

*Bringing buildings to life*  
QVS1 Reading

MEP Strategies Report

WA0305-TBA-Q1-XX-RP-N-00001

15<sup>th</sup> July 2022

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QVS1 Reading

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# 1.0 Introduction

## Project description

The project consists of the redevelopment of 145-148 Friar Street Reading, in order, to provide a new hotel along with a series of retail units.

The development is required to achieve an EPC Rating of 'A' and a BREEAM accreditation of 'Very Good'.

The design philosophies detailed within this report have been done so on their ability to reduce and off-set the development's overall energy consumption and carbon emissions.

In line with the above, the development will utilise intelligent, passive designs (e.g., lower u-values, permeability rates etc.) to allow for the reduction of any unnecessary energy usages (e.g., lighting, power, heating etc.).

Renewable technologies have also been considered to further drive down carbon emissions.

## 1.1 Strategic overview

### 1.1.1 Mechanical and electrical (MEP) systems

In general, this document provides outline strategies for the following MEP systems:

#### Mechanical engineering

- + Energy metering
- + Low temperature hot water heating
- + Natural ventilation
- + Mechanical supply and extract ventilation
- + Comfort cooling
- + BEMS control

#### Public health services

- + Energy metering
- + Cold water distribution

- + Domestic hot water distribution
- + Foul water drainage (above ground only)

#### Fire protection services

- + Fire hydrants
- + Fire detection and alarms installation
- + Automatic sprinkler system

#### Electrical engineering

- + Energy metering
- + Low voltage distribution
- + General power installation
- + Earthing and bonding
- + Works associated with mechanical plant
- + General lighting
- + Emergency lighting
- + External lighting
- + Facilities for the disabled
- + Public address
- + Security systems
- + Lightning protection
- + Surge protection
- + Structured cabling

### 1.1.2 Plant locations

The new development will be provided with dedicated areas for plant.

In summary, a ground floor plant room will be provided to contain the primary domestic hot water and cold water storage together with its ancillary equipment. In addition, a basement switch room will house the building's main LV switch panel.

A separate ground floor ICT hub room will be provided with further, secondary, comms rooms positioned on the upper floors.

External plant consisting of air source heat pumps (ASHPs), condensers, air handling units (AHUs) and photovoltaic (PV) arrays will be located at roof level. Space for an external LV generator has also been allocated if required under the final design proposals.

A roof top switch room will be provided to serve the roof mounted equipment and to house a potential LV generator switch panel.

Distribution will primarily be routed through designated services zones, noting that these will predominantly consist of the main ceiling voids, and risers.

### 1.1.3 Technical basis of design

The MEP design criteria and general methodologies contained within this report give due regard to the current editions of the following regulations and design standards:

#### General standards

- + The Building Regulations (in particular Part L: Conservation of Fuel and Power)
- + BS 7671: IEE Wiring Regulations 18th Edition
- + The Water Supply (Water Fittings) Regulations 1999
- + Legionnaire's Disease – The control of legionella bacteria in water systems – Approved code of practice and guidance (L8)
- + Health and Safety at Work Act
- + The Construction Design and Management Regulations
- + F-Gas Regulations

#### CIBSE guides

- + SLL Code for Lighting
- + SSL Lighting Guide 5
- + SLL Lighting Guide 7
- + SLL Lighting Guide 11
- + SLL Lighting Guide 12
- + Guide B: Heating, Ventilating, Air Conditioning and Refrigeration
- + Guide B3: Ductwork
- + Guide B5: Noise and Vibration Control for HVCA
- + Guide B4 Refrigeration and Heat Rejection
- + Guide C: Reference data
- + Guide D: Transportation systems in buildings
- + Guide F: Energy efficiency in buildings
- + Guide G: Public health engineering
- + Guide J: Weather, solar and luminance data
- + Guide K: Electricity in Buildings
- + Guide L: Sustainability
- + Guide M: Maintenance Engineering and Management

- + TM13: Minimising the Risk of Legionnaires' Disease
- + TM39: Building Energy Metering
- + TM52: The Limits of Thermal Comfort: Avoiding Overheating in European Buildings
- + Commissioning Codes

#### HVCA guides

- + TR/20: Installation and Testing of Pipework Systems
- + TR/19: Guide to Good Practice - Internal Cleanliness of Ductwork
- + TR/36: Installation of Rainwater Harvesting in Non-Residential Buildings
- + TR/30: Good Practice Guide - Heat Pumps
- + TR/6: Guide to Good Practice for Site Pressure Testing of Pipework
- + DW144: Sheet Metal Ductwork
- + DW143: Ductwork Leakage Testing
- + DW145: Installation of Fire and Smoke Dampers
- + DW172: Specification For Kitchen Ventilation systems

### 1.1.4 General commissioning

A schedule of commissioning and testing will be prepared as the scheme develops through the RIBA Work Stages. The schedule will identify the appropriate standards for all commissioning activities, where applicable, these will be in accordance with:

- + Current Building Regulations
- + BSRIA guidelines
- + CIBSE guidelines
- + CIBSE Commissioning Codes
- + Other appropriate standards

An independent commissioning specialist will be appointed to monitor all pre-commissioning, commissioning and testing activities.

### 1.1.5 Seasonal commissioning

Seasonal commissioning will be completed over a 12-month period (minimum) once the building becomes substantially occupied.

## 2.0 Technical design criteria

In general, the following design criteria will be utilised in the development of the MEP systems with all loads being confirmed as the scheme progresses through the RIBA Work stages:

### Heating and cooling allowance:

| Location       | Heating (W/m <sup>2</sup> ) | Cooling (W/m <sup>2</sup> ) | Notes                      |
|----------------|-----------------------------|-----------------------------|----------------------------|
| Hotel room     | 55                          | 100                         | Room cooling peak of 1.7kW |
| Front of house | 75                          | 120                         | -                          |
| Retail         | 100                         | 120                         | -                          |

### Ventilation allowance:

| Location       | Ventilation rate (l/s/p) |
|----------------|--------------------------|
| Hotel room     | 10                       |
| Front of house | 8                        |
| Retail         | 8                        |

### Water storage:

| Location   | Allowance (l/bed) |
|------------|-------------------|
| Cold water | 200               |
| Hot water  | 45                |

### Occupancy:

- + Occupancy rates will be confirmed with as the scheme progresses through the RIBA Work Stages

### Operational hours:

- + Operational hours will be confirmed with as the scheme progresses through the RIBA Work Stages

### Illumination levels:

Average internal illumination levels will generally be in accordance with CIBSE Codes for Interior Lighting:

- + Office / meeting room: 500 lux / 0.6 uniformity (desk)
- + Kitchen: 500 lux / 0.6 uniformity (desk)
- + Toilet areas: 200 lux / 0.4 uniformity (floor)
- + Corridors and circulation: 100 lux / 0.4 uniformity (floor)
- + Stores: 100 lux / 0.4 uniformity (floor)
- + Plant rooms: 200 lux / 0.4 uniformity (floor)
- + ICT hub rooms: 400 lux / 0.6 uniformity (desk)
- + Guest Room: As defined with the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document
- + Average external illumination levels will generally be in accordance with CIBSE codes for exterior lighting:
  - + Roads: 10 lux (External)
  - + Walkways: 10 lux (External)
  - + Amenity areas: 10 lux (External)

### Emergency lighting:

- + Average illumination levels will generally be in accordance with BS 5266

### Fire systems:

- + System classification will be L1 in accordance with BS 5389: Part 1

**Internal noise criteria:**

| Location       | Noise rating (NR) |
|----------------|-------------------|
| Hotel room     | 35                |
| Front of house | 40                |

**External noise criteria:**

- + The impact of external noise will be confirmed as the scheme progresses through the RIBA Work Stages

**Fabric leakage (air-tightness):**

- + A best-practice air permeability of  $3\text{m}^3/\text{hr}/\text{m}^2$  at 50Pa will be targeted

**BREEAM:**

- + The work will align with the BREEAM pre-assessment as completed by the appointed BREEAM assessor

## 3.0 Incoming services

This section outlines the service connections required to serve the new development:

### 3.1 Water

A new metered water mains will be obtained from Thames Water. The new water main will be routed to the ground floor plant room to the main water storage tank.

In addition, a new (dedicated) un-metered fire main supply will be obtained to serve the new automatic sprinkler systems, if required.

Each retail unit shall be provided with individual metered water supplies obtained from Thames water. The new water mains shall enter the properties at the front of the units.

### 3.2 Gas

A new metered gas mains will be obtained from SGN to serve the main development. The new gas main will be routed to the ground floor plant room, fitted with a gas meter, and routed to serve the boilers.

### 3.2 Electricity

New incoming LV connection will be obtained from the Local Supply Company (Scottish & Southern Electricity (SSE)) HV / LV network.

To enable this a new SSE HV/LV substation will be located within the ground floor of the QVS2 development; noting that this new HV/LV substation will also supply the adjoining QVS2 development.

The new LV connection (400V / 230V, TPN, 50Hz) will be routed to the basement LV switch room. It is envisaged that the new supply will provide a maximum capacity of 373kVA. Noting that this figure is to be confirmed as the project progressed through the RIBA Work Stages.

Each retail unit shall be provided with individual metered LV connection obtained from SSE. The new LV connections mains shall enter the properties at the front of the units.

### 3.3 Communications

New incoming cabling ducts and draw pits will be provided to serve the development. The new ducts will be routed to a point of connection that will need to be agreed as the design progresses through the RIBA Work Stages.

The final responsibilities, and requirements, relating to the ordering and provision of a new incoming PSBA connections will also need to be agreed as the design progresses through the RIBA Work Stages.

### 3.4 Metering

Each incoming service will have a statutory meter with suitable outputs to enable remote reading. Sub-metering of the MEP services will be as detailed within the relevant sections of the report.

# 4.0 Mechanical engineering services

This section outlines the strategies for the mechanical designs that will be developed in conjunction with the design team, as the design brief develops through the RIBA Work Stages.

Noting that the strategies should be read in conjunction with the following:

- + Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document

## 4.1 Mechanical Services Overview

The mechanical services within the development will generally comprise of the following:

- + Space heating and cooling via ducted fan coil units located within ceiling voids and bulkheads. Primary heating and cooling will be provided by roof mounted VRF condenser units.
- + Mechanical ventilation to each bedroom will be afforded by local Mechanical vent heat recovery (MVHR) units located within the lobby bulkhead.
- + Hot water generation via ASHPs with gas boiler top up.

Note any information provided on equipment performance / sizing / location is indicative only and preliminary / final selections will be provided at the next stage of design.

## 4.2 Heating / Cooling

Heating / cooling will be provided via roof mounted VRF / air source heat pumps (ASHPs).

Heating and cooling to each guest room, all public areas, food prep area and offices will be provided by fan coils units located within bulkheads and ceiling voids.

The cooling systems will be capable of maintaining an internal temperature of 22°C at the design external ambient temperature within the guest rooms and all public areas.

Comfort cooling will be provided within the ICT hub rooms and will consist of wall mounted cassettes connected to the external condenser units via refrigerant pipework.

Refrigerant pipework will generally run within ceiling voids and risers.

Condensate from the internal cassette units will run via gravity drainage system where possible to the local above ground drainage system via waterless, self-sealing, waste valves.

All other areas will be provided with electric panel heaters where required to maintain the required internal temperatures.

All systems will be connected to the BMS via suitable interface units and remotely monitored.

Each retail unit will be provided via a communal VRF system, the landlord shall operate and manage the system billing the tenants for usage, compatible internal fan coil units will then be connected to the communal system as part of the tenant fit out.

## 4.3 Ventilation

Ventilation will be provided within all enclosed spaces, such as corridors, guest bathrooms, food prep area, internal rooms, back of house areas.

The ventilation will be provided generally via local MVHR units with ductwork running horizontally to external wall louvres.

Each guest room on the western side of the building will be provided with an individual MVHR unit located within the entrance bulkhead and operate at trickle via the master card switch and boost via the bathroom light switch.

Each guest room on the eastern side of the building will be served by a centralised ventilation system, consisting of an air handling unit at roof level and supply / extract grilles in each room as required.

Each retail unit will be provided with dedicated intake and exhaust louvres integrated into the façade / signage on courtyard side, retail units 2 and 3 will require louvres integrated into the shop front signage as they are not directly connected to the courtyard area. Kitchen areas will be served by dedicated

supply and extract ventilation units located at roof level. If the kitchens are provided with gas appliances then interlocks will be provided. The ventilation plant and associated ductwork will form part of the tenant fit out.

fourth floor plantroom used as an energy centre for connection into the district heating network.

## 4.4 Building energy management system

The heating, cooling, ventilation and electrical systems will be provided with dedicated controls with each system being monitored by a central BMS.

## 4.5 Energy metering

Energy metering will be afforded in accordance with Approved Document Part L and the general principles of CIBSE Document TM39.

Each meter will be of the digital type.

The automated metering / monitoring system will form part of the development's BEMS.

## 4.6 Fire fighting

### 4.6.1 Fire hydrants

Existing fire hydrants will serve the new development. It is currently anticipated that no new hydrants are required.

### 4.6.1 Sprinklers

A fully compliant automatic fire sprinkler system will be provided to the development.

The system will be designed, supplied, installed and commissioned by a Level 4 LPS approved sprinkler company in accordance with BS EN 12845 and the relevant LPC Technical Bulletins.

## 4.2 Future District Heating Network

The development is located within the 'Station Hill and Around' clusters that will make up the core Reading Borough Council district heating network as indicated with the Reading Council SPD.

It may be a requirement that the site is connected to a district heating network in the future as the proposed plant nears the end of its life expectancy. In this event it is proposed that the boilers within the roof plantroom will be removed (together with the roof mounted ASHPs) and the

## 5.0 Electrical engineering services

This section outlines the strategies for the electrical designs that will be developed in conjunction with the design team, as the design brief develops through the RIBA Work Stages.

Noting that the strategies should be read in conjunction with the following:

- + Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document

### 5.1 LV distribution

A new low voltage (LV) distribution network will be provided across the new development to meet with the full requirements of BS 7671. The system will be reflective of the overall loading requirements.

The overall LV distribution system will provide 25% spare capacity.

#### 5.1.1 LV panel board

A new LV panel board will be provided to serve the development. The LV panel board will be located within the ground floor LV switch room. The LV panel board will be served via a dedicated SSE connection cut-out and metering arrangement.

Additional LV panel boards will be provided within the risers on each floor and on the roof as required.

All outgoing ways will be afforded protection via suitably rated MCCBs. All MCCBs will be of the adjustable electronic type unless otherwise required by loading characteristics.

Metering will be afforded to the LV switch board in accordance with Approved Document Part L2 and the general principles of CIBSE Document TM39.

#### 5.1.2 Sub-main distribution – LV cables

All distribution cabling will comply with the requirements of BS 7671.

All LV sub-main cabling will be of the copper cored XLPE/SWA/LSOH type, obtained from a BASEC licensed supplier.

All LV sub-main cabling will have a separate CPC.

All sub-main cabling will be run via the main distribution routes, terminating at isolators and distribution boards, etc.

All internal, and above ground external, sub-main cabling will be supported by steel (heavy-duty) cable trays.

All primary containment will be provided with 25% spare capacity.

#### 5.1.3 Distribution boards and circuit protection

Standard and split (dual metered) distribution boards will be provided across the development. Distribution boards will be located in positions that ensure full accessibility in terms of maintenance and operation.

Metering will be afforded to distribution boards in accordance with Approved Document Part L2 and the general principles of CIBSE Document TM39.

All outgoing ways will be afforded protection via suitably rated RCBOs unless the equipment served specifically requires an MCB.

### 5.2 Earthing and bonding

Earthing and bonding will be provided throughout the development in accordance with BS 7671 and BS 7430.

### 5.3 Life safety LV supplies

The provision of life safety supplies is to be confirmed as the scheme develops through the RIBA Work Stages.

These supplies will either be obtained from a secondary Local Supply Company (Scottish & Southern Electricity (SSE)) HV / LV network utility connection or a dedicated LV generator.

If required a new LV generator will be located on the roof. A new life safety LV panel board will also be provided within a roof mounted, LV switch room.

Life safety supplies will be provided to the sprinklers, evacuation lift and other life safety equipment as required by the relevant standards.

All LV sub-main cabling to life safety systems will be of the Prysmian FP600s enhanced type, obtained from a BASEC licensed supplier.

All sub-main cabling will be run via the main distribution routes, terminating at isolators and distribution boards, etc.

All internal, and above ground external, sub-main cabling will be supported by steel (heavy-duty) cable trays.

All primary containment will be provided with 25% spare capacity.

## 5.4 Uninterruptable power supplies

Uninterruptible power supply (UPS) unit will be provided to meet the requirements of Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document.

## 5.5 Energy metering

Energy metering will be afforded in accordance with Approved Document Part L and the general principles of CIBSE Document TM39.

Each meter will be of the digital type capable of collating the following information as a minimum:

- + Current per phase (A)
- + Total current (A)
- + Voltage phase / neutral (V)
- + Voltage phase / phase (V)
- + Instantaneous power (kW)
- + Accumulative power (kWh)
- + Maximum power (kW)
- + Maximum demand (kVA)
- + Power factor

The automated metering / monitoring system will form part of the development's BEMS.

## 5.6 General power

General power will be provided to meet the operational needs of the development.

The system will meet with the full requirements of BS 7671. The final positioning and quantities of outlets will be agreed as the design develops through the RIBA Work Stages.

All system equipment and accessories will be flush mounted. This said, in areas where fair-faced concrete / block / brick is detailed the final installation method will be agreed with the Architect prior to commencing the works.

### 5.6.1 Final circuitry

All system circuitry will generally fall into one of the following categories:

- + **Internal (general)** – System circuitry will consist of LSOH/LSOH single core cables contained within steel cable trunking and galvanized steel conduits.
- + **Internal (Apartments)** - system circuitry will consist of LSZH Insulated multi-cored copper cables (twin and earth) contained within earthed metallic conduit where runs are in metallic stud partitions.
- + **External** – System circuitry will consist of Cu/XLPE/LSOH/SWA/LSOH cabling ducted in ground or buried directly.
- + **Fire rated services** – System circuitry will consist of Prysmian FP Plus enhanced or FP600s enhanced cabling supported by galvanised steel (heavy duty) cable trays.

All cabling will be obtained from a BASEC licensed supplier.

All final circuitry will be phased to avoid, as far as possible, the risk of crossed phases.

### 5.6.2 Containment

Containment will be provided as necessary to complete the installation.

All containment will afford 25% spare capacity.

### 5.6.3 Guest room power supplies

Guest room power supplies will be connected via a local card operated energy saver. The energy saver within each guest room will isolate the following:

- + Small Power
- + Lighting

Noting that the ventilation system, fridge, washing machine, dishwasher & labelled 24hr double switched 13A socket adjacent to bed will not be controlled via the energy saver

#### 5.6.4 ICT distribution requirements

Power supplies to communication cabinets will be via the provision of switched commando sockets served via dedicated distribution boards.

#### 5.6.5 Works associated with mechanical plant

All major plant and motor control centres will be supplied directly from the LV panel board.

All mechanical equipment not serviced by the motor control centres i.e., local ventilation / extract fans, natural ventilation louvres, water boilers, water fountains etc. will be served via the local distribution boards.

#### 5.6.6 Final accessories

All equipment and accessories will be selected to provide suitable ingress protection (IP) to suit the environment in which they will be installed.

All equipment and accessories will be provided in full accordance with the Disability Discrimination Act and Approved Document Part M.

### 5.7 General lighting

General lighting will be provided to meet the operational needs of the development. The lighting installation will be provided in compliance with the following:

- + Approved Document Part L2
- + British Standards including BS EN 12464-1 and BS 7671
- + CIBSE / SLL: Lighting Guides (In particular, LG3, LG5, LG7 and LG12)
- + Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document

#### 5.7.1 Luminaire types

The scheme will be designed to complement the architectural and interior design philosophies

Whist meeting with the above all proposed luminaires will be evaluated to ensure they meet with the functional performance requirements of the areas in which they are to be installed.

#### 5.7.2 Final circuitry

All system circuitry will generally fall into one of the following categories:

- + **Internal (general)** – System circuitry will consist of LSOH/LSOH single core cables contained within steel cable trunking and galvanized steel conduits.
- + **External** – System circuitry will consist of Cu/XLPE/LSOH/SWA/LSOH cabling ducted in ground or buried directly.
- + **Fire rated services** – System circuitry will consist of Prysmian FP Plus enhanced or FP600s enhanced cabling supported by galvanised steel (heavy duty) cable trays.

All cabling will be obtained from a BASEC licensed supplier.

All final circuitry will be phased to avoid, as far as possible, the risk of crossed phases.

#### 5.7.3 Containment

Containment will be provided as necessary to complete the installation.

All containment will afford 25% spare capacity.

#### 5.7.4 Specific wiring / connections requirements

All luminaires will either be connected by means of 'Plug-in' type ceiling roses, lighting control modules (LCMs) or the manufacturers recommended form of connection.

All luminaires will be provided with means of local isolation.

#### 5.7.5 Switching strategy

A lighting system will be provided to serve the lighting installation, as such, all luminaires will be compatible with the lighting controllers.

The control system and its components will provide a programming and operating facility to enable both the manual and / or automatic operation of the lighting installation.

The system will enable the provision of scene setting to the coworking, communal dining, reception and restaurant areas. The scene setting system will utilise MODE Lighting Limited Tiger 18 channel dimming control system with 12 no. dimming circuits and 6 no. switched circuits, or equal and approved.

Presence detection will be required in areas for energy conservation in common and back of house areas. An indication of the areas with presence control, but not limited to, is listed below:

- + Main circulation corridors. 50% presence controlled and 50% manually switched.

- + Toilet and welfare areas (Guest and back of house)
- + Common Areas

Guest room lighting will also be connected via a local card operated energy saver and manual switching.

## 5.8 External lighting

External lighting will be provided to meet the operational needs of the development. The emergency lighting installation will be provided in compliance with the following:

- + Approved Document Part L2
- + British Standards including BS EN 12464-2, BS EN 13201, BS 5489-1 and BS 7671
- + CIBSE / SLL: Lighting Guides (In particular LG5 and LG6)
- + CIBSE / SLL: Codes for Exterior Lighting
- + Secure by Design requirements

The external lighting scheme will be controlled via time-switch and photocell arrangements with presence detection.

The control system will also be provided with a dedicated override switches.

## 5.9 Emergency lighting

Emergency lighting will be provided across the development in compliance with the following:

- + Approved Document Part L2
- + British Standards including BS EN 12464-1, BS 7671 and BS 5266-1
- + CIBSE / SLL: Lighting Guides (In particular, LG3, LG5, LG7 and LG12)
- + The requirements of the Local Building Control Officer (BCO)

### 5.9.1 Emergency lighting – Automatic testing

All emergency lighting provided across the development will be tested via manual key switches, generally located locally to the distribution boards.

## 5.10 Structured ICT cabling

A CAT 6 structured cabling systems for the distribution of voice, data, video and other services will be provided across the development.

The new structured cabling and IT network provisions will be provided in accordance with the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document..

The installations will also be in accordance with the following standards and codes of practice:

- + EN50173-1
- + EN50173-2
- + EN50174-1
- + EN50174-2
- + EN50174-3
- + BS 7671
- + BS 6701
- + BICSI Telecommunications Distribution Methods Manual 13th Edition
- + FIA Code of Practice for the Installation of Fibre Cables

## 5.11 Telephony

Telephony provisions will be provided in accordance with the requirements defined within the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document. Distribution being across the structured cabling system.

### 5.11.1 Auto dialler connection

A telephone connection will be provided to serve an auto dialler that will connect to the fire detection and alarm and security and detection alarm systems - Refer to sections 5.15.6 and 5.18.7 of this report.

## 5.12 TV and media transmission

Digital TV and media will be delivered across the development in accordance with the requirements defined within the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document.

## 5.13 Clock In/Time Attendance

A biometric clock-in/time attendance completes with RFID and fingerprint sensor, ethernet and Wi-Fi connection, a minimum of 50 RFID proximity key fobs and all required back up software for the system.

## 5.14 Public address

A zoned public address system will be provided to serve the development to meet the requirements defined within the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document.

The system will generally afford coverage across the public areas.

The new public address system will be zoned to enable messages, or music, to be relayed as a whole or in part. The final requirements for zoning will be agreed as the design brief develops through the RIBA Work Stages.

## 5.15 Security detection and alarm system

The development will be provided with a security detection and alarm system, consisting of the following.

- + Door monitoring to all non-essential escape doors
- + Panic alarms to reception.
- + Detection to be provided to areas on the ground floor with openable windows
- + 2no remote mobile panic button for use in patrolling the building
- + Full-time connection to 24/7 manned monitoring centre for emergency response

The system will be compliant with the requirements of SSAIB, PD6662, DD243 (EN50131) and NSI Codes of Practice.

## 5.16 Access control

Access control provisions will be provided in accordance with the requirements defined within the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document.

The system will generally afford coverage across the following areas:

- + All guest bedroom doors
- + All access to guest corridors from fire escapes
- + Guest lifts (guest only have access to their floor)
- + All external doors
- + All service doors
- + All office doors

- + All storage areas
- + All staff areas to include changing rooms and canteen
- + All car park entrance and exits
- + Note the main guest entrance must have ability to be always locked. Manual release to be located at reception desk.

A dedicated PC, including software and encoder, will be provided for the monitoring, control and re-programming of the system.

The system will be operated via intelligent SMART cards capable of being programmed via the dedicated PC.

### 5.16.1 Video intercom systems

Video intercom system will be provided to allow 2-way communication and remote door release between the following:

- + main entrance doors and main service door to the front reception desk
- + Reception and the back of house external receiving door
- +

## 5.17 CCTV

CCTV provisions will be provided in accordance with the requirements defined within the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document.

The system will generally afford coverage across the following areas:

- + External:
  - Building perimeter
  - Main entrances/ exits
- + Internal:
  - Main circulation corridors (Guest and back of house)
  - Main reception/foyer
  - Lift cars
  - Lift Lobby Areas to each floor
  - Access to back of house stair cores
  - Access to laundry room and guest laundry room
  - Access exit routes to back of house
  - Areas of high-risk

The CCTV system will be IP based and will utilise the structured cabling system.

Dedicated control, monitoring and recording equipment (network video recorders (NVRs)) will be provided within the ICT HUB room.

The system will be compliant with the requirements of the National Security Inspection (NSI) Code of Practice NCP104 and BS 50132-7.

## 5.18 Fire detection and alarm

The new development will be provided with a new fire detection and alarm system in compliance with the following:

- + Disability Discrimination Act (DDA)
- + Approved Document Part M
- + British Standards including BS 5839, BS EN 54 and BS 7671
- + The requirements of the Local Building Control Officer (BCO)

The fire detection and alarm system will be provided in accordance with L1 standards, subject to BCO confirmation, as defined within BS 5839. The system will also be LPS 1014 accredited.

The installation will take the form of a full analogue addressable 'monitored' open protocol system

The system will be provided with 24-hour integral battery backup. The batteries will be capable of maintaining the standby load for a minimum of 24hrs, and the alarm load for 30mins.

The system will comprise of automatic detectors, electronic sounders, flashing beacons, manual call points, fire alarm interface units and vibrating pillows in accessible bedrooms.

## 5.19 Facilities for the disabled

The following facilities for the disabled will be provided in a full accordance with the following:

- + Disability Discrimination Act (DDA)
- + Approved Document Part M of the Building Regulations
- + Local Building Control Officer (BCO)

### 5.19.1 Audio frequency induction loop systems (AFILSs)

AFILS provisions will be provided across development in accordance with the requirements defined within the Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document.

### 5.19.2 Refuge alarms

Refuge alarms will be provided across the development.

A central control panel will be provided at the main entrance to enable two-way communications to the local points of call.

### 5.19.3 Assistance alarms

Assistance alarms will be provided across the development.

A remote audible / visual alarm panel will be provided in the reception area to duplicate the local points of call.

## 5.20 Lightning protection

A lightning protection system in accordance with BS EN 62305-3 will be provided to development.

The installation will meet with a defined 'Level of Protection' as ascertained through the completion of a risk assessment.

The lightning protection system will generally comprise of the following:

- + An air termination network generally consisting of flat PVC covered copper tapes.
- + Down conductors generally consisting of flat PVC covered copper tapes
- + Earthing provided by the provision of test chambers and earthing electrode arrangements

## 5.21 Surge protection

Electronic Surge Protection will be provided to the incoming supply at the LV panel board, external equipment and external services as required by the lightning protection risk assessment.

## 5.22 Photovoltaic

A monocrystalline photovoltaic (PV) system will be provided across the development to achieve compliance with Regulated Carbon Dioxide Emissions, as defined under Approved Document Part L2.

In addition, the system will be provided to ensure an Energy Performance Certificate (EPC) Rating of A.

The system will be MCS compliant and be manufactured to a suitable standard to meet the warranty and performance required of a UK MCS compliant solar generating system.

The system will be provided with a guaranteed performance of 90% after 10 years and 85% after 25 years. The life expectancy of the system will be 30 years for which a guarantee will also be given. The completed system will be covered by a 12-months installation warranty.

The overall installation will comply with all relevant British Standards, Building Regulations and Industry Standards. In particular, the system will be provided, tested and commissioned in compliance with:

- + BS EN 61194
- + BS EN 6121
- + BS EN 61730

# 6.0 Public health engineering

This section outlines the strategies for the public health designs that will be developed in conjunction with the design team, as the design brief develops through the RIBA Work Stages.

Noting that the strategies should be read in conjunction with the following:

- + Leonardo Master Apartments – Fattal Hotel Group Serviced Apartments Building Services Tenant Requirements Document

## 6.1 Domestic water services

### 6.1.1 Domestic cold water services

The development will be provided with a mains water supply that will be provided with a meter, with a pulsed output, for automated monitoring.

A potable cold water storage tank and booster pump set will be installed in the cold water plant room within the basement and shall be distributed to serve all outlets within the development.

The retail units will be supplied direct from the Thames Water network with individual meters and shall terminate within each retail space at low level with a suitable isolation valve for tenant fit out.

Water softeners / treatment will be provided to suit the hard water zone.

Water will be maintained as potable quality throughout. Distribution will be via the provision of copper insulated pipework routed within the main ceiling voids and risers.

To meet the initial BREEAM requirements the cold water system will be provided with the following and will be confirmed during the later stages of the detailed design:

- + Sub metering of all major water consuming activities
- + Major leak detection system
- + Water shut off valves to WC areas

### 6.1.2 Domestic hot water services

Hot water will be produced centrally via ASHP with gas top up. The system will be designed such that the ASHP will provide the majority of the hot water generation – refer to the energy statement for further details.

The domestic hot water will be distributed via a flow and return system. The method of hot water generation will be subject to a detailed analysis as the scheme progresses through the RIBA Work Stages.

The system will include pumped secondary circuits capable of maintaining a minimum return water temperature of 50°C and attaining the same temperature from every outlet within 1 minute of operation.

## 6.2 Energy metering

Energy metering will be afforded in accordance with Approved Document Part L and the general principles of CIBSE Document TM39.

Each meter will be of the digital type.

The automated metering / monitoring system will form part of the development's BEMS.

## 6.3 Foul above ground drainage

An above ground drainage system will be afforded across the development. The system will be of the fully ventilated soil and waste type and will serve all items of sanitary equipment.

The above ground foul drainage system will meet the performance objectives stated in BS EN 12056.

Stacks will be arranged so they to connect into vertical risers that will drop through the buildings to ground level. From where gravity outfalls to the local sewers or underground drainage system will be made.

For areas over 3 storeys stub stacks will be provided to serve the ground floor.

## 7.0 Items not Covered in the Report

- + Lift design
- + Below ground drainage
- + Rainwater drainage
- + Acoustic design

# Appendix A – Schedule of Drawings

| <b>Mechanical Engineering</b>                     |                              |
|---------------------------------------------------|------------------------------|
| <b>Drawing Name</b>                               | <b>Drawing Number</b>        |
| Basement Level - Mechanical Services Distribution | WA0305-TBA-Q1-B1-DR-M-500001 |
| Ground Floor - Mechanical Services Distribution   | WA0305-TBA-Q1-00-DR-M-500001 |
| First Floor - Mechanical Services Distribution    | WA0305-TBA-Q1-01-DR-M-500001 |
| Second Floor - Mechanical Services Distribution   | WA0305-TBA-Q1-02-DR-M-500001 |
| Third Floor - Mechanical Services Distribution    | WA0305-TBA-Q1-03-DR-M-500001 |
| Fourth Floor - Mechanical Services Distribution   | WA0305-TBA-Q1-04-DR-M-500001 |
| Roof Level - Mechanical Services Distribution     | WA0305-TBA-Q1-RF-DR-M-500001 |

| <b>Electrical Engineering</b>                     |                              |
|---------------------------------------------------|------------------------------|
| <b>Drawing Name</b>                               | <b>Drawing Number</b>        |
| Basement Level - Electrical Services Distribution | WA0305-TBA-Q1-B1-DR-E-600001 |
| Ground Floor - Electrical Services Distribution   | WA0305-TBA-Q1-00-DR-E-600001 |
| First Floor - Electrical Services Distribution    | WA0305-TBA-Q1-01-DR-E-600001 |
| Second Floor - Electrical Services Distribution   | WA0305-TBA-Q1-02-DR-E-600001 |
| Third Floor - Electrical Services Distribution    | WA0305-TBA-Q1-03-DR-E-600001 |

|                                                 |                              |
|-------------------------------------------------|------------------------------|
| Fourth Floor - Electrical Services Distribution | WA0305-TBA-Q1-04-DR-E-600001 |
| Roof Level - Electrical Services Distribution   | WA0305-TBA-Q1-RF-DR-E-600001 |
| Basement Level - Security Layout                | WA0305-TBA-Q1-B1-DR-E-680001 |
| Ground Floor - Security Layout                  | WA0305-TBA-Q1-00-DR-E-680001 |
| First Floor - Security Layout                   | WA0305-TBA-Q1-01-DR-E-680001 |
| Second Floor - Security Layout                  | WA0305-TBA-Q1-02-DR-E-680001 |
| Third Floor - Security Layout                   | WA0305-TBA-Q1-03-DR-E-680001 |
| Fourth Floor - Security Layout                  | WA0305-TBA-Q1-04-DR-E-680001 |
| Roof Level - Security Layout                    | WA0305-TBA-Q1-RF-DR-E-680001 |
| Indicative LV Schematic                         | WA0305-TBA-Q1-ZZ-DR-E-600001 |
| Typical Fire Alarm Schematic                    | WA0305-TBA-Q1-ZZ-DR-E-600002 |
| Typical ICT Schematic                           | WA0305-TBA-Q1-ZZ-DR-E-600003 |

# Appendix B – Schedule of Plant

| QVS I - Mechanical major plant items |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                         |
|--------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Item                                 | Floor area required               | Comments                                                                                                                                                                                                                                                                                                                                                                                                                 | Indicative images                                                                                                                                                       |
| Cold water storage                   | 9m x 5m                           | <ul style="list-style-type: none"> <li>Domestic cold water storage tank with packaged booster pump set located within basement plant room</li> <li>Stored water requirement of 20,800 litres</li> <li>Tank dimensions – 5m x 3m x 1.5m</li> <li>Raised ball valve chamber to be located to avoid down stand beams</li> <li>Tank access to be provided on the side section due to restricted head heights</li> </ul>      |   |
| Hot water generation and storage     | 7m x 4m                           | <ul style="list-style-type: none"> <li>Located at roof level</li> <li>Wall Gas fired boilers with vertical flue discharge</li> <li>Hot water storage calorifiers to meet the anticipated demand</li> <li>Stored water requirement of 4,680 litres</li> <li>Circulation pumps</li> <li>Expansions vessels, pressurisation units, dosing systems, water softeners / treatment</li> <li>Associated control panel</li> </ul> |   |
| External condensers / VRF            | 5m x 2m<br>5m x 2m<br>4m x 4m     | <ul style="list-style-type: none"> <li>Located at roof level</li> <li>Acoustic screen designed not to restrict air flow</li> <li>Plant areas split across level 04 and roof to suit the building layouts</li> </ul>                                                                                                                                                                                                      |                                                                                     |
| Retail ventilation risers            | Subject to confirmation by tenant | <ul style="list-style-type: none"> <li>Vertically through building to roof level</li> <li>Fire rated ductwork</li> <li>Full access for inspection and cleaning of ductwork</li> </ul>                                                                                                                                                                                                                                    |                                                                                                                                                                         |

|                        |                                         |                                                                                                                                                             |                                                                                     |
|------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Kitchen<br>extract fan | Subject to<br>confirmation<br>by tenant | <ul style="list-style-type: none"><li>• Roof level</li><li>• Kitchen extract fan with associated attenuation, filters and discharge louvre / cowl</li></ul> |  |
|------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

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