



**BLUEMONT DEVELOPMENTS LTD.**

FIRHOUSE  
FIRHOUSE ROAD, DUBLIN 24  
BASIS OF DESIGN REPORT  
**PROJECT NO: T255**  
*3<sup>rd</sup> JUNE 2022*



## NOTICE

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## 1. INTRODUCTION

Bluemont Developments (Firhouse) Limited intend to apply to An Bord Pleanála (the Board) for a Strategic Housing Development with a total site area of c.0.46 ha, on lands located at No. 2 Firhouse Road and the former 'Morton's The Firhouse Inn', Firhouse Road, Dublin 24.

The development will consist of the demolition of all existing structures on site (c. 1,326 sq m), including:

- Two storey building formally used as public house, ancillary off-licence and associated structures (c. 972 sq m);
- Two storey building comprising an existing barber shop and betting office (c. 260 sq m);
- Single storey cottage building and associated structures (c. 94 sq m); and
- Eastern boundary wall and gated entrance from Mount Carmel Park.

The development with a total gross floor area of c. 11.638 sq m, will consist of 100 no. residential units arranged in 2 blocks (Blocks 01 and 02) ranging between 3 and 5 storeys in height, over lower ground floor and basement levels, comprising:

- 96 no. apartments (consisting of 2 no. studio units; 45 no. one bedroom units; 10 no. two bedroom (3 person) units; 34 no. two bedroom (4 person) units; and 5 no. three bedroom units), together with private (balconies and private terraces) and communal amenity open space provision at podium and roof levels; and
- 4 no. duplex apartments (consisting of 2 no. one bedroom units and 2 no. two bedroom units (4 person) located within Block 01, together with private balconies and terraces.

Block	Levels	Studio	1 Bed	2 Bed – 3P	2 Bed – 4P	3 Bed	1 Bed Duplex	2 Bed Duplex
Block B.01	0 – 4	2	18	6	18		2	2
Block B.02	0 – 4	0	27	4	16	5		

**Table 1** Outline schedule of accommodation.

The development will also consist of non-residential uses (c. 355 sq m), including:

- 1 no. café (c. 58 sq m) and 1 no. office (c. 30 sq m) located at ground floor level of Block 01;
- 1 no. medical unit (c. 59 sq m) and 1 no. betting office (c. 66 sq m) located at ground floor level of Block 02;
- 1 no barber shop (c. 28 sq m) located at ground floor level between Blocks 01 and 02; and
- 1 no. crèche (c. 114 sq m) located at lower ground floor level of Block 01 and associated outdoor play area to the rear.

Vehicular access to the site will be from the existing access off Firhouse Road. The proposal includes minor alterations to the existing access, including the provision of new and enhanced pedestrian infrastructure.

The development will also consist of the provision of public open space and related play areas; hard and soft landscaping including internal roads, cycle and pedestrian routes, pathways and boundary treatments, street furniture, basement car parking (80 no. spaces in total, including accessible spaces); motorcycle parking; electric vehicle charging points; bicycle parking (long and short stay spaces including stands); ESB substations, piped infrastructural services and connections to existing public services, (including relocation of existing surface water sewer and water main from within the application site onto the public roads area along Firhouse Road and Mount Carmel Park); ducting; plant; waste management provision; SuDS measures; stormwater management and attenuation; sustainability measures; signage; changes in levels; public lighting; and all ancillary site development and excavation works above and below ground.

Included within this report is an overview of the mechanical and electrical systems that are proposed for Firhouse Apartments. It is intended that upon agreement with the Client, this document will form the basis of design for these systems.

### 1.1 Design Criteria

The design criteria for the heating systems are as set out in Table 2 below.

No cooling will be provided within the apartments; however, an overheating assessment will be completed in compliance with CIBSE TM59 (Methodology for The Assessment of Overheating in Homes) to ensure a comfortable environment is maintained during summertime.

AREA	TEMP WINTER	TEMP SUMMER	NOTES
External	-3 °C	26 °C	
Living Areas	21 ± 2 °C	No cooling	
Bedrooms	18 ± 2 °C	No cooling	
Bathrooms	21 ± 2 °C	No cooling	
Common Areas (stairwells, entrance lobbies & corridors)	18 ± 2 °C	No cooling	Heating by electric panel heaters (TBC)

**Table 2** Heating Design Criteria

The design criteria for the ventilation systems is as set out in Table 3 below.

AREA	VENT RATE	UNIT	HUMIDITY	COMMENTS
Continuous Extract Rate (Apartment)	0.3	l/s per m <sup>2</sup>	Uncontrolled	
Bathrooms	8	l/s	Uncontrolled	Boost Rate
Kitchens	13	l/s	Uncontrolled	Boost Rate
Utility Rooms	8	l/s	Uncontrolled	Boost Rate
Creche	10	l/s/person	Uncontrolled	Where Required
Commercial units	10	ACH	Uncontrolled	In accordance with Part F
Central Bin Store	10	ACH	Uncontrolled	
Common areas	Natural Ventilation	No cooling	Uncontrolled	

**Table 3** Ventilation Design Criteria.

### 1.2 Air Permeability

The target value for the air permeability within each apartment is 3 m<sup>3</sup>/hr/m<sup>2</sup> @ 50Pa.

### 1.3 Noise

#### Environmental Noise Criteria:

The M&E systems are to be designed in accordance with noise criteria as set out within planning conditions and as advised by the Acoustic Consultant.

#### Internal Noise Criteria:

The mechanical and electrical systems are to be designed in accordance with the criteria as set out in Table 4.

AREA	NOISE RATING
Living Rooms	NR 30
Bedrooms	NR 25
Kitchens	NR 45
Bathrooms/Ensuites/WCs	NR 40
Halls	NR 40
Landlord Circulation Areas	NR 40
Plantrooms	NR 75 (May need to be lower due to adjacent apartments) Acoustic consultant to advise

**Table 4** Internal Noise Criteria.

## 2. TGD PART L (2021) / BER

A separate Part L report outlines the measures to be taken to ensure compliance with TGD Part L 2021. The Part L 2021 regulations set energy performance requirements to achieve Nearly Zero Energy Building (NZEB) performance as required by Article 4 (1) of the Directive for new buildings.

The definition of Nearly Zero Energy Buildings is defined as:

*“‘Nearly zero-energy building’ means a building that has a very high energy performance, as defined in Annex 1. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby”.*

### 2.1 DEAP Calculation Information

The Part L calculation and BER is completed using DEAP software. The main factors which influence the calculation are as noted below.

The DEAP software runs an annual simulation to predict the primary energy consumption from space heating, domestic hot water and electrical usage.

Factors which have a significant impact on the DEAP calculation include:

- Thermal envelope (u-values of walls, windows, roof etc.);
- Thermal bridging factor (effectiveness of thermal bridging details);
- Air permeability;

- Dwelling orientation (extent of solar gain in dwelling);
- Type of ventilation system (central extract system, MVHR or natural ventilation);
- Efficiency of space heating and domestic hot water system (EAHP or boilers);
- Internal lighting design;
- Renewable technologies.

Factors which do **NOT** impact on the DEAP calculation include:

- Water consumption including rainwater harvesting;
- Unregulated energy (white goods, televisions etc.);
- External lighting.

### 2.2 Renewable Technologies

Under Part L 2021, 20% of a dwelling’s energy consumption must be generated by renewable technologies. Options for renewable technologies include the following:

- Solar photovoltaic (PV) systems;
- Solar thermal systems;
- Wind power;
- Solar thermal system;
- CHP (combined heat & power);
- Biomass;
- Heat Pumps (Minimum COP of 2.5).

Provisionally it is proposed that the renewable energy ratio (RER) as defined in Part L 2021 is achieved using an exhaust air heat pump (EAHP) to be located within each apartment. The exhaust air heat pump is effectively a centralised unit that provides space heating, hot water and heat recovery ventilation.

The basic principle of the unit is that energy in the warm indoor air is extracted and recycled back to the dwelling via the heat pump and radiators.



**Figure 1** Typical Exhaust Air Heat Pump (EAHP) Unit.

The EAHP recuperates heat from air extracted from the bathrooms, kitchens and utility space within the dwelling. The warm exhaust air is then passed through the heat pump where the heat is recycled and delivered back to the house in the form of water-based heat.

A by-product of this process is cold air which is exhausted from the dwelling via a vent in the facade at temperatures as low as -15.0 (°C). Fresh make-up air is supplied to the living areas by trickle vents located in the walls or windows.

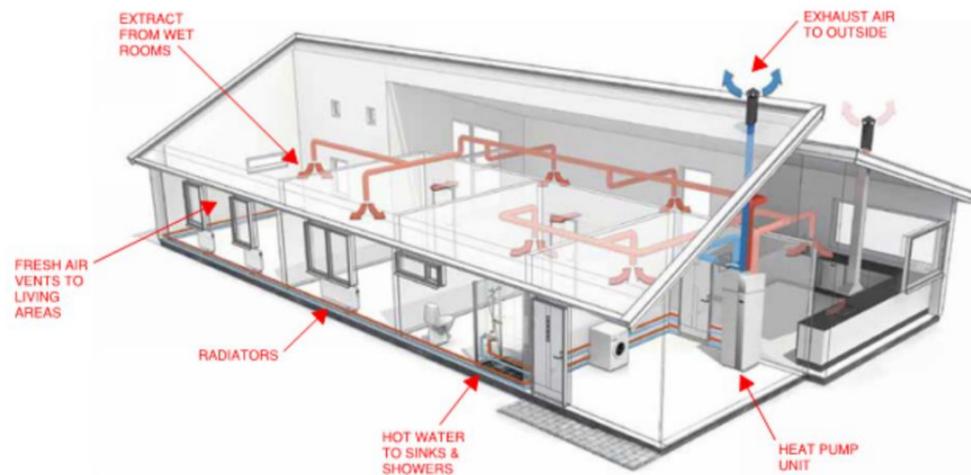


Figure 2 Typical Residential EAHP System.

### 3. UTILITY SERVICES

#### 3.1 Natural Gas

Natural gas will not be provided to this development.

#### 3.2 Mains Water

An existing trunk water main will be diverted as part of the proposed works<sup>1</sup> with a new dedicated mains water supply will be installed to serve the development residential development.

The commercial units will be provided with independent water supply connections with meters as per IW standards and CoP. Meters will be located within the public footpath in front of each unit.

The incoming supply will be connected to the public mains by the main contractor as part of the civil engineering works.

The mechanical contractor will connect to the main at the entry point to the building (within the car park).

<sup>1</sup> Refer to Civil Engineer's design details and specification.

### 3.3 Electrical Supply

It is proposed to provide 1 No. single substation as outlined below to serve the development. The substation will be accessible from Mount Carmel Park. The estimated load for the development is in the order of 990 (kVA). The substation has been sized based on the following assumptions:

- 102 No. apartments;
- 4 No. landlord cores;
- Basement car park (Blocks A & B);
- 4 Commercial units (Barber, Bookmaker, Medical Consultancy, Office);
- 1 Café;
- 1 Creche.

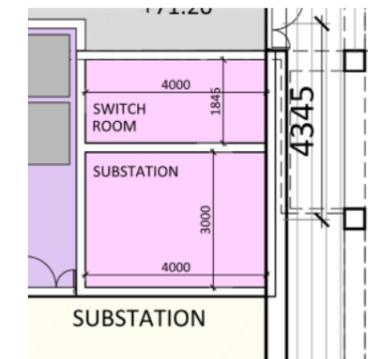


Figure 3 Proposed location of ESB sub-station.

An allowance of 140 (kVA) has been included within the design to serve electric car chargers. All car chargers are to be served from the sub-station. 20% of car parking spaces are to be provided with chargers upon completion of the development with infrastructure installed to facilitate the provision of 100% coverage in the future<sup>2</sup>.

Note the above strategy is subject to final agreement with the ESB.

#### 3.4 Telecoms

Eir and Virgin media services are to be brought onto the site to serve the development. Services will terminate in a dedicated comms / point of presence (POP) room within the car park area for distribution to the apartments.

### 4. MECHANICAL & ELECTRICAL DISTRIBUTION

Central plant rooms are to be located within the car park area to serve the development. These include the following:

- Water storage room (potable water);
- Commercial sprinkler system and associated storage tank and plant room;
- Car park extraction system for basement -2;
- Switch rooms;
- Point of presence (POP).

Dedicated mechanical and electrical risers are to be provided within each block (1,500 x 600mm per riser approx.).

<sup>2</sup> This is in line with the requirements of Irish Building Regulations Technical Guidance Document Part L (TGD L). Ducting and sterile routes will be provided to facilitate future 100 % EV coverage. The electrical infrastructure to cater for 100% EV charging will not be installed as part of the development.

Separate risers are to be provided for smoke shafts and dry risers in accordance with the fire safety compliance report.

Mechanical and electrical services are to run from the plant rooms to the risers at high level within the car park area. Services running to Block C will run from the Block A & B car park area in below ground trenches.

The ESB boards containing the apartment meters are to be located at the entrance to each core, either within a cupboard or dedicated room. The meter boards must be within 2.0 (m) of the entrance to ensure compliance with ESB guidelines.

Ceiling voids are required as follows within the development to facilitate service runs:

- Entrances, common corridors – 450 (mm) approx.;
- Apartment living areas – 200 (mm) approx.;
- Apartment bathroom / store areas – 350 (mm) approx.;
- Carpark – 600 (mm) approx.

The ceiling voids are clear dimensions, without obstruction.

## 5. SPRINKLER

### 5.1 General

A commercial sprinkler system and associated storage tank and pump set plant room will be installed as part of the works to provide coverage to the basement -2 and basement -1 car park.

## 6. MECHANICAL SYSTEM DESCRIPTION

### 6.1 Heating

Heating will be provided within the apartments via the EAHP (refer to section 2.2 for details on exhaust air heat pumps).

Heat will be distributed from the EAHP to radiators via a manifold system and pre-insulated PEX pipework. The final connection to the radiators will be made using copper pipework.

A digital thermostat will be provided in the main living area, master bedroom and other occupied spaces to enable control of the heating system in accordance with TGD L 2021 The thermostats are to enable remote control of the heating system via a mobile device. TRVs are to be installed on all other radiators.

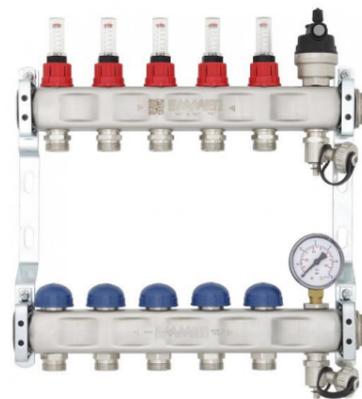


Figure 4 Typical heating distribution manifold.

Heating will be provided in the bathrooms and en-suites by electric towel radiators.

Heating will be provided in the common landlord areas by programmable electric panel heaters.

### 6.2 Domestic Water Services

A mains water storage tank will be located within a dedicated plant room within the car park. The tank will provide 24 hour storage in line with Irish Water (IW) design guidelines. The storage tank will be manufactured using glass reinforced plastic (GRP) and will incorporate a maintenance section.

A duty / assist/ standby booster pump will be installed adjacent to the tank and will distribute boosted potable water to the apartments to serve the kitchens and bathrooms.



Figure 5 Typical multi-head potable water booster set.

A pressure reducing valve and manifold will be installed within the riser on each level to serve the apartments. The stop valve for each apartment will also be located in the riser. Water meters will not be installed for apartments however a spool piece will be installed to allow these to be retrofitted at a later date should apartment metering be introduced.

A separate boosted water supply and break tank will be installed to serve a tap within the bin store.

Hot water will be provided within the apartments via the EAHP. The units typically provide 200 L of storage.

The water services pipework installation at basement level and within the risers will be completed using insulated copper pipework. Pre-insulated PEX pipework will be installed within the apartments.

### 6.3 Above Ground Drainage

Soil vent pipes (SVPs) are to be installed throughout the development to convey foul water from sanitaryware and appliances to the below ground drainage system. The soil vent pipes are to be insulated to prevent nuisance noise within the apartments.

The soil vent pipes are to offset at high level in the basement car park (slung drainage) and connect to the external drainage network (by civils).

HDPE pipework will be installed at high level in the car park. uPVC pipework will be installed within the risers and apartments on the upper floors.

A rodding eye and access door will be installed on the vertical stacks every three levels in accordance with TGD H. Rodding eyes are also to be installed on the SVP's where there is change in direction.

Condensate pipework from the EAHP will connect to the SVPs via a dry running trap.

Fire collars are to be installed on all plastic pipework 40 (mm) and above that penetrates a fire compartment line.

Trapped floor gullies are to be provided within the plant rooms and bin stores at basement level.

## 6.4 Mechanical Ventilation

Continuous mechanical extract ventilation will be provided to all apartments to remove odours and reduce moisture via the EAHP.

Air will be exhausted from the bathrooms, utility and kitchen area by circular disc grilles. A manifold ducting system with semi flexible ducts will be installed above ceiling level to transfer air from the grilles to the EAHP.

Supply air to each individual bedroom and living space shall be provided via trickle vents incorporated into the façade.



Figure 6 Typical apartment ducting system.

Cooker hoods are to be hard ducted to outside via a separate vent in the façade.

A mechanical extract system will be installed to serve the bin store located within the carpark.

## 6.5 Fire Protection Systems

### Dry Riser System:

An internal firefighting mains (dry riser) will be provided in each core in accordance with the Fire Safety Compliance report. The installations will be complete with inlet breechings and landing valves, interconnecting pipe work (galvanized steel), drain valve and automatic air vent.

### Fire Extinguishers:

Fire extinguishers are to be provided throughout the development in accordance with IS 291 and the Fire Safety Compliance report.

### Ventilated Lobbies:

Fire rated ducting will be installed within the car park area terminating at the ventilated lobbies in accordance with the Fire Safety Compliance report. The fire rated ducts are to terminate within vents to be formed in the podium slab.

## 6.6 Smoke Shafts

### Approach Corridor Smoke Ventilation:

Mechanical smoke shaft systems will be installed in designated cores to ensure approach corridors are kept free of smoke. The system will be designed, installed and certified by a specialist sub-contractor.

The system will be complete with the following components:

- Duty / standby extract fan (roof level);
- AOV at head of stairwell;
- AOV at head of smoke shaft;
- Fireman's override switches;
- MCC panel;
- Control panel;
- Pressure switches;
- Builders shaft (0.6m<sup>2</sup>);
- Motorised damper at each level.

The design of the smoke shaft systems, if employed, will be verified by a CFD analysis.

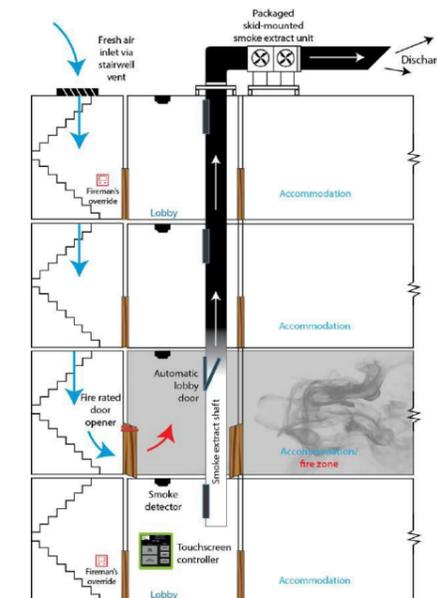


Figure 7 Typical smoke Shaft System.

Smoke ventilation directly to atmosphere on an level by level basis will also be considered comprising an automated AOVs each having an aerodynamic free area of  $A_f = 1.5 \text{ (m}^2\text{)}$ . The AOV will operate on activation of the fire alarm in accordance with the requirements of Irish Building Regulations Technical Guidance B.

## 6.7 Car Park Ventilation

The carpark in basement -1 will be naturally ventilated in accordance with Irish Building Regulations Technical Guidance Document F. Openings equivalent to 5.0 % of the carpark area will be provided and distributed around the perimeter of the space. For smoke and heat ventilation (TGD B), the minimum area of openings to be provided is equivalent to 2.5 % of the carpark area.

For the basement -2, a fully mechanical supply and extract is envisaged to comply with both TGD F and TGD B.

## 7. ELECTRICAL SYSTEM DESCRIPTION

### 7.1 Low Voltage Power Distribution

The main distribution and life safety boards for the development will be located in switch rooms adjacent to the ESB substations.

Unmetered cables are to run from the mainboard to ESB meter boards which are to be housed in a dedicated meter room or cupboard at the entrance to each core. The ESB meter cupboard must be located within 2.0 (m) of the entrance to the core in accordance with ESB guidelines.

A sub-main cable will run from each ESB meter to the apartments terminating within a consumer unit (located at the entrance to the apartment or within the utility room).

The intention is to run the unmetered cables to serve Blocks A and B via the car park (subject to ESB agreement). Separate supplies are to run below ground to serve Block C which is isolated from the rest of the development.

Services to the apartment consumer units are to run on a vertical cable tray in the electrical risers.



**Figure 8** Typical Form 4 main distribution board.

Sub main cables shall consist of multicore copper XLPE/SWA/LSF mounted on galvanized steel cable tray containment concealed within ceiling voids and risers.

Surface mounted MCB / RCBO consumer units are to be installed to serve each apartment.

Earthing & bonding shall be in accordance with the requirements of the National Wiring rules for electrical installations

### 7.2 Standby Generation

A life safety standby diesel generator will be located within a dedicated room within the car park area to provide emergency power to the firefighting lifts, AOVs, smoke shaft systems and basement -2 car park ventilation. The generator will be sized to operate for a period of 8 hours and is to incorporate an integral oil tank. Oil replacement will be provided directly via the car park as opposed to a dedicated oil line.

Intake and exhaust louvres to atmosphere will be provided to ventilate the room during operation. A flue is to run from the generator room and terminate at roof level.

### 7.3 Small Power and General Service Outlets

Power and general services outlets are to be provided in each apartment and in the communal areas. All general service outlets within the common areas are to be TGD M compliant.

### 7.4 Lighting and Emergency Lighting

Lighting is to be installed to meet the requirements and recommendations contained within the CIBSE code for interior lighting.

Illuminances levels are to be provided as indicated below.

#### Apartments:

- Bedroom – 200 Lux
- Living Area – 250 Lux
- Kitchen – 300 Lux
- Store – 200 Lux
- Hallway – 100 Lux
- Bathroom – 250 Lux

#### Communal Areas:

- Main Entrance – 250 Lux
- Corridors – 75 Lux
- Stairs – 100 Lux
- Car Park – 100 Lux

#### Apartments

Lighting within the apartments is to consist of a combination of recessed LED downlights and pendants controlled from wall mounted light switches.

Bathroom and ensuite lighting will be provided by IP rated LED fittings.

An IP rated surface mounted LED luminaire will be installed on balconies.

#### Carpark / Plantrooms

Luminaires within carpark and plantroom area to be IP54 rated.

These luminaires are to be controlled by occupancy sensors.

#### Emergency Lighting

A standalone emergency lighting system will be installed throughout the common areas to include recessed spots and emergency exit signage. Bulkhead type fittings are to be provided within the car park area and twin spots within plant rooms. The installation will be designed in accordance with IS 3217.

#### External Lighting

External lighting will be provided by way of column mounted LED luminaires and wall mounted lights.<sup>3</sup>

## 7.5 Fire Alarm System

A fire detection and alarm system will be installed within the apartments and communal areas in compliance with TGD B and IS 3218.

The fire alarm system will be network based with the central panel located at the entrance to each core.

A Grade D, LD1 system in accordance with BS 5839 Part 6 will be provided in apartments. The LD1 installation shall comprise mains powered smoke detectors with integral sounders installed within the bedrooms, hall and living areas. A heat detector will be installed within the kitchen.

The landlord system shall be extended to each apartment entrance hall. As a minimum a heat detector combined sounder shall be located in the apartment hallway and a landlord sounder base shall be located in each bedroom.

An L3X fire detection and alarm system will be provided in the landlord areas in compliance with IS 3218 and an L2 / L3 system in basement and ancillary areas.

## 7.6 TV System

A TV system shall be installed to meet the requirements and recommendations contained within the following guidance documents:

- CENELEC BS EN 501117 for coaxial cabling;
- CAI codes of practice;
- Virgin Media installation guidelines;
- Open Eir installation Guidelines.

2 No. alternative TV / internet providers will be brought to each apartment (Virgin Media & Eir). No decoding equipment, set top boxes, TVs or customer accounts will be provided as part of the contract works.

## 7.7 Telephone Installation

Each apartment will be provided with fibre optic broadband. The associated router / switch box will be located within the utility cupboard within each apartment.

CAT 6A cabling will be provided from the switch box to each RJ45 point.

## 7.8 Security / Access Control / Intercom Systems

An IP based audio door entry phone system will be installed within each apartment. The system is to incorporate the following features:

- External vandal proof audio/video entry phone panel complete with speaker unit and push button located adjacent to the main entrance door;
- The audio/video entry phone system within the apartment shall be located within the entrance lobby/corridor and shall open the main entrance door;
- A proximity card reader shall be installed at the main entrance door for tenants' access into the building.

<sup>3</sup> The impact of external lighting on bats will be considered as part of Detailed Design. The lighting design for the areas to be handed over will be in accordance with SDCC requirements.

## 7.9 CCTV System

A internet protocol (IP) based CCTV system will be installed to secure the development in accordance with BS EN 50132.

Cameras are to be distributed throughout the development as necessary to meet operational requirements. The CCTV system is to consist of fixed cameras at the entrances to each core and within the car park area and car park ramp.

The system will be monitored via a dedicated security/concierge control room.



Figure 9 Typical Dome Camera.

## 7.10 Disabled Refuge System

A disabled refuge communications system will be provided within each core in accordance with the requirements of TGD B and M.

A call point will be located within the designated disabled refuge area on each level and will be linked back to a main panel located on the ground floor adjacent to the core entrance.

## 7.11 Intruder Alarm System

It is proposed that intruder alarm systems are installed to protect ground floor apartments only.

A central landlord intruder alarm system will be installed to protect the LV switch rooms, POP room, plant rooms and the residential amenity spaces.

## 7.12 Transport Services

Vertical transport throughout the development will be provided by a number of 13 person passenger lifts. 1 No. lifts will be provided in Blocks A, B & C. The lifts are to operate at a speed of 1.6m/s<sup>4</sup>.

The lift shaft sizes have been sized to cater for different lift suppliers including Kone, Otis & Schindler.

## 7.13 Power Supplies and Containment Associated with Mechanical Services

All circuit wiring associated with the mechanical services installation will be fed from a mechanical control centre board (MCCB).

This is to include the following:

- Smoke shaft systems;
- Water booster pumps;
- Residential amenity plant.

<sup>4</sup> Final lift performance and specification will be confirmed at Detailed Design.

### **7.14 Lightning Protection System**

A lightning protection system will be installed to meet the requirements of BS EN 62305. A lightning protection risk assessment will be completed to determine the level of protection required.

## **8. COMMERCIAL UNITS**

### **8.1 General**

A separate metered ESB and water supply will be provided to serve each of the units (creche, café, betting shop, barber, medical consultancy, office).

Drainage, water, heating and ventilation services will be internal to each unit and will be installed as part of tenant fit-out.

As part of the Shell & Core, the following services will be provided:

- Ventilation: louvres will be incorporated in the glazing façade, at high level, for future fit-out connection;
- Drainage: Dedicated connection (upstands);
- Water: dedicated metered mains water connection;
- Heating / Cooling: Dedicated space in the basement -1 for DX condensers.