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DOCUMENT
M&E SERVICES
PLANNING REPORT

LOCATION
176 PRINCE OF WALES
ROAD, LONDON

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176 PRINCE OF WALES ROAD, LONDON NW5 3PT

PLANNING REPORT

MECHANICAL, ELECTRICAL AND PLUMBING (MEP) BUILDING ENGINEERING SERVICES

CONTENTS

1.0 INTRODUCTION

This report describes the proposed electrical and mechanical services installations for the proposed extension to the existing building at 176 Prince of Wales Road and should be read in conjunction with the following enclosed drawings:

3409_MEP_B1_01_P02	Services Layout Basement
3409_MEP_00_01_P02	Services Layout Ground Floor
3409_MEP_01_01_P02	Services Layout First Floor
3409_MEP_02_01_P02	Services Layout Second Floor
3409_MEP_XX_01_P02	Services Layout Section

2.0 INCOMING SERVICES

The building is currently provided with the following incoming services:

Electricity
Gas
Water

New or uprated incoming services will be required to serve the development.

The following new or uprated incoming services are proposed to be provided. All are subject to confirmation by the relevant utility companies.

2.1 Electricity Supply

The existing electricity supply is rated at 200A TPN and terminates in the front electrical cupboard of the existing building.

An uprated three phase electricity supply will need to be requested from the regional electricity supply company (REC) to serve the extended building. The supply capacity has not been calculated at this stage but it is envisaged that an additional capacity of around 75kVA will be required. A supply of this capacity could be provided from the low voltage street network but may this will need to be confirmed in due course with the REC. There is always a risk that a sub-station would be required.

2.2 Gas Supply

The building has 2 existing gas supplies. The first is located below the entrance staircase, and is redundant. The second is located within a cupboard adjoining the rear gallery, it is believed to be a U65 meter, although this will need verification as access is currently limited. This meter serves the existing space heating boilers only.

Both existing supplies will need to be removed and replaced with a single meter, ideally located near to the existing basement boiler room at ground floor level.

2.3 Water Supply

The building is currently served by a 28mm incoming copper pipe, connected directly to all water outlets.

An upgraded water supply will be requested from the regional water supply company. The size of this supply will be 42mm dia copper / 50mm MDPE Blue and is based on a maximum ‘demand unit’ loading of 1.8l/s.

The above assumes simultaneous demand usage data as provided by the CIPHE guide and BS EN 12056.

The supply will terminate within the basement area of the building. The meter will be located in the pavement external to the building.

2.4 Data / Voice

Separate incoming service ducts will be provided for future use by data/voice communications service providers.

The ducts will terminate within the Basement escape corridor where containment will be provided to allow data cabling to be installed to comms rooms at the rear of the building.

3.0 ELECTRICAL INSTALLATION

3.1 General

The proposed electrical scope of works comprises the provision of a complete new electrical installation including the following services and systems.

3.2 Electrical Distribution

Main distribution switchgear will be located in the Basement plant room/areas.

This switchgear will comprise the following equipment:

- Incoming electricity supply cut-outs and electricity company meter
- Main distribution board and landlord's distribution board
- Utility company meters for each individual floor/area as required

Local distribution boards will be provided for each of the individual floors and tenant areas as required by the Client brief. These will generally be located within the electrical service riser or at another location as indicated on the drawings.

Also located within the plant room/areas will be equipment serving the access control and other landlord systems.

The distribution switchgear and metering arrangements will be designed to provide maximum flexibility for future tenants and to allow separate utility company metering for individual floors or areas or for the whole building to be occupied and metered as one.

3.3 Vertical Containment Systems

Containment systems will be provided for major cabling runs with separate runs for lighting/power and data/ancillary services.

Vertical containment will be routed up the services risers and comprise separate tray and trunking systems for general lighting and power cabling, cable trays for landlord's ancillary services and cable trays for future tenant data/telecom cabling.

3.4 Lighting Installation

An internal lighting installation will be provided to the gallery and office areas generally comprising suspended luminaires with high efficiency LED light sources.

The installation will be designed to provide an average minimum service illuminance of 400 lux. Details of the gallery lighting will be developed as part of the gallery design to suit the Client's brief.

Each Luminaire group will be fitted with individual PIR sensors to provide on/off control based on occupancy of the immediate area and daylight sensing.

External lighting will be provided to provide decorative and security lighting.

Emergency lighting will be provided to meet the requirements of BS5266 and the Building Regulations.

3.5 Small Power Installation

13A socket outlets will be provided for general purpose use throughout the building and also in external locations where required.

Wiring accessories in visible locations are assumed to be of high quality flush flat plate metal finish.

3.6 Fire Alarm System

A fire alarm system will be provided to meet the requirements of BS5839 and the Building regulations.

The system will be designed to provide category L1 protection as defined by BS5839.

The system will be a fully addressable system with the main control panel located in the Ground Floor entrance area.

Automatic detection and alarm sounders will be provided to cover all escape routes and areas of high risk. Detection and alarm sounders will be provided to office suites to suit the initial open plan layouts. Tenants will have to provide additional detection and sounders if they subdivide the space.

3.7 Data/Telephone Cabling Installations

Data/telephone outlets will be provided in agreed locations and with containment routed back to a data rack location (details to be agreed).

Containment will be provided from the incoming telecom service location to the data rack position.

3.8 Intruder Alarm/CCTV/Access Control Systems

Intruder alarm, CCTV and access control systems will be provided to protect the new extension and to meet the Client brief.

4.0 MECHANICAL INSTALLATION

4.1 Mechanical Services Design Criteria

The building services shall be designed to assist with achieving a 'very good' BREEAM rating.

4.1.1 External Design Parameters

Building Fabric Calculations

Winter External Design: -3°C db
Summer External Design: 30°C db / 20°C wb

Humidity control is not provided

4.1.2 Noise

External

For new external plant and equipment an independent environmental noise survey has been undertaken by a specialist acoustic consultant Noico.

The local planning restrictions impose conditions whereby all external noise emitted by mechanical plant and equipment must be a minimum dB value below the background level at the nearest affected residential window and shall have consideration for the nearest affected commercial property.

The report prepared by Noico for the planning application confirms that the acoustic treatment measures to be undertaken as part of the design will ensure that the new external plant will comply with the planning authority's requirements.

4.1.3 Hydraulic System Design Parameters

Maximum hydraulic pressure differential for supply water services pipework sizing 300 Pa/m, maximum velocity in pipework 2.5m/s (accessible).

4.1.4 Ventilation System Design parameters

Maximum face velocity heating/cooling coils 2.5m/s
Maximum face velocity - air filters 2.5 m/s
Maximum face velocity - louvres (over gross area) 2 m/s
Maximum air velocities in ductwork;
Main ducts 6m/s
Branch ducts 5m/s
Final run outs to grilles and diffusers including spigots and flexible connections 3m/s

4.1.5 Internal Design Parameters

The following parameters are for guidance purposes and would be superseded as required by the local code design criteria.

Note: the following noise criteria levels apply to noise emitted from mechanical services plant only and are based on CIBSE recommendations for environmental design:

	Summer	Winter	Ventilation Rate	Noise (NR)
General				
Galleries/Performance	22°C	20°C	10 l/s/person	NR30-35
Circulation	-	18°C	N/A	NR35
Classrooms/Library	22°C	20°C	10 l/s/person	NR30-35
AV Room	22°C	20°C	10 l/s/person	NR40-45
Public Support Facilities				
Public Toilets	-	18°C	6 ac/h	NR45
Plant Rooms	-	5°C	-	-
Outside Supply Air	18°C	18°C	-	-

All internal temperatures will be designed to be controlled to a tolerance of +/- 2ºC.

4.1.6 Design Assumptions

Typical lighting levels heat gain – Offices/BoH – 20 W/m²
Typical lighting levels heat gain – Exhibition – 40 W/m²
Typical small power heat gain – 5 W/m²
Sensible heat gain from occupants – 75 W/person (sensible) 55 W/person (latent)

Maximum simultaneous occupancy assumed to be no greater than 1 person per 10m² for normal operations.

In the interests of economics, efficiency of operation, plant capacity, plant space requirements and cost, Building Services systems are to be designed to operate under 'normal' operational circumstances, and not for example in extreme weather conditions, the unlikely event where the population of the building is over and above the assumed maximum simultaneous occupancy identified above.

The client has indicated that humidification is not required for the exhibition or storage areas. However, this could be added by local units later if ever required. CIBSE guide A notes: *conditions required for preservation/conservation of exhibits may override criteria for human comfort; abrupt changes in temperature and humidity should be avoided.*

4.2 Heating & Comfort Cooling

4.2.1 Existing Services

.
Space heating is provided by a gas fired boiler located in the basement boiler room. The boilers are currently out of service and being replaced with 3 Vaillant Ecotec Plus 656/4-5A boilers, under a separate project.

Domestic hot water is provided by various local direct electric heaters.

Comfort air conditioning is not provided.

4.2.2 Proposed Services

All mechanical services are subject to planning environmental noise restrictions. Acoustic treatment will be provided where necessary to reduce the levels emitted.

For the proposed new extension, space heating and comfort cooling will be provided by electric Variable Refrigerant Volume (VRV) air source heat recovery units. The external condenser units will be located at first/second floor level within an external plant area. This system can provide simultaneous heating and cooling.

The system consists of outdoor air cooled condensers connected to various indoor fan coil units via refrigerant quality pipework and cables.

Each heating/cooling zone will be controlled by conventional wall mounted thermostats / return air thermostats as supplied with the fan coil unit system, via a central building management system (BMS).

Communal and circulation areas will be heated by a new low temperature hot water (LTHW) boiler system, serving the radiators, AHU pre-heat coil and a domestic hot water cylinder.

The client has indicated that humidification is not required for the exhibition or storage areas. However, this could be added by local units later if ever required.

The existing space heating system will be retained for the existing part of the building, utilising the boiler which is due to be replaced under a separate project. Therefore there will be 2 independent boiler systems, one for the existing part of the building and another for the new section.

4.3 Hot and Cold Water Services

Cold water will be mains fed and distributed throughout the building to serve both new and existing sanitary appliances.

The incoming mains water will have a water meter; additional meters shall be provided to each area/usage exceeding 10% of the total demand.

Leak detection systems shall be installed to each toilet area, complete with shut-off solenoid valves linked to the local PIRs and the BMS.

The mains water supply will be fitted with a magnetic water conditioner unit to treat all supplied water.

The incoming water supply will be either connected to a cold-water booster set, comprising break tank/pumps/control panel, or water accumulators, depending on the incoming mains water pressure.

The cold water will be distributed to all the cold-water outlets and to an indirect unvented hot water cylinder. Hot water would be distributed via a pumped secondary circuit to both new and existing outlets.

External cold water taps will be provided where agreed and to suit the external landscaping scheme as required.

4.4 Fresh Air Ventilation

Mechanical ventilation will be provided to serve the new construction only; natural ventilation will be retained to the existing building.

An air handling unit (AHU) will be floor mounted within the basement plant room, ducted to fresh air inlet/exhaust louvres within the proposed lightwell, separated by a minimum distance of 10m.

The AHU will comprise inlet/exhaust filters, dampers, LTHW pre-heat coil, DX heat/cool coil for tempering the fresh air, supply/extract fan, high efficiency thermal wheel heat exchanger and integral controls.

Supply and extract air will be ducted from the AHU to various grilles/fan coil units throughout the new building, as required to suit the room occupancy/usage.

Local extract ventilation to the existing building will be retained, together with the natural ventilation to the main areas.

4.5 Control Systems

A building management system (BMS) will be provided to operate the VRV system, new boiler/domestic water/ventilation plant.
The VRV system will operate via a dedicated touch screen unit, linked to the BMS.

Each principle floor / zone will have individual control of heating and cooling temperature set points for the space served. Individual spaces within the building will be able to heat and cool simultaneously.

The controls strategy has been designed to minimise and monitor energy consumption.

The controls system will utilise direct digital control technology to enable maximum interrogation of the system and provide reliability in operation.

4.6 Drainage Systems

A gravity drainage system will be provided to serve the ground floor and above.

It's likely that a pumped drainage will be required for the basement, this will be determined by the structural engineer who will be responsible for the below ground drainage element.

5.0 SUSTAINABILITY

A Planning Statement and Energy Assessment has been prepared as part of the planning application process by Eight Associates who are specialist sustainability consultants. Please refer to their reports for more details.

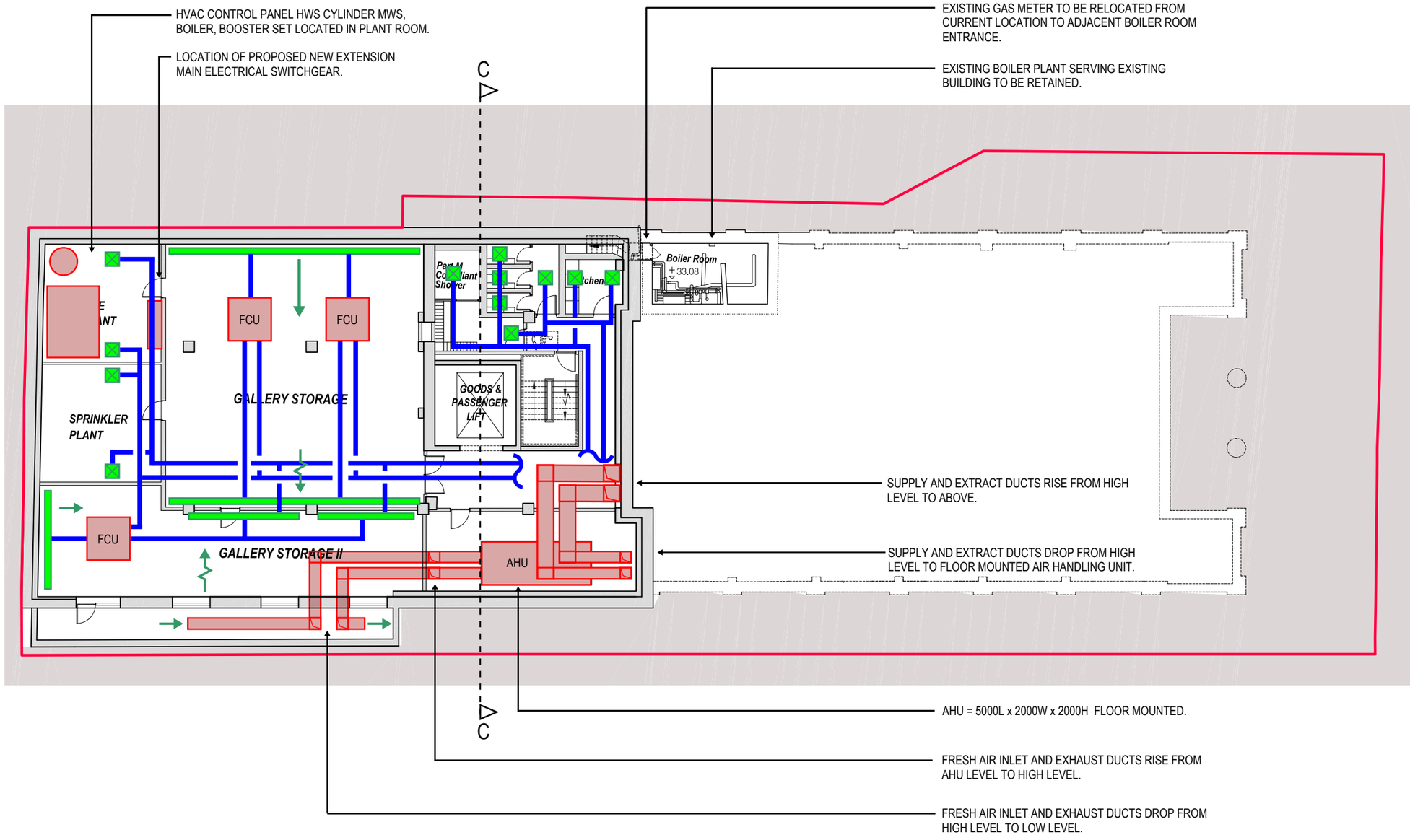
The following additional measures are also to be incorporated within the MEP Building Services scheme design:

- Accurate, zoned and responsive control systems.
- Energy efficient lighting, local movement sensor controls, daylight dimming sensors.
- Air source VRV heat pump systems for space heating and comfort cooling.
- High efficiency condensing boiler system to provide space heating to back of house areas, the AHU pre-heat coil and hot water cylinder.
- Heat recovery air handling unit.
- Upgrading of boiler system to existing building (under a separate project).

6.0 APPENDIX

Please refer to the following documents which are to be issued as part of the planning application:

- Noico Environmental Noise Survey Report, reference 360946 Rev.1 , of 7th December 2016.



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Project
176 PRINCE OF WALES ROAD LONDON

Title
SERVICES LAYOUT BASEMENT

Status
● PRELIMINARY ○ TENDER ○ CONTRACT

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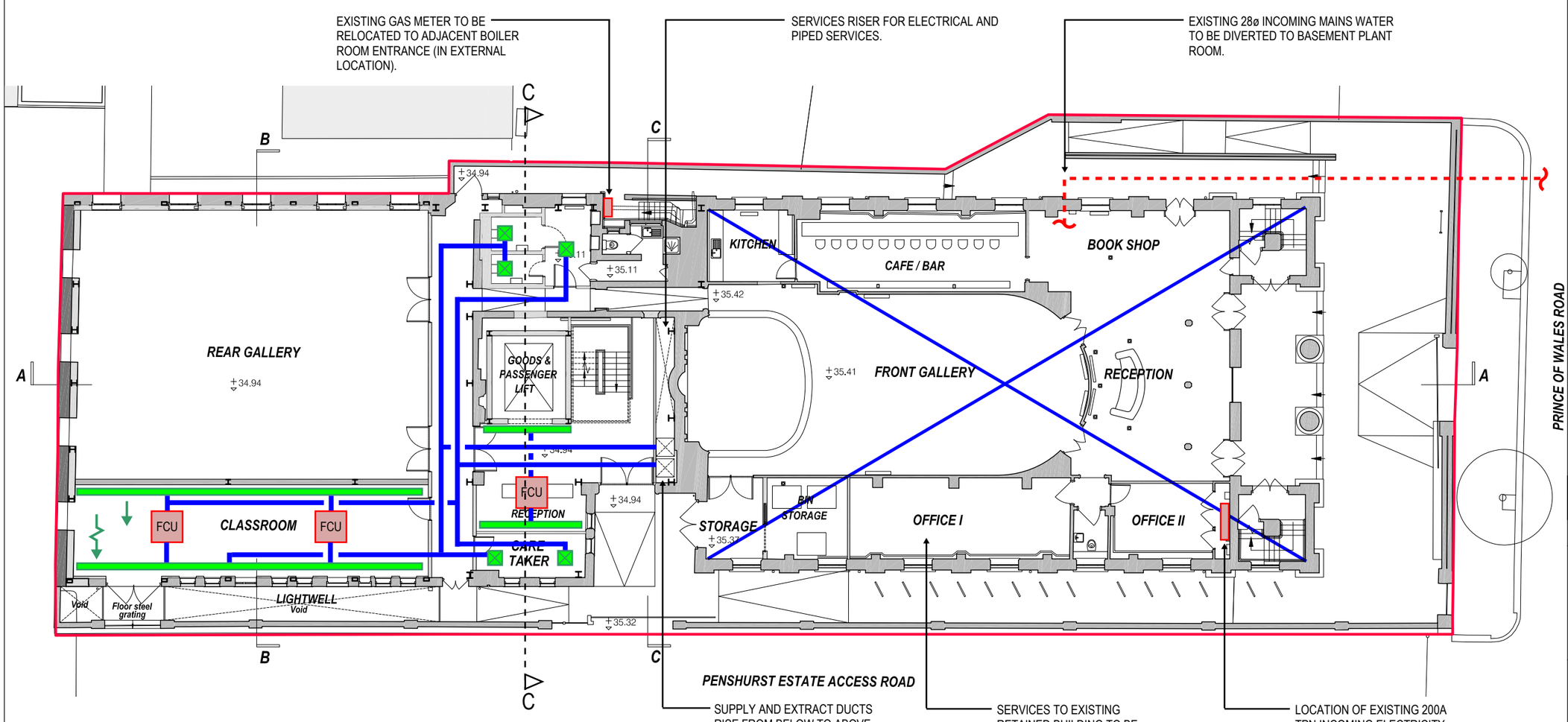
Revision: P02



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Project
176 PRINCE OF WALES ROAD LONDON

Title
SERVICES LAYOUT GROUND FLOOR

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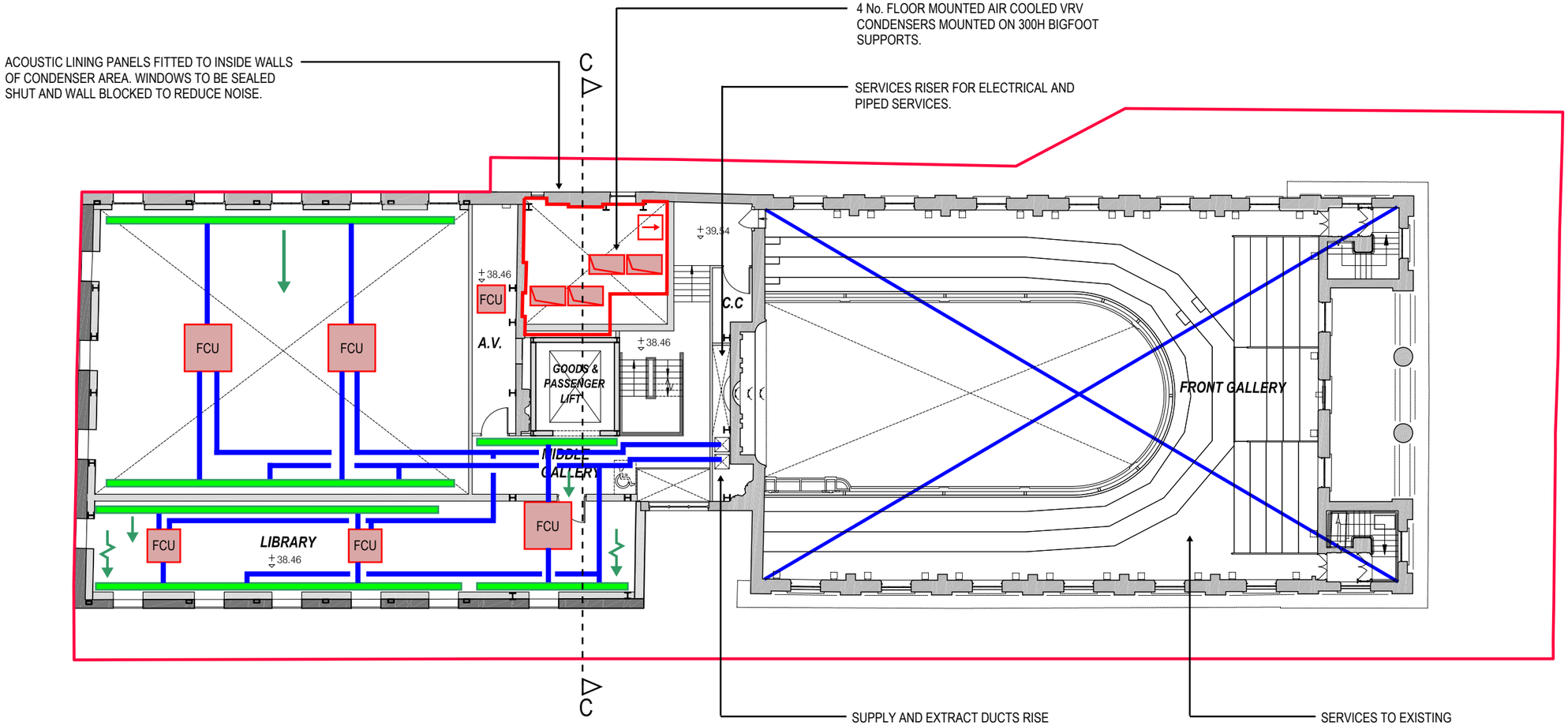

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Project
176 PRINCE OF WALES ROAD LONDON

Title
SERVICES LAYOUT FIRST FLOOR

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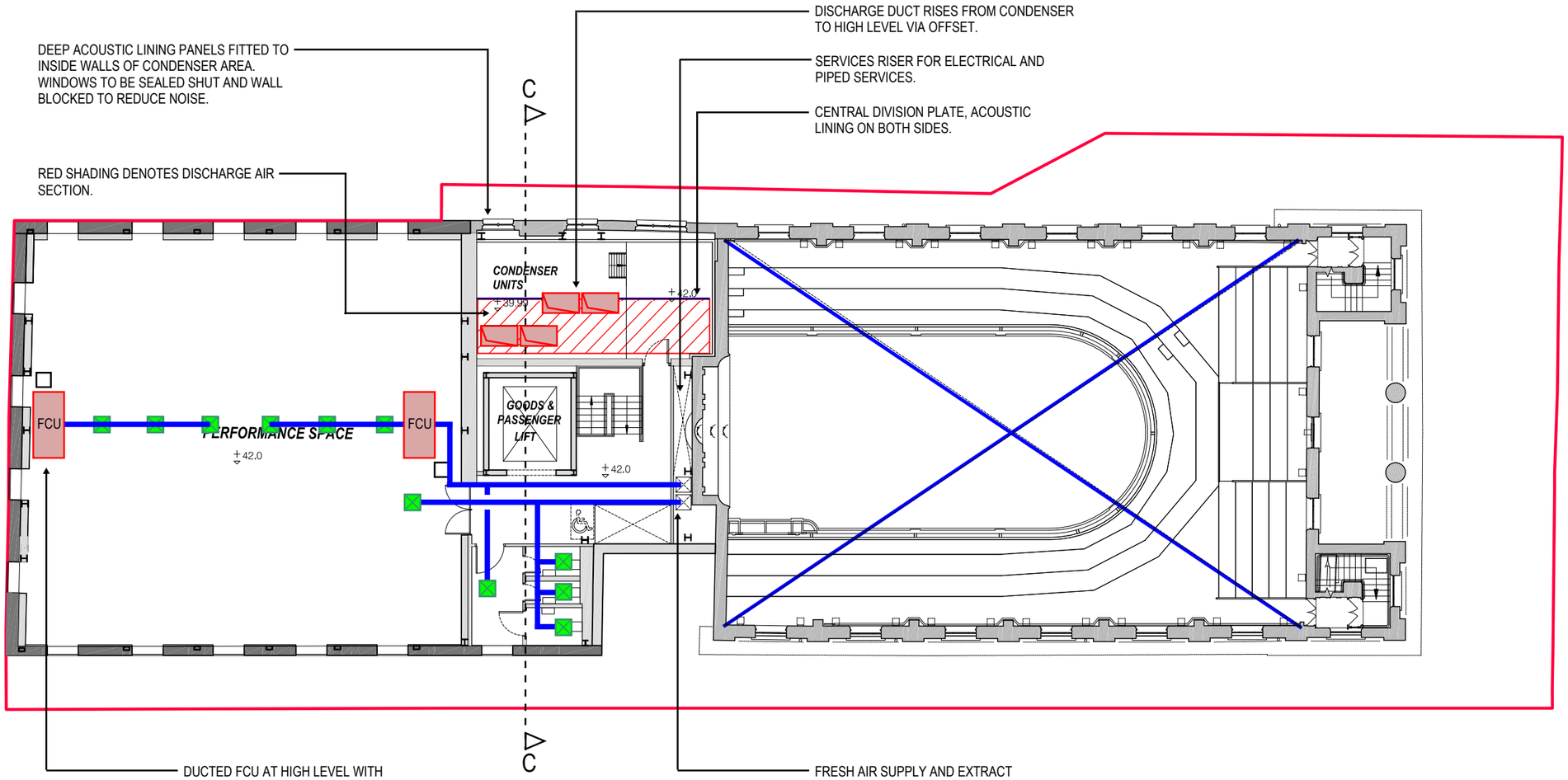

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Title
SERVICES LAYOUT SECOND FLOOR

Status
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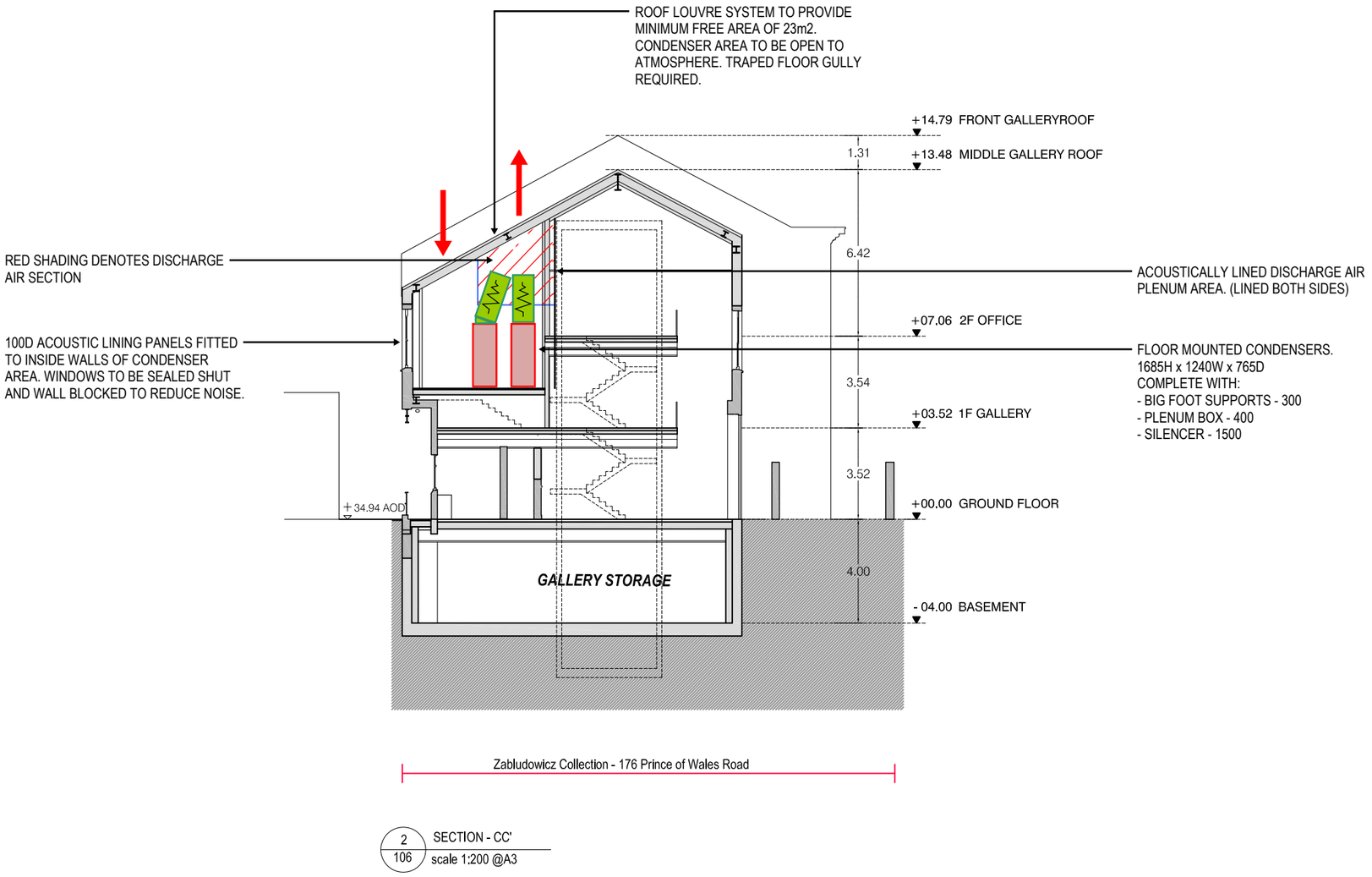

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SERVICES LAYOUT SECTION

Status
● PRELIMINARY ○ TENDER ○ CONTRACT

Date	NOV 2016
Scale	1:50 @ A1
Drawn by	BM
Checked by	JPW
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