154 SHAFTESBURY AVENUE
LONDON
WC2H 8 HL

24 HOUR ENVIRONMENTAL NOISE ASSESSMENT

Our Ref: CPT/140225/010/R3

Written By:

Cliff Tucker AMIOA

Signed 

Date: 27th May 2025

CONTENTS

1.0 Brief

1.1 To carry out an Environmental Noise Assessment & Report in order to establish the prevailing environmental noise levels enjoyed by the site.

1.2 From these measurements we establish a noise limit criterion (the maximum permissible Rating Level) 1.0 meters from the nearest acoustically critical location (the Assessment Position).

1.3 To analyse the published acoustic data for the proposed equipment in relation to the maximum permissible Rating Level including any proposed acoustic control hardware in order to establish compliance or otherwise.

1.4 We have excluded the following from our brief:

- Construction noise
- Any Building Regulations noise considerations
- Traffic noise/traffic count per se, though we have recorded LA10 percentiles.
- Health and safety acoustics.

2.0 Executive Summary

2.1 A Noise Impact Assessment has been carried out at 154 Shaftesbury Avenue, London, WC2H 8HL.

2.2 A representative background noise level for the proposed hours of use of the equipment (24 hours) has been established as 52.1 dB $L_{A90,\ 15\ mins}$.

2.3 In line with the London Borough of Camden's requirements the maximum permissible Rating Noise Levels of the equipment at the Assessment Position should not exceed 42.1 dB $L_{Ar,T}$.

2.4 It is proposed to enclose the units in purpose designed acoustic enclosures with air inlet and discharge via nominally 150 mm deep acoustic louvres.

The acoustic louvres should provide minimum insertion losses as follows:

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
D.I.L	4	4	7	9	12	17	11	10

2.5 The theoretical Rating Noise Level of the equipment at the Assessment Position with the equipment operating at full duty is 39.2 dB-A.

2.6 This is 2.9 dB-A below the maximum permissible Rating Level and the Local Authority's requirements in terms of noise will therefore be met without recourse to additional noise mitigation measures.

3.0 Location & Background

3.1 154 Shaftesbury Avenue is a five storey mixed use property in a street of similar properties within the jurisdiction of the London Borough of Camden.

3.2 It is bounded to the north east by 158-162 Shaftesbury Avenue which is believed to be a commercial property; to the south east by the rear of the mixed use properties aligning Earlham Street; to the south west by the mixed use property 150 Shaftesbury Avenue; and to the north west by Shaftesbury Avenue with further mixed use properties beyond.

3.3 The property is undergoing internal refurbishment with part of the proposed works involving the installation of an air conditioning system.

3.4 It is proposed to install three air conditioning condensers at first floor rear roof level of the property to serve the ground floor commercial areas of the property.

3.5 The most critical noise sensitive receptor in relation to the A/C condenser location is the first floor rear window of 150 Shaftesbury Avenue, the property located immediately to south west of 154 Shaftesbury Avenue, the closest window of which is not less than 5.3 m from the installation location.

3.6 The surrounding area is relatively busy, with road traffic noise clearly audible. There is also pre-existing mechanical services plant adjacent to the proposed installation location serving other buildings in the vicinity, which is the dominant noise source impacting on the surrounding properties.

4.0 Instrumentation

4.1 The instrumentation employed was:

- Rion NL-52/NX-22RT Class 1 Environmental Noise Analyser
- Rion NC74 Class1 Acoustic Calibrator
- Rion 12 mm Condenser Microphone & Foam Windshield on 1.5 meter Extension Pole.
- Rion Weatherproof Security Box

4.2 The instruments carry current calibration certificates copies of which are available from our offices upon request.

5.0 Time, Date & Environmental Conditions

5.1 The survey was conducted from 13.18 on 4th February 2025 through until 11.48 on 5th February 2025.

5.2 The weather throughout the survey was overcast with occasional light rain showers and only light winds.

5.3 The site engineer was Cliff Tucker AMIOA and the results were analysed & reported by Cliff Tucker AMIOA.

6.0 Methodology.

6.1 The survey and report generally follow the procedures, method and assessments as described in BS 4142: 2014 ‘Methods for rating and assessing industrial and commercial sound’.

6.2 The standard requires a comparison between the typical measured background noise level and the equivalent continuous A-weighted sound pressure level of the proposed plant at the Assessment Position.

6.3 BS4142: 2014 also requires uncertainty to be considered as part of the assessment.

- We have undertaken a 24 hour background noise survey and the data gathered has been analysed to ensure that any influences from the weather conditions have been accounted for in the assessment.
- The calibration of the sound level meter was checked before and after the survey period and no significant drift found.
- Standard acoustic theory has been applied in the noise propagation calculations.

It is therefore considered that the uncertainty associated with the assessment is minimal and the results, as stated, are therefore valid.

6.4 The Reference Time Interval used for the survey was 15 minutes.

6.5 The microphone position (the measurement position) was at first floor rear roof level at the mid-point between neighbouring property residential windows.

6.6 The background level as measured at the microphone position is therefore considered to be representative of the levels enjoyed at the Assessment Positions.

6.7 The closest residential property windows are those of the first floor rear windows of 150 Shaftesbury Avenue the property located immediately to the south west the closest window of which is at a distance of not less than 5.3 m from the installation location.

6.8 The Measurement Position; Assessment Position; and the other relevant points of interest are shown on the plan within Appendix ‘A’.

6.9 The measured levels were the principle LA percentiles as prescribed in BS 4142.

6.11 The most significant of the measured percentiles for our purposes are as follows:

- LA_{eq}, (the mean sound pressure level corresponding to a fluctuation level across time period 't'). Used for the measurement and assessment of the Ambient Noise Level; The Specific Noise Level; The Residual Level and the Rating Level
- LA_{10} ('A' weighted level exceeded for 10% of the time) is used for traffic noise assessment.
- LA_{90}, ('A' weighted level exceeded for 90% of the time). Represents the Background Level and is often used as the target threshold against which the acoustic design criteria are set.

We also measured the maximum and minimum levels.

6.12 You will note the basic objective is to establish a Rating Level at the Assessment Point for the specific noise level from any new plant in order to predict the likelihood of noise complaint.

6.13 The London Borough of Camden's standard requirements are taken from the new Local Plan adopted on the 3rd July 2017 and require the Rating Noise Level of the proposed equipment to be at least 10 dB below the representative background noise level.

6.14 The ground floor commercial area of the property is yet to be let and the potential operating hours of the equipment are therefore unknown at this time. It has therefore been assumed that the equipment has the propensity to operate 24 hours per day, 7 days per week in order to provide the most robust assessment.

7.0 Results Summary

7.1 The full set of measured levels are presented in Appendix 'B' of this report

7.2 The table below details the minimum $LA_{90,\ 15\ mins}$ (background) noise levels measured for day time and night time along with the prevailing dB $LA_{eq,\ 15\ mins}$ (ambient) noise level at the same time.

	dB $LA_{90,\ 15\ min}$	**dB $LA_{eq,15\ min}$**
Day-Time/ Evening **(07.00-23.00 hrs)**	50.5	55.8
Night-Time **(23.00-07.00 hrs)**	50.1	54.8

7.3 The table below details the modal $LA_{90,\ 15\ mins}$ (background) and dB $LA_{eq,\ 15\ mins}$ (ambient) noise levels for day time and night time

	dB $LA_{90,\ 15\ min}$	**dB $LA_{eq,15\ min}$**
Day-Time/ Evening **(07.00-23.00 hrs)**	65.3	65.5
Night-Time **(23.00-07.00 hrs)**	52.5	56.5

7.4 The table below details the arithmetic mean $LA_{90,\ 15\ mins}$ (background) and dB $LA_{eq,\ 15\ mins}$ (ambient) noise levels for day time and night time

	dB $LA_{90,\ 15\ min}$	**dB $LA_{eq,15\ min}$**
Day-Time/ Evening **(07.00-23.00 hrs)**	59.6	61.6
Night-Time **(23.00-07.00 hrs)**	52.1	56.1

7.5 The table below details the $LA_{90,\ T}$ (background) and dB $LA_{eq,\ T}$ (ambient) noise levels for day time and night time

	dB $LA_{90,\ T}$	**dB $LA_{eq,\ T}$**
Day-Time/ Evening **(07.00-23.00 hrs)**	62.5	65.5
Night-Time **(23.00-07.00 hrs)**	52.3	56.6

7.6 It is considered that the most representative background noise level for the proposed hours of operation of the equipment in this instance is the arithmetic mean level of 52.1 dB $LA_{90,\ 15\ min}$

7.7 The maximum permissible Rating Noise Level at the Assessment Position in line with the London Borough of Camden's requirements is therefore 42.1 dB $LA_{r,T}$.

8.0 Analysis

8.1 Plant & Location

The proposed items of plant are as follows:

- 3 no. Mitsubishi Heavy Industries FDCA125VNX-W A/C Condensers

The manufacturers published Sound Pressure Level spectrum at 1 metre for the unit in cooling mode is as follows:

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
FDC125V	64	59	56	51	50	46	44	39

BS4142: 2014 has provision for corrections to the specific noise level at the Assessment Position based on tonality, impulsivity, intermittency and any other distinguishing characteristics to the sound.

It is not considered that any corrections for the character of the noise are required in this instance.

8.2 Acoustic Calculations

It is proposed to enclose the units in purpose designed acoustic enclosures with air inlet and discharge via nominally 150 mm deep acoustic louvres.

The acoustic louvres should provide minimum insertion losses as follows:

	Octave Band Mid Frequency Hz							
	63	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
D.I.L	4	4	7	9	12	17	11	10

8.2.1 Cumulative Noise Level

Source	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Unit**
1	64	59	56	51	50	46	44	39	FDC125VNX-W
2	64	59	56	51	50	46	44	39	FDC125VNX-W
3	64	59	56	51	50	46	44	39	FDC125VNX-W
Cumulative	69	64	61	56	55	51	49	44	

8.2.2 Analysis

1.0	**Dist 1 (m)**							
5.3	**Dist 2 (m)**							
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Lp1 Cum	68.8	63.8	60.8	55.8	54.8	50.8	48.8	43.8
Dist	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
DIL	-4.0	-4.0	-7.0	-9.0	-12.0	-17.0	-11.0	-10.0
Screening								
Directivity	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Bend Loss								
Terminal Refl.								
LP2	53.3	48.3	42.3	35.3	31.3	22.3	26.3	22.3
A-Weight	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1
Lp-A	27.1	32.2	33.7	32.1	31.3	23.5	27.3	21.2
dB-A	39.2							
Criteria dB-A	42.1							
Variance dB-A	-2.9							

The theoretical Rating Noise Level of the equipment at the Assessment Position with all units operating at full duty is 39.2 dB-A.

This is 2.9 dB-A below the maximum permissible Rating Noise Level and the Local Authority's requirements in terms of noise will therefore be met.

8.3 Vibration

As the equipment that is to be installed is to be mounted to the building structure it should resiliently mounted such that a vibration isolation efficiency of not less than 95% is achieved.

Additionally, the associated gas and liquid lines should be fixed over the thermal insulation in order to prevent direct metal to metal contact.

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9.0 Conclusion

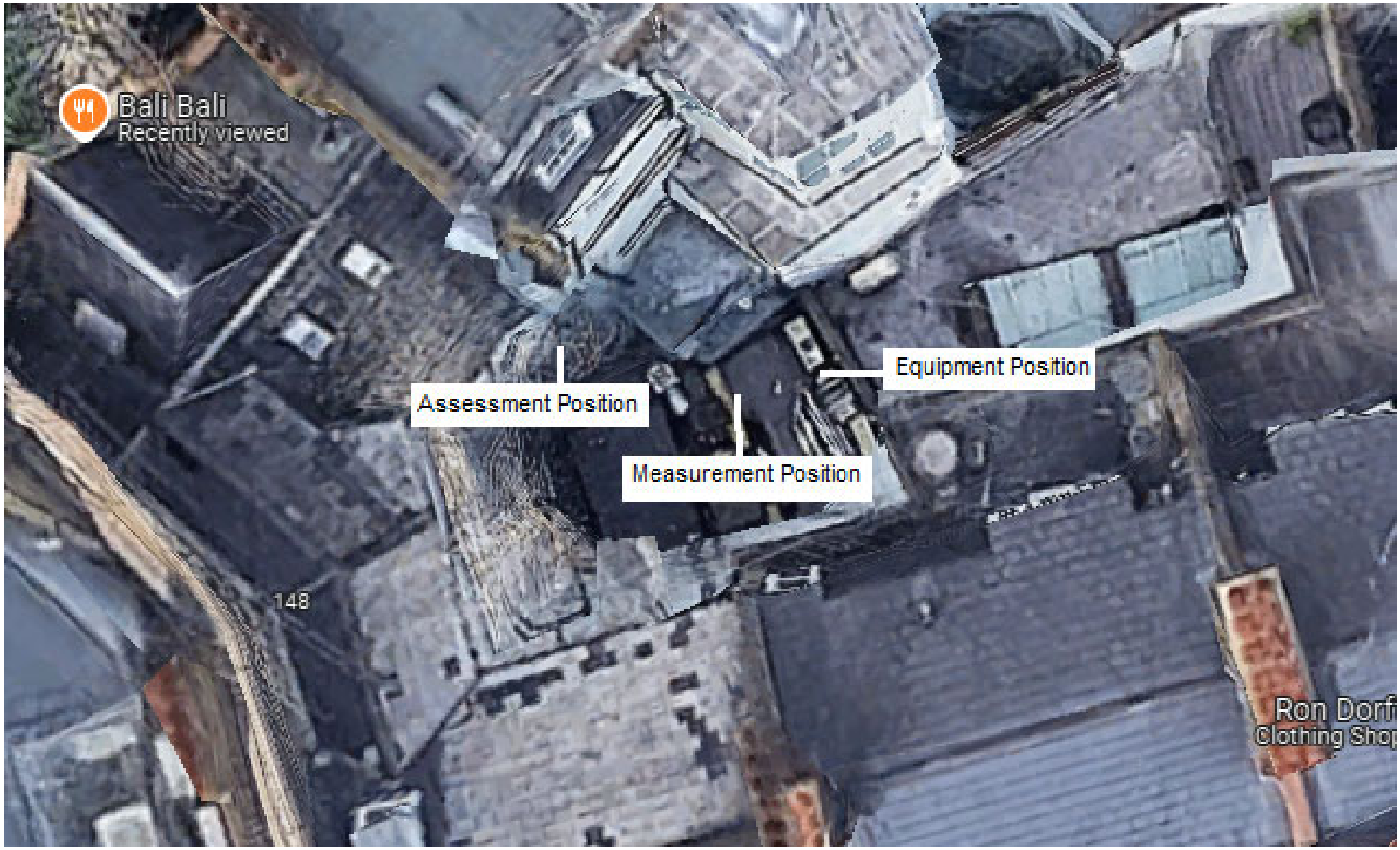
The equipment that is to be installed should be selected, located and operated as detailed within this report.

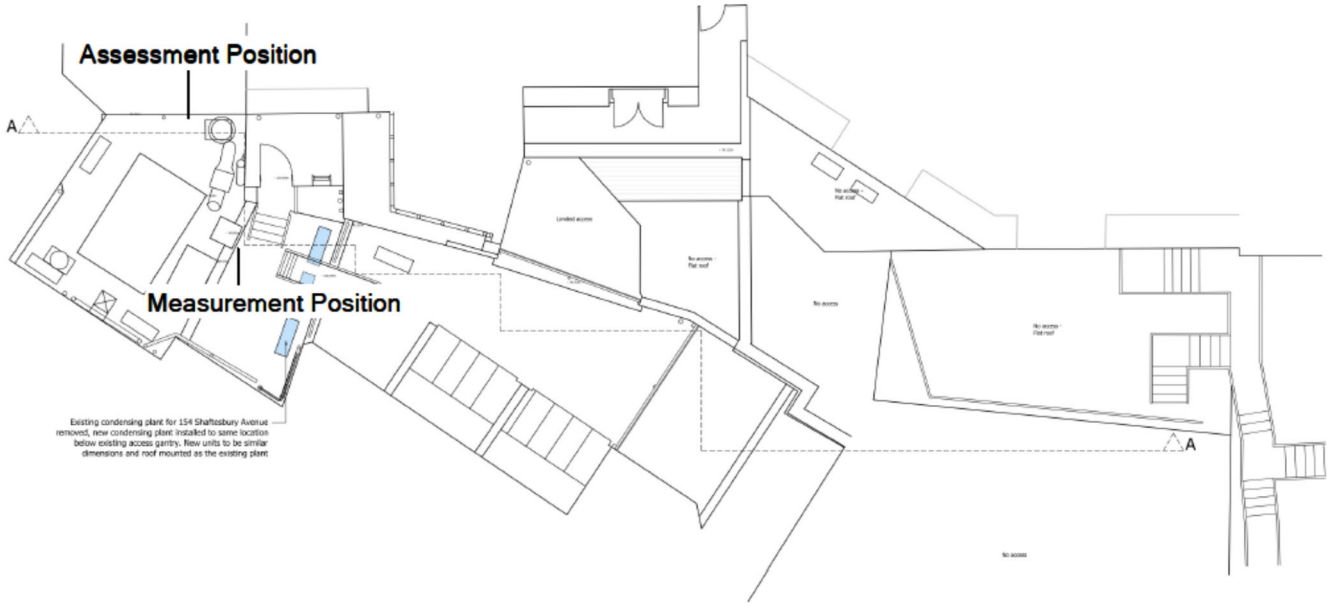
Assuming this is achieved as outlined above then the Local Authority's requirements in terms of noise will be met.

Report ends

Cliff Tucker AMIOA
Eurovib (Acoustic Products) Ltd

Appendix A – Positions, Distances, & Locations


Bali Bali
Recently viewed
Assessment Position
Equipment Position
Measurement Position
148
Ron Dorf
Clothing Sho



NB | Responsibility is not accepted for errors made by others scaling from this drawing | A3

Rev	Description	By	Date

0 1 2 3 4 5m
Scale - 1:100

DRAFT

workman design

Project
154 SHAFTESBURY AVENUE
LONDON

Client
SHAFTESBURY COVENT GARDEN LTD

Title
ROOF PLAN
PROPOSED

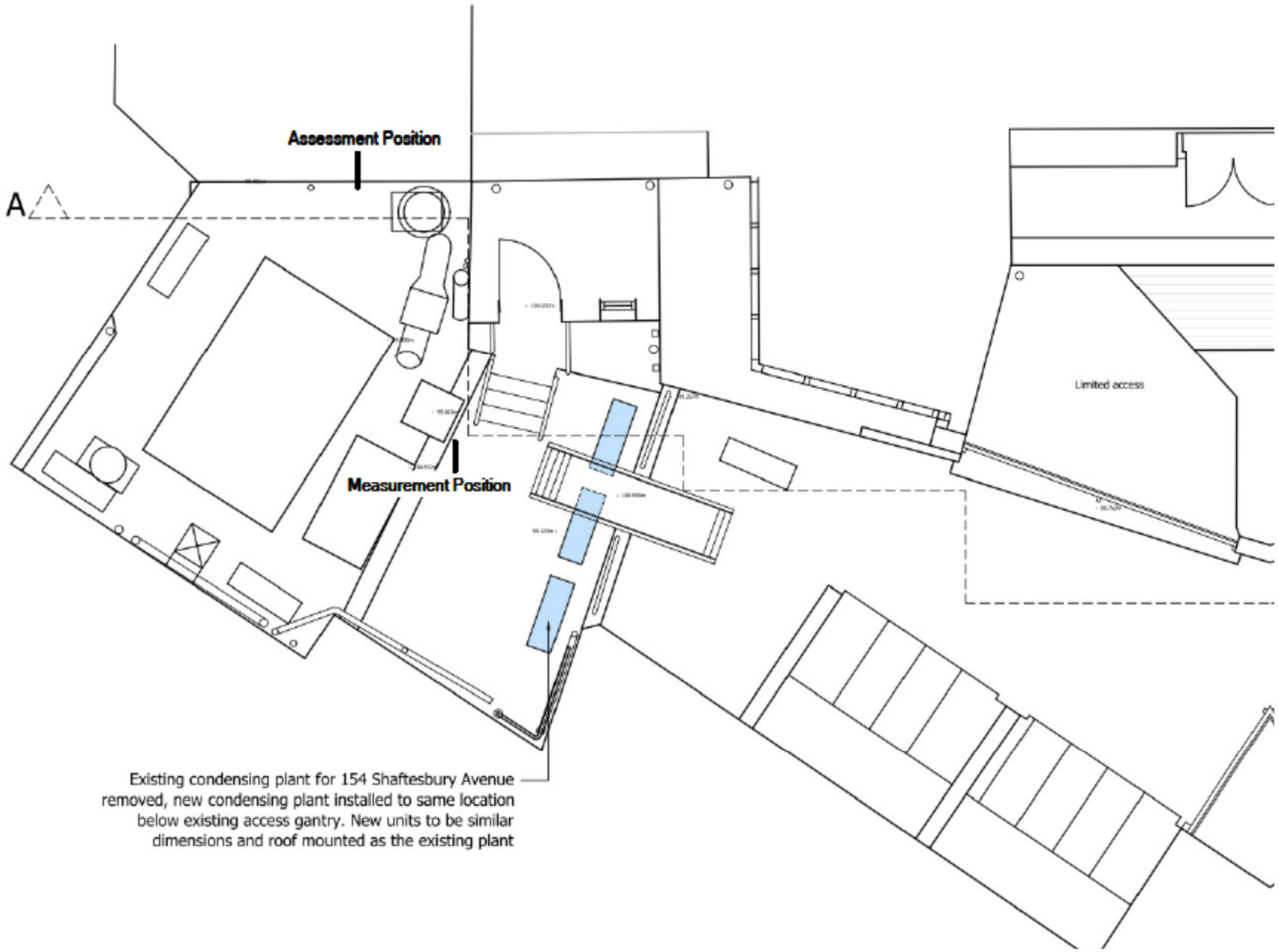
Drawn by	Surveyor	Date
ACD	IKZ	FEBRUARY 2025

Scale
1:100 @ A3

Drawing Number
L231638-A02-50

Revision

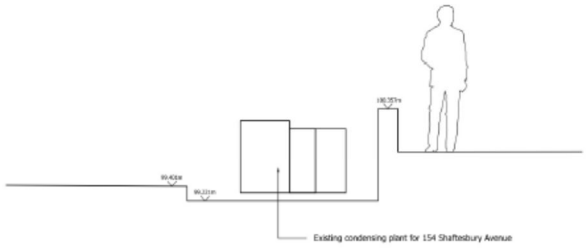
Layouts shown are transcribed from unqualified Landlord's basebuild data and are intended as initial indicative drawings only, Structural Engineers report, M&E Engineers report, Building Control approval, Fire Officer approval and all statutory applications


Assessment Position
A
Limited access
Measurement Position
Existing condensing plant for 154 Shaftesbury Avenue removed, new condensing plant installed to same location below existing access gantry. New units to be similar dimensions and roof mounted as the existing plant

plant for 154 Shaftesbury Avenue

Elevation A-A (Rear) 1:100

Section 1:50



Layouts shown are transcribed from unqualified Landlord's basebuild data and are intended as initial indicative drawings only, Structural Engineers report, M&E Engineers report, Building Control approval, Fire Officer approval and all statutory applications

NB | Responsibility is not accepted for errors made by others scaling from this drawing | A3

Rev	Description	By	Date

0 1 2 3 4 5m
Scale - 1:100

0 0.5 1 1.5 2 2.5m
Scale - 1:50

DRAFT

workman design

Project
154 SHAFTESBURY AVENUE
LONDON

Client
SHAFTESBURY COVENT GARDEN LTD

Title
REAR ELEVATION & SECTION
EXISTING

Drawn by	Surveyor	Date
ACD	IKZ	FEBRUARY 2025

Scale
1:50 & 1:100 @ A3

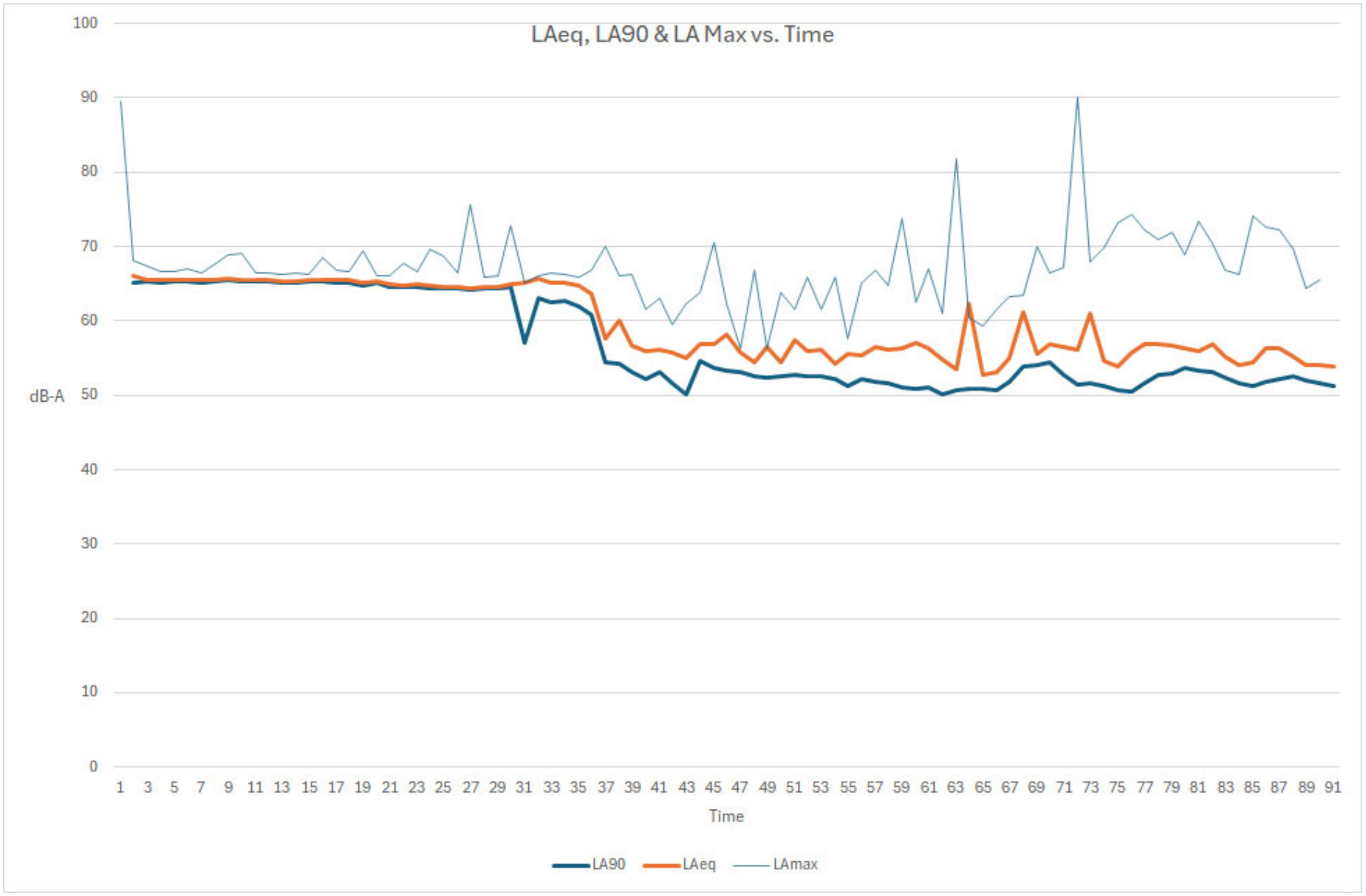
Drawing Number
L231638-B01-50

Revision

Appendix B – Full Measured Levels

Ref	Time	Measurment Time	LAmax	LAmin	LA10	LA50	LA90	LAeq
1	04/02/2025 13:18	0:15:00	89.6	64.5	65.9	65.5	65.2	66.1
2	04/02/2025 13:33	0:15:00	68.2	64.5	66.0	65.7	65.3	65.6
3	04/02/2025 13:48	0:15:00	67.4	64.3	65.9	65.5	65.2	65.5
4	04/02/2025 14:03	0:15:00	66.7	64.8	65.9	65.6	65.3	65.6
5	04/02/2025 14:18	0:15:00	66.7	64.8	66.0	65.7	65.4	65.6
6	04/02/2025 14:33	0:15:00	67.1	64.7	65.9	65.5	65.2	65.5
7	04/02/2025 14:48	0:15:00	66.4	64.6	65.9	65.6	65.3	65.5
8	04/02/2025 15:03	0:15:00	67.6	65.0	66.0	65.7	65.5	65.7
9	04/02/2025 15:18	0:15:00	68.8	64.6	65.9	65.6	65.3	65.6
10	04/02/2025 15:33	0:15:00	69.1	64.7	65.9	65.6	65.3	65.6
11	04/02/2025 15:48	0:15:00	66.5	64.1	65.8	65.5	65.3	65.5
12	04/02/2025 16:03	0:15:00	66.5	64.2	65.7	65.4	65.1	65.4
13	04/02/2025 16:18	0:15:00	66.3	64.8	65.8	65.5	65.2	65.4
14	04/02/2025 16:33	0:15:00	66.4	64.9	65.8	65.6	65.4	65.5
15	04/02/2025 16:48	0:15:00	66.3	64.3	65.7	65.5	65.3	65.5
16	04/02/2025 17:03	0:15:00	68.6	64.3	65.8	65.5	65.2	65.5
17	04/02/2025 17:18	0:15:00	66.9	64.0	65.8	65.5	65.1	65.5
18	04/02/2025 17:33	0:15:00	66.6	63.9	65.6	65.3	64.8	65.2
19	04/02/2025 17:48	0:15:00	69.5	64.1	65.7	65.4	65.1	65.4
20	04/02/2025 18:03	0:15:00	66.0	63.9	65.4	65.0	64.6	65.0
21	04/02/2025 18:18	0:15:00	66.1	63.9	65.1	64.8	64.5	64.8
22	04/02/2025 18:33	0:15:00	67.8	63.9	65.2	64.9	64.6	64.9
23	04/02/2025 18:48	0:15:00	66.7	63.9	65.1	64.7	64.4	64.7
24	04/02/2025 19:03	0:15:00	69.6	63.8	64.9	64.6	64.3	64.6
25	04/02/2025 19:18	0:15:00	68.7	63.6	64.8	64.5	64.3	64.5
26	04/02/2025 19:33	0:15:00	66.5	63.7	64.7	64.4	64.2	64.4
27	04/02/2025 19:48	0:15:00	75.7	63.8	64.8	64.5	64.3	64.5
28	04/02/2025 20:03	0:15:00	65.9	63.8	64.9	64.7	64.4	64.6
29	04/02/2025 20:18	0:15:00	66.1	64.1	65.2	64.9	64.6	64.9
30	04/02/2025 20:33	0:15:00	72.9	54.2	62.8	58.9	57.0	65.2
31	04/02/2025 20:48	0:15:00	65.2	60.4	67.8	65.0	63.1	65.7
32	04/02/2025 21:03	0:15:00	66.0	59.5	66.5	64.4	62.6	65.2
33	04/02/2025 21:18	0:15:00	66.5	60.0	67.0	64.6	62.7	65.2
34	04/02/2025 21:33	0:15:00	66.2	57.3	66.7	64.2	61.9	64.7
35	04/02/2025 21:48	0:15:00	65.8	57.4	65.6	63.3	60.8	63.6
36	04/02/2025 22:03	0:15:00	66.9	50.7	59.7	56.6	54.4	57.7
37	04/02/2025 22:18	0:15:00	70.0	51.0	61.5	56.7	54.3	60.0
38	04/02/2025 22:33	0:15:00	66.1	48.1	58.4	55.9	53.1	56.7
39	04/02/2025 22:48	0:15:00	66.3	47.5	57.7	55.1	52.1	55.9
40	04/02/2025 23:03	0:15:00	61.6	49.1	58.0	55.4	53.1	56.1
41	04/02/2025 23:18	0:15:00	63.1	48.1	57.7	54.3	51.6	55.7
42	04/02/2025 23:33	0:15:00	59.6	46.1	57.2	54.1	50.2	55.0
43	04/02/2025 23:48	0:15:00	62.3	52.7	58.2	56.2	54.6	56.9
44	05/02/2025 00:03	0:15:00	63.9	51.8	58.4	55.6	53.7	56.8
45	05/02/2025 00:18	0:15:00	70.5	51.9	58.3	55.1	53.3	58.2

Ref	Time	Measurment Time	LAmax	LAmin	LA10	LA50	LA90	LAeq
46	05/02/2025 00:33	0:15:00	62.4	51.3	57.5	54.6	53.1	55.8
47	05/02/2025 00:48	0:15:00	56.4	51.0	56.1	54.1	52.5	54.5
48	05/02/2025 01:03	0:15:00	66.8	51.1	57.5	54.1	52.4	56.5
49	05/02/2025 01:18	0:15:00	56.4	51.4	55.9	54.0	52.6	54.4
50	05/02/2025 01:33	0:15:00	63.9	42.9	57.1	51.6	52.8	57.5
51	05/02/2025 01:48	0:15:00	61.5	42.9	55.5	50.3	52.5	56.0
52	05/02/2025 02:03	0:15:00	65.9	42.8	55.1	49.9	52.5	56.1
53	05/02/2025 02:18	0:15:00	61.6	42.8	53.5	49.2	52.2	54.3
54	05/02/2025 02:33	0:15:00	65.8	40.6	52.6	46.8	51.3	55.6
55	05/02/2025 02:48	0:15:00	57.6	41.3	53.2	47.0	52.2	55.3
56	05/02/2025 03:03	0:15:00	65.1	41.1	53.8	47.4	51.9	56.5
57	05/02/2025 03:18	0:15:00	66.8	40.7	53.5	47.4	51.7	56.2
58	05/02/2025 03:33	0:15:00	64.7	40.1	54.0	46.4	51.0	56.3
59	05/02/2025 03:48	0:15:00	73.7	40.1	53.4	44.8	50.8	57.1
60	05/02/2025 04:03	0:15:00	62.5	39.8	54.2	45.7	51.1	56.3
61	05/02/2025 04:18	0:15:00	67.0	39.9	53.3	43.4	50.1	54.8
62	05/02/2025 04:33	0:15:00	61.0	39.8	51.0	43.6	50.6	53.5
63	05/02/2025 04:48	0:15:00	81.9	40.2	55.5	44.1	50.9	62.3
64	05/02/2025 05:03	0:15:00	60.5	40.2	50.4	44.2	50.8	52.8
65	05/02/2025 05:18	0:15:00	59.3	39.9	50.9	43.8	50.7	53.2
66	05/02/2025 05:33	0:15:00	61.5	40.4	52.7	46.4	51.9	55.0
67	05/02/2025 05:48	0:15:00	63.2	41.2	57.9	54.8	53.9	61.2
68	05/02/2025 06:03	0:15:00	63.4	53.4	57.1	55.0	54.1	55.5
69	05/02/2025 06:18	0:15:00	70.1	53.5	58.9	55.4	54.4	56.9
70	05/02/2025 06:33	0:15:00	66.4	46.8	58.1	52.3	52.7	56.5
71	05/02/2025 06:48	0:15:00	67.2	47.8	59.2	54.9	51.4	56.2
72	05/02/2025 07:03	0:15:00	90.0	48.8	58.7	54.5	51.7	61.0
73	05/02/2025 07:18	0:15:00	68.0	48.7	56.8	53.5	51.3	54.6
74	05/02/2025 07:33	0:15:00	69.8	45.8	55.5	52.9	50.6	53.8
75	05/02/2025 07:48	0:15:00	73.2	46.6	56.6	53.1	50.5	55.8
76	05/02/2025 08:03	0:15:00	74.4	49.4	57.0	53.7	51.7	56.9
77	05/02/2025 08:18	0:15:00	72.3	50.0	57.2	54.4	52.7	56.8
78	05/02/2025 08:33	0:15:00	70.9	49.6	58.3	54.4	52.9	56.7
79	05/02/2025 08:48	0:15:00	71.9	50.8	57.7	55.0	53.6	56.3
80	05/02/2025 09:03	0:15:00	68.8	51.3	57.3	55.0	53.4	55.9
81	05/02/2025 09:18	0:15:00	73.4	51.2	57.7	54.8	53.2	56.8
82	05/02/2025 09:33	0:15:00	70.3	49.5	56.8	54.1	52.3	55.2
83	05/02/2025 09:48	0:15:00	66.8	48.4	55.9	53.5	51.7	54.1
84	05/02/2025 10:03	0:15:00	66.2	48.2	56.4	53.7	51.3	54.4
85	05/02/2025 10:18	0:15:00	74.1	48.7	57.1	53.8	51.8	56.3
86	05/02/2025 10:33	0:15:00	72.7	48.7	58.0	54.2	52.1	56.3
87	05/02/2025 10:48	0:15:00	72.2	50.6	56.7	54.5	52.6	55.2
88	05/02/2025 11:03	0:15:00	69.6	50.1	55.6	53.5	52.0	54.0
89	05/02/2025 11:18	0:15:00	64.3	49.3	55.6	53.4	51.6	54.0
90	05/02/2025 11:33	0:15:00	65.6	48.3	55.4	53.4	51.3	53.8

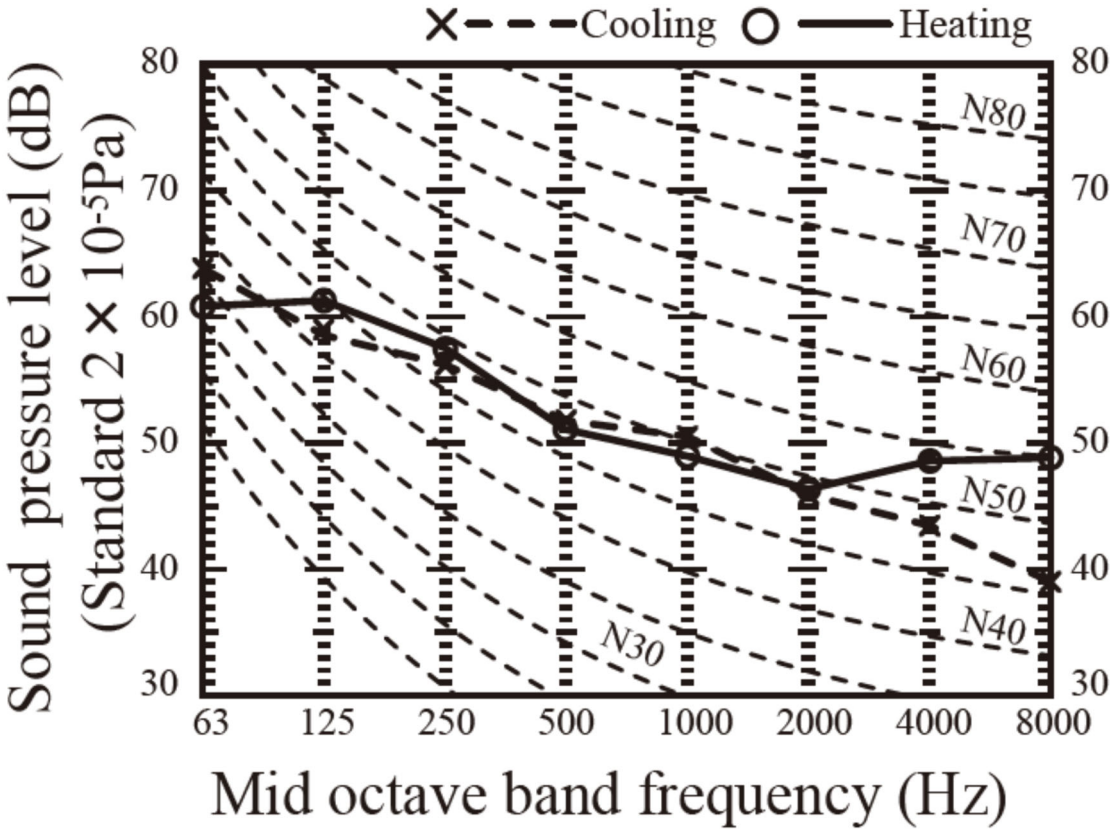

LAeq, LA90 & LA Max vs. Time
100
90
80
70
60
50
40
30
20
10
0
dB-A
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91
Time
LA90
LAeq
LAmax

Appendix C – Unit Data

Models FDC125VNX-W,125VSX-W

Cooling noise level 53 dB (A)

Heating noise level 54 dB (A)



Appendix D – Relevant Guidance

The Department for Communities and Local Government revised the National Planning Policy Framework (NPPF) on 20th December 2023 which sets out government's planning policies for England and how these are expected to be applied.

Paragraph191 of the NPPF contains the following statement:

> *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> a) *mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
>
> b) *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason: and*
>
> c) *Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation*

The Department for Environment Food and Rural Affairs published the Noise Policy Statement for England (NPSE) in March 2010. The explanatory note of NPSE defines the following terms used in the NPPF:

> *"NOEL – No Observed Effect Level*
>
> *This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*
>
> *LOAEL – Lowest Observed Adverse Effect Level*
>
> *This is the level above which adverse effects on health and quality of life can be detected.*
>
> *2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*
>
> *SOAEL – Significant Observed Adverse Effect Level*
>
> *This is the level above which significant adverse effects on health and quality of life occur."*

The NPSE does not define any of the above effect levels numerically.

The NPSE presents the Noise Policy Aims as:

> *"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy and sustainable development:*
>
> - *avoid significant adverse impacts on health and quality of life;*
> - *mitigate and minimise adverse impacts on health and quality of life; and*
> - *where possible, contribute to the improvement of health and quality of life."*

It can be seen that the first two policy aims are similar to Section 11 of the NPPF, with a third aim that seeks to improve health and quality of life. The NPSE later expands on the Noise Policy Aims, stating:

> *2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).*
>
> *2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.*
>
> *2.25 This aim* (the third aim)*, seeks where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."*

It is clear that noise described in the NPSE as SOAEL that would lead to significant adverse effects should be avoided, although there is no definition as to what constitutes a significant adverse effect. Similarly, noise should be mitigated where it is high enough to lead to adverse effects, termed the LOAEL, but not so high that it leads to significant adverse effects.

BS4142: 2014 'Methods for rating and assessing industrial and commercial sound' is intended to be used to assess whether noise from

factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises is likely to give rise to complaints from people residing in nearby dwellings.

The procedure contained in BS4142 for assessing the likelihood of complaints is to compare the "*specific noise level*", which is the measured or predicted noise level from the source in question immediately outside the dwelling, with the background noise level. Where the noise contains a "*distinguishable discrete continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks, clatters or thumps), or if the noise is irregular enough to attract attention*" then a correction of +5dB is added to the specific noise level to obtain the "*rating level*" or L_{Ar}.

The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level. BS4142 states:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on context.

In the context of the NPPF, it is considered that a situation where BS4142 suggests complaints are unlikely would equate to the No Observed Effect Level (NOEL). The situation where BS4142 suggests complaints are likely would equate to the Significant Observed Adverse Effect Level (SOAEL).

The Lowest Observed Adverse Effect Level (LOAEL) has been equated to the situation that BS4142 describes as "marginal" as this is the only intermediate threshold identified in BS4142.

The London Borough of Camden's standard requirements are taken from the new Local Plan adopted on the 3rd July 2017 and require the Rating Noise Level of the proposed equipment to be at least 10 dB below the represntative background noise level.

Appendix E – Definitions

DECIBEL - The ratio of sound pressures that we can hear is a ratio of 106. A logarithmic measurement scale is therefore used for convenience. The resulting parameter is called the 'sound pressure level' (Lp) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.

The threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain.

A change of 1 dB is only perceptible under controlled conditions.

dB(A) - The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). An 'A'-weighting network can be built into a sound level measuring instrument such that sound levels in dB(A) can be read directly from a meter. The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds to a subjective halving or doubling of the loudness of a sound.

EQUIVALENT CONTINUOUS SOUND LEVEL (LEQ) - An index often used for the assessment of overall noise exposure is the equivalent continuous sound level, (LEQ). This is a notional steady level which would, over a given period of time, deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating levels can be described in terms of a single figure level.

The 'A' weighted statistical sound level over a time period, T, is denoted $LA_{eq,T}$.

AMBIENT NOISE - The total encompassing sound in a given situation at a given time. Most often described in terms of the index $LA_{eq,T}$.

SPECIFIC NOISE ($LA_{eq,T}$) - The equivalent continuous A-Weighted sound pressure level at the assessment position produced by the specific noise source over a time interval T.

STATISTICAL NOISE LEVELS - For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation.

- The L10, the level exceeded for ten per cent of the time period under consideration, has been adopted in this country for the assessment of road traffic noise.
- The L90, the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level.

'A' weighted statistical noise levels are generally used and are denoted LA_{10}, LA_{90} etc. The reference time period (T) is normally included, e.g. $LA_{10,\ 15\ mins}$.