ST ANDREWS HOUSE

Anglo American and De Beers

DESIGN & ACCCESS STATEMENT

SAH-AUK-ZZ-ZZ-RP-A-07002

10.06.2021

REV. P03

aukett swanke

CONTENTS

This report is to be read in conjunction with the following drawings :

SAH-AUK-ZZ-ZZ-DR-A-07001-P01 - SITE LOCATION PLAN
SAH-AUK-ZZ-ZZ-DR-A-07002-P01 - SITE PLAN

SAH-AUK-ZZ-00-DR-A-07130-P01 - EXISTING - GENERAL ARRANGEMENT GROUND FLOOR PLAN
SAH-AUK-ZZ-01-DR-A-07131-P01 - EXISTING - GENERAL ARRANGEMENT FIRST FLOOR PLAN
SAH-AUK-ZZ-02-DR-A-07132-P01 - EXISTING - GENERAL ARRANGEMENT SECOND FLOOR PLAN
SAH-AUK-ZZ-03-DR-A-07133-P01 - EXISTING - GENERAL ARRANGEMENT THIRD FLOOR PLAN
SAH-AUK-ZZ-04-DR-A-07134-P01 - EXISTING - GENERAL ARRANGEMENT FOURTH FLOOR PLAN
SAH-AUK-ZZ-RF-DR-A-07135-P01 - EXISTING - GENERAL ARRANGEMENT UPPER ROOF PLAN
SAH-AUK-ZZ-ZZ-DR-A-07140-P01 - EXISTING - GA EAST ELEVATION
SAH-AUK-ZZ-ZZ-DR-A-07141-P01 - EXISTING - GA ELEVATIONS - WEST, NORTH & SOUTH
SAH-AUK-ZZ-ZZ-DR-A-07150-P01 - EXISTING - GA SECTIONS A, B, C & D
SAH-AUK-ZZ-ZZ-DR-A-07151-P01 - EXISTING - GA SECTION E

SAH-AUK-ZZ-00-DR-A-07160-P01 - DEMOLITION LAYOUT - GROUND FLOOR PLAN
SAH-AUK-ZZ-01-DR-A-07161-P01 - DEMOLITION LAYOUT - FIRST FLOOR PLAN
SAH-AUK-ZZ-02-DR-A-07162-P01 - DEMOLITION LAYOUT - SECOND FLOOR PLAN
SAH-AUK-ZZ-03-DR-A-07163-P01 - DEMOLITION LAYOUT - THIRD FLOOR PLAN
SAH-AUK-ZZ-04-DR-A-07164-P01 - DEMOLITION LAYOUT - FOURTH FLOOR PLAN
SAH-AUK-ZZ-ZZ-DR-A-07171-P01 - DEMOLITION - ELEVATIONS - WEST, NORTH & SOUTH
SAH-AUK-ZZ-ZZ-DR-A-07180-P01 - DEMOLITION - SECTIONS A, B, C & D
SAH-AUK-ZZ-ZZ-DR-A-07181-P01 - DEMOLITION - SECTION E

SAH-AUK-ZZ-00-DR-A-07100-P01 - PROPOSED - GENERAL ARRANGEMENT GROUND FLOOR PLAN
SAH-AUK-ZZ-00-DR-A-07200-P01 - PROPOSED GROUND FLOOR APARTMENT 4
SAH-AUK-ZZ-01-DR-A-07101-P01 - PROPOSED - GENERAL ARRANGEMENT FIRST FLOOR PLAN
SAH-AUK-ZZ-02-DR-A-07102-P01 - PROPOSED - GENERAL ARRANGEMENT SECOND FLOOR PLAN
SAH-AUK-ZZ-03-DR-A-07103-P01 - PROPOSED - GENERAL ARRANGEMENT THIRD FLOOR PLAN
SAH-AUK-ZZ-04-DR-A-07104-P01 - PROPOSED - GENERAL ARRANGEMENT FOURTH FLOOR PLAN
SAH-AUK-ZZ-RF-DR-A-07105-P01 - PROPOSED - GENERAL ARRANGEMENT UPPER ROOF FLOOR PLAN
SAH-AUK-ZZ-ZZ-DR-A-07110-P01 - PROPOSED - GA EAST ELEVATION
SAH-AUK-ZZ-ZZ-DR-A-07111-P01 - PROPOSED - GA ELEVATIONS - WEST, NORTH & SOUTH
SAH-AUK-ZZ-ZZ-DR-A-07120-P01 - PROPOSED - GA SECTIONS A, B, C & D
SAH-AUK-ZZ-ZZ-DR-A-07121-P01 - PROPOSED - GA SECTION E
SAH-AUK-ZZ-XX-DR-A-07300-P01 - TYPICAL SECONDARY GLAZING DETAIL

SAH-AUK-ZZ-XX-DR-A-07210-P01 - PLANT ENCLOSURE 1.pdf
SAH-AUK-ZZ-XX-DR-A-07211-P01 - PLANT ENCLOSURE 2.pdf
SAH-AUK-ZZ-XX-DR-A-07212-P01 - PLANT ENCLOSURE 3.pdf
SAH-AUK-ZZ-XX-DR-A-07213-P01 - PLANT ENCLOSURE 4.pdf
SAH-AUK-ZZ-XX-DR-A-07214-P01 - TYPICAL PROPOSED NEW PLANT ENCLOSURE
SAH-AUK-ZZ-XX-DR-A-07300-P01 - TYPICAL SECONDARY GLAZING DETAIL

ISSUE	DATE	BY	APPROVED
P01 - Draft	05/06/2021	DS	SvB
P02 - Draft	09/06/2021	DS	SvB
P03 : Planning	10/06/2021	DS	SvB

1.	INTRODUCTION	3
	CONTEXT	4
2.	SITE & CONTEXT	5
3	ADJOINING BUILDINGS	6
4	LISTED BUILDING & PLANNING HISTORY	7
	THE BRIEF	8
5	THE OVERALL CLIENT BRIEF	9
6	HEATING & COOLING : M&E STRATEGY OPTIONS	10
	THE EXISTING BUILDING	11
7	EXISTING UNIT MIX	12
8	EXISTING FLOOR PLANS, GF to 4th, SECTIONS, ELEVATIONS	13-21
9	EXISTING ROOF CONFIGURATION & PLANT ENCLOSURES	22
10	EXISTING REAR FAÇADE	23
	DESIGN OPTIONS	25
	ROOF LEVEL INTERVENTIONS: HEATING & COOLING EQUIPMENT OPTIONS	26
11	NEW M&E PLANT : EQUIPMENT OPTIONS	27
12	NEW M&E PLANT : SIZE CONSIDERATIONS	28
13	NEW M&E PLANT : LOCATION & PLACEMENT	30
	ROOF LEVEL INTERVENTIONS: PLANT LOCATION OPTIONS	32
	OPTION A	33
	OPTION B	37
	OPTION C	38
	OPTION C1	39
	OPTION C2	42
14	SUMMARY	43
	ROOF LEVEL INTERVENTIONS: THE PREFERRED OPTION	44
15	Proposed Roof Level Plant Configuration	45
16	Structural Considerations	46
	GROUND FLOOR & EXTERNAL INTERVENTIONS	52
17	New Ground Floor Plant Room	53
18	New MVHR System and Air-Bricks	54
19	Replacement timber double glazed doors and windows to the 4th floor	56
20	Penetration for new ductwork at roof level	57
	INTERNAL INTERVENTIONS	58
21	Ceilings	59
22	Pipework and Risers	60
23	Secondary Glazing and Insulation	61
24	Ground Floor : Apartment 4 Layout Update	62

1. Introduction

This document has been prepared as part of the Planning and Listed Building Applications to London Borough of Camden on behalf of our client, Anglo American DeBeers (AADB) for the refurbishment of St Andrews House, Saffron Hill.

The document includes an overview of the proposed interventions, selected layout drawings reproduced at A3 size, as well as key visuals of specific interventions.

This report is further to the pre-application set of documentation submitted in 03/2021, the pre-application consultation meetings that took place on 06/05/2021 and 26/05/2021, and is to be read in conjunction with the Heritage Statement 2021/5849HER provided by Planning Potential.

ST ANDREWS HOUSE FRONTAGE, 1943
SOURCE : HISTORIC ENGLAND

ST ANDREWS HOUSE FRONTAGE, PRESENT DAY

St Andrews House is a Grade II Listed building (Grade II awarded 30/12/99), constructed in 1875, which has been owned by AADB (formally the Diamond Trading Company) since 1973. The five-storey building is currently divided into apartments for use by corporate guests and employees, for short and medium-term stays.

The building is located on the existing Anglo American DeBeers campus at Hatton Garden, Farringdon. It comprises of 27 units over 4 (G+3) floors, with provision for meeting and entertainment in a 4th floor penthouse suite, and on-site estates and security accommodation on Ground Floor. The total GIA is approximately 22,000 sq. ft, and the building is accessed through a paved courtyard which is part of the AADB main campus, adjacent to the recently upgraded headquarters.

The project brief is to bring the standards of St Andrews House (SAH) up to the same standards of the adjacent corporate headquarters. The core requirements of this upgrade are :

- Essential Maintenance and Upgraded M&E systems

- Refreshed redecorating where necessary

- Provision of Comfort Cooling as part of the Heating and Cooling infrastructure.

One of the specific requirements of the project brief is to provide a path to 'zero carbon' – which in this context means the removal of traditional gas fired equipment, and the provision of an all-electric suite of air-source equipment, along with local energy recovery units at apartment level. In tandem with some upgrades to the enveloped fabric, the overall system is designed to provide a maximum amount of comfort and utility while being as efficient as is possible.

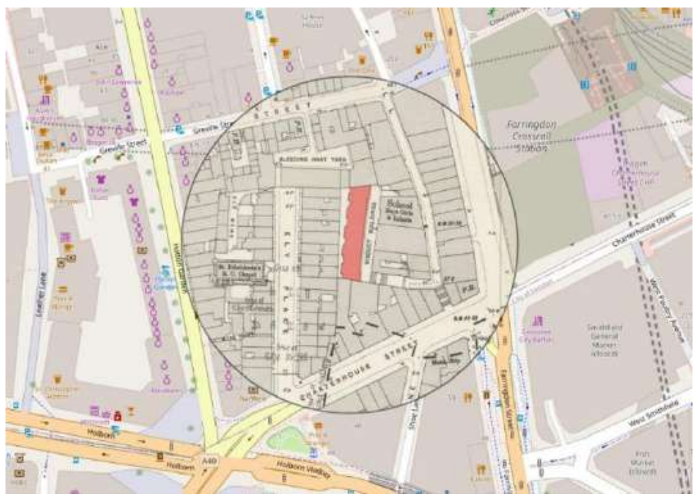
An earlier upgrade in 2006 re-configured the apartments to the current arrangement. (No original features of the early interior remain.) All redecoration internally will take place withing the current configuration, and would include replacement of the existing modern kitchens, appliance, storage and sanitary fittings.

In order to facilitate the core MEP interventions, however, it is proposed that the existing plant enclosures at roof-level are to be upgraded to accommodate new equipment, while new roof level plant enclosures will be formed to accommodate the proposed heating and colling equipment that will operate. The proposed alterations to the exterior of the building are around existing apertures, and are designed to have modest impact on its appearance.

CONTEXT

The earliest history of the St Andrews site can be traced back to records of 1779. Further conveyances in 1868 and 1872 by means of a plan clearly indicated that the buildings shown in Union Court are of a different building than the present St Andrews House.

An article in Building News 17th September 1875 describes the Artisans' Dwellings constructed on the site, the building currently known as St Andrews House. The article also describes the obtainment of the site by the Corporation of the City of London as part of the Holborn Valley Improvements. The site was described as 'situated in the rear of the New Charterhouse Street, crowded with tumble down houses and filthy courts, but building on the site formerly occupied by the gardens and vineyards of the Bishops of Ely'.



OVERLAY OF AN 1880'S OS MAP WITH CURRENT OS DATA

The current building also received a mention in the Architect 02/05/1874 under Tenders and was described as a block of improved dwellings for the labouring poor on the site of the late Union Court in the rear of Ely Place, Holborn, for the Worshipful Improvement Committee of the City of London. It named Horace Jones as the Architect.

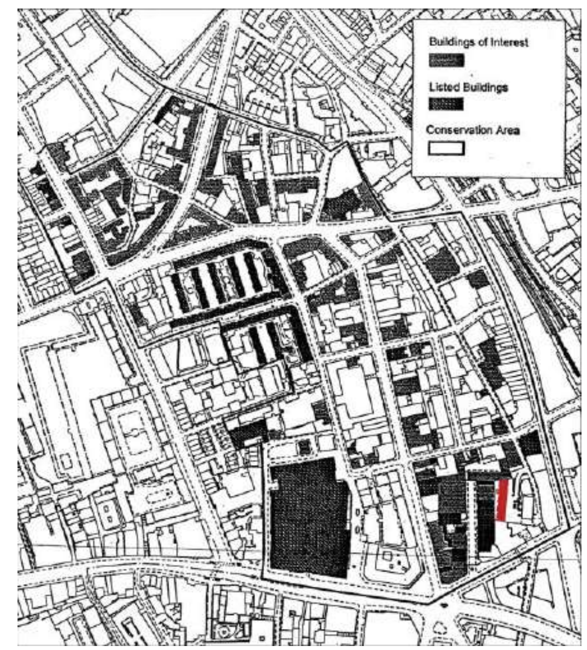
St Andrews House (also formerly known as Asfil House, refer Planning History section for more information) was built as municipal housing and was known as the Viaduct Buildings at the time. It is the oldest surviving purpose-built public housing in London and one of the oldest schemes in Britain. The building is yellow brick faced with painted stucco details, sash windows and decorative cast iron galleries which provide access to the upper floors.1

St Andrews House is situated on Saffron Hill, which is within the Hatton Garden Conservation Area. Hatton Garden is located in the southern part of the Borough of Camden, bordering Islington to the east and the City of London to the South.

POSITION OF ST ANDREWS HOUSE ON THE CURRENT ESTATE.
WORKS TO 17 CHARTERHOUSE STREET SEEN UNDERWAY.

Hatton Garden was first identified as part of the "Royal Courts of Justice, Inns of Court Area of Special Character" in the Greater London Development Plan of 1976, which was then the Statutory Structure Plan for the London Borough of Camden. It also stated that the preservation of these areas "is essential to the retention of the character of London as a whole". 2

The Hatton Garden area has a long history of development, dating back to the medieval period and possibly before. The area has seen substantial waves of change, new investment and development, resulting in a built environment containing many buildings dating from different periods of time. A large number of buildings have fallen into disrepair or have been substantially altered and therefore the origin, architectural quality and history of buildings is not immediately evident. However, on closer inspection, a clear indication of the past does remain and a large number of buildings of national and local architectural or historical importance are to be found within the area. 3



The character and special interest of the Hatton Garden area is defined largely by the quality and variety of buildings and uses, as well as the unique pattern of streets. The character is not dominated by one particular period or style of building, but rather by the combination of styles that make the area of special interest. It is often the case that buildings of different periods, architectural styles and functions exist together in the same street, creating contrasts in scale and character. Subsequently, where alterations have taken place, they usually respect the established character of the adjacent buildings as well as that of the street. 4

The Hatton Garden area is London's jewellery quarter and has long been associated with the jewellery and diamond trade, clock and watch manufacture, repair and retail. Many of these activities, particularly the jewellery and diamond trade remain today and are of national and international significance. These activities provide the area with a distinctive character, with its concentration of retail jewellers along Hatton Garden and a large number of manufacturing and wholesale activities in the area generally. 5 The commitment to these ideas remains in the current Camden Local Plan (2017)

1, 2, 3, 4 & 5 extracted from Hatton Garden Conservation Area Statement, DC Sub-Committee 1999

St Andrews House adjoins 6-6A Bleeding Heart Yard to the North. To the south and east, it adjoins 17 Charterhouse Street, which has recently been significantly upgraded and enlarged. Both these buildings are also owned by Anglo American DeBeers.

The 17 Charterhouse Street building and its Saffron Hill block extension form a private courtyard together with St Andrews House. The front elevation of St Andrews House is just visible from Saffron Hill at the entrance of the AADB driveway.

To the West of the building is a rear courtyard which is adjoined by properties fronting onto Ely Place. These are not owned by AADB.

COURTYARD VIEW, PRESENT DAY, LOOKING SOUTH. THE NEW 17 CHARTERHOUSE DEVELOPMENT IS SEEN ON THE LHS OF THE OF THE VIEW

COURTYARD VIEW, PRESENT DAY, LOOKING NORTH TOWARDS 6-6A BLEEDING HEART YEAR SEEN AT THE END.

VIEW FROM THE NEW 17 CHARTERHOUSE DEVELOPMENT, LOOKING OVER THE ROOF OF ST ANDREWS HOUSE TOWARDS THE WEST AND THE REAR OF THE BUILDINGS OF ELY PLACE BEYOND.

VIEW FROM THE NEW 17 CHARTERHOUSE DEVELOPMENT, LOOKING OVER THE ROOF OF ST ANDREWS HOUSE TOWARDS THE NORTH WEST. 6-6A BLEEDING HEART YARD CAN BE SEEN IN THE RHS OF THE IMAGE

VIEW OF THE REAR OF THE ELY PLACE BUILDINGS, TAKEN FROM THE ROOF OF ST ANDREWS HOUSE LOOKING SOUTH-WEST.

Neither adjacent 6-6A Bleeding Heart Yard nor 17 Charterhouse Street is a listed building. However, 6-6A Bleeding Heart Yard is considered to be a building that makes a "positive contribution to the special character and appearance of the area" (Hatton Garden Conservation Area Statement 05.08.99).

6-6a Bleeding Heart Yard underwent a complete refurbishment by AADB in 2006. The existing character of the façade is being retained and all new work was on a like for like replacement basis.

The following details regarding the Planning History of St Andrew's House were obtained from project archives, originally sourced from the records of AADB :

- An application on 15.11.65 for a showroom building was met with refusal (presumably demolition and construction of a new building)- the reason given that the proposed use was contrary to the zoning as 'light industry'.
- An alternative application was approved the following day (16.11.65) for the 'use for a limited period' of the Viaduct Buildings as 'showrooms'.
- On 23rd October, 1967 the Mayor and Commonalty and Citizens of London transferred the ownership of the building to Afsil Ltd.
- In 1967 Planning permission was granted for the construction of the 4th floor 'Common Rooms'.
- On 1st April 1969 Viaduct Buildings were renamed 155 Saffron Hill.
- On 23rd March 1973 Afsil Ltd. was registered as a charity under Section 29 of the 1960s Charities Act.
- On 31st July 1973 Afsil Ltd sold Afsil House as it was then known to Diamond Properties Ltd with charity consent. It was then leased back to Afsil Trust for 5 years on a peppercorn rent.
- Following this, remodelling of the interior of the building was undertaken and some external repairs and modifications made to St Andrews House during the late 1970's/ early 1980's.
- The building then became known as 140 Saffron Hill.
- The building was Grade II Listed in its earlier configuration and condition, 30/12/1999.

The following historic applications are considered to be relevant to the proposals :

2005/5428/P & 2005/5430/L (Application Approved 09-01-2006) : Conversion of the building involving the creation of 8 additional self contained units at ground and first floor levels, new canopies at roof level, installation of plant/machinery in roof enclosures and at ground floor level to the rear of the building, new lift overrun at roof level, insertion of new windows and doors, erection of new balconies to the rear at first floor level and the installation of new roof railings.

2007/3901/P & 2007/3897/L (Application Approved 23-08-2007) : Amendments of listed building consent dated 5th April 2006 (ref 2005/5430/L) for internal and external alterations/works associated with the conversion of the building, involving alterations to existing windows, proposed location of new satellite dish and aerial at roof level, alterations to plant rooms at rear and roof level, new balcony rail on west (rear) elevation, proposed iron, brickwork and masonry cleaning, painted render and omission of awnings at roof level to St Andrews House.

THE BRIEF

5. The Overall Client Brief

Since its last upgrade in 2006, SAH has been the home to Anglo American DeBeers (AADB) Employees, used by the Group as overnight accommodation, for short, medium and long term visits.

AADB are completing the final phase of programme works to the redevelopment of the adjacent 17 Charterhouse Street (17CHS), their new corporate headquarters; alongside this upgrade, a project has been defined to bring the standards of St Andrews House (SAH) up to the same standards of the corporate headquarters.

Due to the need to maintain and upgrade plumbing pipework inside the building, it was agreed that the brief would include the replacement of all moden kitchen cabinetry and bathroom fittings on a like for like basis. The plan layouts and primary partitions and divisions of the building will not be amended during this project.

In keeping with a stated policy of sustainable development, and in line with an aspiration to move to zero-carbon in the future, it was also proposed to upgrade the M&E systems design, to maximise the comfort of its users while performing efficiently and reliably.

At an apartment level, the removal of the low level radiators, and a move to ceiling mounted Fan Coil Units (FCUs) for heating and comfort cooling means that a proportion of ceilings will be modified to allow for additional distribution pipework and Fan Coil Units (FCUs) – though these modifications are dropped ceilings and bulkheads.

In summary, the key requirements for the upgrade of the building are :

- New plumbing and fittings throughout
- Essential repairs to end of life modern elements
- Replacement of modern Kitchens and Appliances
- Replacement of modern Sanitary fittings
- Improved apartment ventilation
- Combined Heating and Comfort Cooling
- Upgraded and Energy Efficient M&E systems

In order to accommodate the above, an overhaul of the M&E systems is proposed. The key infrastructural upgrades that have been architecturally and structurally coordinated at Stage 2 are :

- New Plant & Relevant Associated External Interventions
- Internal Interventions & Services Distribution

We have addressed the specific architectural, structural and envelope coordination that is required, and has taken place to date, and summarised those in the following sections.

For a summary of the works for the project, please also refer to the OUTLINE SCHEDULE OF WORK, document SAH-AUK-ZZ-ZZ-SH-A-00006, that has been submitted as part of this application.

6. Heating & Cooling : M&E Strategy Options

AN EXISTING PLANT ENCLOSURE AT ROOF LEVEL

THE EXISTING GAS-FIRED PLANT IS LOCATED AT ROOF LEVEL

The existing plant strategy at St Andrew's House is natural gas fired boilers which feed into a wet radiator system to heat the bedrooms, kitchens and living rooms. Gas fired hot water generators supply hot water to serve sanitaryware such as showers, baths, wash hand basins and sinks.

As the plant equipment is approaching the end of its economical serviceable life, the initial client brief was for the replacement plant to have lower operational carbon emissions and ideally cut out the use of onsite combustion altogether.

The two main technology options considered for this project were :

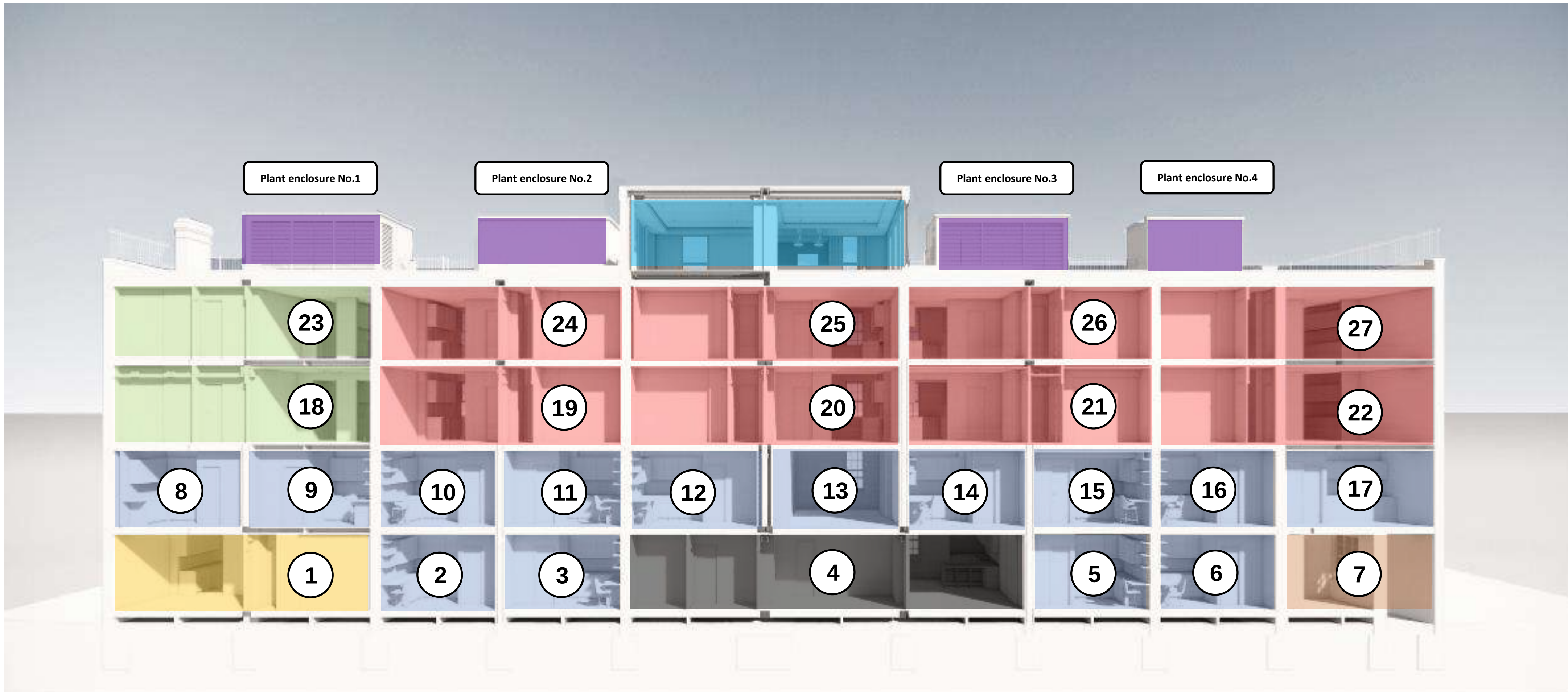
- ground source heat pumps (which would involve piling into the ground). This was deemed unfeasible in a listed structure and developed nature of the site.

- air source heat pumps.

Both technologies have the benefit of being renewable, and both have operating efficiencies approaching 350% (i.e. for every kilowatt of electricity consumed by the system, 3.5 kilowatts of useable heat can be extracted from either the ground of the air.

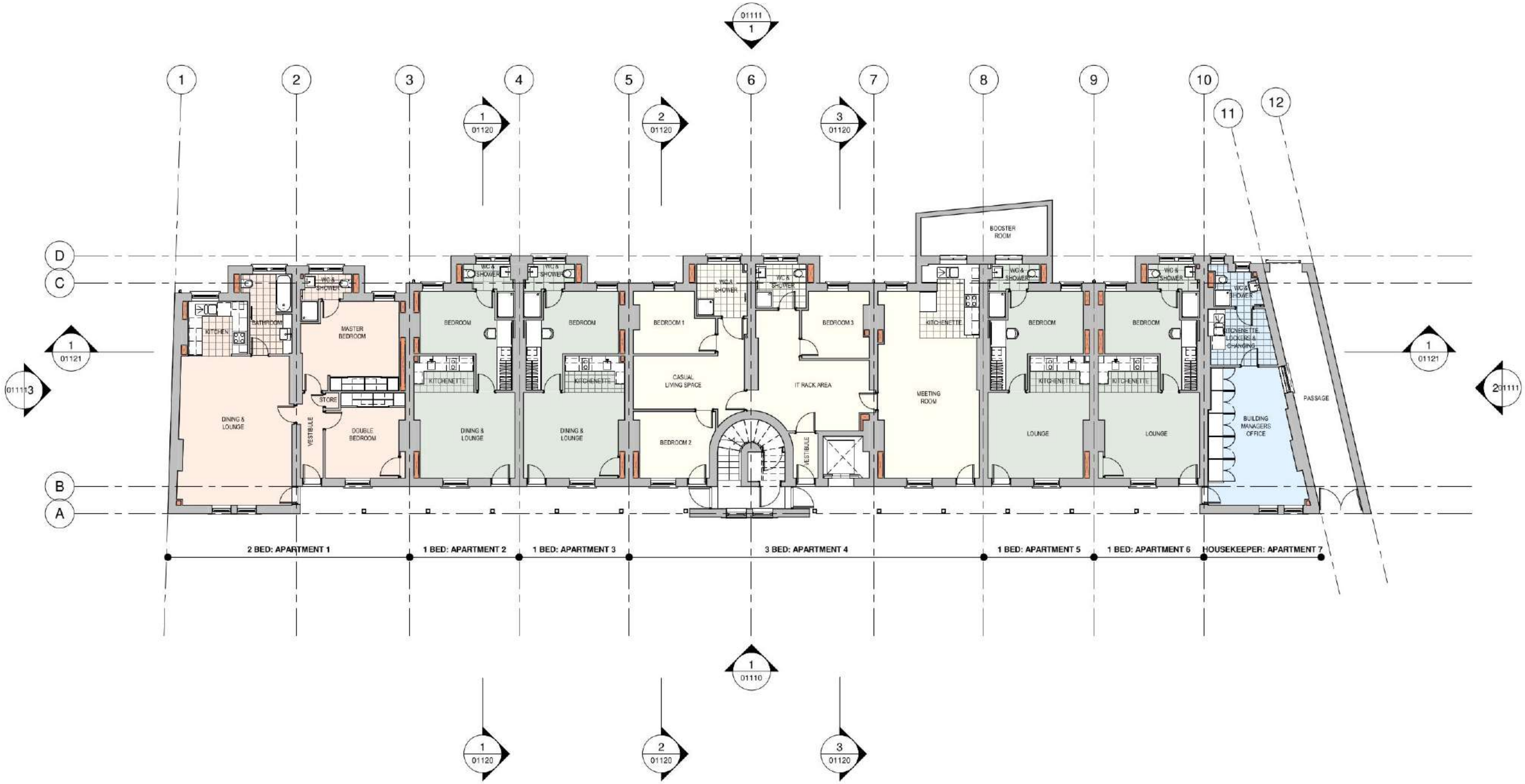
Owing to the complexities, disruption and therefore cost involved with piling in a dense urban environment, the team have progressed the route of an air source heat pump system for the future.

THE EXISTING BUILDING



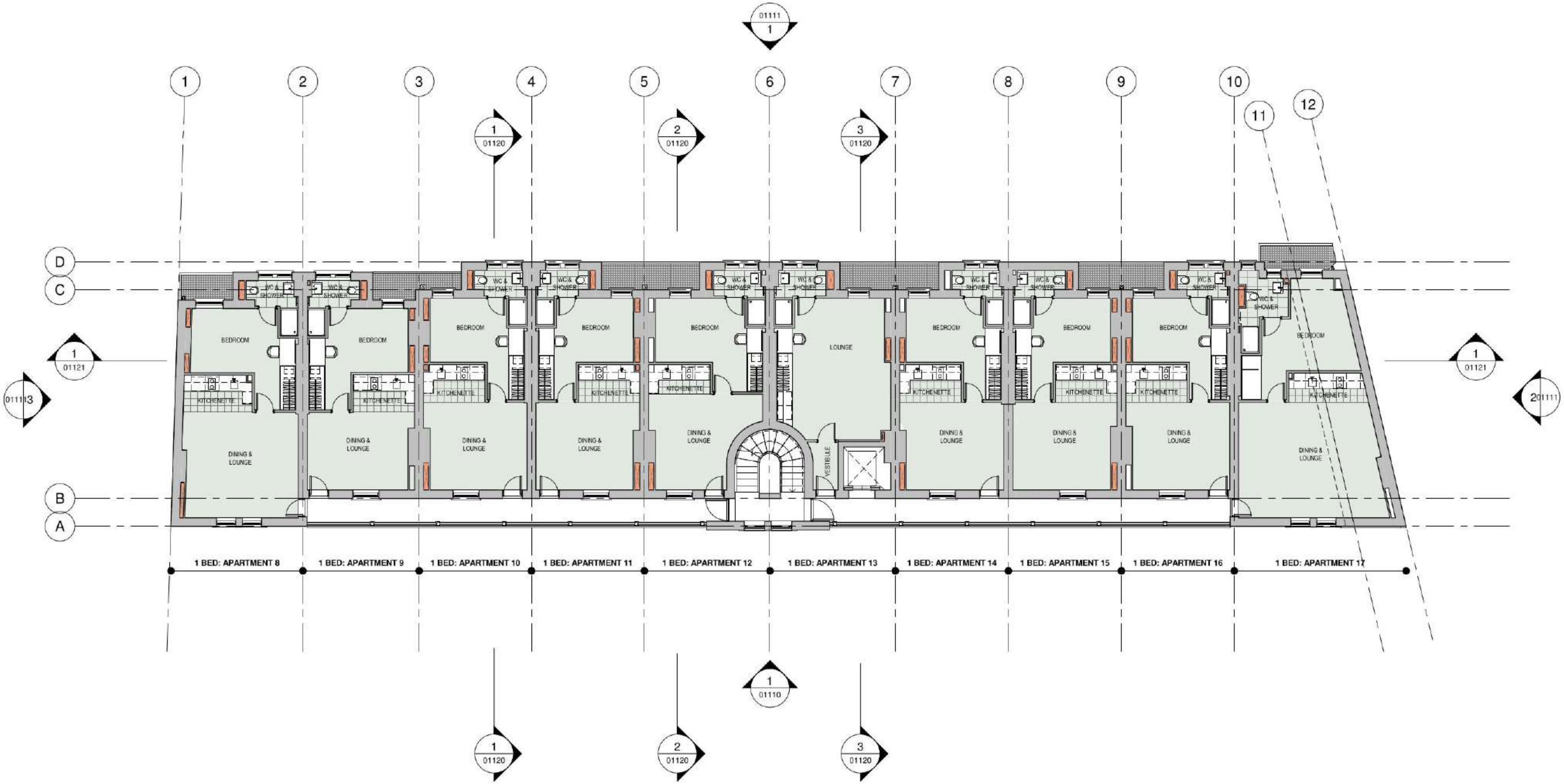
- 14 No. **1 bed** apartments (incl. 1 studio)
- 8 No. **2 bed** apartments
- 2 No. **3 bed** apartments
- 1 No. Future **Assisted** apartment (TBC)
- 1 No. **Penthouse** Meeting Suite
- 1 No. **Estates / Security** & Meeting Facility
- 1 No. **Housekeeping** Office
- 4 No. Plant Enclosures

EXISTING BUILDING : **UNIT MIX**



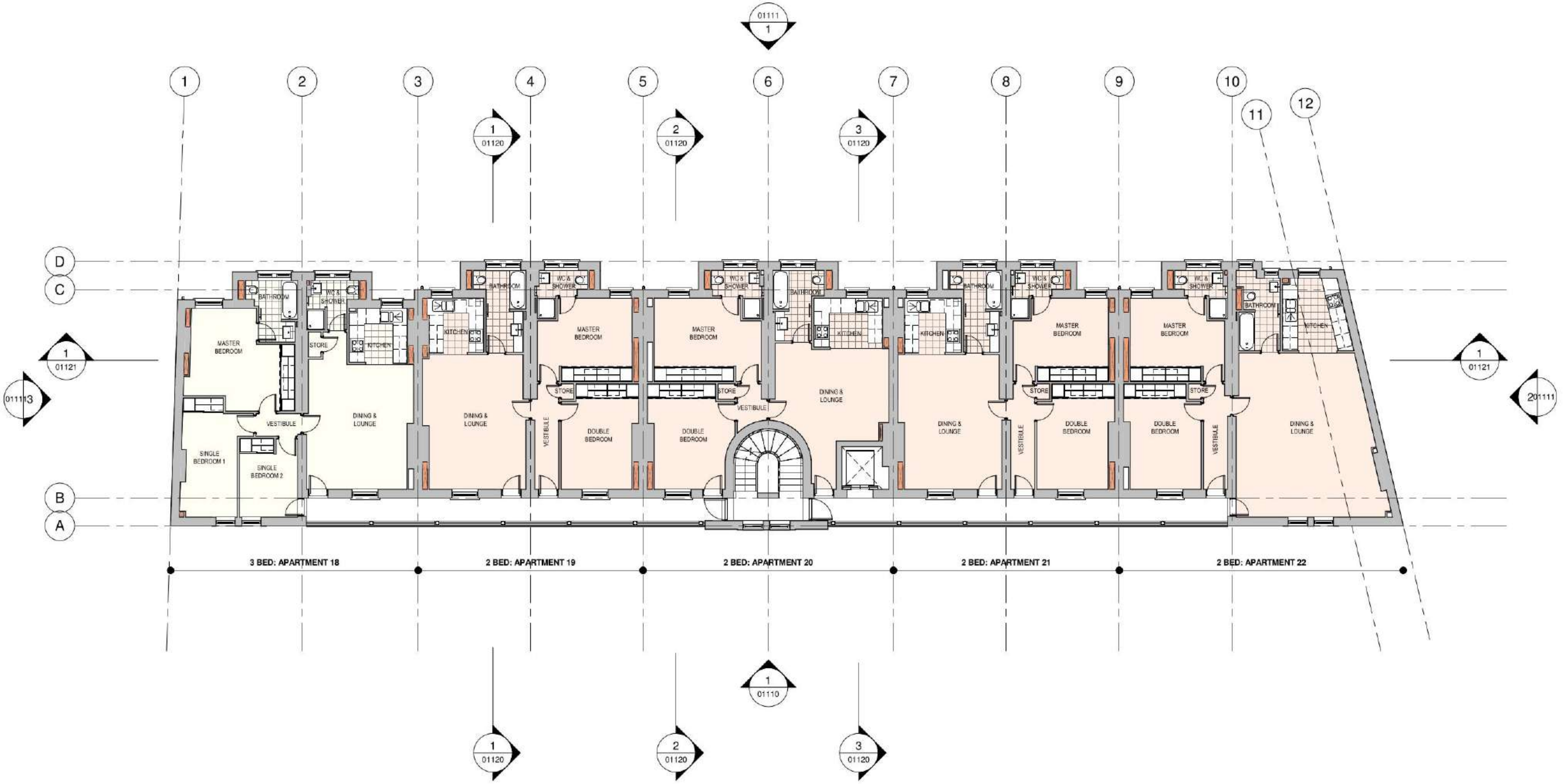
EXISTING FLOOR PLAN : **GROUND FLOOR**

aukett swanke



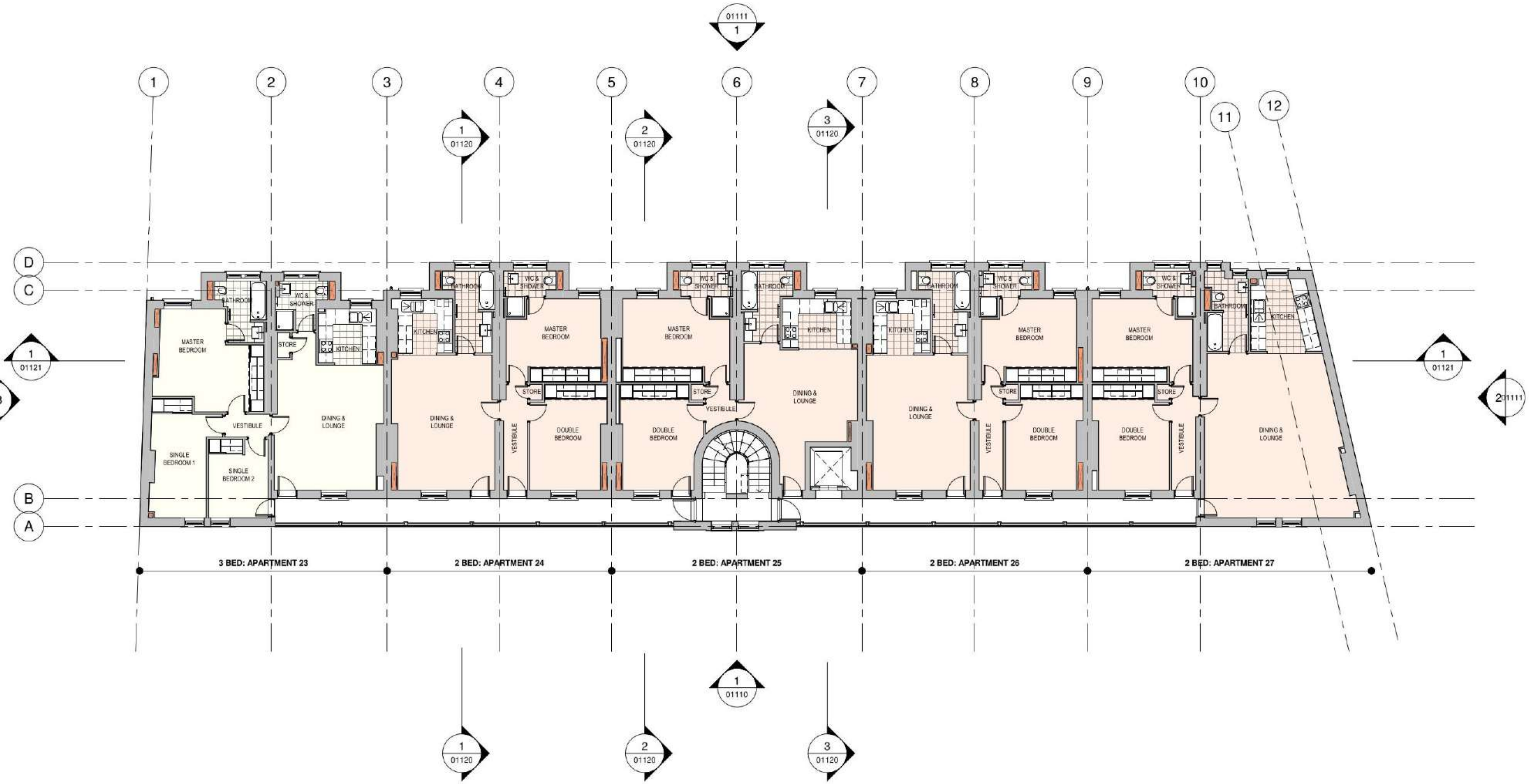
EXISTING FLOOR PLAN : **FIRST FLOOR**

aukett swanke



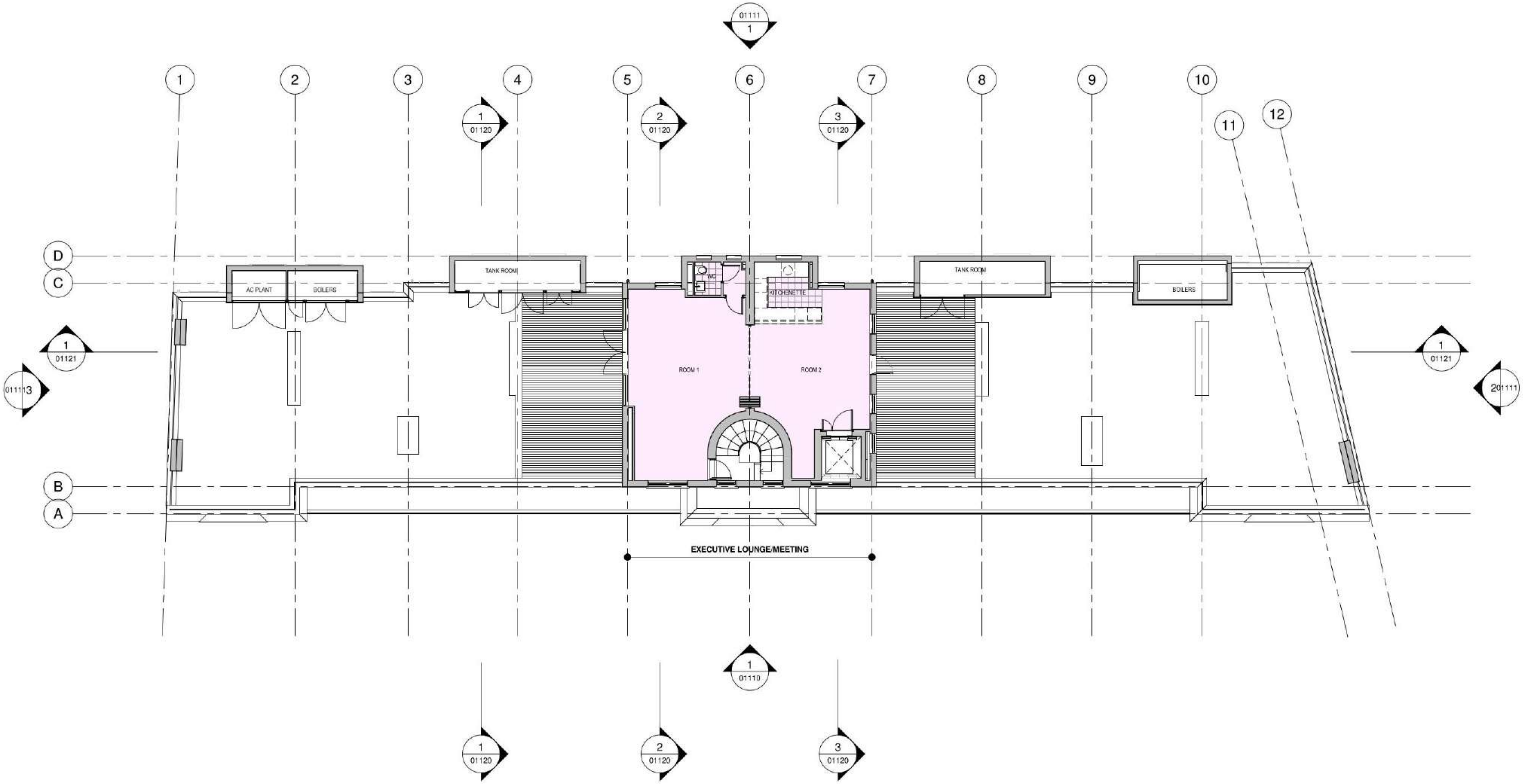
EXISTING FLOOR PLAN : **SECOND FLOOR**

aukett swanke



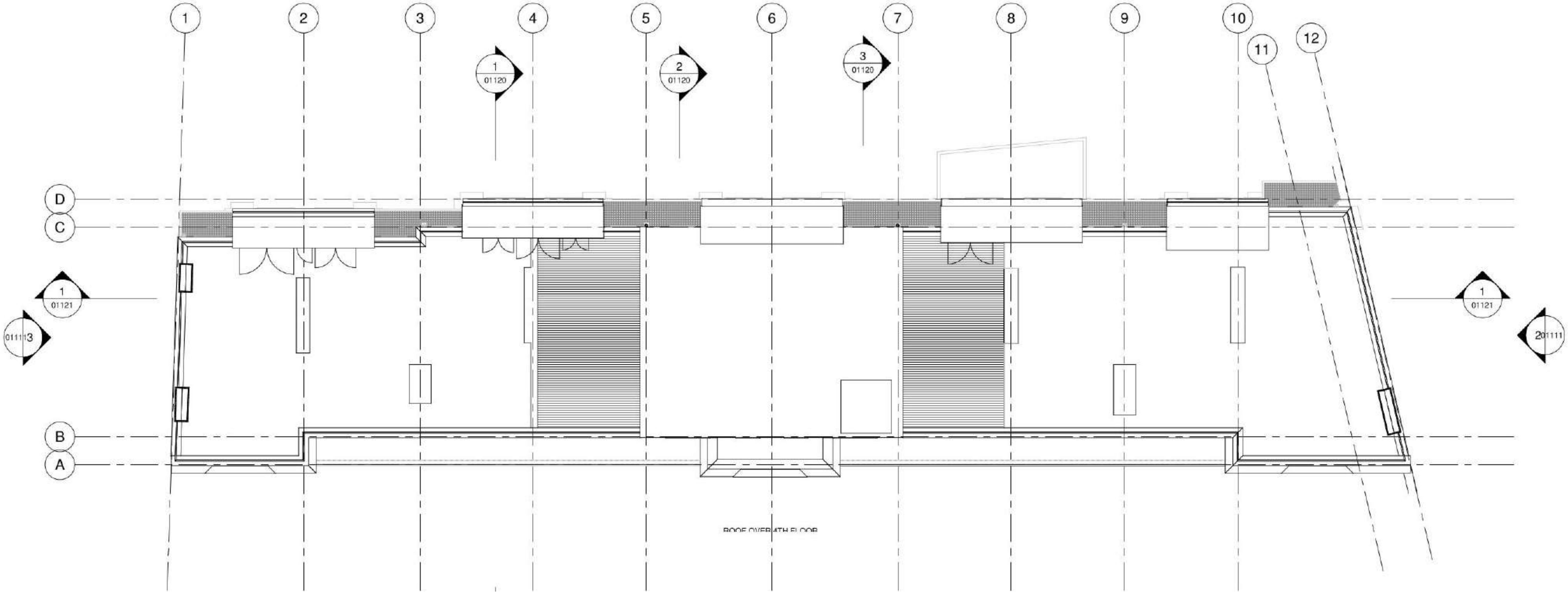
EXISTING FLOOR PLAN : **THIRD FLOOR**

aukett swanke



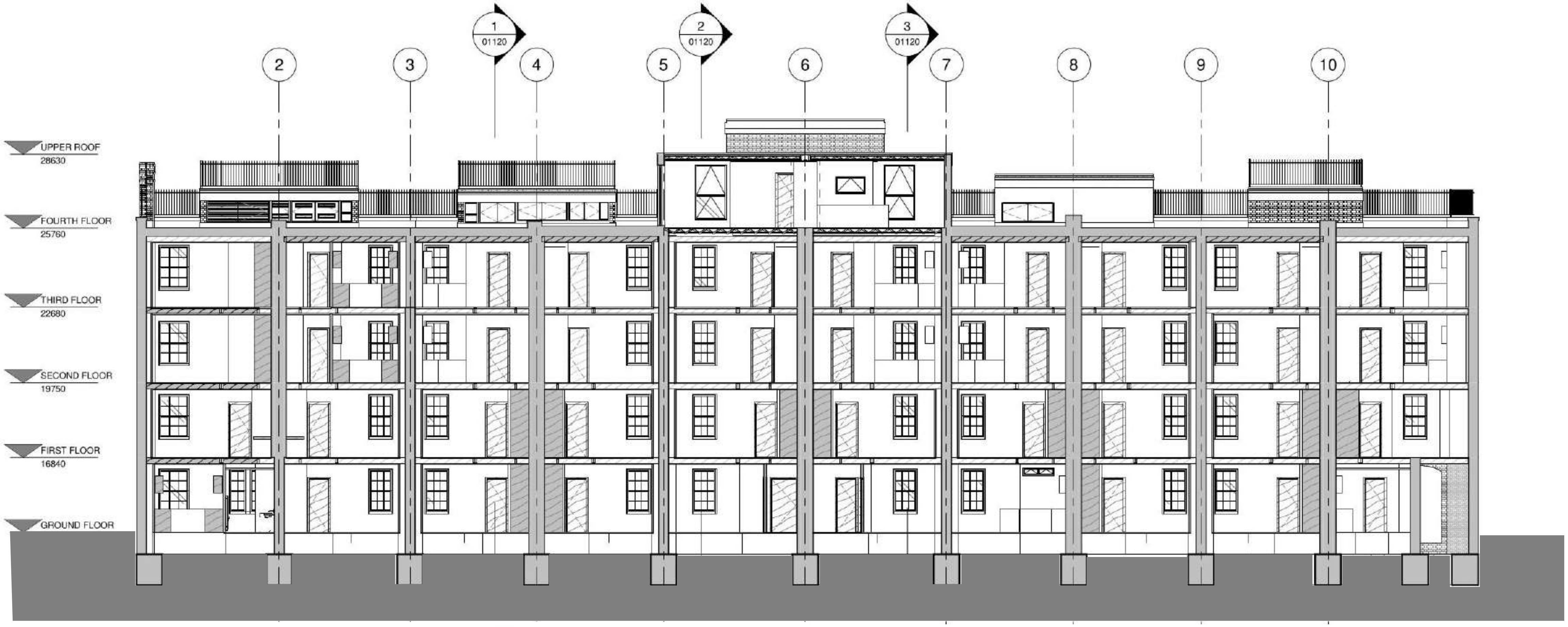
EXISTING FLOOR PLAN : **FOURTH FLOOR**

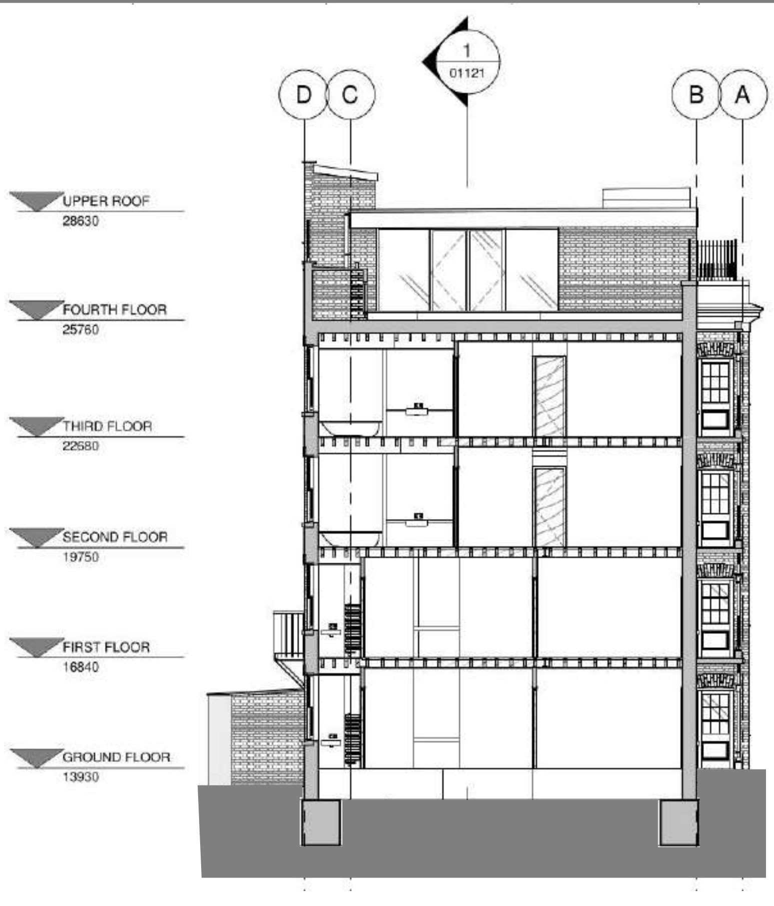
aukett swanke

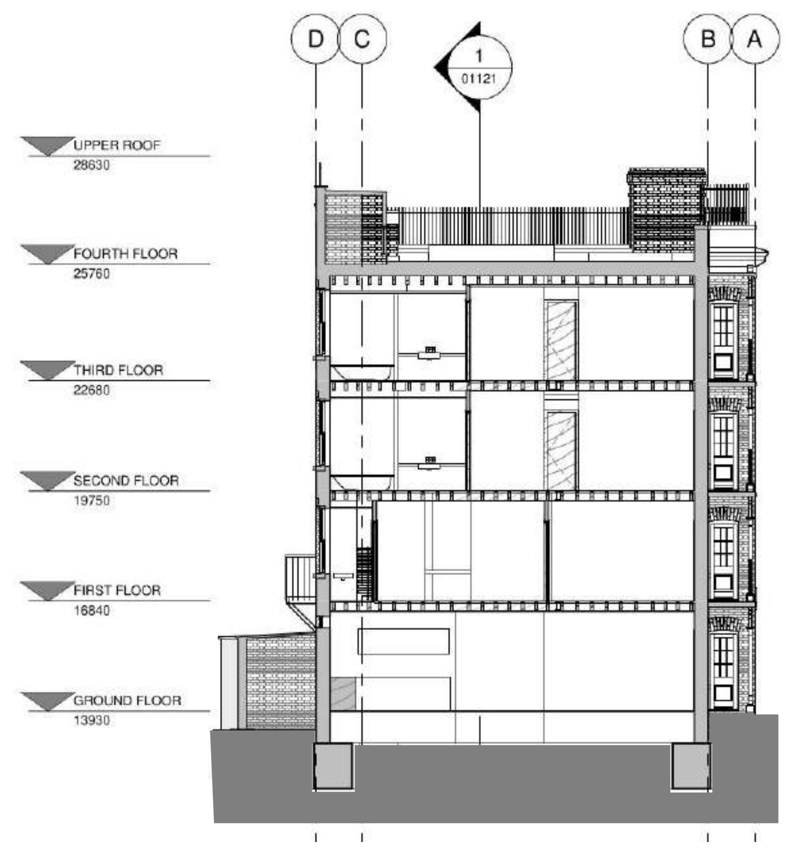


EXISTING FLOOR PLAN : **FOURTH FLOOR**

aukett swanke



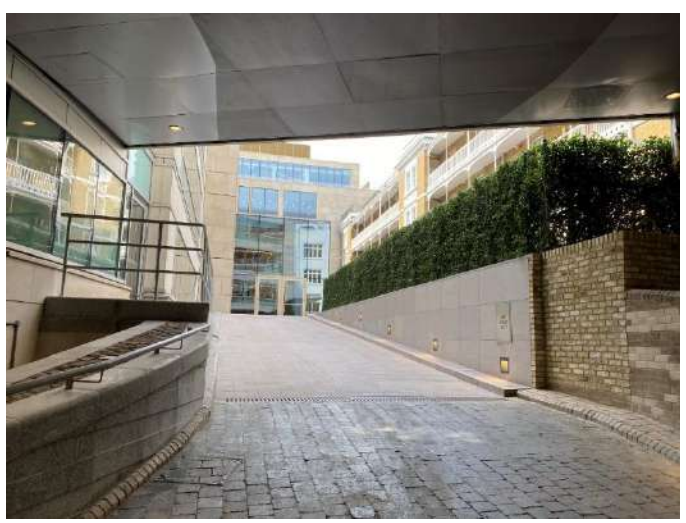




EXISTING BUILDING SECTIONS

aukett swanke

EXISTING ELEVATION: **EAST**



VIEW OF FRONT (EAST) FROM THE RAMP UP, OFF THE STREET (SAFFRON HILL)

VIEW OF FRONT (EAST) LOOKING NORTH

VIEW OF FRONT (EAST) LOOKING SOUTH

EXISTING FRONT FACADE

EXISTING ROOF SCAPE

9. Existing Roof Configuration and Plant Enclosures


THE EXISTING GAS-FIRED PLANT IS LOCATED AT ROOF LEVEL

The existing building roof is the original timber joist construction, that is topped with sarking board and a thin slab and screed to falls, nominally 150mm. The flat roof was upgraded in 2006 to an additional Sarnafil layer of insulation with a single ply membrane, which remains there today.

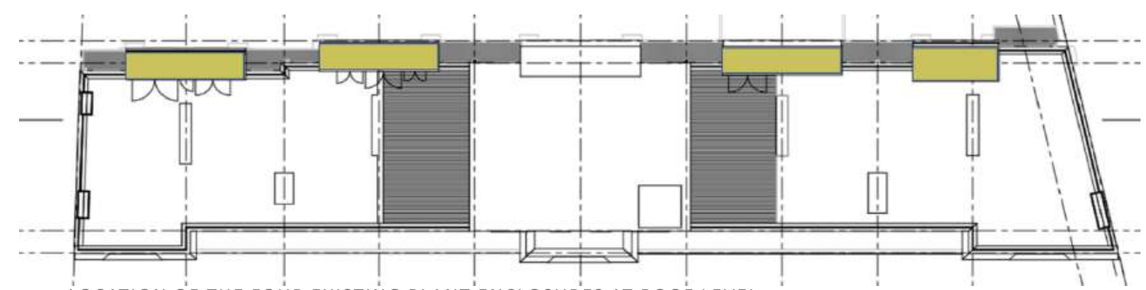
The existing roof level configuration features the original chimney positions which have been capped off and remain as plinths only.

At the top of the rear (west) elevation are four existing plant enclosures that house hot water generation and distribution equipment. These four enclosures sit to the side of the roof, and are located over the main soil pipe and hot-water distribution risers against the rear of the building, to the rear of each WC, in each apartment on each level.

The existing plant enclosures are formed in brick, and project up from the top of the building by around 1200-1500mm in height, about 1000 above the parapet. Atop the parapet is a black cast iron railing, which also runs up over the back of the plant enclosures.

The existing enclosures house the hot water generation and storage for the building; a large gas pipe runs up the building and the gas fired boilers have their own flues that go to atmosphere. There is also some local A/C equipment that serves the penthouse meeting suite. As part of the new overall heat-source / all-electric strategy, the existing plant will be stripped out and new plant will be installed at roof level.


FORMED IN BRICK WITH A SIMPLE ROOF, EACH OF THE PLANT ENCLOSURES – BUT ONE – ARE TOPPED IN EXISTING CAST-IRON RAILINGS

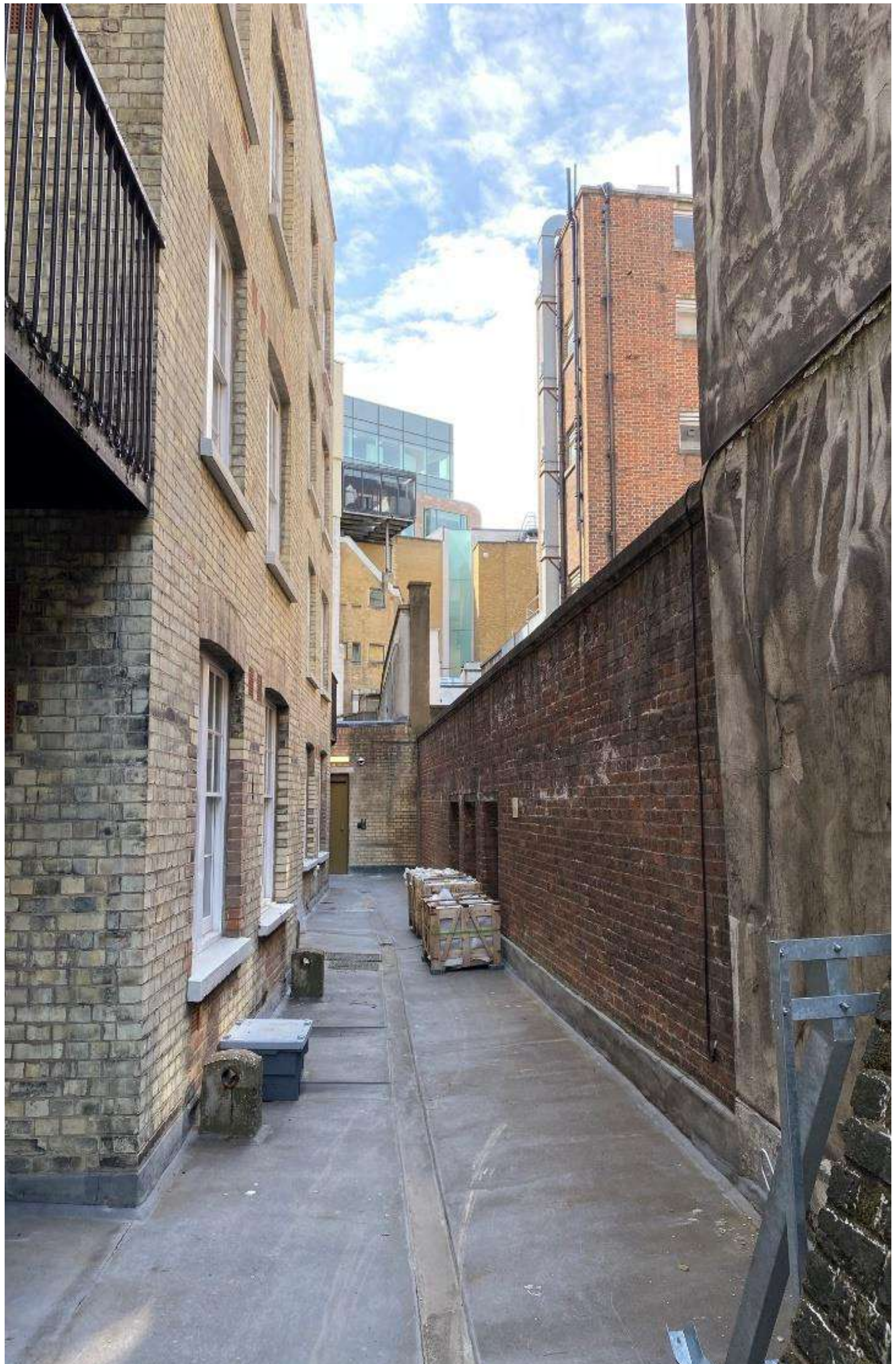

LOCATION OF THE FOUR EXISTING PLANT ENCLOSURES AT ROOF LEVEL

10. Existing Rear Facade

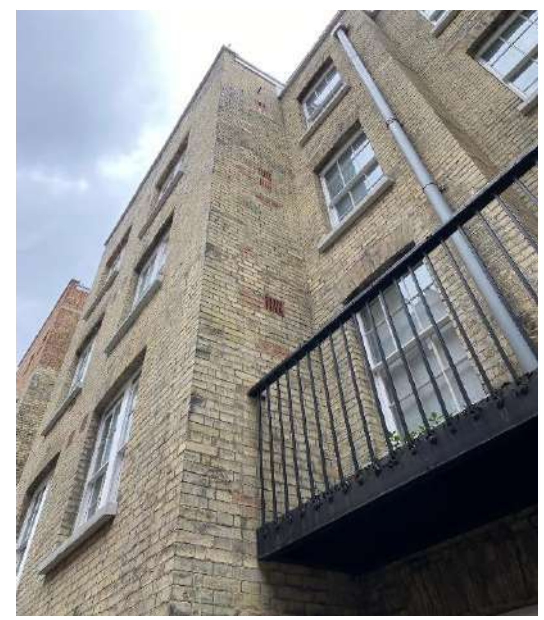
The building perimeter walls are formed in load bearing 225mm thick bonded London Stock brickwork in lime mortar, with the existing enclosures running along the line of the rear façade and around the bay returns, and projecting up from the top of the building by around 1200-1500mm in height, approximately 1 metre above the parapet.

The existing rear (west) elevation features the repetitive brick bays in brick, with timber sash windows that overlook the narrow alley-way, and the rear of Ely Place. Windows are topped with brick lintels and finished with concrete sills. There is evidence of several repairs and in-fills over the years; the 2006 project also replaced several windows with new sash configurations to match the existing. Puncturing the façade in corresponding bays are rows of air-bricks which have to date served as gas-pipe ventilation and general ventilation.

The existing terracotta air-bricks show signs of more recent work, which is not that tidy, suggesting that these specific units are more recent interventions.



VIEW DOWN THE REAR ALLEY-WAY, LOOKING SOUTH



VIEW OF A TYPICAL BAY, FIRST FLOOR CAST-IRON BALCONY IN FORE-GROUND.

ALONG THE REAR, AT LOW LEVEL, ARE A NUMBER OF NOW REDUNDANT CONCRETE GAS-PIPE MOUNTS

AN EXISTING TERACOTTA AIR-BRICK

EXISTING ELEVATION: **WEST**

THE REAR (WEST) FAÇADE HAS BEEN REPAIRED AND CLEANED A NUMBER OF TIMES OVER THE YEARS, HOWEVER, THE WINDOWS ARE LARGELY ORIGINAL. TERRACOTTA AIR-BRICKS ARE SET OUT IN BAYS, ORIGINALLY USED FOR GAS VENTING AND VENTILATION.

DESIGN OPTIONS

ROOF LEVEL INTERVENTIONS

HEATING AND COOLING
EQUIPEMENT
OPTION APRAISAL

11. New M&E Plant : Equipment Options

Based on the proposed overall M&E heating and cooling strategy set out in (6) above, and similarly following the ideal (existing) roof level plant provision, we have set out below a narrative option appraisal of the key factors affecting the choice of equipment, and the resultant impact on the building fabric.

11.1. Location of the Plant in principle

In order to maximise the efficiency of the units, and in order to minimise the impact of the noise on local neighbours, it was deemed that rooftop mounted units would be more appropriate than floor mounted units at ground level.

If mounted at in a tight, ground level location there is an inherent risk of short circuiting the air through the condensers. This is due to them not being able to discharge the rejected air far enough away before it is recaptured and recirculated as the effects of wind at ground level in this urban location are minimal. This means that the system would either operate at a lower efficiency or would not function at all.

(In addition to the above, the rear alley-way is a narrow, restricted space that is already zoned to accommodate the additional cycle storage for the main building, and is itself a means of escape from the property at the end of the alley.)

For this reason, ground-level mounted equipment was discounted.

4 PIPE CHILLER SYSTEM - LOW EMBODIED CARBON IN THE SYSTEM, BUT BULKY AND HEAVY ON THE STRUCTURE.

11.2. Technology Options

A 4 pipe chiller/ air source heat pump system has been initially explored as this minimises the amount of refrigerant used in the project – refrigerant R410A which is typically used for heating and cooling a building has a very high global warming potential of approximately 2100 kg of CO_2 equivalent for every kg of refrigerant charge. However, a 4-pipe chiller/ASHP system is very heavy and the distributions are bulky due to four insulated pipes being required to each fan coil unit internally.

This is the same whether the building is 'super insulated' or not, as the system still requires 4 pipes plus insulation and a minimum fan coil unit size is required.

The 4-pipe system has been ruled out as the roof could not physically withstand a single centralised item of plant such as a chiller/ASHP.

The next option looked at has been VRF. VRF (Variable Refrigerant Flow) systems are typically used for heating and cooling commercial premises as they require two pipes only and can achieve very dense heating and cooling outputs in a modest fan coil unit size. Their condensers are also modular which works better with St Andrew's House's listed status as the weights of the equipment can be more easily accommodated.

However, as mentioned R410A refrigerant typically used has a high embodied carbon content, and so pumping refrigerant around the building results in a high embodied carbon installation, even if the units themselves are efficient at extracting heat from the atmosphere.

Therefore a Hybrid VRF (HVRF) system has been chosen to proceed with, as this both reduces the quantity of refrigerant used in the system by approximately 90%, but a newer, greener, R32 refrigerant will be used as this has an embodied carbon content of approximately 1/3rd of R410A.

With the two items selected in tandem this reduces the embodied carbon content of the refrigerant by almost 97% when compared to traditional VRF systems. To do this, only the pipework between the branch controller boxes and the condensers utilise refrigerant – everything beyond the branch controller boxes is distributed via water.

HVRF CONDENSER, WITHOUT THE ATTENUATION PACKS

12. New M&E Plant : Size Considerations

12.1. Minimising the Plant Scale

Finally comes the question of sizing and locating these condensers.

All HVRF condensers come at a standard height, of 1858mm. Therefore given that on the surrounding rooftops of neighbouring buildings there are a great number of similar units, it has been considered sensible to utilise the existing plant enclosures on the roof as they are located directly above existing risers for the building, meaning the less structural openings are required to feed the numerous HVRF pipes down into the building.

However, during the design progress it has become apparently that attenuation is required to meet the current acoustic strategy. As the condensers operate by drawing in air from all four sides and blowing out the top, the height of the units increases by 600mm to 2458mm. The maximum number of internal fan coil units connected to any one condenser is 30-50 fan coils depending on the condenser model.

This therefore means that even if the size of the fan coil units internally were reduced in output, the volume of the plant enclosures would not decrease.

If the building were to be "super insulated" and have its heating and cooling loads reduced by say, 50%, by utilising this preferred technology the plant enclosures would not become any lower; the same quantity of fan coils would still be required internally to the building and owing to maximum lengths of pipework there would still be the same number of condensers at the same height, just with a different model selected operating with a lower capacity. The external dimensions would not change.

Furthermore, as the existing building has thick masonry walls which creates a great deal of thermal inertia, the performance of the existing building is currently mostly impacted by the lack of airtightness as opposed to insulation. Airtightness is proposed to be tackled via the implementation of secondary glazing and sealing of all building penetrations to atmosphere – where practicable during the re-fit - as well as the internal wall lining with airtightness sealant. The impact of implementing internal wall insulation is less significant in this respect.

There are therefore two ways to reduce the height of the plant enclosures:

1. The acoustic restrictions on the building would need to be relaxed in order for the "top hat" attenuators to be omitted, reducing the height by 600mm.

2. Condensers would need to switch to 1200mm high, front discharge units. Each unit has approximately 1/3rd of the output of the larger units, requiring 3 times the quantity of condensers (approx. 18) and the HVRF technology cannot be used.

Therefore, this would mean an older more "traditional" VRF technology resulting in much larger quantities of refrigerant being pumped around the building. In order to comply with F-Gas phase down regulations, R32 would be the proposed refrigerant for this but this is a more flammable gas and carries a higher asphyxiation risk, mostly probably requiring refrigerant leak detection systems to be installed within the bedrooms and maintained by the client at great cost.

The additional quantities of refrigerant required would negate much of the carbon savings generated by switching from natural gas to electricity when taking a whole life carbon view of the building services carbon footprint, as pumped refrigerant services are more likely to leak over their lifetime owing to the quantity of joints manually created on site. This in itself presents another risk due to the quantity of hot works required on site in close proximity to the listed joists.

12.2. Conclusions

Therefore, in the view of the M&E team, current proposal of 5 No. HVRF condensers to heat and cool the building and a 6th air source heat pump to generate hot water remains the most suitable for this project.

Insulating the fabric of the building will not have a tangible impact on the volume of plant required. Moving to lower condensers will mean the quantity of condensers increases by a factor of 3 and mostly likely by an area to the factor of 5. More condensers mean more sources of noise further requiring more attenuation and plant screening from neighbours. Although slightly taller, the existing proposed strategy, in our view remains the most compact size of plant that is feasible whilst at the same time reducing the operational carbon of the building services for the next 15-20 years.

12.3 In Summary

The current M&E strategy proposal seeks to upgrade the heating and cooling equipment to more modern, efficient plant – air-source type - but maintain as much as possible the original plant and distribution strategy of the building.

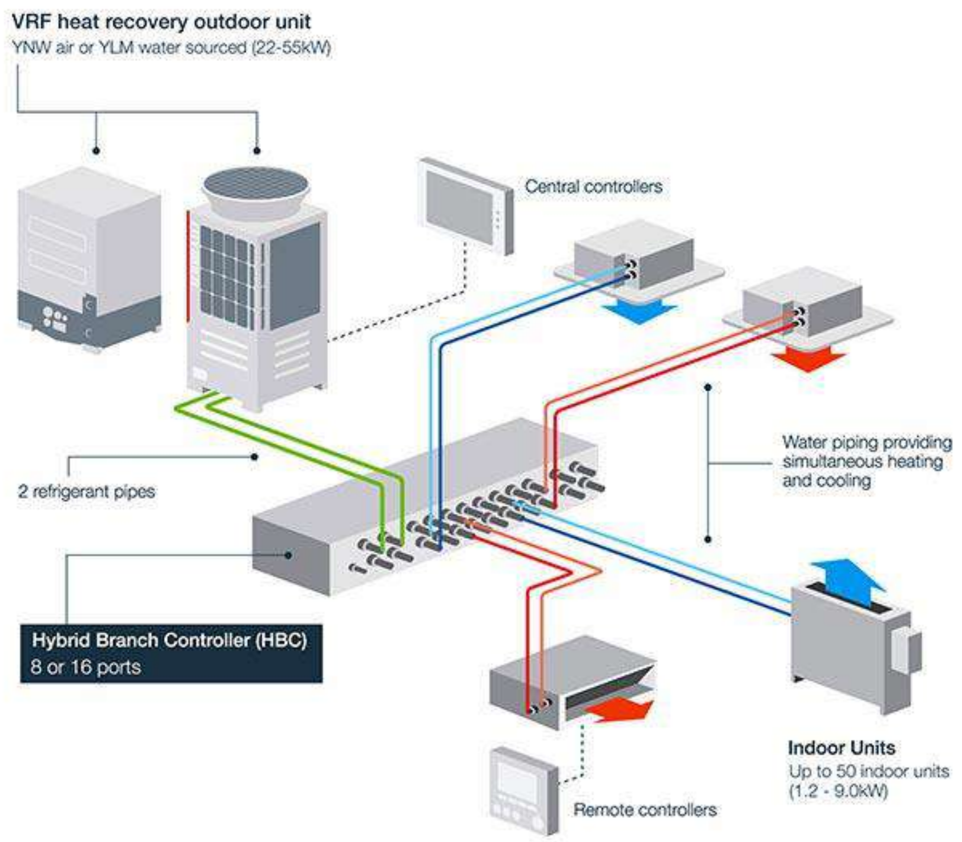
The approach proposed is a Hybrid Variable Refrigerant Flow (HVRF) system. In this all-electric system, the refrigerant volumes are significantly reduced compared with traditional VRF, as refrigerant only exists between the condensers and the hybrid branch controller (HBC) boxes installed in the adjacent roof enclosures. The refrigerant gas R32 has a much lower global warming potential than R410A which is currently used on site to heat and cool the penthouse meeting space, illustrated below. The scale is in kg/CO_2 equivalent /kg of refrigerant. Beyond the HBC box in the plant enclosures, the pipework is filled with water to each bedroom fan coil unit. Using this system, no leak detection is required under the requirements of EN378.

In summary, we will need to accommodate the following :

- A Hybrid Variable Refrigerant Flow (HVRF) Heat Recovery system; 6 x air source heat-pump units, to manage the heating and cooling load.
- New Corresponding Hybrid Branch Controller (HBC) units (FCU pipe-work distribution nodes)
- New FCU distribution pipework

However, because the new equipment is larger and taller, this will require that existing plant enclosures are upgraded and enlarged, or alternative plant enclosures need to be located elsewhere on the roof.

.



A SCHEMATIC DIAGRAM OF AN HVRF SYSTEM

In considering the plant locations at roof level, a number of factors were considered.

13.1. Structural loads of the equipment

There are two structural aspects to consider in locating the plant. The first is the dead-load of the equipment and the plant enclosures. Because the existing roof is timber, and not designed to excessive loads, the total dead load of each of the 450kg components could not be located mid-span on the existing roof, but would need to have the benefit of additional structural support ; either in the form of existing brick walls, or additional structural steel.

In addition to the dead-loads, it should be noted that any enlarged enclosure, be it built off the existing parapet or recessed back from the façade line, will need a wind post structural frame to reinforce the masonry against lateral wind loads, given its free standing height. Furthermore, the additional weight of the brickwork (vs a lightweight cladding solution) will need to be taken through anchors into the heritage brickwork and not into the roof joists, which are not of sufficient capacity to receive such a load.

A greater enclosure wall load will require a greater number of anchors into the existing heritage fabric, which would favour a lightweight scheme.

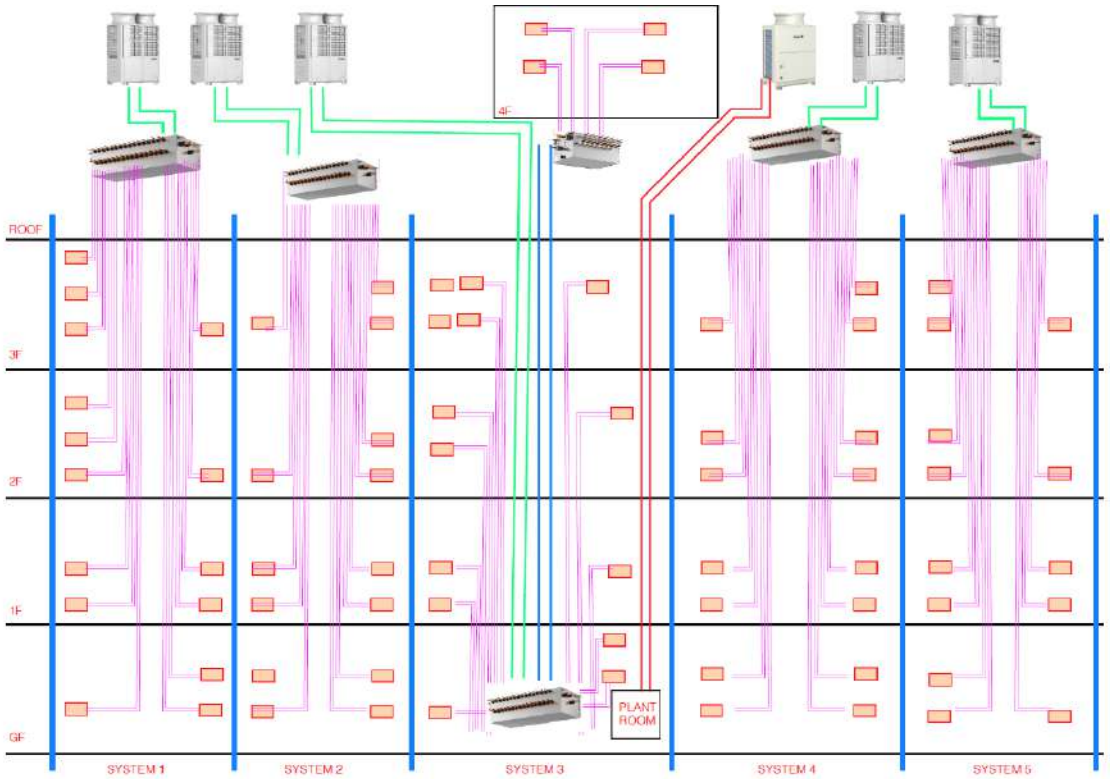
13.2. Distribution Strategy

A key aspect of the plant location placement is the distribution of the pipework from the generating equipment – the Hybrid Variable Refrigerant Flow (HVRF) Heat Recovery Units – to the corresponding Hybrid Branch Controller (HBC) units, and the distribution of the associated pipework downwards through the building.

Early technical studies indicated that the number of pipe-runs from roof-level would increase. (The existing apartment radiator and pipework is to be removed at apartment level, to be replaced with ceiling mounted Fan Coil Units, which would provide the heating and cooling for the apartments.) Therefore the additional pipework runs needed to be considered as an essential factor affecting the chosen plant location. Because the existing risers are located towards the edge of the building, so then should the plant be considered over or adjacent to those riser locations.

As shown schematically, while the pipework does diminish as the runs progress down through the building. Due to the number of pipes at the upper levels, it is important to maintain clear and simple riser locations.

Additional riser locations were considered – but these could require additional structural openings to be formed at roof level and throughout the building; the latter also having an affect on the existing layouts.



A SCHEMATIC DIAGRAM ILLUSTRATING THE HEATING & COOLING PIPEWORK DISTRIBUTION STRATEGY

13.3. Maximum height of the equipment and enclosures.

The height of the existing 4th floor is around 3300mm from FFL. The new plant enclosures should not be taller than the existing, to maintain the proportions of the building Elevation.

The design of the enclosures is also such that they need to mitigate noise, so that the levels are with an acceptable level. (the plant cannot project beyond the top of the screening in any way)

13.4. CDM and Sequence of work

The enclosures should not be overly complex, or heavy, so as to put an excessive load onto the existing brick or the timber roof construction during erection. This approach also facilitates good practice from a CDM perspective, so that erection and construction is quick and safe. This approach mitigates design and construction risks and facilitates easy erection on site, avoiding the need to large tower cranes, netting, etc.

These criteria would suggest a lightweight form of construction.

13.5. Noise

As part of the stage 2 design development, an acoustic design report was commissioned to address inter alia an mitigation measures to be considered in the design of the roof level plant. In relation to the assessment of noise emissions from installed building services plant the London Borough of Camden's (LBC) Camden Local Plan, Adoption version (June 2017) states the following:

…it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10dB below background (15dB if tonal components are present) should be considered as the design criterion.

An environmental noise survey was been carried out to determine the existing sound levels in the area. The noise survey was performed over six days between 10 February and 16 February 2021. The representative background sound levels from the noise survey were LA90,15min 48 dB during the day, and LA90,15min 46 dB during the night.

.

Based on the requirements of the Local Authority (LBC) and on the results of the noise survey, the normal design limits should be such that the cumulative noise level due to all new plant equipment at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed LAeq,15min 38 dB during the daytime, and LAeq,15min 36 dB during the night.

(During the survey period social distancing and lockdown measures were in place due to the COVID-19 pandemic. A review of historical survey data at a similarly representative location to the rear of 17 Charterhouse Street indicates that this may have resulted in lower than normal noise levels being recorded. On this basis, subject to agreement by the Local Authority, it may be appropriate to relax the criteria derived from the survey by a small amount.)

A criterion of LAeq,15min 40 dB is proposed (day and night-time) and has been used as the basis for proposed acoustic mitigation measures.

Based on the information gleaned from the above, two essential design criteria were established :

- That the chosen plant would need to be attenuated, which would increase the height of the plant from the basic 1900mm by a further 600mm.
- That the enclosures would need to be 'solid' enough to contain and direct noise away from t adjacent properties.

13.6. Utility of existing terraces

To the north and south of the 4th floor penthouse meeting suite are terraces that have been laid over the existing roof. These are additional amenity that are used to the benefit of those using the meeting suit, and the client staff generally.

The use of these was discussed at the early stage of the project, and the south facing terrace, in particular, was felt to be key to the function of the 4th floor, and that any new plant should not overly affect the utility of the external space.

.

ROOF LEVEL INTERVENTIONS

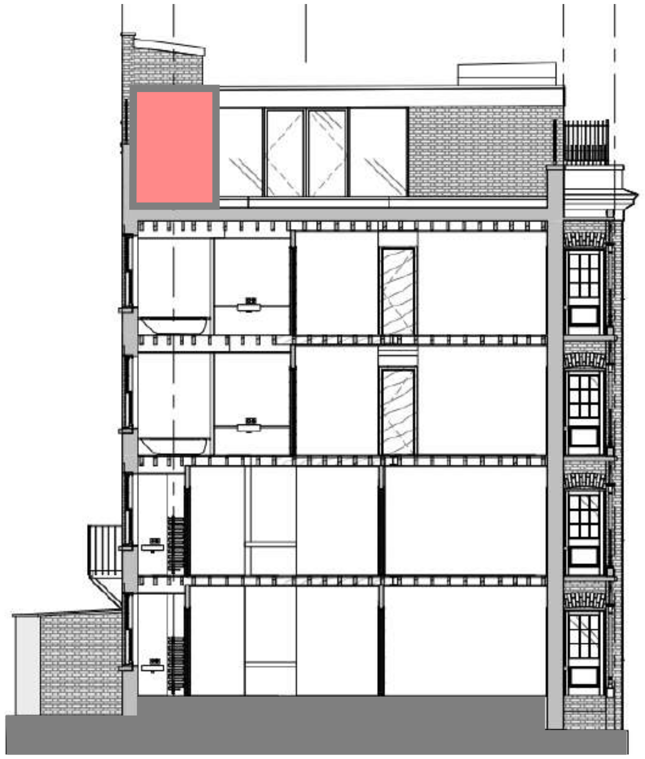
PLANT LOCATION OPTIONS

In this option, due to the proximity to the risers, new plant is proposed in place of the old, sitting directly over the risers that are essentially being used for their original purpose.

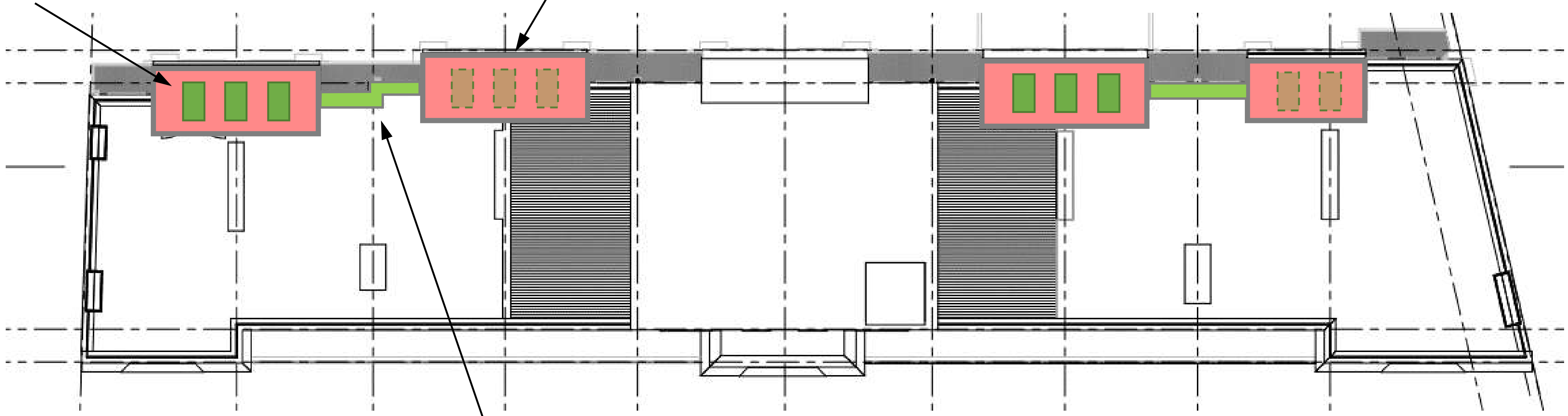
Due to the increase in size of the plant, new steel framed metal clad enclosures would be located over the original enclosure footprints, retaining their basic brick structure, but fixed directly downward. This not only facilitates a reduced structural impact, but also a more honest intervention, maintaining the existing parapets, potentially the remaining metalwork railings, and being set back slightly from the edge of the building. The decision to avoid new brick, or attempt matching brick, was also due to the existence of visible past brick extensions; the effect of *further* brick would be an unsightly patchwork.

As to why the parapets would not simply be extended up - the additional weight of the brickwork (vs a lightweight cladding solution) will need to be taken through anchors into the heritage brickwork and not into the roof joists, which are not of sufficient capacity to receive such a load. Equally, the extent of the brickwork in plan does not extend sufficiently forward in plan to accommodate the footprint of the new enclosure.

There would be some minor builders-work peeling back of the insulation and roof-topping, in order to seat the frame. To the rear, some additional RWP branches to existing hoppers will be required form the two open-air enclosures.



.



OPTION A : EXISTING LOCATION

VIEW DOWN THE REAR ALLEY-WAY, LOOKING SOUTH. THE EXISTING PLANT ENCLOSURES CAN BE SEEN ATOP EACH BAY PROJECTION

COMPUTER GENERATED VIEW OF THE EXISTING REAR ALLEY WAY

COMPUTER GENERATED VIEW SHOWING **OPTION A** PLANT ENCLOSURES

OPTION A : VIEW FROM THE NEW MAIN BUILDING DEVELOPMENT

EXISTING ROOFSCAPE, LOOKING SOUTH

CLICK HERE

COMPUTER GENERATED VISUAL OF THE ROOFSCAPE, LOOKING SOUTH (OPTION A)

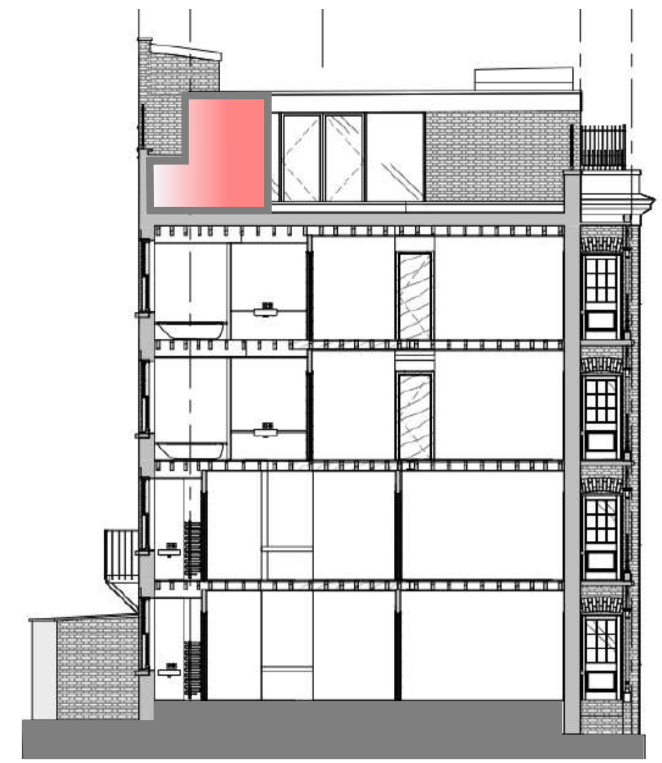
OPTION B : ADJACENT LOCATION

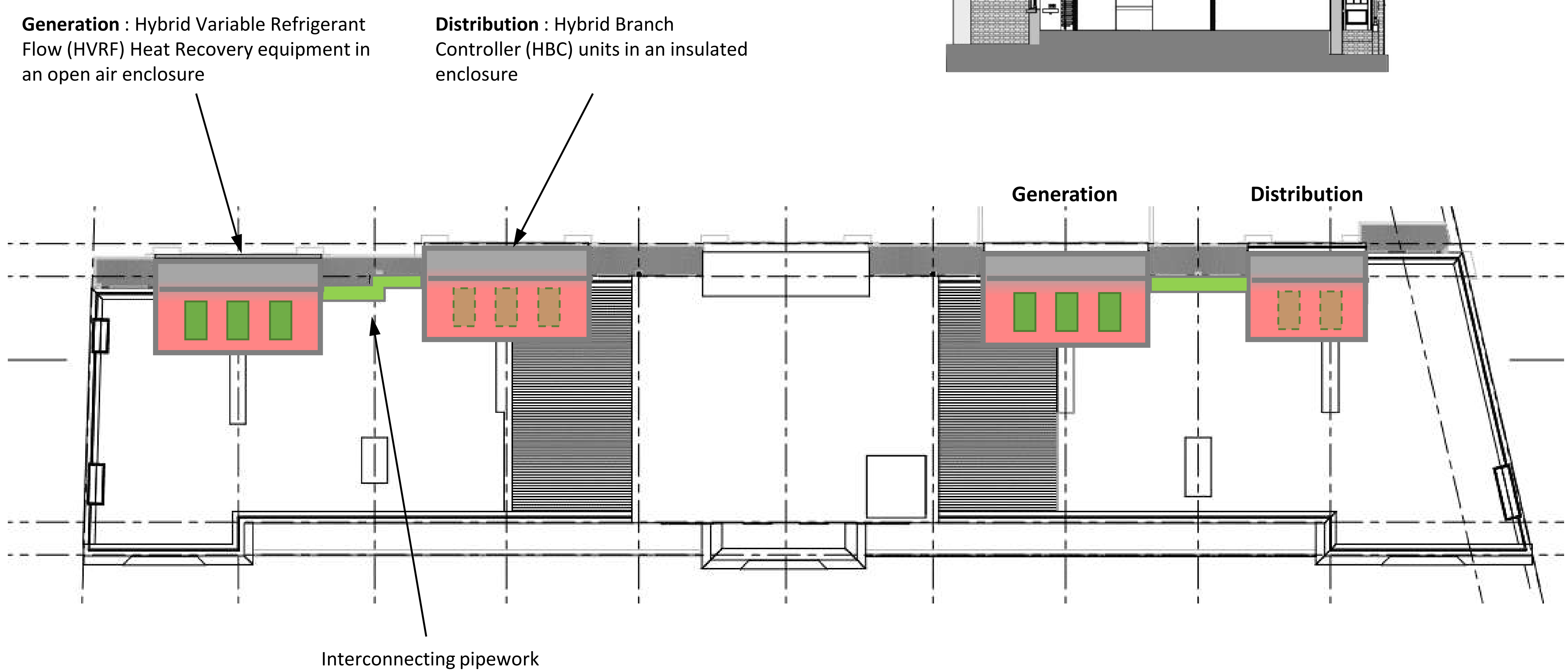
The principles of this intervention are much the same as OPTION A, but address the position of the enclosure superstructure against the rear façade.

In this option, the superstructure is pulled back by around 1000mm. The original profile of the original enclosures are maintained along that edge, and the plant is moved towards the centre of the roof.

Structurally, however, this design places a greater load onto the new cantilever base-frame, which meanes that there would inevitably need to be structural reinforcement in the joist zone. While there is some lightweight steel present in part supporting the brick enclosures above, this would not be sufficient to accommodate the new base-frame loads. The foot-footprint of the enclosure is also then larger than ideal; so that this option has built-in some inefficiencies from the outset.

.





OPTION C : CENTRAL PLANT

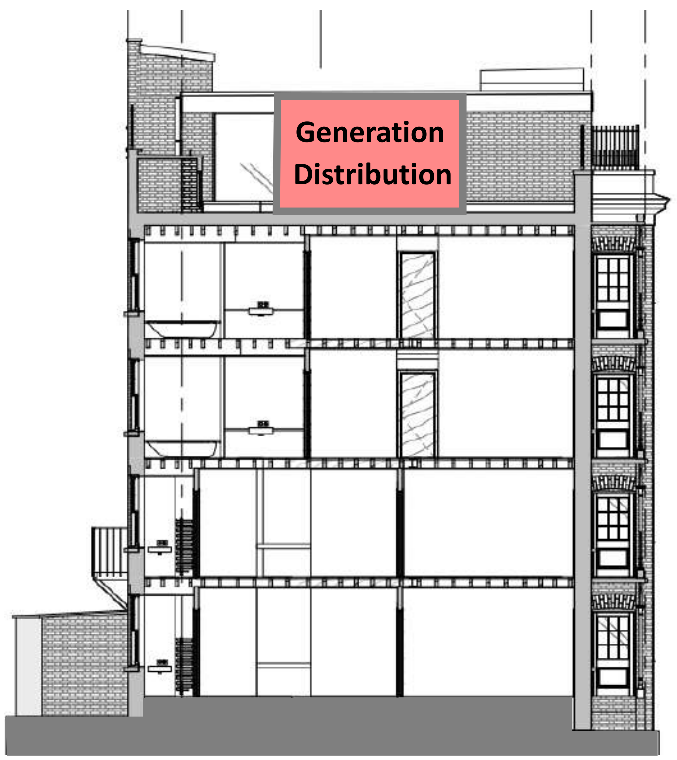
The rational of this option is to retain the existing plant enclosures and parapet profile, and construct two new centrally located plant enclosures.

Structurally, the principles of the base-frame approach would be the same – that no load would be imposed on the existing slab, but rather, the load is transferred through the slab straight down onto brickwork below.

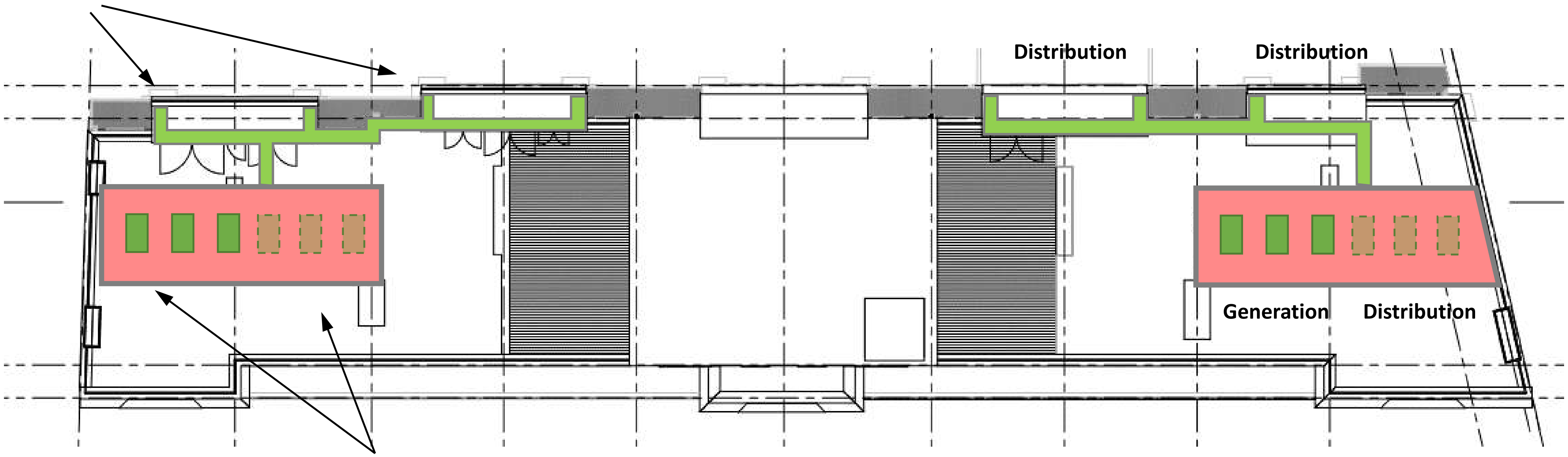
In this option, however, the span of the steels would be greater, as the dividing lines of the units would set the span of the base-frame – around 5100mm per bay. Thereafter, the superstructure approach would be much the same, with a steel base-frame forming a plinth and light-weight superstructure, in this option a fully louvred construction in principle.

This option proposes all plant centrally, and no modifications to the existing plant enclosures, but for any new pipe penetrations at low level. However, the Hybrid Branch Controller units would still need to be insulated; so a portion of the enclosures in this option would not be simple screens only.

There is therefore some inefficiency in this option in its simplest form.



Unaltered Plant enclosures to house the **distribution pipework** over each riser location



Combined Central Plant location for **Generation** and **Distribution** : Hybrid Variable Refrigerant Flow (HVRF) Heat Recovery equipment in an open air enclosure, and Hybrid Branch Controller (HBC) units in an insulated portion of the enclosure

OPTION C1 : REDUCED CENTRAL PLANT & RE-USE OF EXISTING ENCLOSURES

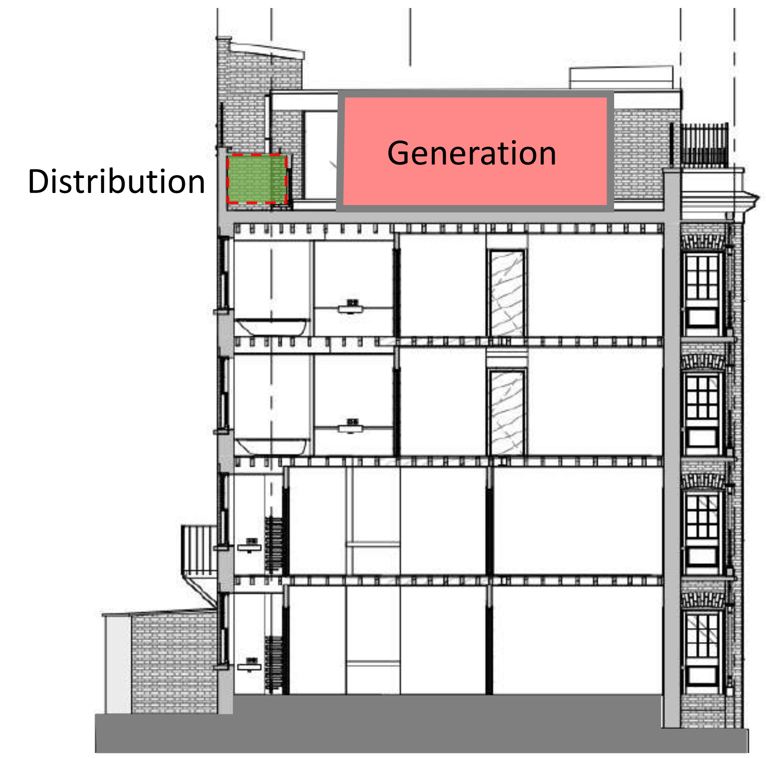
In this option, the new central enclosure is rotated through 90deg to miss the existing roof features. The resultant enclosure is also smaller (nominally 2700x5500)

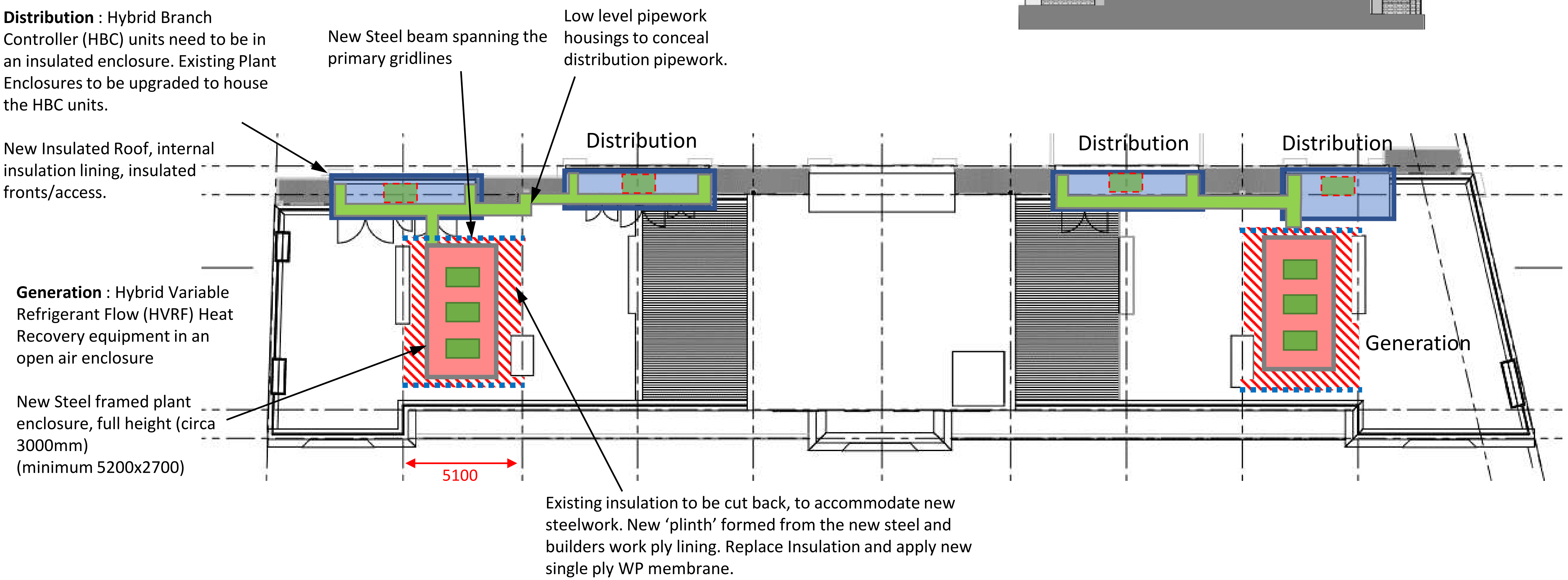
Structurally, the interventions are much the same as Option C, though the span of the base-frame is longer, to span the main supports that need to miss the roof features.

However, this option retains the principles of Option C, but proposed to upgrade the existing plant enclosures to house the HBC units; in this variation, the existing plant enclosures would need to be fully upgraded and insulated to house those units.

As with Option C, the parapet profile of the building is unaltered.

It is also worth noting that there is no significant advantage to noise mitigation by the placement of the enclosures in these locations as opposed to at the edge of the roof.





aukett swanke

EXISTING ROOFSCAPE, LOOKING SOUTH

CLICK HERE

COMPUTER GENERATED VISUAL OF THE ROOFSCAPE, LOOKING SOUTH (OPTION C1)

OPTION C1 : REDUCED CENTRAL PLANT & RE-USE OF EXISTING ENCLOSURES

OPTION C1 : VIEW FROM THE NEW MAIN BUILDING DEVELOPMENT

OPTION C2 : REDUCED CENTRAL PLANT & RE-USE OF EXISTING ENCLOSURES

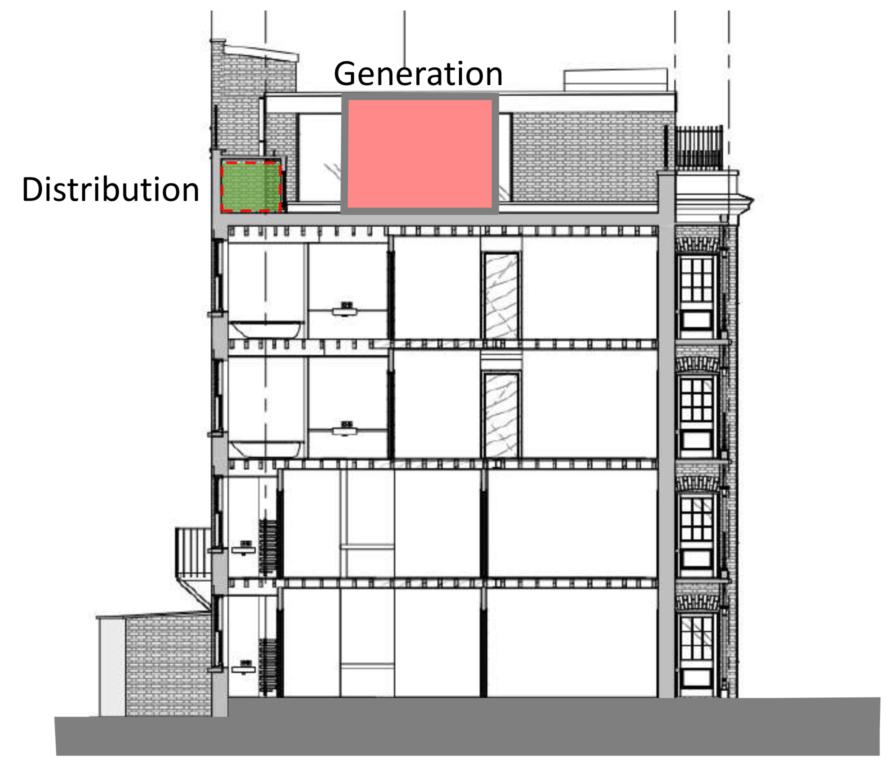
In this option, the enclosure is set out to miss the existing chimney roof features. The resultant enclosure is nominally 2700x5500 (internally), therefore placed slightly towards the rear of the building, but in-line with the rear façade. Set back from the rear-façade, this option does not impose itself on the rear façade, and is more sensitive from an over-looking perspective.

Structurally, the intervention is quite straightforward, with a base-frame, on top of the roof, spanning from GL to GL as noted in the diagram below. The base-frame is then fixed through the roof, and down into the main brickwork dividing walls, so as to not put any load on the roof itself.

This option also proposes to upgrade the existing plant enclosures to house the HBC units; the existing plant enclosures would need to be fully upgraded and insulated to house those units. An upgraded roof and new door fronts would be provided to each.

The parapet profile of the building is unaltered; the existing railings would remain.

Following further review with Camden on 26/05, this was established to be the councils preferred option.

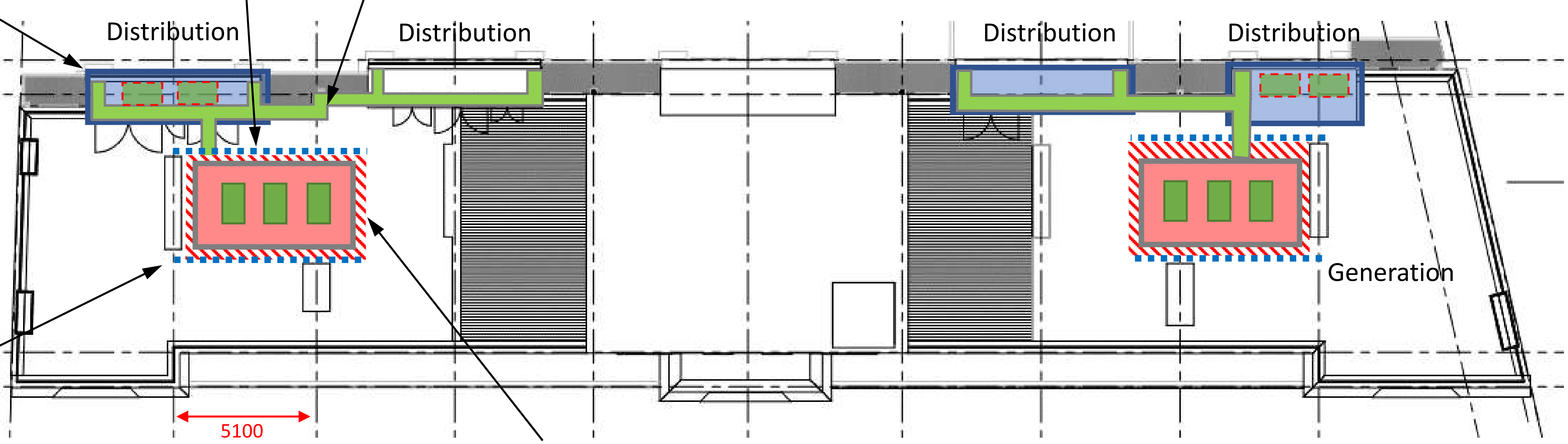


Distribution : Hybrid Branch Controller (HBC) units need to be in an insulated enclosure. Existing Plant Enclosures to be upgraded to house the HBC units.

New Steel beam spanning the primary gridlines

Low level pipework housings to conceal distribution pipework.

New Insulated Roof, internal insulation lining, insulated fronts/access.

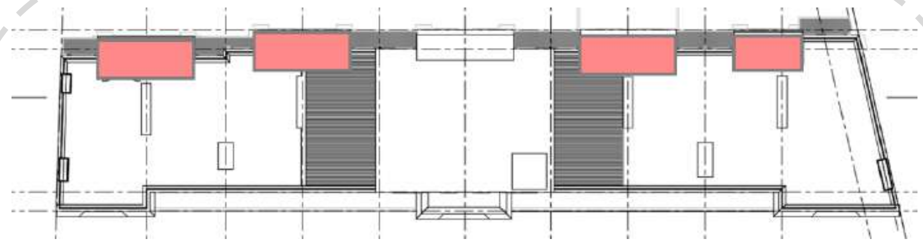


Generation : Hybrid Variable Refrigerant Flow (HVRF) Heat Recovery equipment in an open air enclosure

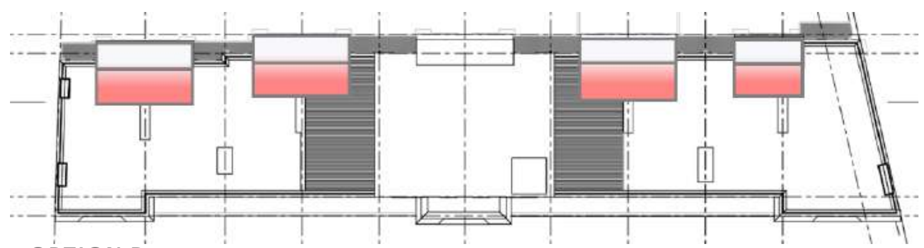
New Steel framed plant enclosure, full height (circa 3000mm) (minimum 5200x2700) Enclosure to be louvred on all four sides.

Existing insulation to be cut back, to accommodate new steelwork. New 'plinth' formed from the new steel and builders work ply lining. Replace Insulation and apply new single ply WP membrane.

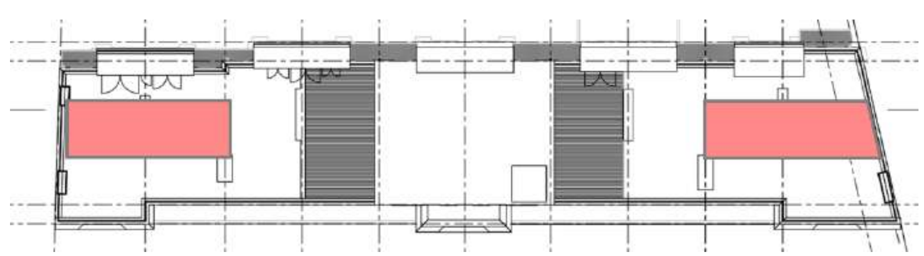
aukett swanke



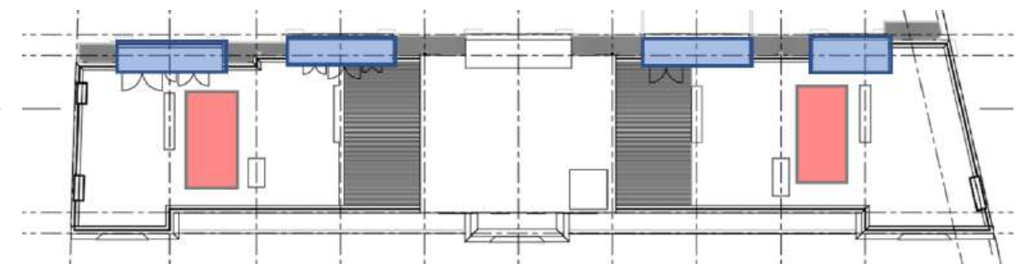
OPTION A : USE THE EXISTING LOCATIONS



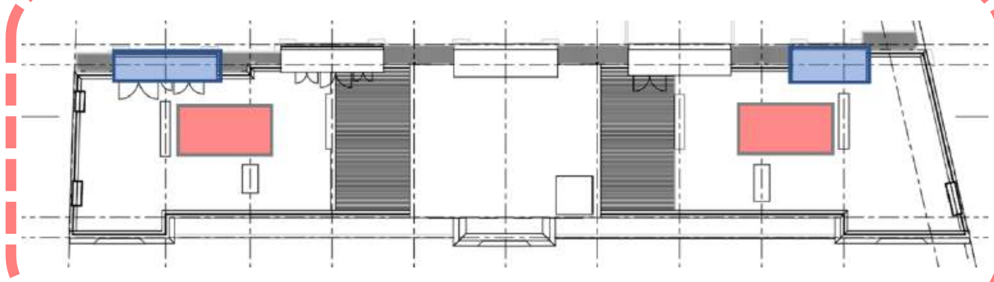
OPTION B : USE ADJACENT LOCATIONS



OPTION C : CENTRALLY LOCATED PLANT



OPTION C1 : CENTRALLY LOCATED PLANT, VARIATION 1



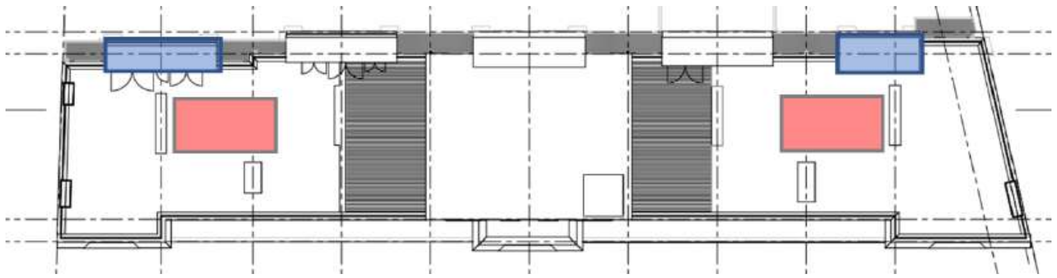
OPTION C2 : CENTRALLY LOCATED PLANT, VARIATION 2

THE PREFERRED OPTION

ROOF LEVEL INTERVENTIONS

THE PROPOSED OPTION

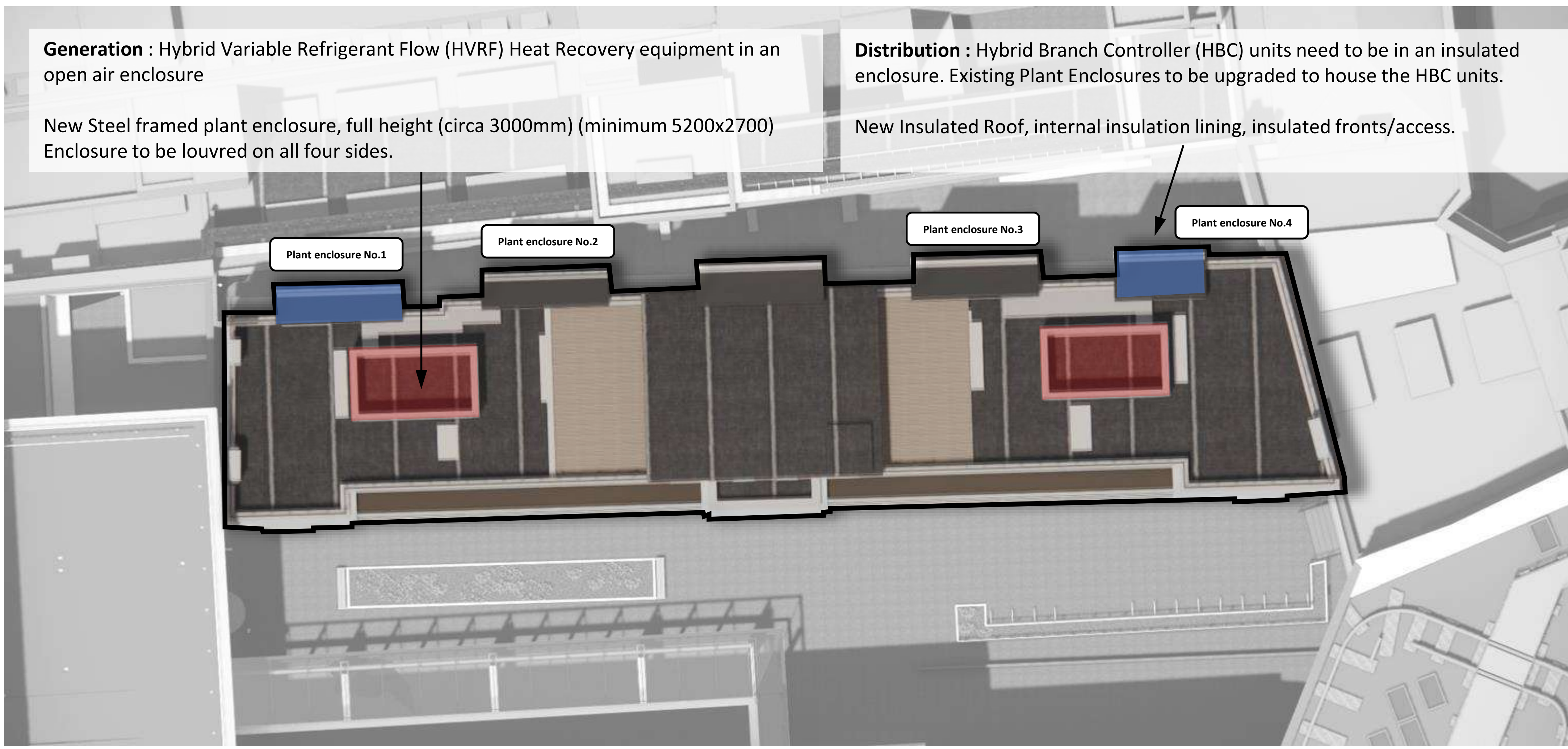
15. Proposed Roof Level Plant Configuration



SKETCH SHOWING THE PREFERRED "OPTION C2" CONFIGURATION

Making the most use of the existing utility, and to avoid and modifications to the existing building parapets, railings and roof-line, it is proposed to retain the existing enclosures, and replace their modern door fronts with replacement timber doors to maintain their integrity. All flues and penetrations will be removed and made good.

A VIEW OF PLANT ENCLOSURE NO. 2



TOP DOWN VISUAL OF THE ROOFSCAPE SHOWING THE PROPOSED NEW PLANT CONFIGURATION IN CONTEXT

Two centrally positioned enclosures are proposed, orientated longitudinally to minimise visibility from the roof level terraces. Each will be circa 3 metres tall and have a minimum internal area of 5.5m x 2.7m to house Hybrid Variable Refrigerant Flow (HVRF) Heat Recovery units, at adequate spacings. (The Hybrid Branch Controller (HBC) units for distribution are to be housed in the existing roof level enclosures, to be upgraded in line with current standards and project requirements.)

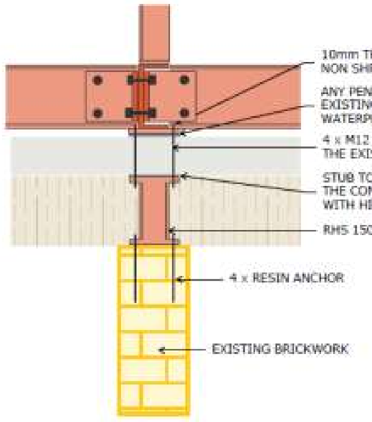
The new HVRF enclosures have been designed to be of simple construction and lightweight, to avoid placing excessive additional load onto the existing brick or temporarily on the timber roof construction during erection. From a CDM perspective, by reducing the complexity of construction, we allow either pre-fabrication and lifting of enclosures (or parts of enclosures) straight into position using cranage or alternatively erection in situ at roof level. The latter approach avoids the need for large tower cranes, etc with the new central position of the enclosure reducing health and safety implications of constructing on a roof.

The low permissible load uplift in the temporary condition led us to a steel 'kit of parts' solution, fully braced in the walls in two orthogonal directions and in the roof plane. The enclosure cladding is to be lightweight pressed metal to further minimise weight whilst providing a visually honest addition to the roof of this heritage asset.

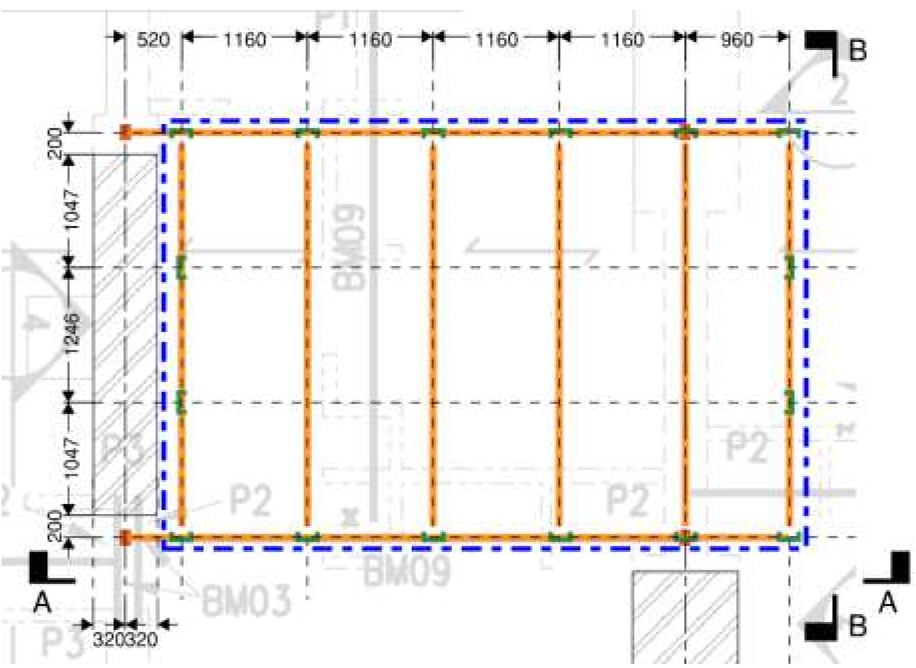
Further facilitating builders-work will include peeling back of the insulation and roof-topping, in order to seat the frame directly onto the screed, which will be supported beneath through the introduction of localised stud members seated on existing load bearing masonry walls, packed tight to the underside of the existing boards – see Figure 9. The studs are to be installed within the structural zone of the existing joists, between them, from below to allow retention of the existing boarding and slabs.

A 15mm vertical separation is to be left between the new steel frame and existing roof slab to ensure load transfer through the studs to the brick wall only, even when the frame deflects under load. Once the base frame is seated, new insulation and membrane is to be installed, including falls, allowing for a lapped interface over the new enclosure base.

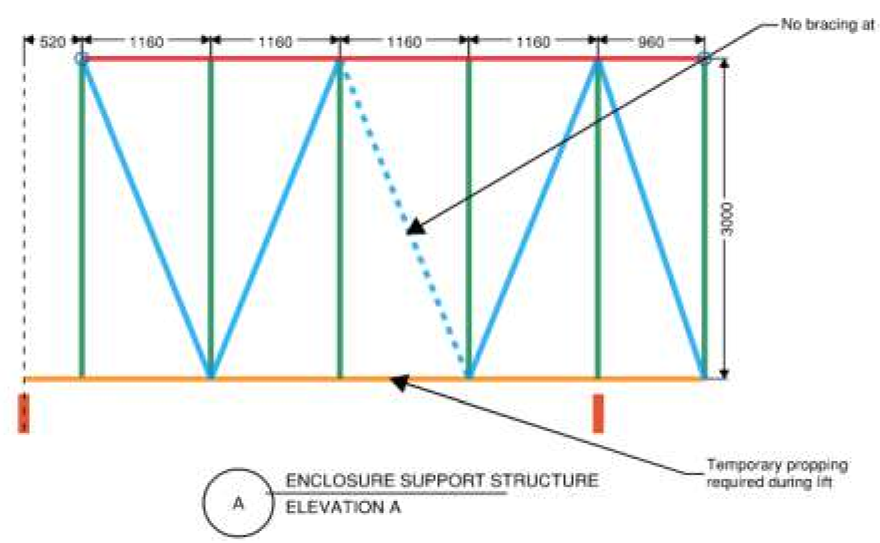
For further detail pertaining to the roof level structural interventions, please also refer to the Ramboll Report ST ANDREW'S HOUSE PLANNING STRUCTURAL REPORT, dated 07/06/2021



STRUCTURAL SKETCH : VERTICAL LOAD TRANSFER FROM THE STEEL FRAME DOWNWARD ONTO THE BRICKWORK BELOW, VIA THE ROOF LEVEL SLAB AND BOARDING.

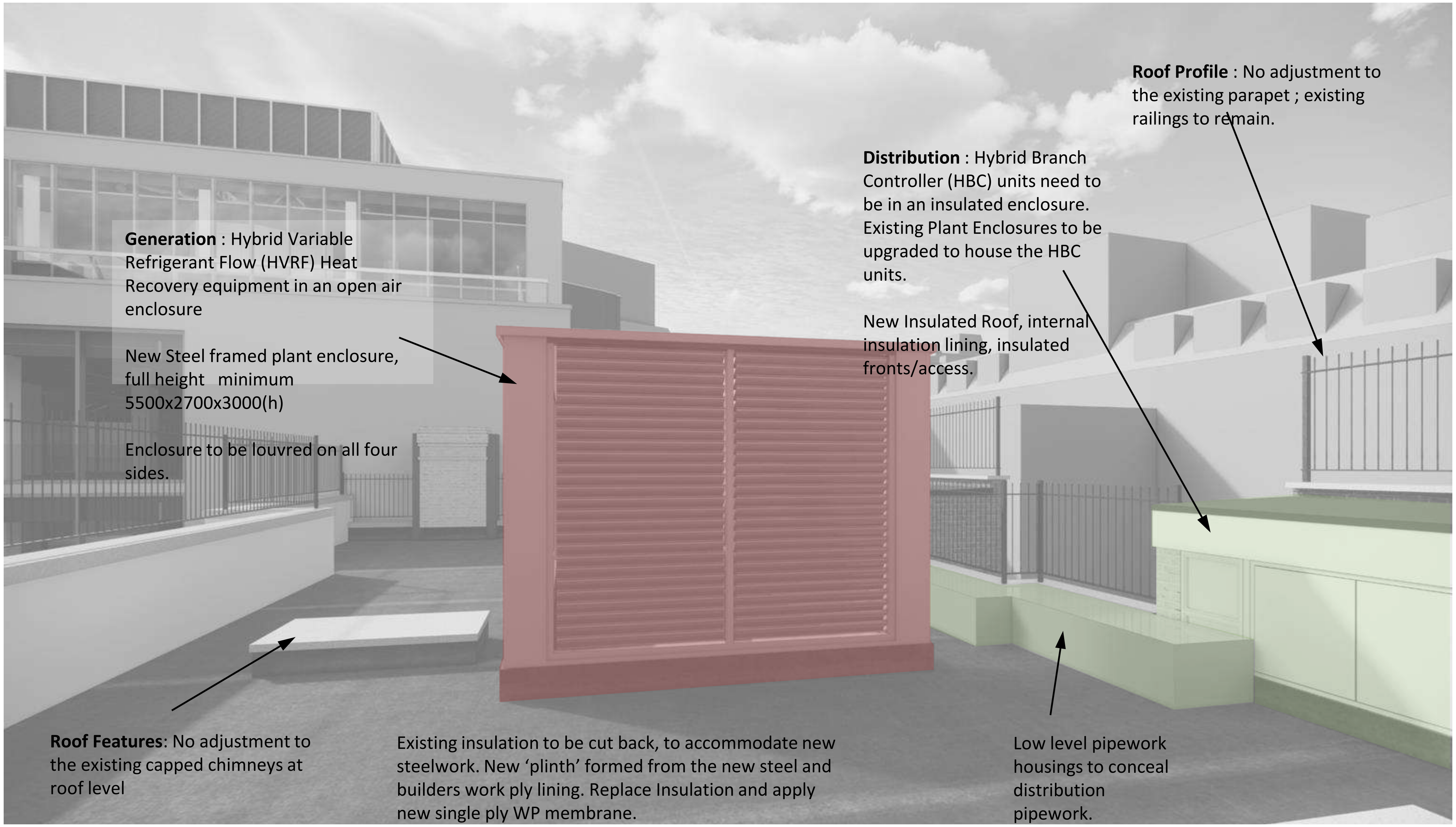


STRUCTURAL SKETCH : PROPOSED BASE FRAME STRUCTURAL ARRANGEMENT AND SETTING OUT, ALLOWING FOR STUDS (RED) TO TRANSFER LOAD TO THE BRICK WALLS UNDER. IN THIS ORIENTATION, THE FRAME MUST CANTILEVER BEYOND THE RIGHTMOST BRICK WALL (UNDER)

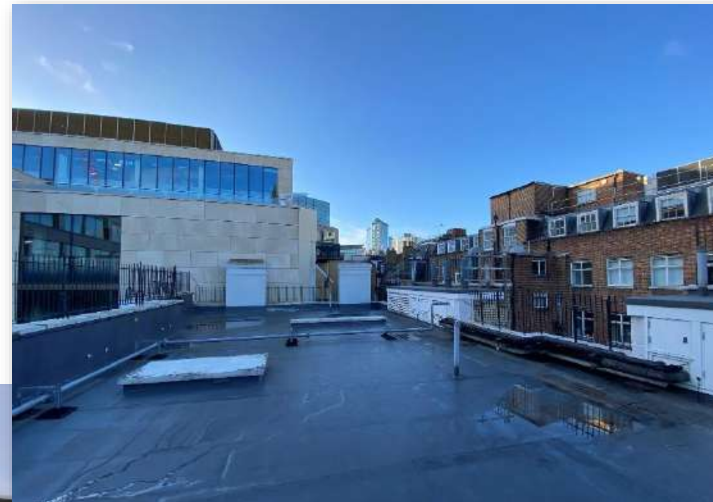


STRUCTURAL SKETCH LONGITUDINAL ELEVATION A OF THE PROPOSED ENCLOSURE, SHOWING THE TRADITIONAL CROSS BRACING WITHIN THE WALLS.

aukett swanke


Generation : Hybrid Variable Refrigerant Flow (HVRF) Heat Recovery equipment in an open air enclosure
New Steel framed plant enclosure, full height minimum 5500x2700x3000(h)
Enclosure to be louvred on all four sides.
Distribution : Hybrid Branch Controller (HBC) units need to be in an insulated enclosure. Existing Plant Enclosures to be upgraded to house the HBC units.
New Insulated Roof, internal insulation lining, insulated fronts/access.
Roof Profile : No adjustment to the existing parapet ; existing railings to remain.
Roof Features: No adjustment to the existing capped chimneys at roof level
Existing insulation to be cut back, to accommodate new steelwork. New 'plinth' formed from the new steel and builders work ply lining. Replace Insulation and apply new single ply WP membrane.
Low level pipework housings to conceal distribution pipework.

VIEW 1



COMPUTER GENERATED VIEW OF THE NEW LOUVRED ENCLOSURES, LOOKING SOUTH FORM THE PENHOUSE MEETING SUITE TERRACE

VIEW 2

VIEW FROM THE TOP OF THE RAMP, LOOKING TOWARDS THE FRONT OF ST ANDREWS HOUSE. THE NEW ENCLOSURES AT ROOF LEVEL ARE NOT BE VISIBLE

COMPUTER GENERATED VIEW OF THE TOP OF THE ROOF OF ST ANDREWS HOUSE, LOOKING SOUTH WEST TOWARDS ELY PLACE

COMPUTER GENERATED VIEW OF THE TOP OF THE ROOF OF ST ANDREWS HOUSE, LOOKING SOUTH WEST TOWARDS ELY PLACE

NEW GROUND FLOOR PLANT
AND
EXTERNAL INTERVENTIONS

17. New Ground Floor Plant Room

To facilitate the storage of water as part of the updated M&E strategy, on the ground floor in Unit 4, a new plant room is proposed. This unit is currently an Estates and BOH function, that includes IT racks, storage and provision & amenity for overnight security in the form of sleeping berths. It is proposed to re-configure this unit to include a new tank room, that will house hot water storage and distribution pump-set that will feed hot-water back up the building through the existing risers.

To facilitate this plant room, the existing timber floor and supporting structure will be modified and structurally enhanced to accommodate the new plant, and to provide the necessary separation and bunding to isolate the plant and any unexpected failures from the rest of the buildings. The timber floor is to be replaced with a concrete slab to support significant localised point loads associated with hot water storage vessels, as well as allowing waterproofing and bunding of the floor.

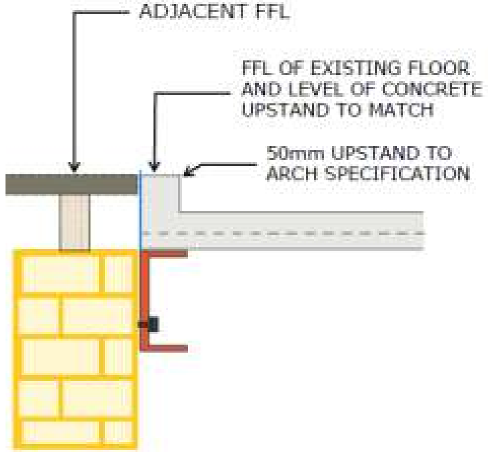
The ground floor is suspended, with a significant sub-floor void down to uncompacted earth at oversite level. The ground floor comprises timber floorboards on 4” deep longitudinal spanning joists between timber wall-plates on sleeper walls within the floor void. There is evidence of past alterations within the floor void, including the introduction of what appears to be a fletton brick pier, but none that are in structural function currently.

At the primary masonry cross walls that run the full height of the building, the joists aren’t able to have a dead bearing and as such are pocketed in. as well as onto sleeper walls, at Flat 4 the joists bear onto a wall plate running along the edge of a solid concrete chimney hearth.

To minimise the structural zone depth and allow the surrounding thresholds to remain a composite steel Slimflor concrete deck construction is proposed. This uses a 110mm deep insitu concrete slab on deep composite steel decking which is supported by bearing onto grout beds on the existing sleeper walls and at the room edges, onto newly introduced PFC walls plates, chem anchored into the brickwork.

This form of construction has the benefit of avoiding downstand beams in the interior of the room, reducing the likelihood of clash with existing sub-floor structure and allowing optimum services distribution. By utilising a concrete solution, an edge upstand bunds can be formed as a plant room requirement.

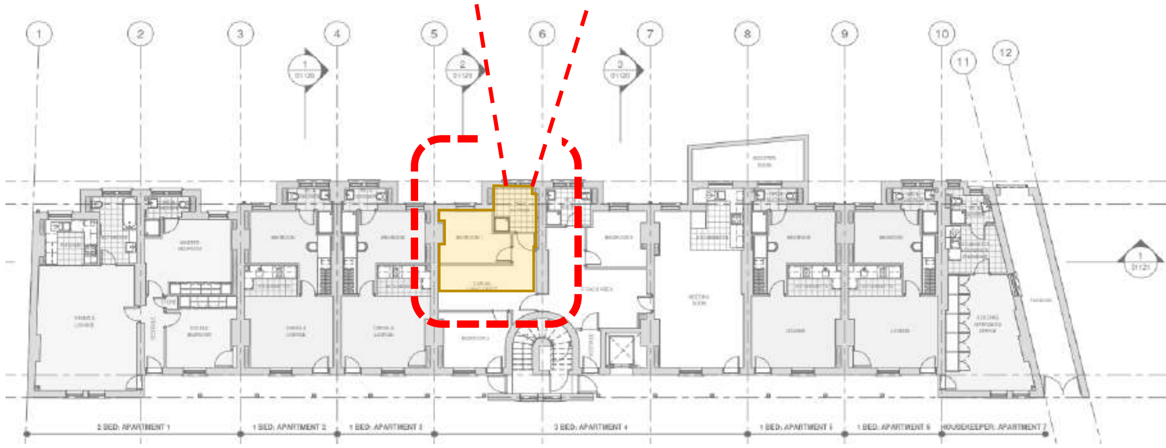
For details of the M&E and Structural interventions, please see the Stage 2 M&E and Structural report



STRUCTURAL SKETCH OF THE PROPOSED INTERVENTION AT FLOOR LEVEL

A new external door for access and maintenance is proposed, replacing on of the existing timber windows, and matching height and width. There is some evidence that an earlier similar opening was bricked up when the windows were installed. In this instance, a door is being reinstated.

EXISTING REAR WINDOW WILL BE MODIFIED TO BE A NEW SERVICE DOOR. EXISTING EXTERNAL FEATURES WILL BE REMOVED



GROUND FLOOR PLAN, SHOWING THE LOCATION OF THE NEW PLANT ROOM IN APARTMENT 4

During Stage 1 and 2 of the St Andrew's House design strategy, Mechanical Ventilation with Heat Recovery units were put forward to improve indoor air quality and to improve the Part L calculations on the design.

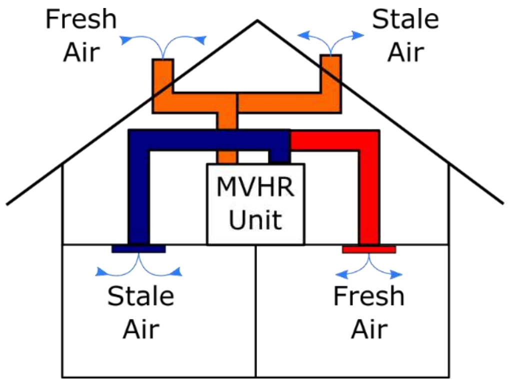
Mechanical Ventilation with Heat Recovery (MVHR) is a ventilation system that both supplies and extracts air throughout a property. It offers a balanced low energy ventilation solution and re-uses up to 95% of the heat that would have otherwise have been lost. The system provides a constant, fresh supply of air to the occupied spaces in the building which runs 24/7 and can boost upon usage of a shower or hob. This reduces internal CO_2 and VOCs internally; whereas a traditional extract system relies on manual opening of windows or through uncontrolled cracks and crevasses in the building fabric. Air is sucked in as a result of dirty air being pushed out and is therefore intermittent.

In their simplest form, an MVHR is a small air handling unit which is typically suspended within a ceiling void or installed in a wall mounted location to mechanical force fresh air into a dwelling or internal space, extract out the stale air, and, at the same time, recover the majority of the heat before exhausting to atmosphere.

In order to facilitate the supply and extract requirements of an MVHR system, it is proposed to make use of the existing air-brick locations, and supplement them with additional, corresponding positions on the rear elevation. In order to provide the required free-air, it is proposed to replace the terracotta units with Cast Iron, using the existing structural opening sizes.

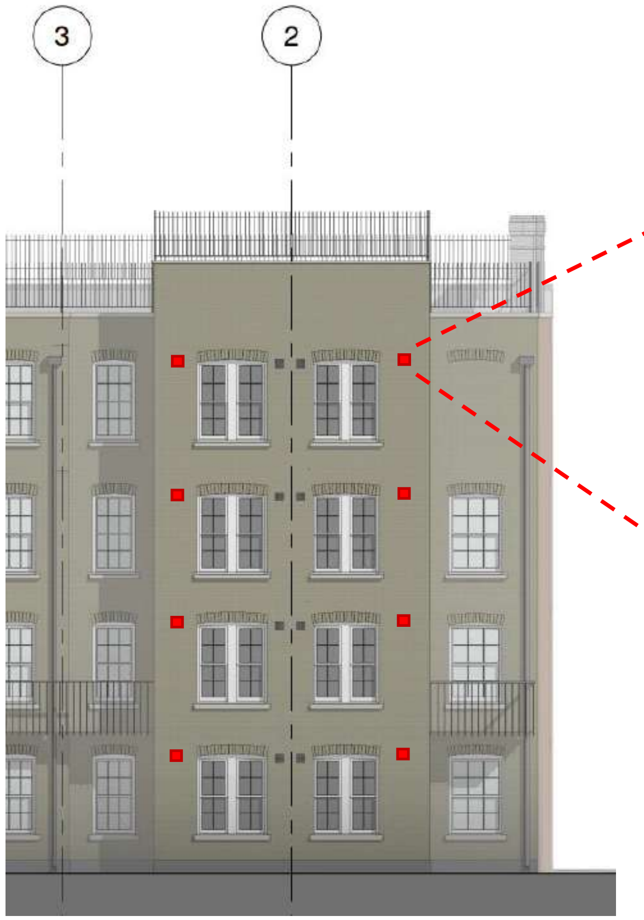
To maximise the air-tightness of the building, the remaining side-facing air-bricks will be blanked from the inside of the building.

The advantages of MVHR are around energy savings and heat recovery. The MVHR system tempers the incoming air to be similar to those internal air temperatures due to passing both air streams through a heat exchanger, whereas in a traditional arrangement, there is no tempering of external air temperatures. Whatever the outdoor air temperature is, will be the temperature of the incoming air. During winter months, up to 80-85% of normally lost heat is recovered and put back into the indoor air stream. During midseason months, a bypass ensures the heat is not recovered and does reject this to atmosphere. In the summer months, where outdoor air is higher than internal, the coolth is recovered and use to drop incoming air temperature.




A TYPICAL REAR BAY, SHOWING THE EXISTING AIR BRICKS

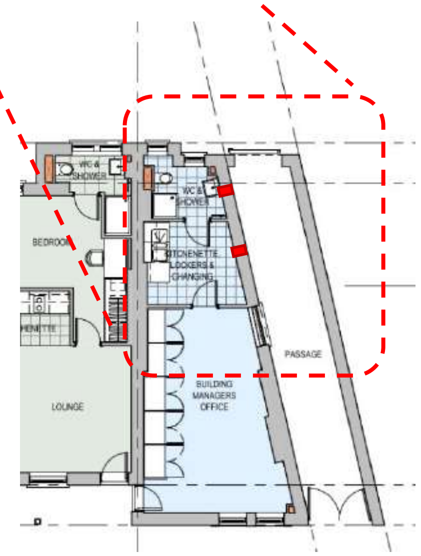

AN EXISTING TERACOTTA AIR-BRICK



A TYPICAL BAY, NEW AIR BRICK POSITIONS HIGHLIGHTED


A CAST IRON VARIETY OF AIR-BRICK BEING PROPOSED TO REPLACE THE TERRACOTTA UNITS

EXISTING ELEVATION: **WEST**



- Existing Airbricks to be replaced : 36 No.
- New openings to be formed and new matching Airbricks to be installed : 42 No.

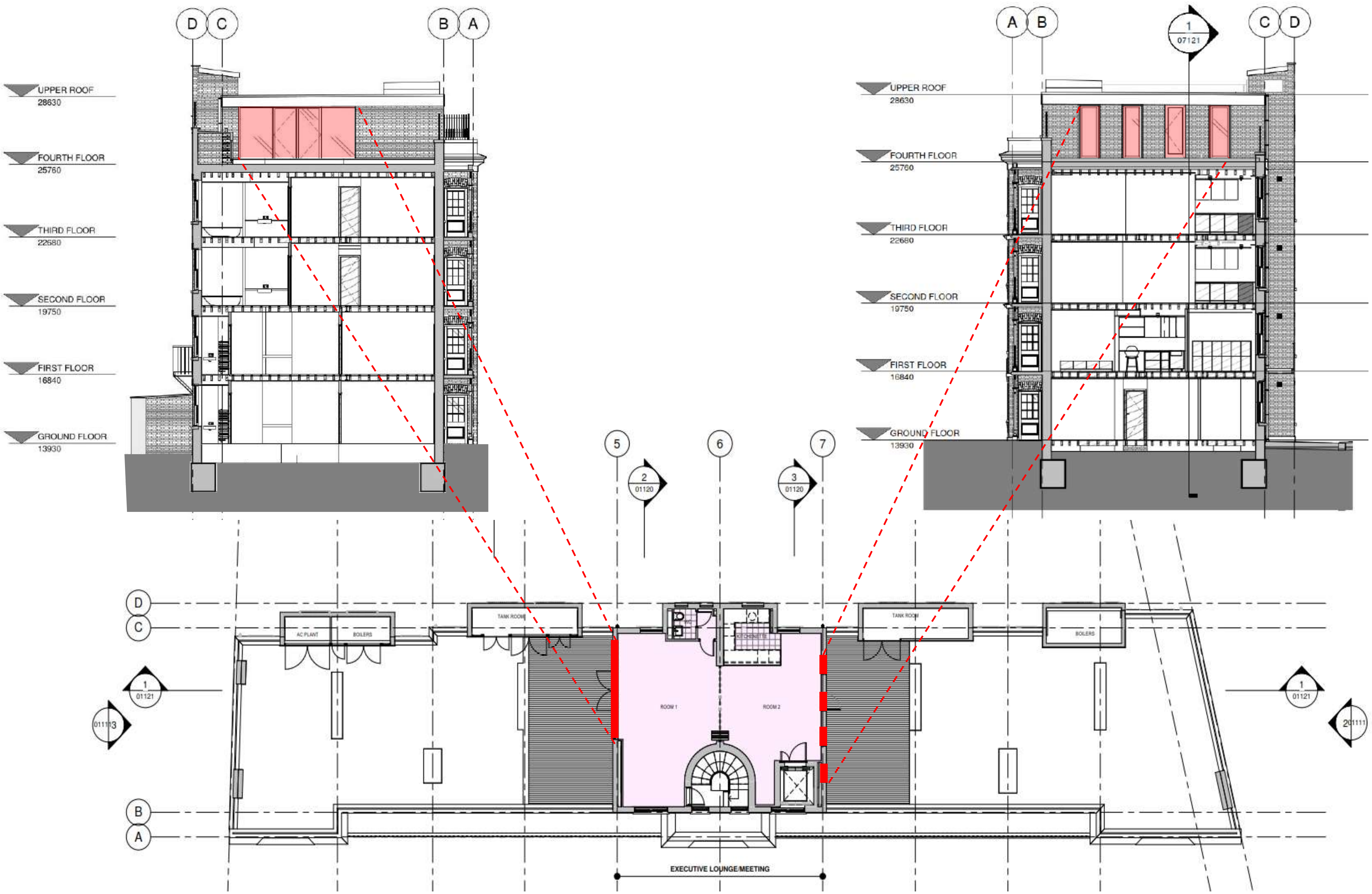
PLAN EXTRACT, GROUND FLOOR **(NEW AIR BRICKS)**

aukett swanke

19. Replacement timber double glazed doors and windows to the 4th floor

As part of the essential refurbishment work and repairs to the building, we are proposing to replace the existing timber-framed double glazed door and window units that were installed into the building in 2006 as part of the last upgrade. These have been heavily used and are now in need to replacement.

Based on the original 2006, it is proposed to replace these on a like for like basis, maintaining all of the structural openings verbatim.

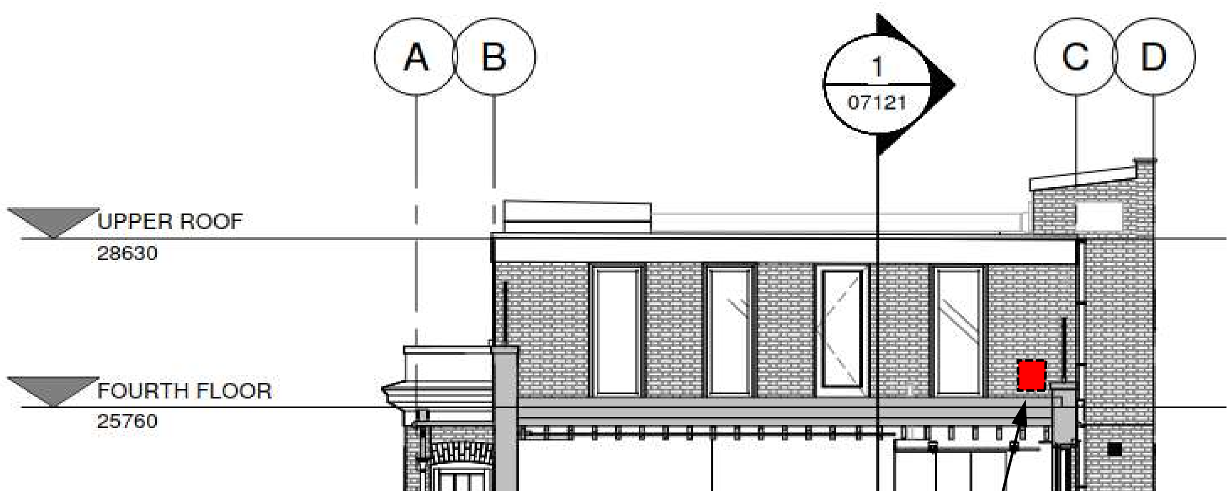


20. Penetration for new ductwork at roof level..

As part of the new roof level plant strategy, and as set out in the proposals, the existing plant enclosures will be re-used where possible to avoid the need for further new structures on the roof. As part of the new heat and energy recovery system for the building, the new MHVR unit (sized to for 12-16 people) for the penthouse meeting suit is proposed to be housed in the original tank room, plant enclosure no.3.

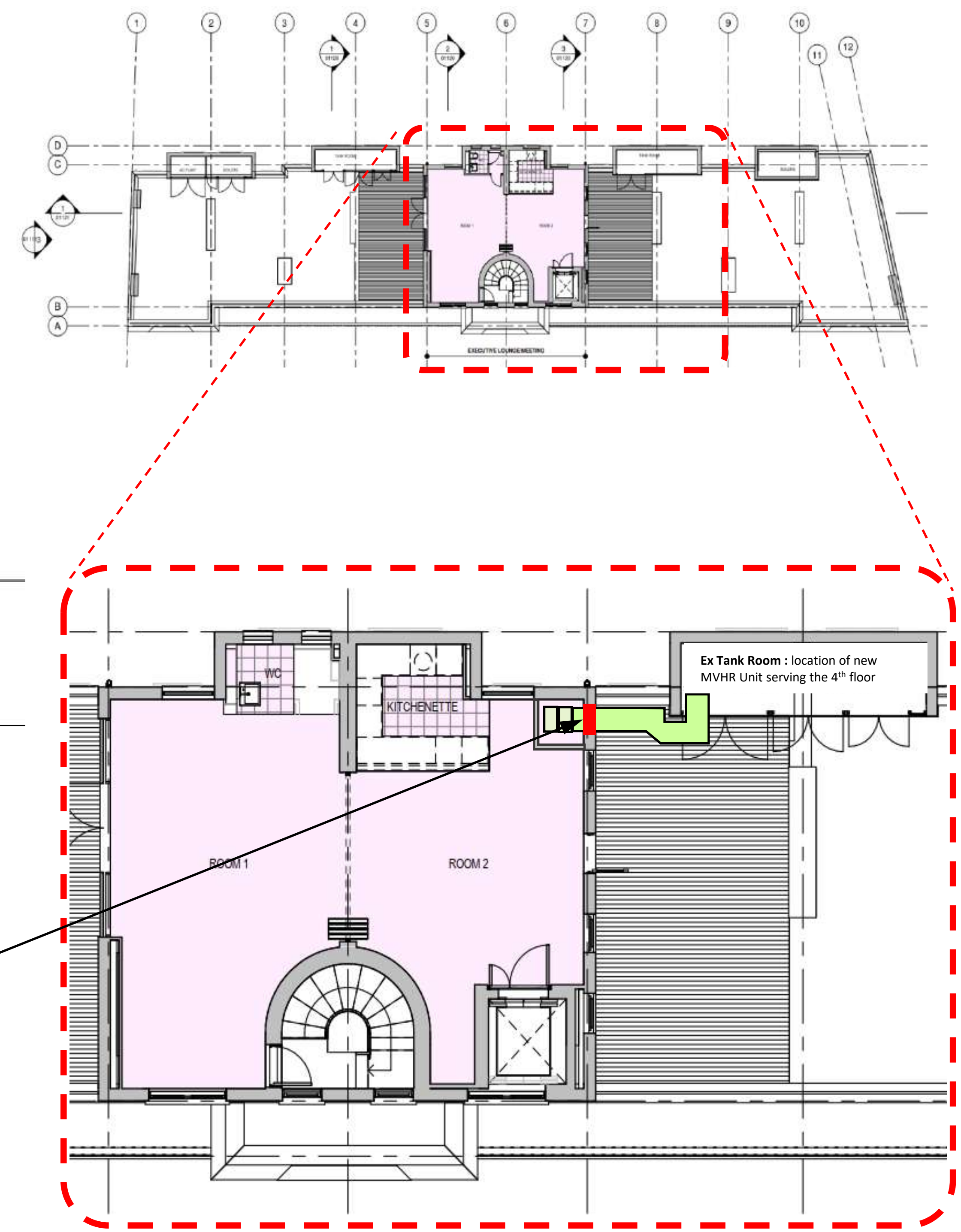
Apart from a new set of timber doors to the housing, no works are proposed to the existing plant enclosure.

In order to manage the intake and extract to the space form the unit, 2 x 500x300 insulated ducts are proposed to run from the plant enclosure into the 4th floor meeting suite. To do this, we propose to saw-cut a new 500x600 hole into the brickwork, insert a sub-frame for additional support, and seal and collar the ductwork penetration externally. The opening will be at low level and would only be visible from the terrace itself.



PART SECTION THROUGH THE BUILDING SHOWING THE TOP FLOOR PENHOUSE STRCTURE AND THE NEW 500X600 OPENING IN THE BRICK REQUIRED FOR NEW DUCTWORK.

Penetration : form new 500x600 opening into the brick at low level



PART PLAN OF THE 4TH FLOOR SHOWING THE POSITION OF THE NEW 500X600 OPENING REQUIRED FOR NEW DUCT WORK.

INTERNAL INTERVENTIONS

Apart from the essential replacement of some failing pipework, the following new M&E systems are to be installed as part of the internal upgrade of the apartments. These are intended to improve both the overall building performance, as well as the levels of user comfort.

- Fan-coil (FCU) driven heating and comfort cooling, delivered through new grilles and local ceiling void duct-work.
- A balanced MVHR driven heat recovery ventilation system which will continuously extract air from the 'wet rooms' (e.g. kitchens and bathrooms) and simultaneously pull in fresh air from outside, which will be is filtered, introduced and extracted via a network of ducting.
- Energy Efficient lighting, replacing existing lighting throughout.

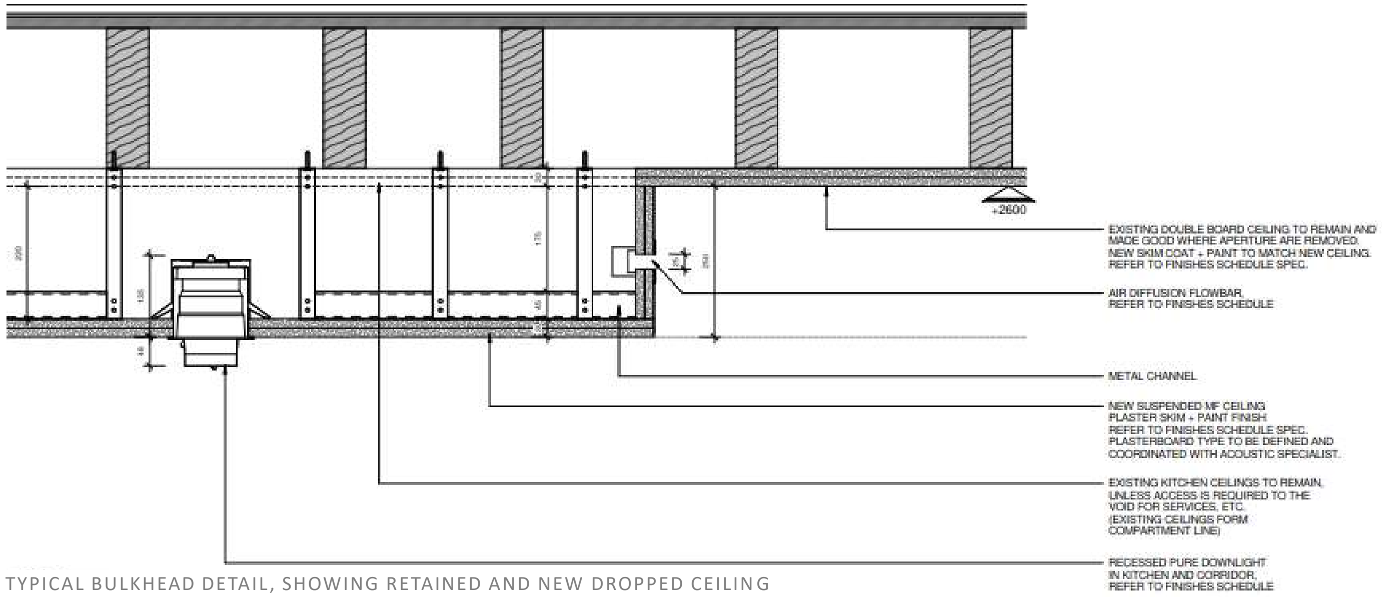
The existing ceilings heights are nominally 2600mm from FFL. To facilitate the space required for the FCU units, the MVHR system, the pipework and any distribution, the ceilings over the kitchens and bathrooms have been dropped to a level of 2350mm, along with some local bulkheads over entrances & vestibules to facilitate wider distribution.

These bulkheads have been architecturally coordinated withing the Interior Design, and are shown on the adjacent visual. In some areas such as bedrooms, the nominal height has been dropped to 2500 to accommodate ductwork and other cross-overs.

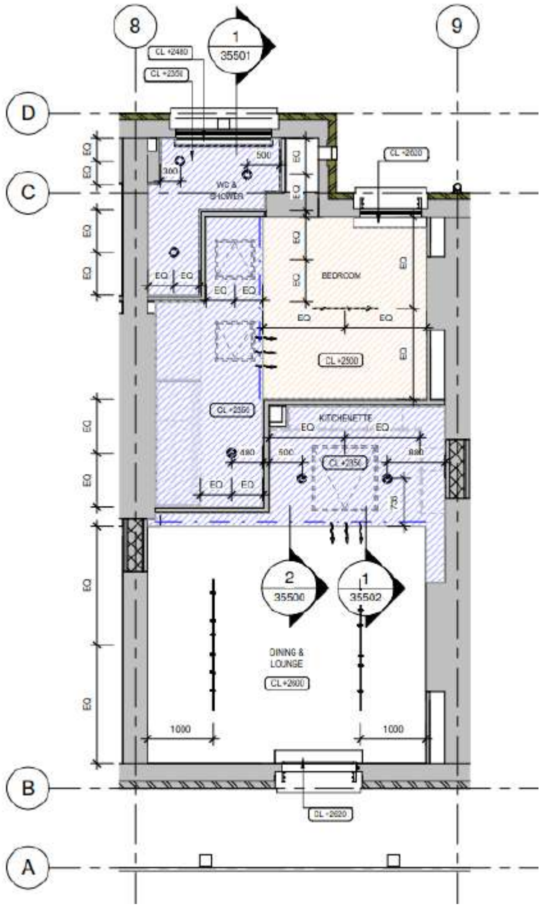
To facilitate access to the FCU and MVHR units, flush plaster faced access panels will be introduced.

As part of the interior design upgrade, the lighting throughout the apartments has been addressed and considered; and where this has been replaced, it has been done so with energy efficiency and user comfort in mind.

ARCHITECTURAL VISUAL, SHOWING THE DROPPED CEILING OVER THE KITCHEN AREA



TYPICAL BULKHEAD DETAIL, SHOWING RETAINED AND NEW DROPPED CEILING



TYPICAL ONE-BED CEILING RCP SHOWING THE EXTENT OF NEW AND DROPPED CEILINGS

22. Pipework and Risers

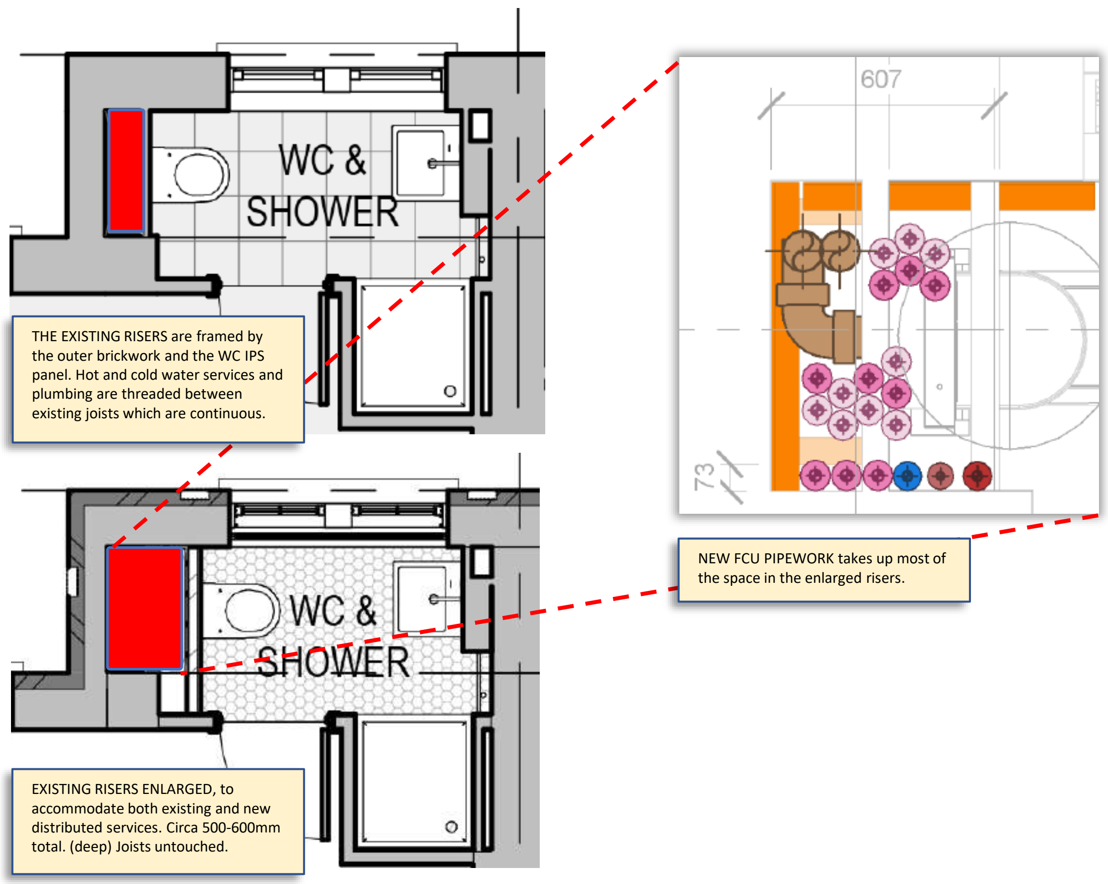
In order to replace the plumbing fittings and pipework, a proportion of the floors will be lifted to provide access to the pipework that runs in the joist-zone. No modifications to the floor joists are proposed; all new pipework will make use of existing builders-work holes, notches and openings.

With reference to the pipework distribution strategy for the whole building indicated in 11.2, and to specifically facilitate the distribution of the FCU pipework from the HBC units (distribution nodes) in the roof-top plant enclosures, the existing risers behind the WCs are proposed to be increased in depth by (nominally) 300mm; these risers will accommodate the existing Soil Vent pipes, Hot and Cold water distribution, and approximately 10-20 distribution pipes per riser. These additional pipes run to the FCU's, which are providing all the heating and cooling for the building.

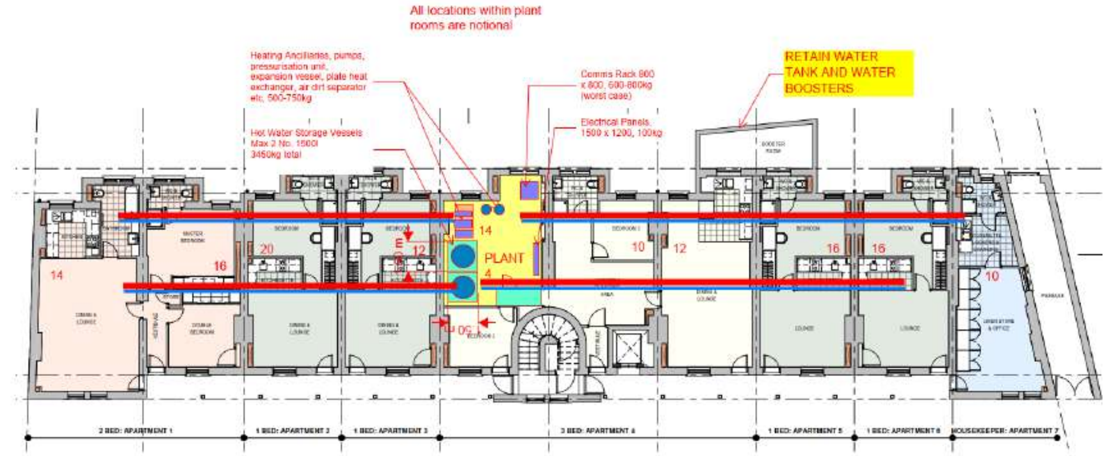
A simple diagram of the change is shown below.

There is no structural alteration that will take place with this increase. The existing floor joists are already variously continuous or trimmed around the existing risers, while the 'front' of the riser is a modern IPS panel.

The enlarged pipework riser will simply be a new false front, with an access panel, while pipes will be coordinated between the joists, and the risers fire-stopped at each level.

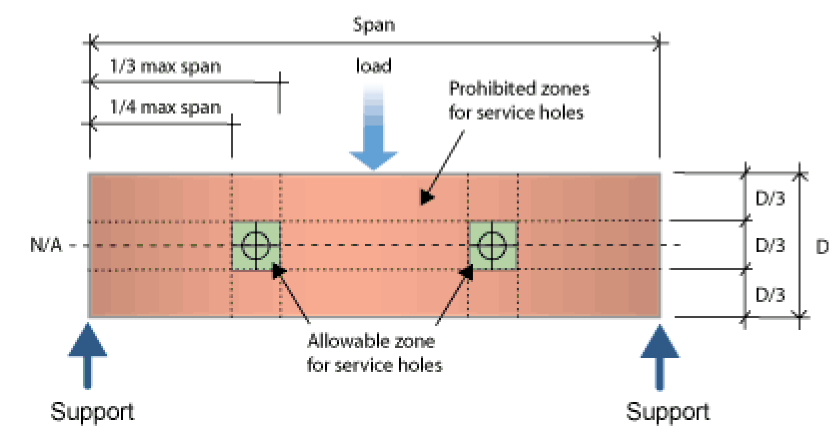


To facilitate distribution of the pipework to the existing risers, from the new plant room on Ground floor, new builders-work slots are proposed at high level at GF, though the existing brick apartment divisions, and the modern steel installed previously. From there the pipework will branch in the ceiling zone to each of the risers, to serve each level as they do at



SCHEMATIC OF THE GROUND FLOOR SHOING THE TWO HIGH LEVEL ROUTE OPTIONS

While the distribution of the this pipework is plausible, externally, it was felt that the loss of energy, and the need for external penetrations was a detrimental effect of this option. Therefore the distribution of this pipework, internally, at high level on GF is currently proposed.



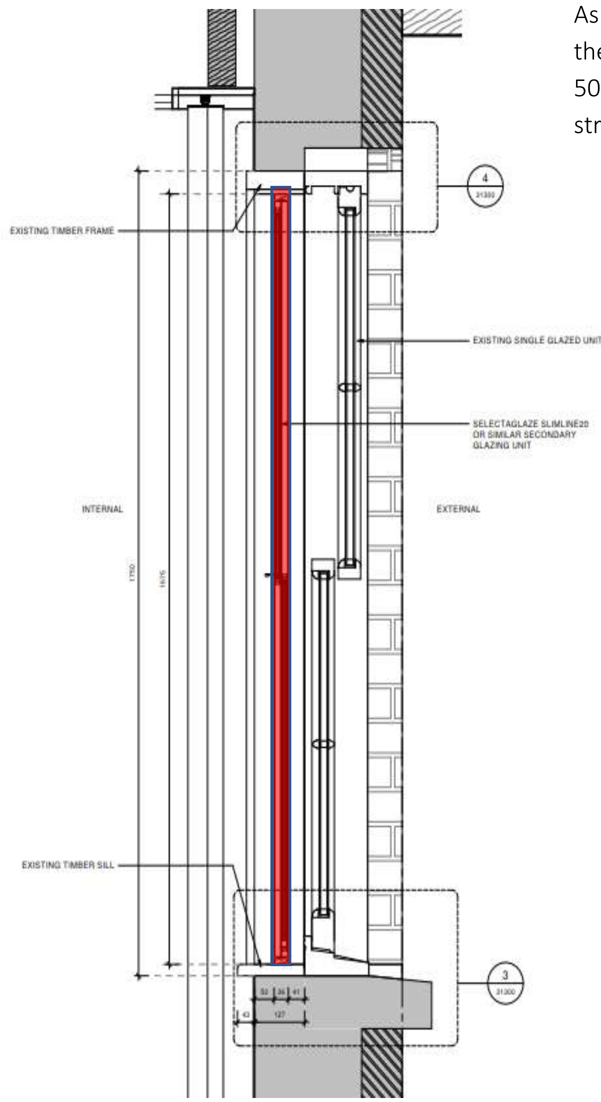
Following a thermographic survey of the existing building, improvements in principle were identified for the existing fabric, namely air-tightness measures where possible, additional insulation at roof level and Secondary Glazing to the existing windows.

An Energy and Overheating report has been produced (see 510499-ELE-XX-XX-RP-YE-51001) which sets out to demonstrate that the proposed renovation works - although not required to meet the Camden Local Plan policies - show a meaningful reduction in energy savings and CO2 reductions as part of the path to ‘zero carbon’ and that would qualify for the Camden policies. The report takes into account some the fabric improvements,

All existing single glazed timber vertical sliding sash windows, to the west and covered east facades are to be retained. However, as these are part of the original listed fabric, no alterations to these are proposed. However – as shown in the adjacent images – slimline secondary units are proposed to each of the inner apertures. This will improve the air-tightness, thermal and acoustic performance of all of the windows.

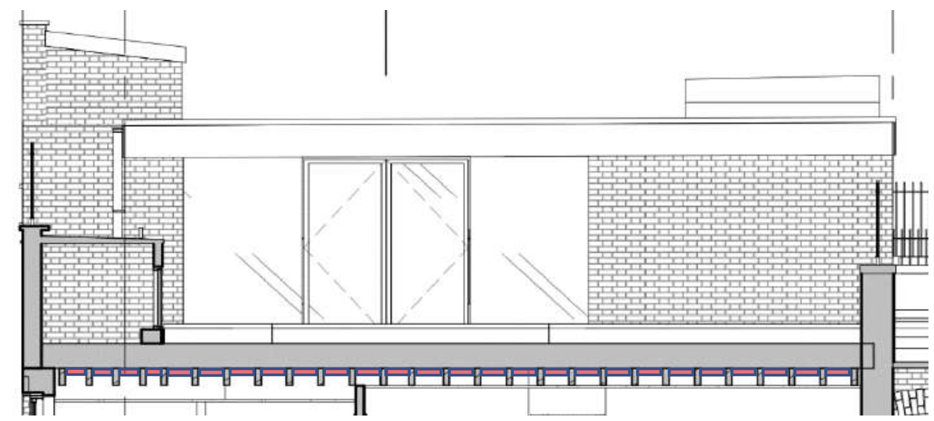
No alterations to the reveals or sills are required, and these interventions are fully reversible.

A TYPICAL SECONDARY GLAZING UNIT

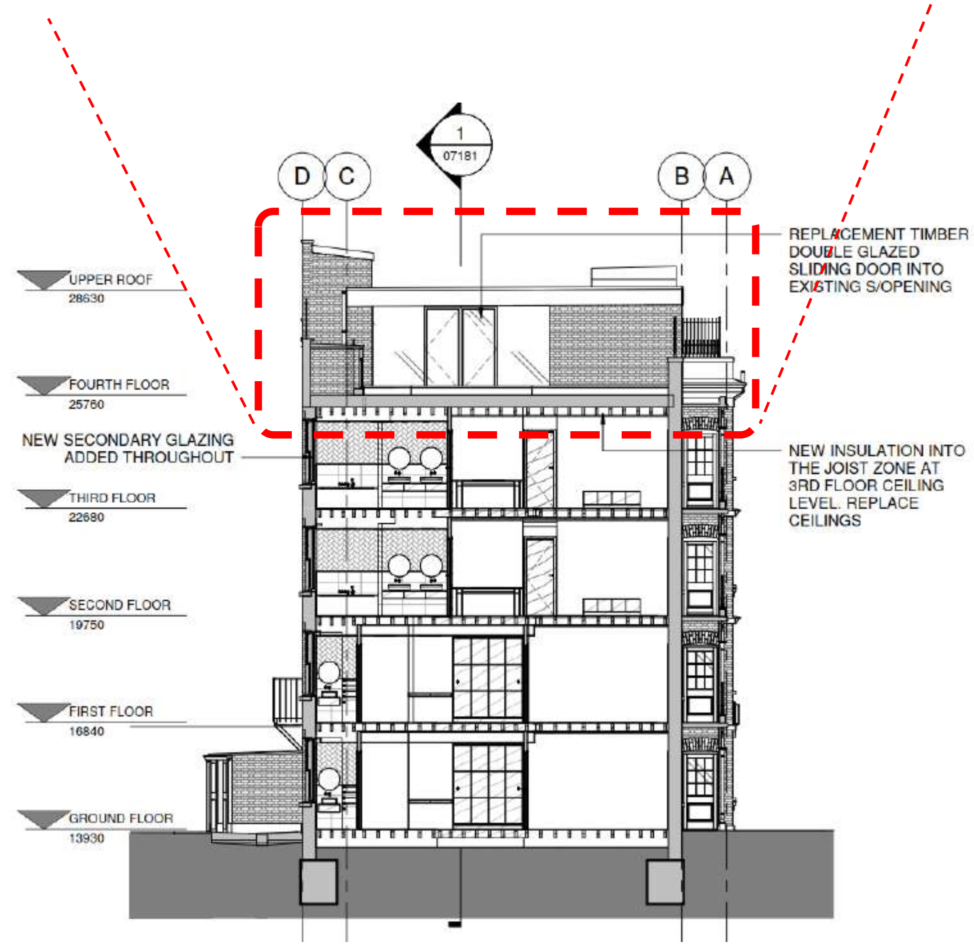


TYPICAL SECTION THROUGH AN EXISTING SAH WINDOW, NEW SECONDARY GLAZING HIGHLIGHTED

As part of the fabric upgrades, it is proposed to install additional insulation at roof level, into the joist zone (accessed from the ceiling of the 3rd floor). This is currently proposed to be a 50mm Rockwool Bat, installed at high level up against the existing timber deck. Apart from the strip out of modern ceilings, no destructive work is required.



SECTION THROUGHT THE ROOF STRUCTURE SHOING THE NEW INSULATION AT HIGH LEVEL

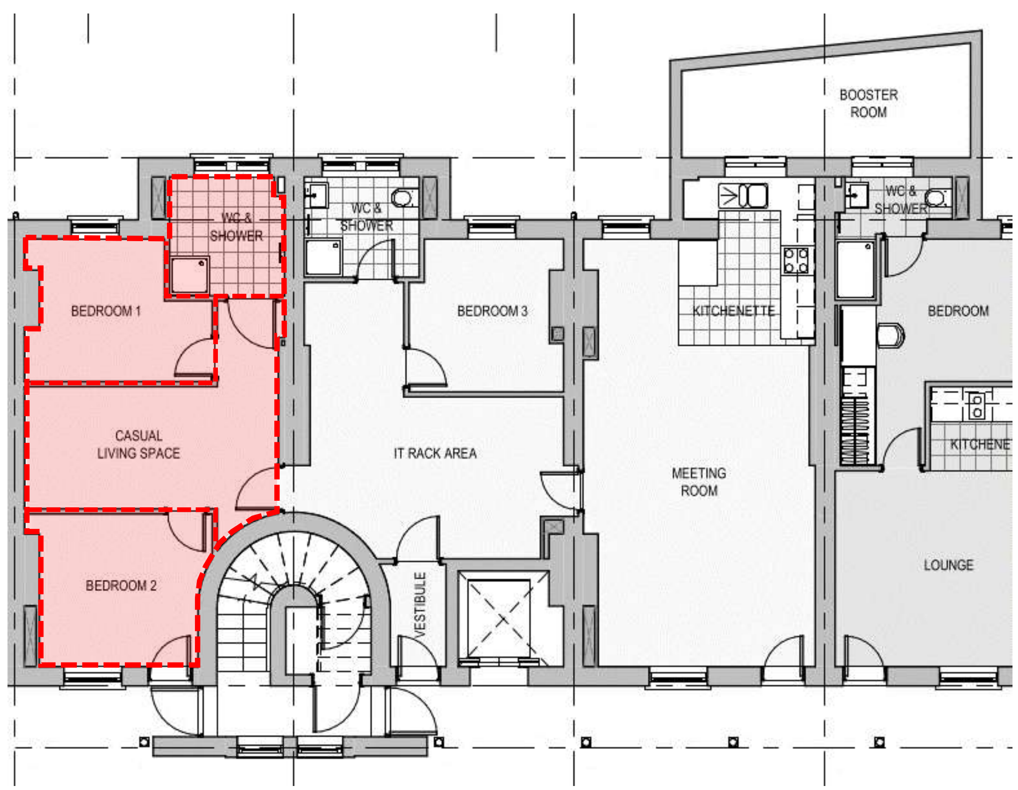


24. Ground Floor : Apartment 4 layout update

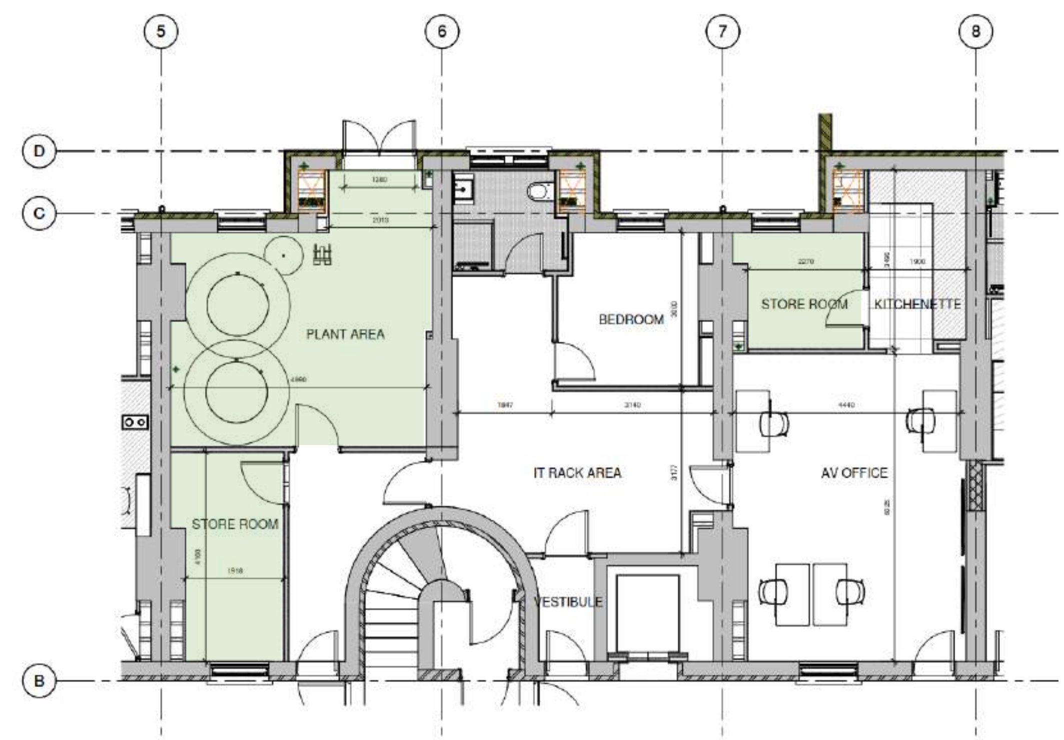
The existing Apartment 4 is not used as part of the corporate accommodation provision at present, and functions as an on site estates, security and IT space, with space of emergency overnight sleeping berths for security staff, and a meeting room, which is also used by the Staff and other on-site operatives.

Further to the plant upgrades (see section 17 on pg 53) – and as part of the refresh generally – it is proposed to modify the existing meeting room and kitchen area to provide an additional store room, and to make the meeting room into a slightly smaller AV / IT Office.

Similarly, the in the process of providing the Plant area, we a proposing to add a large store room in that vicinity. The resultant apartment configuration would have only 1 sleeping berth.



EXTRACT OF THE EXISTING GROUND FLOOR, SHOWING THE EXTENT OF THE LAYOUT TO BE MODIFIED.



PLAN ARRANGEMENT OF THE MODIFIED GROUND FLOOR APARTMENT 4, SHOWING THE NEW PLANT ROOM AND STORE ROOM.