GFZ Properties

4 Tavistock Place

Outline Services Design Report

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		Name	IM	TR	PO'H
		Signature			

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1. Executive Summary

1.1 Introduction

The proposal is to change of use of existing offices to apartments at lower ground to fifth floors and the roof. The residential development will include nine apartments as follows:

- Lower ground floor - flats 2 & 3 – two apartments (2 bed)
- Ground floor - flat 1 (2 bed)
- First floor - flat 4 – one apartment (3 bed)
- Second floor - flat 5 – one apartment (2 bed)
- Third floor - flats 6 & 7 – (1 bed & 2 bed)
- Fourth floor - flats 8 & 9 (duplex) – (1 bed and 2 bed)
- Fifth floor - flat 09 (duplex)

1.2 Servicing Strategy

a) New metered gas supplies will be provided to each apartment to serve gas fired boilers no natural gas fireplaces. Cooking will generally be electric induction type.

b) New metered mains water connections to each apartment. New soil and vent pipework connected to the existing drainage system.

c) New metered low voltage supplies will be installed to distribution boards in each apartment.

d) All apartments are to be served by individual gas fired boilers with separate hot water storage and individual balanced flue the rear façade or to roof level. Balanced flues will require access for annual inspection, joints and changes in direction. Apartment with single bathroom may be served with combi boiler.

e) Comfort cooling will be provided for the apartments via multi-split units with heat rejection on terraces or externally at roof level.

f) All apartments are naturally ventilated with local extract to toilets and kitchen.

g) Electrical services to apartments to include LED dimming (not a lighting control system, except flat 9), lighting including five amp outlets, power for kitchen equipment, TV/Satellite distribution, IT cabling , wiring for Audio visual systems speakers, Video access control system, fire detection and alarm.

h) Services distribution will be via the floor void and ceiling voids of the apartments with pipework, conduit/cables, etc. installed vertically concealed to fittings/outlets.

i) No BMS system assumed, local control panels for comfort cooling units and underfloor heating. Heating and cooling to be interlocked to avoid simultaneous operation.

1.3 Key Risks

a) UKPN acceptance of service head relocation.

b) National grid to confirm requirements of gas infrastructure reinforcement if required.

c) Service trench through lower ground floor apartment.

d) Sprinklers being imposed by the fire brigade.

e) Access to water booster pump set and break tank.

f) Planners may insist on a heating arrangement that complies with the London plan which requires central heating plant with space for a future heat exchanger.

2. Basis of Design

2.1 Room Services Design Parameters

Room Type	Air Temperature (1), (2)		Humidity Control	Occupancy	Ventilation Rate		Electrical Loads / Heat Gains (w/m²)		Noise Criteria (4)	Air Infiltration (Air changes / hr)	Comments
	Summer (Cooling)	Winter (Heating)			Extract	Supply	Lighting	Equipment			
External Ambient (for 'steady state' plant sizing)	30ºC DB, 20ºC WB	minus 3ºC							Refer to section 2.4		External condensers select at 35ºC DB ambient
Kitchen	No control	21ºC +/- 2ºC	None	1 person	Continuous trickle speed with boost via light switch or humidistat activation (Hood details TBA)	Transfer Air	20	1000	NR40 - 45	1	Equipment load is for electric cooking
Living Room / Dining	22ºC +/- 2ºC	21ºC +/- 2ºC	None	6 persons @75% diversity	Transfer to Kitchen	Trickle Vent	20	15	NR30	1	
Master bedroom	22ºC +/- 2ºC	21ºC +/- 2ºC	None	2 persons	Transfer to Bathroom	Trickle Vent	15	20	NR25	1	
Single bedroom	No control	21ºC +/- 2ºC	None	1 person	Transfer to Bathroom	Trickle Vent	15	20	NR25	1	
Double bedroom	No control	21ºC +/- 2ºC	None	2 persons	Transfer to Bathroom	Trickle Vent	15	20	NR25	1	
Bathrooms	No control	22ºC +/- 2ºC	None	-	Continuous trickle speed with boost via light switch or humidistat activation	Transfer Air	25	150	NR35	N/A	Equipment load is for electric UFH
Hall WC	No control	22ºC +/- 2ºC	None	-	Continuous trickle speed with boost via light switch or humidistat activation	Transfer Air	25	150	NR35	N/A	Equipment load is for electric UFH
Communal corridor	No control	19ºC +/- 2ºC	None	-	-		12	5	NR45	N/A	Electric door heater
Plantroom	No control	Frost protection	None	-	-		12	To suit plant items	NR75	N/A	Electric frost protection

Notes

1 All temperatures are dry bulb air temperatures, +/-2°C is the allowable measurement tolerance due to control bands and variation around room etc.

2.2 Environmental Design Parameters

U-values for thermal elements (to comply with Part-L1B 2013) – Residential

Element type	Minimum U-values - W/m²K (Renovated Elements)	Minimum U-values - W/m²K (New Elements)	Comments
Wall	0.3	0.28	Figure shown are minimum values for 2010 Part L1b.
Floor	0.25	0.22	
Roof	0.18	0.18	
Windows	1.6	1.6	
External Doors	1.8	1.8	

Note that the 'U' values above will be improved under 2013 Part L1B.

2.3 Building Services Plant Redundancies

Plant	Redundancy
Boiler	None
Hot water storage & pump	None
Cold water booster Pumps	Duty-Duty (n+1)
Kitchen extract fan	None
WC extract fan	None

2.4 Public Health Services Design Parameters

2.4.1 Domestic Cold Water

- Water Temperature: Assumed 10°C for hot water plant sizing.
- Sanitary fittings to be flow restricted to comply with Building Regulations Part G to meet 125 litres per person per day. Standard bath volume up to 165 litres capacity. Dual flush WC of 6/3 litre flushes to be specified by Architect. Flow rates for showers at 9 litres/min, basin at 4 litres/min, kitchen tap at 6 litres/min,
- Hot water storage based on each shower being used twice an hour, each for a duration of 5 minutes.
- Pipe velocities 1.50 m/s max.
- Incoming mains cold water to be supplied via cold water break tank and boosted / pressurised mains water supplies to serve apartments located at lower ground floor in a plantroom.
- Supply Pressure: Approximately 3 Bar at the entry into the apartment but to suit selected sanitaryware.
- Storage Temperature: 60ºC , hot water distribution 55ºC.
- Water Hardness: As per Thames Water incoming mains water i.e. approximately 300ppm. A Physical Water conditioner will be installed on the cold feed to the hot water heaters to reduce scale build up. Softened water is not required.
- Recovery times to be less than 2 hours.
- Temperature control to all sanitary fittings except kitchen sink.

2.5 Acoustic Design Parameters

We haven't yet seen the acoustic consultant's report.

2.6 Electrical Services Design Parameters

Cooking – electric induction hobs and electric ovens

Lighting levels - Landlord's areas

Corridors – 100 lux on floor

Staircases – 100 lux on floor

Plantrooms – 200 lux on the floor

Lighting levels – Apartments

These are approximate target levels , as there are no specific standards for apartments.

Lounge / dining – -50 Lux approximately(Note LG9 recommendations are for 150 lux , additional lighting via residents luminaires plugged into 5amp outlets)

Bedrooms –-50 lux approximately (Note LG9 recommendations are for 150 lux , additional lighting via residents luminaires plugged into 5amp outlets)

Kitchen – 150 lux on worktops

Bathroom – 100 lux

3. Scheme Design Description

3.1 Utility Services

3.1.1 Electricity

The existing incoming UKPN 200 amp TP&N 50Hz supply is terminated at a service head at lower ground floor level in a room internally accessed from the lightwell. The supply cut out and service head is to be retained (the actual maximum demand service fuse capacity needs to be verified). A new Ryefield distribution panel will be provided to serve the new apartments.

UKPN have been contacted with regards to the maximum demand capacity of the existing supply and we are to meet with them to discuss relocation of the service head.

3.1.2 Gas

The existing gas supply is routed from the lower ground floor gas meter cupboard accessed from the lightwell and positioned under the lightwell stairs. The gas pipe runs from lower ground floor meter room to the existing boiler room.

The existing gas supply is circa 35mm diameter. The new gas pipework will enter the lightwell and drop vertically into the service trench. The existing supply will need to be upgraded and individual new gas meters provided to serve each residential apartments. The gas pipe riser is to be naturally ventilated. Distribution pipework within unventilated void is to be of pipe-in-pipe arrangement.

Emergency Control gas isolation valve (and test point) will be provided inside the apartment within close proximity to the point of entry in the apartment. Gas will supply the boilers. No gas pipe will be routed to the kitchen, however, the infrastructure of the gas pipework should be sized to allow future flexibility for gas cooking in the kitchen.

Further load calculations checks will need be undertaken during the detail design. The gas supply will be sized to allow provision for future change from induction hobs back to gas-fired hobs.

3.1.3 Water

The existing 22mm diameter water supply is be upgraded to serve a new cold water booster set. Due to limited plant space, new duty-standby water submersible booster pumps will be provided. Mains boosted cold water pipework will rise up within the riser to all apartments. New water meters, isolation valves, double check valves for each apartment will be provided within the services riser. Additional isolation valve is to be provided within the apartment.

3.1.4 Telecoms

The existing telecoms terminate in the electrical cupboard.

Each apartment will be provided with a telecom line/service. For landlords services an appropriate number of lines will be provided for the lift and fire alarm dial-out services.

3.2 Mechanical Services

3.2.1 Heating

Flats with one bathroom are to be served by combination boilers with integral enhanced storage (e.g. Potterton PROMAX / Worcester Bosch – Greenstar). Two bed flats and larger require a system boiler with separate hot water cylinder. A balanced flue is to be provided to each boiler which is to be accessible for annual inspection. Pressure relief vent to be discharged externally as per manufacturers guidelines.

Apartment rooms will be generally heated by wet underfloor heating throughout, with bathrooms heated by electric underfloor heating and electric thermostatically-controlled towel rail. Multi-split units can be used to provide initial heat boost function. Simultaneous heating and cooling of internal units is not possible with this system, so all internal units will be either in heating mode or cooling mode.

Boiler to be provided with a 7 day hot water / heating controller with override and frost protection.

Heating and domestic water distribution to be copper pipework.

A temperature sensor / adjuster will be provided in the hall to control overall temperature.

The Landlords areas to be heated by an overdoor electric heater at ground floor only.

3.2.2 Cooling

For the apartments, cooling will be by refrigerant-based multi-split system per flat, with the outdoor units located at terrace or at roof level depending on the apartment. The outdoor condensing units to be selected as low noise units to meet the acoustic environmental planning restrictions (details not currently available). Refer to the room services design parameter for rooms which are cooled.

The multi-split system to be interlocked with the wet underfloor heating system, to avoid simultaneous heating and cooling. Each internal fan coil unit will be provided with separate controllers to adjust temperature, fan speed and mode etc.

Condensate from indoor units to be mounted to nearest foul stack, with waterless traps.

All supply and return air plenum to be acoustically lined. Return air to fan coil is generally via air tight ceiling plenum.

3.2.3 Ventilation

The apartments are to be provided with toilet extract to exhaust to the rear façade or to roof level. Apartments to be naturally ventilated by trickle vents to the new windows to the rear to satisfy minimum ventilation requirements. Bathrooms, toilets and kitchens will be maintained under negative pressure relative to adjacent rooms. Kitchens to the apartments will be provided extract via the extract fans ducted to the rear façade or roof level.

Escape stair is to be provided with automatic opening vent (AOV).

Service riser and lift shaft will be naturally ventilated via louvres at roof level.

All extract grilles to be of linear slot diffuser type with acoustically lined plenum.

3.3 Electrical Services

The Electrical Services are to be in accordance with the 17th Edition IEE Wiring Regulations.

The apartments are to be provided with separately metered electricity services. In the LV riser a new sealed TP & N Ryefield switchboard will be provided with independently metered sub-main supplies via main isolation switches installed on a dedicated low voltage cable tray. This system is to distribute xlpe/swa/lsf 3 core cables to the apartments via an electrical riser with meters and isolation switches on the floors served. Distribution boards will be provided with 2 split RCD protected sections and 1 non rcd protected section, in each apartment with utility metered supplies. A landlords distribution board will feed the communal areas, lift and plant areas.

For apartments , RCD protected circuits will be provided except for security, fire alarm, fridge/freezer and cooker circuits.

Lighting will consist of 5 amp circuits, wall lights, downlighters, furniture lighting, under cupboard lighting, lighting controlled from local switches. Lighting control systems are not required (except for the top duplex), but living, kitchen, dining, hall and bedroom area downlighters are to be controlled via mains LED dimming light switches controlling dimmable drivers to control LED downlighters.

Bathroom lighting to be recessed ceiling mounted IP Rated low energy LED downlighters, with switches outside the rooms, mirror wall lighting, mirror demisters and separate shaver outlets.

Kitchen lighting to be low energy LED downlighters and LED lighting under cupboards.

Cupboard lighting is to be provided by low energy LED linear luminaires.

Living room lighting – LED energy led downlighters and 5 amp lighting outlets.

Bedrooms – low energy LED downlighters and 5Amp lighting outlets adjacent to beds with separate light switches.

Halls – low energy LED downlighters.

Lighting in communal stairs will be PIR controlled wall mounted luminaires . For the plantroom corrosion resistant luminaires will be mains fed and locally switched. Emergency lighting will be provided in landlords areas (plantroom, roof condenser area) in accordance with BS 5266 Part 1.

Provide all lighting and small power cabling in apartments wired in LSF twin and earth cabling clipped fixed to the soffit within the ceiling void and floor void and installed vertically in metal conduit to back boxes. Provide all extra low voltage cabling installed in a similar manner but vertically on PVC conduit to back boxes. General lighting and emergency lighting will be provided on the communal stairs, lift shaft and plant areas. Electric trace heating will be provided for any pipework deadlegs or pipework in exposed areas.

Electric underfloor heating will be provided in all bathrooms. Each bathroom is to be regulated by individual temperature sensors in the floor linked to an individual underfloor heating local controller which must be located in local accessible cupboard and incorporating 7-day/4-event time control and temperature adjustment. System to be rated at 150 w/sqm.

The apartments' Fire Alarm systems to be Grade D LD1 detection coverage in accordance with BS5839 Part 6. This will include individual mains linked detectors/sounders with integral batteries. An automatic opening vent will be provided at the top of the stair, and associated control system in the staircase and at Ground floor, linked to smoke detectors in the staircases wired on the landlords system.

The main landlords fire alarms panel will be in the entrance at Ground Floor level with smoke detectors at every level in front of the lift, including interfacing with the smoke vent system.

A smoke detector will be provided at the top of the lift shaft and the lift interlinked with the fire alarm system to ground on alarm.

Carbon monoxide detectors will be provided in the apartment boiler cupboards and in every room where the boiler flues run through the apartments horizontally to rear façade and to the risers.

Power will be provided in apartments including power for electric ovens, power to electric induction hobs, electric towel rails, multigang switch for kitchen equipment including fridge/freezer with double socket for fridge / freezer., cooker hood, microwave, (switched from multigang switch) , 2 switches on multiswitch for fridge/freezer with unswitched socket outlets behind to serve washing machine + tumble drier etc., Switches for remote kitchen appliances should be engraved for identification, 150mm above worktop. Also fire alarm power, electric underfloor heating power, kitchen and bathroom extract fans.

Apartment socket outlets quantities to be the following minimum

Living rooms – 4 double switched socket outlets

Bedrooms – 3 double switched socket outlets for bedrooms

Kitchens – 4 double socket outlets 150mm above worktop.

Dining areas -– 2 double socket outlets

Hallway – 1 double socket outlet

Ceilings to be wired for ceiling speakers in all main room (bedrooms, dining room and kitchen) with cables wired back to a home hub location. Cat 6 cabling to be star wired from a hub location to all telecom / data locations.

TV and telephone outlets will be provided in each bedroom, living/dining rooms and kitchens. Outlets to be wired from a central home hub location adjacent to the distribution board. All accessories to be flush except the plant room which are to be IP54 surface mounted.

A communal satellite / television system will be provided with an Astra satellite dish at roof along with an aerial, with distribution to splitter units on each floor.

A communal video entry system with an external video call station will be provided , with a colour camera linked to video intercom units in each apartment with door release facility.

A video intercom system will be provided for residents use, with magnetic locks on the doors, on the secure side push to release switch and emergency break glass units. The doors will have an electric strike operated by a manual key on the secure side.

Separate vertical containment for extra low voltage systems will be provided.

Cabling for power operated electric blinds won't be provided.

All apartments to include wiring from a main door contract to a future intruder alarm panel.

Power will be provided in landlords areas including power to lift and lift shaft lighting and power, video access control equipment, entrance lobby, lockable socket outlets in stairs/corridors, fire alarm panel power supply. Additionally an electric overdoor heater will be provided at ground floor level entrance lobby.

External lighting will be provided to the external roof terraces with low level LED lighting. External lighting will be provided to the entrance canopy with photocell controlled LED lighting.

3.4 Public Health Services

Provide a new mains water supply reconfigured to feed a new break tank / booster pump set which will provide minimal amount of cold water storage with inlet flow to match booster pump duty with distribution to serve the new domestic water services. The supply will be metered and distributed to the apartments via a service trench from the lightwell and via risers.

For each metered apartment supply within the water tank room allow for two isolating valves, one drain cock, one double check valve and the Thames Water billing meter and pressure reducing valve.

Cold water pipework to be fully insulated and vapour sealed within building and service voids.

A cold water supply will be provided to washing machines and dishwasher in every apartment with isolating and double check valve.

Hot water storage will be provided locally within each apartment. Expansion relief lines and condensate to connect to soil and waste system via in line traps.

Provide soil and waste system for the apartments with stacks dropping through the building serving bathrooms and kitchens, collecting discharge from all sanitary/kitchen appliances and condensate drains.

Anti-syphon pipes will ventilate sanitary fittings exceeding building regulation distances from soil vent pipes.

Vertical stacks without offsets of soil and waste pipe work (unless absolutely necessary) installed with adequate gradients to prevent blockages and noise, when used. All stacks will be lagged acoustically with fire sleeves at each floor.

Pipes concealed within walls: Wherever possible pipework will be concealed within walls vertically or horizontally from the point at which the pipe exits the wall and becomes visible to the point at which the pipe enters the floor or ceiling void.

Pressure reducing valves will be provided to each floor to ensure equalised water pressure is available to sanitary fittings.

Rainwater pipework routed internally will be thermally insulated and vapour sealed rainwater pipes. Running traps will be provided at the point of connection to the combined system.

All internal waste and rainwater pipework to be HDPE silent DB20 with heat fusion and or electro fusion couplings with expansion joints and anchor points . in accordance with manufacturers recommendations.

Below ground drainage system provided by structural engineer.

Sanitary fittings to be specified by Architect.

Water closet cisterns to be specified with internal overflows.

4. Quality Guide

4.1 Mechanical and Public Health Services

A. Boilers – Viessman or Hamworthy or Worcester Bosch or Potterton

B. Underfloor heating – Warmerfloor or Heatmeister

C. Extract fans – Vent Axia or Solar and Palau or Nuaire

D. Break tank – Bratihwaite, Dutypoint

E. VRF – Mitsubishi or Daiken

F. Booster pumps – Grundfos, Dutypoint

4.2 Electrical Services

A. LV distribution panel – Ryefield

B. Distribution boards – Crabtree or MEM

C. Accessories – Get Premium retractive (dimming)

D. Accessories – Get Premium

E. Apartment LED downlighters – Orluna MRF mini recessed and DMR2 mini tilt and rotate.

F. Stair luminaires – John Cullen step lights – Cazalla led steplight + emergency wall lighting

G. Electric underfloor heating – Devi - Devilink

H. Landlords fire alarms – Kentec panel, Apollo XP95 devices

I. Tenants fire alarms – Kidde Slick