MECSERVE

Liddell Road – Block A – Roof plant

Issue:	001
Date:	10th January 2024
Reference:	P22-008/RPT/JS/Information

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ISSUE

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001	10.01.24	Information	JS	COR	

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1. INTRODUCTION

1.1 GENERAL

Mecserve has been requested to provide a report clarifying reasons for a significant MEP redesign of Block A at Stage 4, mainly with regards to the revised plant location which has led to the requirement for an acoustic roof enclosure.

1.2 INTRODUCTION

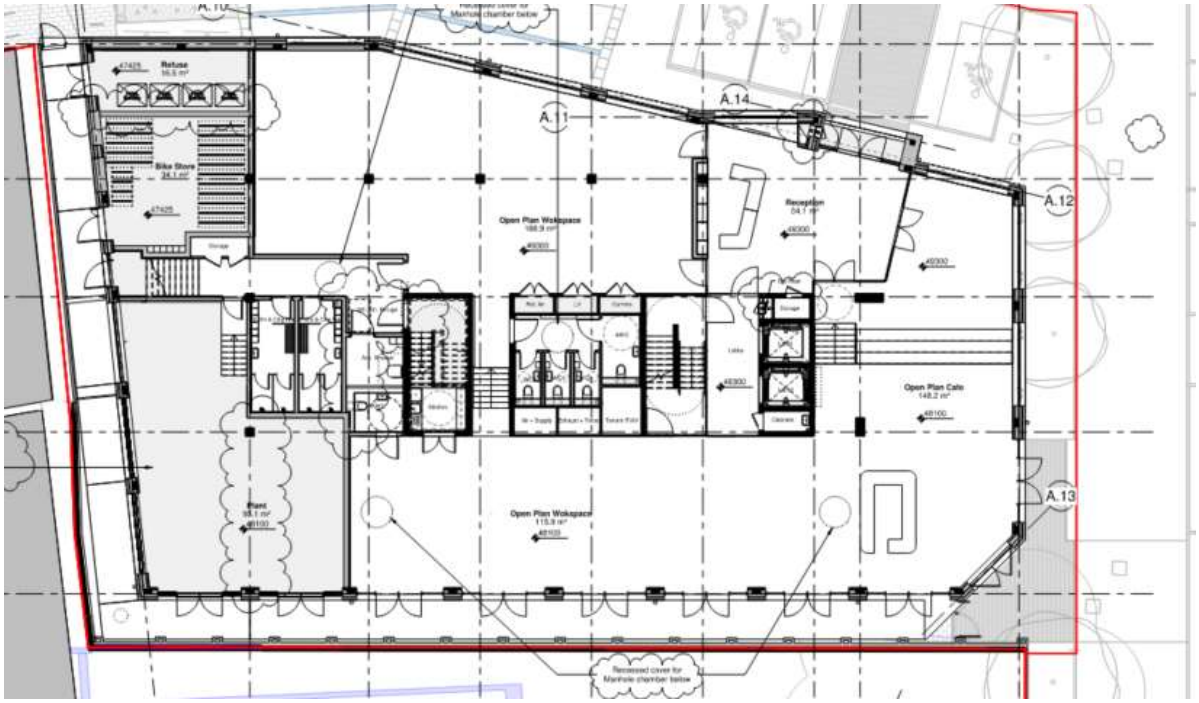
The project is known as Liddel Rd Phase is a mixed-use development of the Liddell Road Industrial Site on Liddell Road, London NW6 2EW (the Site). The proposed development comprises.

- Circa 106 residential units arranged over 2 No. residential blocks (Block B & C)
- A commercial five storey office (Block A).

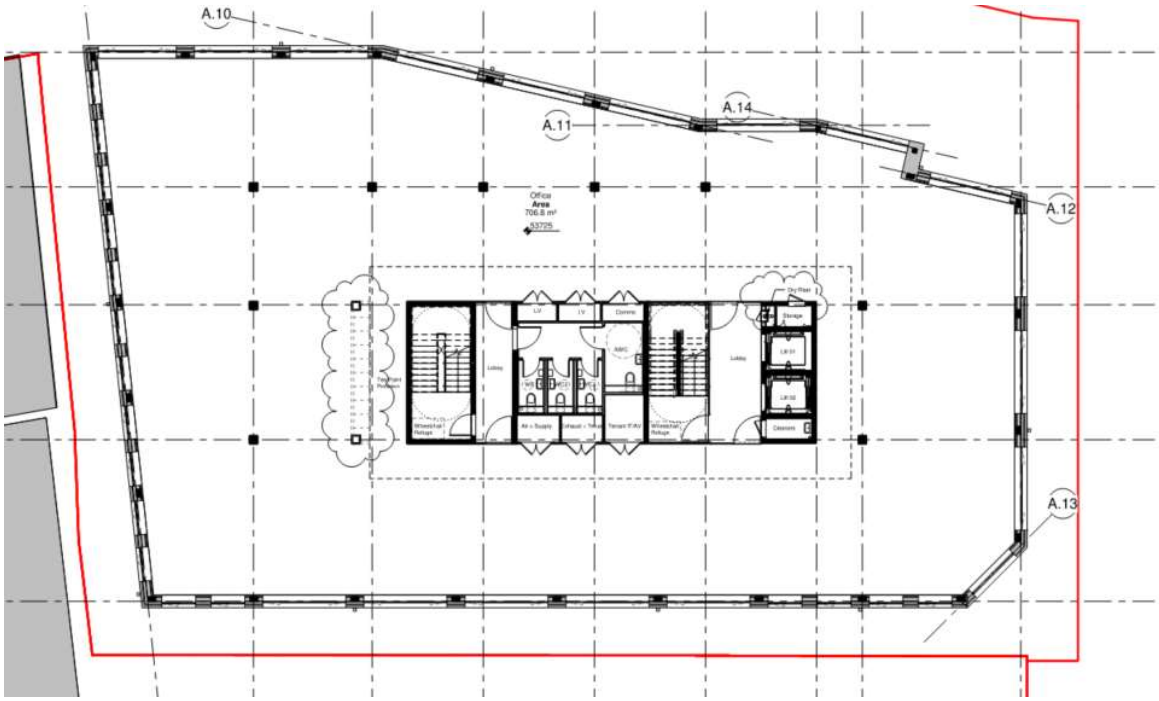
The MEP stage 3 design for block A had been developed by Synergy who was appointed directly by London Borough of Camden. Mecserve have been appointed by DMO (MEP contractor/client) to develop the stage 3 MEP design into Stage 4 design.

Block A is a Ground + 4-storey commercial building being delivered for Camden Council. Please refer to the layouts below:

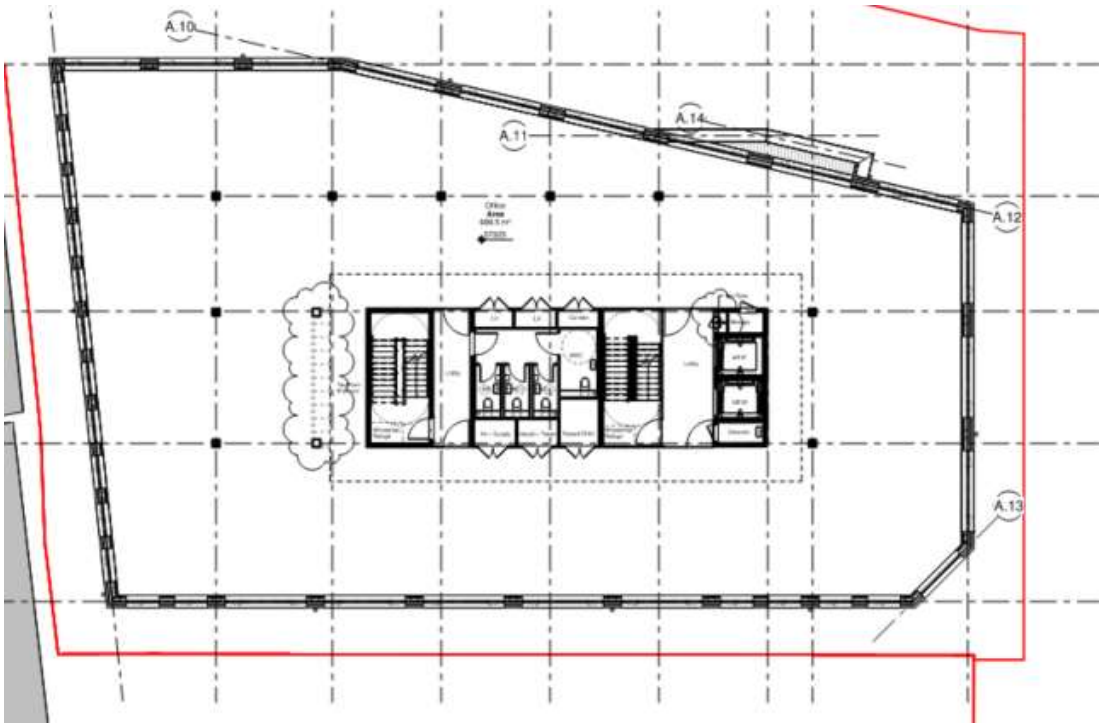
Ground Floor:



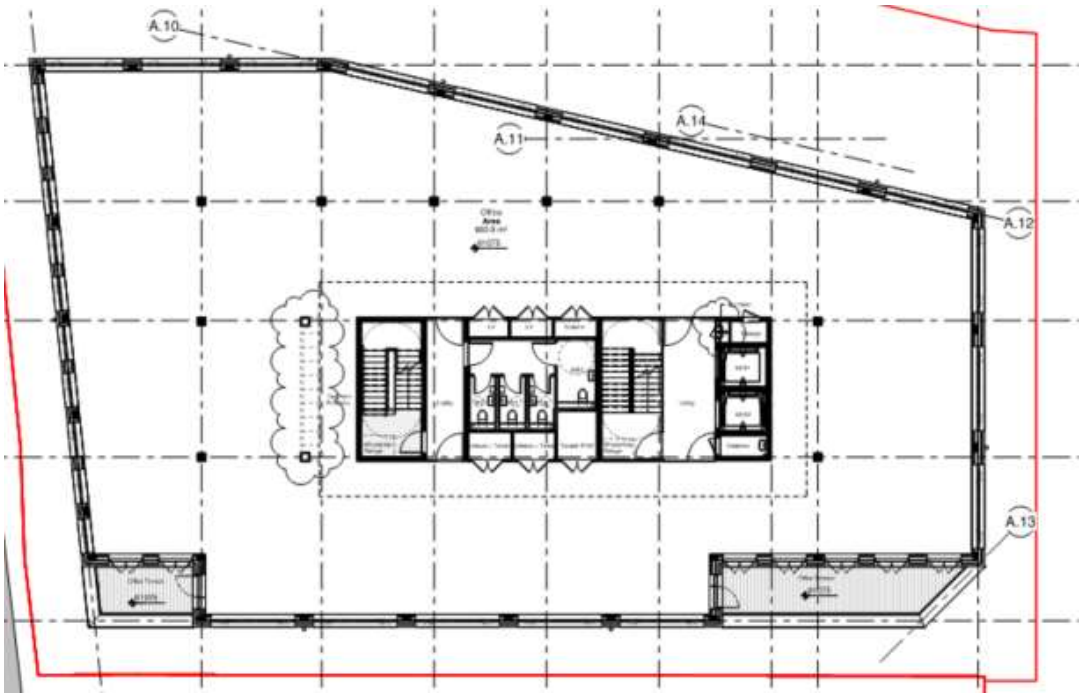
First Floor:



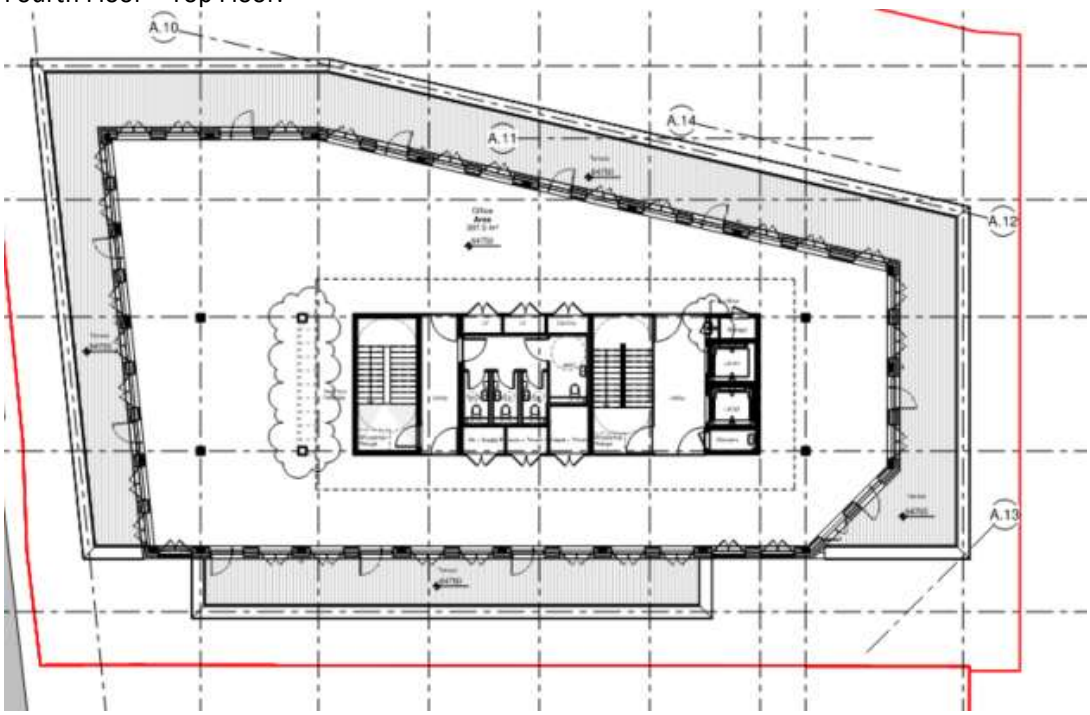
Second Floor:



Third Floor:



Fourth Floor – Top Floor:



Following the review of Stage 3 design Mecserve identified that the Stage 3 design was lacking a sufficient level of coordination, with inadequate level of information, contradicting with other contract documents, including the Base Build Definition Workspace document issued by Camden.

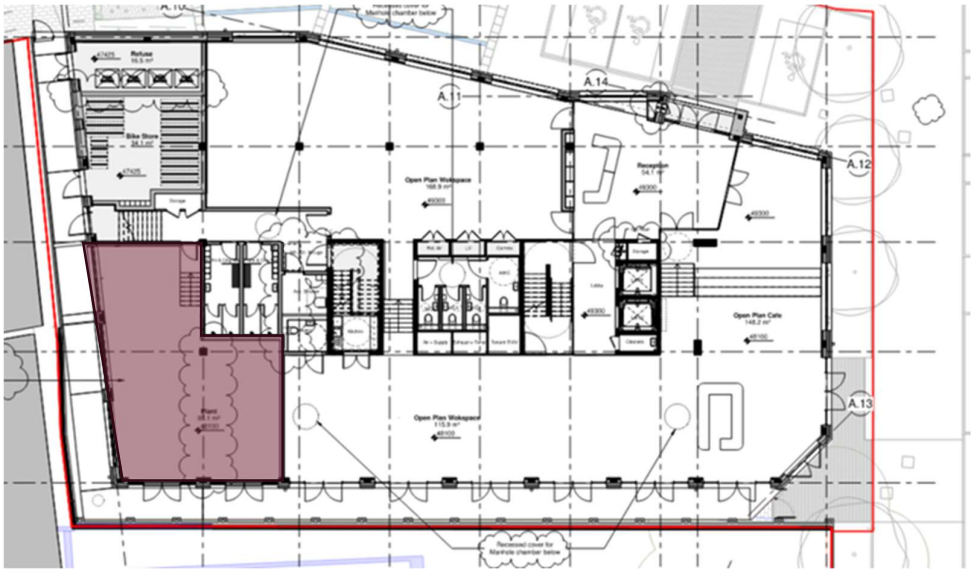
The key elements being identified as:

- Insufficient ground floor plantroom to accommodate outdoors condenser units and other plant required to serve the building.
- Insufficient FCU coverage to comply with the BCO requirements.
- AHU being specified with an internal LTHW with no source of water fed heating systems being present in the building.
- Lack of coordination in terms of the riser distribution/ provision, and key horizontal service runs.

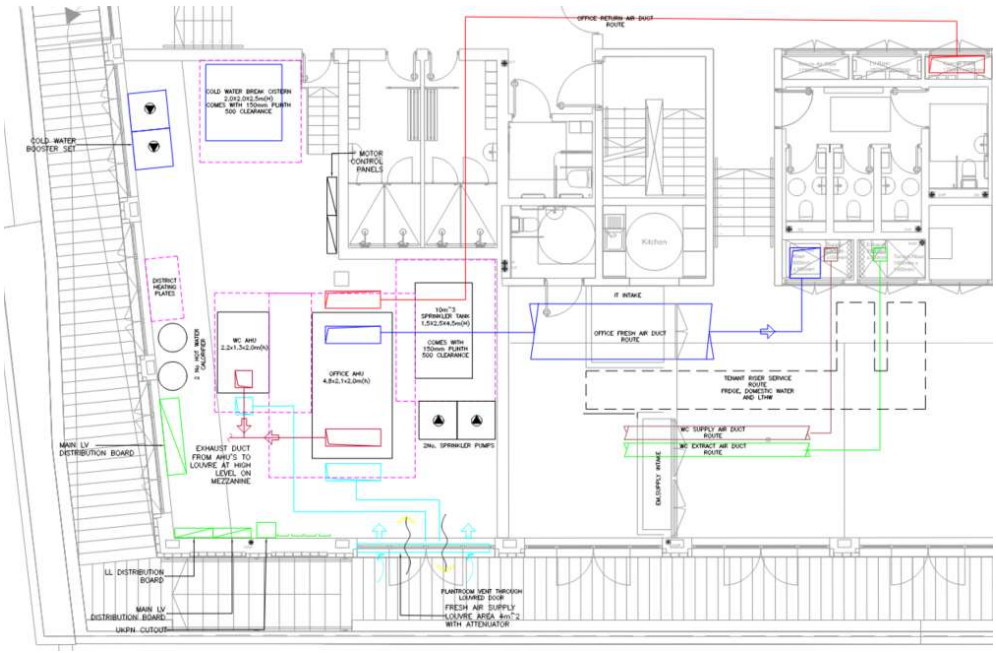
2. BLOCK A PLANT LOCATION

2.1 DESCRIPTION

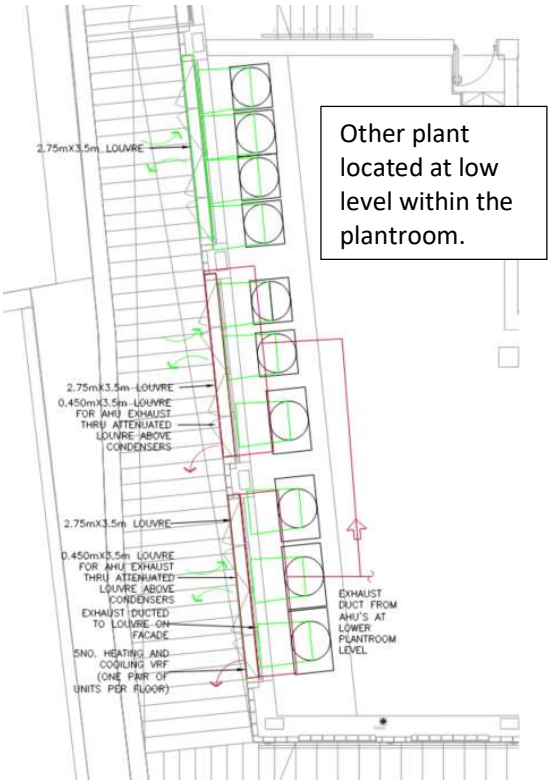
The MEP Stage 3 design proposed by Synergy required for the entire plant including outdoor condenser units being located within the ground floor plantroom of the block A as shown below:

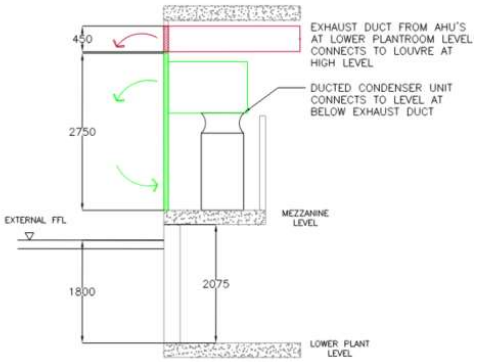


The below illustrates the Stage 3 plantroom design proposed by Synergy for this area:



The proposal was based on the main plant being located at low level of the plant area with the VRF units being located on a dedicated gantry facing external louvres:



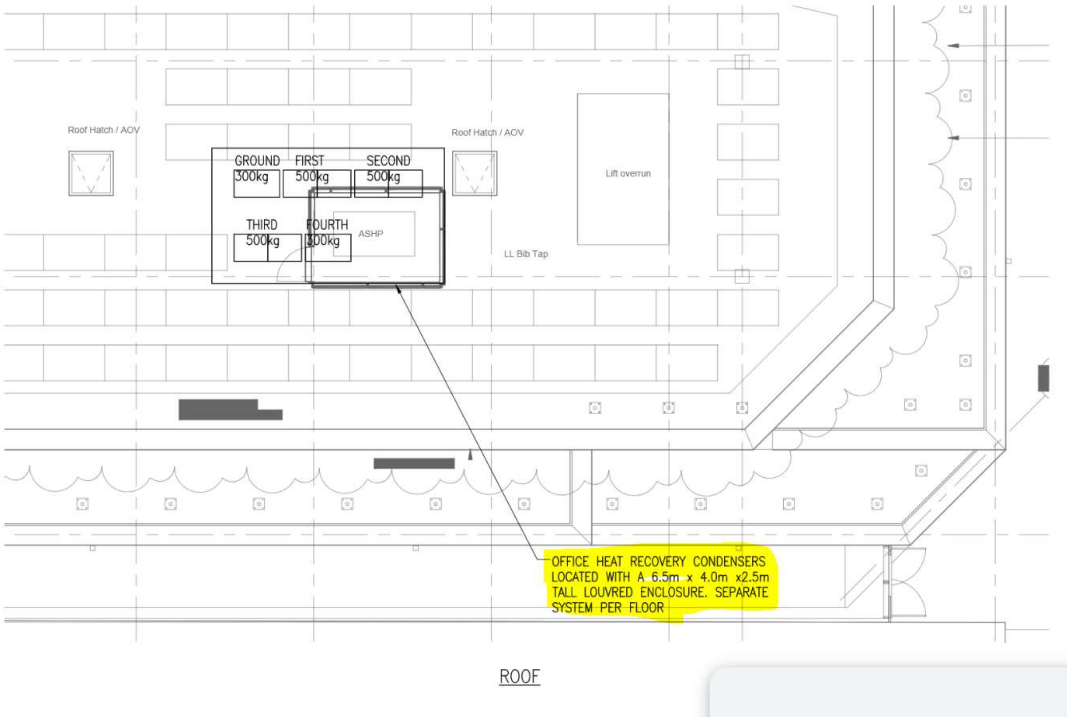


Following the review, Mecserve raised the following concerns:

- Insufficient space for the plant, including associated AHU attenuation and duct routes.
- Insufficient space and height for VRF units discharge attenuation
- Insufficient space for VRF unit's inlet attenuation
- Significant risk of the cold air being discharged during the heating cycles short circuiting back into the plantroom.
- Insufficient plant space overall to accommodate the plant serving the building.

Based on a the above Mecserve, as the only viable solution available proposed to relocate the VRF condenser units to the roof. This proposal has been raised via an RFI#16 on 22nd April 2022.

Extract from RFI#16 shows stage 3 proposal for roof plant & enclosure shown below.



2.2 ACOUSTIC REVIEW

The roof of Block A is overlooked by Block B and surrounded by other residential developments. NRG acoustic consultants were appointed to ensure appropriate acoustic measures are in place in order to comply with the planning noise requirements.

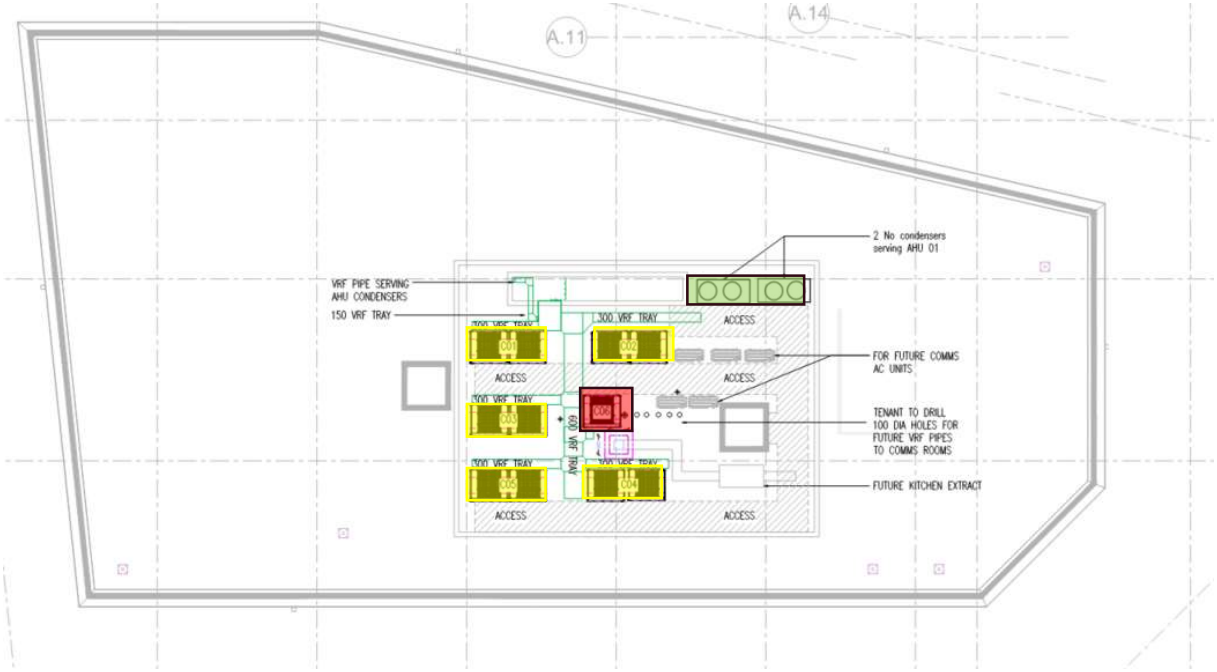
The below illustrates a number of options the team has considered.

The initial option was to install the plant centrally on the roof to provide the best services distribution to all adjacent risers.

The plant comprised of the following plant:

- VRF units serving office plate five no – marked in yellow.
- VRF unit serving the lift lobbies and the reception – marked in red.
- VRF unit serving AHU located on the ground floor level – marked in green.

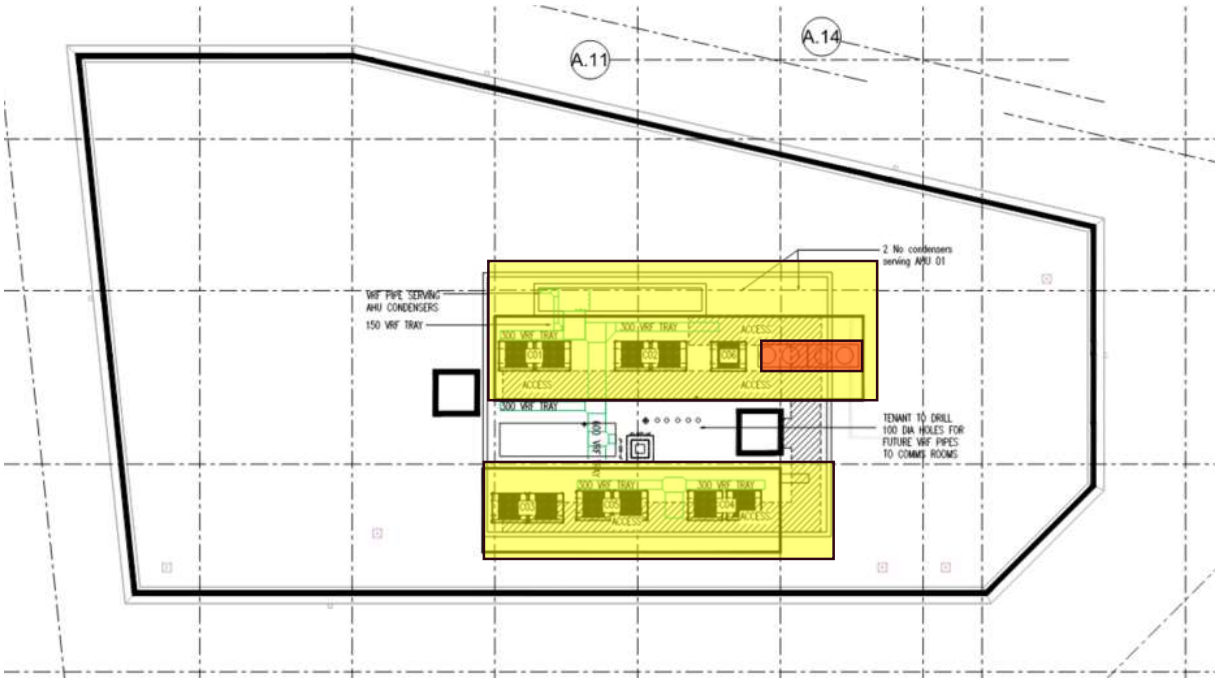
The VRF units serving the ground floor level AHU's were added to the scheme in order to temper fresh air supplied into the building. The Stage 3 design relied on a LTHW coil served from a LTHW system which was not present in the design. RFI#14 raised on 22/4/22 highlighted this.



The plant selection and associated noise levels were provide to NRG for their initial noise assessment. Following the review NRG advised that a standard acoustic louvre plant enclosure as proposed in the revised stage 3 drawing provided in RFI#16 would not provide a sufficient level of noise attenuation. The only solution to meet the planning acoustics requirements was to fully enclose the plant in an enclosure, with sides and roof top being fully attenuated.

The initial assessment indicated that the enclosure would require at least 3m long attenuators sitting above a 3m plant louvre with a risk of still not achieving the noise criteria. Due to the lift overruns & access hatches impeding the space allowed for the condensers, overall size of this enclosure would be circa 10.1m by 7.5m, with a height of 3.6m.

Following this feedback, Mecserve proposed to locate the remaining plant in two dedicated enclosures away from each other as shown on the sketch below:



This arrangement was evaluated again by NRG indicating that the same level of attenuation would be required for two separate enclousures. The assessment also indicted that the unit serving AHU DX coil could not be attenuated any further regardless its location on the roof (marked in red), and remained above the planning acoustic requirements.

Mecserve decided to remove DX unit serving the AHU from the roof and replace it with an integral heat pump located within the AHU in the GF plantroom. This was originally not considered due to previously highlighted spatial constraints within the plant room.

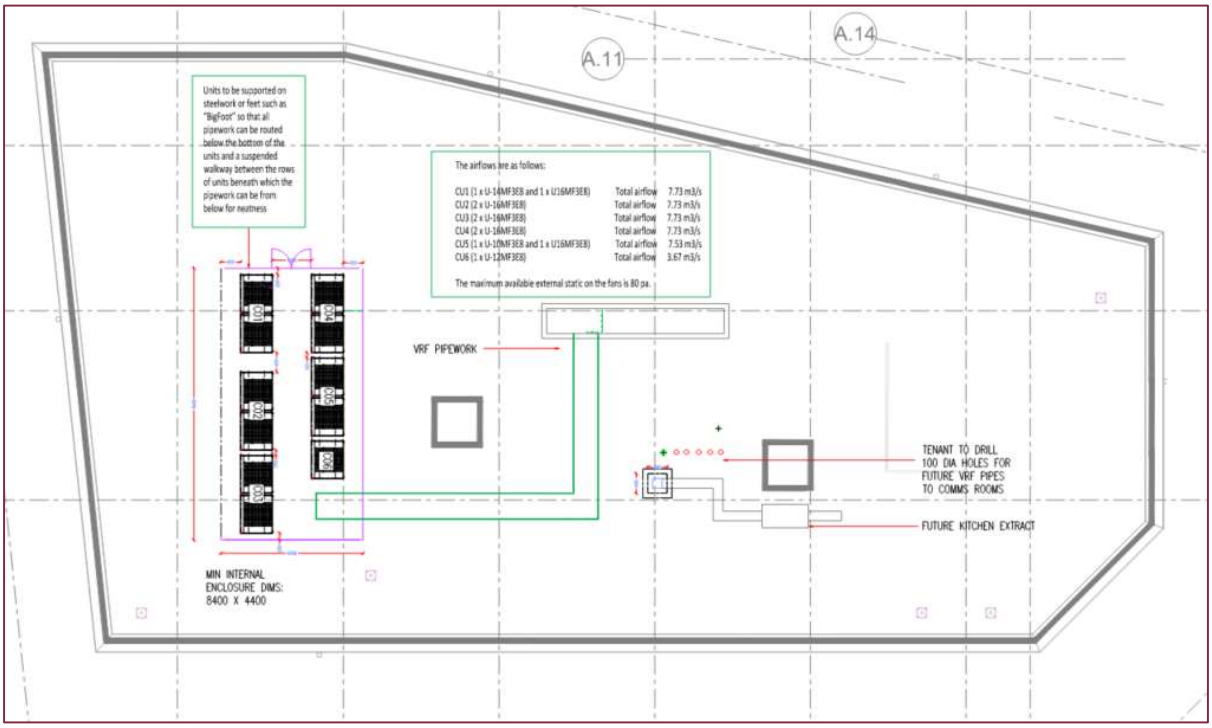
The two enclosures under this proposal were circa 10.1m by 3m x 3.6m high each.

On further evaluation of this proposal with 2 separate enclosures, it was found that the routing of pipework from the AC riser to the 2nd enclosure and maintaining safe maintaince access from the access hatch was difficult to achieve, this enclosure would have been circa 1m from the parapet on the south elevation. Additionally, the route for the future kitchen extract would be impeded and the location of future VRF to the comms room would be affected.

Following this review and the removal of the 2no. units serving the AHU's and incorporating them into the AHU's in the plantroom, Mecserve & NRG carried out a number of simulations to assess the best location for the enclosure against all sensitive noise receptors. In addition, Broadway Malyan architects reviewed the visual impacts. The conclusion was to house VRF units within one single enclosure, located on the east side of the roof to meet the noise criteria. this enclosure size is 9m x 5m x 3.6m high(at highest point). This location sets the enclosure back to a minimum of circa 3.5m from the parapet.

The reason from the increase in enclosure size from the stage 3 proposal shown in RFI#16 and the stage 4 requirements is due to the free area for the air path being limited by a significant amount of attenuation, the enclosure has been sized to ensure that a sufficient air flow for intake and exhaust is maintained, including minimum requirements for the plant maintenance.

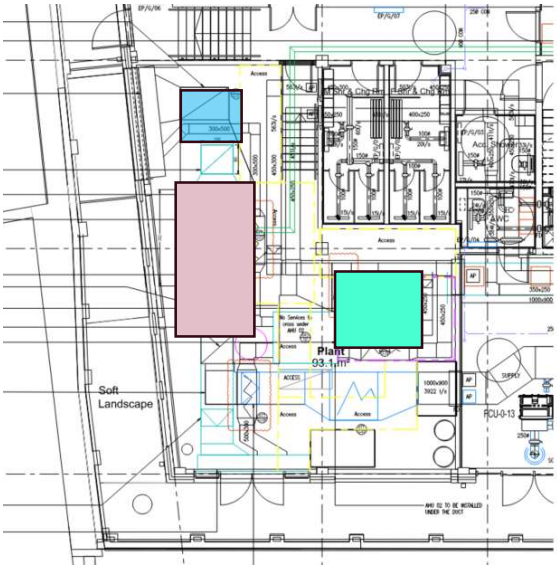
The proposal for the above is illustrated below. The enclosure only accommodates the units serving the office demise.



With the above proposal, as discussed previously, the AHU serving the office block is provided with an integral heat pump to temper the supply air. This has increased the length of this AHU by 800mm, the height by 400mm and required the addition of large attenuators within design of the ground floor plantroom as shown

below. As a result of these increases in size, the sprinkler tank had to be redesigned to fit into a smaller space allocation.

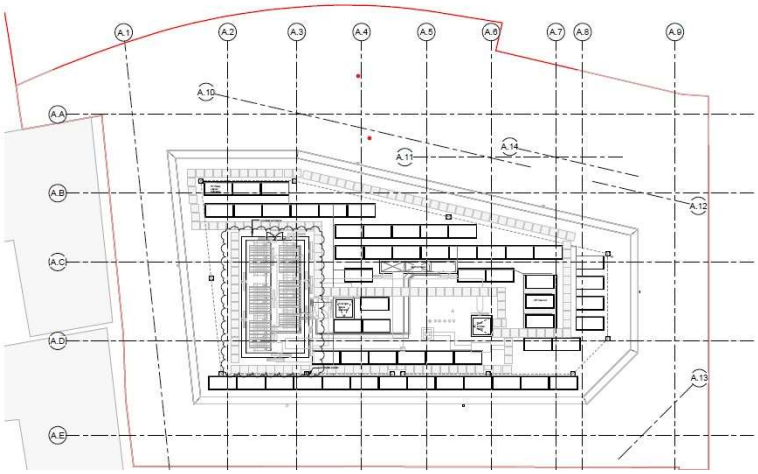
- AHU shown in brown,
- Additional attenuator shown in blue.
- Sprinkler pump in green



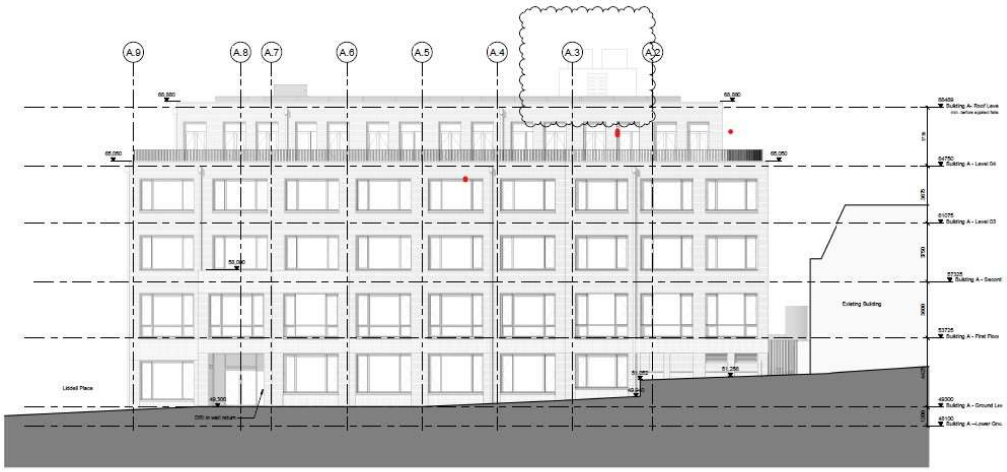
2.3 DRAWINGS

The below drawings show the visual result of the Enclosure in its planned position from all elevations.

Roof plan

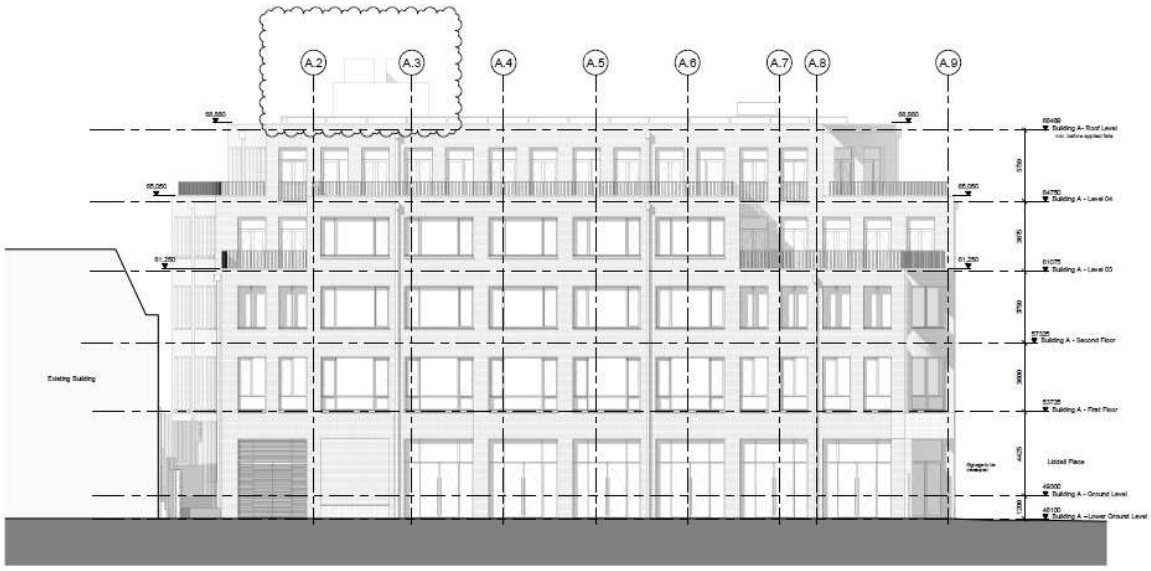


North Elevation



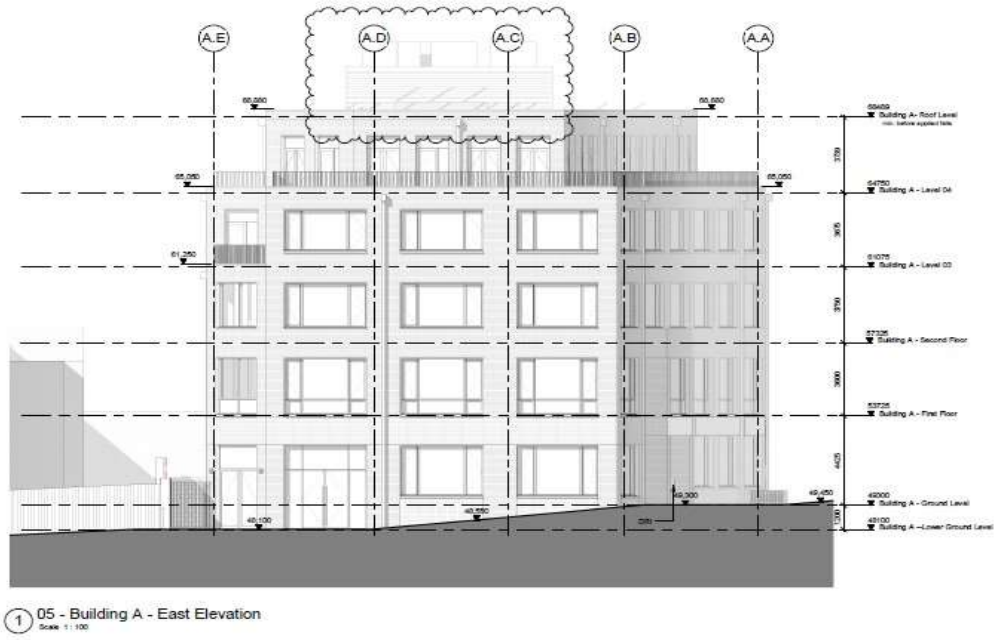
05 - Building A - North Elevation

South Elevation



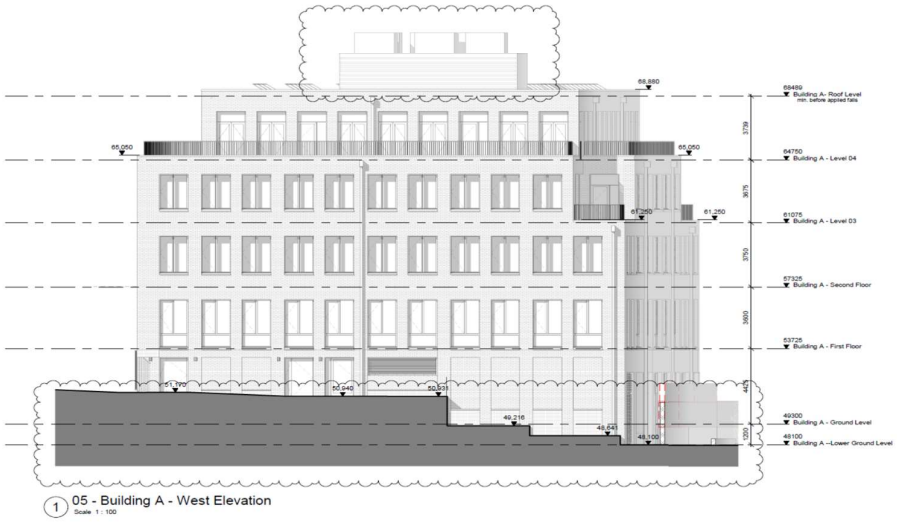
1 05 - Building A - South Elevation

East Elevation



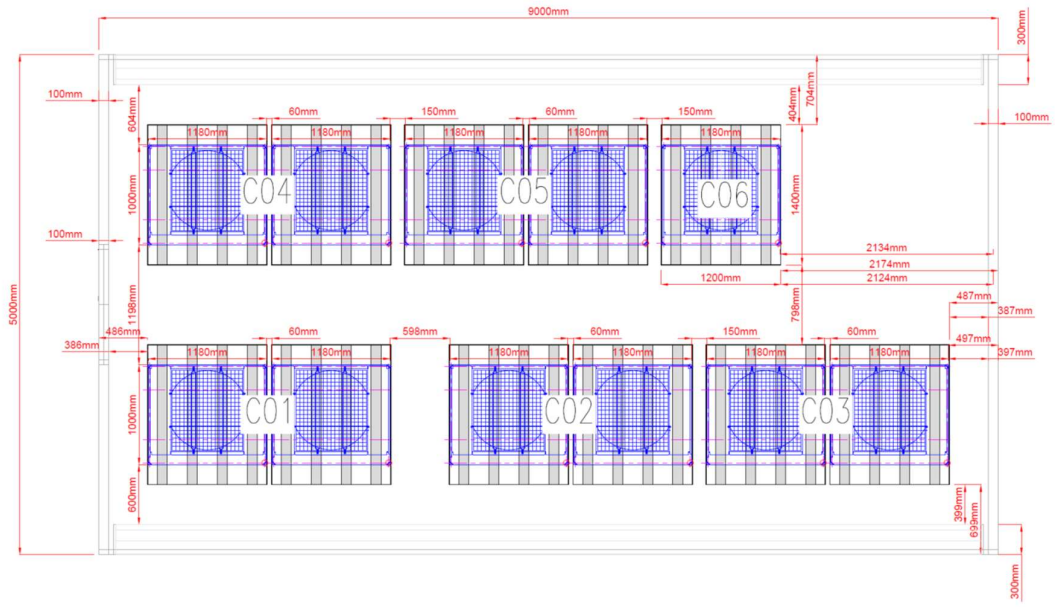
1 05 - Building A - East Elevation
Scale 1 : 100

West Elevation

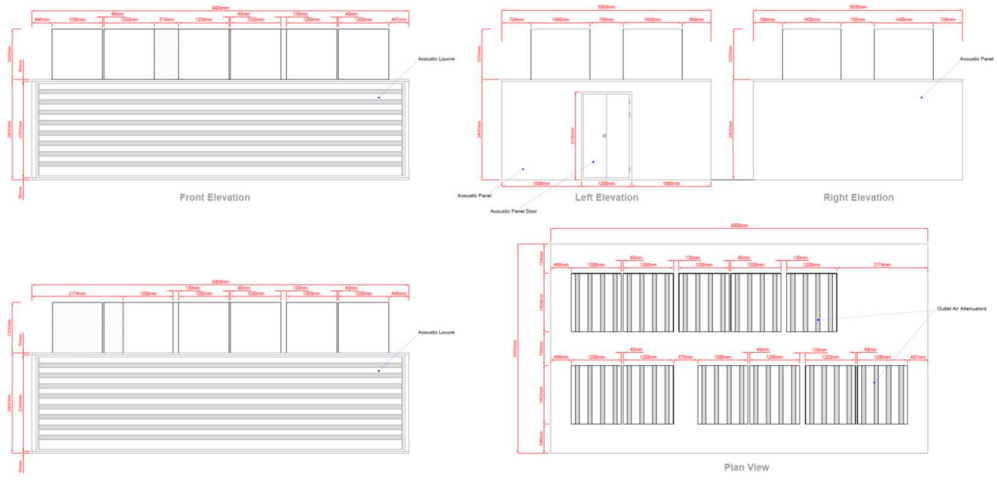


1 05 - Building A - West Elevation
Scale 1 : 100

Final Acoustic Enclosure details.



Rev	Amendment	Date	Project	Scale	Date	
			1 Liddle Place London NW6 2DJ	N.T.S	09/11/2023	soundplanning
Notes			Title	Drawn		Sound Planning Limited Farnham Surrey Phone: 01252 711972 Fax: 01252 601083 Email: enquiries@soundplanning.co.uk
			Sound Enclosure in Relation to Plant Positioning	Drawing No: 1LP0f2C		



Notes

- Paint
- Condenser (VRF) Outlet Air connected to outlet air attenuators by flexible duct connectors to separate warm and cold air within enclosure
- Roof (aggregate) to be levelled below acoustic enclosure using concrete slabs or pads (as recommended by C Field Construction's structural engineer)
- Weight: 6.5T

Rev	Amendment	Date	Project	Scale	Date	
			1 Liddle Place London NW6 2DJ	N.T.S	09/11/2023	soundplanning
Notes			Title	Drawn		Sound Planning Limited Farnham Surrey Phone: 01252 711972 Fax: 01252 601083 Email: enquiries@soundplanning.co.uk
			Sound Enclosure	Drawing No: 1LP0f2A		

2.4 CONCLUSION

As part of this process, we looked at multiple options of enclosures to meet the NRG produced acoustic report. We requested from four different companies their proposals to meet the requirement and only one could achieve the strict Acoustic requirements set by planning.

- IAC – Not compliant
- Nendle – Not compliant
- Sound Planning – compliant
- Configured Platforms – Not compliant.

With Sound planning, the only compliant contractor, we developed 3 clear proposals, and proceeded with best solution from an Aesthetic & functional perspective.

Without the installation of roof plant, the building layout could not be serviced as per the approved planning drawings.