UCL BIOSCIENCES: CLEO & CDB HoRD

PLANNING COMPLIANCE REPORT (NOISE)

PLANNING STAGE
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24TH MARCH 2022

VANGUARDIA

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EXECUTIVE SUMMARY

This **Planning Compliance Report (Noise)** presents the outcomes of a noise impact assessment and applicable recommendations, in demonstration of compliance with *Camden Planning*'s limiting noise criterion, relative to an equipment upgrade strategy proposed by *UCL*'s Biosciences Division for their *CLOE* and *CDB HoRD* departments.

This document has been produced by *Vanguardia*, acting as noise specialists in parallel with *Buro Happold Engineering*, who have been appointed by *UCL* to design and submit for planning consent, the aforementioned equipment upgrade schemes.

By adoption of *Camden Planning*'s Local Plan and applicable Development Policy DP28, *Vanguardia* have set about presenting a noise impact assessment in consideration of scheduled items of equipment which have been specified for both upgrade schemes, which in turn is required to be conducted in accordance with the methodology described in British Standard; *BS4142:2014+A1:2019*.

In summary, *Vanguardia* have determined that based on the current, proposed equipment upgrade strategy, that it would be completely possible to demonstrate compliance at each of the 2No. identified nearest-affected, noise-sensitive receptors (these being; Janet Poole House and Arthur Tattersall House), with *Camden Planning*'s limiting noise criterion, by consideration of the proposed (i.e. Tendered) equipment noise emission performances.

As such, *Vanguardia* conclude that no specific scheme of noise mitigation will be required to any of the proposed items of equipment comprising the two upgrade schemes, in order to demonstrate compliance with *Camden Planning*'s noise criterion.

1. INTRODUCTION

PURPOSE OF THE REPORT

1.1. *University College London* (hereafter; "UCL") have appointed *Buro Happold Engineering* to provide engineering services with regards to a building services upgrade strategy targeted by the Biosciences Division of UCL. This strategy encompasses upgrades to UCL building services assets across both their; *Centre for Life's Origins & Evolution* (CLOE) and *Cell and Development Biology* (CDB) HoRD departments.

1.2. As such, given this upgrade strategy will comprise a number of new, and replacement, plant to be specified and installed on the roof of the *UCL Biosciences*' Darwin Building (B15), it will be necessary for the UCL to submit a Planning Application to the Local Planning Authority (*London Borough of Camden Planning Directorate*, hereafter; "Camden Planning") to seek award of a consent to do so.

1.3. In support of this Planning Application, *Buro Happold Engineering* have collaborated with in-house environmental noise specialist; *Vanguardia* to produce a **Planning Compliance Report (Noise),** demonstrating whether *Camden Council*'s noise planning policy are complied with.

1.4. This report therefore details *Buro Happold*'s proposed services upgrade strategy, including: numbers of, types (makes and models) and installation locations of all new, and replacement, plant as well as details of a baseline noise survey conducted at a location which best represents the typical background noise incident on the nearest-affected, noise-sensitive receptors (NSRs), relative to the locations of the new and replacement equipment.

1.5. A glossary of acoustics terminology used in this report is referenced in Appendix F.

SITE DESCRIPTION

1.6. The Darwin Building of UCL's Biosciences Division is addressed at Gower Street, Camden, London WC1E 6BT, the roof of which houses all of the facility's building services equipment in a West-facing orientation. Opposite the Darwin Building on Gower Street is an existing period terrace comprising a number of office demises (predominantly on the Ground Floors) as well as residential (student accommodation) demises on the upper floors, the majority of which are managed by UCL's Facilities Management team.

1.7. The terracing of student accommodation assets situated along this section of Gower Street, considered residential in nature, are deemed to be the nearest-affected, noise-sensitive receptors (hereafter; "NSRs") relative to the equipment upgrade strategy. Further details of these NSRs will be described in Section 2.4.

EXISTING NOISE CLIMATE

1.8. The UCL Darwin Building site is dominated by Road Traffic Noise (RTN), generated predominantly from Gower Street and is almost continuously observable for 24-hours-a-day, 7-days a week, and only usually subsiding during School Half-Terms and Public Holidays. Some secondary RTN is also generated from the adjoining Torrington Place. In addition, there is a noticeable contribution of existing mechanical services noise which is generated from several UCL building assets, within (and including) a 150-metre radius of the Darwin Building. This existing building equipment, service the majority of UCL's built environment assets.

2. PLANNING REQUIREMENTS

LOCAL PLANNING GUIDANCE

2.1. Prior to the specification and installation of all new, and replacement, building services equipment which will be required to service UCL's CLOE and CDB HoRD facilities, it will be necessary to submit evidence of a noise impact assessment, in demonstration of compliance with the Local Planning Authority's noise planning guidance, relative to external mechanical services equipment.

2.2. To this end, *Vanguardia* have reviewed *Camden Planning*'s Development Policy (Noise), with a view to applying the necessary environmental noise protection criteria stipulated under this guidance. Table E of Camden's Development Policy; DP28 *Noise and Vibration* (2010-2025) details the limiting noise criteria at which planning consent, relative to a submitted scheme of mechanical services equipment, would ordinarily be refused. Figure 1 below excerpts Table E from DP28 for ease of reference:

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre 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 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dB$L_{Aeq'}$

Figure 1 Excerpt of Table E of Camden Development Policy (2010-2025); DP28 – *Noise and Vibration*

IDENTIFICATION OF SENSITIVE FACADES

2.3. Table E of Camden Development Policy DP28, makes reference to "sensitive facades" for which noise generated by proposed schemes of noise-generating equipment, when assessed at a distance of 1-metre immediately in front of these, should demonstrate compliance with the stated planning criterion.

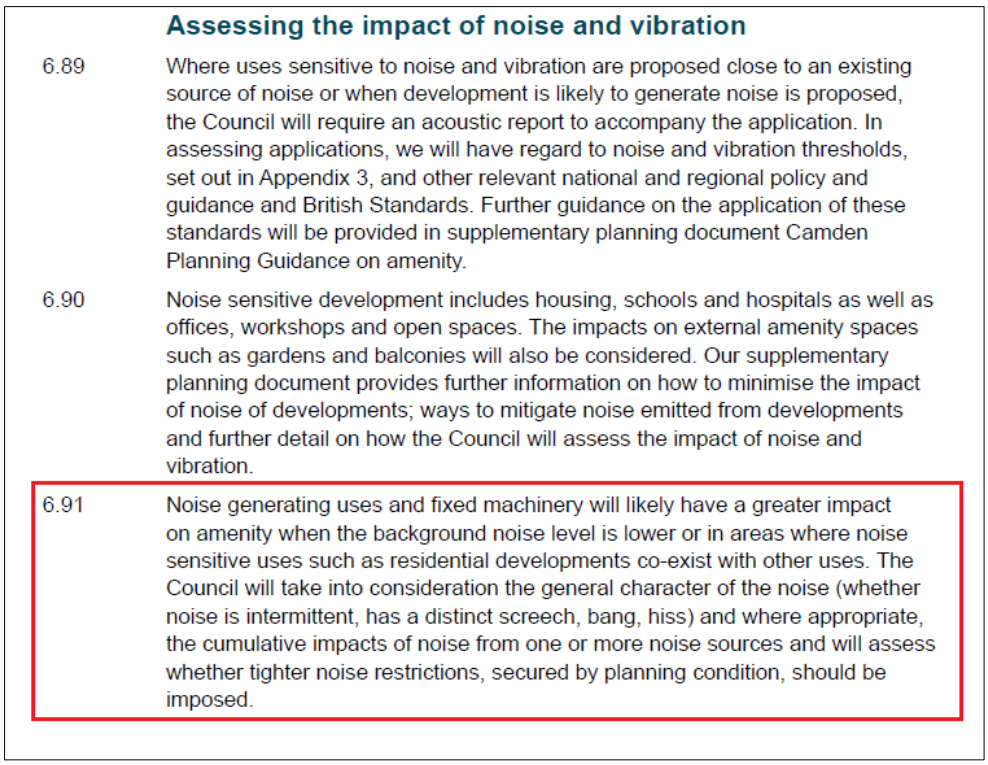
2.4. For the purpose of presenting the outcomes of a noise impact assessment relative to the *UCL Biosciences* scheme, the following nearest-affected, noise-sensitive receptor locations are deemed applicable, from Table 1 below:

Table 1 Identified NSR locations pertinent for assessment with Camden Development Policy DP28 – *Noise and Vibration*

NSR reference	Description	Type	Address	Noise impact assessment position
NSR1	Janet Poole House	Student Hall of Residence (Residential)	105 Gower Street, London WC1E	1-metre in front of 3rd Floor mansard windows
NSR2	Arthur Tattersall House	Student Hall of Residence (Residential)	117 Gower Street, London WC1E	1-metre in front of 3rd Floor mansard windows

APPLICABLE NOISE PLANNING CRITERION

2.5. Additionally, Policy A4 *Noise and Vibration* of Camden's Local Plan (2017) stipulates the following environmental noise protection objectives under Paragraphs 6.89 to 6.91, which are excerpted in Figure 2 below:



Assessing the impact of noise and vibration

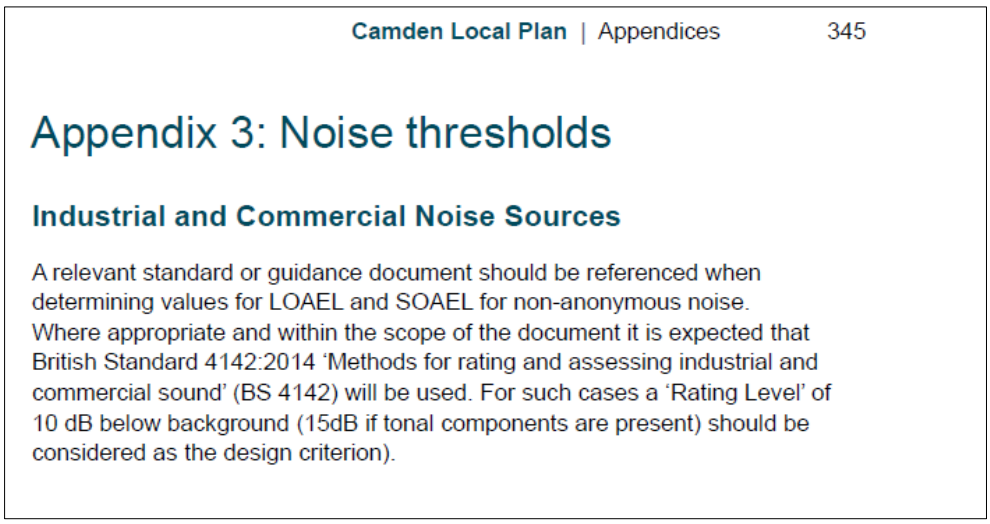
6.89 Where uses sensitive to noise and vibration are proposed close to an existing source of noise or when development is likely to generate noise is proposed, the Council will require an acoustic report to accompany the application. In assessing applications, we will have regard to noise and vibration thresholds, set out in Appendix 3, and other relevant national and regional policy and guidance and British Standards. Further guidance on the application of these standards will be provided in supplementary planning document Camden Planning Guidance on amenity.

6.90 Noise sensitive development includes housing, schools and hospitals as well as offices, workshops and open spaces. The impacts on external amenity spaces such as gardens and balconies will also be considered. Our supplementary planning document provides further information on how to minimise the impact of noise of developments; ways to mitigate noise emitted from developments and further detail on how the Council will assess the impact of noise and vibration.

6.91 Noise generating uses and fixed machinery will likely have a greater impact on amenity when the background noise level is lower or in areas where noise sensitive uses such as residential developments co-exist with other uses. The Council will take into consideration the general character of the noise (whether noise is intermittent, has a distinct screech, bang, hiss) and where appropriate, the cumulative impacts of noise from one or more noise sources and will assess whether tighter noise restrictions, secured by planning condition, should be imposed.

Figure 2 Excerpt of Policy A4 of Camden's Local Plan (2018); *Assessing the impact of noise and vibration*

2.6. To supplement Policy A4 of Camden's Local Plan, Appendix 3: *Noise thresholds*, provides an objective, limiting noise criterion pertinent to submitted schemes containing new noise sources of a mechanical and/or industrial nature. Figure 3 below, excerpts Appendix 3 of Policy A4 relative to Industrial and Commercial Noise Sources:



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Appendix 3: Noise thresholds

Industrial and Commercial Noise Sources

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion).

Figure 3 Excerpt from Camden Local Plan (Policy A4): Appendix 3: Noise thresholds (Industrial and Commercial Noise Sources)

2.7. At the planning stage, an appraisal of the potential for adverse noise impact, when assessed at the identified NSR location(s) relative to a submitted scheme of a mechanical or industrial nature, should apply the overarching guidance contained in British Standard; *BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound*, as stated in Appendix 3.

3. PROPOSED MECHANICAL SCHEMES

OUTLINE OF SCHEMES

3.1. *Vanguardia* have been briefed by *Buro Happold* engineers in terms of UCL's proposed schemes of building services, which shall comprise either the CLOE or the CDB HoRD upgrade strategies (*cf.* Section 1.1.). Table 2 below, summarises the key items of new, noise-generating equipment which will constitute the entirety of both submitted schemes:

Table 2 Summary of key items of new, noise-generating equipment comprising UCL upgrade strategy

UCL upgrade scheme	Description	Make	Model	No. off	Design condition	Location
CLOE	Air Cooled Chiller	Daikin	EWYT085B-SSA1	2	New (replacement of existing)[1]	Darwin Bldg. (Roof, South)
	Outdoor condensing unit	Daikin	RZAG50A	4	New (additional to existing)	Darwin Bldg. (Roof, Central)
CDB HoRD	Outdoor condensing unit	Daikin	RZAG50A	2	New (additional to existing)	Darwin Bldg. (Roof, North)

[1] See Section 3.2. for noise impact assessment dispensation.

3.2. For the purpose of an appraisal of the potential for adverse noise impact due to the proposed items of equipment, and in line with *Camden Planning*'s noise planning policy, the existing 2No. Chillers (ref: "Chillers 3 and 4") are being decommissioned and replaced by 2No. Air Cooled Chillers (ref: "Daikin EWYT085B-SSA1"). As such, where it can be demonstrated that the theoretically-continued noise impact which would have been due to the retention of the existing 2No. Chiller plant ("3 and 4"), is more than that due to the equipment they are being replaced by (i.e. the 2No. Daikin Air Cooled Chillers), then the absolute noise impact due to the replacement equipment (as comprising the submitted schemes), may be omitted under this assessment.

3.3. To supplement the scheduled items of equipment identified in Table 2 above, the locations of these (relative to the Darwin Building roof) are presented in Figure 4 overleaf:

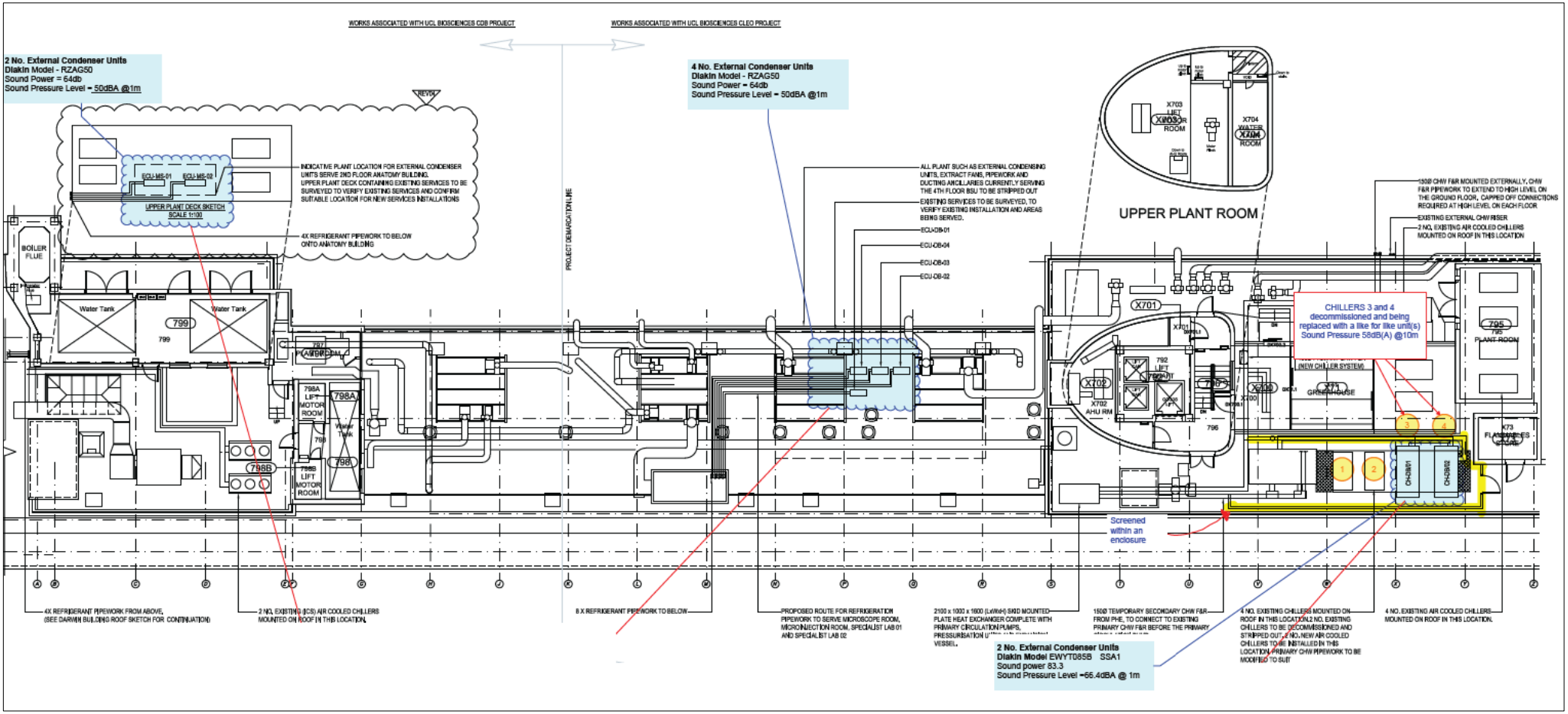


Figure 4 Locations of new, noise-generating equipment comprising UCL upgrade strategy (CLOE and CDB HoRD)

NOISE EMISSION PERFORMANCE

3.4. The noise emission performance statements of the scheduled items of equipment identified in Table 2 above, are presented below:

3.4.1. *UCL CLOE* upgrade strategy (new equipment):

- Daikin EWYT085B-SSA1: See Appendix A.1.
- Daikin RZAG50A: See Appendix A.2.

3.4.2. *UCL CLOE* upgrade strategy (decommissioned equipment):

- ICS TAE301: See Appendix A.3

3.4.3. *UCL CDB HoRD* upgrade strategy (new equipment):

- Daikin RZAG50A: See Appendix A.2.

OPERATING ASSUMPTIONS

3.5. The noise impact assessment presented in this report is considered applicable when the following proposed equipment operating assumptions are in effect. Should any of the following operating assumptions not be applicable at the post-completion stage, then the noise planning criteria adopted under this assessment would need to be revised, to enable final equipment operation to continue in compliance with the planning requirements.

- All services units contained in the identified plant spaces, shall operate under normal design duties, as stated by *Buro Happold Engineering* and specified as per their respective manufacturers' Technical Submittals (at the Design Stage);
- The predicted Specific Sound Level (as defined in Paragraph 3.11 of BS4142:2014) shall be determined to account for distance and future barrier attenuation from each source position, to a point which is 1.0 m in front of the external facing facade of each NSR location;
- All services units contained in the dedicated plant spaces, are assumed to operate for 24-hours-per-day, 7-days-per-week;

- Any residual services noise emitted from the proposed dedicated plant spaces, shall not contain any tonal components, nor be externally observed to demonstrate either intermittent or impulsive characteristics (where appropriate; the fitting of inverters to individual items of equipment (e.g. chillers and condensing plant), to mitigate the likelihood of impulsive operation, is therefore recommended);
- The units shall be regularly serviced by a competent person under the provisions of the Local Planning Policy, to demonstrate continued compliance with the stipulated noise condition.

4. BASELINE NOISE SURVEY

PROCEDURES

4.1. In compliance with the Camden Local Plan guidance as described in section 2.7., a baseline noise survey has been conducted in accordance with the requirements of British Standard; *BS4142:2014+A1:2019* in order to quantify the typical background sound level incident on the facades of the NSRs identified in Table 1 previously.

4.2. Un-attended sound pressure level measurements of the Background Sound were taken at 1No. location which was deemed representative of that which would be incident on the facades of the nearest-affected NSR locations, during both the daytime (07.00 to 23.00 hrs) and night-time (23.00 to 07.00 hrs) periods.

4.3. All measurements were taken using an integrating sound level meter conforming to "Class 1" precision according to British Standard; *BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications* and are quantified relative to a reference sound pressure of $2x10^{-5}$ Pa and taken using the "Fast" (125 ms) time-weighting.

MEASUREMENT LOCATION

4.4. Figure 5 below identifies the survey location, which was one of the 5th Floor offices of the UCL Darwin Building overlooking 113 Gower Street (Newman House). The location was selected to minimise the degree of direct sound, propagated from the existing building services equipment currently located on the roof of the Darwin Building:

Figure 5 Identification of baseline noise survey location (UCL Darwin Building, 5th Floor offices)

4.5. As the measurement microphone was positioned around 1-metre from the edge of the Darwin Building facade, a **-3 dB** correction has been applied to all measured noise indices, to compensate for the effect of facade reflections.

TIME AND DATE OF SURVEY

4.6. The baseline noise survey started at 13.30 hrs on the 4th March 2022 and ended at 12.00 hrs on the 9th March 2022, for a total duration of 118.5 No. hours (4.93 No. days) and over discrete 15-minute intervals (474 No. in total).

WEATHER CONDITIONS

4.7. Prevailing weather conditions during the survey indicate very little (to no) rainfall observed, with an average wind speed of around 5.9 m/s across the duration of the survey period, which exceeds the recommended average wind speed limit of 5 m/s in Paragraph 6.4. of *BS4142:2014* by +0.9 m/s. This excess in wind speed is not deemed sufficient to have significantly increased measured sound pressure levels and therefore no correction to the raw survey dataset is required.

4.8. The average cloud cover observed during the total survey period, was visually estimated at between 0.5 to 0.7 Oktas. The average daily temperatures observed at the start of the survey was 8.2°C and around 10.6°C at the end of the survey.

4.9. The presented weather data was recorded at the nearest independent weather station (London, Charing Cross ID: *ILONDO440* "St. Martins Lane") relative to the microphone location and daily summaries of this are shown in Appendix B.

INSTRUMENTATION USED

4.10. A *Larson-Davis LxT "Sound Expert"* sound level meter (serial no. 0003813) was used in conjunction with a *Larson-Davis PRMLxT1L* preamplifier (serial no. 027653) fitted with a *PCB Piezotronics 377A13* (1/2-inch, prepolarised) pressure microphone (serial no. LW135909). A proprietary windshield was attached to the microphone, to which the effect on the free-field frequency response up to 10 kHz is negligible.

4.11. The instrument assembly (including the microphone extension cable) was calibrated before and after the survey to a linear sound pressure level of 114.0 dB (±0.2 dB SPL) using a *Larson-Davis CAL-200* Field Calibrator (serial no. 13713) to observe the presence of any calibration drifts, of which none were detected at the end of the survey. The field calibrator conforms to "Class 1" precision in accordance with British Standard; *BS EN 60942:2018 Electroacoustics. Sound Calibrators*.

4.12. Certificates of periodic calibration for the instrument assembly and field calibrator, provided by a traceable UK source, are contained in Appendix C.

SURVEY DATA

4.13. The full baseline noise survey data is included in Appendix D, with the following noise indices extracted from the raw (i.e. the uncorrected) dataset, for ease of reference:

- $L_{Aeq,15\text{-}mins}$
- L_{AFmin}
- L_{AFmax}
- $L_{AF90,15\text{-}mins}$

5. NOISE IMPACT ASSESSMENT

DETERMINATION OF BACKGROUND SOUND LEVEL

5.1. From the results presented in Appendix D, it is possible to assess the dataset to determine the typical *Background Sound* level which would be incident on the facades of the identified NSR locations, and according to the methodology described in Section 8 of *BS4142:2014+A1:2019*.

5.2. Under this assessment, the *Background Sound* is quantified using the "$L_{AF90,T}$" (dB) index using a 15-minute interval time (T), as appropriate to assess compliance with the *Camden Planning*'s criterion, and has been applied at each the 2No. NSR locations, as representative of that which would be incident on the facades of those NSRs equally.

5.3. Table 4 below, presents a statistical summary of the assessed *Background Sound* levels observed from the baseline noise dataset, during all of the available daytime (16-hour) and night-time (8-hour) periods, as occurring across the full survey period:

Table 3 Summary of statistical assessment of *Background Sound* levels

Statistical Assessment	Measured *Background Sound* level, $L_{AF90,15\text{-mins}}$		Corrected *Background Sound* level, $L_{AF90,15\text{-mins}}$ [1]	
	Daytime (07.00 to 23.00 hrs)	Night-time (23.00 to 07.00 hrs)	Daytime (07.00 to 23.00 hrs)	Night-time (23.00 to 07.00 hrs)
Mean	58 dB	53 dB	55 dB	50 dB
25th-percentile	55 dB	52 dB	52 dB	49 dB
90th-percentile	54 dB	52 dB	51 dB	49 dB

[1] Corrected by -3 dB to compensate for facade reflections, as described in Section 4.5. of this report.

5.4. From the statistical assessment of *Background Sound* levels presented in Table 3 above, and given the operating conditions of the proposed equipment upgrade strategy assumes continuous operation (i.e. 24-hours per day, 7-days per week, *cf.* Section 3.5.), it is therefore deemed prudent to assess the predicted noise impact of the proposed schemes against the lowermost of the night-time values, as represented by the "90th-percentile" of the $L_{AF90,15\text{-mins}}$. This equates to a typical *Background Sound* level, for assessment with the *BS4142:2014+A1:2019* methodology as an; ***$L_{A90,T}$* 49 dB** (shown in the **amber** cell).

CALCULATION OF THE PLANNING CRITERION

5.5. Consequently, by application of *Camden Planning*'s noise criterion (*cf.* Section 2.6., Figure 3), the limiting noise impact shall not exceed a value which is 10 dB lower than the assessed, typical *Background Sound* level (determined according to *BS4142:2014+A1:2019*).

5.6. Therefore, adopting the value assessed under Section 5.4. above, the limiting noise criterion for planning purposes shall be an; $\boldsymbol{L_{Aeq,T}}$ **39 dB** (i.e. 49 – 10 dB = 39 dB).

NOISE PREDICTION METHODOLGY

5.7. Adopting the noise emission performance values presented in Appendix A alongside the equipment schedule shown in Table 2, and coupled with the proposed equipment locations indicated in Figure 4, a holistic noise impact assessment may be produced.

5.8. By comparison of the noise emission performance of the decommissioned equipment (*cf.* "Chillers 3 and 4" in Section 3.2., presented in Appendix A.2) with that of the equipment which they are being replaced by (*cf.* "2No. Daikin EWTY085B-SSA1", presented in Appendix A.1) and given that the general site topography pertinent to the decommissioned equipment and that of the replacement equipment, is broadly identical (i.e. the propagation distances to each NSR location and barrier (i.e. plant enclosure) attenuation), then it can be seen that the only remaining variable is the relative noise emission performance between the two types of equipment.

5.9. As such, given the noise emission performance of the decommissioned equipment (2No. ICS Chillers) is very close to a sound pressure level of around; 78 dBA at 1-metre (58 dBA at 10-metres) and that of the replacement equipment (2No. Daikin Air Cooled Chillers) is a sound pressure level of; 66.4 dBA at 1-metre (the difference being at least 11 dBA quieter), then this comparison validates the proposed scheme's ability to omit the noise impact at the NSR locations due to the replacement equipment, from this assessment.

5.10. To complete the assessment, the relative plan distances between each item of equipment and the 2No. NSR locations identified in Table 1 are assimilated into a desktop noise propagation prediction, to determine the sum acoustic energy (sound pressure level) contributions, due to all the proposed equipment, to a point which is 1-metre in front of each NSR location, as summarised in Figure 6 overleaf:

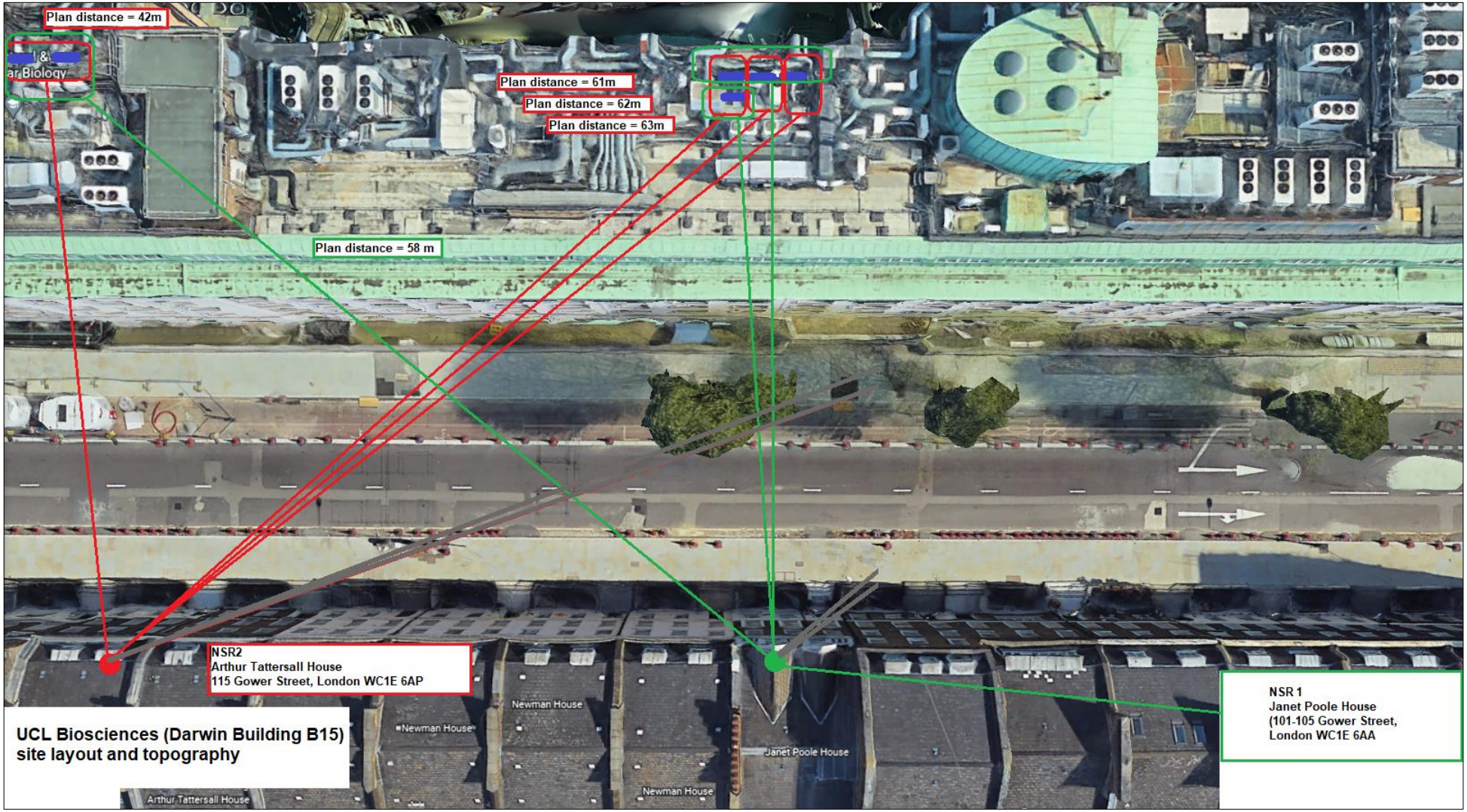


Figure 6 Summary of noise impact assessment parameters

CALCULATION OF RATING LEVELS AND PLANNING COMPLIANCE

5.11. From this desktop calculation, it is possible to determine the predicted *Specific Sound* levels due to all the proposed equipment, when assessed at each of the NSR locations in accordance with the methodology described in *BS4142:2014+A1:2019*.

5.12. Consequently, Table 4 below presents the results of the noise impact assessment from which the *Rating Level* at each NSR location has been determined by adoption of the Subjective Method for assessing acoustic character corrections. Finally, the resulting *Rating Levels* are compared with the limiting noise planning criterion determined under Section 5.6., to demonstrate whether compliance can be achieved.

Table 4 Summary of noise impact assessment and determination of Rating Levels at each NSR location (according to *BS4142:2014+A1:2019*)

NSR Location	**Predicted *Specific Sound* level, $L_{Aeq,Tr}$**	**Character corrections**			***Rating Level*, $L_{Ar,Tr}$**	**Compliance**
		Tonality	**Impulsivity**	**Intermittency**		
NSR1	19.8 dB	0 dB	0 dB	0 dB	19.8 dB	**Yes** (-19.2 dB)
NSR2	17.7 dB	0 dB	0 dB	0 dB	17.7 dB	**Yes** (-21.3 dB)

5.13. As per the uncertainty methodology described in Section 10 of *BS4142:2014+A1:2019*, an Uncertainty Budget has been calculated and is included in Appendix E for reference.

DISCUSSION

5.14. From the results of the noise impact assessment presented in Table 4, it can be seen that based on the proposed site topography and applicable noise impact parameters these, in combination, would permit the equipment upgrade schemes to comfortably comply with *Camden Planning*'s limiting noise criterion at both NSR1 (*Janet Poole House*) and NSR2 (*Arthur Tattersall House*).

5.15. As such, no specific scheme of noise mitigation would be required in order to demonstrate compliance with *Camden Planning*'s stipulated noise criterion.

6. CONCLUSIONS

6.1. The Biosciences Division of UCL have appointed *Buro Happold Engineering* to specify an equipment upgrade scheme for both their *CLOE* and *CDB HoRD* departments, which will require a schedule of mechanical services equipment to be installed on the existing service deck on the roof of UCL's Darwin Building.

6.2. As such, it will be necessary to submit a Planning Application to the *Camden Planning Directorate*, to include a noise impact assessment which may determine whether *Camden Planning*'s limiting noise criterion can be demonstrated as compliant.

6.3. To this end, *Buro Happold Engineering* have instructed noise specialist *Vanguardia* to produce this noise impact assessment, which has been conducted in accordance with the requirements of *Camden Planning*'s Local Plan and applicable Development Policy (DP28). In turn, the assessment methodology contained in British Standard; *BS4142:2014+A1:2019* has been adopted to calculate the predicted *Specific Sound* levels due to the proposed equipment upgrade schemes, when assessed at a position which is 1-metre in front of each of 2No. nearest-affected, noise-sensitive receptor locations.

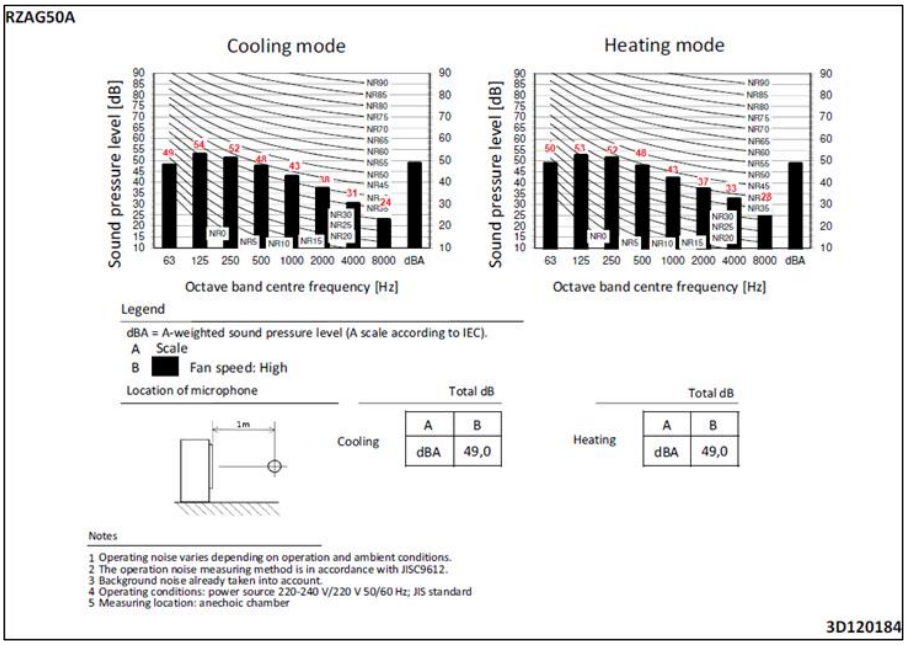
6.4. From this, the *Rating Levels* (according to *BS4142:2014+A1:2019*) have been determined and compared with the limiting noise criterion for planning compliance, which has in turn been determined from the typical *Background Sound* level observed from a set of baseline noise data obtained from a site survey, as representative of those incident on the facades of each of the two identified NSR locations.

6.5. *Vanguardia* have concluded that based on the current, proposed equipment upgrade strategy (for both the *CLOE* and *CDB HoRD* schemes), that it would be completely possible to demonstrate compliance with *Camden Planning*'s limiting noise criterion at each of the 2No. NSR locations equally.

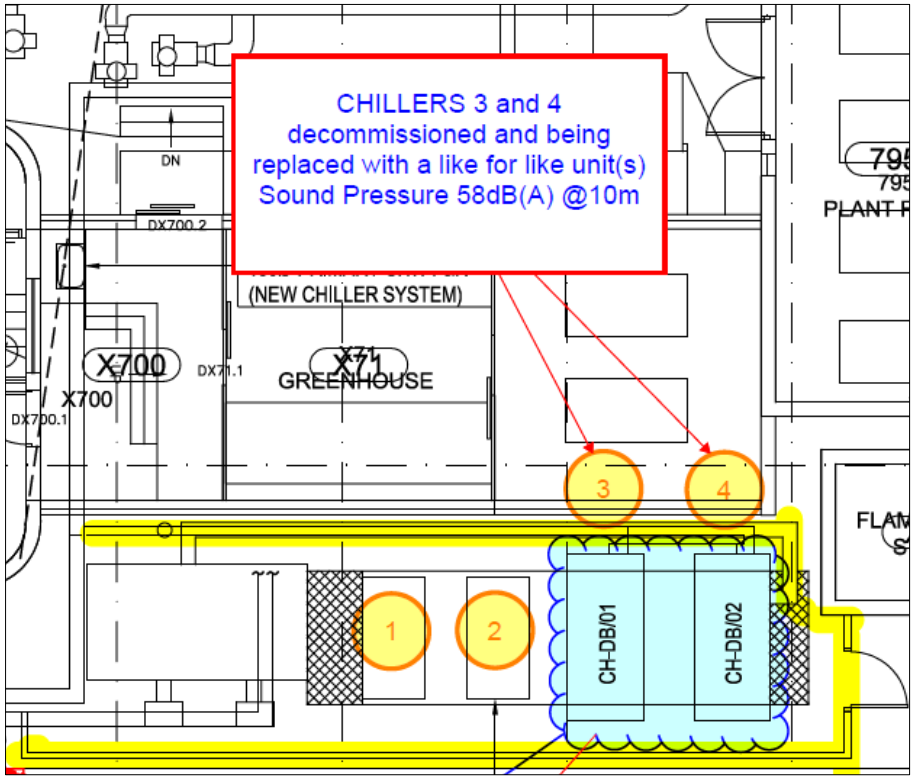
6.6. Consequently, *Vanguardia* conclude that no specific scheme of noise mitigation will be required for the proposed equipment upgrade strategy, to demonstrate compliance with *Camden Planning*'s noise criterion.

APPENDIX A- EQUIPMENT NOISE EMISSION PERFORMANCES

APPENDIX A.1 DAIKIN: RZAG50A



APPENDIX A.2 ICS: (ICS) TAE 301



APPENDIX B- WEATHER CONDITIONS

Historical weather conditions from the geographically-closest location were accessed on the 23/03/22 from weather station: "ST. MARTINS LANE, LONDON" from:

https://www.wunderground.com/dashboard/pws/ILONDO440

WEATHER SUMMARY: FRIDAY 4TH MARCH 2022

March 4, 2022

	High	Low	Average
Temperature	51.8 °F	43.2 °F	46.8 °F
Dew Point	40.8 °F	30.6 °F	35.0 °F
Humidity	66 %	58 %	63 %
Precipitation	0.01 in	--	--

	High	Low	Average
Wind Speed	11.6 mph	0.0 mph	3.9 mph
Wind Gust	14.8 mph	--	6.8 mph
Wind Direction	--	--	WSW
Pressure	30.07 in	29.91 in	--

WEATHER SUMMARY: SATURDAY 5TH MARCH 2022

March 5, 2022

	High	Low	Average
Temperature	45.5 °F	40.1 °F	43.0 °F
Dew Point	32.5 °F	24.4 °F	30.6 °F
Humidity	66 %	53 %	61 %
Precipitation	0.00 in	--	--

	High	Low	Average
Wind Speed	18.1 mph	0.0 mph	5.2 mph
Wind Gust	22.8 mph	--	10.8 mph
Wind Direction	--	--	
Pressure	30.23 in	30.06 in	--

WEATHER CONDITIONS: SUNDAY 6TH MARCH 2022

March 6, 2022

	High	Low	Average
Temperature	45.9 °F	39.2 °F	42.0 °F
Dew Point	25.9 °F	14.5 °F	21.7 °F
Humidity	55 %	28 %	45 %
Precipitation	0.00 in	--	--

	High	Low	Average
Wind Speed	19.5 mph	0.0 mph	7.0 mph
Wind Gust	25.1 mph	--	13.3 mph
Wind Direction	--	--	NE
Pressure	30.31 in	30.22 in	--

WEATHER CONDITIONS: MONDAY 7TH MARCH 2022

March 7, 2022

	High	Low	Average
Temperature	46.0 °F	38.7 °F	41.6 °F
Dew Point	29.1 °F	14.7 °F	21.8 °F
Humidity	64 %	32 %	46 %
Precipitation	0.00 in	--	--

	High	Low	Average
Wind Speed	21.5 mph	0.0 mph	6.6 mph
Wind Gust	27.3 mph	--	12.6 mph
Wind Direction	--	--	East
Pressure	30.28 in	29.97 in	--

WEATHER CONDITIONS: TUESDAY 8TH MARCH 2022

March 8, 2022

	High	Low	Average
Temperature	54.3 °F	36.1 °F	44.9 °F
Dew Point	31.5 °F	14.7 °F	20.9 °F
Humidity	57 %	23 %	39 %
Precipitation	0.00 in	--	--

	High	Low	Average
Wind Speed	15.2 mph	0.0 mph	6.1 mph
Wind Gust	20.6 mph	--	10.7 mph
Wind Direction	--	--	ESE
Pressure	29.98 in	29.82 in	--

WEATHER CONDITIONS: WEDNESDAY 9TH MARCH 2022

March 9, 2022

	High	Low	Average
Temperature	55.2 °F	48.6 °F	51.1 °F
Dew Point	37.4 °F	27.9 °F	33.3 °F
Humidity	64 %	36 %	51 %
Precipitation	0.00 in	--	--

	High	Low	Average
Wind Speed	18.6 mph	0.0 mph	6.6 mph
Wind Gust	27.3 mph	--	11.4 mph
Wind Direction	--	--	SSE
Pressure	29.96 in	29.88 in	--

APPENDIX C- CERTIFICATES OF PERIODIC CALIBRATION

APPENDIX C.1. LARSON-DAVIS L_XT ASSEMBLY

Calibration Certificate

Certificate Number 2021002460
Customer:
Vanguardia Oxted UK

Model Number	LxT SE	***Procedure Number***	D0001.8384
Serial Number	0003813	***Technician***	Ron Harris
Test Results	**Pass**	***Calibration Date***	8 Mar 2021
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	
Description	Sound Expert LxT Class 1 Sound Level Meter Firmware Revision: 2.404	***Temperature***	23.34 °C ± 0.25 °C
		Humidity	52.8 %RH ± 2.0 %RH
		Static Pressure	85.71 kPa ± 0.13 kPa

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis PRMLxT1L. S/N 027653
PCB 377B02. S/N LW135909
Larson Davis CAL200. S/N 9079
Larson Davis CAL291. S/N 0108

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2017.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev J Supporting Firmware Version 2.301, 2015-04-30

LARSON DAVIS - A PCB PIEZOTRONICS DIV.
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ACCREDITED Cert. 43622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

2021-3-8T11:25:59

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D0001.8406 Rev E

APPENDIX C.2. LARSON-DAVIS CAL-200 FIELD CALIBRATOR

Laboratory Location

Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030

0789

Certificate of Calibration and Conformance

Certificate number: **U40162**

Test Object: **Sound Calibrator**

Producer: **Larson Davis**
Type: **CAL200**
Serial number: **13713**
Customer: **Vanguardia Consulting**
Address: **21 Station Road West, Oxted, Surrey. RH8 9EE.**
Contact Person: **Ian Fortune**
Order No: **Contract: 22087**

Measurement Results	Level dB	Level Stability dB	Frequency Hz	Distortion %
Measurement 1	113.93	0.01	1000.36	0.48
Measurement 2	113.93	0.01	1000.34	0.46
Measurement 3	113.94	0.01	1000.35	0.46
Result (Average):	**113.93**	**0.01**	**1000.35**	**0.47**
Expanded Uncertainty:	0.1	0.02	1	0.1
Degree of Freedom:	>100	>100	>100	>100
Coverage Factor:	2	2	2	2

The stated level is relative to 20µPa. The level is traceable to National Standards. The stated level is valid at reference conditions.The following correction factors have been applied during the measurement
Pressure:0 dB/kPa Temperature:0 dB/°C Humidity:0 dB/%RH Load volume: 0 dB/mm3

Conditions	*Pressure kPa*	*Temperature °C*	*Humidty %RH*
Reference conditions	101.325	23	50
Measurement conditions	102.655 ±0.047	22.3 ±0.2	32.2 ±0.9

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2022\LDL200_13713_M1.nmf

Preconditioning
The equipment was preconditioned for more than 4 hours in the specified calibration environment.

Method
Calibration has been performed as set out in the current version of CA Technical procedure TP01

Calibration Dates:

Received date:	02/02/2022	Reviewed date:	11/02/2022
Calibration date:	11/02/2022	Issued date:	11/02/2022

Technicians: (Electronic certificate)
Calibrated by: *Palanivel Marappan B.Eng(Hons), M.Sc*
Reviewed by: *Darren Batten*

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.

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APPENDIX D- NOISE SURVEY DATASET

Record #	Date	Time	Run Duration	LAeq	LAFmin	LAFmax	LAF90.00	LAeq
1	2022-03-04	13:30:00	00:15:00.0	64.9	55.4	80.3	57.9	64.9
2	2022-03-04	13:45:00	00:15:00.0	67.3	55.6	91.4	58.0	67.3
3	2022-03-04	14:00:00	00:15:00.0	79.1	55.9	107.2	58.8	79.1
4	2022-03-04	14:15:00	00:15:00.0	65.4	55.1	81.9	57.6	65.4
5	2022-03-04	14:30:00	00:15:00.0	66.9	55.5	85.0	58.5	66.9
6	2022-03-04	14:45:00	00:15:00.0	64.5	55.2	73.4	58.0	64.5
7	2022-03-04	15:00:00	00:15:00.0	65.3	55.8	84.8	58.8	65.3
8	2022-03-04	15:15:00	00:15:00.0	64.7	55.0	80.2	57.6	64.7
9	2022-03-04	15:30:00	00:15:00.0	65.1	55.6	76.0	58.6	65.1
10	2022-03-04	15:45:00	00:15:00.0	65.8	55.4	80.1	58.2	65.8
11	2022-03-04	16:00:00	00:15:00.0	65.3	55.5	75.2	60.0	65.3
12	2022-03-04	16:15:00	00:15:00.0	66.1	54.4	74.8	58.9	66.1
13	2022-03-04	16:30:00	00:15:00.0	67.4	55.4	88.1	58.5	67.4
14	2022-03-04	16:45:00	00:15:00.0	66.7	56.0	76.0	59.5	66.7
15	2022-03-04	17:00:00	00:15:00.0	66.2	54.7	75.2	57.5	66.2
16	2022-03-04	17:15:00	00:15:00.0	74.9	56.0	99.4	59.2	74.9
17	2022-03-04	17:30:00	00:15:00.0	65.7	55.1	79.9	58.4	65.7
18	2022-03-04	17:45:00	00:15:00.0	65.5	54.9	79.8	57.7	65.5
19	2022-03-04	18:00:00	00:15:00.0	65.4	53.9	72.9	57.9	65.4
20	2022-03-04	18:15:00	00:15:00.0	65.4	53.6	78.9	58.7	65.4
21	2022-03-04	18:30:00	00:15:00.0	65.6	54.8	76.2	59.7	65.6
22	2022-03-04	18:45:00	00:15:00.0	65.5	54.3	85.4	57.2	65.5
23	2022-03-04	19:00:00	00:15:00.0	63.5	53.6	72.5	56.7	63.5
24	2022-03-04	19:15:00	00:15:00.0	70.4	54.3	94.5	57.5	70.4
25	2022-03-04	19:30:00	00:15:00.0	65.5	54.1	83.0	56.8	65.5
26	2022-03-04	19:45:00	00:15:00.0	64.0	53.5	74.7	57.0	64.0
27	2022-03-04	20:00:00	00:15:00.0	66.3	54.3	93.4	57.5	66.3
28	2022-03-04	20:15:00	00:15:00.0	64.2	54.1	75.8	56.3	64.2
29	2022-03-04	20:30:00	00:15:00.0	63.2	53.1	71.7	56.2	63.2
30	2022-03-04	20:45:00	00:15:00.0	63.4	53.2	76.3	55.9	63.4
31	2022-03-04	21:00:00	00:15:00.0	64.2	53.6	78.4	56.2	64.2
32	2022-03-04	21:15:00	00:15:00.0	62.6	52.4	74.7	55.2	62.6
33	2022-03-04	21:30:00	00:15:00.0	63.8	53.1	87.8	55.5	63.8
34	2022-03-04	21:45:00	00:15:00.0	66.9	53.5	90.5	56.6	66.9
35	2022-03-04	22:00:00	00:15:00.0	63.0	52.6	82.6	54.9	63.0
36	2022-03-04	22:15:00	00:15:00.0	62.4	52.8	75.9	55.3	62.4
37	2022-03-04	22:30:00	00:15:00.0	71.6	52.3	98.1	55.2	71.6
38	2022-03-04	22:45:00	00:15:00.0	62.8	53.1	74.9	55.8	62.8
39	2022-03-04	23:00:00	00:15:00.0	61.8	52.7	71.7	54.8	61.8
40	2022-03-04	23:15:00	00:15:00.0	62.3	52.7	77.4	54.5	62.3
41	2022-03-04	23:30:00	00:15:00.0	64.7	53.2	77.9	56.5	64.7
42	2022-03-04	23:45:00	00:15:00.0	64.1	53.0	78.7	55.1	64.1
43	2022-03-05	00:00:00	00:15:00.0	64.4	52.7	77.7	55.8	64.4
44	2022-03-05	00:15:00	00:15:00.0	64.1	52.9	74.2	55.2	64.1
45	2022-03-05	00:30:00	00:15:00.0	63.3	52.7	76.9	55.9	63.3
46	2022-03-05	00:45:00	00:15:00.0	64.0	53.3	78.8	55.8	64.0
47	2022-03-05	01:00:00	00:15:00.0	62.9	52.9	78.2	54.9	62.9
48	2022-03-05	01:15:00	00:15:00.0	62.4	52.5	71.8	54.8	62.4
49	2022-03-05	01:30:00	00:15:00.0	62.8	52.6	76.4	55.5	62.8

50	2022-03-05	01:45:00	00:15:00.0	62.8	52.4	77.5	54.7	62.8
51	2022-03-05	02:00:00	00:15:00.0	61.9	51.8	74.5	54.2	61.9
52	2022-03-05	02:15:00	00:15:00.0	61.4	51.9	70.6	54.0	61.4
53	2022-03-05	02:30:00	00:15:00.0	61.2	52.0	76.7	53.9	61.2
54	2022-03-05	02:45:00	00:15:00.0	62.8	51.8	86.6	53.8	62.8
55	2022-03-05	03:00:00	00:15:00.0	60.1	51.5	70.7	53.6	60.1
56	2022-03-05	03:15:00	00:15:00.0	60.2	51.8	72.3	53.0	60.2
57	2022-03-05	03:30:00	00:15:00.0	60.1	52.0	71.1	53.3	60.1
58	2022-03-05	03:45:00	00:15:00.0	60.6	51.7	72.1	53.9	60.6
59	2022-03-05	04:00:00	00:15:00.0	60.0	51.6	69.4	53.0	60.0
60	2022-03-05	04:15:00	00:15:00.0	60.2	51.8	73.9	53.6	60.2
61	2022-03-05	04:30:00	00:15:00.0	60.2	52.1	73.1	53.3	60.2
62	2022-03-05	04:45:00	00:15:00.0	61.0	52.4	72.9	54.4	61.0
63	2022-03-05	05:00:00	00:15:00.0	59.7	52.5	69.9	53.7	59.7
64	2022-03-05	05:15:00	00:15:00.0	60.8	51.6	74.5	53.1	60.8
65	2022-03-05	05:30:00	00:15:00.0	58.8	51.7	70.7	52.8	58.8
66	2022-03-05	05:45:00	00:15:00.0	59.0	51.9	70.3	53.0	59.0
67	2022-03-05	06:00:00	00:15:00.0	60.5	51.6	73.9	53.1	60.5
68	2022-03-05	06:15:00	00:15:00.0	60.9	51.6	73.6	53.1	60.9
69	2022-03-05	06:30:00	00:15:00.0	60.4	51.9	75.7	53.2	60.4
70	2022-03-05	06:45:00	00:15:00.0	61.4	52.1	75.7	53.8	61.4
71	2022-03-05	07:00:00	00:15:00.0	62.5	52.6	79.4	54.5	62.5
72	2022-03-05	07:15:00	00:15:00.0	61.4	52.7	73.6	54.1	61.4
73	2022-03-05	07:30:00	00:15:00.0	62.5	52.8	75.6	54.8	62.5
74	2022-03-05	07:45:00	00:15:00.0	62.0	52.9	71.9	54.8	62.0
75	2022-03-05	08:00:00	00:15:00.0	63.3	55.1	84.6	56.5	63.3
76	2022-03-05	08:15:00	00:15:00.0	65.1	55.2	84.2	56.7	65.1
77	2022-03-05	08:30:00	00:15:00.0	67.9	55.2	78.2	57.4	67.9
78	2022-03-05	08:45:00	00:15:00.0	62.2	55.3	75.8	56.6	62.2
79	2022-03-05	09:00:00	00:15:00.0	63.0	55.4	73.1	56.9	63.0
80	2022-03-05	09:15:00	00:15:00.0	62.6	55.7	75.7	57.3	62.6
81	2022-03-05	09:30:00	00:15:00.0	63.7	55.6	81.3	57.1	63.7
82	2022-03-05	09:45:00	00:15:00.0	63.6	55.4	81.1	56.9	63.6
83	2022-03-05	10:00:00	00:15:00.0	62.5	55.4	73.7	57.0	62.5
84	2022-03-05	10:15:00	00:15:00.0	65.9	55.7	88.8	57.6	65.9
85	2022-03-05	10:30:00	00:15:00.0	63.6	56.0	73.8	58.1	63.6
86	2022-03-05	10:45:00	00:15:00.0	63.7	55.9	75.8	57.6	63.7
87	2022-03-05	11:00:00	00:15:00.0	64.4	55.9	84.0	57.7	64.4
88	2022-03-05	11:15:00	00:15:00.0	64.0	56.3	77.8	58.2	64.0
89	2022-03-05	11:30:00	00:15:00.0	62.7	55.7	71.0	57.5	62.7
90	2022-03-05	11:45:00	00:15:00.0	63.5	56.2	74.8	57.4	63.5
91	2022-03-05	12:00:00	00:15:00.0	63.5	55.9	71.2	57.7	63.5
92	2022-03-05	12:15:00	00:15:00.0	64.8	56.0	77.8	58.5	64.8
93	2022-03-05	12:30:00	00:15:00.0	64.6	55.6	73.9	58.4	64.6
94	2022-03-05	12:45:00	00:15:00.0	63.9	56.4	80.6	58.2	63.9
95	2022-03-05	13:00:00	00:15:00.0	63.4	55.7	72.8	58.1	63.4
96	2022-03-05	13:15:00	00:15:00.0	65.2	56.3	86.3	58.1	65.2
97	2022-03-05	13:30:00	00:15:00.0	64.0	56.0	75.8	57.6	64.0
98	2022-03-05	13:45:00	00:15:00.0	68.2	56.2	90.4	59.6	68.2
99	2022-03-05	14:00:00	00:15:00.0	64.8	56.2	77.0	58.4	64.8

100	2022-03-05	14:15:00	00:15:00.0	64.2	56.0	82.9	57.9	64.2
101	2022-03-05	14:30:00	00:15:00.0	64.4	55.6	73.4	58.3	64.4
102	2022-03-05	14:45:00	00:15:00.0	64.1	55.9	74.1	58.1	64.1
103	2022-03-05	15:00:00	00:15:00.0	64.7	56.4	75.9	59.7	64.7
104	2022-03-05	15:15:00	00:15:00.0	63.8	53.8	75.5	56.2	63.8
105	2022-03-05	15:30:00	00:15:00.0	65.2	53.9	86.6	56.8	65.2
106	2022-03-05	15:45:00	00:15:00.0	62.9	54.4	74.2	56.8	62.9
107	2022-03-05	16:00:00	00:15:00.0	63.6	54.6	76.1	57.0	63.6
108	2022-03-05	16:15:00	00:15:00.0	64.0	54.8	76.2	57.4	64.0
109	2022-03-05	16:30:00	00:15:00.0	63.1	53.7	73.9	56.6	63.1
110	2022-03-05	16:45:00	00:15:00.0	64.4	53.4	76.7	57.4	64.4
111	2022-03-05	17:00:00	00:15:00.0	64.6	53.7	80.3	57.1	64.6
112	2022-03-05	17:15:00	00:15:00.0	64.4	55.0	76.5	58.0	64.4
113	2022-03-05	17:30:00	00:15:00.0	64.8	54.9	79.3	57.7	64.8
114	2022-03-05	17:45:00	00:15:00.0	63.3	53.9	72.6	56.3	63.3
115	2022-03-05	18:00:00	00:15:00.0	63.2	54.2	72.8	57.4	63.2
116	2022-03-05	18:15:00	00:15:00.0	63.9	53.8	72.4	57.1	63.9
117	2022-03-05	18:30:00	00:15:00.0	64.4	53.9	76.3	57.2	64.4
118	2022-03-05	18:45:00	00:15:00.0	65.3	54.5	76.7	57.0	65.3
119	2022-03-05	19:00:00	00:15:00.0	64.6	53.8	72.1	57.8	64.6
120	2022-03-05	19:15:00	00:15:00.0	64.6	53.3	77.8	57.1	64.6
121	2022-03-05	19:30:00	00:15:00.0	71.2	53.8	96.8	57.7	71.2
122	2022-03-05	19:45:00	00:15:00.0	63.6	53.4	73.8	56.6	63.6
123	2022-03-05	20:00:00	00:15:00.0	65.3	53.7	80.4	57.6	65.3
124	2022-03-05	20:15:00	00:15:00.0	64.7	54.6	76.0	58.2	64.7
125	2022-03-05	20:30:00	00:15:00.0	63.7	53.2	73.6	55.7	63.7
126	2022-03-05	20:45:00	00:15:00.0	63.5	53.0	79.8	55.9	63.5
127	2022-03-05	21:00:00	00:15:00.0	63.4	52.9	72.0	56.1	63.4
128	2022-03-05	21:15:00	00:15:00.0	64.6	53.0	80.4	54.9	64.6
129	2022-03-05	21:30:00	00:15:00.0	62.7	52.5	71.8	55.3	62.7
130	2022-03-05	21:45:00	00:15:00.0	63.1	53.2	72.0	55.8	63.1
131	2022-03-05	22:00:00	00:15:00.0	64.7	53.5	86.8	56.3	64.7
132	2022-03-05	22:15:00	00:15:00.0	64.2	53.6	73.4	56.3	64.2
133	2022-03-05	22:30:00	00:15:00.0	63.7	53.8	75.0	56.5	63.7
134	2022-03-05	22:45:00	00:15:00.0	62.5	52.9	71.2	55.7	62.5
135	2022-03-05	23:00:00	00:15:00.0	62.8	53.5	73.6	55.6	62.8
136	2022-03-05	23:15:00	00:15:00.0	63.8	53.1	78.8	55.8	63.8
137	2022-03-05	23:30:00	00:15:00.0	63.6	53.3	75.8	56.1	63.6
138	2022-03-05	23:45:00	00:15:00.0	63.2	52.4	75.2	55.8	63.2
139	2022-03-06	00:00:00	00:15:00.0	61.7	52.2	73.1	54.5	61.7
140	2022-03-06	00:15:00	00:15:00.0	63.9	52.2	86.9	54.1	63.9
141	2022-03-06	00:30:00	00:15:00.0	62.6	52.0	74.3	54.1	62.6
142	2022-03-06	00:45:00	00:15:00.0	64.0	52.2	84.3	54.7	64.0
143	2022-03-06	01:00:00	00:15:00.0	62.1	52.4	74.6	55.2	62.1
144	2022-03-06	01:15:00	00:15:00.0	62.4	52.3	75.9	54.5	62.4
145	2022-03-06	01:30:00	00:15:00.0	61.4	51.9	73.6	53.2	61.4
146	2022-03-06	01:45:00	00:15:00.0	62.7	52.5	79.7	54.7	62.7
147	2022-03-06	02:00:00	00:15:00.0	61.2	51.7	71.5	53.6	61.2
148	2022-03-06	02:15:00	00:15:00.0	61.1	51.7	74.9	53.1	61.1
149	2022-03-06	02:30:00	00:15:00.0	61.6	51.8	85.5	53.8	61.6

150	2022-03-06	02:45:00	00:15:00.0	61.4	51.3	72.3	53.6	61.4
151	2022-03-06	03:00:00	00:15:00.0	61.1	52.5	70.4	54.0	61.1
152	2022-03-06	03:15:00	00:15:00.0	61.2	51.6	72.2	53.5	61.2
153	2022-03-06	03:30:00	00:15:00.0	60.2	51.9	70.7	53.6	60.2
154	2022-03-06	03:45:00	00:15:00.0	59.8	51.6	71.1	52.9	59.8
155	2022-03-06	04:00:00	00:15:00.0	59.6	50.9	72.6	53.2	59.6
156	2022-03-06	04:15:00	00:15:00.0	58.5	50.6	75.5	51.8	58.5
157	2022-03-06	04:30:00	00:15:00.0	57.7	51.1	69.7	52.2	57.7
158	2022-03-06	04:45:00	00:15:00.0	59.5	50.8	76.2	51.8	59.5
159	2022-03-06	05:00:00	00:15:00.0	59.0	50.5	74.2	51.8	59.0
160	2022-03-06	05:15:00	00:15:00.0	59.4	50.8	72.8	52.3	59.4
161	2022-03-06	05:30:00	00:15:00.0	57.7	50.5	69.5	51.6	57.7
162	2022-03-06	05:45:00	00:15:00.0	58.1	50.7	77.5	51.8	58.1
163	2022-03-06	06:00:00	00:15:00.0	59.7	50.8	73.7	51.9	59.7
164	2022-03-06	06:15:00	00:15:00.0	57.9	50.5	69.4	52.2	57.9
165	2022-03-06	06:30:00	00:15:00.0	60.2	50.8	76.9	52.0	60.2
166	2022-03-06	06:45:00	00:15:00.0	60.6	50.9	73.4	52.5	60.6
167	2022-03-06	07:00:00	00:15:00.0	58.9	50.9	73.6	52.0	58.9
168	2022-03-06	07:15:00	00:15:00.0	58.9	51.1	71.5	52.5	58.9
169	2022-03-06	07:30:00	00:15:00.0	59.2	51.2	75.9	52.4	59.2
170	2022-03-06	07:45:00	00:15:00.0	60.1	51.3	73.4	52.7	60.1
171	2022-03-06	08:00:00	00:15:00.0	59.7	51.4	72.8	52.7	59.7
172	2022-03-06	08:15:00	00:15:00.0	58.6	50.9	70.9	51.9	58.6
173	2022-03-06	08:30:00	00:15:00.0	62.0	51.8	76.2	53.9	62.0
174	2022-03-06	08:45:00	00:15:00.0	65.9	51.3	79.9	52.4	65.9
175	2022-03-06	09:00:00	00:15:00.0	60.4	51.2	73.3	53.1	60.4
176	2022-03-06	09:15:00	00:15:00.0	61.0	51.5	76.6	52.8	61.0
177	2022-03-06	09:30:00	00:15:00.0	60.7	51.9	70.0	54.3	60.7
178	2022-03-06	09:45:00	00:15:00.0	60.2	51.2	70.9	52.9	60.2
179	2022-03-06	10:00:00	00:15:00.0	60.7	51.7	72.5	53.7	60.7
180	2022-03-06	10:15:00	00:15:00.0	61.2	51.3	70.4	53.9	61.2
181	2022-03-06	10:30:00	00:15:00.0	61.9	51.5	79.0	54.0	61.9
182	2022-03-06	10:45:00	00:15:00.0	61.5	51.9	70.5	54.3	61.5
183	2022-03-06	11:00:00	00:15:00.0	62.5	51.7	81.7	54.0	62.5
184	2022-03-06	11:15:00	00:15:00.0	62.5	52.3	79.4	54.6	62.5
185	2022-03-06	11:30:00	00:15:00.0	61.5	52.2	75.5	54.2	61.5
186	2022-03-06	11:45:00	00:15:00.0	61.8	52.0	80.6	54.5	61.8
187	2022-03-06	12:00:00	00:15:00.0	61.7	52.5	75.0	54.7	61.7
188	2022-03-06	12:15:00	00:15:00.0	61.9	53.5	71.7	55.5	61.9
189	2022-03-06	12:30:00	00:15:00.0	62.1	51.9	71.2	54.5	62.1
190	2022-03-06	12:45:00	00:15:00.0	62.9	51.9	75.5	55.5	62.9
191	2022-03-06	13:00:00	00:15:00.0	62.2	53.0	73.5	55.4	62.2
192	2022-03-06	13:15:00	00:15:00.0	63.7	53.1	84.8	56.3	63.7
193	2022-03-06	13:30:00	00:15:00.0	64.0	52.5	83.0	56.8	64.0
194	2022-03-06	13:45:00	00:15:00.0	61.6	52.0	76.3	54.2	61.6
195	2022-03-06	14:00:00	00:15:00.0	61.4	52.3	69.8	55.2	61.4
196	2022-03-06	14:15:00	00:15:00.0	62.9	52.9	80.7	55.5	62.9
197	2022-03-06	14:30:00	00:15:00.0	62.6	51.9	76.4	55.1	62.6
198	2022-03-06	14:45:00	00:15:00.0	62.8	52.6	81.9	55.7	62.8
199	2022-03-06	15:00:00	00:15:00.0	61.9	51.5	72.7	54.5	61.9

200	2022-03-06	15:15:00	00:15:00.0	62.1	53.2	73.1	55.7	62.1
201	2022-03-06	15:30:00	00:15:00.0	62.1	51.9	77.5	54.2	62.1
202	2022-03-06	15:45:00	00:15:00.0	62.0	53.0	69.8	55.9	62.0
203	2022-03-06	16:00:00	00:15:00.0	63.5	52.3	77.9	55.3	63.5
204	2022-03-06	16:15:00	00:15:00.0	61.3	52.5	68.4	55.0	61.3
205	2022-03-06	16:30:00	00:15:00.0	62.2	51.8	72.6	55.7	62.2
206	2022-03-06	16:45:00	00:15:00.0	62.9	52.0	74.8	55.3	62.9
207	2022-03-06	17:00:00	00:15:00.0	62.9	52.7	73.6	55.4	62.9
208	2022-03-06	17:15:00	00:15:00.0	64.2	52.0	85.3	54.6	64.2
209	2022-03-06	17:30:00	00:15:00.0	63.2	53.8	74.5	56.2	63.2
210	2022-03-06	17:45:00	00:15:00.0	63.1	52.1	78.6	55.3	63.1
211	2022-03-06	18:00:00	00:15:00.0	63.0	53.2	72.8	55.6	63.0
212	2022-03-06	18:15:00	00:15:00.0	71.3	53.3	94.4	55.4	71.3
213	2022-03-06	18:30:00	00:15:00.0	62.8	51.5	74.0	55.2	62.8
214	2022-03-06	18:45:00	00:15:00.0	63.5	52.4	77.4	56.2	63.5
215	2022-03-06	19:00:00	00:15:00.0	63.1	51.6	73.5	54.8	63.1
216	2022-03-06	19:15:00	00:15:00.0	63.8	52.7	78.1	55.6	63.8
217	2022-03-06	19:30:00	00:15:00.0	63.9	52.0	78.1	55.8	63.9
218	2022-03-06	19:45:00	00:15:00.0	63.5	52.4	83.6	54.8	63.5
219	2022-03-06	20:00:00	00:15:00.0	62.6	51.6	77.4	54.1	62.6
220	2022-03-06	20:15:00	00:15:00.0	68.8	51.8	94.6	53.9	68.8
221	2022-03-06	20:30:00	00:15:00.0	64.1	52.2	85.8	54.7	64.1
222	2022-03-06	20:45:00	00:15:00.0	61.3	51.9	73.4	54.0	61.3
223	2022-03-06	21:00:00	00:15:00.0	63.8	51.4	85.0	53.9	63.8
224	2022-03-06	21:15:00	00:15:00.0	62.8	51.2	78.7	53.7	62.8
225	2022-03-06	21:30:00	00:15:00.0	61.1	51.0	73.2	53.1	61.1
226	2022-03-06	21:45:00	00:15:00.0	61.5	52.1	70.3	54.1	61.5
227	2022-03-06	22:00:00	00:15:00.0	59.4	51.4	69.8	53.4	59.4
228	2022-03-06	22:15:00	00:15:00.0	61.3	52.4	71.4	54.1	61.3
229	2022-03-06	22:30:00	00:15:00.0	61.1	51.6	72.4	53.5	61.1
230	2022-03-06	22:45:00	00:15:00.0	59.7	51.3	70.2	53.0	59.7
231	2022-03-06	23:00:00	00:15:00.0	60.6	50.9	73.4	52.9	60.6
232	2022-03-06	23:15:00	00:15:00.0	62.0	51.7	75.9	53.8	62.0
233	2022-03-06	23:30:00	00:15:00.0	61.1	51.0	78.1	53.1	61.1
234	2022-03-06	23:45:00	00:15:00.0	61.2	51.3	75.5	53.0	61.2
235	2022-03-07	00:00:00	00:15:00.0	60.8	51.1	71.9	52.9	60.8
236	2022-03-07	00:15:00	00:15:00.0	63.3	51.4	88.5	52.9	63.3
237	2022-03-07	00:30:00	00:15:00.0	60.2	50.7	76.6	52.5	60.2
238	2022-03-07	00:45:00	00:15:00.0	59.4	50.5	74.9	51.9	59.4
239	2022-03-07	01:00:00	00:15:00.0	58.7	50.5	74.2	51.8	58.7
240	2022-03-07	01:15:00	00:15:00.0	59.2	50.7	74.3	51.9	59.2
241	2022-03-07	01:30:00	00:15:00.0	57.4	50.3	72.0	51.6	57.4
242	2022-03-07	01:45:00	00:15:00.0	58.9	50.2	77.0	51.4	58.9
243	2022-03-07	02:00:00	00:15:00.0	59.5	50.5	77.3	51.6	59.5
244	2022-03-07	02:15:00	00:15:00.0	59.1	50.8	74.1	52.2	59.1
245	2022-03-07	02:30:00	00:15:00.0	57.6	50.5	69.8	51.6	57.6
246	2022-03-07	02:45:00	00:15:00.0	57.2	50.6	70.5	51.8	57.2
247	2022-03-07	03:00:00	00:15:00.0	58.1	50.6	73.3	51.6	58.1
248	2022-03-07	03:15:00	00:15:00.0	57.0	50.6	70.6	51.7	57.0
249	2022-03-07	03:30:00	00:15:00.0	57.9	50.7	75.0	51.7	57.9

250	2022-03-07	03:45:00	00:15:00.0	57.7	50.8	69.6	52.2	57.7
251	2022-03-07	04:00:00	00:15:00.0	58.5	50.5	73.3	51.8	58.5
252	2022-03-07	04:15:00	00:15:00.0	58.0	50.9	72.6	51.9	58.0
253	2022-03-07	04:30:00	00:15:00.0	58.1	50.9	71.2	51.8	58.1
254	2022-03-07	04:45:00	00:15:00.0	57.5	50.7	74.8	51.6	57.5
255	2022-03-07	05:00:00	00:15:00.0	57.6	50.7	70.6	52.1	57.6
256	2022-03-07	05:15:00	00:15:00.0	60.1	50.8	77.3	51.9	60.1
257	2022-03-07	05:30:00	00:15:00.0	60.7	51.3	74.7	53.0	60.7
258	2022-03-07	05:45:00	00:15:00.0	62.3	51.7	75.5	53.1	62.3
259	2022-03-07	06:00:00	00:15:00.0	62.4	51.9	74.2	54.1	62.4
260	2022-03-07	06:15:00	00:15:00.0	62.9	51.9	73.7	53.6	62.9
261	2022-03-07	06:30:00	00:15:00.0	63.4	51.7	75.2	54.1	63.4
262	2022-03-07	06:45:00	00:15:00.0	64.6	51.9	82.4	55.0	64.6
263	2022-03-07	07:00:00	00:15:00.0	65.0	52.6	79.1	55.3	65.0
264	2022-03-07	07:15:00	00:15:00.0	64.6	53.1	77.2	55.9	64.6
265	2022-03-07	07:30:00	00:15:00.0	65.6	53.3	75.5	56.8	65.6
266	2022-03-07	07:45:00	00:15:00.0	66.2	53.0	84.6	58.7	66.2
267	2022-03-07	08:00:00	00:15:00.0	66.2	54.0	80.7	57.0	66.2
268	2022-03-07	08:15:00	00:15:00.0	66.8	53.7	81.5	57.0	66.8
269	2022-03-07	08:30:00	00:15:00.0	68.4	53.8	79.5	57.6	68.4
270	2022-03-07	08:45:00	00:15:00.0	66.2	54.3	80.2	57.7	66.2
271	2022-03-07	09:00:00	00:15:00.0	70.8	53.9	94.7	57.8	70.8
272	2022-03-07	09:15:00	00:15:00.0	64.5	53.9	75.6	57.3	64.5
273	2022-03-07	09:30:00	00:15:00.0	65.4	54.7	75.7	58.5	65.4
274	2022-03-07	09:45:00	00:15:00.0	63.8	55.0	73.3	57.1	63.8
275	2022-03-07	10:00:00	00:15:00.0	63.5	54.2	73.6	57.1	63.5
276	2022-03-07	10:15:00	00:15:00.0	66.5	56.8	86.1	60.6	66.5
277	2022-03-07	10:30:00	00:15:00.0	64.1	54.2	78.9	58.6	64.1
278	2022-03-07	10:45:00	00:15:00.0	64.5	54.5	75.1	58.7	64.5
279	2022-03-07	11:00:00	00:15:00.0	68.9	58.2	93.5	61.4	68.9
280	2022-03-07	11:15:00	00:15:00.0	65.0	53.7	81.4	58.2	65.0
281	2022-03-07	11:30:00	00:15:00.0	69.4	54.4	91.7	58.3	69.4
282	2022-03-07	11:45:00	00:15:00.0	65.6	53.8	79.8	58.8	65.6
283	2022-03-07	12:00:00	00:15:00.0	64.8	54.8	75.2	57.3	64.8
284	2022-03-07	12:15:00	00:15:00.0	65.4	54.4	82.5	58.0	65.4
285	2022-03-07	12:30:00	00:15:00.0	64.6	53.4	75.4	58.7	64.6
286	2022-03-07	12:45:00	00:15:00.0	66.6	55.2	87.5	59.0	66.6
287	2022-03-07	13:00:00	00:15:00.0	65.4	54.2	81.3	57.7	65.4
288	2022-03-07	13:15:00	00:15:00.0	64.3	53.8	80.3	58.2	64.3
289	2022-03-07	13:30:00	00:15:00.0	65.6	53.7	78.4	58.6	65.6
290	2022-03-07	13:45:00	00:15:00.0	64.4	54.3	76.0	57.9	64.4
291	2022-03-07	14:00:00	00:15:00.0	69.0	54.0	95.8	58.3	69.0
292	2022-03-07	14:15:00	00:15:00.0	65.2	54.7	76.6	59.0	65.2
293	2022-03-07	14:30:00	00:15:00.0	65.2	54.4	83.4	57.0	65.2
294	2022-03-07	14:45:00	00:15:00.0	64.0	54.2	73.9	58.3	64.0
295	2022-03-07	15:00:00	00:15:00.0	77.4	55.1	107.2	58.4	77.4
296	2022-03-07	15:15:00	00:15:00.0	63.9	53.7	75.3	57.3	63.9
297	2022-03-07	15:30:00	00:15:00.0	64.3	54.3	81.0	57.4	64.3
298	2022-03-07	15:45:00	00:15:00.0	64.1	54.7	74.4	58.2	64.1
299	2022-03-07	16:00:00	00:15:00.0	79.3	53.7	107.0	58.1	79.3

300	2022-03-07	16:15:00	00:15:00.0	71.8	54.8	99.4	57.6	71.8
301	2022-03-07	16:30:00	00:15:00.0	67.1	55.8	79.4	58.8	67.1
302	2022-03-07	16:45:00	00:15:00.0	65.0	54.6	75.1	58.0	65.0
303	2022-03-07	17:00:00	00:15:00.0	68.2	55.5	98.1	59.2	68.2
304	2022-03-07	17:15:00	00:15:00.0	66.9	56.0	83.8	59.0	66.9
305	2022-03-07	17:30:00	00:15:00.0	66.0	56.5	83.9	60.5	66.0
306	2022-03-07	17:45:00	00:15:00.0	63.8	54.6	74.6	57.5	63.8
307	2022-03-07	18:00:00	00:15:00.0	64.4	54.9	76.5	57.5	64.4
308	2022-03-07	18:15:00	00:15:00.0	64.0	54.4	81.2	57.3	64.0
309	2022-03-07	18:30:00	00:15:00.0	64.6	54.9	85.6	58.2	64.6
310	2022-03-07	18:45:00	00:15:00.0	64.1	52.9	79.9	56.8	64.1
311	2022-03-07	19:00:00	00:15:00.0	63.0	53.8	78.5	56.2	63.0
312	2022-03-07	19:15:00	00:15:00.0	63.3	53.1	73.9	56.0	63.3
313	2022-03-07	19:30:00	00:15:00.0	63.0	53.4	72.9	55.7	63.0
314	2022-03-07	19:45:00	00:15:00.0	63.5	52.7	75.6	55.7	63.5
315	2022-03-07	20:00:00	00:15:00.0	64.1	53.4	79.1	56.6	64.1
316	2022-03-07	20:15:00	00:15:00.0	63.2	52.4	75.0	55.4	63.2
317	2022-03-07	20:30:00	00:15:00.0	63.0	52.4	76.0	55.1	63.0
318	2022-03-07	20:45:00	00:15:00.0	62.3	51.9	73.8	53.8	62.3
319	2022-03-07	21:00:00	00:15:00.0	62.2	51.9	72.8	54.1	62.2
320	2022-03-07	21:15:00	00:15:00.0	62.4	51.5	79.9	54.1	62.4
321	2022-03-07	21:30:00	00:15:00.0	61.0	51.7	71.9	53.7	61.0
322	2022-03-07	21:45:00	00:15:00.0	60.6	52.0	73.5	54.3	60.6
323	2022-03-07	22:00:00	00:15:00.0	61.9	52.7	76.8	54.9	61.9
324	2022-03-07	22:15:00	00:15:00.0	61.7	53.8	73.3	55.1	61.7
325	2022-03-07	22:30:00	00:15:00.0	65.0	53.0	87.8	54.7	65.0
326	2022-03-07	22:45:00	00:15:00.0	61.9	53.1	79.5	55.1	61.9
327	2022-03-07	23:00:00	00:15:00.0	62.2	53.0	75.4	54.8	62.2
328	2022-03-07	23:15:00	00:15:00.0	59.5	50.7	70.9	52.7	59.5
329	2022-03-07	23:30:00	00:15:00.0	60.5	51.3	70.6	53.2	60.5
330	2022-03-07	23:45:00	00:15:00.0	59.9	51.0	71.0	52.8	59.9
331	2022-03-08	00:00:00	00:15:00.0	61.8	52.4	86.5	53.8	61.8
332	2022-03-08	00:15:00	00:15:00.0	59.6	50.8	74.0	52.5	59.6
333	2022-03-08	00:30:00	00:15:00.0	61.3	50.8	83.5	52.4	61.3
334	2022-03-08	00:45:00	00:15:00.0	59.0	50.5	70.7	52.3	59.0
335	2022-03-08	01:00:00	00:15:00.0	59.0	50.8	71.6	52.1	59.0
336	2022-03-08	01:15:00	00:15:00.0	57.9	50.8	71.8	52.3	57.9
337	2022-03-08	01:30:00	00:15:00.0	57.7	50.6	78.3	52.0	57.7
338	2022-03-08	01:45:00	00:15:00.0	58.7	50.5	71.0	51.6	58.7
339	2022-03-08	02:00:00	00:15:00.0	58.1	51.1	73.0	52.7	58.1
340	2022-03-08	02:15:00	00:15:00.0	57.4	50.5	72.2	51.6	57.4
341	2022-03-08	02:30:00	00:15:00.0	58.2	50.4	73.0	51.6	58.2
342	2022-03-08	02:45:00	00:15:00.0	56.8	51.0	67.8	52.5	56.8
343	2022-03-08	03:00:00	00:15:00.0	57.1	50.3	71.3	51.2	57.1
344	2022-03-08	03:15:00	00:15:00.0	57.5	50.5	75.6	52.3	57.5
345	2022-03-08	03:30:00	00:15:00.0	58.4	50.4	71.9	52.0	58.4
346	2022-03-08	03:45:00	00:15:00.0	56.9	50.4	71.6	51.5	56.9
347	2022-03-08	04:00:00	00:15:00.0	57.4	50.9	71.0	52.3	57.4
348	2022-03-08	04:15:00	00:15:00.0	58.3	51.0	71.8	52.3	58.3
349	2022-03-08	04:30:00	00:15:00.0	57.8	51.0	71.7	52.4	57.8

350	2022-03-08	04:45:00	00:15:00.0	75.9	51.2	105.5	52.8	75.9
351	2022-03-08	05:00:00	00:15:00.0	59.0	50.9	72.7	51.8	59.0
352	2022-03-08	05:15:00	00:15:00.0	60.8	51.1	74.2	52.6	60.8
353	2022-03-08	05:30:00	00:15:00.0	60.7	51.7	74.5	53.3	60.7
354	2022-03-08	05:45:00	00:15:00.0	60.0	51.4	74.9	52.6	60.0
355	2022-03-08	06:00:00	00:15:00.0	61.7	52.1	72.5	53.8	61.7
356	2022-03-08	06:15:00	00:15:00.0	62.8	51.8	75.1	53.8	62.8
357	2022-03-08	06:30:00	00:15:00.0	63.6	52.2	72.9	54.9	63.6
358	2022-03-08	06:45:00	00:15:00.0	64.7	52.8	77.2	55.6	64.7
359	2022-03-08	07:00:00	00:15:00.0	63.6	52.6	76.0	55.9	63.6
360	2022-03-08	07:15:00	00:15:00.0	64.9	53.5	76.7	55.9	64.9
361	2022-03-08	07:30:00	00:15:00.0	65.3	53.3	84.7	56.2	65.3
362	2022-03-08	07:45:00	00:15:00.0	65.2	54.1	77.8	56.2	65.2
363	2022-03-08	08:00:00	00:15:00.0	66.7	55.2	78.6	58.0	66.7
364	2022-03-08	08:15:00	00:15:00.0	65.4	53.8	76.1	57.9	65.4
365	2022-03-08	08:30:00	00:15:00.0	66.7	54.5	78.6	58.3	66.7
366	2022-03-08	08:45:00	00:15:00.0	69.4	55.1	92.1	58.9	69.4
367	2022-03-08	09:00:00	00:15:00.0	66.3	56.0	78.0	59.6	66.3
368	2022-03-08	09:15:00	00:15:00.0	64.8	54.5	78.0	57.8	64.8
369	2022-03-08	09:30:00	00:15:00.0	64.8	54.8	83.2	58.6	64.8
370	2022-03-08	09:45:00	00:15:00.0	64.7	56.1	76.2	58.7	64.7
371	2022-03-08	10:00:00	00:15:00.0	65.1	55.6	78.8	59.1	65.1
372	2022-03-08	10:15:00	00:15:00.0	64.1	55.5	75.3	57.6	64.1
373	2022-03-08	10:30:00	00:15:00.0	64.9	55.9	77.8	60.3	64.9
374	2022-03-08	10:45:00	00:15:00.0	64.3	55.8	77.9	59.1	64.3
375	2022-03-08	11:00:00	00:15:00.0	64.9	55.1	76.5	57.5	64.9
376	2022-03-08	11:15:00	00:15:00.0	66.0	55.2	86.7	58.8	66.0
377	2022-03-08	11:30:00	00:15:00.0	65.8	57.7	79.8	61.5	65.8
378	2022-03-08	11:45:00	00:15:00.0	65.1	55.1	78.1	59.1	65.1
379	2022-03-08	12:00:00	00:15:00.0	68.4	58.1	90.4	60.9	68.4
380	2022-03-08	12:15:00	00:15:00.0	65.0	55.0	76.5	58.4	65.0
381	2022-03-08	12:30:00	00:15:00.0	64.9	55.4	75.3	58.4	64.9
382	2022-03-08	12:45:00	00:15:00.0	64.3	55.2	76.6	58.2	64.3
383	2022-03-08	13:00:00	00:15:00.0	65.6	55.4	77.0	58.3	65.6
384	2022-03-08	13:15:00	00:15:00.0	67.5	55.8	90.4	59.4	67.5
385	2022-03-08	13:30:00	00:15:00.0	63.6	56.6	76.5	59.4	63.6
386	2022-03-08	13:45:00	00:15:00.0	67.5	55.2	89.3	57.7	67.5
387	2022-03-08	14:00:00	00:15:00.0	65.1	56.3	80.6	60.1	65.1
388	2022-03-08	14:15:00	00:15:00.0	64.9	57.9	75.8	60.7	64.9
389	2022-03-08	14:30:00	00:15:00.0	67.3	54.3	90.1	57.8	67.3
390	2022-03-08	14:45:00	00:15:00.0	63.5	54.3	78.9	57.6	63.5
391	2022-03-08	15:00:00	00:15:00.0	66.7	55.0	91.8	59.3	66.7
392	2022-03-08	15:15:00	00:15:00.0	64.3	53.7	83.2	56.7	64.3
393	2022-03-08	15:30:00	00:15:00.0	80.4	54.0	104.1	58.0	80.4
394	2022-03-08	15:45:00	00:15:00.0	65.5	55.0	86.2	58.3	65.5
395	2022-03-08	16:00:00	00:15:00.0	69.6	54.9	93.4	58.8	69.6
396	2022-03-08	16:15:00	00:15:00.0	65.6	54.5	89.0	57.6	65.6
397	2022-03-08	16:30:00	00:15:00.0	64.5	54.8	77.2	58.6	64.5
398	2022-03-08	16:45:00	00:15:00.0	73.7	55.5	100.1	59.2	73.7
399	2022-03-08	17:00:00	00:15:00.0	64.5	55.2	76.7	57.9	64.5

400	2022-03-08	17:15:00	00:15:00.0	64.8	55.0	81.9	57.5	64.8
401	2022-03-08	17:30:00	00:15:00.0	70.1	54.6	96.3	58.9	70.1
402	2022-03-08	17:45:00	00:15:00.0	63.7	55.3	74.3	58.5	63.7
403	2022-03-08	18:00:00	00:15:00.0	64.7	54.3	78.5	58.7	64.7
404	2022-03-08	18:15:00	00:15:00.0	64.6	57.1	75.9	59.7	64.6
405	2022-03-08	18:30:00	00:15:00.0	74.9	54.6	96.6	57.9	74.9
406	2022-03-08	18:45:00	00:15:00.0	64.1	54.1	80.0	57.9	64.1
407	2022-03-08	19:00:00	00:15:00.0	69.1	53.4	95.0	56.6	69.1
408	2022-03-08	19:15:00	00:15:00.0	64.8	54.0	83.9	56.9	64.8
409	2022-03-08	19:30:00	00:15:00.0	63.0	53.0	74.8	56.0	63.0
410	2022-03-08	19:45:00	00:15:00.0	68.5	54.5	93.6	57.6	68.5
411	2022-03-08	20:00:00	00:15:00.0	62.0	53.7	72.6	55.7	62.0
412	2022-03-08	20:15:00	00:15:00.0	62.3	52.7	79.2	56.0	62.3
413	2022-03-08	20:30:00	00:15:00.0	62.1	53.0	72.3	56.1	62.1
414	2022-03-08	20:45:00	00:15:00.0	62.2	52.7	75.1	54.9	62.2
415	2022-03-08	21:00:00	00:15:00.0	63.0	53.6	82.3	56.0	63.0
416	2022-03-08	21:15:00	00:15:00.0	62.6	52.8	75.6	55.3	62.6
417	2022-03-08	21:30:00	00:15:00.0	61.6	52.9	72.9	54.9	61.6
418	2022-03-08	21:45:00	00:15:00.0	72.9	52.8	100.1	55.1	72.9
419	2022-03-08	22:00:00	00:15:00.0	61.9	52.2	73.5	54.5	61.9
420	2022-03-08	22:15:00	00:15:00.0	61.7	52.6	75.9	55.0	61.7
421	2022-03-08	22:30:00	00:15:00.0	61.5	52.5	73.6	54.9	61.5
422	2022-03-08	22:45:00	00:15:00.0	61.8	50.9	76.8	54.3	61.8
423	2022-03-08	23:00:00	00:15:00.0	61.8	52.0	76.7	54.9	61.8
424	2022-03-08	23:15:00	00:15:00.0	60.8	51.1	71.9	54.2	60.8
425	2022-03-08	23:30:00	00:15:00.0	70.0	51.9	98.2	54.2	70.0
426	2022-03-08	23:45:00	00:15:00.0	60.6	51.4	71.3	53.4	60.6
427	2022-03-09	00:00:00	00:15:00.0	59.8	51.8	69.0	53.7	59.8
428	2022-03-09	00:15:00	00:15:00.0	59.8	51.4	72.0	53.2	59.8
429	2022-03-09	00:30:00	00:15:00.0	61.1	51.2	81.8	53.3	61.1
430	2022-03-09	00:45:00	00:15:00.0	59.2	51.5	70.8	53.5	59.2
431	2022-03-09	01:00:00	00:15:00.0	60.2	51.8	78.3	53.3	60.2
432	2022-03-09	01:15:00	00:15:00.0	57.7	51.2	71.0	53.0	57.7
433	2022-03-09	01:30:00	00:15:00.0	58.5	50.8	69.7	52.9	58.5
434	2022-03-09	01:45:00	00:15:00.0	58.4	50.7	75.7	52.1	58.4
435	2022-03-09	02:00:00	00:15:00.0	59.8	50.6	82.7	53.2	59.8
436	2022-03-09	02:15:00	00:15:00.0	59.8	50.8	72.8	52.5	59.8
437	2022-03-09	02:30:00	00:15:00.0	58.0	51.1	76.1	52.5	58.0
438	2022-03-09	02:45:00	00:15:00.0	59.2	50.7	75.5	52.7	59.2
439	2022-03-09	03:00:00	00:15:00.0	57.3	51.2	69.5	52.6	57.3
440	2022-03-09	03:15:00	00:15:00.0	57.0	51.1	68.9	52.8	57.0
441	2022-03-09	03:30:00	00:15:00.0	60.1	51.1	83.7	52.5	60.1
442	2022-03-09	03:45:00	00:15:00.0	58.4	51.2	75.7	53.0	58.4
443	2022-03-09	04:00:00	00:15:00.0	59.1	51.7	71.9	53.1	59.1
444	2022-03-09	04:15:00	00:15:00.0	56.7	51.1	69.9	52.7	56.7
445	2022-03-09	04:30:00	00:15:00.0	56.3	51.0	69.8	53.0	56.3
446	2022-03-09	04:45:00	00:15:00.0	58.1	50.9	70.0	52.6	58.1
447	2022-03-09	05:00:00	00:15:00.0	58.1	51.0	68.6	52.5	58.1
448	2022-03-09	05:15:00	00:15:00.0	59.8	51.8	74.3	53.7	59.8
449	2022-03-09	05:30:00	00:15:00.0	59.3	52.3	72.1	53.5	59.3

450	2022-03-09	05:45:00	00:15:00.0	61.5	51.3	78.5	53.2	61.5
451	2022-03-09	06:00:00	00:15:00.0	61.1	52.3	72.3	53.9	61.1
452	2022-03-09	06:15:00	00:15:00.0	63.2	53.1	75.8	55.0	63.2
453	2022-03-09	06:30:00	00:15:00.0	62.6	52.5	73.1	54.8	62.6
454	2022-03-09	06:45:00	00:15:00.0	63.0	53.8	75.4	55.5	63.0
455	2022-03-09	07:00:00	00:15:00.0	64.4	53.1	82.2	55.6	64.4
456	2022-03-09	07:15:00	00:15:00.0	64.9	52.8	79.6	56.0	64.9
457	2022-03-09	07:30:00	00:15:00.0	64.6	52.4	75.1	56.8	64.6
458	2022-03-09	07:45:00	00:15:00.0	66.0	53.6	79.3	56.5	66.0
459	2022-03-09	08:00:00	00:15:00.0	67.0	55.6	79.4	60.8	67.0
460	2022-03-09	08:15:00	00:15:00.0	65.6	54.9	75.4	58.2	65.6
461	2022-03-09	08:30:00	00:15:00.0	65.7	54.5	76.6	58.8	65.7
462	2022-03-09	08:45:00	00:15:00.0	64.8	55.8	75.3	59.2	64.8
463	2022-03-09	09:00:00	00:15:00.0	65.7	55.0	86.0	59.3	65.7
464	2022-03-09	09:15:00	00:15:00.0	66.0	55.4	85.8	58.3	66.0
465	2022-03-09	09:30:00	00:15:00.0	64.6	55.4	77.2	58.2	64.6
466	2022-03-09	09:45:00	00:15:00.0	65.0	55.5	73.7	58.7	65.0
467	2022-03-09	10:00:00	00:15:00.0	64.3	55.0	72.9	58.1	64.3
468	2022-03-09	10:15:00	00:15:00.0	67.4	55.6	92.5	57.8	67.4
469	2022-03-09	10:30:00	00:15:00.0	64.8	55.9	80.6	58.0	64.8
470	2022-03-09	10:45:00	00:15:00.0	69.9	56.5	94.3	59.7	69.9
471	2022-03-09	11:00:00	00:15:00.0	75.9	56.6	98.5	60.4	75.9
472	2022-03-09	11:15:00	00:15:00.0	65.8	55.8	83.5	59.9	65.8
473	2022-03-09	11:30:00	00:15:00.0	65.4	55.0	82.0	58.3	65.4
474	2022-03-09	11:45:00	00:15:00.0	64.6	56.1	76.1	58.8	64.6

APPENDIX E- UNCERTAINTY CALCULATION

Source of Uncertainty	Standard Uncertainty (dB)
Source	
— No variance	-
Transmission path	
— Weather	± 1.7
Background Sound	
— Type 1 instrument	± 0.4
Combined uncertainty (root sum square)	± 1.75
Expanded uncertainty (96% confidence level)	± 3.5

APPENDIX F- GLOSSARY OF TERMINOLGY

Decibel

- A dimensionless quantity defined as the ratio of either: a vector quantity (e.g. power), or scalar quantity (e.g. pressure), against a reference value (e.g. 10^{-12} Watts for power quantities, or $2x10^{-5}$ Pascals for pressure quantities) and computed on a logarithmic scale. Used to convey everyday magnitudes of either vector or scalar quantities on a (mathematically) manageable scale. One "decibel" is 1/10th of a "bel" (an early acoustical quantity now obsoleted).

A-weighting

- One of several octave-band frequency weighting networks applied to a measured noise level, closely related to the inverse of the 40 Phon curve (developed by *Fletcher-Munson*). Considered the most commonly used frequency weighting which closely simulates the response to air pressure variations of the human ear. Defined in British Standard; *BS EN 61672 1:2013 Electroacoustics. Sound level meters. Specifications*.

Fast

- One of several time weightings equivalent to an integrating time of 125 ms.

$L_{eq,T}$

- This is the "Equivalent Continuous" noise level. This defines the sound pressure level that would result in the same sound energy being measured as the actual varying sound pressure level over the measurement period, "T". Standardised in International Standard: *ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

L_{max}

- This is the absolute highest RMS (Root Mean Square) noise level of a discrete event occurring during the survey period. Standardised in International Standard; *ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

L_{min}

- This is the absolute lowest RMS (Root Mean Square) noise level of a discrete event occurring during the survey period. Standardised in International Standard; *ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

$L_{90,T}$

- This is the 90th-percentile sound pressure level which corresponds to the sound level which is exceeded 90% of the time, during the measurement period "T". This acoustic metric is commonly adopted to describe the Background Sound level. Standardised in International Standard; *ISO 1683:2008 Acoustics - Preferred reference values for acoustical and vibratory levels*.

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