Key design criteria

1:8

Occupational density

Load densities for cooling

Lighting
12W/m² infrastucture.

Small power
30W/m².

Additional tenant equipment allowance
– On floor secondary equipment rooms (SERs) 20kW per floor.
– Main equipment room (MER 625kW total), allocated on a pro rata basis.

Additional cooling allowance
Of up to 50W/m², over 30% of any individual office floor area.
(Available upon request).

Ventilation and catering facilities

Outside air rate
2 l/s/m².

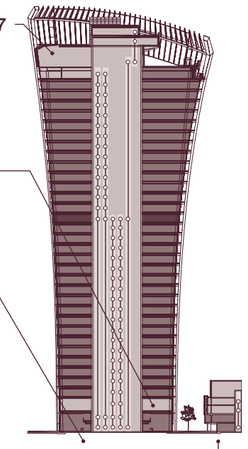
Tenant catering facilities
– 2 x 850mm x 700mm and 5 other ducts of varying sizes.
– Up to 16m³/s of outside supply air is available for kitchen supply air.
– 30 l/s allowance per tea point in main extract system (2 No per floor).
– Dedicated water and drainage connections.
– Metered gas infrastructure.

Air conditioning systems

Low energy fan coil unit system
or
Active chilled beam system

Separate hydraulic on-floor circuits provide full flexibility to tenants.

Plant locations



Levels 34 (part floor) and 37
– Cooling towers
– Ventilation plant
– Sub stations
– Switchrooms

Level 2
– Ventilation plant

Levels -1 and -2
– Incoming utilities
– Boilers
– Chillers
– Fuel cell
– Sub stations
– Switchrooms
– Water storage
– Sprinkler tanks

Annex Building
– Air cooled chillers
– Standby generators
– Satellite dishes
– Fuel cell heat rejection

Energy and sustainability targets

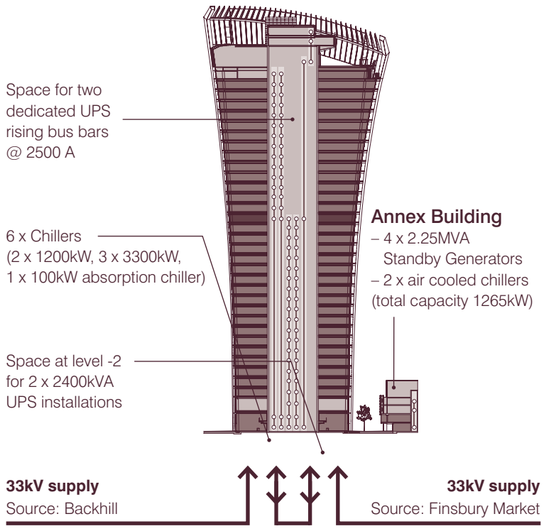
Building regulations
Approved document Part L2A:2010
TER 28.4 kgCO_2/m²/annum
BER 21.6 kgCO_2/m²/annum

Compliance margin over 2010 Part L regulations of 24.1%.

BREEAM
Excellent when incorporating fit out.

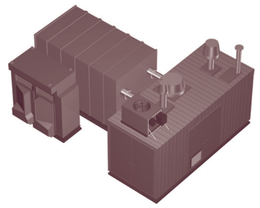
EPC rating 40.

Power, cooling and resilience strategy

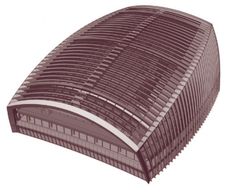


Low zero carbon (LZC) technologies

300kW (electrical output) fuel cell
6.6% CO_2 reduction



Roof mounted PVs
Predicted to generate
27300 kWh per year



BMS, fire alarm & metering strategy

– Type L1 analogue addressable fire alarm system with fully integrated voice alarm.
– Centralised Building Management System.
– Comprehensive energy metering system.

Specification

1. The development

The development will provide approximately 670,000 sq ft of Grade A office space on 32 floors.

A publicly accessible Sky Garden which includes a restaurant and landscaped areas is located at the top of the building.

The development will include a separate small building [the Annex Building] providing retail space and motorcycle/bicycle parking use areas together with shower and changing facilities. Plant, loading and unloading and storage areas are located at the basement levels.

2. External cladding

2.1 Exterior walls for typical floors

The building envelope will comply with BS8200 and other relevant standards.

The exterior walls will consist of a high quality architectural metal prefabricated cladding system with integrated windows.

Windows to be high performance, insulated, solar coated double glazed at all office levels.

The exterior walls will comply with the requirements of BS8233 for maximum internal noise levels and will achieve a noise level of NR-38 for open plan offices.

1.5m planning grid.

3. Interior finishes in public spaces

3.1 Main lobby/office entrance

The office entrances will be from Fenchurch Street and the Pocket Park, and provide a double height space to accommodate the double deck lifts and associated escalators.

Main lobby	Floor stone: Statuario Marble. Wall stone: Chamesson Limestone.

3.2 Toilets

Toilets	Floors and vanity units stone: Celina Grey.

3.3 Lift cars

Main passenger lift cars	Back lit White Onyx.

4. Toilets

4.1 Office floors

Toilet provision designed to comply with BS 6465:1 2009 and BCO Guide 2009 and will provide for the following:-

Office Floors	1:8m² NIA 60/60 male/female Using 80% utilisation (Facilities will be provided for toilets to be extended).

4.2 Disabled toilets

The installation fully complies with Part M of the building regulations with unisex disabled toilets provided on each floor.

5. Occupational density

- Means of escape 1:6m²
- Lifts 1:8m² (with 10% absenteeism factor)
- Air conditioning 1:8m²

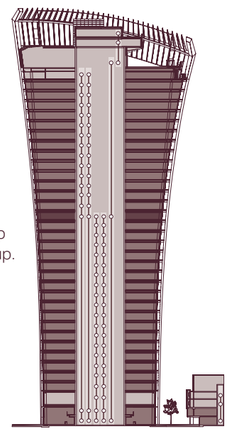
The services are designed to allow any office floor to be subdivided into two independent tenancies on a North – South axis.

6. Vertical transportation

6.1 Passenger lifts

The main passenger lifts use state-of-the-art double deck lifts with fully integrated destination control. The lift performance fully meets the requirements of the BCO guide to specification 2009.

Average waiting time	25 seconds or less during peak, 40 seconds or less at lunchtime.
Handling capacity	15% for up-peak, 12% for lunchtime two-way traffic.
Lift car load factor	80%
Scheme	2 x 7 car double deck lifts, one low rise group and one high rise group.
Cab capacity	21 person
Speed	Low rise 4m/s High rise 6m/s
Control system	Destination control.



6.2 Goods lifts

2 x 3,000kg

6.3 Fire fighting lifts

2 x 800kg

6.4 Other lifts

Dedicated express Sky Garden lifts:
– 2 x 21 person lifts
– 5m/s

The Annex Building will be equipped with a cycle / motorcycle lift, goods / passenger lift and two lorry lifts to provide access to the loading dock.

Four escalators will be provided in the reception area to link lower and upper ground floor levels.

14 double deck lifts

7. Window cleaning system

Purpose designed external and internal window cleaning and maintenance systems will be provided to ensure efficient maintenance and cleaning operations.

Floor to ceiling height

2.75m

8. Structure

8.1 Substructure

The building will be founded on piles bored in the London Clay. A thick reinforced concrete raft will be used to distribute load from the cores and columns to the piles and the underlying ground.

8.2 Loadings

Typical office floors will be designed to support a live load of 4.0kN/m² plus 1.0kN/m² for lightweight partitions. An area for enhanced loading of 7.5kN/m² equal to at least 5% of the NIA will be identified on the floor plate.

8.3 Vibration

General and enhanced office areas will be designed to give a response factor of 6 or better.

9. Mechanical services

9.1 Building services

The design of building services will comply with all current appropriate Statutory Regulations, Building Regulations, Local Authority Regulations, British Standards Codes of Practice, CIBSE and BCO best practice guides.

9.2 Services design parameters

The design criteria for the mechanical services installations are as follows:-

a. External design conditions

Summer	30°C db, 21°C wb
Winter	-4°C db, 100% saturated
Heat rejection	34°C db, 21°C wb

b. Internal comfort conditions

Offices

Fan coil solution	22°C db ± 2°C, 45% ±10% relative humidity
Chilled beam solution	24°C db ± 2°C, 35% to 50% relative humidity
Circulation routes to air conditioned spaces	21°C db ± 3°C
Circulation routes to non air conditioned spaces	18°C minimum
Toilets	18°C minimum
Reception	Localised climate control to 21°C ± 3°C at reception desk.

c. Outside air quantities

2 l/s/m² for offices providing flexibility for high density occupation.

d. Sky Garden:

Naturally ventilated with localised climate controlled areas for the restaurant and café.

e. Load densities for cooling

Air conditioning equipment will be designed to meet the following internal loads.

Offices	Lighting	8–12W/m²
	Small Power to offices	25W/m² + 5 W/m² at riser
	Small Power for enhanced use	80W/m² (50 + 25 + 5 W/m²) for up to 10,000 m² of the office NIA
Critical cooling allowances		Main equipment room (MER) 625KW
		Secondary equipment room (SER) 20kW per floor (level 34 10kW)

Note; up to 30% of any individual office floor can be provided with the enhanced small power allowance of 80Wm² upon request.

Occupancy 1:8m²

f. Noise and vibration control

The base-building will be designed to achieve the following limiting noise levels, from engineering services installations.

Area	Noise level
Open plan offices	NR38
Entrance lobby	NR40
Public circulation areas	NR40
Toilets	NR45

9.3 Systems

a. Primary heating system

The primary on floor heating will be provided by a low temperature hot water (LTHW) heating system. A plate heat exchanger will be provided at each floor connection to hydraulically separate the on floor distribution from the shell and core systems.

b. Primary cooling systems

The building will be provided with an independent chilled water system using multiple water cooled chillers with associated pumps and cooling towers. Chilled water will be circulated to each floor via two separate risers. A plate heat exchanger will be provided at each floor connection to separate the on floor distribution from the shell and core systems.

The primary cooling system is also sized to include the MER load within the plant and risers to allow the tenants to connect to the system at any floor for this provision.

A tenant's critical cooling system will be provided to serve the MER and SER loads described in section 9.2.e. This system will comprise 2 No. air cooled chillers, with a total capacity of 1265kW, with dual risers to enable the tenant to connect to these risers at any floor.

c. Kitchen extract riser

4 No. fire rated kitchen extract ducts will be provided to serve tenants kitchen facilities. Enhanced capacity allows for supply air make up to be taken from the office ventilation supply system.

9.4 Plumbing and fire protection

Water conservation

– Grey water recovery systems will be provided.
– Sprinklers and Wet Risers will be installed.

Dual power supply

10. Electrical services

– Landlord and tenant generator system.
– Life-safety supplies.
– Space provision for tenant UPS.
– Photo voltaics.
– Aircraft warning light installation.

10.1 Design criteria

a. Load densities:

Office areas:

Lighting	8–12W/m²*
Sockets and small power office areas	30W/m²
Small Power to enhanced use areas:	80 (50 + 30 W/m²) W/m² over 10,000m² of the office NIA
Main equipment room	625 kW
Secondary equipment room	20 kW per floor (10 kW level 34)

b. Lighting Levels:

General offices (Catergory A)	400 lux average maintained illuminance at the working plane.
Entrance hall	Contrasting levels 200 lux minimum at finished floor level.
Reception desk	500 lux.
Toilets	200 lux minimum at finished floor.

*Lighting infrastructure design based on 12W/m² Cat A design based on 8W/m² or lower to achieve BREEAM excellent rating.

10.2 Systems

a. Main incoming power supplies

Two 33kV HV supplies will be provided for the building each rated at 10MVA to provide 100% back up capabilities in the event of a primary circuit or transformer failure.

High voltage switchgear and sub-stations will be separated into two physically remote electrical plantrooms.

b. Distribution

Dual busbar risers each sized to be able to support the whole floor are provided.

c. Lighting and small power

Two electrical risers / cupboards per floor.

d. Standby generation

In addition to the dual incoming mains supplies, a tertiary level of redundancy is provided by emergency generators.

Four No 2, 250 kVA standby containerised high voltage generators located on the roof of the Annex Building to support the life safety loads, landlords central plant and equipment and tenant essential and critical loads in the event of a mains failure.

24 hours of fuel storage based upon all 4 No generators running at full load.

In addition to the standby diesel generators a gas fuelled CCHP fuel cell plant will be used to reduce the buildings CO_2 emissions as part of the building's energy strategy.

e. Uninterruptible Power Supply (UPS) and distribution

Space provision at basement level will be provided for the future installation of a central tenant UPS system, based on 2 No. independent static uninterruptible UPS systems comprising 2400kVA each (3 x 800kVA modules) with 15 minutes of battery autonomy.

f. Other electrical systems

– Auto changeover life safety supplies.
– Aircraft warning light installation.
– Roof mounted photovoltaic panels.

10.3 Special systems

a. Telecommunications

Two diversely located telecommunications intake rooms will be provided at basement level -B1. These are located to the West of the building (Philpot Lane) and the East of the buildings (Rood Lane).

b. Security provisions

A CCTV system will be provided to cover the building perimeter and points of access / egress including loading bay.

Access control will be provided at all points of entry and exit to the building. The main entrances will be provided with speed gates at ground level.

Central monitoring equipment will be located within the security / fire command control room.

11. Sustainability

– The development will achieve a minimum "Very Good" BREEAM rating for shell and core which can be upgraded to Excellent when the fit out works are incorporated.
– A fuel cell tri–generation system will be installed to reduce the CO_2 emissions of the building.
– PV cells will be installed on the roof fins to provide renewable energy to the building.
– An extensive area of greenwall will be installed on the Annex Building in the Pocket Park.