

AES

PO Box 322, West Byfleet
Surrey KT14 6YN, UK
tel: 01932 352 733
fax: 01932 355 265
www.aesuk.co.uk

Acoustic Engineering Services (UK) Ltd

**Acoustic Survey Report
Reference 145053
55 Rochester Place
London NW1 9JU**

Client: Charles Newbold

Performed by: Mark Stagg BSc. (Hons) AMIOA

Date of survey: 2nd to 3rd July 2014

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Map Sheet 145053/map1

Horizon Air Conditioning Drawing J 140422-03D

Marked up Horizon Air Conditioning Drawing J 140422-03D

Photographs 145053/photo1-5

Acoustic Survey Data Sheets 145053 ASDS 1 & 2

Graphs 145053/g1& g2

Calculation sheet 145053/ACS1

Allaway Acoustics Data Sheet L70D

Calibration certificate UCRT13/1163

Glossary of Commonly Used Acoustic Terminology



PO Box 322, West Byfleet
Surrey KT14 6YN, UK
tel: 01932 352 733
fax: 01932 355 265
www.aesuk.co.uk

Acoustic Engineering Services (UK) Ltd

**Acoustic Survey Report
Reference 145053
55 Rochester Place
NW1 9JU**

Summary

A noise level survey has been carried out at 55 Rochester Place NW1 9JU, to establish the existing background noise levels at the closest locations likely to be affected by noise emissions from a proposed air-conditioning plant installation.

Measurements have been made over a typical 24-hour period at a suitable location exposed to representative levels of general background noise with the lowest recorded levels being as follows –

Location	Daytime 07.00hrs - 19.00hrs	Evening 19.00hrs –23.00hrs	Night 23.00hrs – 07.00hrs
Roof Level	42.7dB LA90, 15mins	40.3dB LA90, 10mins	35.1dB LA90, 10mins

Using the measured background figures a maximum noise emission criterion has been proposed in accordance with our conversation with The London Borough of Camden's Environmental Health Department for the proposed plant operating hours.

Maximum level of plant noise emission 08.00hrs to 20.00hrs	33dB(A)
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A calculation has been performed using manufacturer's plant and acoustic treatment data confirming that the installation will be compliant with the local authority's requirements.

All comments are subject to approval by the local authority.



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**Acoustic Survey Report
Reference 145053
55 Rochester Place
London NW1 9JU**

1 Introduction

- 1.1 55 Rochester Place is a commercial building under the planning jurisdiction of the London Borough of Camden.
- 1.2 The property is currently undergoing refurbishment with part of the fit-out works being the provision of air-conditioning, necessitating the installation of two air-cooled condenser units.
- 1.3 In accordance with Camden's standard planning requirements an acoustic survey has been carried out of the existing background noise levels at the site in order to set a maximum level of plant noise emission and thus ensure compliance with the planning conditions likely to be imposed.
- 1.4 This report is prepared solely for the use of Charles Newbold. Acoustic Engineering Services (UK) Ltd accepts no responsibility for its use by any third party.
- 1.5 The report is limited to addressing only the noise aspects specifically identified within the report.

Our Ref: 145053

2 Site Description

- 2.1 55 Rochester Place is a three storey building situated adjacent to the junction with Wilmot Place. See the attached map sheet 145053/map1 for a general aerial view of the site and photograph 145053/photo1 for an exterior view.
- 2.2 The surrounding buildings appear to be predominantly residential with a limited number of commercial properties.
- 2.3 It is proposed that the condensers be located internally within a small plant area at second floor level served by an external louvre at the far end of the building. See Horizon Air Conditioning drawing J 140422-03D. We have been advised that the plant room will be lined with acoustically absorbent material and that the louvre will be a 300mm deep acoustic type.
- 2.4 The closest noise sensitive locations which could be affected by noise from the proposed plant are windows on the rear façade of buildings in Wilmot Place. See marked up Horizon Air Conditioning drawing J 140422-03D.
- 2.5 Numbers 1 and 2 are approximately 5m from the louvre and it is understood that they are undergoing building works to convert from office space to residential. See photograph 145053/photo2.
- 2.6 Numbers 3 and 3A Wilmot Place are residential properties backing directly onto 55 Rochester Place. The closest windows are approximately 7m from the condenser louvre. See photographs 145053/photo2, 3 and 4.
- 2.7 It was noted that there are existing air-conditioning condensers located at first floor level on the flat roof at the rear of 2 Wilmot Place. See photograph 145053/photo5. It is not clear whether these are still operational and they did not appear to be working at the time of our visits.
- 2.8 As the survey was unattended we cannot comment on the make up of the background noise throughout the whole survey period. However, at the times of our visits it was perceived as being a relatively quiet area with little disturbance from road traffic or other noise sources. (It should be noted that there were some building works being carried out at 1 and 2 Wilmot Place and within 55 Rochester Place itself although these are not believed to have affected the lowest recorded background noise levels).

Our Ref: 145053

3 Date and Time of Survey

- 3.1 The survey was carried out between approximately 11.30hrs on Wednesday 2nd July 2014 and 10.30hrs on Thursday 3rd July 2014.

4 Weather

- 4.1 Although the survey was unattended it is believed that the weather conditions were favourable, being dry, warm and sunny with little cloud cover and minimal breeze.
- 4.2 The prevailing climatic conditions were therefore suitable for the purposes of the measurements.

5 Instrumentation

- 5.1 RION NL-52 sound level meter serial number 00420711 complete with environmental protection case.
- 5.2 The instrument was calibrated before and after the survey using a RION NC-74 calibrator with no appreciable drift noted.
- 5.3 The current annual calibration certificate UCRT13/1163 is attached.

6 Procedure

- 6.1 The microphone was mounted on a tripod on the flat roofed area close to the proposed condenser louvre between the roof lights at 2nd floor level. See marked up Horizon Air Conditioning drawing J 140422-03D. This location was chosen as being the most appropriate accessible position at which the microphone could be mounted being exposed to the same level of background noise as the closest sensitive locations.

Our Ref: 145053

6 Procedure cont.

- 6.2 Measurements were made generally in accordance with British Standard 4142 "Method for rating industrial noise affecting mixed residential and industrial areas", in terms of the L_{A90} percentile and the L_{Aeq} , continuous equivalent noise level. These are defined in the enclosed Glossary of Commonly Used Acoustic Terminology.
- 6.3 Sample periods of 15 minutes were used.

7 Findings

- 7.1 Please see the enclosed Acoustic Survey Data Sheets 145053 ASDS1 and ASDS2 for details of the recorded background noise levels.
- 7.2 These results are also depicted graphically on graphs 145053/g1 and g2.
- 7.3 The background L_{A90} noise level was found to be consistent throughout the day time, falling gradually during the evening and night before rising back to day time levels.
- 7.4 The L_{Aeq} levels were found to exhibit a generally similar pattern to the L_{A90} figures with more individual peak intensity events presumably due to short term noisy building operations.
- 7.5 The lowest recorded L_{A90} background noise levels were:
- | | | |
|------|----------------------------------|--------------------------------|
| 7.51 | Day time (07.00hrs – 19.00hrs) | 42.7dBL _{A90, 15mins} |
| 7.52 | Evening (19.00hrs to 23.00hrs) | 40.3dBL _{A90, 15mins} |
| 7.53 | Night time (23.00hrs – 07.00hrs) | 35.1dBL _{A90, 15mins} |

Our Ref: 145053

8 Planning Requirements

- 8.1 The London Borough of Camden's Unitary Development Plan provides noise criteria for mechanical plant within a residential area. It is summarised in Table E as follows –

Noise levels from plant and machinery at which planning permission will **not** be granted

Noise description & location of measurement	Period	Time	Noise level
Noise at 1m external to a sensitive façade	Day, evening and night	0000-2400	5dB(A)<LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1m external to a sensitive façade	Day, evening and night	0000-2400	10dB(A)<LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1m external to a sensitive façade	Day, evening and night	0000-2400	10dB(A)<LA90
Noise at 1m external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL _{Aeq}

9 Plant Noise Emission Criterion

- 9.1 We have been in contact with Mario Houska of Camden's Environmental Health Department who has advised that the planning requirement for condenser fans is that the noise produced must be at least 10dB below the lowest existing background noise level.
- 9.2 It is understood that the units will operate only during office hours – 08.00hrs to 20.00hrs.
- 9.3 We can summarise the expected maximum allowable level of noise emission for new mechanical plant as follows
Table 9.3

Maximum level of noise emission at closest noise sensitive location due to mechanical plant 08.00hrs to 20.00hrs	33dB(A)
---	---------

Our Ref: 145053

9 Plant Noise Emission Criterion cont.

- 9.4 Noise break-in to 55 Rochester Place itself is outside the scope of this report and has not been considered.

10 Plant Noise Data

- 10.1 We have been provided with the following manufacturer's data with regard to condenser noise emissions -

- 10.2 2No. Hitachi RAM-70NP3A

- 10.21 Noise output – Cooling 48dB(A) @ 1m
 Heating 52dB(A) @ 1m

- | | | | | | | | | | | |
|-------|------------|----|----|-----|-----|-----|----|----|----|----|
| 10.22 | Frequency | Hz | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| | Lp Cooling | dB | 43 | 48 | 49 | 44 | 42 | 41 | 36 | 37 |
| | Lp Heating | dB | 44 | 49 | 52 | 48 | 45 | 46 | 41 | 38 |

- 10.23 All noise levels are understood to be sound pressure levels measured at 1m in free field hemispherical conditions.

11 Calculation

- 11.1 Calculation sheet 145053 ACS1 estimates the resultant noise level at the closest windows on the rear façade of 2 Wilmot Place due to operation of the new condensers in cooling mode as being 31dB(A). This is in line with the planning restriction. The resultant level rises to 33dB(A) with the condensers in heating mode, which is still in line with the planning requirement.
- 11.2 The calculation incorporates acoustic louvre transmission loss data from Allaway Acoustics – data sheet attached and typical textbook data for absorbent wall lining materials.

Our Ref: 145053

12 Conclusion

- 12.1 A background noise level survey has been carried out in order to establish the existing environmental noise climate at relevant locations close to a proposed air-conditioning condenser installation at 55 Rochester Place, London NW1 9JU.
- 12.2 A plant noise emission criterion has been set based on the results of the measurements and taking into account the planning requirements of the Local Authority.
- 12.3 A calculation has been performed based on manufacturer's noise output data, and provisional drawings of the proposed installation which demonstrates compliance with the planning restriction.
- 12.4 All findings are subject to local authority approval and it is advised that no works should be carried out until such approval is received.

AES

P.O. Box 322
West Byfleet
Surrey
KT14 6YN
Tel: 01932 352733
Fax: 01932 355265

Client:
Charles Newbold

Client Order No.:

Project:
55 Rochester Place
NW1 9JU

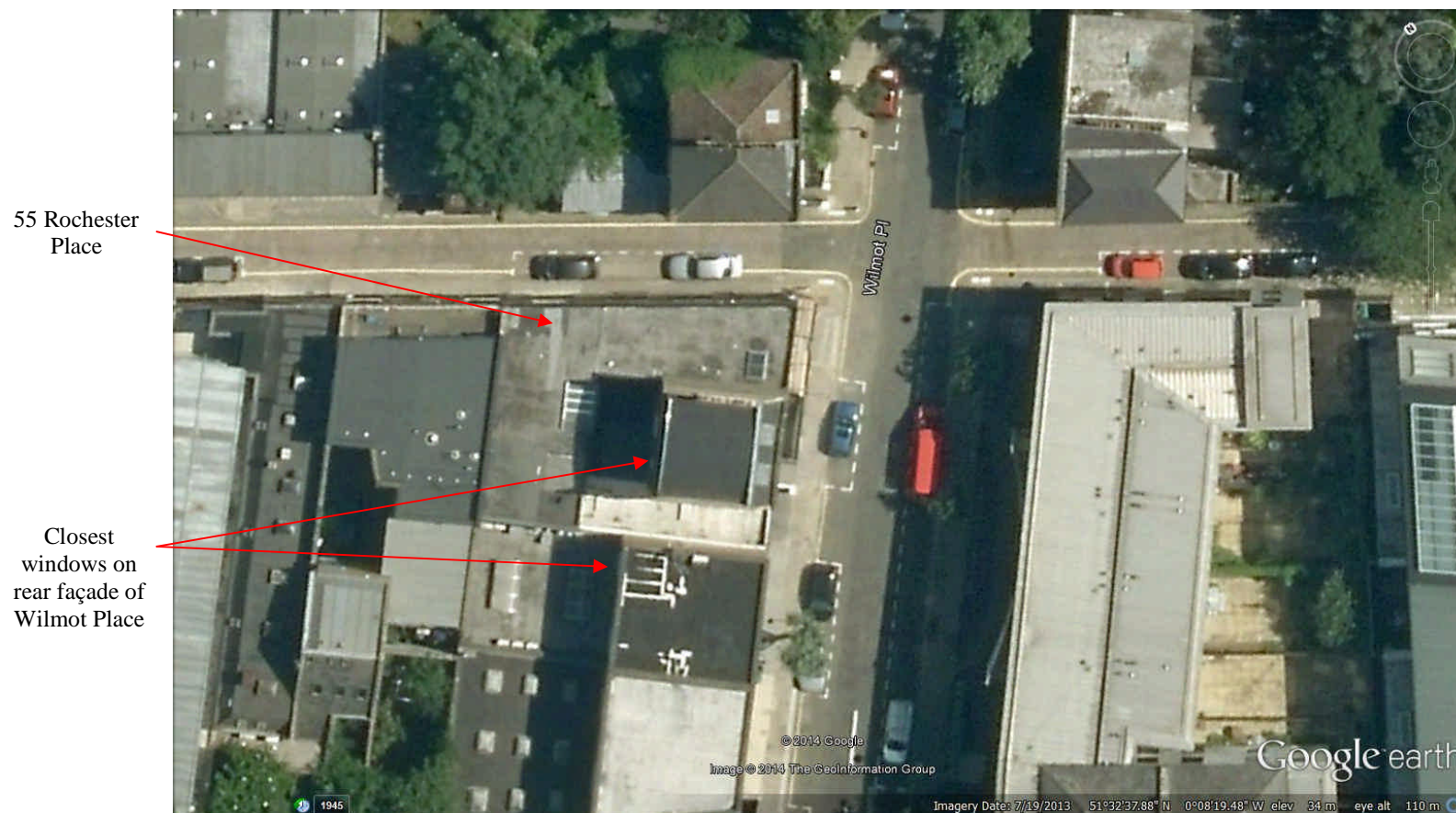
AES (UK) Ltd Ref.:
145053 / map1


Drawn By:
MS

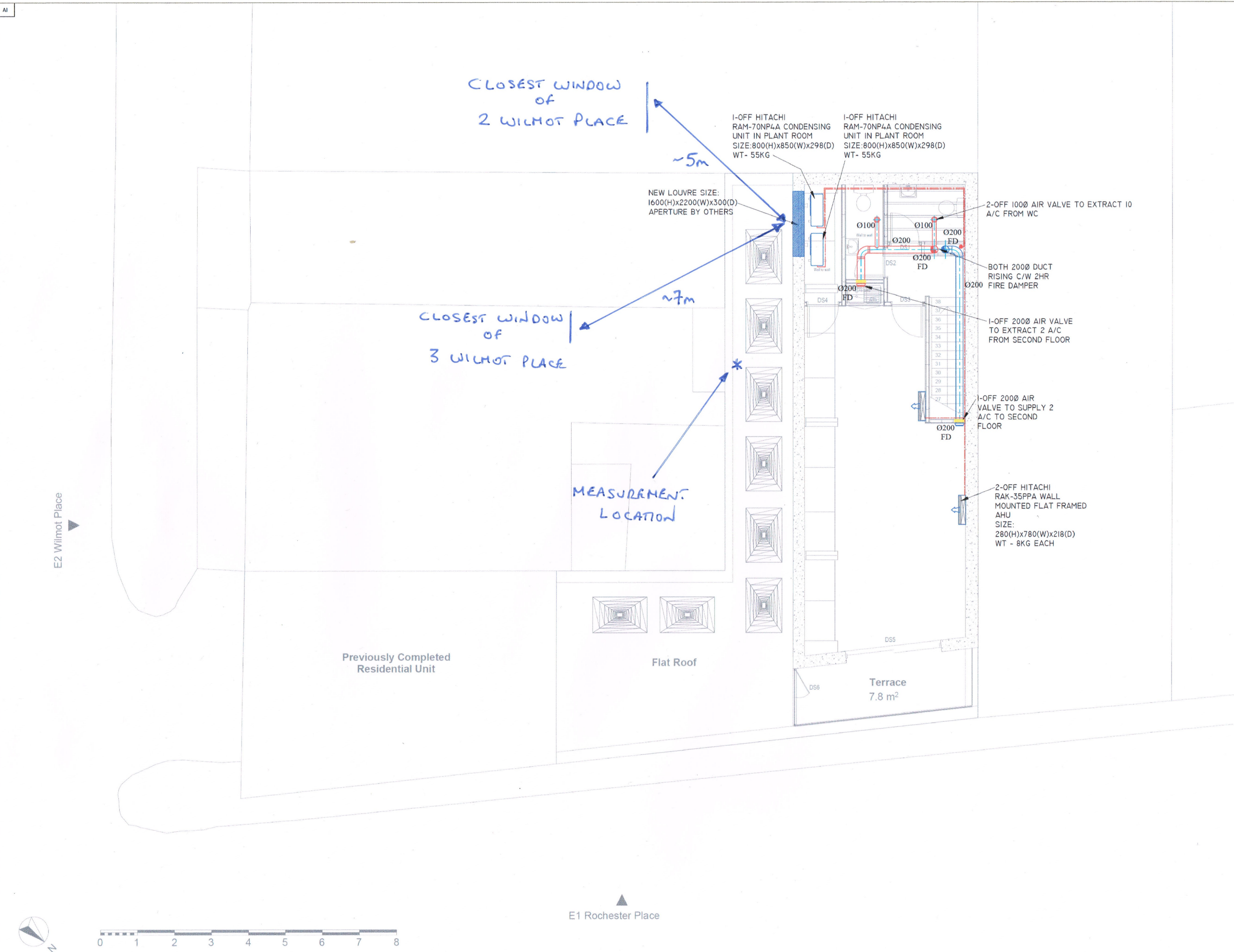
Date:
03.07.14

**Map
Sheet**

Aerial View of Site



<div><h1>HORIZON</h1><p>AIR CONDITIONING LIMITED</p></div> <div><p>HORIZON AIR CONDITIONING LTD UNIT 8, EMBASSY INDUSTRIAL ESTATE ATTWOOD STREET, LYE STOURBRIDGE WEST MIDLANDS, B99 8RY</p><p>TEL: 01824 893139 WEB: WWW.HORIZONAC.CO.UK FAX: 01824 892854 E-MAIL: CONTACT@HORIZONAC.CO.UK</p></div>	
CLIENT	TOP NOTCH JOINERY
MAIN CONTRACTOR	TOP NOTCH JOINERY
SITE LOCATION 55 ROCHESTER PLACE LONDON MW1 9JU	
DRAWING TITLE HVAC SECOND FLOOR	
DRAWN BY JRM	CHECKED BY SM
SCALE 1:50@AI	DATE JULY 2014
DRAWING No J 14.04.22 -03D	
REVISIONS	
A. DUCTWORK ALTERED	
B. ALTERED DUCTWORK	
C. ALTERED LOUVRE SIZE AND ADDED SOUND PRESSURE	
D. CHANGED CONNECTIONS	
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HORIZON AIR CONDITIONING
PARTS AND GENERAL SPECIFICATION
AIR CONDITIONING
EQUIPMENT & TYPE
AHU MODEL
C/U MODEL
UNIT HANGING METHOD
REFRIGERATION
PIPEWORK SIZES
DRAIN OF AHU SIZE
C/U DRAIN SIZE
DUCTWORK
SUPPLY
RETURN
FRESH AIR
TOILET EXTRACTION
TOILET SUPPLY
GENERAL EXTRACTION
SMOKE EXTRACTION
TERMINAL INSULATION
FANS, SIZE & TYPE
SUPPLY
EXTRACTION
TOILET
SMOKE
OVER DOOR HEATER
ELECTRIC DUCT HEATER

GENERAL REQUIREMENTS:
ELECTRICAL
CONTRACTOR TO PROVIDE THE FOLLOWING SUPPLIES TO SWITCHED FUSED ISOLATOR POINTS ADJACENT TO AIR CONDITIONING PLANT AND GENERAL ELECTRICAL REQUIREMENTS. ELECTRICAL CONTRACTOR SHOULD ALLOW FOR CONTROL WIRING BETWEEN FIRE ALARM PANELS AND AIR CONDITIONING CONTROL PANELS TO THE APPROVAL CLIENT/ARCHITECT.
PLEASE NOTE: RUNNING CURRENTS OF AIR CONDITIONING/ VENTILATION PLANT ARE SHOWN ABOVE THEREFORE, FUSES SHOULD BE H.R.C. TYPE OR SIMILAR TO ACCOUNT FOR INITIAL STARTING CURRENTS. ALL WORK TO BE IN ACCORDANCE WITH I.E.E. REGULATIONS.

A. X
B. X
C. X
D. X
E. X

SHOPFITTER/BUILDING WORK
MAIN CONTRACTOR TO ALLOW FOR ALL BUILDERS WORK RELATED TO THE AIR CONDITIONING AND VENTILATION WORKS AND MAKING GOOD OF THE SAME ON COMPLETION OF THE INSTALLATION TO ALLOW FOR POSITIONING OF DUCTWORK, PIPEWORK, ELECTRICAL CABLE AND OTHER ASSOCIATED WORKS.

-HORIZON-
AIR CONDITIONING LIMITED

HORIZON AIR CONDITIONING LTD
UNIT 8, EMBASSY INDUSTRIAL ESTATE
ATTWOOD STREET, LYE
STOURBRIDGE
WEST MIDLANDS, DY9 8RY

TEL: 01584 893139 WEB: WWW.HORIZONAC.CO.UK
FAX: 01584 892854 E-MAIL: CONTACT@HORIZONAC.CO.UK

CLIENT	TOP NOTCH JOINERY
MAIN CONTRACTOR	TOP NOTCH JOINERY
SITE LOCATION	55 ROCHESTER PLACE LONDON MW1 9JU
DRAWING TITLE	HVAC SECOND FLOOR
DRAWN BY	JRM
CHECKED BY	SM
SCALE	1:50@AI
DATE	JULY 2014
DRAWING NO	J 140422 -03D
REVISIONS	
A.	DUCTWORK ALTERED
B.	ALTERED DUCTWORK
C.	ALTERED LOUVRE SIZE AND ADDED SOUND PRESSURE
D.	CHANGED CONDENSING UNIT
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AES

P.O. Box 322
West Byfleet
Surrey
KT14 6YN
Tel: 01932 352733
Fax: 01932 355265

Client:
Charles Newbold

Client Order No.:

Project:
55 Rochester Place
NW1 9JU

AES (UK) Ltd Ref.:
145053 / photo1

Drawn By:
MS

Date:
03.07.14

Photograph Sheet

View of the corner of Rochester Place and Wilmot Place



55 Rochester Place

3 and 3a Wilmot Place

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P.O. Box 322
West Byfleet
Surrey
KT14 6YN
Tel: 01932 352733
Fax: 01932 355265

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55 Rochester Place
NW1 9JU

AES (UK) Ltd Ref.:
145053 / photo2

Drawn By:
MS

Date:
03.07.14

Photograph Sheet

View looking along flat roof of 55 Rochester Place at second floor level



Rear façade of
2 Wilmot Place

Proposed louvre
location

Rear façade of 3 Wilmot Place

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P.O. Box 322
West Byfleet
Surrey
KT14 6YN
Tel: 01932 352733
Fax: 01932 355265

Client:
Charles Newbold

Client Order No.:

Project:
55 Rochester Place
NW1 9JU

AES (UK) Ltd Ref.:
145053 / photo3

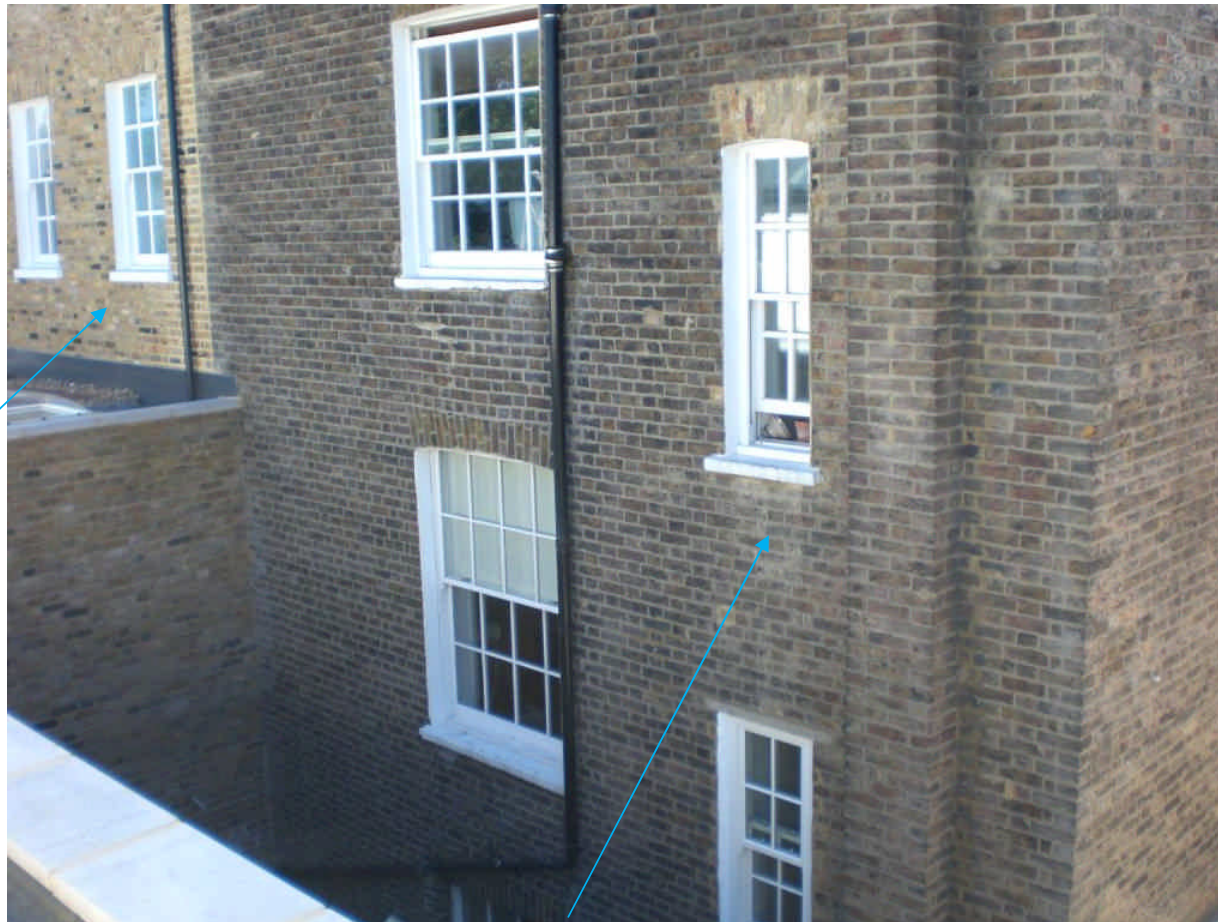
Drawn By:
MS

Date:
03.07.14

Photograph Sheet

Rear façade of 3 and 3A Wilmot Place looking from second floor flat roof of 55 Rochester Place

Rear façade of
3a Wilmot Place



Rear façade of 3 Wilmot Place

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P.O. Box 322
West Byfleet
Surrey
KT14 6YN
Tel: 01932 352733
Fax: 01932 355265

Client:
Charles Newbold

Client Order No.:

Project:
55 Rochester Place
NW1 9JU

AES (UK) Ltd Ref.:
145053 / photo4

Drawn By:
MS

Date:
03.07.14

Photograph Sheet

Upper floor rear façade of 3 and 3a Wilmot Place looking from second floor flat roof of 55 Rochester Place



Rear façade of
3a Wilmot Place

Rear façade of 3 Wilmot Place

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P.O. Box 322
West Byfleet
Surrey
KT14 6YN
Tel: 01932 352733
Fax: 01932 355265

Client:
Charles Newbold

Client Order No.:

Project:
55 Rochester Place
NW1 9JU

AES (UK) Ltd Ref.:
145053 / photo5

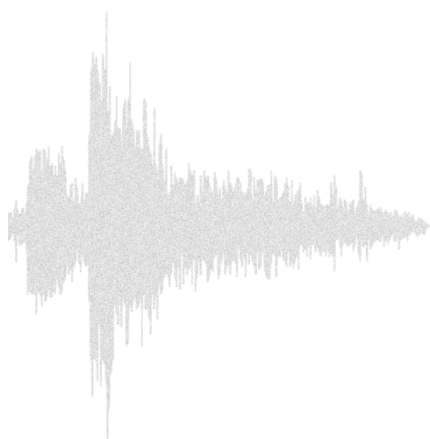
Drawn By:
MS

Date:
03.07.14

Photograph Sheet

View of existing condensers at rear of 1 and 2 Wilmot Place





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Acoustic Engineering Services (UK) Ltd

PO Box 322, West Byfleet
Surrey KT14 6YN, UK
tel: 01932 352 733
fax: 01932 355 265
www.aesuk.co.uk

ACOUSTIC SURVEY DATA SHEET 145053 ASDS1

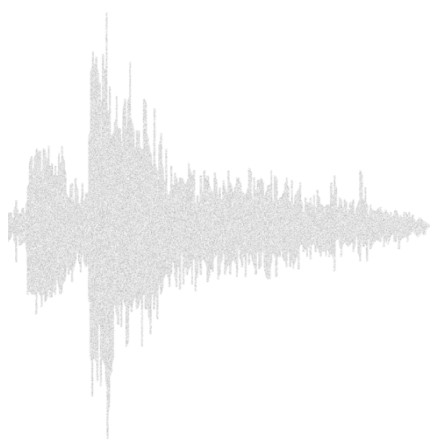
Client: Charles Newbold

Date of Survey: 2nd & 3rd July 2014

Project: 55 Rochester Place NW1 9JU

Description: L_{A90} background noise levels

Time 24-hour	L _{A90} dB	Time 24-hour	L _{A90} dB	Time 24-hour	L _{A90} dB	Time 24-hour	L _{A90} dB
11.30	45.7	17.45	43.0	0.00	39.1	6.15	43.0
11.45	43.5	18.00	42.9	0.15	39.0	6.30	43.4
12.00	43.0	18.15	44.6	0.30	38.3	6.45	43.1
12.15	44.8	18.30	43.3	0.45	37.3	7.00	44.4
12.30	43.5	18.45	44.6	1.00	37.6	7.15	44.1
12.45	42.7	19.00	43.6	1.15	38.5	7.30	43.9
13.00	44.5	19.15	44.0	1.30	37.0	7.45	45.0
13.15	44.9	19.30	45.8	1.45	36.6	8.00	45.6
13.30	46.0	19.45	45.2	2.00	35.1	8.15	45.7
13.45	46.3	20.00	45.2	2.15	35.3	8.30	46.6
14.00	46.4	20.15	44.7	2.30	35.7	8.45	46.9
14.15	46.2	20.30	44.8	2.45	35.7	9.00	45.9
14.30	44.0	20.45	45.0	3.00	36.0	9.15	45.2
14.45	50.0	21.00	45.3	3.15	36.0	9.30	45.7
15.00	46.1	21.15	44.6	3.30	36.2	9.45	45.4
15.15	45.3	21.30	44.9	3.45	38.1	10.00	44.7
15.30	44.7	21.45	42.5	4.00	37.9	10.15	47.1
15.45	43.7	22.00	42.9	4.15	37.5	10.30	46.7
16.00	43.3	22.15	43.2	4.30	37.9	10.45	
16.15	42.9	22.30	42.5	4.45	38.4	11.00	
16.30	43.1	22.45	41.9	5.00	39.4	11.15	
16.45	42.7	23.00	40.3	5.15	38.6		
17.00	42.6	23.15	39.6	5.30	40.3		
17.15	42.8	23.30	39.4	5.45	40.5		
17.30	42.9	23.45	38.3	6.00	42.2		



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tel: 01932 352 733
fax: 01932 355 265
www.aesuk.co.uk

ACOUSTIC SURVEY DATA SHEET 145053 ASDS2

Client: Charles Newbold

Date of Survey: 2nd & 3rd July 2014

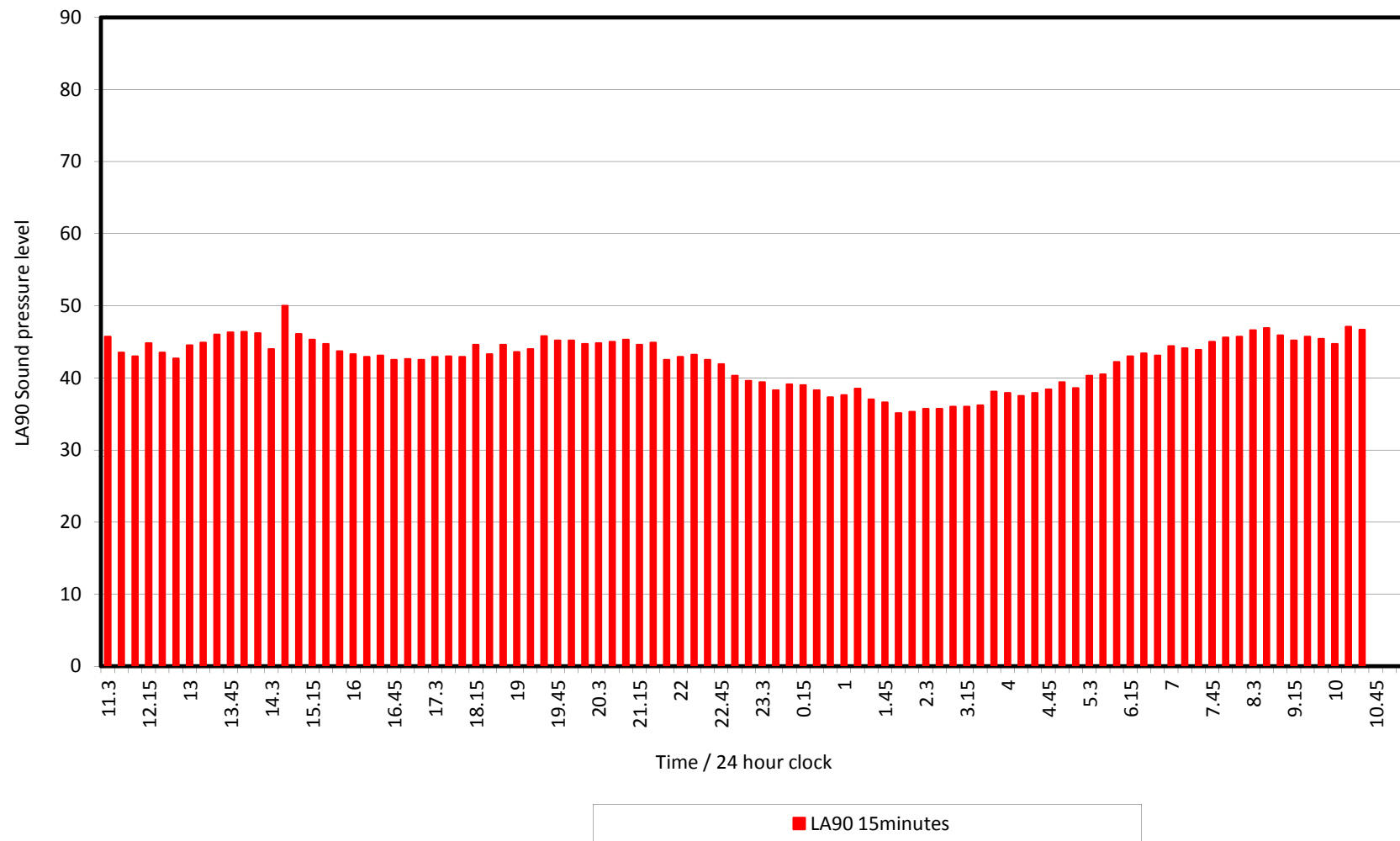
Project: 55 Rochester Place NW1 9JU

Description: L_{Aeq} background noise levels

Time 24-hour	L _{Aeq} dB	Time 24-hour	L _{Aeq} dB	Time 24-hour	L _{A90} dB	Time 24-hour	L _{Aeq} dB
11.30	53.8	17.45	49.0	0.00	44.1	6.15	47.3
11.45	49.3	18.00	51.8	0.15	43.6	6.30	49.1
12.00	49.9	18.15	48.9	0.30	44.8	6.45	48.2
12.15	51.1	18.30	49.3	0.45	42.8	7.00	49.5
12.30	56.2	18.45	52.6	1.00	42.1	7.15	51.6
12.45	54.2	19.00	48.6	1.15	43.3	7.30	50.7
13.00	59.1	19.15	50.7	1.30	41.8	7.45	50.0
13.15	57.4	19.30	51.0	1.45	41.6	8.00	50.4
13.30	56.0	19.45	49.3	2.00	40.7	8.15	50.6
13.45	55.3	20.00	51.6	2.15	42.7	8.30	51.2
14.00	55.7	20.15	49.4	2.30	39.4	8.45	52.4
14.15	57.2	20.30	49.9	2.45	40.7	9.00	51.6
14.30	56.5	20.45	49.4	3.00	41.0	9.15	50.2
14.45	58.0	21.00	49.6	3.15	39.7	9.30	53.9
15.00	55.8	21.15	49.2	3.30	43.8	9.45	54.2
15.15	54.7	21.30	51.0	3.45	50.2	10.00	50.2
15.30	56.4	21.45	47.9	4.00	45.7	10.15	52.0
15.45	52.7	22.00	46.6	4.15	45.7	10.30	51.6
16.00	48.4	22.15	47.0	4.30	44.6	10.45	
16.15	48.0	22.30	49.3	4.45	47.1	11.00	
16.30	50.2	22.45	46.4	5.00	46.2	11.15	
16.45	52.8	23.00	44.6	5.15	45.8		
17.00	51.1	23.15	43.9	5.30	45.2		
17.15	51.9	23.30	45.5	5.45	44.4		
17.30	48.0	23.45	44.4	6.00	46.7		

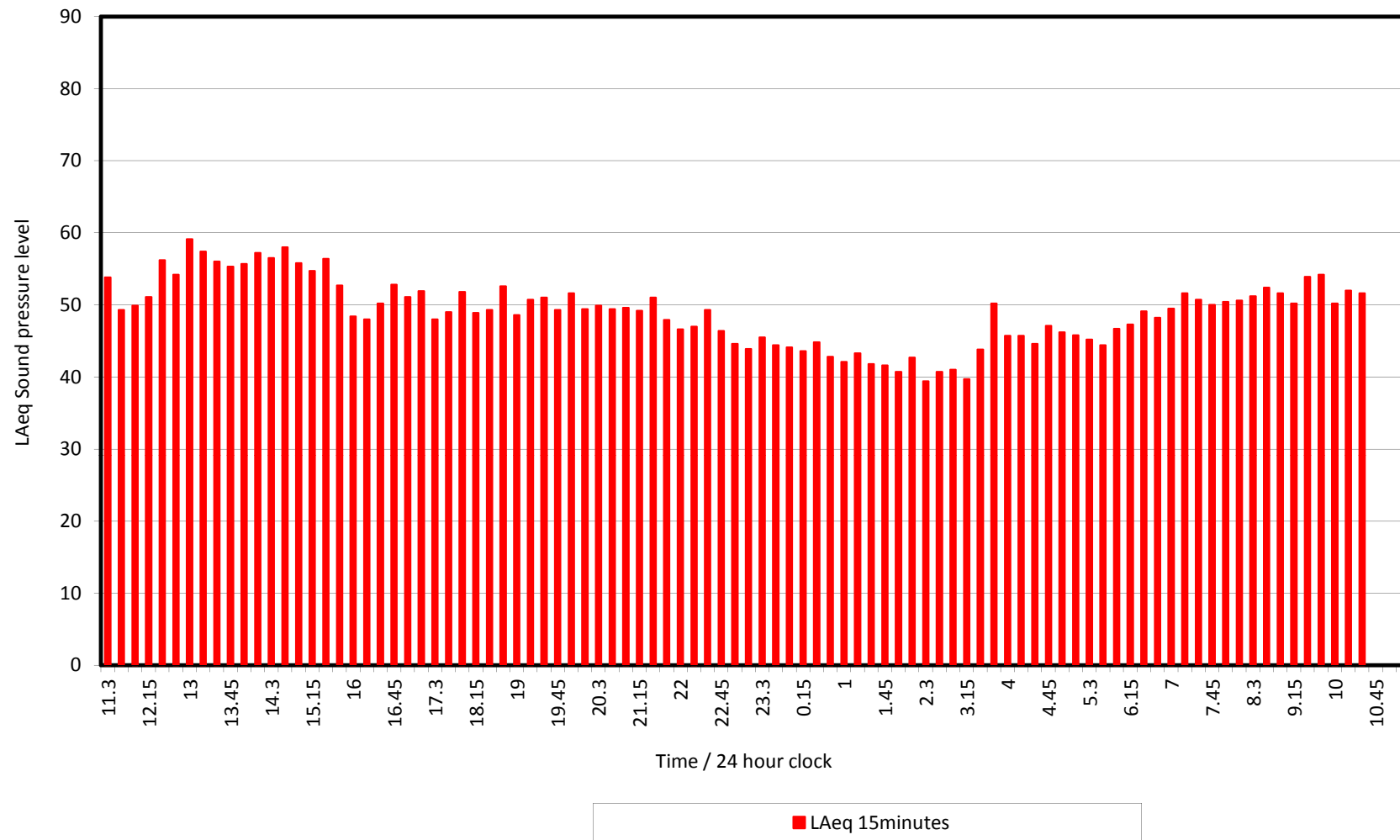
Background Noise Level Survey
55 Rochester Place NW1 9JU

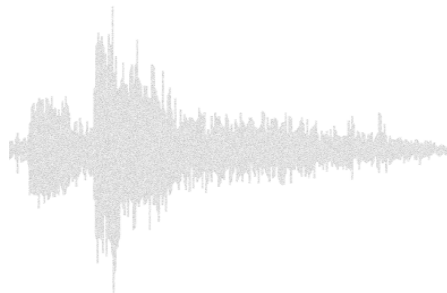
145053 / g1



Background Noise Level Survey
55 Rochester Place NW1 9JU

145053 / g2





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ACOUSTIC CALCULATION SHEET 145053 ACS1

Client: Charles Newbold

Date: 03.03.2014

Project: 55 Rochester Place NW1 9JU

Description: Calculation of resultant noise level
at closest windows of 2 Wilmot Place

	Frequency / Hz								
	dB(A)	63	125	250	500	1k	2k	4k	8k
Cooling									
Calculate sound power level									
Hitachi RAM-70NP3A Lp@ 1m		43	48	49	44	42	41	36	37
2No.		+3	+3	+3	+3	+3	+3	+3	+3
Convert Lp to Lw hemispherical radiation		+8	+8	+8	+8	+8	+8	+8	+8
Total sound power level Lw of plant		54	59	60	55	53	52	47	48
Calculate plant room noise 10m ² of absorbent lining									
Reverberant Lp=Lw+10log4/R _c									
Direct Lp=Lw+10logQ/4πr ²									
Overall effect		+4	+2	-1	-1	-1	-1	-1	-1
Plant room Lp		58	61	59	54	52	51	46	47
Calculate noise transference to closest window									
+10log louvre area (2.2m x 1.6m)		+5	+5	+5	+5	+5	+5	+5	+5
-20log distance (4m)		-12	-12	-12	-12	-12	-12	-12	-12
-R 300mm deep acoustic louvre		-5	-6	-8	-11	-18	-25	-20	-16
Reverberant to direct field correction		-6	-6	-6	-6	-6	-6	-6	-6
Directivity 1/4 sphere		-5	-5	-5	-5	-5	-5	-5	-5
Façade correction		+3	+3	+3	+3	+3	+3	+3	+3
Resultant with plant in cooling mode	31	38	40	36	28	19	11	11	16
Heating									
Calculate sound power level									
Hitachi RAM-70NP3A Lp@ 1m		44	49	52	48	44	46	41	38
2No.		+3	+3	+3	+3	+3	+3	+3	+3
Convert Lp to Lw hemispherical radiation		+8	+8	+8	+8	+8	+8	+8	+8
Total sound power level Lw of plant		55	60	63	59	55	57	52	49
Calculate plant room noise 10m ² of absorbent lining									
Reverberant Lp=Lw+10log4/R _c									
Direct Lp=Lw+10logQ/4πr ²									
Overall effect		+4	+2	-1	-1	-1	-1	-1	-1
Plant room Lp		59	62	62	58	54	56	51	48
Calculate noise transference to closest window									
+10log louvre area (2.2m x 1.6m)		+5	+5	+5	+5	+5	+5	+5	+5
-20log distance (4m)		-12	-12	-12	-12	-12	-12	-12	-12
-R 300mm deep acoustic louvre		-5	-6	-8	-11.00	-18.00	-25.00	-20.00	-16.0
Reverberant to direct field correction		-6	-6	-6	-6	-6	-6	-6	-6
Directivity 1/4 sphere		-5	-5	-5	-5	-5	-5	-5	-5
Façade correction		+3	+3	+3	+3	+3	+3	+3	+3
Resultant with plant in heating mode	33	39	41	39	32	9	16	16	17

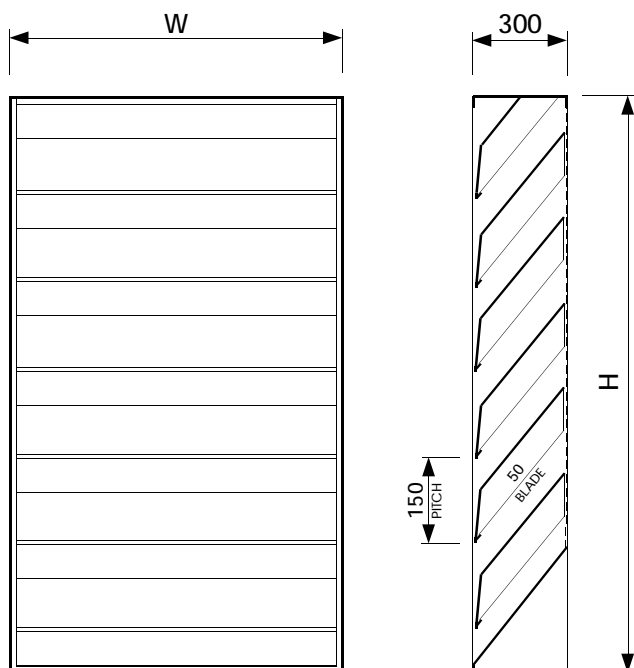
DATA SHEET L70D ACOUSTIC LOUVRE MODEL AL3015

THIS IS NOT A STAND ALONE DOCUMENT AND UNLESS REFERRED TO IN A DATED EQUIPMENT SCHEDULE IS SUBJECT TO REVISION WITHOUT NOTICE.



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DIMENSIONS



SUFFIX

THE SUFFIX DEFINES ADDITIONAL FEATURES OR SPECIAL CONSTRUCTIONAL DETAILS

- A ALUMINIUM CONSTRUCTION.
- G GALVANISED STEEL CONSTRUCTION.
- P POLYESTER POWDER COAT.
- X SPECIAL CONSTRUCTION - REFER TO EQUIPMENT SCHEDULE FOR DETAILS.

WEIGHT

LOUVRE WEIGHTS ARE GIVEN ON THE EQUIPMENT SCHEDULE. APPROXIMATELY:

52kg/M² GALVANISED CONSTRUCTION
37kg/M² ALUMINIUM CONSTRUCTION

SPECIFICATION

LOUVRES ARE CONSTRUCTED FROM FOLDED SHEET METAL AND HAVE A SERIES OF HORIZONTAL BLADES CONTAINED WITHIN A FOUR SIDED EXTERNAL FRAME.

THE MATERIAL OF CONSTRUCTION MAY BE PRE-GALVANISED STEEL (SUFFIX G) OR ALUMINIUM (SUFFIX A).

LOUVRE BLADES HAVE LOWER FACES OF PERFORATED SHEET METAL, CONTAINING A FIBROUS SOUND ABSORBENT INFILL THAT IS NON-SHEDDING, NON-COMBUSTIBLE, NON-HYGROSCOPIC AND CHEMICALLY INERT. THE INFILL IS FACED WITH GLASS CLOTH TO MINIMISE FIBRE MIGRATION.

GALVANISED BIRD SCREENS ARE FITTED AS STANDARD.

CASING SIDES ARE PROVIDED WITH 10mm DIA HOLES FOR FIXING ADJACENT SECTIONS TOGETHER, OR FIXING THE LOUVRE INTO THE BUILDERSWORK OPENING.

LOUVRES ARE SUPPLIED SELF FINISH AS STANDARD OR WITH AN OPTIONAL POLYESTER POWDER FINISH (SUFFIX P).

NOTES

THIS DATA SHEET IS TO BE READ IN CONJUNCTION WITH THE EQUIPMENT SCHEDULE.

WIDTH (W) AND HEIGHT (H) DIMENSIONS GIVEN ON THE EQUIPMENT SCHEDULE ARE AS MANUFACTURED. ADEQUATE CLEARANCE MUST BE ALLOWED WHEN CONSTRUCTING THE BUILDERSWORK OPENING, A MINIMUM OF 10 mm IS RECOMMENDED.

LOUVRES WILL BE SUPPLIED WITHOUT SUPPORT STEELWORK, CLEATS, BRACKETS, FIXINGS, FLASHING, MASTIC, OR OTHER SUCH ITEMS, UNLESS OTHERWISE STATED.

EXCESSIVELY LARGE OR HEAVY LOUVRES MAY BE MANUFACTURED IN MATING SECTIONS FOR EASE OF HANDLING.

LOUVRES ARE MANUFACTURED TO STANDARD SHEET METAL TOLERANCES OF +/- 3 mm.

STANDARD SIZES

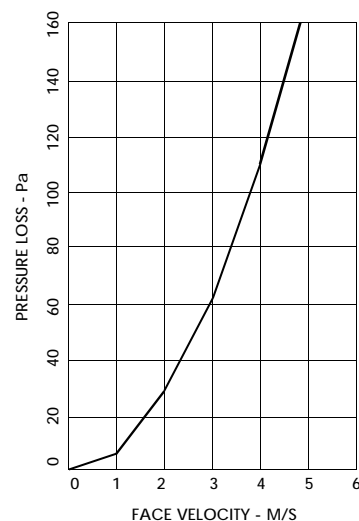
THERE ARE NO STANDARD SIZES. ALL LOUVRES ARE MADE TO ORDER.

ACOUSTIC PERFORMANCE

SOUND REDUCTION INDEX B.S. 2750/3-1980 (ISO 140/3 -1978)

63	125	250	500	1000	2000	4000	8000	Hz
5	6	8	11	18	25	20	16	dB

PRESSURE LOSS



Date of Issue: 08 October 2013

Certificate Number: UCRT13/1163

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way


Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page	1	of	2	Pages
Approved Signatory				
				
M. Breslin []		K. Mistry []		

Customer ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes
MK5 8HL

Order No. ANV MS HIRE

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00420711
	Rion	Firmware		1.5
	Rion	Pre Amplifier	NH-25	10744
	Rion	Microphone	UC-59	03508
	Brüel & Kjær	Calibrator	4231	3002998
		Calibrator adaptor type if applicable		UC 0210

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 04 October 2013

ANV Job No. UKAS13/10097

Date Calibrated 08 October 2013

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	Initial Calibration		

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

CERTIFICATE OF CALIBRATION

Certificate Number

UCRT13/1163

UKAS Accredited Calibration Laboratory No. 7623

Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter	NL-42 / NL-52
SLM instruction manual ref / issue		11-03
SLM instruction manual source	Manufacturer	
Internet download date if applicable	N/A	
Case corrections available	Yes	
Uncertainties of case corrections	Yes	
Source of case data	Manufacturer	
Wind screen corrections available	Yes	
Uncertainties of wind screen corrections	Yes	
Source of wind screen data	Manufacturer	
Mic pressure to free field corrections	Yes	
Uncertainties of Mic to F.F. corrections	Yes	
Source of Mic to F.F. corrections	Manufacturer	
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes	
Specified or equivalent Calibrator	Specified	
Customer or Lab Calibrator	Lab Calibrator	
Calibrator adaptor type if applicable	UC 0210	
Calibrator cal. date	07 October 2013	
Calibrator cert. number	UCRT13/1160	
Calibrator cal cert issued by	ANV Measurement Systems	
Calibrator SPL @ STP	94.12	dB Calibration reference sound pressure level
Calibrator frequency	1000.00	Hz Calibration check frequency
Reference level range	25 - 130	dB

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End	
Temperature	23.22	23.23	± 0.20 °C
Humidity	56.6	55.1	± 3.00 %RH
Ambient Pressure	101.31	101.32	± 0.03 kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.0	dB	Adjusted indicated level	94.1	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device -		UR = Under Range indicated			
Weighting	A	C	Z		
	13.6	dB	UR	18.3	dB
				23.5	dB
					UR

Uncertainty of the electrical self generated noise ±	0.12	dB
--	------	----

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the Actual microphone free field response was used.

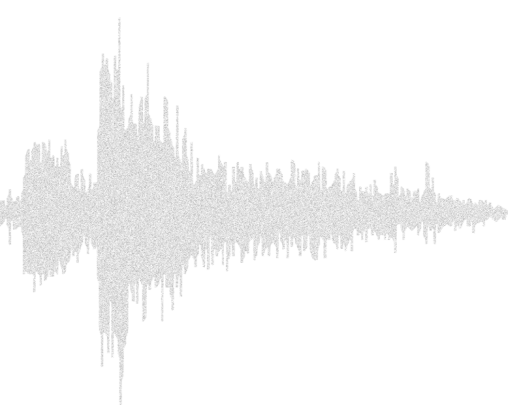
The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: A Albans

Additional Comments

None



GLOSSARY OF COMMONLY USED ACOUSTIC TERMINOLOGY

Decibel (dB)	Unit of measurement of sound. The human ear has an approximately logarithmic response to sound over a large dynamic range and hence a logarithmic scale is used to describe sound levels.
Sound power level (L_w)	This is an inherent property of the noise source and is independent of its surroundings. It is the decibel measure of the ratio of power output in watts to a reference power of 1pW.
Sound pressure level (L_p)	This is the level of sound pressure as measured at a particular point in space by a sound level meter. It is the decibel measure of the ratio of the level of pressure generated by the sound compared to a standard reference pressure (20μPa). It is dependent on the acoustic properties of the surroundings.
Octave and Third Octave Bands	The human ear is sensitive to sound over a range of frequencies – approximately 20Hz to 20kHz. To define the frequency content of a sound the spectrum is divided into frequency bands and a sound pressure measurement made at each band. The most commonly used frequency bands are full octave bands in which the mid frequency of each band is twice that of the band below it. For finer analysis each full octave band may be split into three bands thus producing third octaves.
"A" Weighting	In an attempt to replicate the inconsistent response of the human ear to different frequencies the "A" weighting is applied to provide a single figure index of the subjective loudness of a sound.
Noise Rating (NR) Noise Criteria (NC)	Sets of curves giving a single figure rating by limiting values of sound pressure level in each full octave band
L_{A90, T}	The A-weighted sound pressure level exceeded for ninety per cent of the measurement time period, T. It is used in British Standard 4142:1997 as a measure of background noise level.
L_{A10, T}	The A-weighted sound pressure level exceeded for ten percent of the measurement time period, T. It is widely used to measure traffic noise.
L_{Aeq, T}	The A-weighted equivalent continuous sound level. It is defined as the steady sound level that would contain the same quantity of acoustic energy as the time varying source over the measurement time period, T.