution boards typically have a 18 way tenant board and a 12 way landlord board. Because there are no sub-letting arrangements it would make sense to remove this 2 boards and provide a single 36 way SP&N board at each floor. This will provide considerably more space in the risers of both Jockeys' Field and Bedford Row. Jointing of existing circuits is permitted using adaptable box

Note some boards are single phase and mechanical equipment is three phase.



Figure 5 Existing Jockeys' Field boards 10 Way capacity



Figure 6 Existing distribution board at LG Bedford Row

The power on floor will remain in existing phase arrangements via existing sub mains. The distribution boards will be arranged vertically as pictures below to maximise the available space for rising services including new data trays. Trunking and joint boxes will be used to extend the existing final circuits where they are being re-used



Figure 7 New distribution boards should be arranged vertically to maximise riser space

<http://www.cef.co.uk/catalogue/products/1487204-8-way-tp-n-type-a-distribution-board-c-w-100a-switch-disconnector>

Note existing distribution boards are SP&N

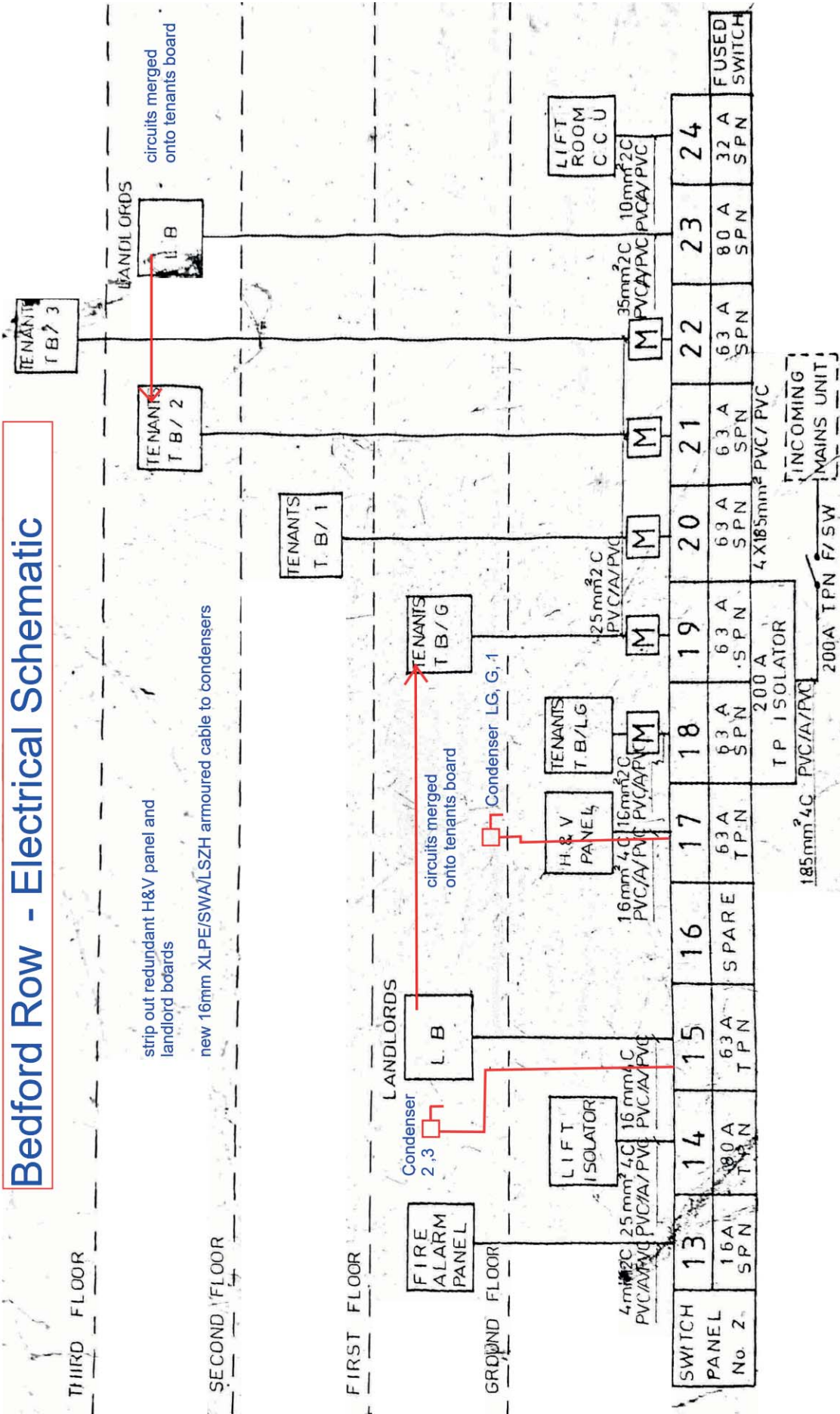


Figure 8 Bedford Row Electrical Schematic

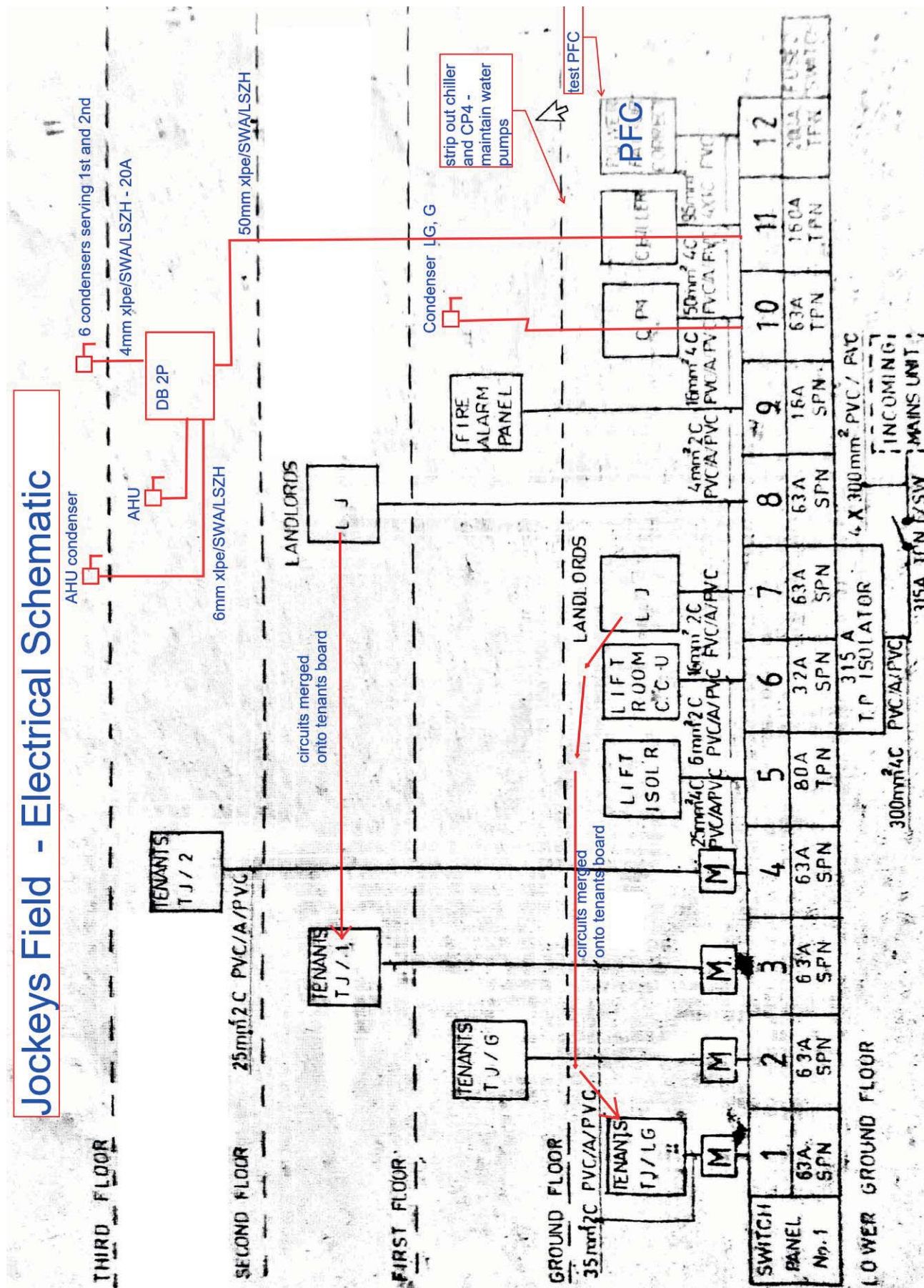


Figure 9 Jockeys Field Electrical Schematic

8.3 Back-up power

There is not generator or secondary power supply at present and this is not a requirement a generator would not be expected for this office.

8.4 Final Circuits Generally

Due to budget constraints it is hoped, that subject to testing on site much of the existing final circuits can be reused. Within Bedford Row this is doubly important because of the listed building restriction and need to limit damage to plaster

In particular the following are anticipated to be re used

- Main LV panels
- Sub Main cables
- Underfloor power in Jockeys' Field
- Small power circuits in Bedford Row
- Lighting circuits in Bedford Row
- Floor boxes where not broken
- Fire alarms

Provide the following new services

- Supplies to new condensers and plant
- New plant distribution board sub main
- Lighting and Lighting circuits at Jockeys' Field
- Supplies to new fan coils in Bedford Row
- Supplies to lamp circuits
- Supplies to new electric radiators in transient parts and plant areas
- Supplies to new electric hot water plant/ showers and shower pumps
- Electrical accessories which are visible.
- Data cables

8.5 Small power

Generally, within Jockeys' Fields floor boxes and grommets will be used to provide power using the existing underfloor busbar system or new circuits to suit. The indicative drawings indicate a floor box arrangement, but the contractor shall provide options to the client.

For Bedford Row the new

Within Bedford Row there is currently a mix of wall mounted sockets, floor boxes and extension leads. In many cases the floor boxes are not used because they are in the wrong location. New grommets will be provided in Bedford Row to suit the proposed desk positions and existing floor boxes retained.

The contractor will repair existing floor boxes to avoid costs of floor repair and English Heritage involvement in repairing the holes in the floor boards etc.. The existing floor boxes may not be in the correct position for the currently proposed desk layout but could be useful in future.

The contractor will relocate surface mounted sockets and data from skirting boards and walls to be within a new floor box directly adjacent the wall. Provide a detailed proposal showing sockets in each room and liaise with architect and English heritage to agree

Having additional floor boxes won't look as elegant, but will save costs vs repairs to floor, but it will avoid inaccessible joints (which are not permitted) and also provide more flexibility to relocate desks at a later date.

For the new desks present options to the client for grommets and floor boxes – noting that there are existing floor boxes and

Within Jockeys' Field the raised access floor will be used with existing under floor busbar to provide power in a conventional manner to new floor boxes or grommets. The existing underfloor bus bar tap offs may be re-used and new grommets provided.

Provide power supplies for hand dryers for future use.



Figure 10 Typical cables tangle due to existing floor boxes being in wrong location

The contractor will provide accurate drawings in CAD of the final small power layout showing positions of all floor boxes. The contractor will measure these to allow for future desk planning.

The contractor will broadly indicate joist locations and routes of cables in floor

8.6 Electrical accessories

The contractor will provide new electrical accessories throughout Bedford Row and Jockeys field where these are visible. These are not all shown on the drawings and the contractor shall survey to ensure adequate accessories are included. L

Plant room areas and ceiling voids are to be metal clad type by MK, under sink can be white plastic.

Refer to architects details for the details of the visible electrical accessories this, however please note that it is a high quality metal plate with dark finish at Bedford Row.

Where this document refers to existing electrical items being re-used, new accessories and switch plates are still required.

8.7 Comms Room power

In larger comms rooms a dedicated board is normally provided in the comms room, however due to the single rack and only one circuit and no resilient cooling system, the comms room rack power will be fed from the local tenant distribution board.

Provide a fused connection unit to allow an extract fan to be fitted in future as required, noting that there are louvred doors on the lower ground floor comm room location adjacent to the light well

8.8 Lighting

8.8.1 Lighting Generally

New LED lighting throughout is recommended to give a durable and modern lighting system and reduce heat and provide a bright space in Bedford Row in particular, where many rooms rely on domestic quality floor lamps

At Bedford Row the existing lighting circuit cabling will be reused and generally downlights will be changed from incandescent low voltage fitting to high efficiency LED lighting. The contractor will need to ensure that all lights recessed into the ceiling at Bedford row have a suitable fire rating or have a hood. A fire rated light fitting is preferred to hoods being fitted

Feature lighting will be specified by the architectural team in coordination with the client

In tea point areas the contractor will provide LED strip lights on the top of cupboard and under shelves – and carry out a lighting calculation to prove lighting levels on floor and worktop

The following lighting types are identified on the drawings, although this detail is early for this stage of the design process. Generally, the contractor will refer to architects drawings for details on feature lighting.

A - LED non dimmable downlight

A1 - LED non dimmable downlight IP44

B - LED strip light with opal diffuser

B1 - LED strip light with opal diffuser

C - LED dimmable downlight

D- LED mirror light

E - suffix which denotes emergency light

F- under cupboard LED strip

G- LED uplight

G1 LED uplight

H -600sq non dimmable LED opal diffuser

H1-600sq dimmable LED opal diffuser

J - Industrial LED IP65 vandal resistant batten

K - LED Wall light with integral emergency pack

L – track lighting with LED spot lights and neat drivers

P1 to P5- feature pendants

Flood lights – LED to light Bedford row

X- Security PIR lights at vaults

An external feature lighting scheme is not included, the contractor will provide cost options and schemes to highlight the features of the façade and the rear terrace area. An external feature lighting scheme would make the best of this beautiful building – but costs need consideration, and also requirements of planners and ability to integrate into existing windows. For the feature lighting scheme an external warm white LED uplighter strip per floor is envisioned at the front of the building to Bedford Row and for the terraces looking into the courtyard – this would replace the large flood lights in the vaults.

Dimmable lighting may add more cost and complexity to the lighting control system but will be required for the Jockeys' Field meeting room suite and Bedford Row reception / visitor area.

8.8.2 Illumination Levels

Provide all lighting will be in line with LG7, CIBSE CODE for interior lighting Part L requirements for luminous efficacy of 65 lumens per circuit watt. There will be no halogen lighting

Average illumination over area:

Offices (open plan) 450 lux. Uniformity 0.8.

Toilets 250 above basins 150 elsewhere

Stairs 150 lux

Corridors 200 lux

Plant rooms 200 lux

Comms room – 400 lux at floor level

Reception by lighting specialist 200 lux expected

Reception Desk by lighting specialist 400 lux expected

Kitchen – 300 lux minimum on worktop

8.8.3 Emergency lighting

Generally to BS 5266

Escape routes 1 lux (minimum)

Open areas (anti-panic) 0.5 lux (minimum)

High risk areas 10% minimum of normal lighting level

8.8.4 Bedford Row Lamp sockets

In Bedford Row there are a large number of 5A sockets commonly used with for lamps which are switched from a light switch near the door. Test these switches and cable route and report. Generally additional 5A lamp sockets will be provided.

Within Bedford Row the cooling will be built into joinery in many instances and a LED uplight provide at the top. It is hoped that we may be able to extend power from the lamp sockets to allow this switching to be effected without needing to replace much of the lighting circuit or switch line.

If additional lighting to that provided on the top of the new book cases proves to be necessary, the shelves could have additional LED strips. Also, some 5Amp plugs will be provided to allow lighting to be easily supplemented by the users. The bookshelf lighting and the lamp socket should switch via the light switch.

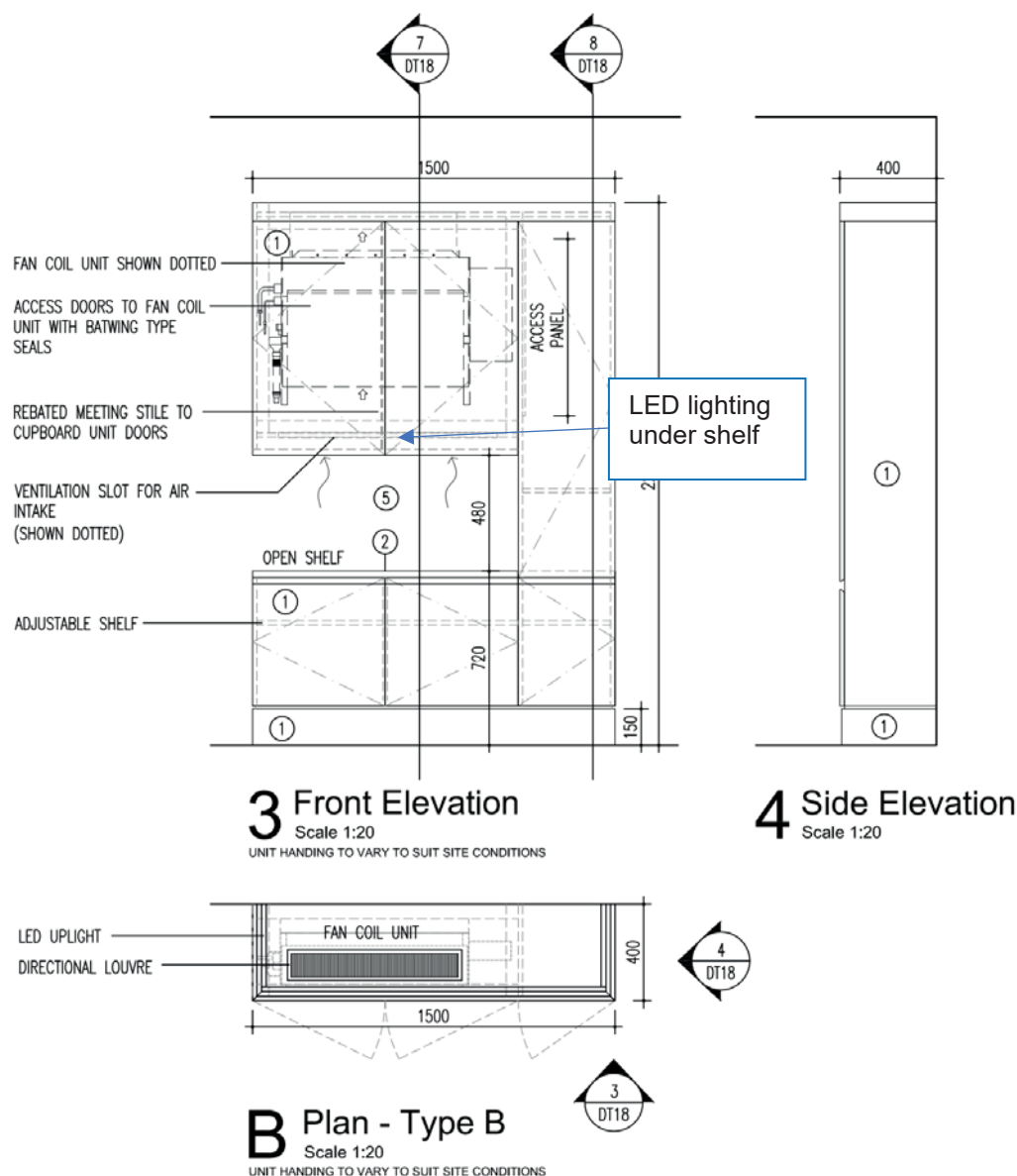


Figure 11 LED uplight and shelf light is to be integrated into Fan coil Joinery



Figure 12 Existing typical domestic quality uplighter with 13A plug cant use light switch

8.8.5 Jockeys' Field lighting

At upper floors generally new 600mm square opal LED lights are proposed and a number of small circular LED light to demark breakout spaces.

For lower floors at Jockeys field refer to architects drawings where specific lights such as iGuzzini blade LED are proposed.

8.9 Lighting Control

Generally, within Bedford Row the manual light switching system will remain albeit with new face plates to front of house areas. The contractor will investigate integrating passive infrared occupancy sensor in the joinery LED uplight or a manual switch discreetly located.

Provide a simple lighting control system for Jockeys' Field to avoid high commissioning costs and noting the small floor plate does not lend itself to needing a high flexible system

Dimmable lighting may add more cost and complexity to the lighting control system but will be required for the Jockeys' Field meeting room suite and Bedford Row reception / visitor area.

The manufacturer of the lighting control systems for Jockeys' Field is open for contractor choice but Simmtronic, Prologic are considered to be beyond the budget for this installation and Flex7 or similar should be considered by the contractor

In plant areas PIR should be provided – because many existing fluorescent lights have failed in these areas due to being left running presumably. PIRs may be wired into the existing light switches to reduce costs.

8.10 Fire Detection and Alarm

Generally, the existing smoke heads, cabling and panels will be reused in Bedford Row, however the contractor will relocate the fire panels from 7BR entrance to 6BR entrance corridor to reduce the clutter of ugliness in 7BR reception.

Additional smoke detectors, sounders, flashing beacons will also be required in both buildings. Joints on fire alarm cables are not acceptable so the first run of the fire alarm will need to be re-wired for each loop at Bedford Row.

Within Jockeys' Field the reused existing heads and panel and wiring where practicable and spares are readily available.

Provide an BS 5839 L1 category fire detection and alarm system with sensor sounders.

Provide a fire alarm schematic confirming the as installed arrangements and loops and interfaces which cannot be determined from simple visual inspection. The contractor can offer options on wireless systems in Bedford Row to suit

Provide all new air handling plant, platform lift and lift with fire alarm interfaces to shut the plant down in the event of a fire alarm.

Refer to architects Fire strategy drawings for details of fire line and fire dampers.



Figure 13 The existing Atrium Beam detection will be re-used

8.12 Intercoms, and Access control

The existing access control system will be re-used. Provide additional controls to enclose the client meeting room suite at LG of Jockeys' Field, interface with the platform lift

Re-use the existing intercoms and relocate the handset for reception to suit

8.13 Security / intruder alarm

The wiring of the existing system will be re-used and supplemented and new sensors provided to give new appearance and use smaller, more discreet devices – PIR type generally will be provided by the contractor.

The devices cover every entrance from outside, and windows at ground and lower ground floor.

The contractor will engage a security specialist to review the system and provide advices such as the need for a secondary device as required to confirm there has been a security breach. The contractor can offer options on wireless systems in Bedford row to suit

8.14 Disabled toilet alarm

Provide a disabled toilet alarm system and link to the disabled refuge communication system as per schematic below.

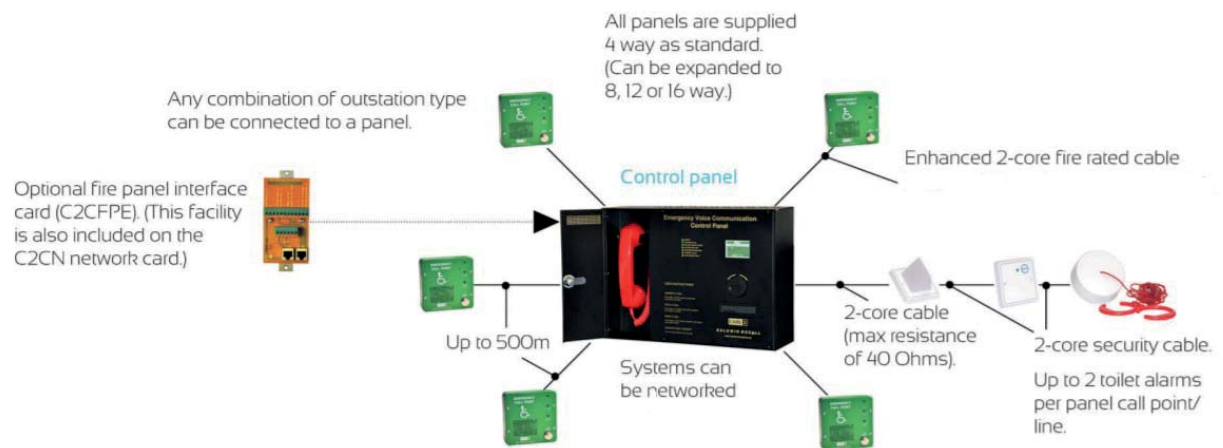


Figure 14 Schematic of disabled toilet alarm link to EVC system

8.15 Lightning Protection

At this time a lightning protection system is not anticipated.

The existing building does not have lightning protection system. Lightning protection is not mandatory, however not having lightning protection may impact building insurance costs. This client should compare risks and costs, including consideration of the construction and flammability.

Using the BS 6511 lightning protection risk assessment, with consideration to our building being higher than those adjacent and some of the construction being wood results in a recommendation for lightning protection to be installed

If required, the proposed solution for lightning protection is as follows

- Air terminations – a grid of metal tape across roof. Any plant and metal handrails will be bonded to the lightning system
- Down conductors - flat metal tapes at 5 to 10 meter intervals around perimeter, insulated from human touch and connected to air termination
- Earth termination network - earth rod driven into basement at approx. 2 locations on opposite corners of building, connected to the down conductor

Lightning protection is a CDP (contractor design portion) always and the lightning protection installer would develop the design principles and coordinate if the lightning protection system is required.

9.0 IT AND AV INTERFACE

The clients' IT specialist, "Challow" will provide details documentation on the IT aspects of the project.

Continue to liaise and develop the IT checklist discussed below and provide power and containment requirements

9.1 IT checklist to be developed

The following IT and AV questionnaire was submitted, and some answer have been completed. The remaining items will be closed out in detailed design

	Question	Suggested answer	Challow response	Meeting notes (19.04.18)
At desk	Number of outlets to desks, meeting rooms, support areas	We anticipate phone service will be voice over IP. The system will be wired to allow flexibility of use with breakout spaces capable of being used for desks without need to add additional data cable Full Wi-Fi coverage will also be provided Generally 2 data points per desk suggested using day desk layout	VOIP adoption will almost certainly be a prerequisite for this level of refurbishment but currently the system is digital handsets with onsite equipment	
At desk	data presentation, i.e. floor box, grommets, desk top?	We recommend re-use of floor boxes in this instance. Grommets can be discussed		To be confirmed
At desk	cable data quantities only as required or flood wire for flexibility and future	we would always recommend 10% spare included in tender as there are many items such as printers which may be added later	We would like to discuss the option to use our own data cabling company recommended by our IT Provider	Requested names of two companies 'preferred' by Challow. 7 BR to obtain own quotation based upon specification written by Challow
At desk	Are any sit stand powered desks anticipated	It is anticipated that these will be provided		Yes
At desk	Will workstation cable management be included in furniture package	A special umbilical will be needed for any rise and fall desks of any of these are proposed. Generally, need to consider neatness with furniture selection -it's important not to include twice - these are normally in furniture package, so I will not include in services document	We would expect the desks to perform the cabling management function.	Correct. Extent of installation by data cabling company and furniture supplier to be discussed and agreed to ensure no gaps or overlap in specification.
At desk	Do any desks required and uninterruptable power supply? E.g. for computers which are accessed out of hours	Assume no computers are UPS backed	No	

	Question	Suggested answer	Challow response	Meeting notes (19.04.18)
At desk	Phasing of this project will require several instances of patching the comms equipment and cabling may need to accommodate other arrangements during the works - to suit swing space - final data quantities to be understood	IT consultant to advise	This will require detailed discussion regarding the timing once the scope of the project has been decided.	
At desk	how many power sockets at desk	Suggest 6 under desk and 2 desktop plug and 2 USB power at top of desk		Agreed
At desk	Uninterruptible power supplies for desks	It is anticipated that desks will have not have UPS back up. Instead of separate UPS and non UPS it is recommended that a single set of underfloor busbar is provided. Size, location and load of UPS to be agreed.	Not required	
AV	Which meeting rooms / break out areas will have a TV	Assume all meeting rooms		Allow for all to have capability
AV	Repeater screen	Are there any all hands meeting or other situation where repeater screens might be required?		No
AV	Video conferencing	What rooms might have video conferences, maybe need extra lights/ dimmable lights, tv /blackout blinds		Conference and seminar rooms
AV	Is lighting required to link to AV for scene setting	The key meeting rooms and any space where staff gather for an all hands conference are proposed to have scene setting lighting - buttons to allow many setting to be changed in one press		Not generally. Possibly in main seminar room only.
AV	Are any rooms having intelligent white boards or similar	Assume no touch screens		7 BR already have one. No further requirement.
AV	Requirements at each TV	2 data twin socket and an HDMI to floor box of meeting table or credenza suggested. Will tv use some kind of Bluetooth or Wi-Fi connection to cast from devices	Would prefer as much of the breakout to be over Cat 6 with converters and dongles to maintain flexibility	
Comms room	How many racks are required including any future expansion, IT, AV, patching	Assume two racks required in 7BR and 1 or two patch racks in Jockeys' Field- 1 of the 7BR comms rack will be for patching with most information being off site	Ideally would want all patching to one rack unless cable runs too long for Cat 6, if not limit to 2 x comms rack with 600 mm depth at both sites	
Comms room	What is the total heat load of equipment in the comms room	Assume 4kW - 3kw for server rack and 1 kW for patch rack	Dependant on above - note server rack heat requirements are non-traditional due to cloud adoption	16 amp commando socket required for each cabinet
Comms room	Do you require a highly resilient cooling system for comms room	Assume cooling resilience - 2 cooling units, each capable of supporting load	See above - further discussion required	Possibly not. Could use a portable solution in the event of failure

	Question	Suggested answer	Challow response	Meeting notes (19.04.18)
Comms room	Uninterruptable power supply for comms room what duration of autonomy for UPS would you require noting whether its rack mounted and the load of the racks.	Recommend 20 minutes minimum at full load located in rack	Timing is sufficient, but load is going to be a lot less than traditional expectations	
Comms room	servers and cabinet requirements - quantity, size and space front and rear	including any future expansion. Assume 1000 deep 800 wide. X 2 number. Allow 1000 front and 600 rear for access?	1 number only. 1000 mm deep rack not required	2000 x 800 x 600 mm max
Comms room	Who is drawing up the rack elevations	Rack equipment list will be needed by IT consultant,	Will be supplied once other factors are considered	
Comms room	What comms room alarms required and how are they sent to client mobiles/emails	Is the client happy that UPS system will have a smtp card and will give mains failure alarm via the smtp card? Some clients provide netbox or GSM or require a high temperature alarm	UPS does not need to be room sized - please can this be discussed further?	
Comms room	Is leak detection required in comms room	Assume not required	No	
Comms room	Do you require fire suppression systems for comms room	Assume not required as information likely stored off site	No	
Comms room	Is dedicated distribution board to comms room required	I would recommend that the comms room has a small dedicated distribution board, ideally to be fed direct from the riser so works to other lighting and power does not impact the comms room, however we can feed from a local distribution board to save cost	This would be a good idea	
Comms room	Are intruder alarms or CCTV required	Assume intruder alarm coverage and CCTV for reception - has this been accounted for in rack		To be confirmed
Comms room	is access control required to comms room door or other rooms.	Assume no access control		If an access control system is to be utilised in the rest of the building, then it would be a good idea. Otherwise a lockable door.
General	Is there a corporate strategy on IT or other such document that I or the IT consultant or contractor should be aware of - e.g. policies on cables or rack or manufacturers etc	7BR to advise		
Incoming	Are there any new incoming data cables and are you aware of wayleave agreements and timetables for these	the incoming fibre and wayleave agreement will normally be procured by the client when placing order. It is assumed that two incoming fibre optics for resilience will not be required	New Fibre. Openreach. Server room presentation	
Incoming	Do you require 4G Last resort Emergency DR link or other services	client IT to implement as required and advise	No taken care of by Fibre Provider	

	Question	Suggested answer	Challow response	Meeting notes (19.04.18)
Incoming	Who is managing any wayleave process?	Client team / IT dept. / Lawyers		See Openreach report
Network	What Cabling type or specification is required for on floor structured data cabling	We anticipate a high specification future proof and suggest CAT 6 instead of CAT 6A. If the client has a standard manufacturer this could be inserted. - some manufacturers such as Panduit are premium cost.	Cat 6 is acceptable	
Network	Who is providing Wi-Fi points	Normally client would provide the IT equipment. It should be agreed if this is a PoE system needing data but no power or a mech system which requires power but no data except at one point	It Provider responsibility	
Network	Data quantities to Wi-Fi	some Wi-Fi points require 3 data points. We assume 2 data points at each Wi-fi point until agreed	Wi-Fi points are single data points	Power over ethernet
Network	What cables will be required between comms room and patch panels	Do you want 24 copper pairs in addition to fibre for analogue connectivity?	For discussion	Generally agreed fibre between the building and possibly a small hub locally in Bedford Row risers.
Network	Wireless network quantity	Will the IT team undertake a heat map to establish exact quantity of Wi-Fi points after partitions installed, or should we add one access point per 30m ² for tender? When partitions are built a heat map can be carried out by IT team to test coverage	Wireless is out of scope. FYI we would expect cabling points to be in all refurbished rooms sympathetically sited, so antenna may be hidden.	
Network	Is there any requirement for analogue or separate voice circuits? Fax machine number not on normal system etc.	do franking machines or any security system require an analogue line? Client to confirm		All utilise eFax. Only analogue line required may be for 'Redcare' alarm monitoring.
Network	Data and power for printers in reprographics areas	Printers - we recommend 2 data points at each printer at wall - rather than floor box so they are easy to access and don't have a box of paper on them	Agreed.	
Network	Are you having any voice recording systems or equipment which is not within the rack of the comms room?	all voice over IP assumed. client will provide handsets / reuse existing? No recording assumed	VOIP system will have zero footprint. Handsets will be provided for the system.	7 BR to confirm move to VOIP otherwisw space will still be required for comms equipment.
Network	Do you require a satellite for Sky or other and where would the TVs for this be?	We assume any sky TV or similar will be data based with no satellite and equipment will be in patch rack		No.
Network	Are you proposing to build new IT room and then transfer equipment?	often it is impractical to move large quantities of IT equipment on the weekend of the move without risk that the new demise will not function correctly on the Monday morning. Recommend purchase of new racks, patching equipment where practicable.	Cloud adoption de-risks this largely but careful planning still required.	Yes.

9.2 Incoming data / Wayleaves

The client will procure new incoming data to the lower ground floor comms room to suit and will process any wayleave agreement. Pulling in a fibre sleeve by the services provided could be undertaken prior to the main works being undertaken

Provide containment for the fibre using 50 x 50 trunking or similar to suit.

9.3 Structured cabling

From the lower ground floor comms room provide trays to run to the risers in Bedford Row and Jockeys field at high level lower ground.

The data cabling works will be by Challeng

Provide containment to suit.

It is anticipated that CAT5E cables will be used to directly supply all data points in Bedford Row and Jockeys field from this location

The route through Bedford Row to the riser is not known and the contractor will need to investigate options and routes when floor boards are lifted. Two or Three small trays might be needed to suit structural requirements of the joists, (this is not indicated on the drawings) with the focus on minimising disturbance to Bedford Row finishes and English heritage concerns associated with this and cable length for any copper parts of the network.

The riser should have more space when the distribution boards have been changed as detailed.

This is not a high rise building so the issues with sharing are minimal providing the 400volt electrical sub main and data cables are more than 300mm apart.

As detailed in the IT checklist new data cables will be CAT 5E.

The contractor is to liaise with the Cabling contractor to work with any outfitting company. This contractor will be supplying Hellerman Tyton cabling products and is an approved installer thus 7BR will benefit from the 25 year warranty. The contractor is an experienced operative and would expect to work within the confines of the timescales of existing fit out and liaise where necessary with both the outfitters project management and on site teams

9.4 Landlord telephone lines

After the data cables are removed the contractor will provide new telephone lines for the fire alarm and the lift alarm systems. GSM autodialers will not be accepted and a landline via BT should be procured.

10.0 LIFTS

10.1 Headline issues

The existing lifts will remain and may have new interior finishes.

A new platform lift is being sought for the ground level atrium to resolve the difference in levels between Bedford Row and Jockeys' Field.

This lift will need to have battery pack to return to lowest level in the event of a fire alarm

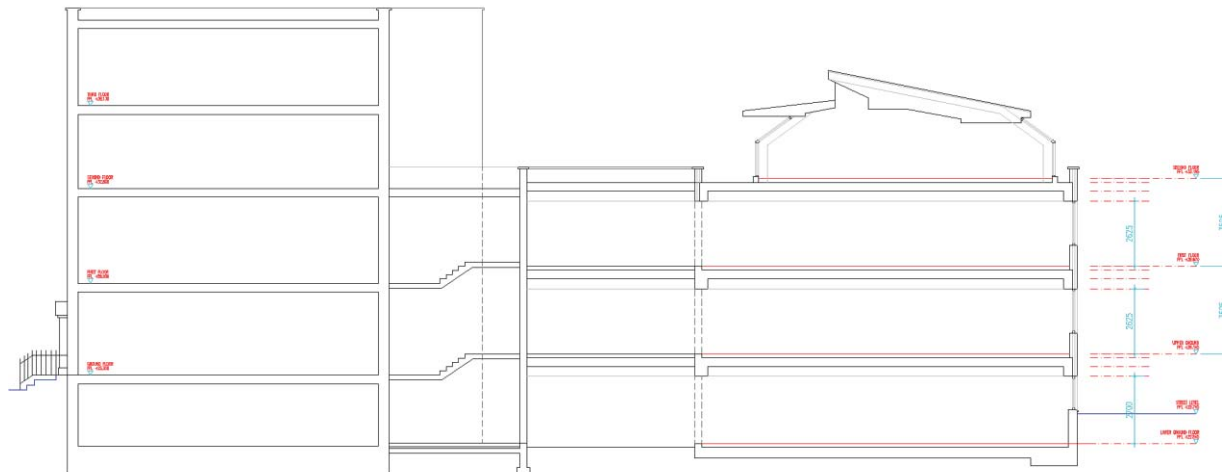


Figure 15 simplified levels and Bedford Row and Jockeys' Field

11.0 MECHANICAL SERVICES

Refer to the latest Fire compartmentation documents from the architect provide fire dampers in ducts and fire collars around soil pipes as required to achieve the fire compartmentation.

11.1 Design Criteria

The contractor will use the following data and provide detailed HEVAcomp or IES calculations to design the heating and cooling systems at stage 4, prior to order of any equipment

Element	Description	Input Data
U Values	Solid brick walls-No cavity or insulation/Door - Existing Building	1.6 (W/²2.K)
	Solid brick walls for New Extension conservatory -U value	0.25 (W/m².K)
	Existing glazing/Windows -U value	1.6 (W/m².K)
	Glazing/Windows for New Extension conservatory -U value	1.2 (W/m².K)
	Shading co-efficient of glazing/glass	0.9
	Solar Heat Gain co-efficient of glazing/glass	SHGC = SC X 0.87 = 0.78
	Partition walls	From CIBSE guide A, Pg 183 Table 3.50 Thermal properties of typical internal partitions.
	Exposed Roofs	Refer to architects plans and calculate u value
	Floors	1.2 (W/m².K)

Element	Description	Input Data
Internal Heat Gains	People (Watts)	Sensible Heat - 90 (W) Latent Heat - 50 (W) From CIBSE guide A, Pg 6-2 Table 6.1 Heat emissions from an adult male body
	Lighting (W/sqm)	10. lower than standards to reflect new LED
	Small Power (W/sqm)	25 From BSRIA ,Pg 53 Table 17 Internal Heat gains in offices
	Office Equipment	Computers (Sensible Heat- 75(W) Monitor (Sensible Heat- 15 (W) each 2 per desk Printers (Sensible Heat-275(W) Working, 15 (W) Idle Microwave (Sensible Heat- 800 (W) but highly diverse Coffee Machine (Sensible Heat- 1050(W), Latent Heat- 450(W), 150w per meeting room for tv screen on the wall.
Outdoor Air	Fresh Air	10 litres per second per person - the minimum of British building regulations and then this is diversified after.
Infiltration	Leaky Building	0.8 ACH
Solar Heat Gains based on Orientation of the Building and Month	WALLS ROOFS/FLOORS & GLASS	Maximum design conditions for Summer - August Winter Occurs In- January

Element	Description	Input Data
Solar-Air temp for stated Orientation and Surface Colour	Walls as Dark Surface	Summers At August 12.30pm Winters At January 07.30 am Table 2.14(g) Air and corresponding sol-air temperatures: London (London Weather Centre) (January 1996–December 2005)
Solar cooling load at stated sun time / W/m ²	Glass/Glazing	Summers At August 12.30pm Winters At January 07.30 am Table 5.17(g) Solar cooling loads for fast-response building with single clear glazing: London (51.5°N); unshaded type 1 glazing Pg No - 5-49

EXTERNAL DESIGN CONDITIONS	
CITY	CENTRAL LONDON
LOCATION	UNITED KINGDOM
LATITUDE	51.52°N
LONGITUDE	0.112°W
SUMMER DB	30.8 °C
SUMMER MCWB	19.5°C
WINTER DB	-4°C
SUMMER DAILY RANGE	7.5°C
ALTITUDE	39 MTRS
INTERNAL DESIGN CONDITIONS	
SUMMER	23±2 °C
WINTER	23±2 °C

11.2 Fresh air at Jockeys' Field

At Bedford Row there is currently no fresh air supply system and there are openable windows. There is no mandatory requirement to provide a fresh air system and listed building consent would prohibit ductwork being installed, so no fresh air system is proposed for Bedford Row.

At Jockeys' Field a diversified fresh air requirement has been initially calculated as follows;

- 2nd floor 110 litres
- 1st floor 330 litres
- Gnd Floor 515 litres
- LG floor Vmin 480, Vmax 990 litre. CAV and VAV boxes and operated on signal from microswitch.

Undertake detailed fresh air calculations and seek revised AHU quote and duct sizing.

Provide an AHU at the second floor plant to provide tempered air only -the new fan coils will do the rest on floor. The AHU will have a thermal wheel and a VRF coil with condenser on roof above. An AHU suitable for no frost protection should be provided and it is strongly recommended that an electric heater is placed in the air supply duct to assist with heating in winter mornings. This heater is not shown on the initial design concept drawings.

Provide fresh air based upon 1 person per 10m² and 10 litres a second per person which is the building regulations minimum, and this has been chose to keep plant sizes small and to reflect the low actual occupation. Further diversity can be taken in the larger rooms. The Chartered institution of Building services Engineers recommend 12 litres a second per person and British Council for Offices recommends an additional allowance to cover meeting rooms. Not that with increased air flow an L shaped AHU may be necessary

The drawings indicate the litres per second being delivered to each area as a concept only – provide calculations and proposals for a new fresh air system

To save energy and costs the Jockeys' Field meeting room suite will not always receive maximum air required for the 82-person lecture mode. Provide control system of constant volume boxes and VAV boxes linked to the air handling unit to reduce the fresh volume to the lecture theatre /meeting room whilst maintained the fresh air volumes to the other floors.

Distribution low velocity galvanised sheet steel ductwork will be installed complete with branch volume control dampers for system balancing.

The contractor will develop the calculations provided for fresh air and update to suit.

The fresh air system needs to be able to increase for the lecture mode and so a demand based AHU is required – a SWEGON AHU has been investigated and fits within the plant room although the ducts will need to pass through the top of the electrical riser and the distribution boards will need to be relocated at this level.

Provide attenuators on the ducts to each floor because there is insufficient space in the plant room

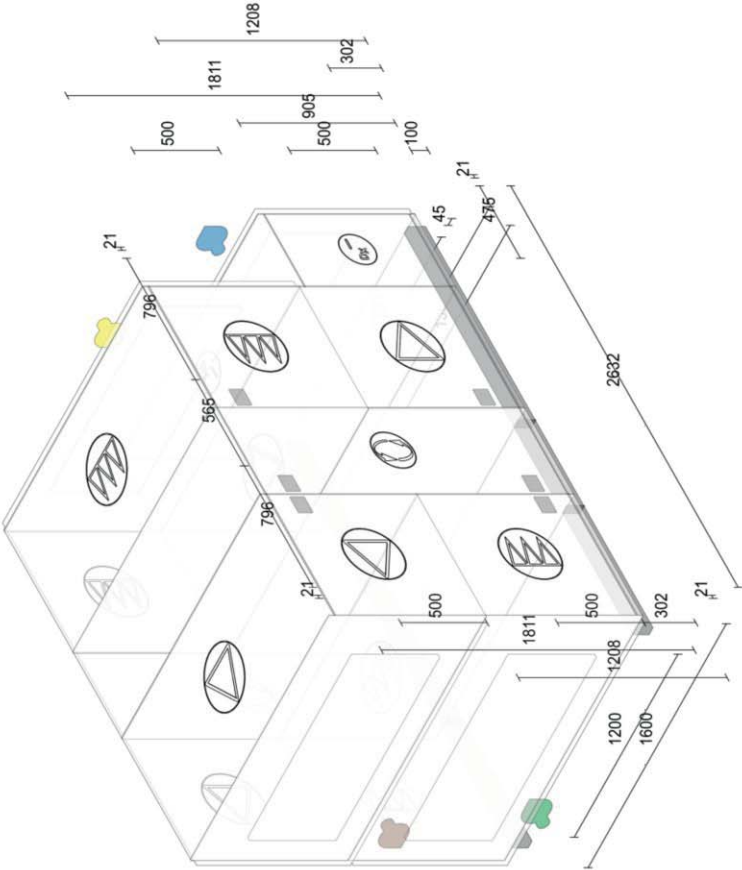
Level	S. No	Floor Name	Description	Room Reference Number	Area (Sqm)	Ht (Mtr.)	Number of Occupants	Fresh air requirement per person (L/s/P)	Calculated Fresh air requirement (L/s)	Mode 1 Normal Mode Occupancy	Mode 2 Lecture Mode Occupancy	Diversity	Total Fresh air Mode 1 (L/s)	Total Fresh air Mode 2 (Lecture Mode) (L/s)	Exhaust Air requirement Mode 1 (L/s)	Exhaust Air requirement Mode 2 (Lecture Mode) (L/s)
-1	1	Lower Ground	Meet and Greet (Zone 1)	R.LG 17	33.0	3.100	7	10	70	6	6	1.00	60	60	60	60
	2	Lower Ground	Meet and Greet (Zone 2)	R.LG 17	50.0	3.100	7	10	70	6	6	1.00	60	60	60	60
	3	Lower Ground	Booth	R.LG 18	1.9	3.100	1	10	10	1	1	1.00	10	10	10	10
	4	Lower Ground	Booth	R.LG 19	1.9	3.100	1	10	10	1	1	1.00	10	10	10	10
	5	Lower Ground	Meeting Room	R.LG 20	10.8	3.100	7	10	70	7	7	0.75	50	50	50	50
	6	Lower Ground	Prep Kitchen	R.LG 21	8.4	3.100	1	10	10	1	1	1.00	10	10	10	10
	7	Lower Ground	Seminar Room	R.LG 30	35.5	3.100	11	10	110	11	41	1.00	110	365	110	365
	8	Lower Ground	Seminar Room	R.LG 31	36.5	3.100	11	10	110	11	41	1.00	110	365	110	365
	9	Lower Ground	Hot Office	R.LG 32	8.3	3.100	1	10	10	0	0	1.00	0	0	0	0
	10	Lower Ground	Touch Down	R.LG 33	32.0	3.100	6	10	60	6	6	1.00	60	60	60	60
					218					50	110		480	990	480	990
0	1	Ground	Waiting/ Breakout	R.G 12	51.0	3.025	7	10	70	4	0	0.75	30	0	30	0
	2	Ground	Conference Room	R.G 13	17.5	3.025	7	10	70	7	0	0.75	50	0	50	0
	3	Ground	Tele/ Conf	R.G 14	3.5	3.025	1	10	10	2	0	0.75	15	0	15	0
	4	Ground	Tele/ Conf	R.G 15	3.5	3.025	1	10	10	2	0	0.75	15	0	15	0
	5	Ground	Meeting Room	R.G 16	15.5	3.025	7	10	70	7	0	0.75	53	0	53	0
	6	Ground	Kitchen	R.G 20	9.6	3.025	1	10	10	1	0	1.00	10	0	10	0
	7	Ground	Conference Room	R.G 21	16.0	3.025	8	10	80	8	0	0.75	60	0	60	0
	8	Ground	Conference Room	R.G 22	24.5	3.025	11	10	110	11	0	0.75	83	0	83	0
	9	Ground	Conference Room	R.G 23	17.8	3.025	6	10	60	6	0	0.75	45	0	45	0
	10	Ground	Conference Room	R.G 24	17.8	3.025	6	10	60	6	0	0.75	45	0	45	0
	11	Ground	Conference Room	R.G 25	17.8	3.025	6	10	60	6	0	0.75	45	0	45	0
	12	Ground	Conference Room	R.G 26	8.3	3.025	4	10	40	4	0	0.75	30	0	30	0
	13	Ground	Conference Room	R.G 27	8.3	3.025	4	10	40	4	0	0.75	30	0	30	0
					211					68	0		510	0	510	0

Figure 16 Initial Fresh air requirements at LG and G

Level	S. No	Floor Name	Description	Room Reference Number	Area (Sq.m)	Ht (Mtr.)	Number of Occupants	Fresh air requirement per person (L/s/P)	Calculated Fresh air requirement (L/s)	Mode 1 Normal Mode	Mode 2 Lecture Mode	Diversity	Total Fresh air Mode 1 (L/s)	Total Fresh air Mode 2 (Lecture Mode)	Exhaust Air requirement Mode 1 (L/s)	Exhaust Air requirement Mode 2 (Lecture Mode)
1																
	1	First	Admin Office	R.1.12	20.0	3.025	4	10	40	4	0	1.00	40	0	40	0
	2	First	Break Area	R.1.13	20.0	3.025	8	10	80	4	0	1.00	40	0	40	0
	3	First	Comms Room	R.1.14	6.9	3.025	0	10	0	0	0	1.00	0	0	0	0
	4	First	Post / Reprographics	R.1.19	38.0	3.025	4	10	40	2	0	1.00	20	0	20	0
	5	First	Meeting Room	R.1.20	7.5	3.025	4	10	40	3	0	1.00	30	0	30	0
	6	First	CE Office	R.1.21	13.0	3.025	4	10	40	2	0	1.00	20	0	20	0
	7	First	Corridor	R.1.22	20.0	3.025	1	10	10	0	0	1.00	0	0	0	0
	8	First	Office	R.1.23	87.5	3.025	18	10	180	18	0	1.00	180	0	180	0
					213					33	0	330	0	330	0	0
2																
	1	Second	Plant Area	R.2.14	12.0	3.025	1	10	10	0	0	1.00	0	0	0	0
	2	Second	Office	R.2.17	18.0	3.025	4	10	40	2	0	1.00	20	0	20	0
	3	Second	Tee Point	R.2.18	12.0	3.025	4	10	40	0	0	1.00	0	0	0	0
	4	Second	Office	R.2.19	15.3	3.025	2	10	20	2	0	1.00	20	0	20	0
	5	Second	Office	R.2.20	18.8	3.025	3	10	30	1	0	1.00	10	0	10	0
	6	Second	Office	R.2.21	24.0	3.025	3	10	30	3	0	1.00	30	0	30	0
	7	Second	Office	R.2.22	15.3	3.025	1	10	10	1	0	1.00	10	0	10	0
	8	Second	Office	R.2.23	14.6	3.025	1	10	10	1	0	1.00	10	0	10	0
	9	Second	Office	R.2.24	12.1	3.025	1	10	10	1	0	1.00	10	0	10	0
	10	Second	Corridor	R.2.25	25.4	3.025	1	10	10	0	0	1.00	0	0	0	0
					168					11	0	110	0	110	0	0
			Total		810					162	110		1430	990	1430	990

Figure 17 Initial Fresh air requirements at level 1 and 2

AHU Design
Sketch: Above left



- Outdoor air
- Supply air
- Extract air
- Exhaust air



Project: 7 Bedford Row
Unit name: AHU 01 - Single AHU Unit option with reverse cycle DX Coil section - External Condensers needed
Unit ID: AD-10000395123
13 / 1.0.20180918, 1141432
Date: 21/09/2018

Connection size	
outdoor air	1,200 x 500 mm
supply air	1,200 x 500 mm
extract air	1,200 x 500 mm
exhaust air	1,200 x 500 mm

GOLD F RX	025
Unit size	kg
Unit weight	962
Duct Component Weight	0
Length, max	2,736 mm
Height, max	1,911 mm
Width, max	1,600 mm

11.3 Staircase pressurisation

A staircase pressurisation system is not anticipated to be required, pending final comment from building control and a fire strategy document.

11.4 Heat rejection plant space

Currently, condensers are located in every available location around the building including on the terraces of Jockeys' Field, in the lightwell, and on the wall and facades and on the roof of Jockeys' Field. Many of these are thought to be redundant and the new system need to provide both heating and cooling whilst using lots less plant space. Strip out all redundant condensers, pipework, fixings and traywork

The location for heat rejection plant is detailed on the drawings and is at two locations

- On the roof on Jockeys' Field – limited to 1500mm high slim condenser unit PUMY type
- Within the courtyard between the Bedford Row and Jockeys' Field



Figure 20 Plant screen above Jockeys' Field with existing condensers



Figure 21 Roof plant areas

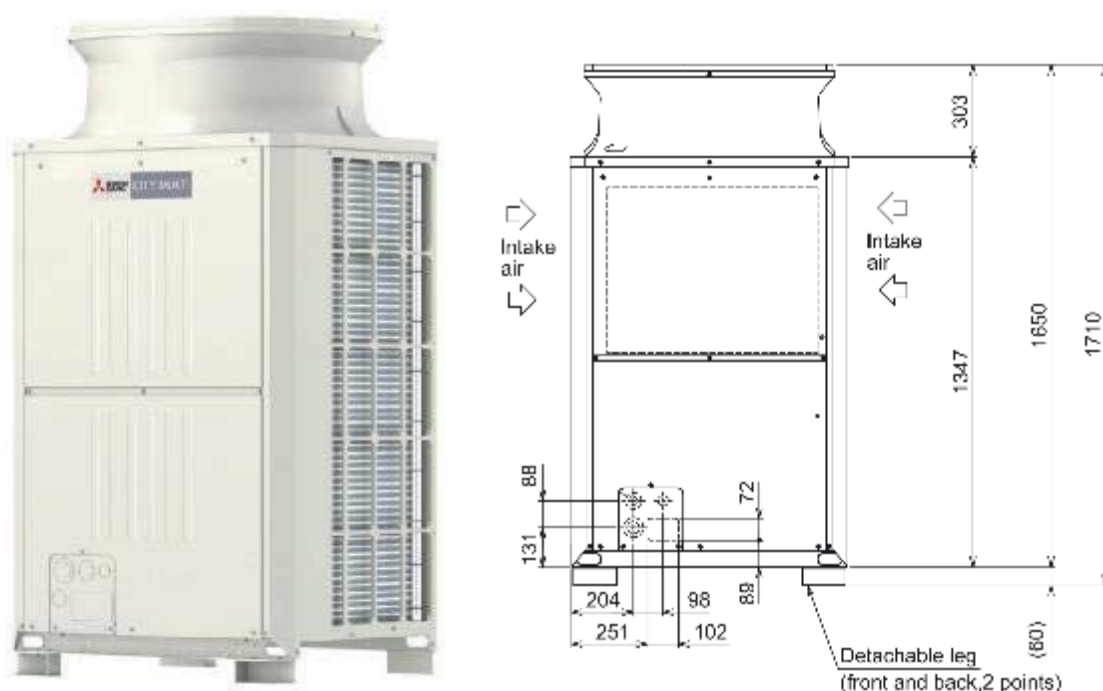


Figure 22 Typical Heat rejection unit for VRF system within courtyard

11.5 Condenser unit Acoustics

Engage a specialist acoustician and liaise with the manufacturers of the condensers, and manufacturers of attenuation systems and screens to meet the requirements of the planning authority, including background noise and noise at local windows.

Undertake sound measurement and advise a night time sound level for the condensers running at the reduced night time load so achieve compliance with the local authority's defined night time acoustic target. This may require some condenser to be turned off at night, but the contractors attention is drawn to the need to optimise heating and to achieve the required temperature in the winter by 8am, and this means starting the condensers and heating system early

Condensers may be sized larger than required to reduce the %load and therefore reduce the noise level when running, subject to confirmation by the local authority.

11.5.1 Discharge Attenuation

The contractor will provide discharge attenuators, to the condensers to meet local authority acoustic requirements. The contractor will spray these an appropriate RAL colour to minimise visual impact

At this early stage of design it has been assessed that each of the 3 no. PURY P450YNW-A outdoor units will require 900mm long high performance discharge attenuators. Ambient Acoustics <https://www.ambientacoustics.co.uk/> has advised these can be purpose designed such that they fit directly onto the top of the condensers following removal of the fan cowl which should save around 300mm in height resulting in a total height increase of 600mm.

In this instance the total height of the attenuated units will be approximately 2.5m plus around 75-100mm for anti-vibration mountings plus any support steelwork required.

The contractor shall continue to liaise with their selected acoustic attenuation provider. At this time Ambient Acoustics have confirmed the following in relation to the pressure drop affect of the discharge attenuator on the unit performance:-

“As for pressure drop, according to Mitsubishi, these units have 60Pa external static available as standard plus we know that the removal of the plastic fan cowl to facilitate the fitting of the top attenuators also releases some additional static so we can confidently say that the top attenuators will have negligible impact on the operation of the units.”

Ambient Acoustics confirmed the following with respect to colour finish options:-

“As standard, the attenuators are polyester powder coated to match the Mitsubishi units but they can be supplied in any stock RAL colour. For brickwork, we would suggest RAL3011, RAL3016, RAL8012 or RAL3031 as possibilities as brick shades do differ but the architect should be able to provide guidance for a suitable match.”

Please see attached photo showing typical discharge attenuators on two outdoor units (please note these are 600mm long discharge attenuators and a different type of outdoor unit to that proposed but it does give a good indication of the general appearance of the discharge attenuators).

11.5.2 Intake Attenuation

The contractor will assess the acoustics when final selections and loads have been assessed and provide intake attenuators if necessary. Our current assessment is that these are not necessary provided that 900mm long discharge attenuators as detailed from “Ambient Acoustics” are installed, and the surrounding enclosure is formed from at least 75mm thick solid proprietary modular acoustic panels with fully sound absorbent internal face.

Many condensers such as the ‘YNW-A’ outdoor unit type have intake coils on all four sides of the unit, and so space is required around them on all sides. The contractor will refer to the manufacturers’ requirements for the final condenser units selected and provide sufficient space for maintenance and air flow to avoid derating of the units.

11.5.3 Acoustic Enclosure Screen

The contractor will assess acoustic requirements and provide 75mm thick (minimum) acoustic screening to the same height as the top of the discharge attenuator.

To further improve acoustics and provide some visual screening, Provide the acoustic screen to extend down to within 50mm from the floor to prevent any sound leakage at the base of the screen whilst assisting airflow, noting any bigfoot plant support system



Figure 23 Typical discharge attenuators

11.6 Acoustics

Refer to the latest versions of the Equus Partnership acoustic report and provide acoustic screens, discharge attenuator and treatments to the AHU and Condensers to suit

The contractor will design the plant and enclosure in line with acousticians report to comply with planning requirements, noting that oversizing plant will reduce noise level for the design load, but planning might perceive that the plant is capable of a higher noise level.

Provide an attenuator schedule as below

Attenuator Schedule

Notes

1. Attenuators supplied by Caice.
2. Pressure losses are stated in accordance with ISO 7235, which is based on laminar airflow conditions. The system designer shall make allowance for increased attenuator pressure losses where turbulent airflow conditions exist on the attenuator entry or exit.
3. Unless stated otherwise all attenuators shall be constructed as follows: Galvanised sheet steel casings with 30mm profile flanges that are fully compliant with DW/TM1 at a high pressure rating (+2000/-750Pa). Profile flanges shall be compatible with Doby, Mez & Metu flanging systems. Elements shall be installed in the vertical plane, with side elements provided as standard, and all elements shall have aerodynamic inlet and outlet fairings. Element facings shall be constructed from expanded galvanised steel mesh with fibre glass tissue bonded to the inner face. Mineral wool infill shall be overpacked to minimise voids due to settlement. Attenuator ends shall be protectively wrapped, and all attenuators shall be delivered to site on pallets and individually labelled.

Ref.	Description	Type and Model Code	Dimensions (mm)			Free Area	Vol (m ³ /s)	PL (Pa)	Qty	Features
			W	H	L					
ATT01	ATT-B1-01 Room side	Rectangular LG01V/3C/L/S	600	400	1200	32.5%	0.75	37	1	

Figure 24 example attenuator schedule

11.7 Comms equipment cooling

The single rack does not have servers and is mainly housing equipment for Power Over Ethernet devices within. The low load actually consumed in the room means that the door can be left open to achieve cooling.

Provide a power supply and external louvre 250mm square allowing a future boosted extract fan to be provided by the client if required. This reduces the number of condensers, noise impact and save cost.

Note that for POE equipment that the load is being drawn/used outside the comms room so the heat dissipation occurs elsewhere, noting some loss of efficiency inside the POE units will remain in the room.

11.8 Tea Points

Generally, provide 6 air changes per hour from the office system or from the toilet extract system

Provide high quality low noise kick space heaters with thermostatic control and timer (to prevent them being left on 24/7) where no VRF fan coil unit is present.



KICKSPACE®

TECHNICAL INFORMATION (cont...)

ELECTRIC MODEL			
Dimensions		Fan Speed	Model
			500E
	Nominal Height (mm)	-	101
	Nominal Depth (mm)	-	203
Sound Levels*	Sound Pressure (dBA) (at 2.5m)	Low	27.2
			40.2
		High	40.2
Weight	Unit Weight (kg)	-	3.0
Air Flow Rates	Air Flow (m³/h)	Low	70
		High	90
	Air Flow (ft³/h)	Low	2471
		High	3177

*Sound levels tested in accordance with EN 23741.

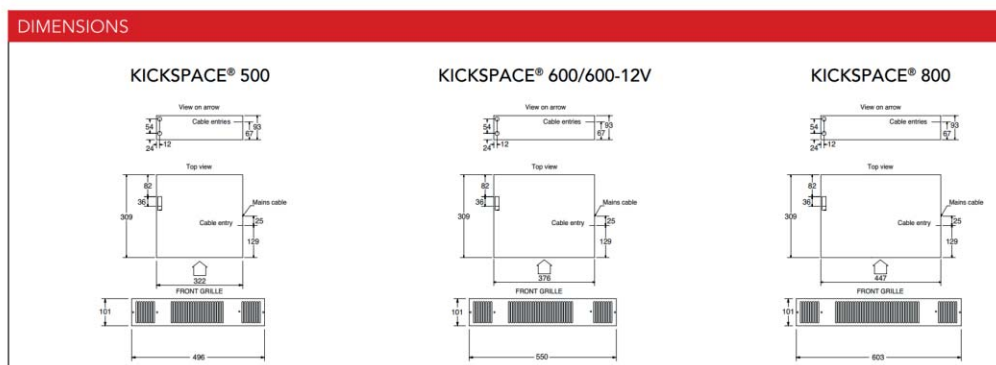


Figure 25 Typical kick space heater 40.2 db at 2.5m

11.9 Toilet Extract

Generally, the existing toilet extract ductwork will be reused and Bedford row and new ductwork provide to suit at Jockeys field

For storage areas provide a system to maintain negative pressure with 1 air change per hour (min). For toilets 10 air changes per hour with, make up air through transfer grille or undercut door from heat recovery HRU.

Within Jockeys' Field it appears that a 400Square duct drops from the fan located in the second floor plant room void, however this may restrict the fresh air system

A new heat recovery toilet extract fan will be provided in Jockeys' Field– subject to testing by the contractors. Provide make up air outside each WC / shower area

Adapt the existing local on floor toilet extract to suit the new layouts, generally at each WC a 100mm duct will extract 15 litres a second from each toilet cubical to give 10 air changes an hour. The new ducts are not to cross into the office space for aesthetic reasons and also to minimise fire dampers

The showers are to have a greater level of extract in line with CIBSE recommendations of 15 air changes an hour

Provide a new toilet extract fan is to be constant volume twin extract fan have an acoustic enclosure and attenuator. The twin extract fan unit will be operated when activated by a time clock via a simple local controller and be complete with a 20min over run.

The contractor will develop the toilet extract schematic when the full details of the riser can be surveyed during the strip out phase of the works.

Each extract point will consist of an extract valve Branch volume control dampers will be provided for system balancing, complete with access panels.

The toilet extract shall be ducted to at least 3m away from any fresh air intake

All galvanised sheet steel ductwork will be low velocity and installed in accordance with DW144.

Toilet area ventilation	The basebuild strategy is to be retained.
Storage Areas	
Cleaners Cupboard Print rooms Tea points	20 l/s per machine extract only. Make up air through transfer grille 6 air changes per hour minimum

11.10 Shower heating

Provide chrome heated towel rails and electric oil filled radiators to suit heat loss noting the extract air and fabric heat losses.

11.11 Kitchen / Catering capability

There will be no catering or cooking facilities in the building. The rooms marked as kitchens are in fact tea points / reheat pantries which have far less onerous requirement in regards air, cooling, fire compartmentation, odour dilution, fire rated ductwork, grease filtration etc.

Within the “kitchen” of Jockeys’ Field LG floor provide a simple 4 way blower ceiling cassette fan coil

11.12 Heating within the demise

Heating within the demise will be provided by the VRF system of Jockeys’ Field and Bedford Row generally, however there are many common part such as stairwells, landings and plant rooms which need heating.

These “transient” spaces, spaces that people do not spend much time in will be heated with oil filled electric radiators – not convector heaters, Provide radiant heaters and kick space heaters

VRF can be slow to heat up so a few more fan coils or slightly oversized condenser is recommended to ensure the offices are warm on winter mornings.

Provide a heating system such that a 2 hour pre heat is enough for the office to reach 23 degrees on a winter morning with -4 external temperature.

Provide additional temperature sensors and demonstrate the heating

11.13 Fan coils for heating and cooling for Bedford Row

Provide a Mitsubishi based VRF system.

Provide a fan coil schedule as example headings below modified to suit VRF arrangement.

Reference Details			Airflow / NR / Speed Data				Cooling Phase Data						Glycol Content (% by weight)						Heating Phase Data						Glycol Content (% by weight)						SFP	
Unit Reference	Qty.	Model Reference	Airflow & Ext. Pressure	Fresh Air	Ind. Unit Guide	Speed Setting	Entering Air Temp.	Summer FA Temp.	Cooling Duty Sensible	Total	Air Off	Air Off	Flow Temp	Return Temp	CW Flow Rate	Hyd. Pressure	Entering Air Temp.	Winter FA Temp.	Heating Duty	Element Rating	Air Off	Flow Temp	Return Temp	HW Flow Rate	Hyd. Pressure	Each	SFP					
			l/s Pa	l/s	NR		db°C	wb°C	Watts	Watts	db°C	wb°C	°C	°C	l/s	kPa	db°C	db°C	Watts	Watts	db°C	°C	°C	l/s	kPa							
FCUMZ/NC	1	H27Bec-WHCH-09/1	101 30		27	xLOW	24.0 17.0	- -	1208 1443	14.0 12.7	6.0 12.0	0.057 1.2	21	-	2500	-	41.7 82.0	71.0 0.056	1.2 0.17													

Joinery and acoustic services Generally, the existing heating system at 6&7 Bedford Row does not work, and although it would be possible to repair it, it is beyond its useful life and would likely continue to have failures on the aged parts. The system also does not provide cooling. Bedford Row has many window sills which are too low to be able to accommodate a fan coil below – generally 65cm is required and in many instances the cooling units intrude into the room as per pictures below



Figure 26 Existing fan coils intrude into the space.

Secondly it appears that additional filing space would be useful, and I understand that lighting may be difficult to renew due to listed building consent.

Provide joinery in line with architects' drawings to house the fan coils. These will allow full access to the fan coil via side, bottom and front panels and which will have uprights on the top. Routes for pipes and cables need to be agreed with English heritage but will generally be in the floors of Bedford Row

Procure the fan coils early and liaise with the joiners and acoustician

Provide attenuators at top of fan coils as necessary to meet requirements defined in Equus report.

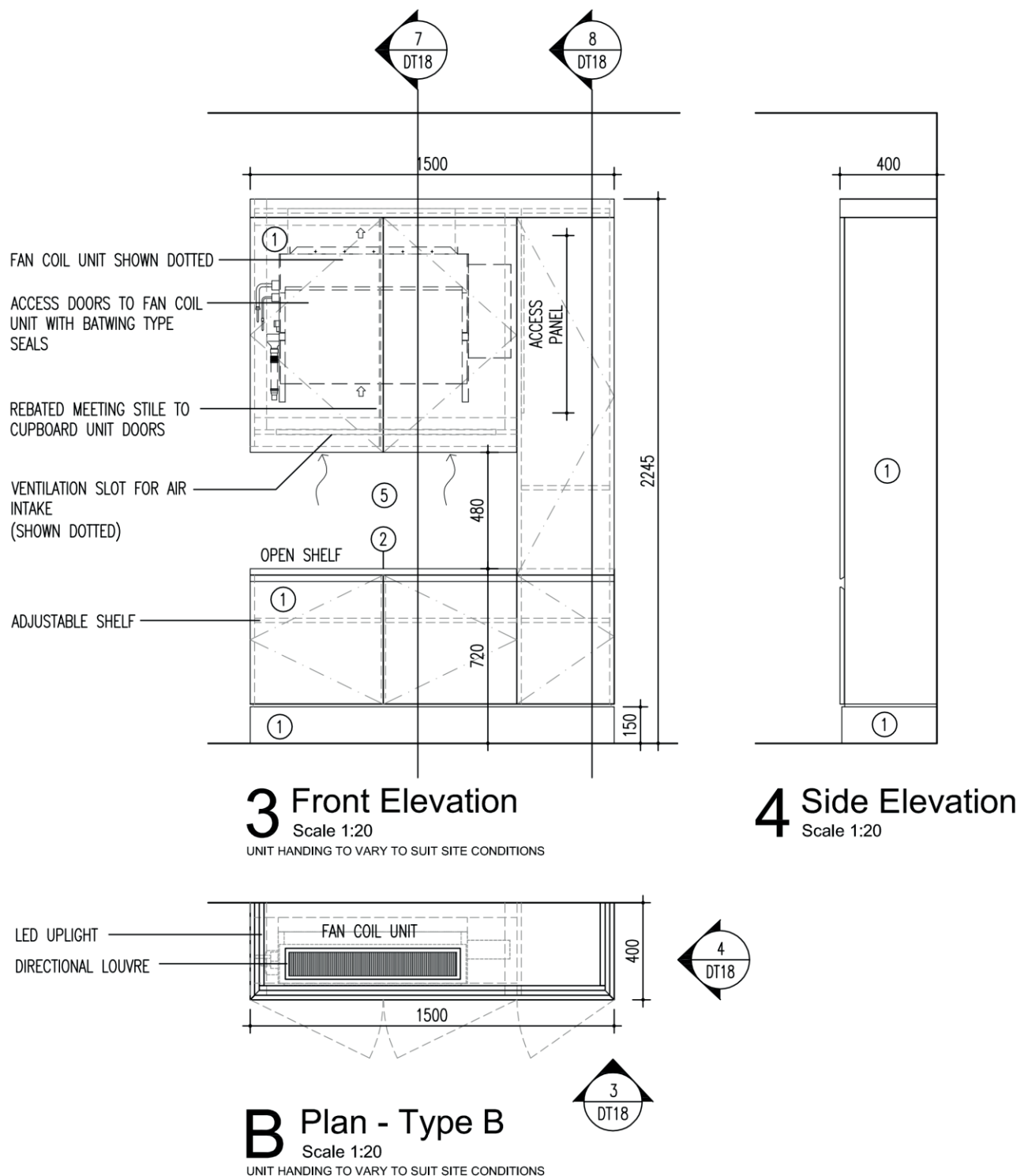


Figure 27 Proposed fan coil joinery for Bedford Row to be developed by contractor

The fan coils are proposed as a VRF system. Within Bedford Row there is no space for branch selector boxes so a system using branch selectors – heat pump type is required rather than heat recovery. Without this BC box the fan coils of each floor will all heat or all cool – it will not be possible to heat one room and cool another – this is generally not expected to be an issue because there are no meeting rooms on floor

VRF draws heat out of the air in the winter instead of using a boiler and they are very efficient in regards energy and also economically when considering providing a boiler

system, however it has been reported that they can take some time to get a building up to temperature in the winter and the design needs to be well thought out to avoid this, and acknowledge the construction having little insulation and poor glazing u-values and the likely infiltration of cold external air through the façade.

The condensate from these fan coils will need to be pumped down through the floor with the refrigerant pipes and there will be no future access. Provide a rigid pipe system for the condensate and pressure test.



Figure 28 Fan coil unit to be located under window sill

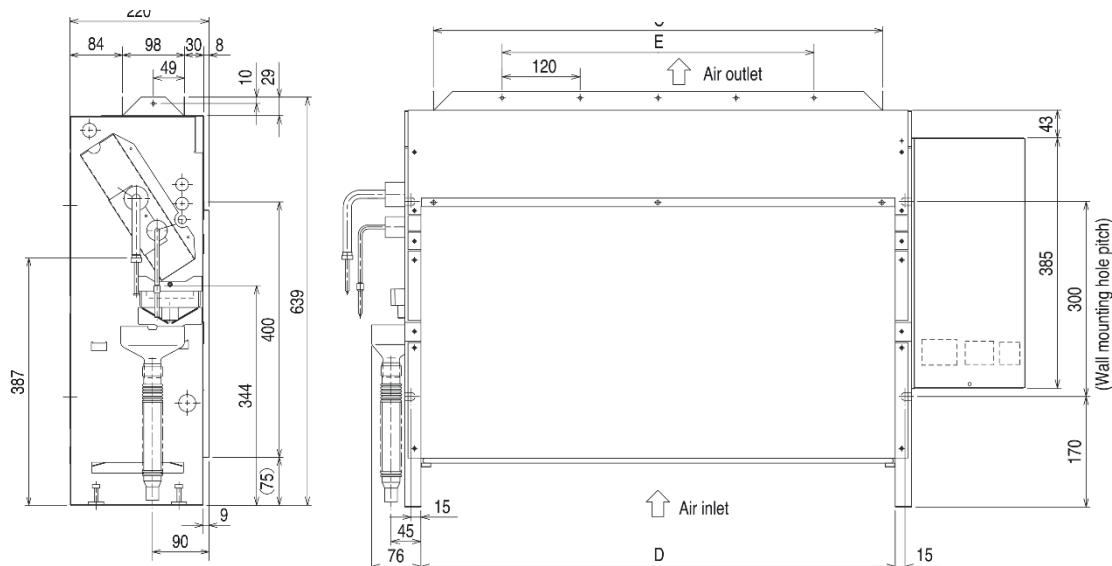


Figure 29 Typical Dimensions of fan coil unit to be used below sill and behind joinery



Figure 30 This style of wall mounted cooling/heating unit will not be used



Figure 31 Typical Small housing floor mounted VRF unit – Aesthetics not suitable

11.13.1

[illegible]

11.13.2 Initial Bedford Row Summer loads

Floor	Description	Room Reference Number	Room Condition		Area	Height	Fabric Gains	Lighting		Power		Equipment	People				Infiltration				Room Sensible Cooling Load	Room Latent Cooling Load	Room Total Cooling Load	Summer																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
			Design Dry Bulb	Design Wet Bulb				RH	Tdb	Twb	RH		A	H	Gf	L	(TL)= A*L	(W/m2)	W	S				SP	(TL)= A*L	W	S	EL	n	TSL = n*SLD	TLL = n*LLD	T = TSL + TLL	Infiltration	Infiltration Volume	Sensible Load	Latent Load	QL=3*(W-o - Wi)	RSHL = Gf+(TL)+ (TL)P+EL+TSL+QS	RHLH = TLL + QL	TRH = RSHL + RLHL	ΔT = T3 - T1	FCU on coil		FCU Off coil	Calculated Cooling Requirement	W/sqm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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11.13.3 Initial Jockeys Field Winter loads

Floor	Description	Room Reference Number	Winter		Area	Height	Fabric Gains	Lighting		Power		Equipment	People			Infiltration				Room Latent Heating Load	Room Total Heating Load	Winter				W/sqm						
			Design Dry Bulb	Design RH				Winter	Total Load	Small power Rate	Total Load		Sensible Load	No. of Persons	Total Sensible Load	Total Latent Load	Total Load (W)	N	Infiltration Volume			Sensible Load	Latent Load	RSHL = Gf+(TL)+ (TL)P+EL+TSL+QS	RLHL = TLL + QL		TRH = RSHL + RLHL	FCU on coil		FCU off coil		Calculated Heating Requirement
																												Tdb	Twb	RH	T1	
			°C	(%)	(m2)	(m)	(W)	(W/m2)	(W)	(W/m2)	(W)	(W)	(W)	(W)	(ACH)	L/s	(W)	(W)	(kW)	(kW)	(kW)	°Cdb	°Cwb	°Cdb	°Cwb	KW						
Basement	Meet and Greet (Zone 2)	R.LG 17	22.0	15.41	50.0	33.0	-1827	0	0	0	0	0	0	0	0	0	0	0	-1.83	0.00	-1.83	-7	20	15.09	27	20.3	-4.14	-55.3				
Basement	Meet and Greet (Zone 2)	R.LG 17	22.0	15.41	50.0	31.00	-1070	0	0	0	0	0	0	0	0	0	0	0	-1.07	0.00	-1.07	-7	20	15.09	27	20.3	-2.43	-21.4				
Basement	Booth	R.LG 18	22.0	15.41	50.0	1.9	-119	0	0	0	0	0	0	0	0	0	0	0	-0.12	0.00	-0.12	-7	20	15.09	27	20.3	-0.27	-63.0				
Basement	Booth	R.LG 19	22.0	15.41	50.0	1.9	-119	0	0	0	0	0	0	0	0	0	0	0	-0.12	0.00	-0.12	-7	20	15.09	27	20.3	-0.27	-63.0				
Basement	Meeting Room	R.LG 20	22.0	15.41	50.0	10.8	-497	0	0	0	0	0	0	0	0	0	0	0	-0.50	0.00	-0.50	-7	20	15.09	27	20.3	-1.13	-45.9				
Basement	Seminar Room	R.LG 30	22.0	15.41	50.0	35.5	-1177	0	0	0	0	0	0	0	0	0	0	0	-1.18	0.00	-1.18	-7	20	15.09	27	20.3	-2.67	-33.2				
Basement	Seminar Room	R.LG 31	22.0	15.41	50.0	36.5	-975	0	0	0	0	0	0	0	0	0	0	0	-0.88	0.00	-0.88	-7	20	15.09	27	20.3	-1.98	-24.0				
Basement	Hot Office	R.LG 32	22.0	15.41	50.0	8.3	-327	0	0	0	0	0	0	0	0	0	0	0	-0.33	0.00	-0.33	-7	20	15.09	27	20.3	-0.74	-39.5				
Basement	Touch Down	R.LG 33	22.0	15.41	50.0	32.0	-886	0	0	0	0	0	0	0	0	0	0	0	-0.89	0.00	-0.89	-7	20	15.09	27	20.3	-2.01	-27.7				
Total						210															-7					-16						
Ground	Waiting/ Breakout	R.G 12	22.0	15.41	50.0	51.0	-1219	0	0	0	0	0	0	0	0.8	34	-1070	-586	-2.29	-0.59	-2.88	-7	20	15.09	27	20.3	-5.19	-56.4				
Ground	Conference Room	R.G 13	22.0	15.41	50.0	17.5	-694	0	0	0	0	0	0	0	0.8	12	-367	-201	-1.06	-0.20	-1.26	-7	20	15.09	27	20.3	-2.40	-72.1				
Ground	Tele/ Conf	R.G 14	22.0	15.41	50.0	3.5	-59	0	0	0	0	0	0	0	0	0	0	0	-0.06	0.00	-0.06	-7	20	15.09	27	20.3	-0.13	-16.8				
Ground	Tele/ Conf	R.G 15	22.0	15.41	50.0	3.5	-130	0	0	0	0	0	0	0	0	0	0	0	-0.13	0.00	-0.13	-7	20	15.09	27	20.3	-0.29	-37.1				
Ground	Meeting Room	R.G 16	22.0	15.41	50.0	15.5	-3025	0	0	0	0	0	0	0	0.8	10	-325	-178	-0.81	-0.18	-0.99	-7	20	15.09	27	20.3	-1.83	-63.7				
Ground	Conference Room	R.G 21	22.0	15.41	50.0	16.0	-705	0	0	0	0	0	0	0	0.8	11	-336	-184	-1.04	-0.18	-1.22	-7	20	15.09	27	20.3	-2.36	-76.5				
Ground	Conference Room	R.G 22	22.0	15.41	50.0	24.5	-3025	0	0	0	0	0	0	0	0.8	16	-514	-282	-1.42	-0.28	-1.71	-7	20	15.09	27	20.3	-3.23	-69.6				
Ground	Conference Room	R.G 23	22.0	15.41	50.0	17.8	-3025	0	0	0	0	0	0	0	0	0	0	0	-0.14	0.00	-0.14	-7	20	15.09	27	20.3	-0.32	-7.9				
Ground	Conference Room	R.G 24	22.0	15.41	50.0	17.8	-3025	0	0	0	0	0	0	0	0	0	0	0	-0.14	0.00	-0.14	-7	20	15.09	27	20.3	-0.32	-7.9				
Ground	Conference Room	R.G 25	22.0	15.41	50.0	17.8	-3025	0	0	0	0	0	0	0	0.8	12	-372	-204	-0.63	-0.20	-0.84	-7	20	15.09	27	20.3	-1.43	-47.1				
Ground	Conference Room	R.G 26	22.0	15.41	50.0	8.3	-3025	0	0	0	0	0	0	0	0	0	0	0	-0.10	0.00	-0.10	-7	20	15.09	27	20.3	-0.23	-12.0				
Ground	Conference Room	R.G 27	22.0	15.41	50.0	8.3	-3025	0	0	0	0	0	0	0	0	0	0	0	-0.10	0.00	-0.10	-7	20	15.09	27	20.3	-0.23	-12.0				
Total						201															-10					-18						
First	Admin Office	R.1.12	22.0	15.41	50.0	20.0	-693.6	0	0	0	0	0	0	0	0.8	13	-419	-230	-1.11	-0.23	-1.34	-7	20	15.09	27	20.3	-2.52	-67.1				
First	Break Area	R.1.13	22.0	15.41	50.0	20.0	-396.8	0	0	0	0	0	0	0	0.8	13	-419	-230	-0.82	-0.23	-1.05	-7	20	15.09	27	20.3	-1.85	-52.3				
First	Comms Room	R.1.14	22.0	15.41	50.0	6.9	-318.1	0	0	0	0	0	0	0	0.8	5	-144	-79	-0.46	-0.08	-0.54	-7	20	15.09	27	20.3	-1.05	-78.7				
First	Post/ Reprographics	R.1.19	22.0	15.41	50.0	38.0	-3025	0	0	0	0	0	0	0	0.8	26	-797	-437	-2.17	-0.44	-2.61	-7	20	15.09	27	20.3	-4.92	-68.6				
First	Meeting Room	R.1.20	22.0	15.41	50.0	7.5	-285.3	0	0	0	0	0	0	0	0.8	5	-157	-86	-0.44	-0.09	-0.53	-7	20	15.09	27	20.3	-1.00	-70.5				
First	CE Office	R.1.21	22.0	15.41	50.0	13.0	-1064.6	0	0	0	0	0	0	0	0.8	9	-273	-149	-1.34	-0.15	-1.49	-7	20	15.09	27	20.3	-3.03	-114.4				
First	Corridor	R.1.22	22.0	15.41	50.0	20.0	-3025	0	0	0	0	0	0	0	0.8	13	-419	-230	-1.48	-0.23	-1.71	-7	20	15.09	27	20.3	-3.37	-85.7				
First	Office	R.1.23	22.0	15.41	50.0	87.5	-590.1	0	0	0	0	0	0	0	0.8	59	-1835	-1006	-2.43	-1.01	-3.43	-7	20	15.09	27	20.3	-5.50	-39.2				
Total						213															-13					-23						
Second	Plant Area	R.2.14	22.0	15.41	50.0	12.0	-748	0	0	0	0	0	0	0	0.8	8	-252	-138	-1.00	-0.14	-1.14	-7	20	15.09	27	20.3	-2.27	-94.8				
Second	Office	R.2.17	22.0	15.41	50.0	18.0	-3025	0	0	0	0	0	0	0	0.8	12	-378	-207	-1.15	-0.21	-1.36	-7	20	15.09	27	20.3	-2.61	-75.5				
Second	Tea Point	R.2.18	22.0	15.41	50.0	12.0	-3025	0	0	0	0	0	0	0	0.8	8	-252	-138	-0.74	-0.14	-0.68	-7	20	15.09	27	20.3	-1.22	-56.3				
Second	Office	R.2.19	22.0	15.41	50.0	15.3	-3025	0	0	0	0	0	0	0	0.8	10	-321	-176	-1.00	-0.18	-1.17	-7	20	15.09	27	20.3	-2.26	-76.6				
Second	Office	R.2.20	22.0	15.41	50.0	18.8	-3025	0	0	0	0	0	0	0	0.8	13	-394	-216	-0.89	-0.22	-1.11	-7	20	15.09	27	20.3	-2.03	-59.1				
Second	Office	R.2.21	22.0	15.41	50.0	24.0	-3025	0	0	0	0	0	0	0	0.8	16	-503	-276	-1.91	-0.28	-2.19	-7	20	15.09	27	20.3	-4.34	-91.2				
Second	Office	R.2.22	22.0	15.41	50.0	15.3	-3025	0	0	0	0	0	0	0	0.8	10	-321	-176	-0.76	-0.18	-0.93	-7	20	15.09	27	20.3	-1.71	-60.9				
Second	Office	R.2.23	22.0	15.41	50.0	14.6	-3025	0	0	0	0	0	0	0	0.8	8	-254	-139	-1.17	-0.14	-1.31	-7	20	15.09	27	20.3	-2.65	-107.7				
Second	Corridor	R.2.25	22.0	15.41	50.0	25.4	-3025	0	0	0	0	0	0	0	0.8	17	-533	-292	-1.04	-0.29	-1.34	-7	20	15.09	27	20.3	-2.37	-52.6				
Total						168															-12					-23						
Grand Total						791.6															-41.3					-80.1						

11.13.4

Initial Jockeys Field Summer loads

Floor	Description	Room Reference Number	Room Condition			Area	Height	Lighting		Power		suppliment	People				Infiltration				Room Sensible Load	Room Latent Load	Room Total Load	Temp Diff	Summer				W/sqm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
			Design Dry Bulb	Design Wet Bulb	Design RH			Fabric Gains	L	Lighting	(TL) _L = A × L		Small power	SP	(TL) _P = n × P	Sensible Load	Total Latent Load	TLL = n × L	Infiltration	A × H × N / Volume					Infiltration	OS = 1.2 × S	Latent Load	RSHL = G + (TL) _L		G + (TL) _L	Room Cooling Load	Room Latent Load	Room Total Load	TRH = 1.06 × R	T4	T3	T2	T1	FCU on Coil	Calculated Cooling Requirement																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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11.14 Fan coils for heating and cooling for Jockeys' Field

Provide a Mitsubishi based VRF system.

Provide Jockeys' Fields and ducted ceiling cassette fan coil in ceiling voids. The plant space availability has some impact on the system choice. The roof plant space at Jockeys' Field can only accommodate PUMY type condensers, which are low height but not very space efficient compared to PURY type condensers.

For Jockeys' Field we would need 14 PUMY type condensers, but the same load can be achieved by 2 PURY type condensers. This demonstrates the space efficiency of the taller PURY type condensers, however the roof space of Jockeys Field is very close and this short route avoids clogging up the riser.

Provide PUMY type condenser for 1st and 2nd floor of Jockeys Field located on the roof.
Provide PURY type condensers for LG and G and locate in the courtyard.



Figure 32 PUMY type condenser can be used on roof of Jockeys' Field for JF1, JF2

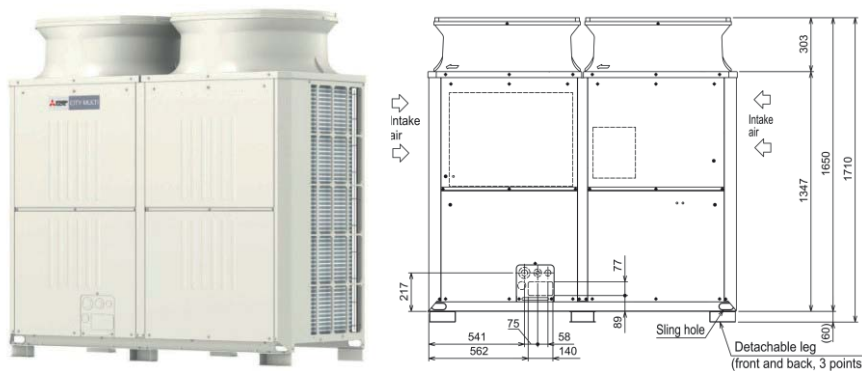


Figure 33 PURY type condenser for Bedford Row and LG & G of Jockeys' Field

11.15 Enhanced Capital allowances

Undertake all requirements to maximise ECA

ECA is a Government tax incentive for businesses to invest in specific energy efficient technologies, such as heat pump and heat recovery refrigerant systems.

Under the scheme, all businesses liable for UK corporation tax are able to claim an Enhanced Capital Allowance on any qualifying expenditure, meaning businesses can offset the full cost of specific technologies against taxable profits of the period of the investment. Investment in new and unused plant and machinery qualify.

The scheme is managed by the Carbon Trust, who support businesses keen to save energy and reduce carbon emissions, through the use of energy efficient equipment and low carbon technologies. The trust has developed a criteria which targets the top 20% of highest performing heat pumps across the industry

The Mitsubishi units proposed allow ECA to be claimed

11.16 Boiler Room

The existing boiler room and pump set occupies an area at lower ground adjacent to the lightwell atrium and a further boiler room in the plant area below the condensers which serves Jockeys field

Strip out and remove boilers, pumps and other equipment to allow this to be used as comms room. Provide new pumps and divert water as necessary to serve the water systems to tea points / kitchens .

VRF used for heating and electric point of use will be used for domestic hot water. Transient spaces will be heated with radiators

11.17 Building Management System and Controls.

A full BMS system is not recommended for this building, and some existing pumps will continue to be used without BMS

Provide the VRF system with a single centralised touch screen controller serving both buildings. This will also allow the clients facilities team to interrogate and change set points etc.

The VRF system will use standalone controllers for the fan coils to allow local temperature set points and fan speeds to be selected. Note that controllers in Bedford Row will need to be located so as to no impact the walls or cause issues with English Heritage.

Centralised Controller System

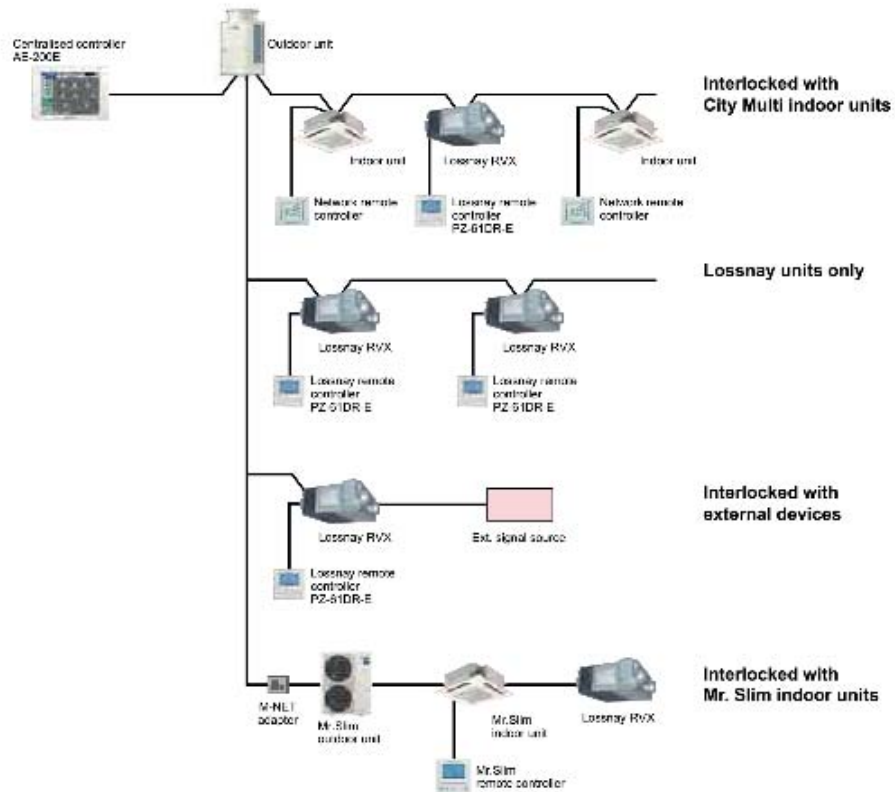


Figure 34 Many kinds of VRF devices can be networked to central controller

provide individual unit or zone control, integral 7-day timer with up to 10 operational schedule settings and energy saving control using the Intelligent Touch Screen Controller. The controller will provide fault indication as well as a fault history

Interface the VRF and ventilation plant will be with the fire alarm system to switch off plant in the event of a fire signal.

12.0 PUBLIC HEALTH

12.1 Boosted Cold water

The existing system uses a large cold water tank in the vaults of Bedford Row and local pump set. The pipework routes within the building and pipework sizes are unknown. Survey the existing system and provide a detailed drawing in CAD format showing pipe sizes and valves . pumps

Provide new double check valves to suit at dishwashers.

Adapt the existing cold water services, keeping the main vertical distribution where practicable. Strip out and remove the hot water systems, riser, boilers and replace with point of use electrical water heaters.

The existing cold water tank is over sized - office buildings generally do not have such large water tanks anymore because the water supplies are reliable and storing water in a tank for many days resulted in reduced water quality. However, to reduce costs it is not proposed to replace the existing tank or booster set

A high quality plastic piping system is recommended to reduce installation cost and speed construction. This would still be pressure tested and meet all requisite specifications.

All hot and cold water services installed will be chlorinated upon completion

No solenoid valves or leak detection system are to be provided. The water supplies to each floor will not be separately metered

The contractor shall ensure water services at tea points have double check valves drain cock, isolator and pressure regulator. Provide power and ventilation for water heaters as required.

A water meter is not to be provided for each floor



Figure 35 Existing pumps at Bedford row to be retained

Services and repair the existing water pumps and insulation. Provide a new schematic showing the full system. Provide a full chlorination at the end of the works.

Locations of existing water risers are unknown as are the schematic arrangements of water pumps, expansion vessels pressure reduction valves etc. Because these are hidden they will are not shown on the initial design concept drawings for tender – but because the general principle is to adapt locally this should not present an issue. The contractor is to take care when stripping out the existing plant rooms to not interup services where Bedford Row is still occupied.

12.2 Drainage

As with the cold water system, the drainage arrangements are not changing significantly, only local adaption will be provided and small runs back to the existing stack from new showers, tea point etc.

The location of the existing stacks below ground drainage and outfall locations are not known at this time, however manholes are visible outside the vaults, in the boiler room and plant room at LG.

Any new below ground drainage design will be designed by a qualified structural engineer – it is not clear if any modifications to the below ground drainage are required yet – subject to detailed survey information and the final arrangement of showers at LG. The final layouts by the contractor will need to respond to the setting out of existing drainage to minimise below ground drainage and pumped drainage.

Pumps are to be avoided but any required should be high quality dual pumps with alarm and linked to solenoid valve and leak detection as per drain major range for tea point. The LG showers will require dedicated pumps, noting that there is a disabled shower and adequate fall into a conventional pump will be difficult to achieve so a suction pump is anticipated, and a flow matching pump is required to avoid suction noise. The “instant match” system by Whale pumps is anticipated to be suitable. Saniflo pumps are not considered to be suitable and should be avoided.

12.2.1 Foul drainage system

Complete the design and provide a system of foul water drainage including condensate drainage to the following Standards: To BS EN 12056-1, BS EN 12056-2, relevant parts of BS EN 12056-4, BS EN 12056-5 and in accordance with BS EN 12056-2

SANITARY FIXTURE	Minimum Diameter of trap
Washbasin	32mm
Sink	40mm
Shower Tray	40mm
Bath	40mm

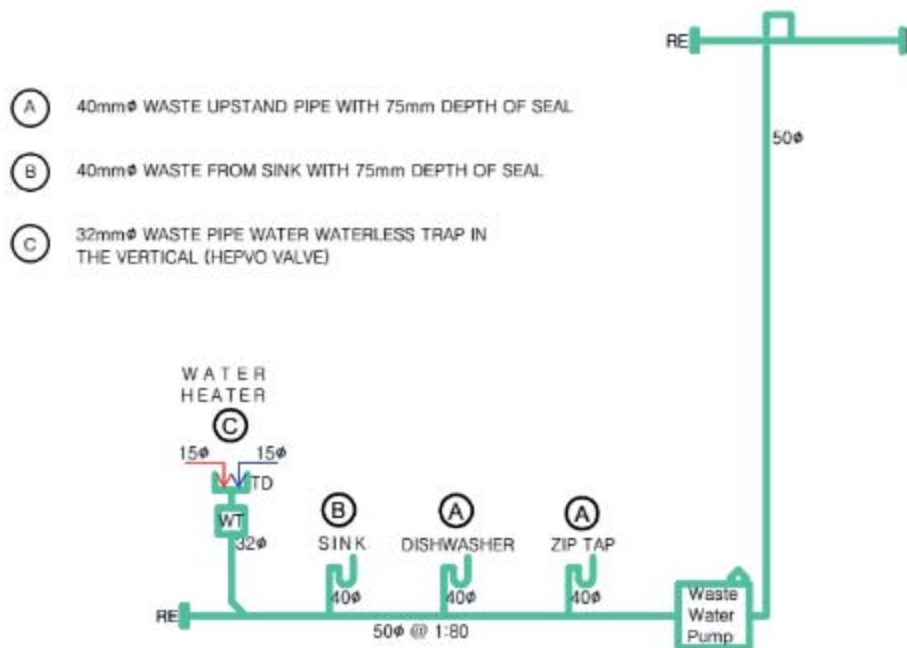


Figure 36 Notional drainage at tea point

12.3 Hot water

The existing boilers will no longer serve heating and are in poor condition.

Within Bedford Row there is a single WC on each floor and a tea point at ground floor so circulating hot water via pumps or providing heat maintenance tape would seem to be unnecessary.

Provide 3KW electric point of use water heaters for each tea point and toilet under sink. At Jockeys' Field will also exclusively use electric water heating and electric showers but at LG re-heat kitchen, the capacity of the heater should be at least 50 litres and will be located in ceiling void to preserve space in kitchen cupboards. At Jockeys' Field where there is more than one toilet on the same floor a single point of use electric water heater 15L can serve up to three wash hand basins

The contractor will note the phase of the works when stripping out hot water systems etc to form the comms room in phase 1 and provide electric point of use heaters / showers to keep Bedford row running.

Generally, all taps are to have mixer valves to prevent scolding and be suitable for local point of use – vented type. Provide samples of suitable taps for the electric water heaters and liaise with architect to agree finishes

The two showers at lower ground floor Jockeys' Field will be high quality electric 10kW, recessed and suitable for DDA

All hot and cold water services installed, and re-used existing will be chlorinated by the contractor upon completion

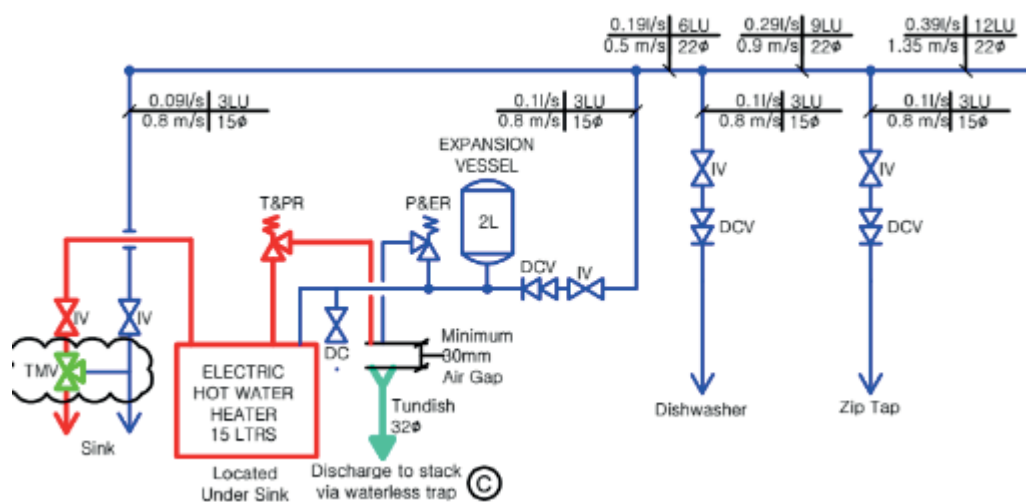


Figure 37 Typical tea point water systems to be developed by contractor

12.4 Toilets

Generally, drainage of toilets will be by gravity using existing soil stacks except at LG where a cost analysis and options will be presented to the client. Saniflow pumps will not be permitted and high quality resilient dual pumps with alarms will be provided if any pumps are located above ground.

Quality plastic pipework is proposed to save costs vs cast iron. New drainage pipework should be acoustic grade

Point of use electric heaters will provide hot water.

No solenoid valves or leak detection system are to be provided

Hot water storage temperature 60°C

HWS Basin Outlet Temperature- 43°C (TMV2 mixing valves and TMV3 for DDA areas)

Hot water storage - Electric calorifier

13.0 LIFE SAFETY SYSTEMS

Engage a fire engineer as required to develop the fire strategy and provide a report which can be used in future to define document. The following life safety systems are estimated to be required

- Emergency lighting
- Fire detection and alarm system category L1
- Disabled refuge communication systems
- Interface unit linked to lifts and platform lifts
- Flashing beacons in toilets and showers

The following systems are not anticipated to be required ;

- Sprinklers
- Automatic opening vents
- Firefighting lifts
- Staircase pressurisation systems
- Dry risers
- Basement smoke extract systems

13.1 Disabled refuge system

The contractor will provide a disabled refuge system complying with BS5839-9 2008 or more recent update. The panel is to be located at the fireman's entrance adjacent existing fire alarm panel

All wiring is to be enhanced type fire proof cable

13.1.1 Outstations

At each refuge the contractor will provide a Type B outstation as defined in BS5839-9:2011 – for use by the public and disabled persons requiring assistance and mounted at between 900 and 1200 affl.

- stainless steel finish
- Induction loop output to feed an external amplifier
- Surface mountable (optional flush mount bezel available)
- Call is reset at the control console when the occupant of the refuge area has been safely evacuated
- Hands-free, speech steered, operation



REMOTE UNITS - IN REFUGE AREAS:

Typically disabled refuge remotes:

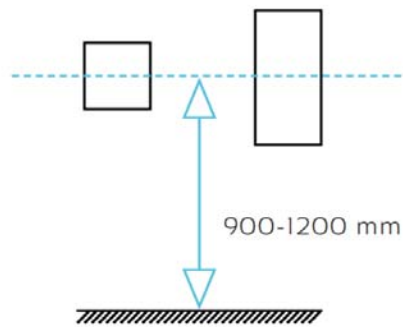


Figure 38 Type B refuge unit in stainless steel

13.1.2 Disabled refuge main panel

At the entrance provide a panel to communicate with the disabled refuges

Refer to architects' details and provide the optional flush mounted bezel to recess this into local wall finishes as far as practicable.

Provide the option link to fire detection system to prevent hoax disabled refuge calls (C2CFPE required)

Include disabled toilet alarm monitoring on this panel to reduce the number of panels in reception

Comply with BS5839-9:2011 for mounting heights by locating the centre point of the control console at 1400-1500mm from floor level.

CONTROL PANEL:

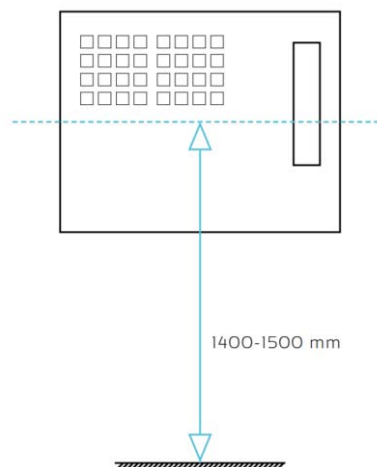


Figure 39 Main panel should be stainless steel version

13.2 Cabling

The system shown uses 2 core enhanced cabling radial circuits from the main panel, however options using loop wiring and 4 core enhanced cabling are acceptable.

Any cabling exposed shall be within rigid metal conduit to afford further mechanical protection in excess of any mandatory requirements.

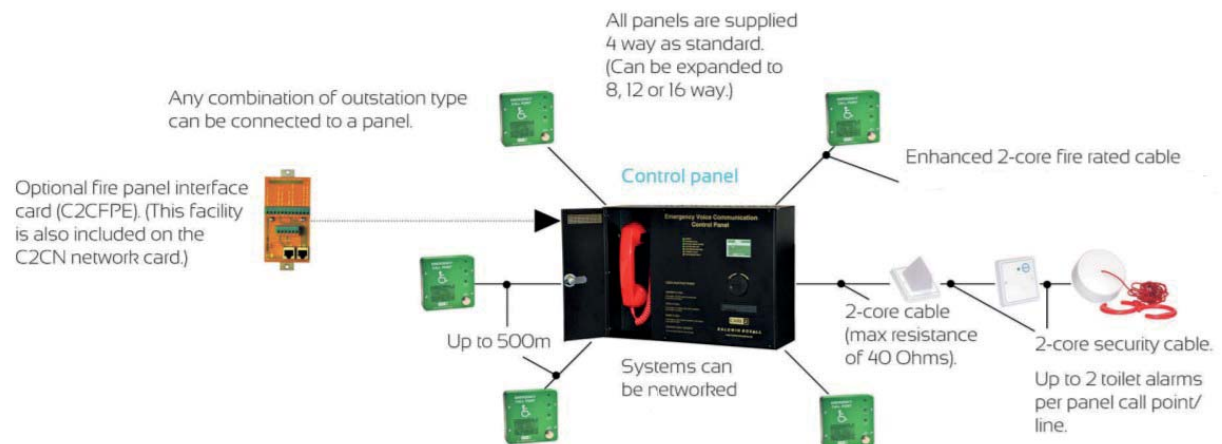


Figure 40 Schematic of EVC system

13.3 Fire stopping and Fire dampers

Refer to the architect's fire strategy drawings to show line defining fire rating of walls. Provide fire dampers to ducts passing through these lines regardless of whether they are shown on the initial design concept services drawings.

There are no details of the existing ductwork routes so the contractor will undertake a detailed survey to ascertain which ductwork can be re-used and at this time when duct locations are known, the location, size and quantity of fire dampers can be accurately determined.

14.0 VALIDATION & TESTING AT END OF CONTRACT

Submit drawings and O&M information prior to practical completion for comment

Prepare snag sheets throughout the project with room reference and actively close out snag items raised. Populate with snags prior to offering to client team for snagging. Keep and organised snagging system ready for sign off for each item when client team is satisfied. Do not close up ceilings without offering to client team for approval. Approval will require a contractor team snag sheet to have been signed off for mechanical and electrical contractors.

Provide the client team with details of the proposed commissioning programme and witnessing of the VRF and air systems

14.1 Operation and maintenance manual checklist

Print and keep a copy this checklist with completed dates, status and signature. Provide a copy for the handover process for PC

Item	Requirement	Date submitted	Status	Signature
A	Operation and maintenance manual			
1	Submit drawings and O&M information prior to practical completion for comment			
2	Electrical test certificate			
3	Distribution board Charts			
4	Fire alarm test certificate			
5	Emergency lighting test certificate			
6	Commissioning data			
7	As built drawings in CAD format			
8	O&M other general items			
9	Chlorination for each water system			
10	Amtech based calculation pack			
11	Fire strategy document.			

14.2 Site validations checklist

Print and keep a copy this checklist with completed dates, status and signature. Provide a copy for the handover process for PC

Item	Requirement	Date submitted	Status	Signature
B	Site items			
1	Prepare snag sheets for each room and actively close out snag items raised. Populate with snags prior to offering to client team for snagging. Keep and organised snagging system ready for sign off for each item when client team is satisfied.			
2	Are electric radiator and kick space heaters operating correctly and boilers on at appropriate times.			
3	Lighting louvers/reflectors are to be clear of visible finger prints and dust			
4	Demonstrate programmable logic control functions for every permutation of any sliding folding wall – including for lighting and HVAC (no sliding walls at tender stage)			
5	Demonstrate AV screen operations			
6	Demonstrate control system for fan coils relating to sliding folding wall permutations			
7	Demonstrate fan coil control system and alarms including set point adjustment			
8	Test and demonstrate Acoustic level for AHU fire alarm sounders and record on drawing and submit this to employers' agent			
9	Test and demonstrate noise levels for fan coils and air conditioning systems and record on drawing and submit this to employers' agent			
10	Test emergency lighting duration during hours of darkness and take lighting levels at end of 3-hour test. Submit drawing showing measured values of emergency lighting to employers' agent			
11	Check condensers and comb out minor damage to fins take photos and submit to employers' agent			
12	Test and measure time and report if taps at sinks in toilets and at tea point are getting hot water in appropriate time at a safe temperature report for each toilet. Report on legionella issues.			
13	Test that the fire alarm has no fault light indications and the cause and effect is documented			
14	Prepare documentation recording the witnessed commissioning data for air flow rates such fan coil or AHU, at toilets and from tea points			
15	Document in a report format and demonstrate Lighting control settings including dimming and settings for each space with sliding folding wall in each position			
16	Document and demonstrate the operation of leak detection systems			
17	Risers are swept out cleaned and photographed with a date stamp.			

Item	Requirement	Date submitted	Status	Signature
18	Demonstrate filters for equipment are clean for a sample of on floor fan coil units any new AHU			
19	Pump drainage unit operation (if any pumps are provided) and fault shut off of associated solenoid valve. Record noise level when pump running. Demonstrate access for maintenance			
20	Provide a table listing each fan coil with a tick box for the following <ul style="list-style-type: none"> ○ actuator drives correctly upon controls instruction ○ condensate drains with no drip ○ Controls functioning correctly when is cooling mode the off-coil temperatures are appropriate and same in heating mode. ○ Fan coil off coil temperature changes after change in set point by control ○ Is delta T of off coil more than 3 degrees C ○ Can filter be cleaned and accessed? ○ Is filter clean? ○ Is noise level satisfactory – NR 38 ○ Other - comment 			
21	Provide copies of testing equipment Calibration certificates			
22	VRF set to optimise and heat for winter morning and time schedule programmed in			

14.3 Comms room IST checklist

Print and keep a copy this checklist with completed dates, status and signature. Provide a copy for the handover process for PC

Item	Requirement	Date submitted	Status	Signature
C	As part of the IST;			
1	Test alarms from UPS when they are low on power / nearly depleted			
2	UPS load tests for comms room duration			