ARUP

Il Bottaccio

Camden Town Hall Fitout

Environmental Noise Emission from Mechanical services -Bidborough Works

Reference: AAVT/298097-03/R03

00 | 20 February 2024

Job number 298097-03

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Document Verification

Project title	Camden Town Hall Fitout
Document title	Environmental Noise Emission from Mechanical services -Bidborough Works
Job number	298097-03
Document ref	AAVT/298097-03/R03
File reference	

Revision	**Date**	**Filename**	R03-nc		
00	20 Feb 24	**Description**	Issue		
			Prepared by	**Checked by**	**Approved by**
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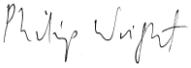
		Signature			
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1. Introduction

Further to the completion of a major refurbishment of Camden Town Hall, design work is being undertaken for events company Il Bottaccio for areas of the building that they will use for their tenancy at basement, second and third levels as well as the Camden Centre.

Camden Council has set out limits for noise emission to nearby noise sensitive buildings in terms of building services noise.

This report provides an assessment of the expected environmental noise emission to the nearby residential buildings against the Camden Council criteria, providing requirements for noise mitigation where appropriate. It covers noise emission from new mechanical services installed as part of the Il Bottaccio fitout. This report does not cover entertainment noise emission which is covered in the licencing agreement.

2. Project description

2.1 Description of the existing site

The Camden Town Hall (CTH), formerly St Pancras Town Hall, was built between 1934-37 to designs by AJ Thomas. It is a Grade II listed building, bounded by Judd Street, Euston Road, Tonbridge Walk and Bidborough Street. It is located within the King's Cross Conservation Area, and on the boundary of the Bloomsbury Conservation Area. It has been the primary public building and focus of the civic and democratic functions of the London Borough of Camden.

The building has 3 main storeys with a basement. The main entrance is from Judd Street. The former Assembly Room, now known as the Camden Centre, lies at the east end of the building with its foyer currently accessed from Bidborough Street.

After the completion of a major refurbishment project between 2018 and 2022, Camden Council has reoccupied the ground and first floors of the building. It is proposed that Il Bottaccio will occupy the basement, second and third levels as well as the Camden Centre.

2.2 The surroundings

The site is bounded to the north by Euston Road, a major road with fast flowing traffic. Directly to the north of the site is St Pancras Station and Chambers and the St Pancras Renaissance Hotel. Adjacent to this, on either side, are the Grade I listed British Library and Kings Cross Station. To the west of the site, on Judd Street, are office buildings and student accommodation, the offices of the Royal National Institute for the Blind are located to the south west of the site. Directly south of the site on Bidborough Street are the Queen Alexandra Manson Block, a 5-7 storey residential block. At the end of Bidborough Street is the Argyle Primary School. Directly to the east of the site, on Tonbridge Walk is The Standard Hotel.

2.3 Proposal

This submission is in relation to additional plant requirements for air handling units for conference suites and kitchen facilities as part of the co-working fit out.

The additional equipment is also to serve the kitchen in the basement which serves the Camden Centre which has not been fitted out yet.

The proposed additional equipment is shown in paragraph 5.2. The proposed new roof plant at RIBA Stage 2 is set out in Appendix B.

3. Planning criteria

Planning Conditions 9 and 10, presented in the decision notice letter date 20 December 2019 from Daniel Pope, Chief Planning Officer at Camden Council, refer to the control of noise and vibration from new plant. These conditions are set out below:

9 External noise

The external noise level emitted from plant, machinery or equipment at the development hereby approved shall meet the minimum green noise criteria set in The Camden Local Plan, Table C at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity.

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017.

10 Anti-vibration

Prior to use, machinery, plant or equipment and ducting at the development shall be mounted with proprietary anti-vibration isolators and fan motors shall be vibration isolated from the casing and adequately silenced and maintained as such.

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017.

Table C and associated footnotes from the Camden Local Plan is reproduced below.

Existing Noise sensitive receptor	***Assessment Location***	***Design Period***	***LOAEL (Green)***	***LOAEL to SOAEL (Amber)***	***SOAL (Red)***
*Dwellings***	*Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)*	*Day*	*'Rating level' 10dB* below background*	*'Rating level' between 9dB below and 5dB above background*	*'Rating level' greater than 5dB above background*
*Dwellings***	*Outside bedroom window (façade)*	*Night*	*'Rating level' 10dB* below background and no events exceeding 57dBLAmax*	*Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB LAmax*	*'Rating level' greater than 5dB above background and/or events exceeding 88dBLAmax*

**10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In*

addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

On this basis, noise radiating from new plant associated with the fitout of Camden Town Hall will be designed to be at least 10dB below the prevailing background noise outside the nearest dwellings, with adjustments made as necessary for tonality as appropriate.

4. Environmental noise climate

Arup installed an environmental noise logger on the roof terrace on the southeast corner of Camden Town Hall to measure the existing background noise climate.

The measurements were conducted by Bareld Nicolai, who is an Associate Member of the Institute of Acoustics, in the location shown below.

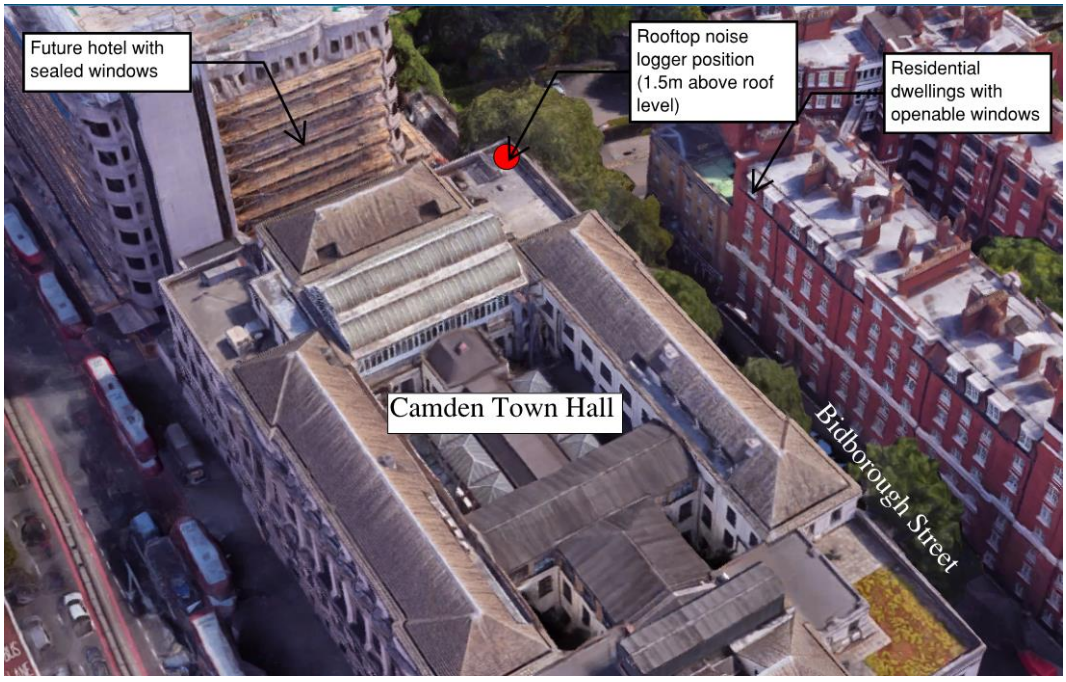


Figure 1: Location of noise logger

The selected logger location is considered to have an equivalent noise climate to that outside the nearest noise sensitive receptors to the building – namely:

- the upper bedroom windows on the opposite side of Bidborough Street
- outside the new hotel to the east on the other side of Tonbridge Walk.

The measurements were made using a Rion NL-52 Sound Level Analyser. The sound level meter and microphone are Type 1 conforming to BS EN 61672-1: 2003. The sound level meter and microphone were calibrated before and after use, to confirm that there was no significant drift in meter response at the calibrator frequency and level. This verification indicated that there was no more than a 0.1 dB variation between checks. The meter is annually calibrated and this calibration is traceable to international standards. All measurements were made with A-weighting and fast (0.125 s) time constant.

Noise levels were measured continuously for one week from 15-22 December 2016. Whilst the survey was conducted a number of years ago it is not expected that the noise climate will have got any quieter in the interim. New landlord plant associated with the recently completed main refurbishment project was designed to be 10dB below the prevailing background noise outside the nearest dwellings, so is not expected to have changed the background noise climate in the surround area.

Figure 2 sets out the measured ambient noise levels for the quietest day of the measurement period (19/20 December 2016). The lowest measured ambient levels ($L_{Aeq,5min}$) for the day, evening and night period are marked on the graph and given in Table 1. The lowest measured background levels ($L_{A90,5min}$) for day and night period are set out in Table 1.

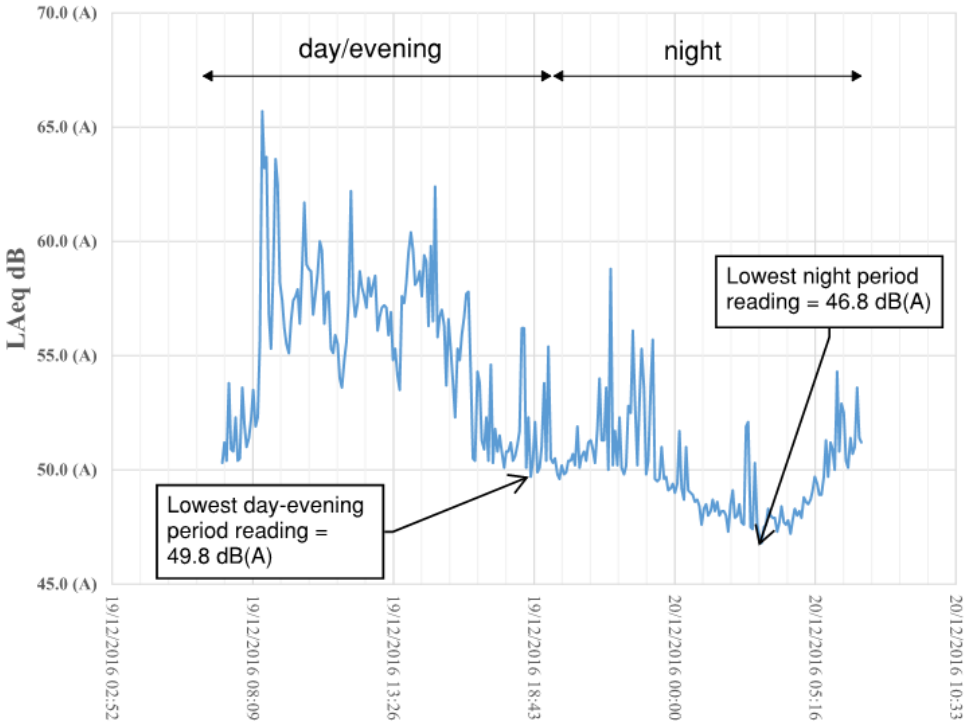


Figure 2: Time history of measured noise levels from the quietest day of the unattended noise survey

	Day (0700-2300)	Night (2300-0700)	Day (0700-2300)	Night (2300-0700)
Date:	$L_{Aeq,5min}$	$L_{Aeq,5min}$	$L_{A90,5min}$	$L_{A90,5min}$
Thu 15/12/16	47	50	46	46
Fri 16/12/16	50	47	46	44
Sat 17/12/16	49	48	46	45
Sun 18/12/16	48	48	44	44
Mon 19/12/16	50	47	45	44
Tue 20/12/16	50	47	46	44
Wed 21/12/16	49	48	45	44

Table 1: Summary of unattended noise survey

5. Environmental noise emission from plant

5.1 Criteria

Based on the measured existing background noise levels and the requirements of Camden Council described in the section above, the plant noise criteria are as follows:

Maximum total building services noise level outside the nearest noise sensitive receptor	
Day (0700-2300) rating level, dBLAr,Tr	**Night (2300-0700) rating level, dBLAr,Tr**
34	34

Table 2: Building services noise emission limits outside the nearest noise-sensitive receptors

As defined in BS4142:2014 *Methods for rating and assessing industrial and commercial sound*, the rating level $L_{Ar,Tr}$ is the A-weighted sound pressure level of the combined building services noise terms of L_{eq} plus any adjustment for the characteristic features of the sound.

5.2 Proposed equipment

The proposed tenant building services equipment is summarised in the table below.

(Note that upon confirmation of specific items for Cold room condensers, appropriate attenuation measures will be selected as required to achieve the criterion outlined in Table 2.)

Proposed equipment	Area served	Reference	Location
Air Handling Unit	Camden Centre	AHU-B1-04	Basement plant room, east side louvres
Air Handling Unit	Camden Centre	AHU-B1-05	Basement plant room, east side louvres
Air Handling Unit	Basement	TBC	New basement plant space, louvres in light well (south)
Kitchen supply fan	Basement kitchen	KSF-B1-01	Basement plant room, east side louvres
MVHR	Toilets	MVHR-B1-01	Basement toilets ceiling, east side louvres
MVHR	Level 2 conference suite	TBC	Level 2 cupboard, louvres in light well (north)
MVHR	Level 2 conference suite	TBC	Level 2 cupboard, louvres in light well (south)
MVHR	Level 3 co-working Lounge	MVHR-04-04	Level 3 cupboard, south side louvres
MVHR	Level 3 co-working Lounge	MVHR-04-03	Roof void, east side louvres
Kitchen supply fan	Level 3 Kitchen	KSF-04-02	Roof void, south side louvres
Kitchen extract fan	Level 3 Kitchen	KEF-03-02	Roof void, south side louvres
Kitchen supply fan	Level 3 Kitchen	KEF-04-01	Flat roof area

Proposed equipment	Area served	Reference	Location
Kitchen extract fan	Level 3 Kitchen	KSF-04-01	Flat roof area
Kitchen extract fan	Level 3 Kitchen	KEF-04-03	Flat roof area
Cold room condenser	Level 3 cold room	TBC	Flat roof area
Cold room condenser	Leel 3 cold room	TBC	Flat roof area

Table 3: Proposed tenant plant

5.3 Calculated noise levels

Noise from the proposed equipment will be radiated from a variety of elements, including:

- Via ventilation openings (e.g. louvres) on the roof and at first floor level
- Via equipment casing and enclosures on the roof

Total noise levels due to operation of the proposed equipment at the nearest noise-sensitive receptors have been calculated, taking into account the following:

- Manufacturers' noise data of proposed plant
- Dimensions of noise-radiating element of proposed plant
- Distance between noise-sensitive receptor and plant
- Noise reduction due to any screening
- Insertion loss provided by ventilation ductwork where applicable
- Regenerated noise from elements such as attenuators and louvres based on proposed plant air speeds

Where required to comply with the criteria set out in Table 2, the following additional mitigation measures have been incorporated into the design:

- In-duct attenuators
- Acoustic lagging to the fan casings of KEF-04-1 and KEF-04-03 (minimum 10kg/m^2 surface mass, eg Muftilag)
- Louvred ventilation openings with air velocity limits to control airflow noise generation
- Duct bends (in particular directing the rooftop kitchen fan intakes/discharges away from the hotel)

Details on mitigation measures are presented in Appendix A.

The calculated noise levels due to proposed Landlord plant are presented in tables below for:

- the nearest residential building on Bidborough Street
- The Standard Hotel on Tonbridge Walk.

Proposed item of equipment	Reference	Sound pressure level incident on flats on Bidborough Street, dBL_{Aeq}
Air Handling Unit	AHU-B1-04	15
Air Handling Unit	AHU-B1-05	15
Air Handling Unit	TBC (Basement)	22
Kitchen supply fan	KSF-B1-01	15
MVHR	MVHR-B1-01	15
MVHR	TBC (Level 2 conference)	2
MVHR	TBC (Level 2 conference)	2
MVHR	MVHR-04-03	16
MVHR	MVHR-04-04	12
Kitchen supply fan	KSF-04-01	15
Kitchen extract fan	KEF-04-01	13
Kitchen supply fan	KEF-04-02	6
Kitchen extract fan	KSF-04-02	6
Kitchen extract fan	KEF-04-03	16
Cold room condenser	TBC	Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.
Cold room condenser	TBC	Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.
Total sound pressure level		**26**
Noise emission limit		**34**

Table 4: Calculated noise emission from tenant plant to the flats on Bidborough Street

Proposed item of equipment	Reference	Sound pressure level incident on Standard Hotel, dBL_{Aeq}
Air Handling Unit	AHU-B1-04	19
Air Handling Unit	AHU-B1-05	19
Air Handling Unit	TBC (Basement)	23
Kitchen supply fan	KSF-B1-01	21
MVHR	MVHR-B1-01	15
MVHR	TBC	9
MVHR	TBC	9
MVHR	MVHR-04-03	16
MVHR	MVHR-04-04	19
Kitchen supply fan	KSF-04-01	26
Kitchen extract fan	KEF-04-01	22
Kitchen extract fan	KEF-04-02	24
Kitchen supply fan	KSF-04-02	12
Kitchen extract fan	KEF-04-03	16
Cold room condenser	TBC	Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.
Cold room condenser	TBC	Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.
Total sound pressure level		**32**
Noise emission limit		**34**

Table 5: Calculated noise emission from tenant plant to the Standard Hotel (upper levels)

Proposed item of equipment	Reference	Sound pressure level incident on Standard Hotel, dBL_{Aeq}
Air Handling Unit	AHU-B1-04	26
Air Handling Unit	AHU-B1-05	26
Air Handling Unit	TBC (Basement)	10
Kitchen supply fan	KSF-B1-01	27
MVHR	MVHR-B1-01	15
MVHR	TBC	-6
MVHR	TBC	-6
MVHR	MVHR-04-03	5
MVHR	MVHR-04-04	8
Kitchen supply fan	KSF-04-01	13
Kitchen extract fan	KEF-04-01	9
Kitchen extract fan	KEF-04-02	6
Kitchen supply fan	KSF-04-02	8
Kitchen extract fan	KEF-04-03	14
Cold room condenser	TBC	Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.
Cold room condenser	TBC	Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.
Total sound pressure level		**30**
Noise emission limit		**34**

Table 6: Calculated noise emission from tenant plant to the Standard Hotel (lower levels)

5.4 Discussion

The available noise data for the proposed equipment do not suggest that any of them generate sound that is tonal in nature. Furthermore, each individual plant component is estimated to be at least 15dB below prevailing background at the receivers, so it is considered this is a positive indication that attention catching characteristics of individual sources should not be an issue. It is also noted that the Standard Hotel has sealed windows.

The tables set out above demonstrate that appropriate attenuation has been selected for all proposed new tenant mechanical equipment to meet the emission requirements.

All plant will have isolators specified to control internal nise and vibration transfer, and this will also satisfy the requirement for anti-vibration measures.

On this basis the proposals comply with the relevant requirements of Camden Council.

Appendix A

Control measures for external plant noise emission

A.1 AHUs

The current selection of AHUs proposed by the mechanical engineer present the sound data shown in table below.

Table 7: AHU Sound data and attenuator insertion loss data

		Octave Band Centre Frequency, Hz							
		63	125	250	500	1K	2K	4K	8K
AHU-B1-04									
Intake	Sound Power, L_w	65.0	74.0	63.0	58.0	53.0	51.0	46.0	44.0
	Attenuator Insertion loss, dB	-9.0	-19.0	-34.0	-46.0	-50.0	-44.0	-33.0	-25.0
	Regenerated noise limit, dB	54.0	51.0	49.0	47.0	46.0	43.0	40.0	37.0
Exhaust	Sound Power, L_w	73.0	84.0	76.0	79.0	75.0	72.0	68.0	64.0
	Attenuator Insertion loss, dB	-9.0	-19.0	-34.0	-46.0	-50.0	-44.0	-33.0	-25.0
	Regenerated noise limit, dB	43.0	40.0	38.0	35.0	33.0	29.0	26.0	23.0
AHU-B1-05									
Intake	Sound Power, L_w	65.0	74.0	63.0	58.0	53.0	51.0	46.0	44.0
	Attenuator Insertion loss, dB	-9.0	-19.0	-34.0	-46.0	-50.0	-44.0	-33.0	-25.0
	Regenerated noise limit, dB	54.0	51.0	49.0	47.0	46.0	43.0	40.0	37.0
Exhaust	Sound Power, L_w	73.0	84.0	76.0	79.0	75.0	72.0	68.0	64.0
	Attenuator Insertion loss, dB	-9.0	-19.0	-34.0	-46.0	-50.0	-44.0	-33.0	-25.0
	Regenerated noise limit, dB	43.0	40.0	38.0	35.0	33.0	29.0	26.0	23.0
AHU (Basement Bar/Lounge)									
Intake	Sound Power, L_w	65.0	74.0	63.0	58.0	53.0	51.0	46.0	44.0
	Attenuator Insertion loss, dB	-3.0	-5.0	-10.0	-18.0	-20.0	-18.0	-12.0	-9.0
	Regenerated noise limit, dB	54.0	51.0	49.0	48.0	46.0	43.0	40.0	37.0
Exhaust	Sound Power, L_w	73.0	84.0	76.0	79.0	75.0	72.0	68.0	64.0
	Attenuator Insertion loss, dB	-7.0	-13.0	-23.0	-38.0	-41.0	-35.0	-22.0	-18.0
	Regenerated noise limit, dB	43.0	40.0	38.0	35.0	33.0	29.0	26.0	23.0

A.2 MVHRs

The current selection of MVHRs proposed by the mechanical engineer present the sound data shown in table below.

Table 8: MVHR Sound data and attenuator insertion loss data

		Octave Band Centre Frequency, Hz							
		63	125	250	500	1K	2K	4K	8K
MVHR-B1-01									
Intake	Sound Power, L_w	81.0	74.0	75.0	63.0	64.0	61.0	53.0	41.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	46.0	44.0	41.0	40.0	39.0	36.0	33.0	30.0
Exhaust	Sound Power, L_w	86.0	81.0	84.0	71.0	72.0	71.0	66.0	63.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	40.0	36.0	35.0	32.0	30.0	26.0	23.0	20.0
MVHR (Level 2 Conference, north)									
Intake	Sound Power, L_w	42.0	47.0	52.0	49.0	45.0	33.0	25.0	25.0
	Attenuator Insertion loss, dB	-4.0	-7.0	-14.0	-25.0	-28.0	-25.0	-17.0	-13.00
	Regenerated noise limit, dB	23.0	19.0	18.0	15.0	13.0	9.0	6.0	3.0
Exhaust	Sound Power, L_w	56.0	62.0	69.0	67.0	66.0	64.0	58.0	53.0
	Attenuator Insertion loss, dB	-4.0	-7.0	-14.0	-25.0	-28.0	-25.0	-17.0	-13.00
	Regenerated noise limit, dB	23.0	19.0	18.0	15.0	13.0	9.0	6.0	3.0
MVHR (Level 2 Conference, south)									
Intake	Sound Power, L_w	42.0	47.0	52.0	49.0	45.0	33.0	25.0	25.0
	Attenuator Insertion loss, dB	-4.0	-7.0	-14.0	-25.0	-28.0	-25.0	-17.0	-13.0
	Regenerated noise limit, dB	23.0	19.0	18.0	15.0	13.0	9.0	6.0	3.0
Exhaust	Sound Power, L_w	56.0	62.0	69.0	67.0	66.0	64.0	58.0	53.0
	Attenuator Insertion loss, dB	-4.0	-7.0	-14.0	-25.0	-28.0	-25.0	-17.0	-13.0
	Regenerated noise limit, dB	23.0	19.0	18.0	15.0	13.0	9.0	6.0	3.0
MVHR-04-03									
Intake	Sound Power, L_w	81.0	74.0	75.0	63.0	64.0	61.0	53.0	41.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	46.0	44.0	41.0	40.0	39.0	36.0	33.0	30.0
Exhaust	Sound Power, L_w	86.0	81.0	84.0	71.0	72.0	71.0	66.0	63.0

	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	40.0	36.0	35.0	32.0	30.0	26.0	23.0	20.0
MVHR-04-04									
Intake	Sound Power, L_w	81.0	74.0	75.0	63.0	64.0	61.0	53.0	41.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	46.0	44.0	41.0	40.0	39.0	36.0	33.0	30.0
Exhaust	Sound Power, L_w	86.0	81.0	84.0	71.0	72.0	71.0	66.0	63.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	40.0	36.0	35.0	32.0	30.0	26.0	23.0	20.0

A.3 Kitchen Fans

The current selection of Kitchen extract and supply fans proposed by the mechanical engineer present the sound data shown in table below.

Table 9: Kitchen Extract Fan sound data and louvre insertion loss data

		Octave Band Centre Frequency, Hz							
		63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
KEF-04-1									
Outlet	Sound Power, L_w	81.0	86.0	85.0	83.0	80.0	80.0	76.0	72.0
	Insertion loss, dB	-8.0	-17.0	-33.0	-48.0	-50.0	-45.0	-29.0	-21.0
	Regenerated noise limit, dB	45.0	41.0	40.0	37.0	35.0	31.0	28.0	25.0
Casing	Sound Power, L_w	71.0	65.0	59.0	58.0	55.0	52.0	56.0	49.0
	Enclosure insertion loss, dB*	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
KEF-04-02									
Outlet	Sound Power, L_w	54.0	72.0	90.0	89.0	91.0	88.0	84.0	77.0
	Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	53.0	50.0	48.0	46.0	45.0	41.0	38.0	36.0
Casing	Sound Power, L_w	63.7	73.7	81.7	86.7	86.7	83.7	79.7	72.7
	Insertion loss, dB**	-5.0	-8	-10.0	-15.0	-20.0	-20.0	-20.0	-20.0
KEF-04-03									
Outlet	Sound Power, L_w	87.0	90.0	88.0	85.0	81.0	80.0	77.0	73.0
	Insertion loss, dB	-8.0	-17.0	-33.0	-48.0	-50.0	-45.0	-29.0	-21.0
	Regenerated noise limit, dB	54.0	51.0	49.0	48.0	47.0	44.0	41.0	38.0
Casing	Sound Power, L_w	77.0	69.0	62.0	60.0	56.0	52.0	57.0	50.0

	Enclosure insertion loss, dB	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0

* Conservative insertion loss for enclosure to fan casing applied.

** Internal fan installation

Table 10: Kitchen Supply Fan sound data and louvre insertion loss data

		Octave Band Centre Frequency, Hz							
		63	125	250	500	1K	2K	4K	8K
KSF-B1-01									
Outdoor	Sound Power, L_w	66.0	85.0	74.0	70.0	65.0	60.0	53.0	51.0
	Attenuator Insertion loss, dB	-7.0	-13.0	-23.0	-38.0	-41.0	-35.0	-22.0	-18.0
	Regenerated noise limit, dB	37.0	33.0	32.0	29.0	27.0	23.0	20.0	17.0
KSF-04-01									
Outdoor	Sound Power, L_w	68.0	77.0	78.0	72.0	65.0	62.0	57.0	53.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	46.0	42.0	41.0	38.0	36.0	32.0	29.0	26.0
Casing	Sound Power, L_w	65.0	72.0	57.0	54.0	55.0	52.0	47.0	31.0
KSF-04-02									
Outdoor	Sound Power, L_w	64.0	76.0	77.0	69.0	63.0	60.0	54.0	50.0
	Attenuator Insertion loss, dB	-5.0	-10.0	-20.0	-32.0	-38.0	-32.0	-22.0	-16.0
	Regenerated noise limit, dB	43.0	39.0	38.0	35.0	33.0	29.0	26.0	23.0
Casing	Sound Power, L_w	61.0	70.0	55.0	52.0	53.0	50.0	45.0	28.0

A.4 Condenser Units

Table 11: Condenser sound data and louvre insertion loss data

		Octave Band Centre Frequency, Hz							
		63	125	250	500	1K	2K	4K	8K
Condenser Unit (Flat roof area)									
Outdoor	Sound Power, L_w	TBC Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.							
	Insertion loss, dB	TBC							
Casing	Sound Power, L_w	TBC							
	Insertion loss, dB	TBC							
Condenser Unit (Flat roof area)									
Outdoor	Sound Power, L_w	TBC Awaiting confirmation of item. Appropriate attenuation to be provided to reach criteria.							

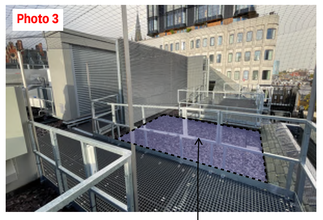
	Insertion loss, dB	TBC
Casing	Sound Power, L_w	TBC
	Insertion loss, dB	TBC

Appendix B

Proposed new tenant roof plant at RIBA Stage 2

Exhaust from pastry kitchen AHU runs through roof void space

New louvred panel next to door for Pastry kitchen exhaust to atmosphere. Intake via existing louvres to room.



3000 x 4000mm Space for kitchen cold room condensers. Space requirements to be confirmed by kitchen designer. Design of cold room cooling system by kitchen designer.

Kitchen supply and extract fan to sit in void space. Window openings to be adapted to accommodate intake and exhaust louvres for ventilation units (approx 3sqm face area each)

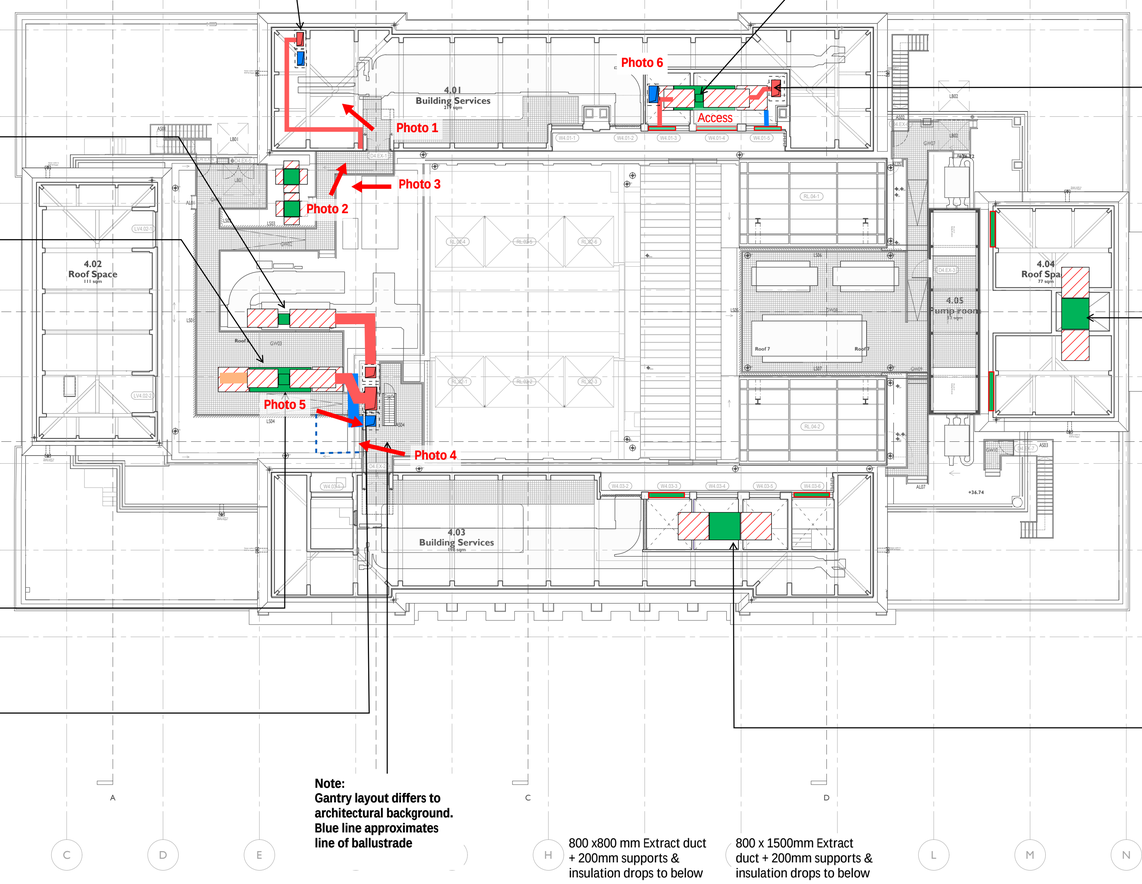
450 x 1000mm intake & exhaust duct + 200mm supports & insulation from below terminate to atmosphere

KEF-04-01
Kitchen extract fan 700Dia x 700L sits above AHU intake duct. Unit to be provided with attenuation, filtration and heat recovery

KSF-04-01
Kitchen supply fan 4000L x 1600W x 1500H sits in roof space. Access hatch required from below

KEF-04-03
Kitchen extract fan 700Dia x 700L sits above single deck AHU. Unit to be provided with attenuation, filtration and heat recovery

800 x 1500mm Extract duct + 200mm supports & insulation drops to below



KEF-04-02
Kitchen extract fan 700Dia x 700L sits above AHU intake duct. Unit to be provided with attenuation, filtration and heat recovery

KSF-04-02
Kitchen supply fan 4000L x 1600W x 1500H sits in roof space. Access from roof level

MVHR-04-03
General fresh air supply to local zone below 2000L x 1800W x 500H sits in roof space. Access via hatch from below

New intake and exhaust louvres to roof (approx 0.6sqm face area each)

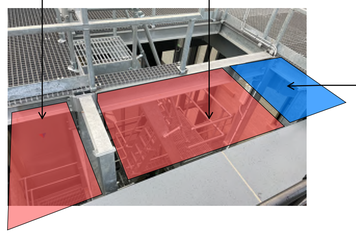
MVHR-04-04
General fresh air supply to local zone below 2000L x 1800W x 500H sits in roof space. Access via hatch from below.

Window openings to be adapted to accommodate intake and exhaust louvres (approx 0.6sqm face area each)

Note:
Gantry layout differs to architectural background. Blue line approximates line of ballustrade

800 x800 mm Extract duct + 200mm supports & insulation drops to below

800 x 1500mm Extract duct + 200mm supports & insulation drops to below



800 x800 mm Supply duct + 100mm supports & insulation drops to below

Roof

General Notes

1. This drawing shall be read in conjunction with all relevant Mechanical, Electrical, Public Health, Architectural and Structural drawings and all other schedules and relevant documentation.

2. The MEP services drawings should not be scaled and all dimensional setting out of furnitures fittings and equipment shall be taken from the architectural drawings.

3. All distribution services passing through walls and slabs which are fire compartments shall be fire sealed at the wall and slab to meet the compartmentation requirements as per the Fire Strategy drawings.

4. This drawing is for design intent only. Final distribution, dampers, diffusers and grilles are not shown.

5. Several options are indicated to show possible solutions required to increase occupancy for information. The feasibility of these options has not yet been confirmed and the options are provided for information at this stage.

- Supply
- Extract
- Intake
- Exhaust
- Plant item
- Duct riser with insulation
- Space allowance for ductwork connections & attenuation

10/05/2023 12:46:28

Issue	Date	
01	08/12/23	Stage 2 Issue

ARUP

Client: Il Bottaccio

Project Title: Camden Town Hall Fit Out

Drawing Title: Mechanical Services Layout - Roof

Scale at A1: 1:200		Dsg/Drw/Chkd/Appd: HP, MK, AS
Role: Mechanical Services		
Status: Stage 2 Issue		
Arup Job No: 298097	Rev: 01	
ID: SK-M-005		

Do not scale