M&E Residential Services Strategy

Project: 55 Cumberland Terrace, London NW1 4HJ and

29 Cumberland Terrace Mews, London NW1 4HT

KUT Project No: 6618

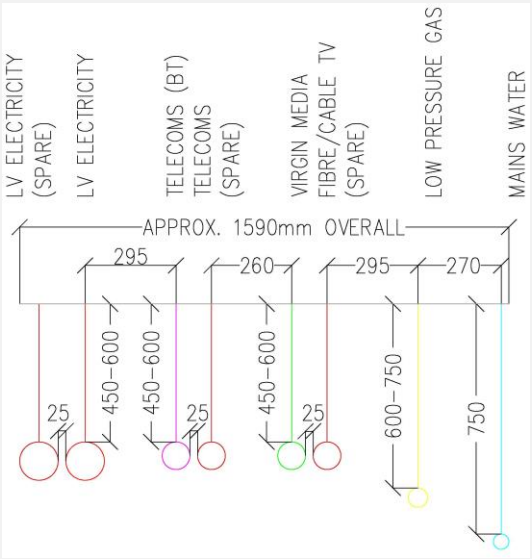
Date: 09 November 2020 (Issue No.4)

Item No.	Description
1.0	**Site Overview** The project comprises the refurbishment of a grade 1 listed single family home, including a mews house which would be linked. This services strategy is intended as a scoping document, formalising the M&E proposals and thereby informing the services design. The services strategy can be used for the basis of the detailed design works to a Stage 4 Tender pack under a procurement route to form the Employer's Requirements and steer the Contractor Design Portions when procuring a Design & Build Contract. It is expected that the appointed contractor would adhere to performing works suited for grade 1 listed building. All onsite works including new installations shall be carefully approached and shall refer to architects list of items to identify protected areas throughout the building. Where services cross floor area, say inside the house, they should carefully remove and reinstate. All protected areas shall be protected and reinsure are reinstated to original. **This is considered as a working document requiring input from all members of the Client's Design Team. Where required further issues will be submitted incorporating various comments and observations from Team Members**
2.0	**Incoming Service Provision** The development is to be provided with new utility service connections typically routed from Cumberland Terrace with the exception of utilising the existing foul drain connection via Cumberland Terrace Mews. New services to include: • Mains cold water • Low voltage electrics (LV) • BT/Comms • Gas • Cable/Fibre

In addition, the site is expected to be connected to the foul sewer in Cumberland Terrace Ways and the surface water sewer in Cumberland Terrace, assuming that the existing connection requires changing. If possible, the existing connection should be retained and remedial works to reline if required.

A CCTV survey should be undertaken to assist in the decision making process. KUT understand the in-slab drainage and site wide drainage will be undertaken by the Structural Engineer. This includes any sewer connections or outfall works.

New incoming services will be arranged in accordance with the National Joint Utilities Group guidance (NJUG); see typical detail below:



The proposals for the Contractor's temporary builders supplies (TBS) are to be confirmed upon appointment. The existing main house electricity service and water services would be retained in readiness for the contractor's usage.

3.0 Building Fabric

No other principle thermal improvements are intended due to the property Listing.

The new build elements of the property are to be designed and constructed to the minimum building fabric efficiencies to meet the requirements of the Building Regulations calculations for approved document Part L1A (unless deemed as L1B by BCO/AI).

Design U-values, Air Tightness, and Plant Efficiencies will be driven by the Standard Assessment Procedure Calculations (SAP calculations.).

In addition, subject to the L1A calculations, the following M&E elements are proposed:

- AD Part F System 4 MVHR unit to be provided for the Lower Ground Floor and AD Part F System 3 to be provided to ventilate the remainder of the property. The unit shall be Vectaire or equal.
- Heating and DHW by gas fired boiler with 95% seasonal efficiency and indirect Hot Water Storage cylinders.
- 100% low energy lights.

4.0 **M&E Services Strategy**

New M&E services are to be provided throughout, broadly as follows:

4.1 - ELECTRICAL SERVICES

1. General

1 No. New incoming electricity service capable of 100amps TP&N 3-phase service with associated whole current electricity meter is proposed to be located within the dedicated electrical services intake located at Lower Ground Floor vault.

Dwellings electrical sockets and switches fixing heights typically at 450-1200mm above finished floor level.

Distribution Board (DB) shall be provided to the property and area, as required. Each DB is expected to be a minimum of 12 ways.

2. Lighting

The Client's requirements are yet to be finalised; however initial proposals assume standard switching arrangements.

The lighting proposals are to be confirmed by the Architect, however it is expected that the lighting will comprise energy light emitting diode (LED) or compact fluorescent (CFL) lighting throughout, incorporating recessed fittings and coffer lighting.

All fixed lighting to be low energy types, with IP rated external to bathroom, wet and lighting.

Lighting levels as CIBSE guides:

Room	*Illuminance (lux)*
Living Room	50 - 300
Bedroom	100
Bathroom / En-suite	150
WC	100
Kitchen in House/Kitchenette in Office	150 - 300
Hall/Stair/Landing	100
Office	450

5A lighting circuits will be considered as part of the interior design.

3. Small Power

13A fused twin sockets throughout.

The proposal is to include a number of USB sockets to the property.

4. Audio/Visual and Telecoms

The Client's preference on inclusion of A/V is yet to be finalised.

Fibre Optic Broadband is required, subject to availability. CAT6 or CAT5e data outlets throughout including in utility cupboards for wireless routers to be part of the installation by Client's specialist.

BT Openreach, Virgin Media and / or equal TV installation to be provided to the House. New incoming telecoms and fibre-optic services intake are proposed to be located within the dedicated electrical services intake located at Lower Ground Floor vault.

Outlets shall be to all habitable rooms, bedrooms etc. Additional areas to be agreed with the Client but allow 16 points.

A number of visible and invisible speakers in ceiling, wall & joinery are proposed for the project. The speakers are typically plaster-in, recessed and or obscured view types. For design development purposes, typical speaker locations layout is enclosed to the document.

5. Access Control/Door Entry

Audio visual door entry system as BPT or similar (TBC), with colour monitor entry panel at the front door of the main house as well as to the entrance door via the mews.

A doorbell/chime will also be provided to the house.

It is presumed that a 'spy hole' will be provided in the front and side doors, if not glazed.

6. Security

House - Hard-wired intruder alarm fitted comprising of door contacts, 4-way PIR detector, panic buttons to bedroom and entrances, front and ancillary entrances and hall located fob/keypad.

CCTV – A CCTV system shall be provided covering site wide and internal courtyard. For pricing purposes, allow for 6 cameras but can be adapted to suit Client requirements.

7. Smoke Alarm

Mains operated smoke detection heads with battery back-up will be installed in all areas of escape e.g. hallways, in accordance with BS5839 Part 6 in all living rooms and lobbies.

A heat detector will be provided in the Kitchen and a carbon monoxide detector above the boiler's within the boiler cupboard.

4.2 - MECHANICAL SERVICES

1. Environmental Control

Design parameters as follows:

Winter

Location	*Dry bulb temp/℃*
External ambient	-5 (saturated)
Bedroom	22
Living Room / Kitchen	22
Hallway, Stairs and Reception Room	21
Gym	18

Summer

VRF (Variable Refrigerant Flow) comfort cooling is proposed for the dwelling.

Location	*Dry bulb temp/℃*
External ambient	30
Bedroom	23 ± 2
Living Room / Kitchen	23 ± 2
Hallway, Stairs and Reception Room	21
Gym	18

1. Space Heating

A pair of condensing system boilers is proposed to serve the dwellings heating and domestic hot water services requirements. The boilers are proposed to be in a dedicated utility cupboard at Lower Ground Floor and the boilers to have either a concentric or twin flue arrangement discharging through the roof of Main House building, with flue diverters where required. Flues run horizontally to be laid to fall back to boiler to suit Manufacturer's recommendations for the purposes of condensate drain, typically at 1½ - 3° incline. All to be agreed with the Architect and Listed Building Officer.

Location and flue arrangements to be agreed.

Wet underfloor heating system is proposed throughout and wet panel radiators are proposed to supplement and provide back up to the Underfloor system. Where carpet is provided, the requirement is for underfloor heating to all areas including carpets, however consideration should be given if tog values of carpets are high, as radiators may be the more appropriate solution.

Wet underfloor heating is most likely to be an overboard system at Lower Ground floor and battened system at ground floor and all floors above. Other underfloor heating systems options will be considered, where applicable, are screed in system type. All to be agreed with the Architect. Local 'Heatmeiser' (or other)

controls per heating zone. Final arrangement TBC.

The Listed building underfloor heating system shall be either within the floor joists or over floor system. Use of existing notches and joists to be used where practical. **Any new notches and holes shall be carried out in the accordance with listed building regulations and structural engineer's details.** All to be developed as the design progresses and shall be in compliance to planning, regulations and structural engineers design details.

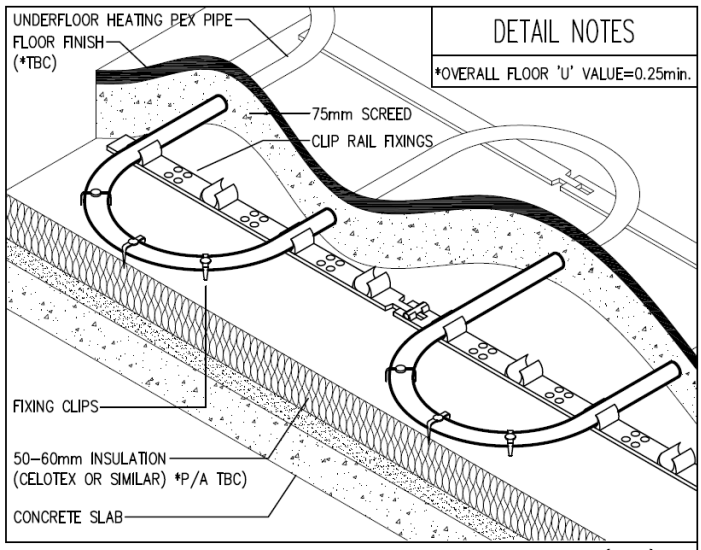
Underfloor heating controllers to be provided in each zone for scheduling delayed start thermostat of boiler. Floor probes to be provided under sensitive floor finishes such as timber or engineered board.

As a point of note, floor finishes must not provide insulation levels above 2tog in order to guarantee effectiveness of the underfloor heating systems.

Underfloor warming to be provided in the bathrooms, shower rooms, en-suites, etc. in the form of either water based or electric mats within the tile bedding.

Heating water or electric towel rails in all bathrooms, shower rooms, en-suites, etc.

Wet underfloor heating assumed to be a traditional 'clipped' system within the appropriate system proposed at Lower Ground & Floors above. Final arrangement TBC.
Typical UFH system details below:



SOLID EXPOSED FLOOR UNDERFLOOR HEATING DETAIL (NTS)

Floor probes to be provided under sensitive floor finishes such as timber or engineered board where applicable floors above.

Consideration will be given for interfacing the underfloor heating with the A/V and home automation packages, where provided, typically via connection with a 'Heatmeiser' control system or equal & approved.

2. Comfort Cooling

VRF (Variable Refrigerant Flow) comfort cooling is proposed for the dwelling. A total of 5 No. Outdoor condenser units are proposed to be located at the Lower Ground Floor Vault and roof of the main house to serve the dwelling.

AC pipes and electrical cables from the condenser shall be routed to the dwelling within the designated services risers.

The outdoor units are specially selected in terms of its make such that the space and noise constraints are met. Where required to meet noise control, acoustic enclosures are proposed for the roof mounted condensers.

The average COP of the system in cooling mode shall meet Class A standard.

The internal fan coil units inside the dwelling shall generally be chassis type installed as detailed on the drawings, refer to 6618/M105-M108 for details. All condensate pipes from the fan coil units shall be taken to soil or waste stacks.

3. Cold Water

An application for new metered water connections shall be made to serve the dwelling. The existing water supply is retained for the temporary builders works usage. Main contractor upon their appointment shall verify the connection size suits to their requirements and shall undertake all remedial works including making any new TBS water application where required.

Sanitaryware and fittings (plus white goods) to be selected to meet Building Regulations Part G, G2 calculations for water efficiency for new build elements.

4. Hot Water

Hot water to be provided by quick recovery indirect hot water storage cylinders.

2 - 3 No. HWC of Sizes expected to be 300 or 200L vessels to serve the dwelling.

Thermostatic mixing valves on all bath outlets (TMV), and to be included integral to shower valves for lock-out at 43°C from hot water outlets.

Sanitaryware and fittings (plus white goods) to be selected to meet Building Regulations Part G, G2 calculations for water efficiency for new build elements.

5. Ventilation

Mechanical ventilation shall be as required under Building Regulations Part F.

Approved Document Part F System 4 MVHR (*Mechanical Ventilation with Heat Recovery*) unit to be provided to serve the Lower Ground Floor and AD Part F System 3 MEV (*Mechanical Extract Ventilation*) unit to be provided to ventilate the remainder of the property. The unit shall be Vectaire MBOX unit to limit ventilation

ductworks runs across the floor. Any alternative units shall be verified with the project team for approval prior to placing orders.

The Lower Ground Floor MVHR Unit fresh air intake and exhaust air ventilation terminals are proposed to terminate above the Mews house roof level.

The exhaust air ventilation terminals of the MEV Units located at Ground Floor and above are proposed to terminate on the dwellings external rear façade and above the Main House roof level.

MVHR ventilation system and MEV ventilation system to run at trickle rates with simple interlock with bathroom lighting or dedicated movement detector for 'boost' rate, plus a remote 'boost' switch in Kitchen for associated MEV units operation.

Where applicable, the windows to the existing property are to be replaced with appropriate heritage windows. No trickle vents will be provided at Lower Ground Floor Level.

Ducted cooker extractor hood is proposed and the unit selection is by the Kitchen/Kitchenette Designer. A 200mm dia cooker extract ventilation ductwork termination is proposed to be above the Mews House roof level.

Purge ventilation by openable windows to Architect's details.

Lower Ground Floor vaults to be ventilated naturally via louvered doors across all the 3 No. existing vaults and air bricks to supplement and provide back up to achieve required air flow.

Extract ventilation rates as Building Regs' approved document Part F:

Room	*Extract rate (ltr/s)*
Utility Room	8 (min. high rate)
Bathroom / En-suite	8 (min. high rate)
Kitchen	13 (min. high rate) (or as Kitchen Designer's specification)
Basement	2-4 air changes/hour
Toilet	8 (min. high rate)

Air valves located within ceilings for supply and extract air ventilation is proposed. Finishes to architects specifications and details.

Where feasible, the supply air ventilation would be via comfort cooling high induction slot diffusers (located in joinery).

6. Gas

Main contractor shall make relevant applications to statutory authorities for the existing incoming gas connection located at Lower Ground Floor lightwell intake cupboard is disconnected from the parent gas main and associated gas meters are removed.

For the proposed family dwelling, a new gas connection is proposed suitable to serve 2 No. Gas fired condensing system boilers, 5 No. Gas Fires and gas hob. The new incoming gas service is proposed to be terminated within one of the existing lower ground floor vaults with associated ECV and a gas meter.

The gas fire locations proposed by the architects are as follows:

- Ground Floor
  - G.01 Study (*Existing E.G.01 Dining Room*)
  - G.02 Dining Room (*Existing E.G.02 Kitchen*)

- First Floor
  - 1.02 Drawing Room (*Existing E.1.02 Drawing Room*)
  - 1.03 Reception Room (*Existing E.1.03 Library*)

7. Acoustics

As per CIBSE guides:

Room	*Noise Rating (NR)*
Living Room	NR30
Bedroom	NR25
Bathroom / En-suite	Not controlled
Kitchen	NR40 - 45
External ambient	Refer to Acoustic Report by Acoustics Plus
Office	NR35

Background Noise Survey and Acoustic Report by others.

4.3 - PUBLIC HEALTH SERVICES

The current property is served by direct drain connections to Thames Water sewers located in Cumberland Terrace Mews and Cumberland Terrace.

1. **Above Ground Foul Water Drainage**

HDPE or PVCu soil and waste vent stacks with PVCu branch pipework.

All drainage to be concealed, but to include access points for rodding at heights above the appliances being served e.g. above wash hand basin heights.

Multi-manifolds to be used where floor levels dictate, or where 'no-connection zones' on SVPs can't be avoided.

Soil vent pipes (SVP) and waste vent pipes (WVP) to vent to atmosphere where practicable.

Air admittance valves (AAV) to be used where stacks can't vent to atmosphere (ventilation openings to be provided where AAVs are concealed). Where stub-stacks installed with AAVs, these can be used for rodding access. Stub-stacks and AAV's to terminate above the flood level of the associated appliances e.g. wash hand basin spillway.

Wire balloons on all SVP terminals to prevent bird ingress.

Existing SVP's strip out works shall be undertaken carefully and replace with new installations and reinstated to original conditions.

2. **Above Ground Rain Water Drainage**

HDPE or PVCu pipework, rainwater goods and accessories throughout with rodding access.

Existing RWP's strip out works shall be undertaken carefully and replace with new installations and reinstated to original conditions.

3. **Below Ground Drainage**

Drainage to be conveyed to the external drain. Design by others.

5.0	**SUSTAINABILITY** Sustainability items are not secured for this grade 1 listed building. However, the following are considered and may include: • Use of high efficiency gas fired condensing system boilers. • High efficiency MVHR whole house ventilation system for Lower Ground Floor only (subject to confirmation of SAP calculations). • SAP calculations shall be prepared. • U values to new build elements would be better than Building Regulations.
6.0	**RENEWABLES** No renewable options considered due to grade 1 listed building.

	Circulation: The 55 Cumberland Terrace & 29 Cumberland Terrace Mews Design Team