



BOND STREET HOUSE,
LONDON W1

Plant Noise Impact
Assessment

Reference: 11638.PNA.1

Prepared: 11 February 2022

Revision Number: 1

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Revision	Comment	Date	Prepared By	Approved By
1	Added survey methodology	11 February 2022	Doug Shearer	Martin Raisborough
0	First issue of report	11 February 2022	Doug Shearer	Martin Raisborough

Terms of contract:

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed in to full working drawings by the lead designer to incorporate all other design disciplines.



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1.0 INTRODUCTION

As part of the Bond Street House project for a new tenant, level 3 of the building will be refurbished to form new office and staff collaboration accommodation. The project requires the installation of a number of new noise-generating plant items at 5th floor rooftop level, and on a 2nd floor roof area within a lightwell.

RBA Acoustics has been commissioned on behalf of the Client to undertake a noise impact of the proposed plant items in order to ensure that the Westminster City Council's noise emission requirements are satisfied.

This report occasionally employs technical acoustic terminology. In order to assist the reader a glossary of terms is presented in Appendix A of this report.

2.0 SITE DESCRIPTION

Bond Street House is a 5-story commercial building home to the offices of several tenants, located on the junction between New Bond Street and Clifford Street. It is situated in a busy commercial area within Mayfair, Westminster, with a noise climate consisting of varying urban related sources.

The roof of Bond Street House has items of plant installed on it, and nearby commercial properties also have significant items of plant with direct line of sight to the roof area of Bond Street House and nearby receptors.

We have considered the nearest affected receptor to be that of the top floor windows, doors and terrace of 6 Cork Street, approximately 25 meters east of the nearest new plant item.

A plan of the site, including identification of the nearest identified receptor, is shown in Figure A in Appendix B.

3.0 ENVIRONMENTAL NOISE SURVEY

Baseline environmental sound monitoring has taken place on the roof of the building in order to quantify the prevailing background noise climate as experienced at the nearest noise sensitive receptors. The details and results of the survey are presented in the following sections.

3.1 General

The monitoring survey was undertaken by Matt Wildman of RBA Acoustics and commenced at approximately 16:00 hours Thursday 20th February, concluding at approximately 12:00 hours Monday 24th February 2020.

Throughout the survey, continuous measurements were made of the L_{A90} , L_{Amax} and L_{Aeq} noise levels.

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period. However, Table 1 below presents a summary of historical weather conditions observed at a local weather station.

Table 1 – Weather Conditions

Date	Period	Weather Summary	Windspeed (m/s)
Thursday 20 th to Friday 21 st February 2020	Daytime	Mostly cloudy in the morning, light rain in the afternoon.	8
	Night time	Clear	6
Friday 21 st to Saturday 22 nd February 2020	Daytime	Dry with broken clouds all day	8
	Night time	Passing Clouds	10
Saturday 22 nd to Sunday 23 rd February 2020	Daytime	Dry with broken clouds all day	11
	Night time	Partly cloudy	8
Sunday 23 rd to Monday 24 th February 2020	Daytime	Light rain in the morning, partly sunny later in the afternoon	8
	Night time	Clear	8
Monday 24 th February 2020	Daytime	Dry, partly sunny	8

Note: Source www.timeanddate.com

Based on the above data, high wind speeds during the following periods are considered to have had an adverse effect on recorded noise data, and as such have been omitted from the subsequent analysis:

12:00 hours Friday 21 February to 12:00 hours Sunday 23 February 2020.

3.2 Instrumentation

Details of the instrumentation used to undertake the survey are provided in Appendix C.

The sound level meter was calibrated both prior to and on completion of the survey with no significant calibration drift observed. The sound level meter and calibrator have been laboratory calibrated within the past two years and past year respectively.

3.3 Measurement Position

The microphone was attached to a railing along the perimeter of the roof at the south-eastern corner and was raised approximately 2.5m above roof level. The measurement position is illustrated on Figures A & B in Appendix B.

We have designed our criteria with the nearest residential property in mind, which is considered to be the top floor windows, doors and terrace of 6 Cork Street, approximately 25 meters east of the nearest new plant item.

During our time on site, the prevailing noise climate was noted to be generally typical of an urban environment, mainly consisting of external plant belonging to nearby commercial properties – although these are somewhat screened from the aforementioned receptor - and distant road traffic noise.

The survey was undertaken during Lockdown measures due to the COVID-19 pandemic. As such, noise levels would be expected to be a little quieter than current levels and as such represent a worst-case.

3.4 Results

The noise levels measured are shown as time-histories on the attached Graphs 1 and 2 in Appendix D.

In order to ensure a worst-case assessment, the lowest background L_{A90} noise levels measured have been used in our analyses. The lowest L_{A90} and the period averaged L_{Aeq} dB noise levels measured are summarised below.

Table 2 – Measured Levels, Rooftop Survey

Measurement Period	Minimum $L_{90,15\text{ mins}}$ (dBA)	$L_{eq,15\text{ mins}}$ (dBA)
Daytime (07:00 – 19:00)	55	58
Evening (19:00 – 23:00)	55	56
Night-time (23:00 – 07:00)	54	56

4.0 CRITERIA

The requirements of Westminster City Council's Environmental Health Department regarding new building services plant are confirmed as follows.

Any noise generated by new building services plant should be designed to a level either 5dB or 10dB below the lowest background $L_{A90,15\text{-minute}}$ sample during operational hours, as measured 1m outside the nearest affected residential window.

Whether the criterion is a 5dB or 10dB reduction is dependent on the existing external noise levels at the nearest noise sensitive properties, at the quietest time during which the plant operates. If the measured $L_{Aeq,T}$ is found to be above the World Health Organisation (WHO) criteria a reduction of 10dB is applied. A less stringent 5dB reduction is required where existing $L_{Aeq,T}$ noise levels are currently below WHO criteria.

The specific WHO guideline levels are detailed as follows:

Daytime (07:00 - 19:00)	$L_{Aeq,12\text{ hours}}$	55 dB
Evening (19:00 - 23:00)	$L_{Aeq,4\text{ hours}}$	50 dB
Night-time (23:00 - 07:00)	$L_{Aeq,8\text{ hours}}$	54 dB

The measured $L_{Aeq,T}$ levels are above the WHO criterion for daytime, evening and night-time. As such, a plant noise emission limit of 10dB below the lowest measured L_{A90} level is applied.

In line with the above requirements, and based on the results of the background noise survey in Table 2, we propose noise from items of mechanical services be designed so that noise emissions from the plant do not exceed the following levels when assessed at the nearest noise sensitive location:

- Daytime 45 dB
- Evening 45 dB
- Night-time 44 dB

In line with BS 4142: 2014, should the proposed plant be identified as having intermittent or tonal characteristics, a further penalty should be subtracted from any of the above proposed noise emission limits.

5.0 PLANT NOISE IMPACT ASSESSMENT

Westminster City Council requires the following information to be addressed when specifying new or relocated items of plant:

- The location of the nearest noise sensitive premises to the proposed locations of the plant and the distance from the plant location to the nearest noise sensitive window.
- The proposed operational hours of the plant, plant type, number of plant and location of plant.
- Manufacturer's specifications of plant and/or proposed noise levels of internal activity in octave or 1/3 octave band format.
- Calculations for the predicted noise level 1 metre from the window of the nearest sensitive property including distance, directionality and screening effects.
- The report should demonstrate that the predicted noise level outside the most affected window will comply with the limits stated in the standard condition.
- Details of any proposed attenuation measures and details of noise reductions achieved (including manufacturer's guidance on acoustic performance of any acoustic louvres, enclosure, screens etc).

The above are considered in this section of the report.

5.1 Plant Details

The following items of plant are proposed to be installed to serve floor 3. From details received by the mechanical services consultants for the project, WB Shiels, and from Mitsubishi, the units' manufacturers, noise levels for the plant items are shown in Table 3 below.

Table 3 – Measured Levels, Condenser Units

Unit	Distance to receptor	Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
PURY-P450YNW (roof)	25m	78	62	62	59	52	48	49	43	61
PUZ-ZM50VKA (roof)	35m	78	62	62	59	52	48	49	43	61
PUZ-ZM50VKA (2fl)	17m (3 floors below)	58	51	45	44	40	37	32	31	46

Two condenser units are proposed to be installed at roof level, while the another is proposed to be located on a 2nd floor plant roof area. Plant locations are shown in Figure A in Appendix B

5.2 Noise Impact Assessment

Table 4 – Plant Noise Impact Assessment

Plant Type Unit	Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) at Receptor (dB)
PURY-P450YNW (roof)	37
PUZ-ZM50VKA (roof)	10
PUZ-ZM50VKA (2fl)	3
Total	37dBA
Plant Noise Emission Limit	44dBA

From Table 4, it can be seen that the plant noise emission limit is achieved without the need for any specific mitigation measures.

6.0 CONCLUSION

As part of the Bond Street House project for a new tenant, level 3 of the building is proposed to be refurbished to form new office and staff collaboration accommodation. The project requires the installation of three new noise generating plant items at 5th floor rooftop and 2nd lightwell roof levels.

RBA Acoustics has been commissioned on behalf of the Client to undertake a noise impact assessment of the proposed plant items in order to ensure that the Local Authority's noise emission requirements are satisfied. An environmental noise monitoring survey was undertaken at the site between Thursday 20th and Monday 24th February 2020, the results of which have been used to set noise emission limits for the future plant items based on the requirements of Westminster City Council.

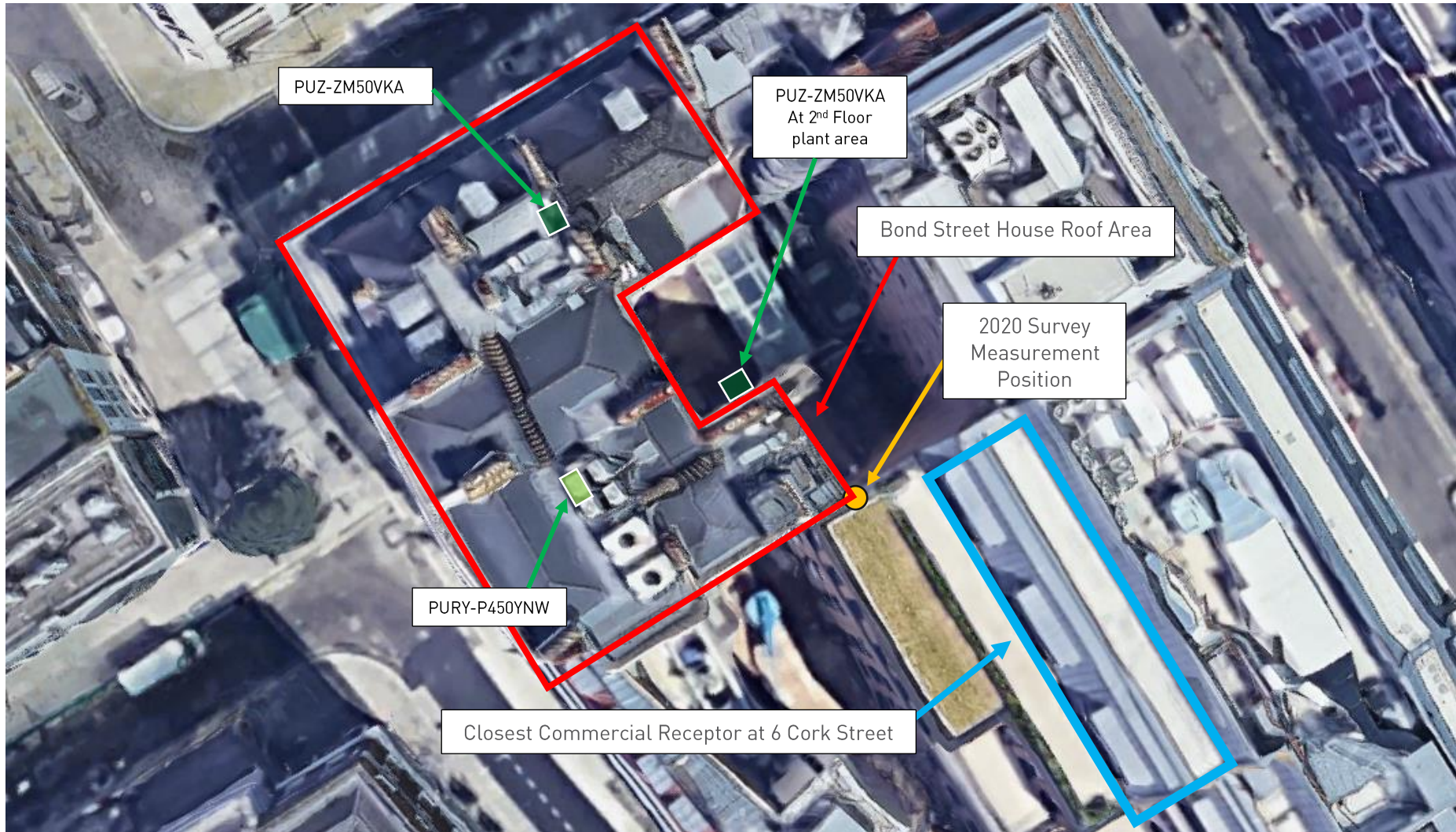
We have not been able to identify a residential receptor within the near vicinity of the site. As such, we have instead considered the nearest affected receptor to be that of the top floor windows, doors and terrace of 6 Cork Street, approximately 25 meters east of the nearest new plant item. A plan of the site, including identification of the nearest identified receptor, is shown in Figure A in Appendix B.

Based on the details of proposed items of noise generating plant, a noise impact assessment has been undertaken to determine the impact on the nearest affected receptor. The results of the assessment indicate the Local Authority's noise emission control requirements will be achieved without the need for any specific mitigation measures.

Appendix A - Acoustic Terminology

dB	Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.
L_{eq}	L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (1 hour).
L_{Aeq}	The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.
L_{An} (e.g. L_{A10} , L_{A90})	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.
$L_{max,T}$	The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the L_{eq} value.

Appendix B – Site Plan & Measurement Position



Bond Street House, London W1
Site Plan
Project 11638

Figure A
11 February 2022
Not to Scale





Bond Street House, London W1
2020 Survey Location
Project 11638

Figure B
11 February 2022
Not to Scale



Appendix C - Instrumentation

The following equipment was used for the measurements

Manufacturer	Model Type	Serial No.	Calibration	
			Certificate No.	Valid Until
Norsonic Type 1 Sound Level Meter	Nor140	1406971	U32753	2 September 2021
Norsonic Pre Amplifier	1209	21571		
Norsonic 1/2" Microphone	1225	335306	32752	2 September 2021
Norsonic Sound Calibrator	1251	35016	U32751	2 September 2021

Appendix D - Graphs

Bond Street House

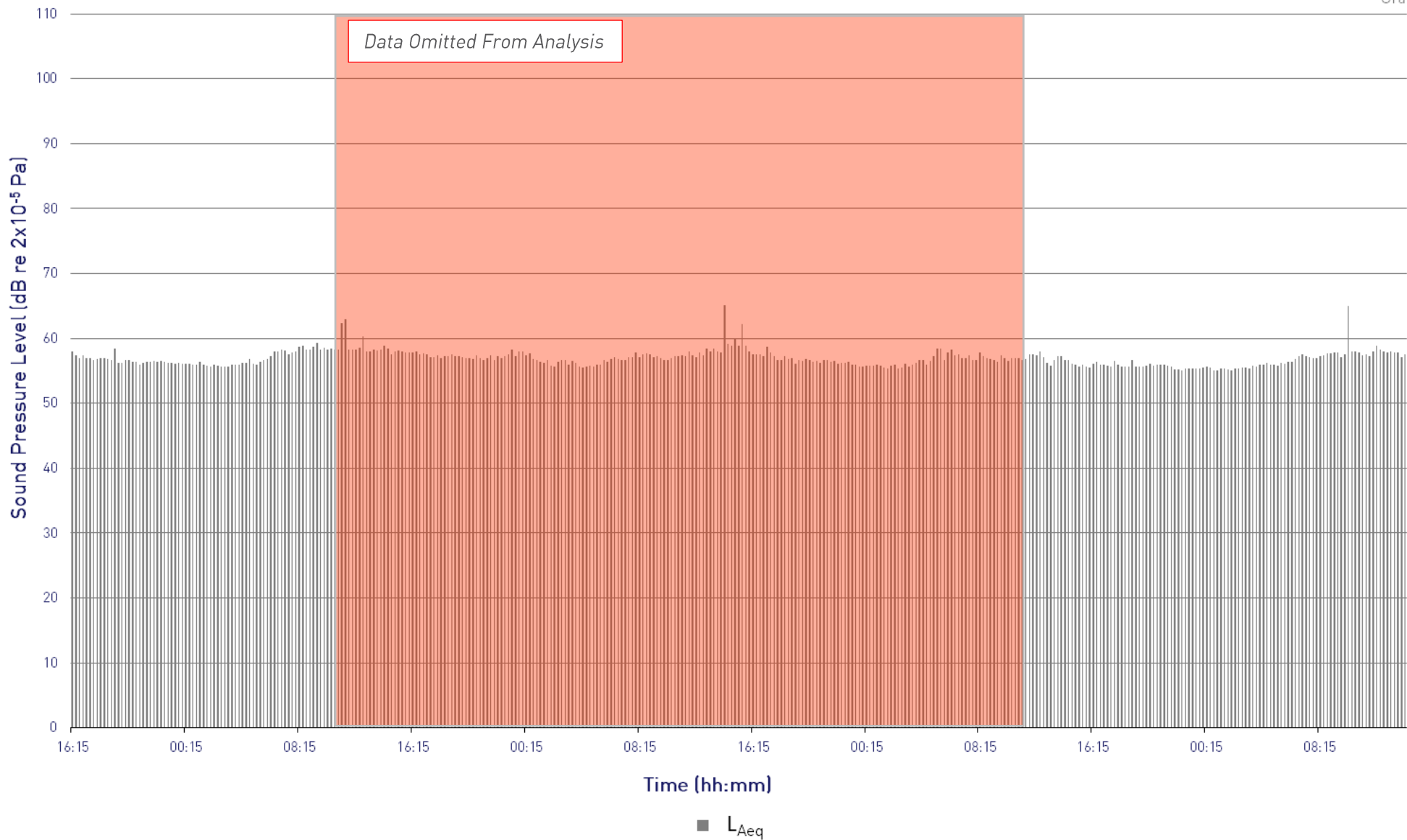
L_{Aeq} Time History

Measurement Position 1, Thursday 20th February to Monday 24th February 2020



Project: 9924

Graph 1



Bond Street House

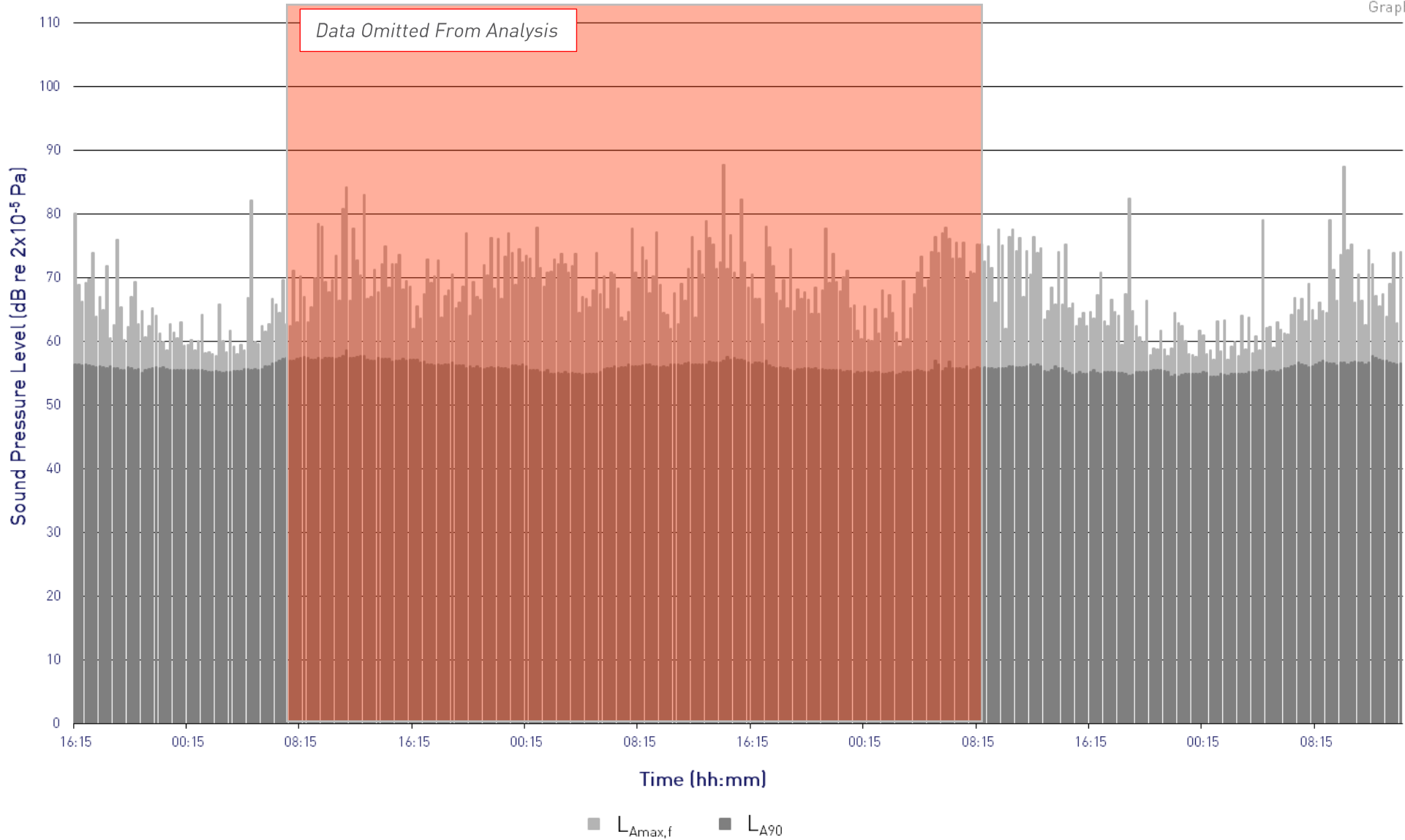
$L_{Amax,f}$ and L_{A90} Time History

Measurement Position 1, Thursday 20th February to Monday 24th February 2020



Project: 9924

Graph 2



Appendix E – Example Calculation

Unit	Sound Pressure Level (dB re 20x10 ⁻⁶ Pa.) @ Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
PURY-P450YNW (roof)	78	62	62	59	52	48	49	43	61
Attenuation due to Distance (25m)	-28	-28	-28	-28	-28	-28	-28	-28	
Screening	-5	-5	-5	-5	-5	-5	-5	-5	
Total Noise Level @ Receptor	50	38	38	36	30	28	23	18	37

Appendix F – Raw Survey Data

Period	Time	Noise Level	
		L_{A90} [dB]	L_{Aeq} [dB]
1	20/02/2020 16:15:00.000 - 20/02/2020 16:29:59.999	56.3	58
2	20/02/2020 16:30:00.000 - 20/02/2020 16:44:59.999	56.3	57.4
3	20/02/2020 16:45:00.000 - 20/02/2020 16:59:59.999	56.2	57
4	20/02/2020 17:00:00.000 - 20/02/2020 17:14:59.999	56.4	57.4
5	20/02/2020 17:15:00.000 - 20/02/2020 17:29:59.999	56.2	57
6	20/02/2020 17:30:00.000 - 20/02/2020 17:44:59.999	56.1	56.9
7	20/02/2020 17:45:00.000 - 20/02/2020 17:59:59.999	55.9	56.6
8	20/02/2020 18:00:00.000 - 20/02/2020 18:14:59.999	56	56.8
9	20/02/2020 18:15:00.000 - 20/02/2020 18:29:59.999	55.9	56.9
10	20/02/2020 18:30:00.000 - 20/02/2020 18:44:59.999	55.8	56.9
11	20/02/2020 18:45:00.000 - 20/02/2020 18:59:59.999	56	56.8
12	20/02/2020 19:00:00.000 - 20/02/2020 19:14:59.999	55.8	56.6
13	20/02/2020 19:15:00.000 - 20/02/2020 19:29:59.999	55.8	58.4
14	20/02/2020 19:30:00.000 - 20/02/2020 19:44:59.999	55.4	56.2
15	20/02/2020 19:45:00.000 - 20/02/2020 19:59:59.999	55.5	56.2
16	20/02/2020 20:00:00.000 - 20/02/2020 20:14:59.999	55.9	56.7
17	20/02/2020 20:15:00.000 - 20/02/2020 20:29:59.999	55.8	56.7
18	20/02/2020 20:30:00.000 - 20/02/2020 20:44:59.999	55.5	56.4
19	20/02/2020 20:45:00.000 - 20/02/2020 20:59:59.999	55.6	56.4
20	20/02/2020 21:00:00.000 - 20/02/2020 21:14:59.999	55	55.9
21	20/02/2020 21:15:00.000 - 20/02/2020 21:29:59.999	55.5	56.2
22	20/02/2020 21:30:00.000 - 20/02/2020 21:44:59.999	55.6	56.4
23	20/02/2020 21:45:00.000 - 20/02/2020 21:59:59.999	55.8	56.4
24	20/02/2020 22:00:00.000 - 20/02/2020 22:14:59.999	55.9	56.5
25	20/02/2020 22:15:00.000 - 20/02/2020 22:29:59.999	55.8	56.4
26	20/02/2020 22:30:00.000 - 20/02/2020 22:44:59.999	55.9	56.5
27	20/02/2020 22:45:00.000 - 20/02/2020 22:59:59.999	55.6	56.3

28	20/02/2020 23:00:00.000 - 20/02/2020 23:14:59.999	55.5	56.2
29	20/02/2020 23:15:00.000 - 20/02/2020 23:29:59.999	55.5	56.2
30	20/02/2020 23:30:00.000 - 20/02/2020 23:44:59.999	55.5	56.1
31	20/02/2020 23:45:00.000 - 20/02/2020 23:59:59.999	55.5	56.2
32	21/02/2020 00:00:00.000 - 21/02/2020 00:14:59.999	55.5	56.1
33	21/02/2020 00:15:00.000 - 21/02/2020 00:29:59.999	55.4	56.1
34	21/02/2020 00:30:00.000 - 21/02/2020 00:44:59.999	55.4	56.1
35	21/02/2020 00:45:00.000 - 21/02/2020 00:59:59.999	55.4	55.9
36	21/02/2020 01:00:00.000 - 21/02/2020 01:14:59.999	55.4	56
37	21/02/2020 01:15:00.000 - 21/02/2020 01:29:59.999	55.5	56.3
38	21/02/2020 01:30:00.000 - 21/02/2020 01:44:59.999	55.3	55.9
39	21/02/2020 01:45:00.000 - 21/02/2020 01:59:59.999	55.2	55.8
40	21/02/2020 02:00:00.000 - 21/02/2020 02:14:59.999	55.1	55.6
41	21/02/2020 02:15:00.000 - 21/02/2020 02:29:59.999	55.3	55.9
42	21/02/2020 02:30:00.000 - 21/02/2020 02:44:59.999	55.1	55.8
43	21/02/2020 02:45:00.000 - 21/02/2020 02:59:59.999	55	55.6
44	21/02/2020 03:00:00.000 - 21/02/2020 03:14:59.999	55.1	55.7
45	21/02/2020 03:15:00.000 - 21/02/2020 03:29:59.999	55.1	55.7
46	21/02/2020 03:30:00.000 - 21/02/2020 03:44:59.999	55.3	55.9
47	21/02/2020 03:45:00.000 - 21/02/2020 03:59:59.999	55.3	55.9
48	21/02/2020 04:00:00.000 - 21/02/2020 04:14:59.999	55.3	55.9
49	21/02/2020 04:15:00.000 - 21/02/2020 04:29:59.999	55.6	56.2
50	21/02/2020 04:30:00.000 - 21/02/2020 04:44:59.999	55.6	56.2
51	21/02/2020 04:45:00.000 - 21/02/2020 04:59:59.999	55.5	56.8
52	21/02/2020 05:00:00.000 - 21/02/2020 05:14:59.999	55.6	56.1
53	21/02/2020 05:15:00.000 - 21/02/2020 05:29:59.999	55.5	56
54	21/02/2020 05:30:00.000 - 21/02/2020 05:44:59.999	55.6	56.3
55	21/02/2020 05:45:00.000 - 21/02/2020 05:59:59.999	56.1	56.7
56	21/02/2020 06:00:00.000 - 21/02/2020 06:14:59.999	56.1	56.8

57	21/02/2020 06:15:00.000 - 21/02/2020 06:29:59.999	56.5	57.2
58	21/02/2020 06:30:00.000 - 21/02/2020 06:44:59.999	56.7	57.9
59	21/02/2020 06:45:00.000 - 21/02/2020 06:59:59.999	56.9	57.9
60	21/02/2020 07:00:00.000 - 21/02/2020 07:14:59.999	57.2	58.2
61	21/02/2020 07:15:00.000 - 21/02/2020 07:29:59.999	57.3	58.1
62	21/02/2020 07:30:00.000 - 21/02/2020 07:44:59.999	56.9	57.5
63	21/02/2020 07:45:00.000 - 21/02/2020 07:59:59.999	57	57.8
64	21/02/2020 08:00:00.000 - 21/02/2020 08:14:59.999	57.2	57.9
65	21/02/2020 08:15:00.000 - 21/02/2020 08:29:59.999	57.3	58.7
66	21/02/2020 08:30:00.000 - 21/02/2020 08:44:59.999	57.5	58.9
67	21/02/2020 08:45:00.000 - 21/02/2020 08:59:59.999	57.4	58.2
68	21/02/2020 09:00:00.000 - 21/02/2020 09:14:59.999	57.1	58.2
69	21/02/2020 09:15:00.000 - 21/02/2020 09:29:59.999	57.1	58.7
70	21/02/2020 09:30:00.000 - 21/02/2020 09:44:59.999	57.3	59.3
71	21/02/2020 09:45:00.000 - 21/02/2020 09:59:59.999	57.1	58.2
72	21/02/2020 10:00:00.000 - 21/02/2020 10:14:59.999	57.4	58.6
73	21/02/2020 10:15:00.000 - 21/02/2020 10:29:59.999	57.3	58.2
74	21/02/2020 10:30:00.000 - 21/02/2020 10:44:59.999	57.4	58.4
75	21/02/2020 10:45:00.000 - 21/02/2020 10:59:59.999	57.2	58.2
76	21/02/2020 11:00:00.000 - 21/02/2020 11:14:59.999	57.4	58.3
77	21/02/2020 11:15:00.000 - 21/02/2020 11:29:59.999	57.6	62.4
78	21/02/2020 11:30:00.000 - 21/02/2020 11:44:59.999	58.5	63
79	21/02/2020 11:45:00.000 - 21/02/2020 11:59:59.999	57.4	58.3
80	23/02/2020 12:00:00.000 - 23/02/2020 12:14:59.999	56.4	57.6
81	23/02/2020 12:15:00.000 - 23/02/2020 12:29:59.999	56	57.4
82	23/02/2020 12:30:00.000 - 23/02/2020 12:44:59.999	56.4	58
83	23/02/2020 12:45:00.000 - 23/02/2020 12:59:59.999	56.1	57.1
84	23/02/2020 13:00:00.000 - 23/02/2020 13:14:59.999	55.3	56.2
85	23/02/2020 13:15:00.000 - 23/02/2020 13:29:59.999	55.1	55.8

86	23/02/2020 13:30:00.000 - 23/02/2020 13:44:59.999	55.4	56.6
87	23/02/2020 13:45:00.000 - 23/02/2020 13:59:59.999	56	57.3
88	23/02/2020 14:00:00.000 - 23/02/2020 14:14:59.999	55.8	57.2
89	23/02/2020 14:15:00.000 - 23/02/2020 14:29:59.999	55.7	56.7
90	23/02/2020 14:30:00.000 - 23/02/2020 14:44:59.999	55.3	56.6
91	23/02/2020 14:45:00.000 - 23/02/2020 14:59:59.999	55	56.1
92	23/02/2020 15:00:00.000 - 23/02/2020 15:14:59.999	54.7	56
93	23/02/2020 15:15:00.000 - 23/02/2020 15:29:59.999	54.9	55.6
94	23/02/2020 15:30:00.000 - 23/02/2020 15:44:59.999	55.1	56
95	23/02/2020 15:45:00.000 - 23/02/2020 15:59:59.999	54.8	55.7
96	23/02/2020 16:00:00.000 - 23/02/2020 16:14:59.999	54.8	55.5
97	23/02/2020 16:15:00.000 - 23/02/2020 16:29:59.999	55.2	56.1
98	23/02/2020 16:30:00.000 - 23/02/2020 16:44:59.999	55.4	56.4
99	23/02/2020 16:45:00.000 - 23/02/2020 16:59:59.999	55	56
100	23/02/2020 17:00:00.000 - 23/02/2020 17:14:59.999	54.9	55.9
101	23/02/2020 17:15:00.000 - 23/02/2020 17:29:59.999	55.1	55.8
102	23/02/2020 17:30:00.000 - 23/02/2020 17:44:59.999	55.1	55.7
103	23/02/2020 17:45:00.000 - 23/02/2020 17:59:59.999	55.1	56.5
104	23/02/2020 18:00:00.000 - 23/02/2020 18:14:59.999	55.1	56
105	23/02/2020 18:15:00.000 - 23/02/2020 18:29:59.999	55	55.7
106	23/02/2020 18:30:00.000 - 23/02/2020 18:44:59.999	55	55.6
107	23/02/2020 18:45:00.000 - 23/02/2020 18:59:59.999	54.8	55.6
108	23/02/2020 19:00:00.000 - 23/02/2020 19:14:59.999	54.6	56.6
109	23/02/2020 19:15:00.000 - 23/02/2020 19:29:59.999	54.7	55.6
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111	23/02/2020 19:45:00.000 - 23/02/2020 19:59:59.999	55.1	55.7
112	23/02/2020 20:00:00.000 - 23/02/2020 20:14:59.999	55.2	55.8
113	23/02/2020 20:15:00.000 - 23/02/2020 20:29:59.999	55.2	56.1
114	23/02/2020 20:30:00.000 - 23/02/2020 20:44:59.999	55.3	55.8

115	23/02/2020 20:45:00.000 - 23/02/2020 20:59:59.999	55.4	55.9
116	23/02/2020 21:00:00.000 - 23/02/2020 21:14:59.999	55.4	55.9
117	23/02/2020 21:15:00.000 - 23/02/2020 21:29:59.999	55.4	56
118	23/02/2020 21:30:00.000 - 23/02/2020 21:44:59.999	55.3	55.8
119	23/02/2020 21:45:00.000 - 23/02/2020 21:59:59.999	55.2	55.7
120	23/02/2020 22:00:00.000 - 23/02/2020 22:14:59.999	54.5	55.2
121	23/02/2020 22:15:00.000 - 23/02/2020 22:29:59.999	54.7	55.2
122	23/02/2020 22:30:00.000 - 23/02/2020 22:44:59.999	54.5	55.1
123	23/02/2020 22:45:00.000 - 23/02/2020 22:59:59.999	54.7	55.3
124	23/02/2020 23:00:00.000 - 23/02/2020 23:14:59.999	54.8	55.4
125	23/02/2020 23:15:00.000 - 23/02/2020 23:29:59.999	54.8	55.3
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132	24/02/2020 01:00:00.000 - 24/02/2020 01:14:59.999	54.4	55
133	24/02/2020 01:15:00.000 - 24/02/2020 01:29:59.999	54.5	55.3
134	24/02/2020 01:30:00.000 - 24/02/2020 01:44:59.999	54.8	55.4
135	24/02/2020 01:45:00.000 - 24/02/2020 01:59:59.999	54.7	55.2
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143	24/02/2020 03:45:00.000 - 24/02/2020 03:59:59.999	55.1	55.7

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145	24/02/2020 04:15:00.000 - 24/02/2020 04:29:59.999	55.5	56
146	24/02/2020 04:30:00.000 - 24/02/2020 04:44:59.999	55.4	56.2
147	24/02/2020 04:45:00.000 - 24/02/2020 04:59:59.999	55.2	55.9
148	24/02/2020 05:00:00.000 - 24/02/2020 05:14:59.999	55.3	56
149	24/02/2020 05:15:00.000 - 24/02/2020 05:29:59.999	55.3	55.8
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154	24/02/2020 06:30:00.000 - 24/02/2020 06:44:59.999	56	56.8
155	24/02/2020 06:45:00.000 - 24/02/2020 06:59:59.999	56.2	57.3
156	24/02/2020 07:00:00.000 - 24/02/2020 07:14:59.999	56.6	57.5
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159	24/02/2020 07:45:00.000 - 24/02/2020 07:59:59.999	55.9	56.9
160	24/02/2020 08:00:00.000 - 24/02/2020 08:14:59.999	56.1	56.9
161	24/02/2020 08:15:00.000 - 24/02/2020 08:29:59.999	56.4	57.3
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163	24/02/2020 08:45:00.000 - 24/02/2020 08:59:59.999	56.9	57.7
164	24/02/2020 09:00:00.000 - 24/02/2020 09:14:59.999	56.7	57.7
165	24/02/2020 09:15:00.000 - 24/02/2020 09:29:59.999	56.5	57.8
166	24/02/2020 09:30:00.000 - 24/02/2020 09:44:59.999	56.5	57.8
167	24/02/2020 09:45:00.000 - 24/02/2020 09:59:59.999	56.2	57.1
168	24/02/2020 10:00:00.000 - 24/02/2020 10:14:59.999	56.6	57.6
169	24/02/2020 10:15:00.000 - 24/02/2020 10:29:59.999	56.6	64.9
170	24/02/2020 10:30:00.000 - 24/02/2020 10:44:59.999	56.4	57.9
171	24/02/2020 10:45:00.000 - 24/02/2020 10:59:59.999	56.6	57.9
172	24/02/2020 11:00:00.000 - 24/02/2020 11:14:59.999	56.8	57.8

173	24/02/2020 11:15:00.000 - 24/02/2020 11:29:59.999	56.6	57.4
174	24/02/2020 11:30:00.000 - 24/02/2020 11:44:59.999	56.6	57.6
175	24/02/2020 11:45:00.000 - 24/02/2020 11:59:59.999	56.4	57.3
176	24/02/2020 12:00:00.000 - 24/02/2020 12:14:59.999	56.7	57.9
177	24/02/2020 12:15:00.000 - 24/02/2020 12:29:59.999	57.7	58.8
178	24/02/2020 12:30:00.000 - 24/02/2020 12:44:59.999	57.3	58.3
179	24/02/2020 12:45:00.000 - 24/02/2020 12:59:59.999	57.1	57.9
180	24/02/2020 13:00:00.000 - 24/02/2020 13:14:59.999	56.9	57.8
181	24/02/2020 13:15:00.000 - 24/02/2020 13:29:59.999	57	57.9
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184	24/02/2020 14:00:00.000 - 24/02/2020 14:14:59.999	56.3	57.1
185	24/02/2020 14:15:00.000 - 24/02/2020 14:29:59.999	56.5	57.6

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