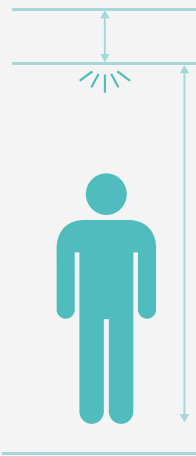




Fan assisted VAV air conditioning

Metal tiled suspended ceilings with integral lighting



2.7m

Dual power back-up



200mm raised floors with Electrak Busbar power provision

Specification

1. Base building structure

1.1 Structure

The 42 storeys above ground floor are generally framed with a 70mm lightweight concrete slab on a 60mm composite metal deck (total depth 130mm) supported by steel beams, columns and reinforced concrete walls within the core areas.

At ground floor level and below, a reinforced concrete structure is used with only the principal tower columns continuing to basement level one in steel. These columns are encased in concrete.

Raised floor void	Floor to ceiling heights	Slab to slab heights
200mm overall	2.7m	4.1m

1.2 Loading allowances

Live Loads

Office	4.0 kN/sq m
Stairs, corridors and lobbies	4.0 kN/sq m
Plant rooms	7.5 kN/sq m

1.3 Planning grid

1.5m

2. Mechanical services installation

2.1 Design criteria

The building services have been designed using the following criteria:

External conditions

Temperature and humidity

Summer	28°C Dry bulb
	20°C Wet bulb
	exceeded for less than 2.5% of the year

Winter	-4°C Dry bulb
	100% Relative humidity
	exceeded for more than 99% of the year

Internal conditions

Internal climate control is based upon a maximum occupancy of 1 person per 10 sq m and 16 litres per sec per person fresh air.

Office areas

Temperature	
Summer	22°C +/-1°C
Winter	22°C +/-1°C

Fresh air

Three and three quarter air changes per hour of fresh air are available. This equates to an average of 16 litres per sec per person based upon an occupational density of 1 person per 10 sq m. Cooling capacity at 1:8 sq m can be provided.

Air-conditioning

Two compartment unit air handlers per floor provide conditioned supply air to the occupied spaces. Each unit is supplied complete with replaceable filters, cooling coil, rust resistant construction including a coated galvanised steel drip pan, silencers to achieve NR38, variable speed fan, trapped condensate drain, controls etc.

Medium pressure ductwork distributes air from compartment units to fan powered VAV control boxes and from the boxes to ceiling diffusers in the interior and slot diffusers at the perimeter. The perimeter fan powered VAV boxes have electrical resistance heating coils sequenced with the cold air supply to heat only at minimum supply air quantity.

The boxes are zoned to provide a separate zone for each corner, each 9m length of the perimeter and interior zones of approximately 80 sq m. Return air migrates through the ceiling plenum to the compartment units.

Heat recovery

Heat recovery systems are incorporated to reduce running costs.

2.2 Provision for tenant services

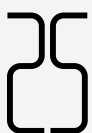
The following facilities are available for installation and completion by the tenants:

- Roughed in kitchen exhaust risers to use with tenant supplied fans and ecology units. Provision is made for 2000 l/s of exhaust for each five floors.
- General exhaust system (capped) with an allowance of 1,500 l/s per floor in the south east corner of the core.
- Toilet exhaust system (capped) with an allowance of 500 l/s per floor. Two spigot connections are provided – one outside each of the two WCs.
- Access to the building chilled water risers for supplementary cooling (capped and valved) inside the compartment unit room. 35 kW of cooling is available per floor.

2.3 Vertical transportation design criteria

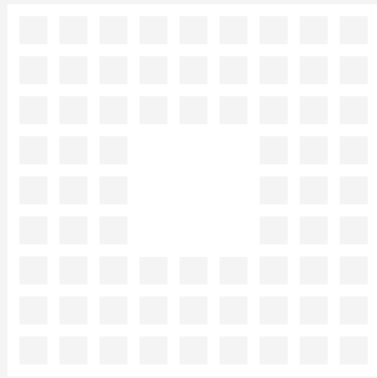
Average Waiting Interval	20.8 seconds or less
Five Minute Ratio	15%
Capacity Factor	13.7% or less

Based upon the above performance criteria, the installed main passenger lift installations serve a uniform occupancy of 1 person / 8.6 sq m.





Ceiling heights



1.5m
planning grid



1 person per
8.6 sq m
Occupational density



Secure bicycle and car parking
in the basement

2.4 Chilled water system

The refrigeration plant consists of multiple hermetic electric centrifugal refrigeration machines with associated condenser water pumps, chilled water pumps and closed evaporative cooling towers providing N+1 redundancy.

Chilled water is circulated to the on floor handling units via two separate risers, which are divisible into separate circuits.

2.5 Plumbing systems

Domestic water

A complete domestic water system is provided serving all typical floor WCs. Typical floor WCs are equipped with all plumbing fittings including low water flow WCs and counter-mounted basins. Domestic hot water is provided to the WCs by local electric storage type heaters located on each floor.

Provision for tenant's services

In the north west corner or south east corner of the building core, connections for water and drainage services for tenant fit-out are provided as follows:

- 100mm drain capped connection
- 50mm vent capped connection
- 20mm water valved and capped connection

2.6 Telecoms

Vodafone, Cable & Wireless, Colt, Verizon, Fibernet, Above.net, Level 3, Interoute and Thus supply the building.

3. Finishes

3.1 Offices

Raised floors

600 x 600mm galvanised steel encased tiles.

Walls

Plasterboard linings to core walls and columns are decorated with a paint finish. Internal faces of external wall panels are anodised aluminium.

Ceilings

Fully accessible plain and perforated metal tiles set in a 1.5m grid.

Shades

Shearweave fabric blinds are installed as part of the base design with manual control.

4. Environment

4.1 Design

High efficiency lighting systems

- <11W/sq m with integrated lighting control
 - Low energy inverter drives on major items of plant
- Distributed direct digital control systems
 - Control down to individual FATVAV units
- Integrated heat recovery systems
 - On fresh air plant
- Adiabatic humidity control

4.2 Building systems flexibility

Extensive use of free cooling

- Variable static pressure management
 - Minimising fan power
- Optimisation of fresh air supply volumes
- Flexibility of operational times
 - Split floor working
- Systems selection to optimise sustainable operation
 - Demountable systems, modular wiring and controls system design

4.3 Building operations

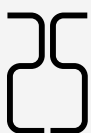
Recycling programmes

- 100% of all building waste is diverted from landfill. All waste is either recycled or sent to a waste energy plant
- Two electric vehicle charge points are located in the basement of the building
- ISO 14001 – Certified in March 2014, setting benchmark targets for energy & waste reduction
- Citi were awarded the Carbon Trust Standard in May 2014 for their efforts in reducing the carbon footprint of their UK portfolio. They were also recognised for their commitment to investment in energy efficient "Green" technology as a means of reducing CO2 emissions. Citi are partnering with Global Action Plan to lessen the environmental impact of doing business in the UK

4.4 Resilience

Extensive use of free cooling

- Supported by 2 rising busbars supplied from 4 of 2,000kVA Rotary Diesel Uninterruptable Power Sets (RDUPS)
- RDUPS are arranged in a parallel configuration to give 2 of N+1 resilience, system A and system B
- Each RDUPS rated at 1,500kW (2,000kVA at power factor of 0.75)
- Each system is supplied directly from separate 11kV double ended substations. Each being supplied directly from two separate 132kV/11kV EDF substations
- As standard at each floor level, tap offs can be installed to supply an average 40kVA of critical UPS power, which can be doubled by utilising both UPS Bars for Dual powered TI equipment for example



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