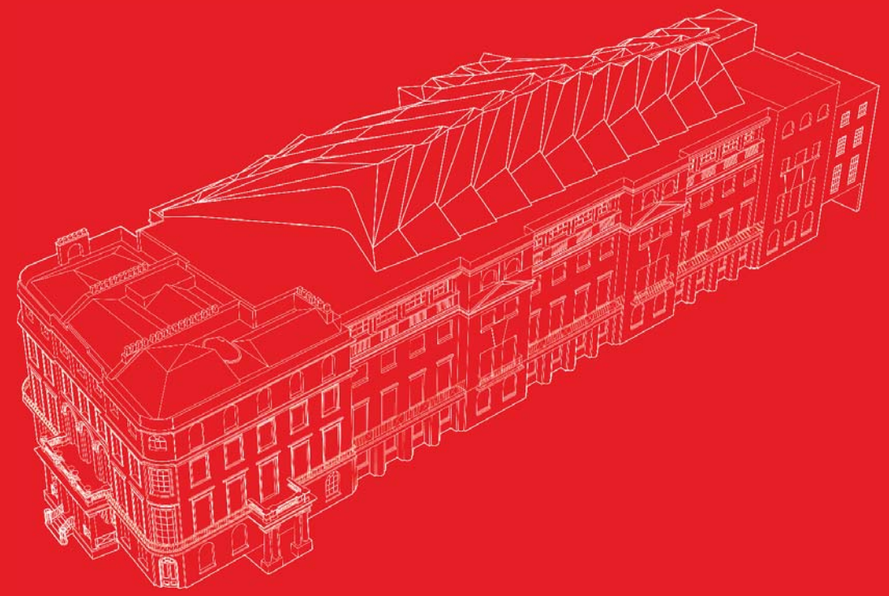
WHICH? HEADQUARTERS

2 MARYLEBONE ROAD AND 1-9 ALBANY STREET

MECHANICAL AND ELECTRICAL STATEMENT

AUGUST 2013



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EXECUTIVE SUMMARY

This building services report is for the Which? magazine head quarter building located at 2 Marylebone Road & 1-9 Albany Street, London. This is a refurbishment and extension project, which includes replacing the existing building services system and adding an additional level on the existing roof.

This report identifies the building services proposed for the building at Stage C, at planning submission.

Refer separately to the 'Sustainability Statement ' identifying the Camden Council Planning requirement is to provide a pre-assessment that exceeds BREEAM 2008 (refurbishment) 'Very Good' for the building and also demonstrate a 20% renewable technologies commitment (from the London Plan) for the new extension only.

Mechanical:

- New chillers and adiabatic coolers to provide chilled water for chilled beam system, fan coil unit systems and air handling units;
- Existing boiler system is to be replaced with the new, provide low pressure hot water for chilled beam system, fan coil unit systems and air handling units;
- New kitchen and toilet extract fans;
- New fan coil unit system for the south part of the building, and new chilled beam system for the open plan office area.

Electrical:

- The existing Main Electrical Switchgear shall be retained, and modified as required to suit the revised electrical installation;
- The electrical load required to serve the building is estimated to be in the region of 520 kVA. As such the service capacity agreement requires renegotiation;
- UPS back-up shall be provided to the Server Room (and associated air conditioning plant), with consideration being given to providing an alternative 'back-up' supply to the building's essential systems;
- The existing extension and listed areas of the building shall be independently serviced electrically, with dedicated riser cupboards provided within each;
- Electrical supplies to different services shall be individually metered to allow the monitoring and recording of energy usage;
- The existing incoming telecommunications/data services shall be retained, and re-routed to terminate within the newly former Server Room. Any additional new services shall follow the same service routes as the re-routed existing supplies, and shall also terminate within the Server Room;
- A photovoltaic (PV) installation shall be provided on the remodelled roof

Public Health:

- New hot water cylinders/calorifiers and booster set for domestic hot water services;
- New cold water tank and booster set for cold water services;
- New rain water harvesting system for green wall irrigation;
- New foul drainage and rain water services to suit the updated floor and roof layout.

The following project risks and MEP design issues require consideration/development as the design progresses:

- Engineer needs to take special care when maintaining the equipment inside the 3rd floor and 4th floor plantrooms, due to limited amount of accessible space.
- The comfort cooling system is designed to provide 25°C indoor temperature in summer based on 7m²/person occupancy. If the building occupancy exceeded the design value, there will be a risk of overheating during summer time;
- Chilled beam system is proposed for the open plan office space, this system is not adaptable if the open plan offices changed to cellular offices in the future.
- Final maximum electrical demand for the redeveloped building, and renegotiation of the existing service capacity agreement;
- Necessity of providing an alternative/back-up LV supply to the building;
- Requirements for 'life safety' systems;
- Final requirements of the lightning protection system through undertaking of a full risk assessment;
- Location and full requirements of the Server Room;
- Final details of Which?'s telecommunications and data services requirements;
- Confirmation that the existing UPS installation provides suitable back-up provisions for the Client's IT requirements;
- Full requirements of the Audio Room;
- Final kitchen electrical requirements;
- Final lighting fitting types;

Final security and access control requirements

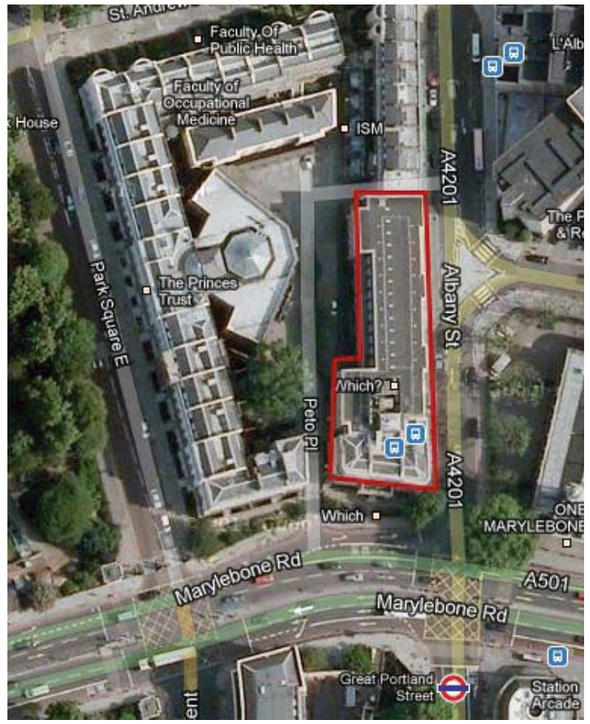
1 Introduction

Number 2 Marylebone Road is a Grade II listed early 19th Century building listed for group value with the Regent's Park Nash terraces, which connects to 1-9 Albany Street, a modern 1980's office extension. The building is located in the Regent's Park Camden Conservation Area and forms the single office building occupied by the headquarters of Which?.

Which? is a product-testing and consumer campaigning charity with a magazine, website as well as various other services. Which?'s influence is constantly increasing. Changes in working practices and staff structure, as a result of a rapid shift towards digital publishing and anticipated increases in staff numbers, mean that the existing office space is unsuitable for its continued occupation without extension and refurbishment. The existing building is without the desired facilities to host events such as awards ceremonies, roundtable discussions, lobbying events and seminars. At present, Which? expends considerable resources (which could be better directed towards its charitable aims) in renting conference space off the premises. The refurbishment of the building will address this deficiency.

The plan to extend includes a new level added at existing Roof, along with new 'pods' modifying the Peto Place elevation to accommodate core functions, such as lifts, toilets, meeting rooms etc. The extension will add approximately 20% to the building internal net area, with the Albany street 'extension' fully refurbished and the Nash Terrace front building with a 'light' refurbishment.

This report describes the building services proposed at planning (Stage C) for the new refurbishment and extension project, confirming the client brief, the basis of design, details of utilities, systems and the builderswork, including options available.



Which? Headquarter on Google Map

2 Design Considerations

Design criteria for the refurbishment and extension shall be as follows;

- Mechanical, Electrical and Public Health equipment/component sizes, locations, layouts and quantities are indicative only and a final installation design will be developed;
- Routing and diagrams of services are indicative only and a final installation design will be developed;
- Any assumptions made in our calculations or design are outlined, and agree to be developed/confirmed during the detailed design stages;
- Where services run within voids, it has been assumed that adequate space is available. Void requirements are to be confirmed during detailed design stages.
- Coordination with the Architect has been conducted to produce this report. Further coordination with all those concerned shall be required as the development progresses into detailed design stages;

2.1 Mechanical

External conditions: Summer 25°C @ 20°C WB;
Winter -4°C @100% RH;

General indoor condition: Summer 25° C ±2°C, no humidity control;
Note; de-humidification at central plant to prevent condensation on chilled beams;
Winter 22°C ±2°C, no humidity control;
Note; night time set-back after 20:00 to 05:00 at 15°C

General office area occupancy: 7m²/person;

Fresh air supply: 12l/s/person;
Lighting energy: 2.5W/m²/100lux;

Toilet extract: 10 air changer per hour;
Hot kitchen extract: 45 air changes per hour;

2.2 Public Health

The domestic hot and cold water services design follows BS EN 806 and Water Regulations. Sanitary plumbing and rainwater disposal services design follows BS EN 12056.

Domestic cold water daily demand at 45l/person/day and 6hours storage;
Domestic hot water stored at 5l/person/day and 1 hour reheat period;
10,000 litres (approximately) rain water harvesting tank is proposed.

2.3 Electrical

- Rule of Thumb figures, CIBSE guidelines and information from the IES modelling software has been used when evaluating the usage and requirements of the building.
- In accordance with the existing functionality of the building it has been assumed that a Server Room will be required to support the new IT services. The design detailed within this report assumes that the telecommunications services infrastructure shall be relocated to the new Server Room. As such, allowances for this space and its associated systems have been accounted for at this stage of the services design.
- Where a chilled beam solution has been utilised within the building, all lighting, lighting control and fire alarm services shall be incorporated within the unit as appropriate for each individual space.
- Any design and allowances made pertaining to the kitchen areas have been based on Humble Arnold Associates preliminary information, with assumptions made regarding the existing kitchen/canteen area at basement level as required. All details shall be confirmed as the design progresses.
- The details of the Audio Room at second floor level are unknown at this stage of the design. Assumptions have been made regarding the electrical requirements for this space, which will need to be confirmed as the design progresses.

2.3.1 Lighting & Small Power Load Assumptions (New Electrical Demand);

Table 2.3.2 (next page) provides a breakdown of the figures used for each space when calculating the maximum demand of the redeveloped building.

Note:
a) Lighting W/m^2 figures are based on CIBSE Guide F (Table F9.1) guidelines for compact fluorescent lighting.
b) Small power loads are based on IES Thermal Modelling Software (2012) database figures.

Mechanical Plant
The following allowances have been made for the fixed items of mechanical plant that will service the building (see *Mechanical Systems* section for further information).

Item	Location	Single Ø or 3Ø	Running Load	Diversity
Adiabatic Coolers (x2)	4th Floor	1	1.17A (x2)	0.8
AHU 1	3rd Floor	3	45.6A	0.8
AHU2	3rd Floor	3	8.4A	0.8
AHU3	Basement	3	4.6A	0.8
Chillers (x2)	Basement	3	68kW (x2)	0.8
Boilers (x3)	Basement	1	0.582kW (x3)	0.8

Table 2.3.1 Mechanical Plant Electrical Loads

An allowance for miscellaneous items of mechanical plant has also been included to account for currently un-sized plant and to factor in a degree of redundancy. This has been estimated to be 20% of the total of all other items of mechanical plant.

In addition to the above data, the following assumptions have been applied to the Maximum Demand calculation:

Lifts

- 15kW has been allowed for each of the 3No Main Lifts, with electrical diversities of 1, 0.7 & 0.33 applied respectively.
- 12kW has been allowed for the Service/Goods Lift, with an electrical diversity of 0.5.

Hand Dryers

- An allowance for hand dryers has been made depending on the size of each WC (2No. max), with 1No hand dryer allowed per disabled toilet (35 total). A load of 1.6kW per hand dryer has been included within the maximum demand calculation, with a diversity of 0.15 applied to each.

The table details the lighting levels to be achieved throughout the building and the associated power required to achieve them, as well as the small power loads allowed for each area. The diversity factors applied to the lighting and power usage within each space are also detailed.

Area	Lighting level (Lux)	Lighting W/m^2	Applied Diversity	Power W/m^2	Applied Diversity
Open Plan Office	500	14	1	27.81	1
Private Office	500	14	1	11.8	1
Meeting Room	500	14	0.8	11.8	0.6
Reception	300	8	1	11.8	1
Circulation	100	6	1	1.85	0.2
Internal Public Zone	300	8	1	1.83	0.6
Storage	100	6	0.4	1.85	0.2
Security	300	8	0.8	11.8	0.8
Kitchens (Ground & Fourth)	500	14	1	Based on Kitchen Specialist info.	
Sub-Kitchen/Canteen (Basement)	500/300	14	1	42	0.7
WC's	200	8	0.8	1.85	0.2
Event Space	500	14	0.7	20	0.7
CER (Server Room)	200	8	0.2	300	1
Audio Room	300	8	0.8	300	0.8
Staircase	150	7	1	1.85	0.2
Vertical Services	100	6	0.2	0	0
Plantroom	200	8	0.3	1.85	0.2
Car Park	75	5	0.7	1.85	0.2
Bike Store	150	7	0.4	0	0

Table 2.3.2 Maximum Electrical Demand Assumptions

3 Existing Utilities and Modifications Required

Terminations of existing services to the existing sites to suit the new building requirements;

3.1 HV Sub-station/Incoming Electrical Supply and Resilience

3.1.1 Existing LV Supply Characteristics

The existing electrical infrastructure within the building has been surveyed and evaluated. Information pertaining to the buildings current electricity supply and usage over the last decade has been obtained from UK Power Networks (obtained 21.01.13) and it's suitability to serve the redeveloped building analysed.

- **Existing Main Electrical Meter Details:**
  MPAN: 12000136238
  Serial No: P05A20870
  Part No: P3TA23/11B43EN5

The building is a Low Voltage site with an agreed ***existing service capacity of 400kVA***, from 1994.
Electricity usage data for the building has been obtained dating back to December 2003. This data shows that the maximum and minimum demands for the building during this period have been:

- *Maximum demand*: **352.9kVA**, June '05
- *Minimum demand:* **216.5kVA**, Feb '09

UK Power Networks have confirmed that there have been no power outages and no call outs to this address within the last 24 months (as far as their records go back), and the supply has remained consistent throughout this period.

3.1.2 Maximum Demand Calculation for the Redeveloped Building

A detailed pre-planning stage maximum electrical demand calculation has been undertaken in order to estimate the connected load required of the redeveloped building. This has been based on the latest GA's, with a number of assumptions made regarding how the various spaces of the building shall be used (see Section 2, Design Considerations).

The calculation shows that a supply in the region of **520kVA** will be required to serve the redeveloped building.
This figure is greater than the existing service capacity agreement with the supply provider.
As such, at this stage of the design it is thought that a new service capacity agreement will be required.

The exact requirements for the increased electrical supply to the building shall be confirmed as the design progresses, however the relevant applications shall be made at the earliest possible point in order to ensure that the needs of the redeveloped building can be met by the electricity service provider.

3.1.3 Existing Uninterruptable Power Supply (UPS)

An existing UPS system provides a backed-up electrical supply to the Server Room and the associated IT equipment.

The UPS is rated at 60kVA, is in good condition and could be retained. It is reported that the UPS provides 15 minutes redundancy. All the associated switch gear to the UPS is in good condition and can also be retained.

3.1.4 Resilience of Existing Electrical Supply

The existing Main Electrical Switchgear is of suitable condition and capacity to be retained and reused to serve the redeveloped building. The incoming supply is not prone to any faults or disconnections, and is reliable in nature.

Due to these facts, and the nature of the buildings use and the tasks undertaken within it, it is not felt that an alternative/back-up supply for the entire building is necessary.
As such, standby generation to protect against failure or disruption of the public supply is not proposed at this stage.

Although it is not felt that standby power generation is required to protect the supply to the entire building, critical power protection should be provided to the systems essential for the functionality of Which?

It is therefore assumed that the IT Network (Server Room), and associated air conditioning plant, will again require a backed-up supply, and as such the Client must decide on the level of resilience required to their essential IT systems in order to ascertain whether the installed 60kVA can meet their revised requirements.

Should it be determined that the 60kVA capacity is insufficient, or that additional resilience is required, a new UPS system shall be provided. Any new UPS system shall be rack mounted if possible.

Consideration is also being given to providing an alternative (reserve) LV supply to the building should it be determined that fire fighting and/or active smoke control systems are required. Should this be the case then such systems shall be supplied from both the main electrical infrastructure and the alternative 'back-up' supply, with changeover between the two in the event of mains failure being automatic.

The retained electrical switch panels have an existing chamber for future generator connections, making the installation of a generator a viable option to provide any back-up supplies.
The feasibility of bringing a secondary LV supply to the building from an alternative local transformer (on a separate HV ring) is also being investigated.

As the design progresses further discussions shall be held with the Client (and other members of the design team) to ascertain their requirements for backed-up supplies to the critical systems within the building. This shall determine the requirement for any local secondary supplies and/or UPS systems, and their associated capacities.

3.2 Combined Sewer Connection

Existing rainwater and foul drainage drops through the building and combined at exit point and discharges on the Peto Place (east side of the building) at high level Car Park.

Please refer to appendix I for the existing drainage infrastructure map obtained from Thames Water.

3.3 Gas

Appendix I includes the existing gas service map produced by national grid. The external grid gas supply passes along the pavement perimeter of the Which building's east side (Albany Street). The supply continues the pavement along the south side of the Which building and continues up through Peto Place where the drawings indicate a supply to the building close by the existing basement plant room.

Modification is required on incoming gas services to suit the new boiler room location. Boilers will be replaced by the new ones.

3.4 Water

Thames Water is the current water provider to Which building. An existing portable water service map is included in the appendix I. A 9" water distribution main is running along the east side of the building, a 12" water distribution main is running parallel across the south side of the building and a 6" main and a 3" main are running at the west side of the building. All the mains water pipework are at approximately 900mm below ground level.

The existing cold water tank and the pump set are located at north side of the existing roof. The current incoming cold water supply comes from Albany Street(east side of the building), it needs to be re-routed to the south side of the basement, where the new cold water tank is going to be located.

3.5 Telecommunications & IT/Data Supplies;

The existing incoming telecommunications and data services shall be retained to supply the redeveloped building.
Currently, BT multicore cabling and fibre cabling from various suppliers enter the building within the car park at basement level, and rise through the dry riser to terminate in the dedicated Telecommunications and Server Rooms respectively.

At the time of writing, the requirement for/location of the Telecoms (PABX) room is unconfirmed. However, based on conversations with the Client it is assumed that the telecoms/data services shall be unified to terminate in a single room – this being the new server room. Therefore the BT service shall terminate here.

Which? are looking into the possibility of replacing the current ISDX Public Automatic Branch Exchange (PABX) internal telephone system. The nature of the new installation is currently unknown, but the requirements for the new system shall be considered and provided for as the design progresses.

Should the existing PABX system be replaced, any new incoming telecommunications services and associated hardware shall be located within the new Server Room.

The retained existing incoming telecommunications and data services shall be re-routed to rise to the ground floor floor void via a new riser adjacent to the basement lift shaft. Any junction/extension boxes required shall be located within the newly formed telecoms cupboard at this location on ground floor. From here the service shall be distributed within the ground floor floor void to the new 'North Electrical Riser', where they shall rise to terminate in their new locations.
Each service shall be extended as required to meet these new requirements.

Any new incoming services associated with the telecommunications/data installation shall be accommodated using the same methods/routes as the revised existing system, and shall also terminate within the Sever Room.

4 Building Services Systems

The building services for the refurbishment and extension will be as follows;

4.1 Mechanical Systems

4.1.1 Mechanical Ventilation including supply and extract, toilet, plant and ancillary areas;

The open-plan office supply and extract ventilation to the building comes down from the Third floor North-East plant room. The fresh air intake is taken through the riser from 4th floor roof, down into a duct supply, and then runs horizontally into the 3rd floor plantroom. The Air Handling Unit (AHU) takes fresh air and filters, then heat/cools the air as appropriate to provide a minimum fresh air supply to the office space, via a central riser at the North end of the building, with floor supply running along the 'central; spine' bulkhead. The air is then discharged through assisted chilled beams.

Return air in the open plan office area is taken through the central ductwork bulkhead back to the central riser, then up to the AHU located in the Third floor plant room, with filtration (to protect heat recovery coils) and then heat recovery to transfer the heat in/out of the exhaust air. In winter, heat is taken from the extract and reintroduced to the supply. In the summer, heat is taken from the supply air and rejected into the exhaust air. Exhaust air is ejected from the unit up through the 'mesh/grate' plant platform above, past the dry cooler to external.

The south side of the building (cellular offices) is served by a basement located supply air only AHU, the fresh air intake to the AHU is taken from the street level at west side of the building, the supply air from this air handing unit is then distributed to the back of the Fan Coil Units (FCU) from ground to 3rd floor. Heating and cooling coil are included in the air handling unit, the supply air is maintained at 18°C all year round.

Basement, ground and 4th floor kitchen area are provided by dedicated kitchen hood extract fans, which will provide sufficiently high extract rates and air change suitable for cooking areas. The discharge from 4th floor kitchen extract fan located in the 3rd floor plant room, and it will discharge through the louvered screen to the 4th floor plant room, then to outside. The extract fan for basement and ground floor kitchen located in the basement plantroom, it discharges to street level at west side of the building.

Toilet areas will be provided with dedicated ventilation systems to provide high extract rates to remove odours and generally negatively pressurize the toilet spaces relative to surrounding office areas.

4.1.2 Air-conditioning and Mechanical Ventilation Services;

Potentially, there are two options available with a minimum fresh air and four pipe 'base build' system for the main open-plan office area;

- Chilled beams (supply air assisted);
- Fan coil units;

Chilled beams have the advantage of not having internal fan energy that a fan coil system has and therefore a positive advantage on the building energy use. In order to reach the BREEAM target and minimise the overall energy consumption, chilled beams have been adopted for the main open plan office area, and fan coil units option for this area has been dropped.

The Fourth floor extension is largely to be a function space, with large numbers of people attending events (up to 300 people), but more normally used for 'breakout' space for the staff to use. Therefore a supply only displacement air supply system is suggested as the best method of providing a good rate of fresh air, control of the space in a passive way (i.e. no distributed fan coil electrical motor control) and due to the 'monocoque' structure to minimise the Roof structure, it also prevents the need to have mechanical services at high level in the space.

However, the south side of the building (cellular offices) is proposed to have a new four pipe minimum fresh air cabinet fan coil units system. This part of building is Grade II listed, in order to keep minimum impact of the refurbishment work on this part of building, the proposed scheme is replace the existing building services system with the new. Currently, there are vertical four pipe fan coil units situated in the low level cabinet boxes in each cellular offices. Hence, a new fan coil unit system in the same fashion is proposed.

4.1.3 Comfort Cooling;

Comfort cooling will be provided in the office spaces via chilled beams or FCU's, via the absorption of heat energy from the office spaces into the chilled water via heat exchangers. The control of this comfort cooling will be via two port variable flow electronic controlled motorised valves.

No humidification is suggested to be applied to the supply air, as this type of control has not been identified as a problem by Which in the past and such plant would require further maintenance. De-humidification at central plant is recommended to prevent condensation on chilled beam system.

Comfort cooling in the open plan offices from ground to 3rd floor is provided through active chilled beam system, while comfort cooling in the cellular offices from ground floor to 3rd floor is provided through four pipe fan coil unit system.

The Fourth floor extension provided with displacement ventilation at 18°C at the peak summer time (and scheduled between 18°C to 25°C across the season, depending on external temperature) provides comfort cooling to the conference/open/meeting room spaces.

The server room will have dedicated down-flow units in a N+1 configuration to maintain comfort conditions in the space. Further discussion with Which will be required to determine if humidification systems are required in these areas.

4.1.4 Cooling Water Systems;

Chilled water systems distribute cooling around the building, generated in the Basement chiller room and then pumped round the building.

The system will be split into several sections, one serving the open plan office areas at the north side, another serving the 'listed building areas' at the south side and another serving the air handling units. This is required as the chilled beam circuit will require an 'elevated' temperature, based on nominally 15°C-20°C i.e. above the 'dew point' condensation temperature of the minimum supply temperature in summer time, to prevent condensation

forming on the chilled beams. On the 'listed building' circuit however, the temperatures will be at 'more standard' 6/12°C to obtain the highest efficiency of this system, as fan coil units need to be located within the cabinet areas. The air handling unit circuit will need to also be at the more 'standard' chilled water temperatures, as it needs to de-humidify the incoming supply air in the summer, when humidity levels may be at high maximum conditions and drop the air below the chilled beam 'dew point' temperature.

4.1.5 Refrigeration Installations;

The chilled water system is to be generated by water cooled chiller(s), refrigerant circuit is concealed inside the basement chiller(s), which is located in the basement plantroom.

4.1.6 Heating Installations;

Low Pressure Hot Water (LPHW) is generated by gas-fired boiler system, which is located in the basement, LPHW(F&R) is then pumped around the building to serve chilled beams, fan coil units and air handling units. The same as the chilled water, the LPHW is split into several circuits. One is for the chilled beams at around 40/35°C, the other two circuits are for fan coil unit system and air handing units, both at around 80/60°C. If using 80/60°C LPHW for the chilled beam system, the warm air will stay at high level, and it won't effectively condition the space, hence a lower temperature 40/35°C is used for the chilled beam system. In order to obtain the highest efficiency of fan coil unit systems and air handling units, a more 'standard' 80/60°C LPHW(F&R) are provided.

4.1.7 Gas Fired Boiler Plant together with associated Low Pressure Hot Water (LPHW) systems;

3 numbers of gas fired boilers are located in the basement plantroom, this boiler system produces LPHW (F&R) and pump it to the rest of the building. A low loss header and four secondary circuits are designed to suit the heating and hot water requirement in the building. Temperature sensors are provided at all the secondary circuit LPHW flow and the primary circuit LPHW flow, they are linked to the boiler sequence controller, so the correct LPHW flow temperature is maintained at all time.

4.1.8 Boiler Plants and Auxiliaries

Low loss header is included in the LPHW system, as well as primary circulation pump and secondary circulation pumps. Pressurisation unit and expansion vessel are used to maintain system pressure between the minimum working pressure and maximum working pressure in this sealed heating system. Dosing pot is included in the primary circuit for adding chemical inhibitors into the LPHW system.

4.1.9 Exhaust gas treatment and flues;

3 numbers of lined boiler flues will be taken through the existing chimney (located in the south side of the building) straight up to the roof and discharge from there.

4.1.10 Fuel Gas Distribution Systems;

The incoming gas service comes into the building from its west side to the basement plant room, the gas pipework will be running in a vented space, the exposed gas pipework will be labelled and painted yellow.

4.1.11 Calorifiers

Hot water cylinders/calorifiers are used for Domestic Hot Water (DHW) generation, they are located in the basement plantroom, next to the gas-fired boilers. Cold water feed to the calorifiers comes from the cold water storage tank, the water in the calorifiers is then heated by the boilers through a closed LPHW(F&R) loop. The domestic hot water is then distributed around the building at a supply temperature between 40°C and 50°C.

4.1.12 Building Management Systems

The current building management system will be replaced by Trend IQ3 for the ease of management. This new system will monitor and control central plant equipment (chillers, coolers, air handling unit, boilers, etc.) and record energy usage.

4.1.13 Energy Management Systems;

Trend IQ3 system will monitor and record all the electricity, natural gas and water usage, etc. per every floor. This includes the energy consumed by the central plant as well as energy used by the occupants. The recorded data then can be compared and analysed to give recommendation for future energy use.

4.1.14 Metering;

All incoming services will be metered (water, natural gas, etc.). Sub-meters will also be provided at every floor level for domestic water, electricity, natural gas, chilled water and LPHW.

4.1.15 Natural and / or mechanical smoke extract and ventilation systems in accordance with the fire strategy (Fire Strategy being produced by others);

The existing basement car park is naturally ventilated, and this natural ventilation system will be kept as it is during the refurbishment work.

4.1.16 Power operated louvers (electrical supplies only);

The louvers will not be power operated, hence this item is not applicable.

4.1.17 Ramp Heating;

No heating is provided for the ramp, hence this item is not applicable.

4.1.18 Refuse disposal systems;

Please refer to KPF Design and Access Statement page 95.

4.1.19 Air compressors and compressed air systems

No compressed air system on site, hence this item is not applicable.

4.1.20 Thermal Insulation applied to the engineering systems;

All the external pipework should be adequately insulated, the external hot water pipeworks and LPHW pipeworks should also be trace heated. All the internal hot water pipeworks, LPHW pipeworks and chilled water pipeworks need to be adequately insulated to prevent heat transfer between the pipe and the adjacent environment.

4.1.21 Vibration Control applied to the engineering systems;

The air handing units, chillers and adiabatic coolers all have in-built vibration isolators, hence no extra vibration control is required.

4.1.22 Water Treatment and Filtration;

No water treatment is required for the domestic water services. Chemical dosing is required for heating services, inhibitors to be put into LPHW system.

4.1.23 Automatic blinds and shutters (electrical supplies only)

There are only manual blinds and shutters, no automatic once, hence this item is not applicable.

4.1.24 Acoustic treatment of plant and equipment

Acoustic treatment of plant and equipment to meet the criteria set by the acoustic consultant;

4.1.25 Façade access and cleaning systems (engineering systems supplies to the equipment).

There is no façade cleaning system, so this item is not applicable.

4.1.26 Provision of plant space and distribution for tenant's plant and equipment and category A and B services and fitting out;

This building is owned and occupied by Which? Magazine, hence his item is not applicable.

4.1.27 New basement kitchen extract and new extract ductwork

The existing basement kitchen extract fan will be replaced and relocated to the basement, the extract air will be discharged to street level at west side of the building. This new kitchen extract fan will also pick up the ground floor kitchen, with motorised dampers in both extract ductworks and fan inverter controller. Depends on which kitchen hood is turned on, the inverter will self-adjust to provide adequate extract rate. The new kitchen extract ductwork needs to be fire-rated.

4.2 Public Health Systems

4.2.1 Public Health & Plumbing services;

New drainage stacks are introduced to suit new floor layout and new toilet arrangement. New staff shower rooms in the basement also requires sump pump for foul drainage.

New rainwater pipeworks/stacks are introduced to suit new roof layout, floor layout and new façade. Rain water harvesting system is also included for irrigation purpose.

4.2.2 Boosted Hot Water Systems;

The boosted hot water is produced by gas-fired boilers and hot water cylinders/calorifiers. The hot water is then pumped by a booster set to various parts of the building (toilets, kitchen, showers, etc.). Domestic hot water re-circulation is also included to offer instant hot water supply and to save water and energy.

Pipework is re-distributed to suit the new toilet and kitchen layout.

4.2.3 Boosted Cold Water Services;

A new cold water tank is proposed at the basement plant room, booster set is required to pump the cold water to the rest of the building (toilets, kitchen, showers, etc.).

Pipework is re-distributed to suit the new toilet and kitchen layout.

4.2.4 Drainage – above lowest slab level foul and surface water;

New drainage stacks are introduced to suit new floor layout and new toilet arrangement. There is one toilet core in the south of the building, and another one in the north. 2 or 3 vented drainage stacks per toilet core are proposed. New staff shower rooms in the basement also requires sump pump for foul drainage.

4.2.5 Fire Protection Services;

There is no fire protection services , so this item is not applicable.

4.2.6 Dry/Wet Risers and hose reel systems;

There are no dry/wet risers and hose reel system, so this item is not applicable.

4.2.7 Rain water recycling;

Rain water is recycled for irrigation purpose. Rain water will be collected and stored in a rain water tank (in the basement plant room or possibly in the sub-basement) and the rain water will feed the irrigation pipe network buried in the green wall at west façade.

4.2.8 Cold Water Mains for domestic and fire fighting purposes;

No fire fighting water supplied on site, so this item is not applicable.

4.3 Electrical Systems

4.3.1 Electrical transmission, HV/LV power distribution and electrical supplies

The site is served by a local HV Substation, located in the basement and accessed from the car park ramp.

The ring main sweeps in to the substation at high level via ducting from Albany Street to serve the transformer, where the electrical supply is stepped down to serve T1 LV (low voltage) board. Supplies are then derived from T1 LV board to serve Services 1 & 2 located in the adjacent switch room.
The transformer is rated at 800kVA, which correlates to a load rating of 1100Amps.

The substation is owned and maintained by UK Power Networks, and it is envisaged that no works will be required to it as part of this project.

4.3.2 Electrical Sub-Station and Switchgear

The substation serves 2No Main Distribution Switch Panels (Service 1 & Service 2) located in the adjacent Intake Electrical Switch Room.

The existing switchgear was replaced in early 2011 and is in suitable condition, and of sufficient capacity to be retained to serve the redeveloped building.
The building's electrical supply is metered within the switchroom, with each switch panel individually sub-metered.

Electrical supplies shall be taken from the existing Main Switch Panels and distributed around the building to the various sub-distribution boards, items of plant and building services as required to allow the redeveloped building to function.

The currently installed switchgear has a built in section for connection of future electrical capacity, and generator terminations.

An indicative schematic representation of the electrical low voltage distribution within the redeveloped building is detailed in Electrical Services LV Schematic, Drawing TR-WHQ-E-001.

4.3.3 Electrical Surge Suppression

An electrical surge suppression system shall be implemented within the new electrical installation.

This shall consist of a building wide lightning protection system, as well as secondary protection devices as required.

The secondary protection shall include the provision of LV surge arrestors on the incoming electrical supplies to the building within the main switchgear should it not already be in place as part of the retained existing installation. Should surge suppression devises already be installed within the retained main electrical switchgear their condition and functionality shall be evaluated to determine if they require replacing.

Low current surge arrestors shall also be utilised if required to protect all applicable telecommunications and switching networks against voltages surges.

The full requirement for this element of the system shall be developed as the design progresses.

See also Section 4.3.12 *Lightning Protection Services.*

4.3.4 Metering

The metering within the redeveloped building will take into account the recommendations of CIBSE TM39: Building Energy Metering and will enable the energy consumption of the building's systems to be monitored and recorded. The following metering shall be provided as a minimum:

- Each Main Switch Panel
- Lighting & Power distribution boards at each level
- All lifts
- Plant and equipment associated with the heating system
- Plant and equipment associated with the domestic cold water system

All meters shall be provided with a pulsed output to allow for future connection to a Building Energy Management System (BEMS).

4.3.5 Photovoltaic Electricity Generation

A photovoltaic (PV) system will be installed on the remodelled roof of the building.
This system will connect into the LV distribution infrastructure via Main Switch Panel Service 2 located in the Intake Electrical Switchroom at basement level.

At this stage, it is assumed that the inverter equipment required for the PV installation can be located at roof level.

The PV system shall be installed, commissioned and tested by a contractor licensed under the micro-generation scheme, and must be registered under the scheme in order to benefit from the government's feed-in-tariffs.
The PV array will consist of individual panels mounted on the new Event Space roof. The orientation of the panels will to a large extent depend on the final roof design, but shall be designed to offer the optimum output for the local conditions.

Typically the output of the system peaks at an angle of 30 degrees and facing due south, however sub-optimal conditions still achieve outputs in excess of 80% of optimum.

4.3.6 Electrical Distribution Services, including small power connections to workstations, filing banks, meeting room tables and credenzas, to Audio Visual equipment and to IT equipment within Comm's Rooms

A new sub-main cable shall be taken from existing Switch Panel Service 1 to feed a rising busbar within the North Electrical Riser. From here tapped-off supplies shall feed new sub-distribution boards located in the Electrical Riser Cupboards at each floor.
A new sub-distribution board, located within the plantroom at basement level shall be supplied directly from Switch Panel Service 1, from which further sub-distribution boards at each level within the listed building shall be supplied.

Separate dedicated lighting and power sub-distribution boards shall be provided at each floor to serve the existing extension areas, with a 'split' lighting and power distribution board provided at each level to serve the listed building.

Details of the proposed electrical distribution system are indicatively detailed on the Electrical Services LV Distribution Schematic.

Final circuits shall be derived from these lighting and power distribution boards as required to power the electrical systems within each floor.

An underfloor bus-bar system shall be provided within the floor void at each level to distribute power around the Open Plan Office spaces. The system shall include tap-off connections to grommets to desks, and floor-boxes to isolated desks within adjacent Meeting Rooms and Private Offices and at filing banks and credenzas.

Power shall be delivered to workstation clusters by way of socket outlet units contained within the desks cable containment system.

Floor boxes or floor boxes with cable management within desks will be provided in Private Offices, Meeting Rooms and Conference Rooms etc, recessed into the floor screed in agreed appropriate locations to serve the final layout of the rooms. Perimeter outlets will also be provided as required.

Any items of Audio Visual equipment shall be supplied from the local dedicated power distribution board as required.

A new sub-main cable shall be taken from Switch Panel Service 1 to supply a dedicated sub-distribution board within the Server Room (location to be confirmed – assumed Third Floor at this stage). All electrical supplies within the Server Room (excluding lighting) shall be drawn from this distribution board, including supplies to the various items of IT equipment and Server Racks.

An additional sub-main cable shall be taken from Switch Panel Service 1 to supply a dedicated sub-distribution board within the Audio Room, from which all supplies to equipment within this room shall be taken.

4.3.7 Distribution Mains for any of the Building Services/Electrical Services for Mechanical Plant

Each mechanical plantroom shall be provided with a dedicated distribution board from which items of plant shall be powered. These distribution boards shall be supplied directly from the Main Switch Panels, as indicated on the Electrical Services LV Schematic, and will supply mechanical plant including but not limited to the Boilers and Air Handling Units.

A dedicated supply shall be taken from Main Switch Panel Service 2 to supply the new chiller installation. This shall be drawn from the same chamber of Service 2 as the existing chiller installation, and terminated in a sub-distribution board located within the Chiller Room, from which all chiller and associated supplies shall be drawn.

Each kitchen area shall be provided with a dedicated sub-distribution board from which all supplies pertaining to that kitchen shall be drawn. These distribution boards shall be supplied directly from Main Switch Panel Service 2.

The car park and general services within the Basement shall be supplied from the Basement lighting and power distribution board, with any external lighting circuits also derived from here.

4.3.8 Small Power for Maintenance and Landlord's Spaces

Final circuits to all interior landlord's areas shall be taken from the local power and lighting distribution board as appropriate.

Staircase lighting circuits shall be derived from the lowest served floors' distribution board, with one circuit feeding the entire staircase.

Small power convenience outlets will be provided throughout the redeveloped building as required. Generally, outlets will be provided flush-mounted within the internal building fabric.

Small power outlets in plant areas and store rooms will be surface mounted, and of metal-clad construction, with any external outlets being of the appropriate IP rating.

Fused and switched-fused connections shall be provided for electrical plant and equipment as required – e.g. Hand-dryers etc.

4.3.9 Electric Lighting & Power Installations, and Lighting Controls

All areas of the redeveloped building shall be provided with new artificial lighting, designed to provide light levels as recommended within The SLL Code for Lighting.

4.3.9.1 Internal Lighting

The aim of the lighting design is to provide a functional and visually comfortable environment for the members of staff and any guests to the building, and to offer controls to ensure that the lighting provision can be changed according to the user requirements of each space.

Lighting will be designed with due reference to appropriate CIBSE/SLL lighting guides, specifically LG3 and LG7.

All internal lighting for general use will utilise linear or compact fluorescent light sources, complete with high frequency ballasts and controls, with consideration also given to using LED fittings where suitable. Dimming ballasts will be used where required by the design. Luminaires will be recessed where possible, with surface mounted fittings used within plant, store and 'back of house' areas.

Throughout the main areas of the building a chilled beam solution shall be implemented for the HVAC installation. The lighting within such areas shall be incorporated into the units, with any additional fittings installed around the perimeter of spaces as required to achieve the desired lighting level.

The controls for all internal lighting will be provided as recommended by *The SLL Code for Lighting* and *The CIBSE Lighting Guides*. This includes the zoning of luminaires to provide separate switching/controls for areas differentiated by use, or by availability of daylight.

Lighting within general Circulation, Reception, Internal Public Zone and Open Plan Office areas will be controlled via time-clock, with manual override.
Private Offices and Meeting/Conference Rooms shall be provided with manual switching, supplemented with absence detection to turn off lighting in unoccupied spaces.

Areas adjacent to glazing will be provided with daylight-linked dimming controls to dim or switch off lighting when sufficient natural light is present within the space.

Meeting/Conference Rooms shall include scene-setting lighting controls to enable a selection of pre-set visual environments to be selected at the touch of a button.

The lighting installation in all other areas of the building shall be controlled via either manual switching or automatic presence/absence detection.

A summary of the key information for the lighting installation within each space of the redeveloped building is given in Table 3.3 below. This table details the lighting levels to be achieved, and the type of luminaire and control methodology to be used within each space.

Area	Lighting level (Lux)	Lamp type	Controls
Open Plan Office	500	Chilled Beam Solution	Time-clock with manual override plus daylight-linked dimming
Private Office	500	Chilled Beam Solution	Manual on/off, auto off (absence) with daylight-linked dimming
Meeting/Conference Room	500	Chilled Beam Solution	Manual on/off, auto off (absence) with scene selection
Reception	300	Compact/Linear fluorescent	Time-clock with manual override plus daylight-linked dimming
Circulation	100	Compact/Linear fluorescent	Time-clock with manual override
Internal Public Zone	300	Chilled Beam Solution	Time-clock with manual override
Storage	100	Linear fluorescent	Auto on/off (presence detection)
Security	300	Chilled Beam Solution	Manual on, auto off (absence) with daylight-linked dimming
Kitchens	500	Linear Fluorescent	Manual switching on/off
Sub-Kitchen/Canteen (Ground Floor)	500/300	Linear Fluorescent	Manual switching on/off
WC's	200	Compact fluorescent	Auto on/off (presence detection)
Event Space	500	tbc	tbc
CER (Server Room)	200	Linear Fluorescent	Auto on/off (presence detection)
Staircase	150	Compact/Linear fluorescent	Time-clock with manual override
Vertical Services	100	Linear Fluorescent	Auto on/off (presence detection)
Plantroom	200	Linear Fluorescent	Auto on/off (presence detection)
Car Park	75	Linear Fluorescent	Auto on/off (presence detection)
Bike Store	150	Linear Fluorescent	Auto on/off (presence detection)

Table 3.3 Internal Lighting Summary

4.3.9.2 Floodlighting Systems & External Lighting

The full extent of any external lighting will be determined and agreed during design development.

At this stage, in line with the existing building and those in the surrounding area, it is felt that the external lighting installation shall simply provide functional amenity lighting for escape routes, security and any external walkways/baloneys, with no architectural façade lighting being incorporated into the design.

Any external lighting will be provided with time-clock and/or photocell controls to ensure that it is only switched on during darkness or low-light conditions, and shall be designed so as to keep the light pollution to the surrounding areas to a minimum.

All external lighting will be designed in accordance with CIBSE Lighting Guide 6 - Outdoor Environment, and ILE - Guidance notes for the reduction of obtrusive light 2005.

4.3.9.3 Emergency Lighting

Emergency and escape route lighting and emergency exit sign illumination will be provided throughout the redeveloped building to enable occupants to safely find their way out of the building in the event of a local or total power failure.

The emergency lighting installation shall utilise maintained and non-maintained luminaires, complete with integral battery packs and inverters wherever possible.

Further details of the emergency lighting system and escape signage will be concluded during detailed design.

4.3.10 Standby Generation Equipment

As noted in the Existing Utilities section, there have been no reported power outages to the building within the last 24 months. Due to this fact, and bearing in mind the usage of the building, standby generation to protect against failure or disruption of the public supply is not proposed at this stage.
The existing retained electrical infrastructure does however support the future installation of a generator to provide a back-up supply, should it become a requirement.

See Section 3 *Existing Utilities and Modifications Required*.

4.3.11 Electric Generation Plant and Systems/Generating Plant Installations

Critical power protection shall be provided to those systems deemed essential for the functional operation of Which? by way of appropriately rated uninterruptable power system infrastructure.

The exact requirements of the UPS installation and the systems it will back up shall be determined as the design progresses, as will the level of redundancy required.

At this stage it is assumed that the IT Network and Telecommunications systems, and associated air conditioning plant, are the only business critical systems that will require a protected supply.

See Section 3 *Existing Utilities and Modifications Required*.

4.3.12 Lightning Protection Services

A risk assessment will be undertaken by a specialist contractor to assess the requirements for the revised lightning electromagnetic pulse protection management system.

At this stage it is assumed that the existing Lightning Protection installation shall be modified as required to suit the redeveloped building.

Allowance shall be made for the provision of lightning surge arrestors on all incoming supplies to the building, and within the main electrical switchgear should it not already be in place as part of the retained existing installation. The full requirement for this will be confirmed by the lightning protection assessment.

The revised lightning protection system should wherever possible make use of building structure. For example, if possible utilise structural steelwork and or reinforcement steel to form lightning protection down conductors.
If structural elements are not used, then metallic down conductor tapes will be used, which should be concealed wherever possible.
The new installation shall make use of the existing final earth termination points, with any additional points required determined during the detailed design, and agreed with the Architect.

The full extent of the lightning protection system will be assessed during the detailed design phase following the requirements of BS EN 62305 and BS 7430.

4.3.13 Electrical Earthing Systems

The existing earthing and bonding installation shall be extended and modified to suit the revised layout of the building.

The supply authority's main earth terminal (MET) for each supply shall be connected to all extraneous conductive parts of the installation by means of equipotential bonding conductors. Connections shall be retained to all metallic services entering the buildings, such as water, gas and all other service pipes and ducting. In addition, all metal enclosures and cable containment systems and all circuit protective conductors shall be bonded to the MET.

At this stage it is unclear if a separate Earthing Terminal shall be required for the IT equipment within the Server Room and within the Audio Room. This shall be determined in conjunction with Which's IT team as the design develops.

The earthing & bonding system shall be installed in accordance with the requirements of BS7671 & BS7430.

4.3.14 Fire Detection and Alarm Services

A new fire detection and alarm system shall be provided throughout the redeveloped building designed and installed in accordance with BS 5839.

The system shall provide Category L2 coverage, and shall comprise of multi sensors, programed as appropriate for their local environment. Consideration shall also be given to using an aspirating type detection system within the protected part of the building, to ensure that the impact on the protected features of the building are minimised.
Manual call points, beacons and sounders shall also be provided as required within the scheme.

Fire alarm interfaces shall be provided for, but not limited to, the following items:

- Passenger Lifts
- Gas Supply
- Access Control System
- Disabled Refuge Points
- Lighting Controls (where applicable for dimmed areas)

The full requirements of the fire detection and alarm system shall be determined with the appointed Fire Officer and Client as the design progresses.

4.3.15 Life Safety Systems (fire alarms smoke detection and maintained/secondary power services)

Due to the nature of the building and its usage, at this stage it is not envisaged that an emergency back-up power supply is required. This shall be confirmed as the design progresses.

All life safety systems shall be provided with battery back-up supplies in order that they function as required in the event of an emergency. Such systems will include, but not be limited to:

- Fire Alarm System
- Disabled Refuge Points/Call Systems
- Security System (tbc)

4.3.16 Engineering Services to Lifts (goods, passenger and fire fighting) and Escalators

The redeveloped building shall be served by a main bank of 3No passenger lifts serving the Ground to Fourth floors, with an additional passenger lift provided to allow movement between Ground and the basement.

The size and capacity of the lifts is to be confirmed as the design progresses, however the safe working load of the passenger lifts shall be no less than 630kg (8 persons) and have minimum clear internal car dimensions of 1100mm wide by 1400mm deep, thus meeting the requirements of Building Regulations Part M.

All passenger lifts shall be machine room-less (MRL) electric traction type.

Subject to confirmation from the appointed Fire Officer, it is not envisaged that a fire fighting lift shall be required within the building.

For further details of the lift installations refer to WSP's Vertical Transportation package.

4.3.17 Power Supplies to Vertical Transportation/Lifts

A new lift supply panel shall be provided, supplied from the rising busbar within the North Electrical Riser, dedicated to powering the new main passenger lift bank. From here the required supplies shall be drawn to power the 3No lifts.

An additional supply shall be derived from Main Switch Panel Service 2 to supply passenger lift No. 4 directly.

4.3.18 Power for External Signage, Traffic Management and Lighting Systems

Any power supplies for external signage and lighting shall be derived from the Basement lighting and power distribution boards as required.

At this stage it is not envisaged that a traffic management system is required.

4.3.19 Public Address, Personnel Location and Call Services - space provision for and including cable tray and conduit

The requirement for a public address system within the redeveloped building shall be considered as the design progresses.

Alarm systems will be incorporated within the redeveloped building to provide refuge and assurance to disabled individuals.

4.3.19.1 Emergency Voice Call (Disabled Refuge) System

An integrated emergency voice call (EVC) system will be provided at appropriate positions throughout the building. The system will provide emergency voice communication between disabled refuge points or disabled facility assistance panels and a central manned location.

The extent of provision and the locations of the call points will be discussed in more detail with the Architect and Fire Officer during design development.

4.3.19.2 Disabled Assistance and Assurance

Disabled WCs will be provided with a distress alarm and associated assurance intercom (EVC system) with an integral reassurance lamp.
In addition to the assurance intercom, visual indication will be provided in the main circulation space as close to the disabled facility as possible. This indicator will be internally illuminated, and it should be possible to reset the indication from within the disabled facility.

Appropriate space provisions and containment for all services associated with all Call Systems shall be made within the detailed design of the electrical services for the redeveloped building.

4.3.20 Cableways to Link Radio and Television Installation and Satellite Systems at Roof Levels to Main Building Risers

Provisions shall be made for the routing of all cabling and services relating to the buildings Radio, Television and Satellite systems.
The hardware associated with the Radio, Television and Satellite systems shall be located within the electrical riser as close to roof level as possible, and distributed around the building as required from here, with any larger items located within the Audio Room.

The exact requirements of these systems shall be determined as the project develops.

4.3.21 Security and Access Control Systems

Security and access control systems will be provided in line with the building's current access and security policies. The exact details of the installation require further investigation and discussion, but proposals for the systems are detailed below.

4.3.21.1 Intruder Detection and Alarm Systems

At this stage, allowances will be made for the provision of door contacts for all doors leading to external areas throughout the entirety of the building, including any doors/hatches leading to the roof area at fourth floor level.
In addition, window contacts will be provided for all open-able glazing at basement, ground and first floor levels, and any open-able elements of the fourth floor structure.

Dual technology (PIR/Microwave) movement sensors will be installed to provide full internal coverage throughout the Basement, ground and forth floors.

4.3.21.2 Door Access Control Systems

A new access control system shall be installed throughout the remodelled building, which subject to Client confirmation shall consist of the following:

A door entry system shall be provided at the main entrance to the building, linked to the reception desk via a video/intercom system.

Access control shall be provided to all doors intended to be used for staff access to the building, including from the car park at basement level. Further access control shall be provided to doors between public and secure areas of the building, with restricted access also provided to any plantrooms, kitchens and server/comm's rooms.

Access controlled doors will be secured with magnetic locking mechanisms controlled by electronic card/proximity readers, with push-to-exit buttons located on the secure side of the doors.

The main entry/exit from the basement car park shall also be controlled using proximity readers and/or key fobs. Because the car park is used by non-staff members, a discussion is required with the Client as to whether the existing system is to be retained or a new system implemented and new key fobs distributed to the users.

The full requirements of the access control system shall be developed with the Client as the design progresses.

4.3.21.3 CCTV Systems

The extent of any CCTV provision and full requirements for the system are to be confirmed and agreed with the Client as the design progresses.

At present it is assumed that CCTV coverage shall be required to all access controlled entrances and 'public' areas of the building.
Cameras shall be selected to be visually unobtrusive.

Fixed CCTV cameras shall be provided with power over Ethernet (PoE), with any cameras with controllable elements (pan, tilt or zoom functions) provided with an un-switched fused connection unit.

For all CCTV cameras, visible cable connections will be minimised by providing data outlets (and fused connection units where required) in a concealed location or immediately adjacent to the camera.

External CCTV cameras shall be positioned as required to provide full coverage of the building.

The Client's requirements for viewing/recording CCTV footage are as yet undetermined, but it is felt that a digital video recorder shall be provided for the storage of images.

4.3.22 Car Park Management Systems

At this stage it is not envisaged that a car park management system is required.

4.3.23 Telecommunications and IT cableway infrastructure to support incoming services into the building to communications intake rooms and from these rooms to the base of the IT risers

The existing incoming telecommunications and data services shall be retained to supply the redeveloped building.
The incoming services rise from their intake position within the Car Park at basement level up the newly formed risers to their termination points using the same methods as currently employed. The exact location of these termination points within the redeveloped building are currently undetermined, and shall be confirmed as the design progresses.

It is assumed that both the BT service and data fibre shall terminate in the new Server Room, and shall therefore be extended as required to reach this destination.

Final telecommunications and data cabling shall be distributed from the Server Room around the building via the IT Riser and false floor void on appropriately sized cable trays and/or cable matting.

4.3.24 Telephone Equipment and Distribution services to support the voice and data;

The existing building utilises two telecommunications systems, one being voice over internet protocol (VoIP) and the other being an analogue system. The existing analogue telecommunications system shall be stripped out and replaced with VoIP technology.

Which? are looking into the possibility of replacing the current ISDX Public Automatic Branch Exchange (PABX) internal telephone system. The nature of the new installation is currently unknown, but the requirements for the new system shall be considered and provided for as the design progresses. Any new incoming services associated with the new installation shall where possible be accommodated using the same method as the existing system.

It is assumed that the existing incoming telecommunications and data services are adequate to meet the requirements of the redeveloped building. This shall be confirmed as the design progresses, with any additional services required determined and provided for as necessary.

4.3.25 Information Technology/Data and Voice Cabling Systems - space provision for and including cable tray and conduit;

IT/Data cabling shall be distributed throughout the building as required from the Server Room. Vertically the cabling shall rise within the electrical risers on appropriately sized cable tray(s) as required, and shall be distributed horizontally within the false floor void on appropriately sized cable trays and/or cable matting.

Because the building shall utilise VoIP differentiation between individual data or telephony outlets is unnecessary.
Data outlets shall be provided throughout the building to serve all normally occupied locations. Where possible, data outlets will be flush-mounted, with the exception of outlets within plant spaces and stores, which will be metal-clad surface mounted outlets.

At desk locations data outlets shall be provided as required within the desk power outlet system, which shall be finalised as the design progresses.
All floor box locations shall be provided with data outlets as required to serve desk positions and meeting/conference room tables.

In addition to the general data provisions, outlets shall be provided at pre-agreed locations for the connection of wireless internet access points (Wi-Fi). These will generally be located in concealed locations and within the ceiling void where possible.

The full requirements of the buildings IT and Telecommunications installations shall be discussed and agreed during the design development before the final proposals are presented.

4.3.26 Communication systems (data for remote monitoring of BMS, fire alarms and security systems plus telephone line(s) for lifts to a 24/7 remote monitoring centre.)

Provisions shall be made for providing data outlets as necessary to all building wide communications systems, including but not limited to:

- Where required by the BMS system
- As required by the fire alarm installation
- For fixed CCTV cameras utilizing power over Ethernet (PoE)
- At disabled refuge points
- Within each lift shaft as required for connection to the lift's emergency communication auto-dial facility
- Within WCs where required as a part of the EVC system.

The exact requirement of each system shall be determined as the design progresses.

4.3.27 The Consultant shall be responsible for integrating the design for the removal, renewal and reinstatement of existing telecommunications equipment

Through coordination with the Client it shall be established which of the existing telecommunications services are to be retained and which are to be stripped out. Those services which are to be retained shall be rerouted, and extended as required, to their new termination point within the new server room.

All works associated with rerouting/extending the telecommunications services shall be undertaken in conjunction with both the Client and the service provider.

Should any new telecommunications services be required these shall enter the building in the same location as the retained services, and shall be routed around the building using the same methods as the existing.

5 Builderswork

Coordination with the architecture and structure will include the following;

5.1 Façade options

No services are running on the façade apart from the green wall irrigation pipe network, so this item is not applicable.

5.2 Utilities

Builders work is required for new incoming water pipework from Albany Street to the basement plant room.

Builders work is required for new drainage stacks connecting to the existing foul drainage network.

5.3 Mechanical

New risers are introduced to suit new floor layout and new building services design. New plant room on the north-east side of the 3rd floor, modification of the existing plant rooms in the basement. New openings required on the basement plant room wall for air discharge and intake. Central spine bulkhead required on every office floor for ductwork, pipework, etc.

5.4 Public Health

New risers are required for foul drainage stacks (in the toilet area) and vertical rain water pipeworks.

Builders work is required for irrigation pipework connection between the sub-basement rain water harvesting system and the irrigation pipe network at the west façade green wall.

5.5 Electrical

Dedicated electrical risers are required at specific locations throughout the building (as detailed on the Electrical Services Layout drawings) for the distribution of electrical services.

Brackets and supports for the installation of cable containment shall be required throughout the floor and ceiling voids and within the electrical risers.

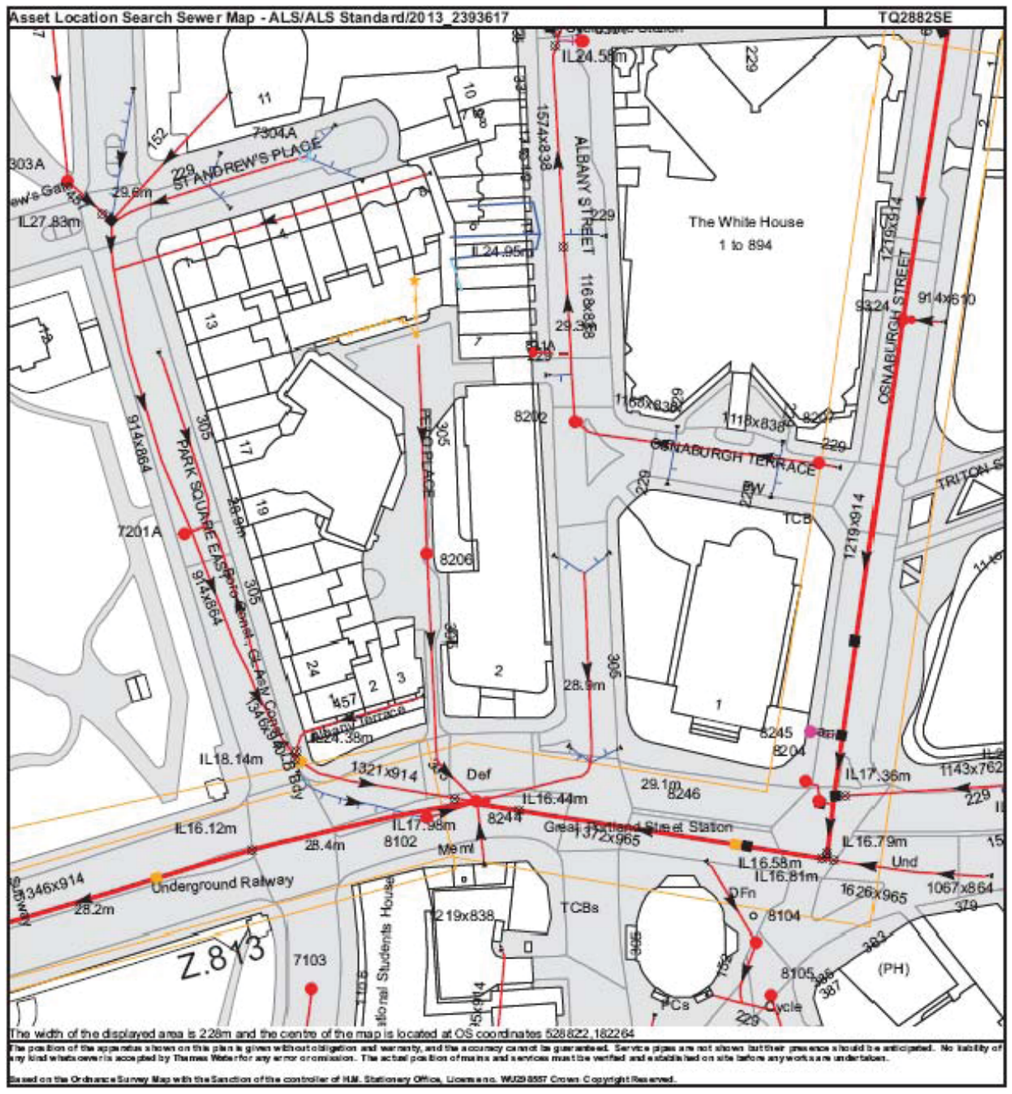
6 Conclusions, Project Risks, Recommendations & Next Stages of Design

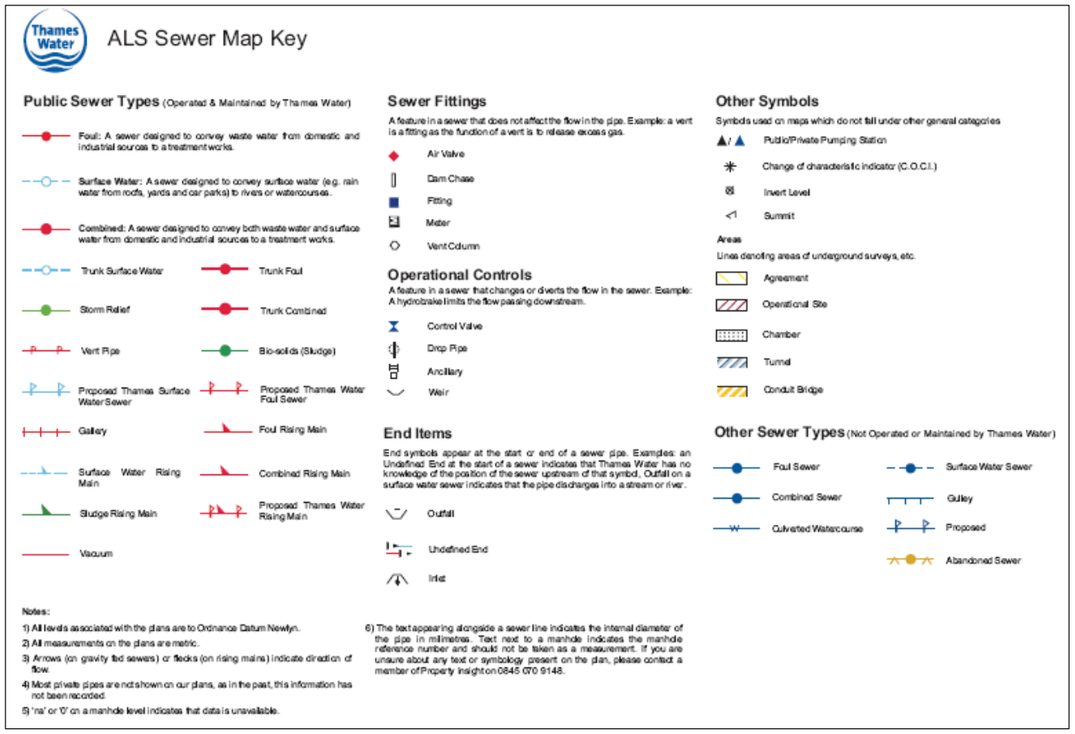
The following project risks and MEP design issues require consideration/development as the design progresses:

- Engineer needs to take special care when maintaining the equipment inside the 3rd floor and 4th floor plantrooms, due to limited amount of accessible space.
- The comfort cooling system is designed to provide 25°C indoor temperature in summer based on 7m²/person occupancy. If the building occupancy exceeded the design value, there will be a risk of overheating during summer time;
- Chilled beam system is proposed for the open plan office space, this system is not adaptable if the open plan offices changed to cellular offices in the future.
- Final maximum electrical demand for the redeveloped building, and renegotiation of the existing service capacity agreement;
- Necessity of providing an alternative/back-up LV supply to the building;
- Requirements for 'life safety' systems;
- Final requirements of the lightning protection system through undertaking of a full risk assessment;
- Location and full requirements of the Server Room;
- Final details of Which?'s telecommunications and data services requirements;
- Confirmation that the existing UPS installation provides suitable back-up provisions for the Client's IT requirements;
- Full requirements of the Audio Room;
- Final kitchen electrical requirements;
- Final lighting fitting types;
- Final security and access control requirements.

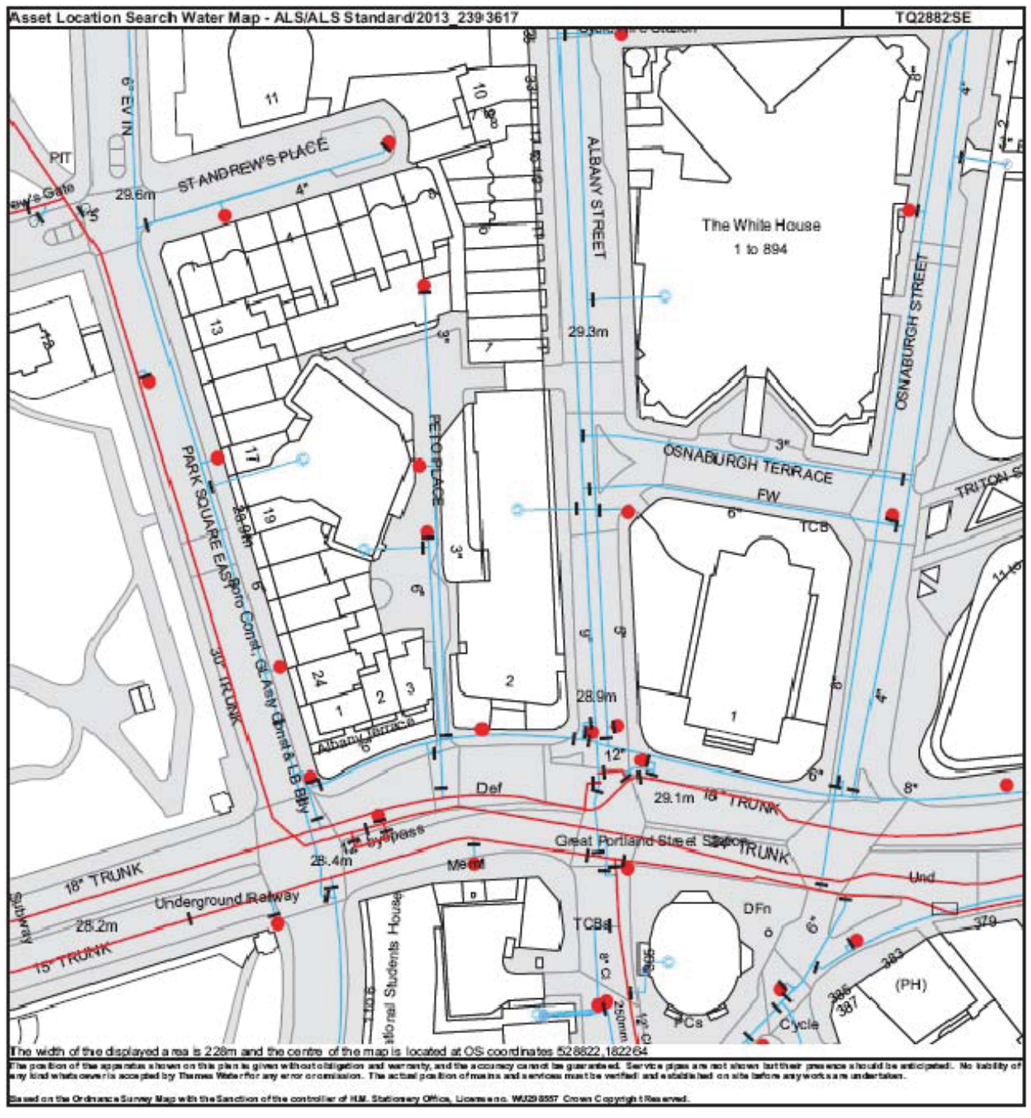
7 APPENDIX 1 – EXISTING UTILITY MAPS

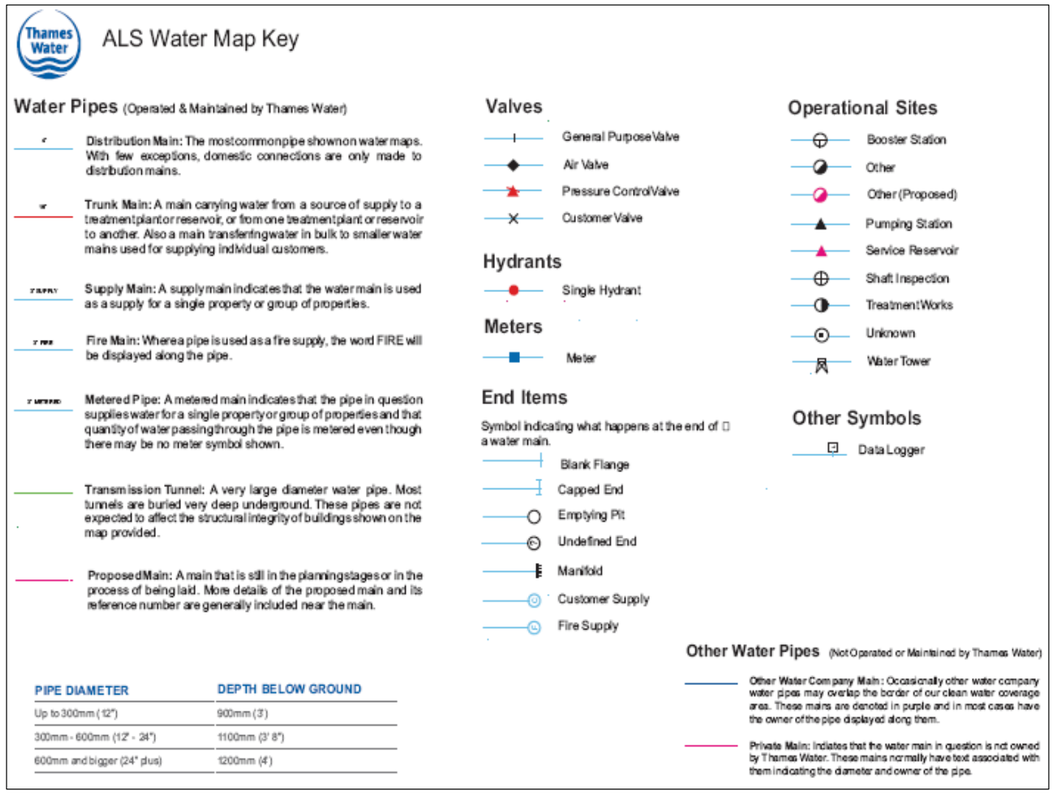
Existing Sewer Service Map





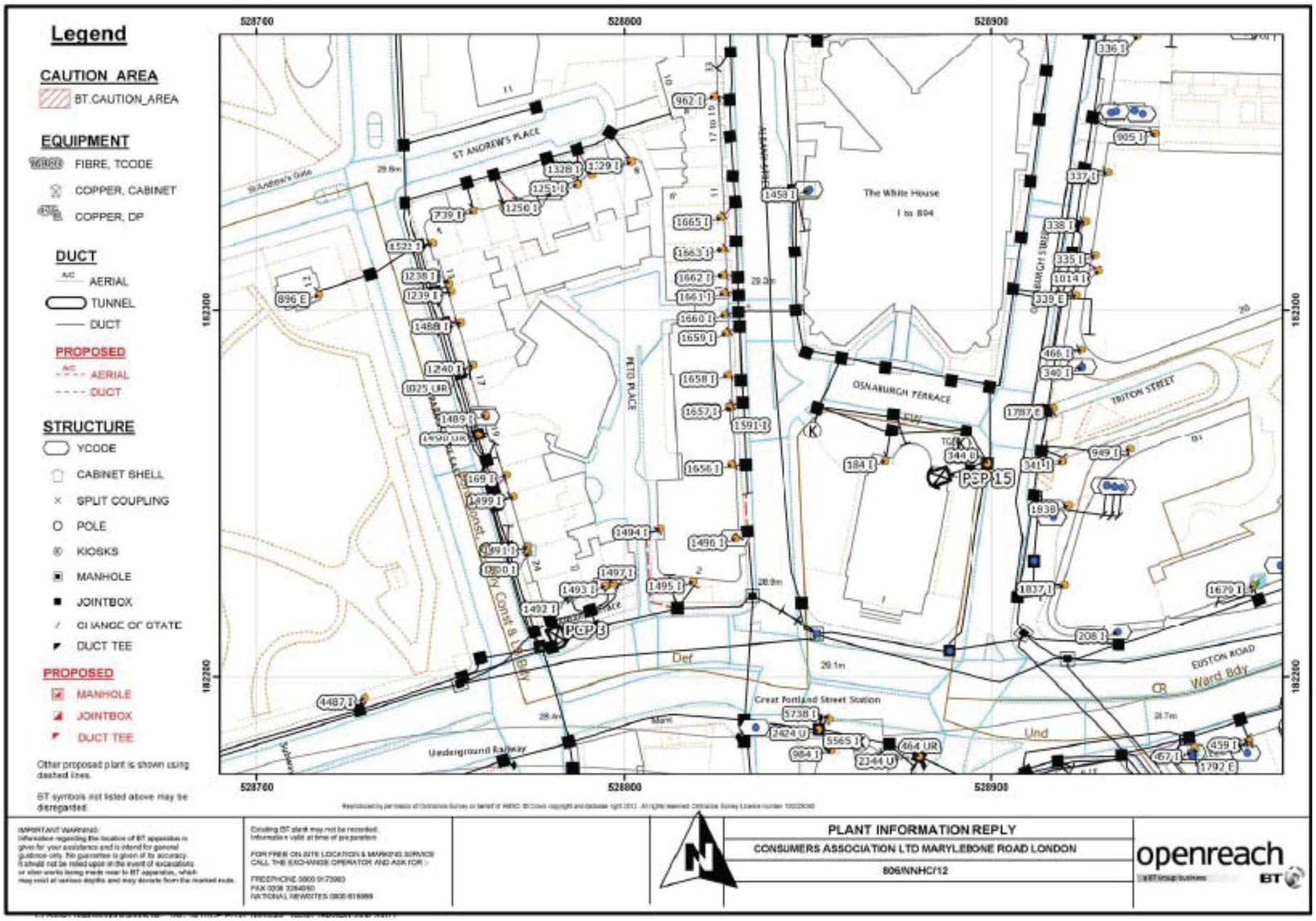
Existing Water Service Map





Existing Gas Service Map

Existing Telecom Service Map



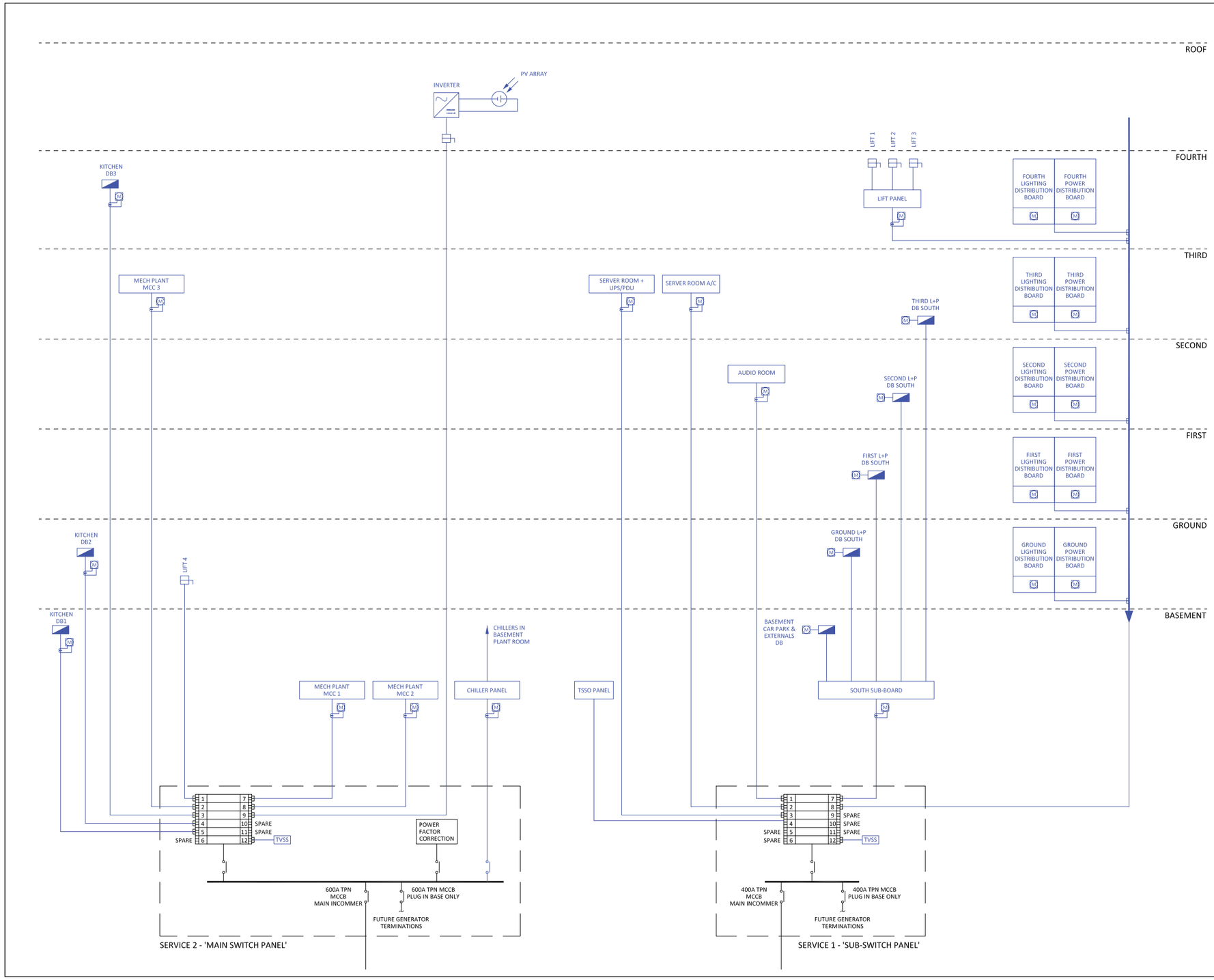
8 APPENDIX II – DRAWINGS

The Stage C+ planning issue of drawings consists of the follow;

- TR-WHQ-M-001: Which?HQ Mechanical Services Ventilation Schematic;
- TR-WHQ-M-002: Which?HQ Mechanical Services Heating Schematic;
- TR-WHQ-M-003: Which?HQ Mechanical Services Chilled Water and Condensing Water Schematic;
- TR-WHQ-M-100: Which?HQ Mechanical Services Ground Floor Layout;
- TR-WHQ-M-101: Which?HQ Mechanical Services First Floor Layout;
- TR-WHQ-M-102: Which?HQ Mechanical Services Second Floor Layout;
- TR-WHQ-M-103: Which?HQ Mechanical Services Third Floor Layout;
- TR-WHQ-M-104: Which?HQ Mechanical Services Fourth Floor Layout;
- TR-WHQ-M-150: Which?HQ Mechanical Services Basement Layout;

- TR-WHQ-P-001-01: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Schematic Sheet 1of3;
- TR-WHQ-P-001-02: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Schematic Sheet 2of3;
- TR-WHQ-P-001-03: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Schematic Sheet 3of3;
- TR-WHQ-P-100: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Ground Floor Layout;
- TR-WHQ-P-101: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal First Floor Layout;
- TR-WHQ-P-102: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Second Floor Layout;
- TR-WHQ-P-103: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Third Floor Layout;
- TR-WHQ-P-104: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Fourth Floor Layout;
- TR-WHQ-P-150: Which?HQ Public Health Services Sanitary Plumbing and Rain Water Disposal Basement Layout;

- TR-WHQ-E-001: Which?HQ Electrical Services LV Distribution Schematic;
- TR-WHQ-E-100: Which?HQ Electrical Services Ground Floor Power Layout;
- TR-WHQ-E-101: Which?HQ Electrical Services First Floor Power Layout;
- TR-WHQ-E-102: Which?HQ Electrical Services Second Floor Power Layout;
- TR-WHQ-E-103: Which?HQ Electrical Services Third Floor Power Layout;
- TR-WHQ-E-104: Which?HQ Electrical Services Fourth Floor Power Layout;
- TR-WHQ-E-150: Which?HQ Electrical Services Basement Floor Power Layout;
- TR-WHQ-E-201: Which?HQ Electrical Services First Floor Typical Lighting Layout.



Notes
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2. This drawing should be read in conjunction with all relevant architectural, civil, structural, mechanical, electrical and public health drawings, specifications and room data sheets.
3. Do not scale from this drawing. Refer to Architects drawings for building dimensional information.
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KEY:

NEW ELECTRICAL INFRASTRUCTURE

RETAINED EXISTING ELECTRICAL INFRASTRUCTURE

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Client	Which?		
Date	3-Jul-13	Drawn by:	LS
Scale @ A1	NTS	Checked by:	TD

Drawing Title:

Which? HQ
Electrical Services
LV Distribution Schematic

Drawing Number:

TR-WHQ-E-001 -

Notes
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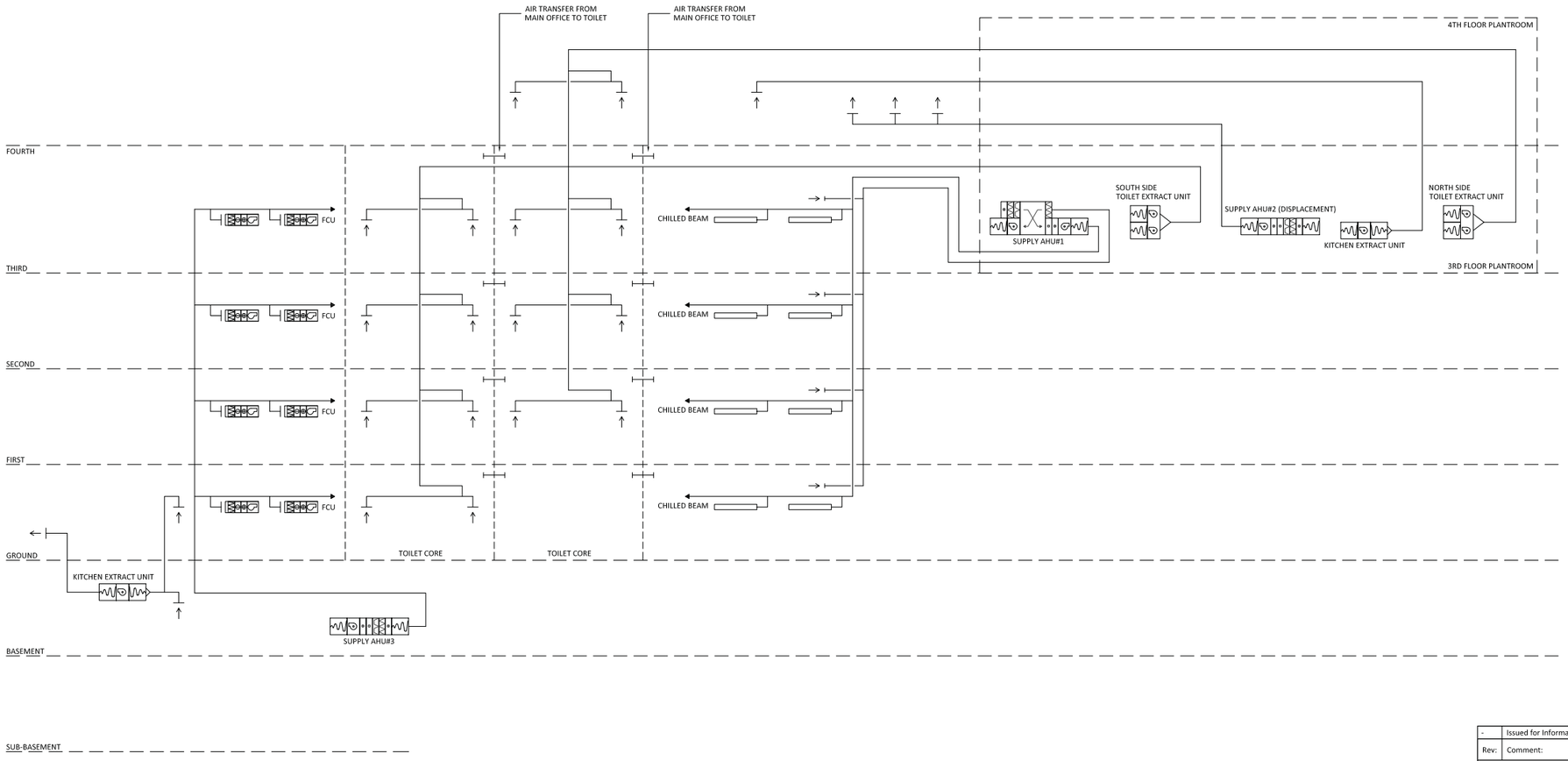

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Scale @ A1	N.T.S.	Checked by:	XS

Drawing Title:
Which? HQ
Mechanical Services
Ventilation Schematic

Drawing Number:
TR-WHQ-M-001 -

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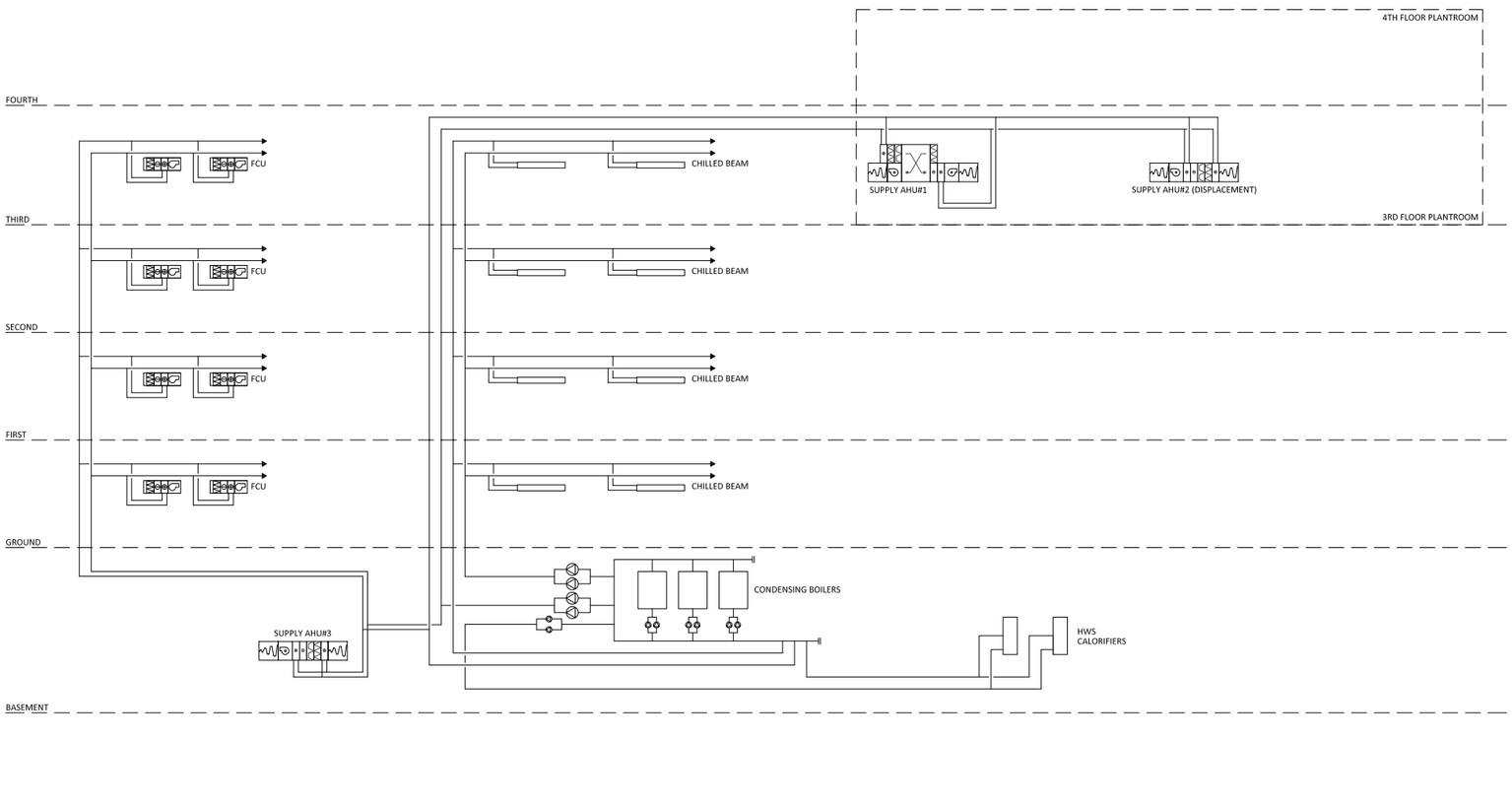

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Scale @ A1	N.T.S.	Checked by:	XS

Drawing Title:
Which? HQ
Mechanical Services
Heating Schematic

Drawing Number:
TR-WHQ-M-002 -

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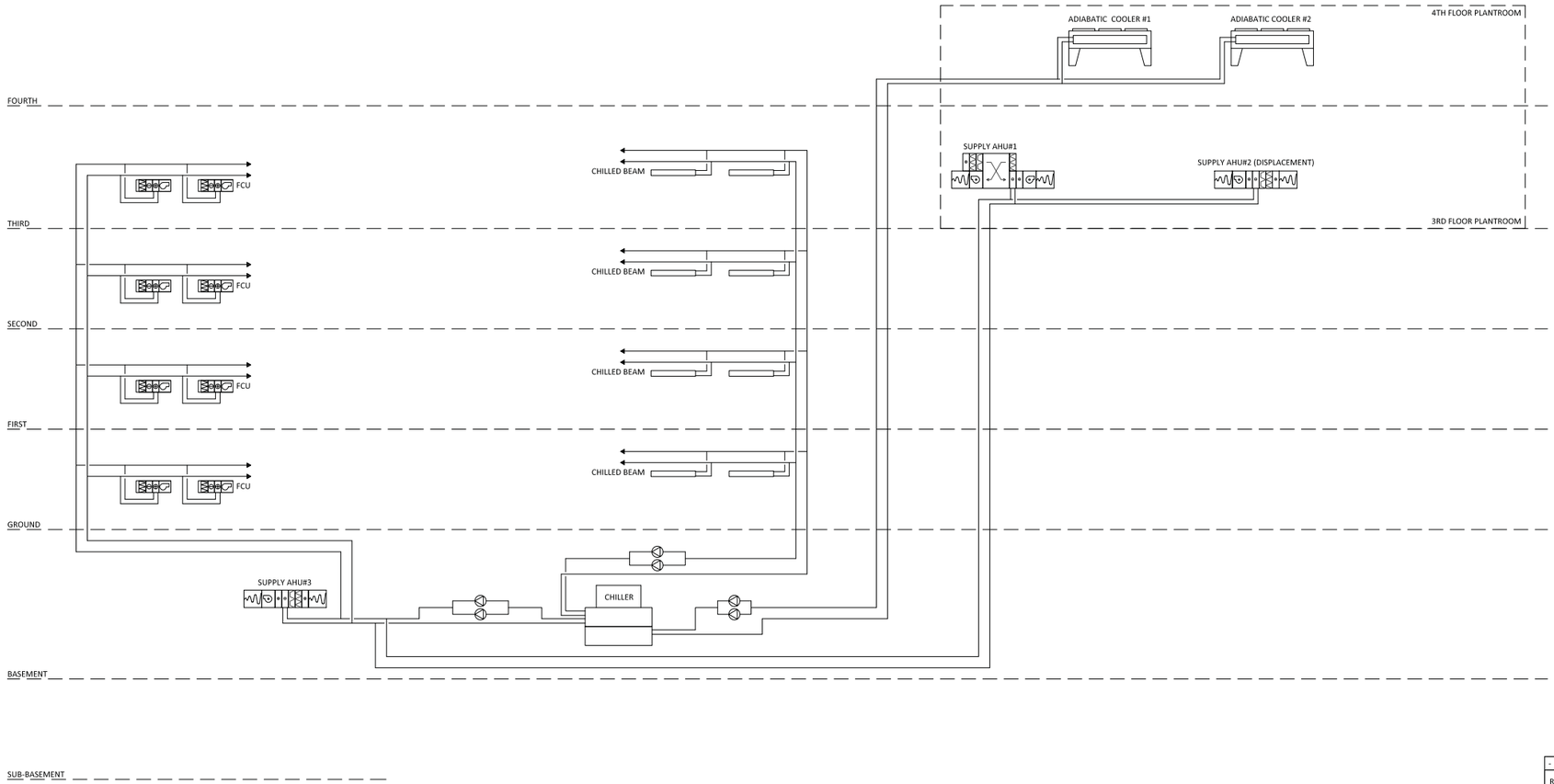

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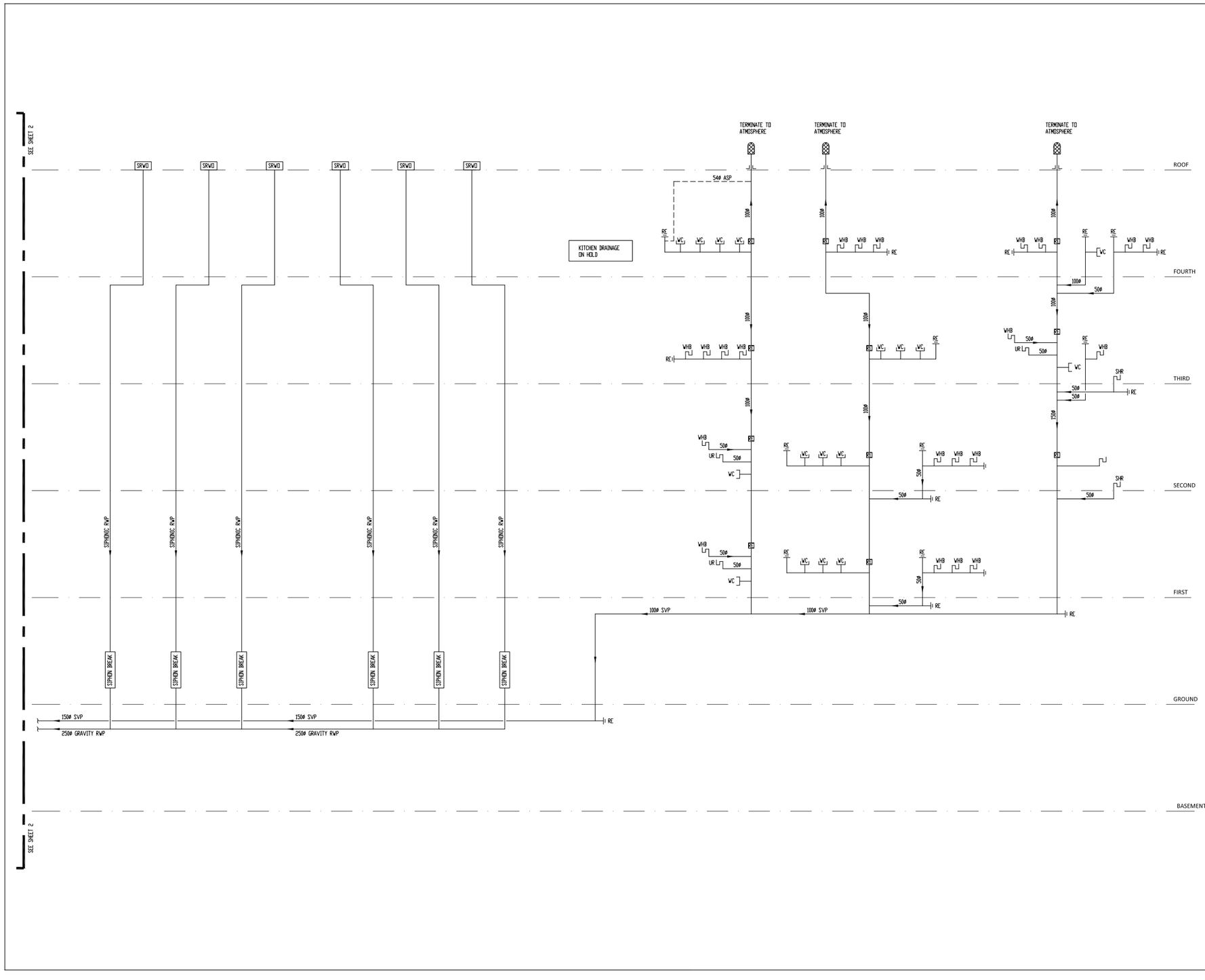
Drawing Title:
Which? HQ
Mechanical Services
Chilled Water &
Condensing Water
Schematic

Drawing Number: TR-WHQ-M-003 -



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LEGEND
RE - RODDING EYE
RWP - RAIN WATER PIPE
SHR - SHOWER
SRWO - SIPHONIC RAINWATER OUTLET
SVP - SOIL VENT PIPE
TTA - TERMINATE TO ATMOSPHERE
UR - URINAL
WC - WATER CLOSET
WHB - WASH HAND BASIN

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Drawing Title:
Which? HQ
Public Health Services
Sanitary Plumbing
and RW Schematic
Sheet 1 of 3

Drawing Number:
TR-WHQ-P-001-1 -

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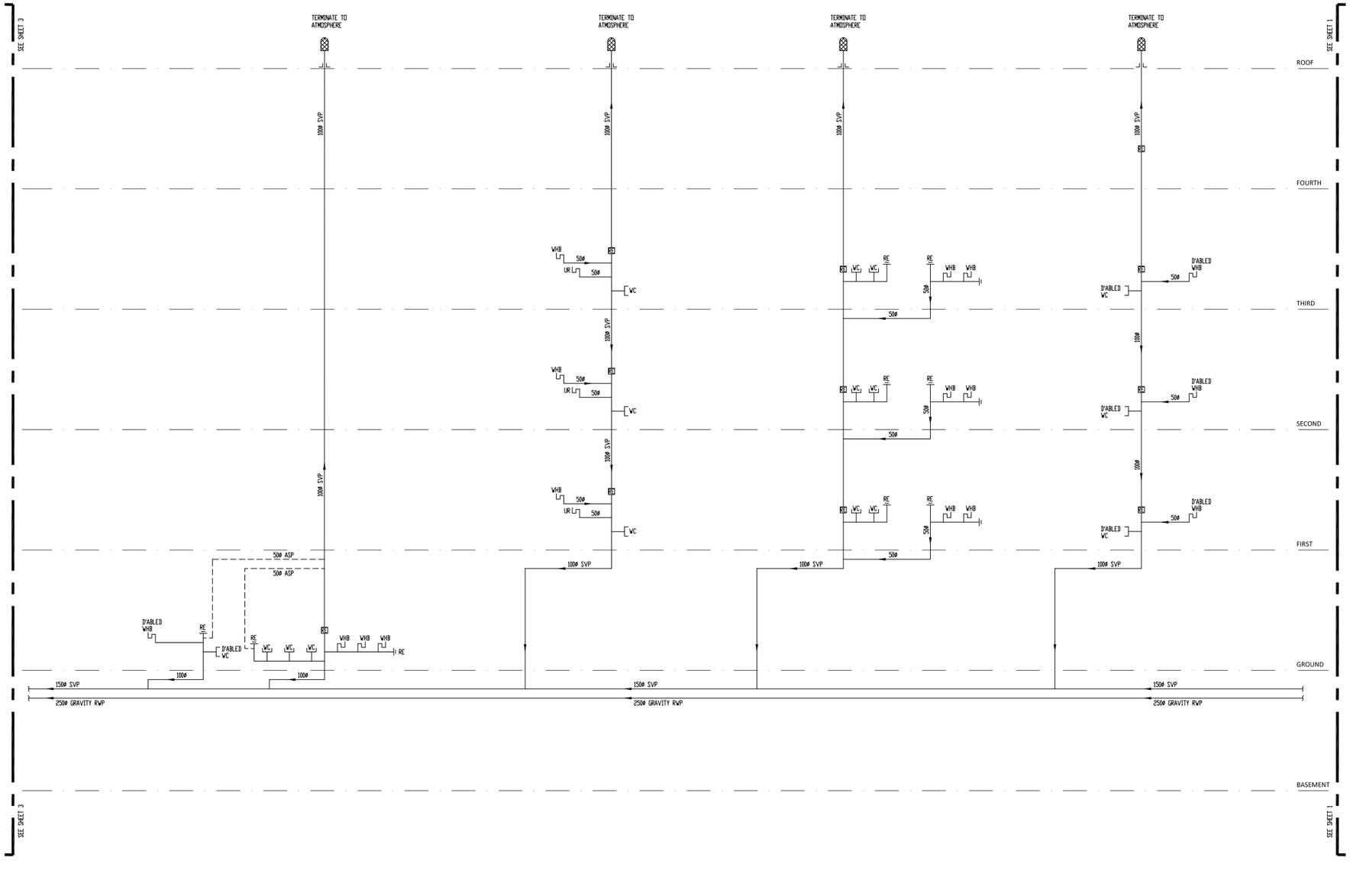

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Date	3 Jul 2013	Drawn by:	LS
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Drawing Title:
Which? HQ
Public Health Services
Sanitary Plumbing
and RW Schematic
Sheet 2 of 3

Drawing Number: TR-WHQ-P-001-2 -

Notes
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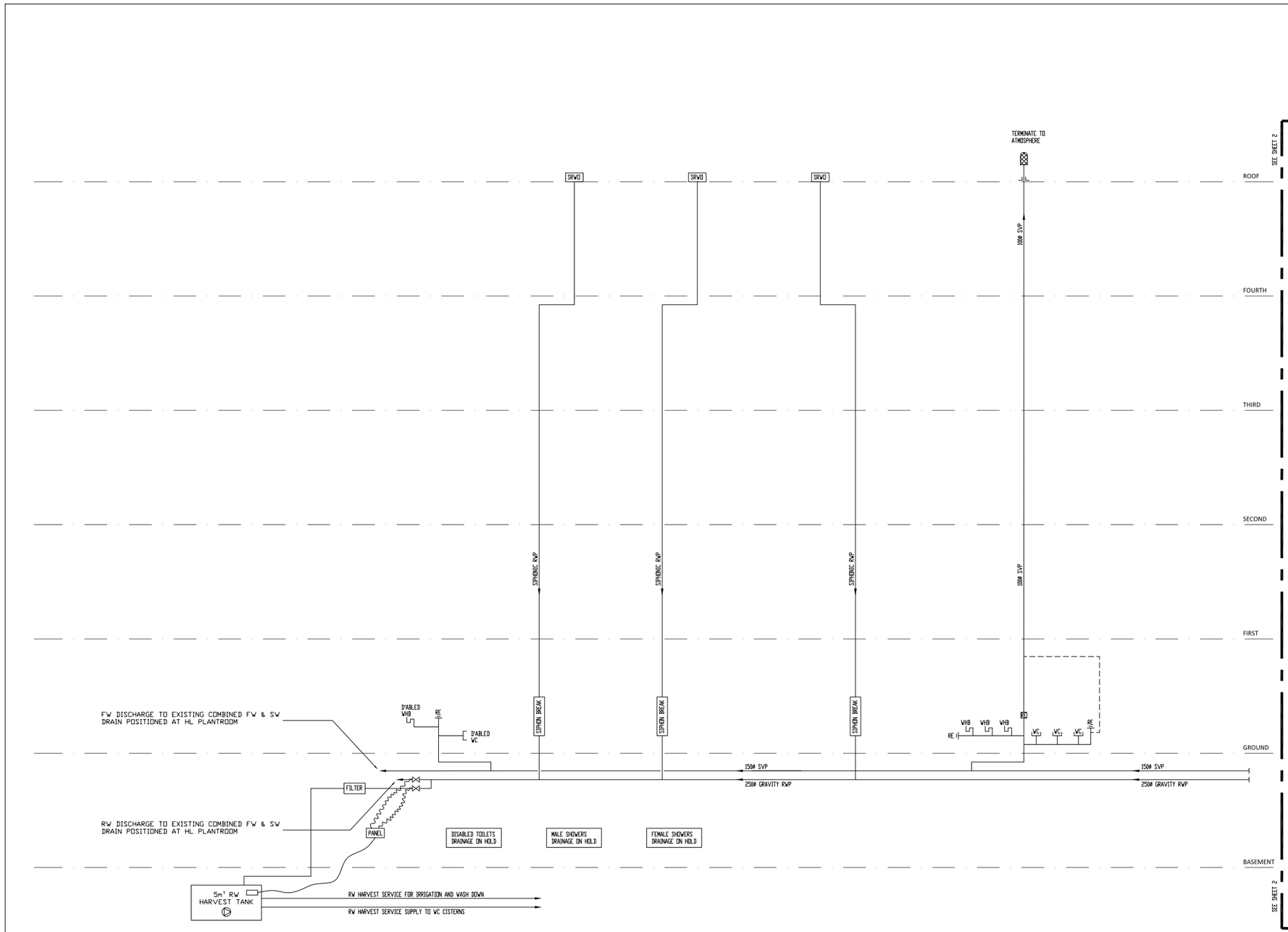

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Scale @ A1	N.T.S.	Checked by:	DC

Drawing Title:
Which? HQ
Public Health Services
Sanitary Plumbing
and RW Schematic
Sheet 3 of 3

Drawing Number:
TR-WHQ-P-001-3 -