

4 Tavistock Place

Outline Design Report

For: GFZ Investments

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Executive Summary

This report has been prepared for the client, GFZ Investments, in response to their instruction for the design team to proceed to planning submission

The building consists of a basement, Ground Floor core and 4 floors of commercial space and a roof top plant area.

This document is intended to be used as a basis for the development of the detailed design and preparation of the Stage '3' element of the works. A number of assumptions are identified, which require verification and agreement.

This Cat A fit out will consist of open plan office space on all floors, with plant in the basement and on the roof.

The existing core will be reconfigured with new mechanical, public health and electrical riser.

1.1 Services Overview

Cundall have been employed to provide design services in connection with the following:

- Provide a ventilation strategy to lower ground to fourth areas. Locating VRF heat pump cassette units, ductwork, grilles and Mechanically Ventilated Heat Recovery units (MVHRs) with associated control devices.
- Provide a heating and cooling strategy across floors. This will be achieved using a 2-pipe VRF system with condensers, Variable Refrigerant Flow (VRF) pipework and BC boxes enabling simultaneous heating and cooling.
- Space for future tenants comms rooms cooling will be provided at roof level.
- Provision of new dedicated extract systems serving the toilets.
- Fire detection and alarm system to suit layout and incorporation of new fire alarm zones. fire detection sensors and alarm sounders will be installed as required to suit the Cat A fit-out.
- Roof mounted exhaust heat rejection plant, with associated power and controls
- New lighting, lighting control and emergency lighting for the open plan office areas. New specialist lighting to front of house areas
- New small power on-floor to suit Cat A fit-out
- 150mm raised floor void for future Cat B Underfloor data distribution
- Tenant plant zones

1.2 Key Assumptions

The following outlines the high level briefing and / or assumptions which will be used as key criteria for the development of the design and requires client sign-off:

- Design to Part L 2013 of the Building Regulations.
- BCO Office Guidelines

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2. General Building and Design Criteria

2.1 Base Building

2.1.1 The Building

The Building is located in Euston in Camden, in a dense, urban environment.

The existing offices have no raised floor, but there is a suspended ceiling.

Plant area was at a basement only.

Heating and cooling was via VRF heat pump units with recessed ceiling mounted cassette units in the office space. Heat rejection was via condensers at ground level at the rear.

2.1.2 Base Build Design Criteria

DESIGN PARAMETER	BASE BUILD DESIGN CRITERIA		COMMENTS
Air Temperatures:	Winter	Summer	
External Conditions	-4°C DB saturated	29°C DB / 20°C WB	
General Offices	22°C ± 2°C	22°C ± 2°C	
Primary Supply Air Temperature	18°C	18°C	Limited by grille selections to avoid dumping
Humidity:			
General Offices	Uncontrolled	70% RH maximum expected	Condensate drainage serves FCUs and MVHRs
Occupancy Density:			
General Offices	Assumed 1 person per 10 m/sq		
WC Provision	As per architectural layout		
Outside Air / (Supply Air):			
General Offices	12l/s per person		Refer to table 1 & 2
Cooling:			
Small Power	25W/m² to all levels		
Lighting	8W/m²		
Occupancy	75W/person sensible 55W/person latent		
Comms Room	Future Cat B fit out , space for refrigerant pipework and condensers , any UPS to be on floor		
Acoustic Levels:			
Meeting Rooms	NR35		Cross talk attenuators will be required
Toilets	NR45		MVHR selections will impact on ceiling design
Open Plan	NR38		
Electrical:			
Small Power	25W/m²		
Lighting	8W/m²		
Lighting Levels	400 lux open plan		

3. Mechanical Services

3.1 General Design Criteria and Standards

The office space will consist primarily of open plan office spaces with provision for future tea points.

The specific design criteria for each of the office and ancillary spaces are included within the design criteria data sheets within this report.

In addition to the project specific design criteria the new mechanical services will be designed and installed in accordance with the following industry standards and good practice guidelines:

- British Standards, Codes of Practice and Building Regulations
- CIBSE Guides and Technical Memoranda
- BCO Guide to Specification 2014
- BCO Guide to Fit Out 2011
- BSRIA Guides
- Local Authority Requirements
- BREEAM for Offices 2014 (TBC)
- IET Wiring Regulations
- IOP Guides
- HVAC Publications
- Manufacturer's Literature

3.2 BREEAM

We are not aware of any requirements for the development to be designed and constructed to an equivalent standard rating under BREEAM Offices 2014.

3.3 Existing Systems

The existing offices comfort cooling and heating is by VRF cassette units provided in the raised ceilings with heat rejection at ground floor. The air handling unit was at basement level. The existing boilers are located at Basement level. Hot water was via central calorifiers.

3.4 Office Ventilation / Comfort Cooling and Heating System

The general objectives of the system are:

- Provide a comfortable working environment for occupants of the building;
- Provide cooling to offset the effects of summer fabric heat gain, winter fabric heat loss and internal gains due to equipment, lights and occupancy;
- Provide conditioned fresh air supply and vitiated air exhaust, maintaining offices at slight positive pressure, to reduce ingress of dirt-laden air from outside building;
- Provide occupants with a degree of localised control over their immediate environment;
- Minimise energy and maintenance life cycle costs.

The plant area available for mechanical equipment is located on the roof.

The heating and cooling strategies will be new, there is a wide scope of methods that can be considered.

3.5 Mechanical Services Strategy for Offices

3.5.1 Office Areas Comfort Cooling and Heating Systems

The heating and cooling duties will be served by 2-pipe VRF system that splits across both floors with condenser units at roof level. A 2-pipe system allows the ability to simultaneously heat and cool separate areas with the same condensers. These condensers will be located on the roof plant areas. A single central riser is located inside the core that connects the roof plant area to the lower ground floor.



Figure 1: Office Area Condenser Unit



Figure 2: Spiral wound Duct

Cooling and heating duties will be serviced by surface mounted horizontal ceiling mounted fan coil type units connected to surface mounted plenum boxes. Fan coil units will be specified with spigot air outlet plenums to allow ductwork connections to Swirl diffusers utilising a combination of spiral wound circular ductwork and flexible connections with a maximum of 500mm length. All open plan areas will have no suspended ceiling and thus a visible soffit and services. These fan coil units will be run at low speed to reduce noise.



Figure 3: Swirl Diffuser



Figure 4: Slot Diffuser



Figure 5: Fan coil unit (FCU)



Figure 6: Flat Oval Duct

Open plan FCU units will have control via individual return air sensors set to a central controller temperature. Individual set-point adjusters would be provided for any future Cat B fit out rooms.

The new fan coil units will utilize condensate drainage which will be run at high level to the foul drainage stacks located across the floor plate complete with Hepvo traps. Where new drainage runs are required, these will drain back to existing drainage stacks running by the columns. Condensate drainage will not be connected to rainwater drainage.

3.5.2 Office Area Ventilation

Fresh air will be provided by centrally located MVHR (mechanically ventilated heat recovery) unit at roof level. Primary ductwork to the fan coil units will be pre-insulated flat oval to provide an aesthetically pleasing finish. Secondary ductwork to grills and diffusers will be circular. Airflow will be balanced on the primary duct work by way of VCDs.



Figure 10: Flexible Ductwork

Extract is provided by the same MVHR units serving as supply.

Toilet extract will be managed by separate extract fans serving the toilet areas and exhausting directly to atmosphere at roof level with the fans located in the acoustic enclosure.

Incoming fresh air to the building will be provided via acoustic louvres at roof level. Due to likely external temperatures the incoming fresh air ductwork to the MVHR unit will be both insulated and vapour sealed to offset condensation risk. Whilst not needed for everyday operation, the exhaust ductwork will be similarly treated to ensure no risk of cold bridging when the units are not running, e.g. out of hours and/or at weekends. Plenum box connection to external louvres will also be insulated and vapour sealed.

The MVHR unit incorporates a counter flow heat exchanger to increase efficiency of the unit by either preheating or precooling, depending on the prevailing environmental conditions, the incoming air with the extract air being exhausted out through the unit. In addition, G4 filters will be specified on the intake and extract flow connections. A condensate pump is fitted with alarm facility as standard on all units.

Due to residential apartments located locally, rooftop plant equipment will be acoustically dampened with attenuators, louvres and physically isolated from the building structure to comply with noise regulations.

Electric over door heater will be used above the ground floor door to reduce energy losses that occur when these doors are opened and to improve the environment.



Figure 7: Over door heater/air curtain



Figure 8: Condenser Unit

4. Electrical Services

4.1 Building Capacities

The maximum available electric power capacity for the development is approximately 140kVA (200 amps a phase at 3 phase). This is based on the combined small power, lighting and on floor mechanical plant allowances.

The proposed power provision allocated for the office area floor is 25W/m2 for small power, 12W/m2 overall for lighting, 60W/m2 for HVAC (Heating, Ventilation and Air Conditioning)

4.2 Low Voltage Distribution

A new low voltage switchboard will be provided at Basement level to feed the building. Electrical sub-main cables will be terminated into lighting and power split distribution boards. The on floor distribution boards feed the general lighting, small power and the mechanical systems on each floor.

New distribution boards will be complete with MCB's and RCD's/RCBO's to protect final circuit ways.

4.2.1 Metering

Metering of the installation will need to comply with Part L 2013. The requirement is to install meters on tenant distribution boards, landlord distribution boards, and main mechanical plant; this should be linked back to a central power monitoring system to allow energy usage reports to be easily compiled.

The meters will need to be MID approved and this will allow direct billing by the landlord for electrical consumption.

4.3 General Electrical System Descriptions

4.3.1 Small Power

On floor small power on each floor will be provided from the small power pan of the split metered Type B distribution board located in the local electrical riser. All power circuits, equipment and accessories will be designed for continuous operation and 230/400 volt 50Hz supplies as applicable. The power installation will include, but not necessarily limited to the following;

- Small power supplies
- Mechanical systems – Fan coil units etc.
- Public Health systems – Water heaters etc.
- Automated systems – Fire Alarm etc.
- Security system

A 150mm raised floor will be provided for future Cat B underfloor busbar system.

Cleaner's sockets will be provided around circulation areas and will be RCD/RCBO protected.

Separate circuits will be provided for tea point provided for tea points to suit the function for the area. The power will be presented by flush mounted socket outlets.

Suitably sized power outlets, protected to IP65 rating, will be provided as necessary at roof level for mechanical plant and maintenance.

4.3.2 Lighting & Lighting Controls

The lighting design shall generally be in accordance with the CIBSE Lighting Guides in particular CIBSE Lighting Guide 7 'Lighting for Offices', BS EN 12464-1 Lighting of work places Part 1: Indoor work places and the requirements as detailed in the design criteria matrix listed in section 1.

A new lighting system will be provided for the new office layout. The system will consist of energy efficient suspended direct/indirect DALI-dimmable LED luminaires.

Selected luminaires throughout the office areas will be provided with integral battery packs and inverters to maintain operation to the lamps in event of power failure.

4.3.3 Fire Alarms

In the absence of a fire strategy report, it is currently proposed that the fire alarm system on the office floors should be designed and installed to category L2 – where automatic detection devices are installed in the office floors to provide very early warning signals.

4.3.4 Containment

New dedicated cable containment will be installed throughout the office space for the purpose of containing the cables for all electrical services

In general cable tray will be used to convey all sub main cables to the distribution boards in the risers and the mechanical plant on the roof.

Dedicated containment will be provided for the Fire alarm, Security, BMS and IT cables.

4.3.5 Security

Access control facilities will be provided on all external doors (main entrance and exit doors).

The access control system will consist of:

- Maglock door release button, break glass unit, Swipe card, Proximity reader, Push to release button

Containment will be provided to the doors onto the office floors for future access control

4.3.6 IT & AV Systems

Vertical containment will be provided vertically for future Cat B IT cable installation

4.3.7 Earthing & Bonding

All relevant metal construction elements including structural steelwork and water pipes will be earthed and bonded as required by IEE Wiring Regulations.

4.3.8 Lightning Protection

We have assumed that a lightning protection system won't be provided although we believe that a risk assessment will recommend that one is installed.

5. Public Health Services

5.1 Domestic Hot and cold Water Supply

The building is provided by a single cold water main supply consisting of one metered domestic supply which serves the entire building. Metering is provided by the water utilities company for this domestic service.

A break tank/booster pump unit will be needed in the basement and the supply would be boosted and fed to the toilets and tea points.

Boosted cold water supplies are provided to the landlord's core, servicing all building domestic requirements via copper pipework rising mains located within the risers.

For hot water an electric hot water cylinder will be located in the basement plant room serving the new toilets on each floor.

5.2 Water Distribution to Floors

- Generally, the cold water services will be designed and installed in accordance with:
- The Water Regulations Design Guide Supply (Water Fittings) Regulations 2000,
- BS 8558,
- I.O.P. Guide
- CIBSE Guide
- Building Regulations, and all relevant local and statutory authority's regulations and byelaws.
- L8, The control of legionella bacteria in water systems, approved code of practice and guidance
- Design Criteria

Maximum velocity of water in pipework: 1.5 m/sec.

Maximum pressure for all fittings 3.0 Bar

Minimum Pressure for all fittings 1.5 Bar

Maximum temperature 15°C

Pressure reducing valves and flow restrictors will be provided on all sanitary appliances.

Automatic shut-off solenoid valves linked to leak detection and presence detection will be provided on cold supplies to each floor and are intended to isolate the supply when the area is un-occupied or a leak is detected.

Instantaneous hot water heaters for kitchenettes will be installed by the sub tenant. All cold water supplies to water heaters will be fitted with an isolating valve, non-return valve, double check valve, expansion vessel, pressure reducing valve, inline magnetic water conditioner and drain off valve. To ensure compliance with HSE L8 provide all hot water supplies from instantaneous hot water heaters (by sub tenant) with local self-regulating heat maintenance tape powered from an independent circuit from the local distribution board.

Public Health will generally be in accordance with the following:

BS EN 12056, BS EN 12050, BS EN 12380 and BS EN 752.

BS 8000-13:1989 Workmanship on Building Sites. Code of Practice for above ground drainage and Sanitary Appliances.

The Building Regulations Part H of the Building Act 1984.

Where pipes pass through fire compartments, all penetrations will be fire sleeved.

5.3 Foul Drainage

Foul drainage and ventilation stacks serving the office toilet accommodation will be located at the core. Fan coil unit condensate will be drained back to the foul stacks.

Foul drainage will generally be in accordance with the following:

- BS EN 12056, BS EN 12050, BS EN 12380 and BS EN 752.
- BS 8000-13:1989 Workmanship on Building Sites. Code of Practice for above ground drainage and Sanitary Appliances.
- The Building Regulations Part H of the Building Act 1984.

Drainage will be achieved via a mix of gravity and lifting pumps in conjunction will gravity dependant on location. The pumped drainage units will be equipped with high level alarms to allow early identification of faults.

Appendix 1 - Drawings
