19 John Street

Outline Design Report

For: GFZ Developments

Job No: 1013127

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Project Name:	19 John Street
Client:	GFZ
Report Title:	Outline Design Report
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Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision

Document Validation (latest issue)

Revision	Issue Date	Purpose of issue / description of revision / version			
-	22/04/2016	Revised to incorporate Architects comments			
			Prepared by	Checked by	Verified by
		Initials	IM	SS	POH
		Signature			

Executive Summary

1.1 Introduction

The existing building is used as an office and the proposal is for a change of use from B1 office to C3 residential. The building consists of lower ground floor to 3rd floors with a roof terrace on top. The building will be extended including an extension of the closet wing and modification of the rear lightwell.

1.2 Servicing Strategy

a) The existing 35mm gas intake terminates at a meter in the Lower Ground Floor front office area. The supply will be replaced to feed new boilers in the lowered vault.

b) A new metered mains water connection will be provided to the vault to feed a combined break tank and booster set, with a meter in the vault.

c) A metered 100amp 3 phase low voltage supply is currently provided to the house. The supply will be relocated to the vaults.

d) No comfort cooling will be provided.

e) New gas fired condensing boilers and hot water storage cylinder (s) will be provided in the plantroom vault. Boiler flues will be discharged into the lightwell at the front of the building. Underfloor hot water heating (UFH) generally throughout, with electric underfloor heating and towel rails in Bathrooms. Trench heaters will be used to reduce downdraughts from single glazing in listed rooms.

f) New telecom lines will be provided. A separate new line for the lift.

g) Extract systems will be by MVHR or local extract fans for the rear of the building and the bathroom/toilets. Purge ventilation will be achieved by natural means by opening windows.

h) Softened water will not be provided.

i) Domestic hot water supply system to be provided with trace heating or a pumped return. 1No. wash down point in the lightwell and watering points on both terraces.

j) Electrical services to include LED dimming, lighting including five amp outlets, power for kitchen equipment, electric oven, TV/Satellite distribution, IT cabling, wiring for Audio visual system speakers, Video access control system, fire detection and alarm. Also electric UFH to Bathroom and mirror demisters, terrace small power supplies.

k) A sky satellite dish at roof level will not be provided.

l) CCTV will not be provided.

m) Intruder alarm system will not be provided

1.3 Access to Plant and Plant Removal

Mechanical and electrical plant will be located to ensure adequate maintenance access space is achieved and all equipment can be serviced in accordance with the manufacturer's recommendations. Plant will be mainly located in the vaults at Lower Ground Floor.

Internal Plant and Equipment

Access panels to be provided where regular servicing is required for drainage traps and valves. Access doors will be provided to service zones/cupboards for access to boilers, hot water cylinders, distribution board, UFH modules etc.

To limit number of access panels, it is accepted that destructive access will be used for volume control dampers (VCD), recabling etc. Location of VCD's to be dimensioned on the record drawings to walls to facilitate location in the future.

Plant in the Vault

Plant located in the vault is to be removed either via the lightwell stairs to ground, or if heavy equipment lifted using a mobile crane located in the road.

Contents

2. Basis of Design

2.1 Design Codes & Standards

The following latest codes and standards will be applied to the development:

- Building Regulations and its corresponding Approved Documents
- British and European Standards, and Codes of Practice
- Public Utility Company and / or Statutory Authority Regulations, specifications and installation guides
- Health & Safety (HSE) Guidance
- The Construction (Design and Management) Regulations
- All current statutory and other codes
- BRE Design Guidance
- Buildings Services Research and information Association (BSRIA)
- Relevant EN and ISO standards
- BSRIA Application and guidance notes
- CIBSE Guides, Technical Memorandums and Commissioning Codes.
- Thames Water Bylaws/Regulations
- BS EN 12056 Gravity drainage systems inside buildings
- Chartered Institute of Plumbing and Heating Engineers (CIPHE)
- The Institute of Plumbing and Heating Engineers – Plumbing Engineering Services Design Guide
- BS7671 (IEE Wiring Regulations)
- Electricity Acts, Electricity at Work Regulations
- Gas Safety (Installation and Use) Regulations. The Institute of Gas Engineers and Managers (IGEM)
- Clean Air Act, The Control of Pollution Act
- Insurance Company Requirements
- Local council and Borough Statutory Requirements

2.2 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	- 4ºCdb saturated							Refer to section 2.4		
Kitchen	No control	21ºC +/- 2ºC	None	4 person	Continuous 13l/s Intermittent (boost) 50l/s	Ducted from terrace above	20	1000	NR40 - 45	1,5	MVHR supply and extract Equipment load is for electric cooking
Reception	No control	21ºC +/- 2ºC	None	6 persons @75% diversity	48	48	20	15	NR30	1.5	
Master bedroom	No control	21ºC +/- 2ºC	None	2 persons	16 l/s	12 l/s	15	20	NR25	1.5	
Dining room	No control	21ºC +/- 2ºC	None	4 persons			20	15	NR30	1.5	MVHR supply & extract
Double bedroom	No control	21ºC +/- 2ºC	None	2 persons	Transfer to Bathroom		15	20	NR25	1.5	
Bathrooms	No control	23ºC +/- 2ºC	None	-	12l/s continuous extract	Transfer Air	25	150	NR35	N/A	Equipment load is for electric UFH
Entrance Hall	No control	19ºC +/- 2ºC	None	-						2.0	
Study	No control	21ºC +/- 2ºC	None	2 persons	16	16 l/s	20	15	NR30	1.5	
Dressing Room	No control	23ºC +/- 2ºC	None		Transfer to bathroom		15	10	NR30	1.5	
Laundry	No control	21ºC +/- 2ºC	None		8 l/s		20	40	NR40	N/A	
Vault plant	No control	12ºC +/- 2ºC	None	-	Nat vent	Nat vent	15	-	NR65	N/A	Equipment load to suit plant equipment
Hallway & Stairs	No control	16ºC +/- 2ºC	None	-	Nat vent	Nat vent			NR35	2.0	
Cinema Room	No control	21ºC +/- 2ºC	None	4 persons	10 l/s	12 l/s	15	15	NR30		
Gymnasium	No control	20 ºC +/- 2ºC	None	4 persons	50 l/s	40 l/s	15	10	NR30		
Changing rooms	No control	23 ºC +/- 2ºC	None								
Powder room	No control	22 ºC +/- 2ºC	None	-							
Formal dining room	No control	21 ºC +/- 2ºC	None	6 persons			20	15	NR30		

Notes

1. All temperatures are dry bulb air temperatures, +/-2℃ is the allowable measurement tolerance due to control bands and variation around room etc.
2. There will be no humidity control, save for fortuitous de-humidification as a result of air cooling by the fan coil units (i.e. the removal of moisture by condensation forming on cooling coils).
3. Purge Ventilation is to be provided through operable windows sized in accordance with Part F of the Building Regulations, or mechanical extract to internal rooms where necessary.

2.3 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 2013 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.

2.4 Building Services Plant Redundancies

Plant	Redundancy
Boiler	2 modular sized at 65% each
Hot water storage & pump	None
Cold water booster Pumps	None
Kitchen extract fan	None
WC extract fan	None

2.5 Public Health Services Design Parameters

2.5.1 Domestic Cold Water

- 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 20 litres/min, basin at 4 litres/min, kitchen tap at 6 litres/min. All fittings to be provided with flow restrictors to reduce flow rates to Part G requirements.
- Pipe velocities 1.50 m/s max.
- Supply Pressure: Approximately 3 Bar to suit selected sanitaryware.
- Water Hardness: As per Thames Water incoming mains water i.e. approximately 300ppm.
- Water Storage capacity is 650l, with 22 l per person with approx. 4 hours of daily water storage

2.5.2 Domestic Hot Water

- Water Temperature: Assumed 10℃ for hot water plant sizing.
- Mixed temperatures to be based upon 65% hot and 35% cold.
- Hot water storage based upon 80% of showers to be used in a one hour period, each shower being used for a duration of 8 minutes.
- Recovery times to be less than half an hour.
- Storage Temperature: 60ºC, hot water distribution 55ºC.
- Temperature control to all sanitary fittings except kitchen sink.

2.5.3 Drainage

System	Criteria
Design rainfall intensity	210mm/hr rainfall intensity
Foul drainage	BS EN 12056 Discharge Units

2.6 Acoustic Design Parameters

Awaiting acoustic report

2.6.1 Electrical Services Design Parameters

2.6.2 Electrical Demand

The current estimated diversified power requirement has still to be calculated, but it is expected that a 100amp 3 phase supply will be required.

2.6.3 Lighting Levels

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

Area	Illumination level lux	Comment
Lounge / dining	50	LG9 recommendations are for 150 lux, additional lighting via luminaires plugged into 5amp outlets
Bedrooms	50	LG9 recommendations are for 150 lux, additional lighting via luminaires plugged into 5amp outlets
Kitchen	150	On worktops
Bathroom	100	
Vault Plantroom	200	On the floor

The emergency lighting isn't required.

2.6.4 Fire Detection and Alarm System

Fire safety systems will comply with the requirements of the Fire Strategy outlined by the Fire specialist consultant.

The system will be designed in accordance with the requirements of BS 5839 Part 6 LD1 Grade D. Fire alarm sounders will be provided on the 1st floor terrace and the roof terrace. Approval from the Fire Officer and the Building Control Officer is required.

2.7 Design Life

Plant and Equipment Design Life

The building and its component parts will be designed to provide a Service Life in accordance with BS 7543 Table 1, Category 4: Normal Life.

Generally

System	Service life
Mechanical Engineering Systems	15 years
Electrical Engineering Systems	15 - 20 years
Lift Installations	20 years
Control Systems (incl. Fire Alarms)	15 years

3. Outline Design Description

3.1 Utility Services

3.1.1 Electricity

The existing incoming UKPN supply is rated at 100 Amp TP&N is terminated at a service head in the Lower Ground Floor front office in an electrical cupboard. The supply cut out and service head will be replaced and relocated to the vaults.

3.1.2 Gas

The existing gas meter is located within the Lower Ground Floor front office area in a cupboard.

The existing 35mm diameter gas supply is to be replaced with a new incoming gas supply. Any new gas pipework is to be sized to ensure the gas pressure drop is within acceptable limits to serve the new gas appliances.

Provision should be allowed for new pulsed output gas meter.

3.1.3 Water

There is an existing incoming 22mm water supply. The intention is to provide a new supply to a water booster/ pump set in the vault that will serve the house.

3.1.4 Telecoms

New telecoms cables will be installed via an incoming 90mm diameter duct, with the facility for copper and / or fibre. Separate copper line will be provided for the lift.

3.2 Mechanical Services

3.2.1 Heating

The house will be provided with new high efficiency gas-fired condensing boilers located within the vault. The boiler flue is to discharge to the front light well.

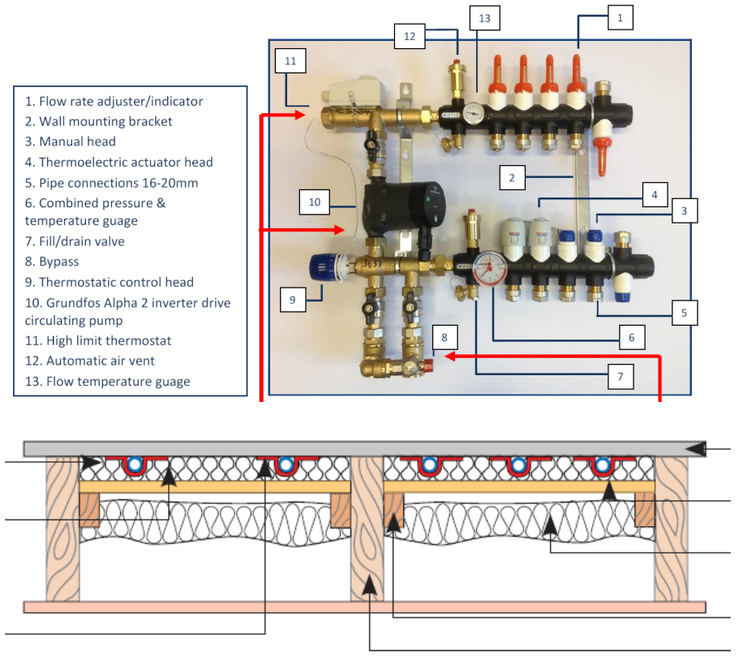
Two system boilers (Fig1.1) are to be provided with separate unvented indirect cylinders (Fig1.2)

System boilers (Fig1.1)

Unvented Indirect Cylinders (Fig1.2)

The house will be generally heated by wet underfloor heating(Fig1.3) throughout with individual temperature and time control and fan assisted trench heaters under the windows. The bathrooms and shower room are to be heated by electric underfloor heating(Fig1.4) and thermostatically-controlled towel rail (Fig 1.5).

Wet fan powered trench heaters are to be provided under all Sash windows to offset the downdrafts from the windows. The wet underfloor heating and trench heaters are to be fed from Heatmiser UH1 wiring centres/controllers.



Wet Underfloor Heating (Fig1.3)

Electric Underfloor Heating (Fig1.4)

Electric Thermostatically-Controlled Towel Rail (Fig 1.5)

A fail-safe high temperature limit thermostat to be included to prevent the manifolds and circuits form overheating, should the TRV head fail. Each room to have underfloor temperature sensor and temperature adjustment via Heatmiser Controllers. Controls to include a slow warm up cycle to suit the joinery specialist's requirements.

Existing walls are to be thermally lined to improve the performance of the building fabric where possible.

Boiler to be provided with a 7 day hot water and heating controller with override, frost protection and weather compensation, and control via the internet when owners are abroad.

Heating distribution to rooms with underfloor heating to be via a manifold complete with 2-port motorised valves to each room served, isolation valves, drain points and a circulation pump / 3 – port valve for temperature control. Manifolds are to be located in accessible positions.

LTHW heating distribution to be copper pipework, insulated and vapour sealed to Approved Document Part L1B standard to minimise heat loss.

A temperature sensor (with a remote adjuster) will be provided in the hallway to provide temperature feedback to the boiler controller.

The temperature / pressure relief line from the boiler is to be routed in copper pipework and discharge to the nearest stack via a tundish and dry trap, all to be suitably temperature rated. Boiler condensate to be run in plastic pipework and discharge to the same tundish via a condensate neutraliser unit as necessary.

Each heating system is to be provided with an expansion vessel, magnetic filter and an air de-aerator.

All exposed heating pipework is to be neatly thermally insulated, and provided with all isolating valves, commissioning sets and other pipework ancillaries to allow the commissioning and maintenance of the system to be undertaken satisfactorily.

3.2.2 Ventilation

The extract ventilation unit is to run on trickle mode with boost function linked to the light switches and humidistat with a minimum of 20mins overrun facility and humidity sensor.

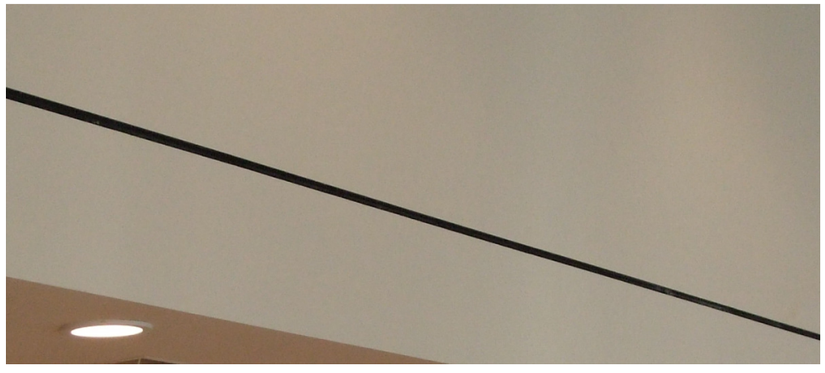
Local extract to the rear terrace for kitchen hood is to be provided where permitted.

Bathroom and toilets will have local extract fans.

Natural ventilation is to be provided to all the front rooms (receptions, bedrooms, formal dining, study)

The gym, cinema room, dining room, kitchen are to be ventilated via MVHR units

All supply and extract grilles to be linear, single slot, high capacity diffuser (Fig1.8), flanges plastered into the finishes, with acoustically lined plenums.



High Capacity Single Slot Diffuser (Fig1.8)

For the rooms with gas fires, permanent vents are to be provided to the fireplaces ducted from the front façade. Chimneys to be reused are to be re-lined for gas tightness by a chimney specialist then tested for air tightness. Chimney fan (Fig1.9) to replace the chimney pots at roof level complete with a noise attenuator within the chimney breast.

Chimney Fan (Fig1.9)

3.3 Electrical Services

A 100 amp 3 phase metered low voltage supply will be provided to the vault plantroom, with the service head and cutout located in one of the service vault at lower ground floor level. The vault floor will be lowered to suit.

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

The meter and isolator will be located at this position with separate xlpe/swa/lsf cables to the distribution boards.

The distribution boards (Fig1.10) will be provided with 2 split RCD protected sections and 1 non RCD protected section. The boards will be provided with 150 x 150mm steel trunking along the top and side which will rise to the ceiling void.

Distribution Boards (Fig1.10)

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 will be with mains dimming LED, lighting with a lighting control system in the cinema room only.

Bathroom lighting to be recessed ceiling mounted IP Rated low energy LED downlighters, concealed 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 – Central lighting point/s and 5 amp lighting outlets.

Bedrooms – Central lighting point, wall lights and 5Amp lighting outlets adjacent to beds with separate light switches.

Halls – Central lighting point, wall lights and 5Amp lighting outlets.

Terrace – Low level LED location lighting

Lighting in the front lightwell will be PIR controlled with wall mounted luminaires. For the vault plant room corrosion resistant luminaires will be mains fed and locally switched.

Provide all lighting and small power cabling is to be wired in LSF twin and earth cabling clipped/banded / 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.
Electric trace heating will be provided for any pipework dead legs or pipework in exposed areas.

Wiring for window treatments isn't required except for the cinema.

Electric underfloor heating will be provided in all bathrooms (Fig 1.4). Each bathroom is to be regulated by individual temperature sensors in the floor linked to an individual underfloor remote Heatmiser heating controller which must be located locally. System to be rated at 150 w/sqm.

The Fire Alarm system to be Grade D LD1 detection coverage in accordance with BS5839 Part 6. This will include individual mains linked detectors/sounders in all principle rooms with integral batteries. Sounders will be provided on the 1st floor and roof terrace.

A carbon monoxide detector will be provided in the vault plant room.

Power will be provided including power for electric ovens, power electric hobs and for gas hob ignition, 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 multi gang switch for fridge/freezer with unswitched socket outlets behind. Switches for remote kitchen appliances should be engraved for identification. Also power will be provided for the mains fire alarms, electric underfloor heating power, kitchen and bathroom extract fans, Wet manifolds, control system equipment, water conditioner, immersion heaters, boilers, shaver/charger outlets in each bathroom, video intercom psu's, dimmer rack, etc.

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 rooms (bedrooms, family living room, dining room and kitchen) back to future AV rack location in the cinema. Cat 6 cabling to be star wired from a home hub location in the cinema to all telecom / data locations.

Telephone cabling from the intake location will run on a ELV cable tray via the riser, along with access control cabling, TV cabling, intruder alarm cabling, etc. Incoming telephone cables to terminate at the home hubs.

TV and telephone outlets will be provided in each bedroom, living/dining rooms and kitchens. Outlets to be star wired from a central home hub location in a cupboard with cat 6 cabling. All accessories to be flush except the vault plant room which is to be IP54 surface mounted.

A satellite system at roof level is to be provided. Digital aerial and DAB antenna will be provided wired to a head end amplifier will be provided with vertical distribution with splitters in the electrical riser with cables to outlets.

A video entry system (Fig1.13) with an external video call stations at the main entrance will be provided, with a colour camera linked to video intercom units at lower Ground, Ground floor and First floor levels with door release facility.

A Video Entry System (Fig1.13)

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

An intruder alarm system will be provided with alarm contracts at external doors and windows at Lower Ground Floor and Ground Floor and PIRs in the hall.

Leak detection and alarm systems aren't required.

3.4 Public Health Services

3.4.1 General

The public health engineering systems details in this report will be designed and installed in accordance with all statutory requirements and in particular the following:

1. The Building Regulation and to comply with Building Control Requirements
2. BS EN 12056-2: sanitary pipework, layout and calculation.
3. BS EN 12056-3: Roof drainage layout and calculation.
4. The Plumbing Engineering Services design Guide. (IOP)
5. BS EN 806:2 Specification for installations inside buildings conveying water for human consumption.
6. L8 - The control of legionellae bacteria in water systems.
7. BS 8558:2011 Guide to the design installation, testing, and maintenance of water services pipework.
8. BS 9990:2006 for non-automatic fire automatic fire fighting system in buildings.
9. BS 9251: Sprinkler system for residential

3.4.2 Hot and cold Water Supply

Provide a new metered mains water supply to enter the vault at the front of the building. Mains water supply to feed a new break tank / booster pump (Fig 1.16) set with soft fill control within the vault 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.

Break Tank / Booster Pump (Fig 1.16)

Within the water tank room allow for two isolating valves, one drain cock, one double check valve and pressure reducing valve.

The boosted water supply will be also provided with an electromagnetic (Hydromag or equivalent) water conditioning unit to reduce scale build-up.

A statutory water meter will be located within the vault. Pressure regulation, isolating valve and a double check valve will be provided.

Provide anti-surge pressure valves at top of circuits.

To mitigate against overheating of cold water supplies, the property owners will have to draw-off water regularly.

Main external terrace at 1st floor and roof to be provided with a water supply for irrigation purposes, complete with double check valves (DCV) internal drain valve for winter frost protection.

Sanitaryware and brassware will be detailed and specified by the architect and be WRAS approved.

Hot and cold water pipework to be fully insulated and vapour sealed within building and service voids to reduce heat gain to cold water service.

Water softener units are not required.

Pre-insulated un-vented hot water storage will be provided within the vault. Expansion relief lines and condensate to connect to soil and waste system via in line traps.

To ensure that hot water is available at the outlet within a short time of opening the tap/mixer valve either a pumped secondary return circuit will be provided or the flow will be electrically trace heated. Hot water distribution systems and hot water dead-legs are not to exceed 0.5m, including any mixed temperature pipework downstream of the TMV.

Baths will be provided with a thermostatic mixing valve (TMV) as Part G of the Building Regulations. Shower mixer valves will also include integral TMV control.

3.4.3 Drainage

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

Anti-syphon pipes will ventilate sanitary fittings exceeding building regulation distances from soil vent pipes. Vertical stacks are to be routed without offsets of soil and waste pipe work (unless absolutely necessary) installed with adequate gradients to prevent blockages and noise. All stacks will be lagged acoustically with fire sleeves at each floor.

Pipes concealed within walls: Wherever possible pipework concealed within walls will run 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.

Rainwater pipework will be routed externally using existing routes on the facade of the building. Repairs etc to be detailed by the Architect. Where routed internally, it will be thermally insulated and vapour sealed. Running traps will be provided at the point of connection to the combined system.

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

Sanitary fittings to be specified by Architect. Water closet cisterns to be specified with internal overflows.

Below ground drainage system to be developed by the structural engineer following receipt of the underground drainage survey.

3.5 Controls

The control system is to provide simple and 'user friendly' control of the heating and domestic hot water systems. The following facilities will be provided:

Individual time control of the overall heating system

ON/OFF over-ride of timed heating

Night set back and optimum start facilities

Individual adjustable temperature and time control to all rooms served by UFH system

Automatic and manual override control of ventilation system i.e. 'boost' mode

All spaces will have discrete temperature sensors/adjusters. The wet underfloor heating manifolds are to be wired back to the Heatmiser wiring centres. All main areas are to be provided with a temperature controller located on the wall.

Electric underfloor heating zones in bathrooms will be switched by relay/contactors controlled by Heatmiser controllers.