PEAK acoustics



Noise Validation Report

Client:	Euro-Tel Design
Site:	Fishersgate Rec, West Road, Brighton, BN41 1QH
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Executive Summary

A Noise Validation Report has been undertaken on behalf of City Fibre for the installation of 1 No. data cabin with associated air conditioning units at Fishersgate Rec, Brighton.

The validation testing was conducted in order to identify if the installation of the data cabin and associated air conditioning units has complied with the previous Noise Impact Assessment report *(Ref. KD0804218NR Rev 1.0).*

Unattended and attended measurements of the prevailing background noise climate were undertaken when the equipment was not operational from Wednesday 10th August – Thursday 11th August 2022 at a location representative of the identified Noise Sensitive Receptors (NSRs).

Further unattended and attended measurements were undertaken when the equipment was operational from Monday 5th September – Tuesday 6th September 2022 in order to identify the Noise Impact of the data cabins and associated air conditioning units.

The nearest or most-affected Noise Sensitive Receptors (NSRs) were identified as the residential properties located to the east of the site on West Road and the northwest of the site on Gardner Street.

Three sets of unattended 24-hour measurement data were first compared showing a slight increase in level during the operational period in comparison to the non-operational period and original report. However, no increase in level was seen during the night-time measurements when comparing the non-operational and operational periods.

The attended measurement data at each NSR location was then compared to predicted Specific Sound Levels modelled in 'SoundPLAN' with the attended measurement data of both the non-operational and operational periods being louder than what was predicted at each NSR location in the noise model.

The non-operational and operational unattended measurements were then compared against each other with results showing levels during the operational period far lower than during the non-operational period.

Although measured levels were higher than predicted in the original report *(Ref. KD0804218NR Rev 1.0)*, a contextual assessment of the measurement data would indicate this is due to the contribution of the existing acoustic environment and not the contribution of the data cabin and associated air conditioning units.

After three different methods of measurement verification, this report indicates a potential for *Low Impact* in accordance with BS4142:2014, corresponding to the achievement of 'NOEL – No Observed Effect Level' in the NPSE and compliance with Condition 3 of the Planning Permission issued by Adur District Council.

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1. Introduction

1.1 A validation Noise Impact Assessment has been undertaken at Fishersgate Rec, Brighton in relation to the installation of 1 No. Data cabin with associated air conditioning units and plant equipment.

1.2 Details of the proposed air conditioning units for the cabin have been sourced from the previous report *(Ref. KD0804218NR Rev 1.0)* and are listed below:

- *4 No. LG. UU85*
- *2 No. LG ZUUW301GA1 (UUC1 U40)*

1.3 Manufacturer technical data sheets can be found by referring to the original report *(Ref. KD0804218NR Rev 1.0).*

1.4 The cabin has been installed on a plot of land near the northeastern border of Fishersgate Rec.

1.5 The air conditioning units are associated with the equipment within the data cabin.

1.6 A validation test of the Data cabin and air conditioning units is to be undertaken to determine whether the installation of the data cabin and associated air conditioning units has complied with the original Noise Impact Assessment report *(Ref. KD0804218NR Rev 1.0).*

2. Planning Policy & Guidance

2.1 Guidance for the assessment of noise affecting new residential development is given in the National Policy Framework (NPPF). Section 15 of the NPPF states:

"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:
E) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…noise pollution."

Section 185 further states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

1. *Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
2. *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

Section 187 states:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

2.2 To avoid and mitigate adverse noise effects on health arising from and impacting new development, the NPPF makes reference to NPSE. The Noise Policy Statement for England (NPSE) was published in March 2010 and covers all forms of noise other than occupational noise. For the purposes of this report, "Neighbourhood Noise" is most relevant as NPSE defined in paragraph 2.5.

"neighbourhood noise which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street."

2.3 The Noise Policy Statement for England (NPSE) states the following aims in paragraph 2.2.

NOEL – No Observed Effect Level.
This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level.
This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level.
This is the level above which significant adverse effects on health and quality of life occur.

3. Assessment Criteria – BS4142

3.1 The common standard for the assessment of industrial and commercial sound is ***'BS4142 – Methods for rating and assessing industrial and commercial sound'.*** The industrial noise assessment method in BS4142 is based on the difference between the measured 'background sound level' (L_{A90}), and the 'Rating Level' of the industrial source, at a noise-sensitive location (NSR). BS4142:2014 states:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs."

An estimation of the impact of the specific sound can be obtained by the difference between the rating sound level and the background sound level whilst considering the following:

"A Sound Rating Level at or below the background noise level is indicative of Low Impact;

A Sound Rating Level that exceeds the background noise level by around +5dB is likely an indication of Adverse Impact, depending on the context;

A Sound Rating Level that exceeds the background noise level by around +10dB is likely an indication of Significant Adverse Impact, depending on the context;"

BS4142 further states:

"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact, depending on the context."

3.2 Achievement of a *Low Impact* in accordance with BS4142 can be deemed to correspond to '*NOEL – No Observed Effect Level'* in the NPSE, as detailed above in Paragraph 2.3.

3.3 Condition 3 of the Planning Permission document issued by Adur District Council states that:

"The development hereby permitted shall be carried out in accordance with the recommendations of the Noise Assessment Report (KD0804218NR Rev 1.0 dated 08/07/2021). Within one month of implementation, a test shall be carried out and the result submitted to the Local Planning Authority to demonstrate compliance with the Noise Assessment Report."

4. Site Location

4.1 The site is located at Fishergate Rec, Brighton in a predominantly residential area. To the east of the site are three Residential Apartment buildings on West Road, to the south of the site is Fishersgate Rec playing fields which is utilised by locals for dog walking and sporting activities. Further south is the A259, this is a busy main road utilised throughout the day and night-time by people travelling to access the neighbouring areas. To the north of the site is Gardner Street, this is predominantly a residential street but is also utilised to access the warehouses associated with 'On the Wheel Superstore' and 'Sinnis Motorcycles' which are also located further west on Gardner Street.

4.2 The site, proposed noise source and receptor locations are shown in Figure 1 below:

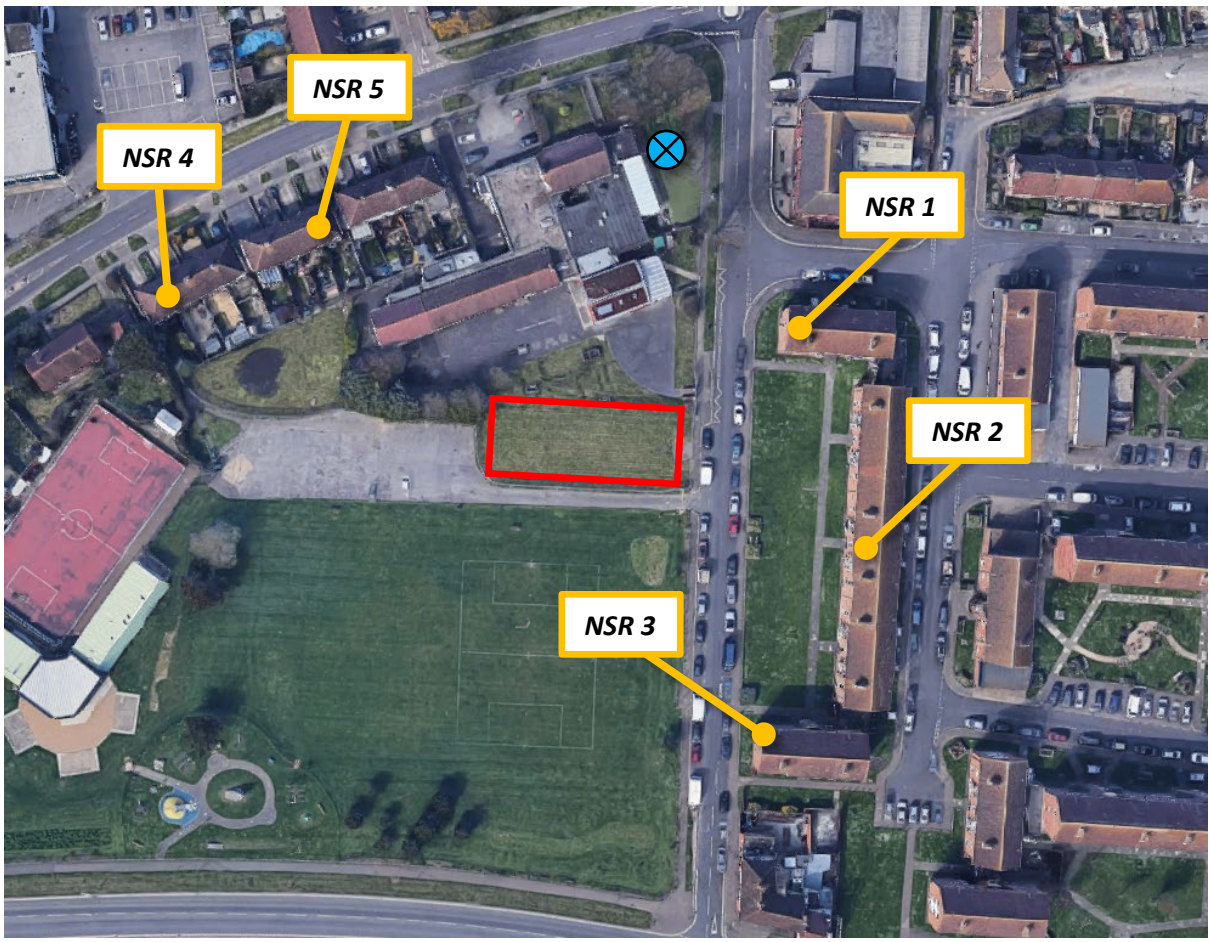


Figure 1: Site & NSR Locations - https://google.co.uk/maps

Site Boundary *(Approx.)*

Noise Sensitive Receptors (NSRs)

Background Monitoring Location M1 & M7 *(Approx.)*

5. Noise Sensitive Receptors

5.1 The nearest or most-affected Noise Sensitive Receptors (NSRs) have been identified as Residential dwellings. These include the three apartment buildings located on West Road (NSRs 1, 2 & 3) and the residential dwellings located on Gardner Street (NSRs 4 & 5).

5.2 It should be noted that in the original report *(Ref. KD0804218NR Rev 1.0)* the school directly to the north of the site was denoted as NSR 5. As the school is no longer in use, No. 93 Gardner Street will be denoted as NSR 5 instead.

5.3 The NSR locations and reception points are shown in an aerial image (**Figure 1)** on Page 7, monitoring positions at each NSR location be seen in **Figure 2** below.



Figure 2: Monitoring Locations - https://google.co.uk/maps

- Monitoring Position M1 *(Approx.)*
- Monitoring Position M2 and M8 *(Approx.)*
- Monitoring Position M3 and M9 *(Approx.)*
- Monitoring Position M4 and M10 *(Approx.)*
- Monitoring Position M5 and M11*(Approx.)*
- Monitoring Position M6 and M12 *(Approx.)*
- Monitoring Position M7 and M13 *(Approx.)*

6. Background Noise Survey – Original Report *(Ref. KD0804218NR Rev 1.0)*

6.1 An unattended noise survey was undertaken at position M1 over a period of approximately 24 hours from Tuesday 25th – Wednesday 26th May 2021. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 5-minute intervals in accordance with BS7445 - *'Description and Measurement of Environmental Noise'*.

6.2 Position M1 is located within the grounds of the abandoned school to the north of the site, the microphone was placed roughly 1.7 metres above ground level and away from any reflective surfaces. The noise climate at this location was deemed representative of that at the identified Noise Sensitive Receptors. Position M1 can be seen by referring to **Figure 2.**

6.3 Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.

6.4 Equipment was calibrated before and after use and no significant drift occurred during measurements. Up-to-date calibration certification can be provided upon request. Full calibration details are provided in **Appendix D**.

6.5 Daytime temperatures during the survey were noted as between 14 - 15°C and negligible winds; deemed suitable for conducting environmental noise monitoring. Full meteorological details can be found in **Appendix C**.

7. Background Noise Survey – Non-Operational and Operational Periods

7.1 An unattended background noise survey was conducted at position M2 over a period of approximately 24 hours from Wednesday 10th – Thursday 11th August 2022 during a period in which the air conditioning units and plant equipment were not operational.

7.2 A second unattended background noise survey was also conducted at position M8 over a period of approximately 24 hours from Monday 5th– Tuesday 6th September 2022 during a period in which the air conditioning units were operational. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 5-minute intervals in accordance with BS7445 - *'Description and Measurement of Environmental Noise'*.

7.3 A series of attended measurements were conducted on Wednesday 10th August 2022 during the AC units' non-operational period at positions M3- M7.

7.4 A second series of attended measurements were also conducted on Monday 5th and Tuesday 6th September 2022 at positions M9 - M13 during the AC unit's operational period.

7.5 All attended measurements were conducted over a period of approximately 15-minutes. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 1-minute intervals in accordance with BS7445 - *'Description and Measurement of Environmental Noise'*.

7.6 At positions M2 and M8 shown in Figure 1 and Figure 2, the microphone was attached to a gated fence within the grounds of the abandoned school. Positions M2 and M8 are located roughly 1.5 metres above ground level and away from any nearby reflective surfaces. The noise climate at this position was deemed representative of the noise climates at the nearest NSR locations over 24 hours.

7.7 At monitoring positions M3 - M13 the microphone was placed 1.5-metres above ground level and away from hard surfaces in the positions displayed in Figure 2.

7.8 The noise climate at all of the monitoring positions was dominated by road traffic (A259, West Road and Gardner Street) and the residents of the apartment buildings located on West Road. Occasional trains and aircraft were noted as secondary noise sources.

7.9 Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.

7.10 Equipment was calibrated before and after use and no significant drift occurred during measurements. Up-to-date calibration certification can be provided upon request. Full calibration details are provided in **Appendix D**.

7.11 Daytime temperatures during the noise surveys conducted between Wednesday 10th August – Thursday 11th August 2022 were noted as between 28 - 29°C with wind speeds typically between 3 - 4 m/s.

7.12 Daytime temperatures during the noise surveys conducted between Monday 5th August – Tuesday 6th September 2022 were noted as between 21 - 22°C with wind speeds typically between 2 - 6 m/s. These conditions were deemed suitable for conducting environmental noise monitoring. Detailed meteorological information can be found in **Appendix C.**

8. Background Sound Levels – Original Report

8.1 The day and night-time background sound levels from measurements M1 are summarised below. The data has been sourced from the original report *(Ref. KD0804218NR Rev 1.0)*.

Measurement	Date(s)	Period	$L_{Aeq,T}$	$L_{A90,T}$
M1	25th May 2021 – 26th May 2021	Daytime (07:00 – 23:00) (Aggregate Period)	50	44
		Night-time (23:00 – 07:00)	44	34

Table 1: Background Noise Survey Results – Original

8.2 Full-time history of the survey data is shown in **Appendix E**.

9. Background Sound Levels – Non-Operating Period

9.1 The day and night-time background sound levels from measurements M2 - M7 conducted on the first visit to the site are summarised below.

Measurement	Date(s)	Period	$L_{Aeq,T}$	$L_{A90,T}$
M2	10th August 2022 – 11th August 2022	Daytime (07:00 – 23:00) (Aggregate Period)	52	40
		Night-time (23:00 – 07:00)	42	32
M3	10th August 2022	Daytime (15:48 – 16:02)	54	59
M4		Daytime (15:31 – 15:45)	50	61
M5		Daytime (15:13 – 15:28)	55	62
M6		Daytime (16:28 – 16:41)	51	62
M7		Daytime (16:11 – 16:25)	49	60

Table 2: Background Noise Survey Results - Non-Operating

9.2 A full-time history of the survey data is shown in **Appendix E.**

10. Background Sound Levels – Operating Period

10.1 The day and night-time background sound levels from measurements M8 - M13 conducted on the second visit to the site are summarised below.

Measurement	Date(s)	Period	$L_{Aeq,T}$	$L_{A90,T}$
M8	5th September 2022 – 6th September 2022	Daytime (07:00 – 23:00) (Aggregate Period)	52	47
		Night-time (23:00 – 07:00)	51	32
M9	5th September 2022	Daytime (15:56 – 16:10)	53	45
M10		Daytime (15:38 – 15:53)	47	44
M11		Daytime (15:20 – 15:35)	60	48
M12	6th September 2022	Daytime (14:14 – 14:28)	56	50
M13		Daytime (14:31 – 14:45)	55	49

Table 3: Background Noise Survey Results - Operating

10.2 A full-time history of the survey data is shown in **Appendix E**.

11. Source Noise Levels

11.1 Details of the proposed air conditioning units for the cabin have been sourced from the previous report *(Ref. KD0804218NR Rev 1.0)* and are listed below:

- *4 No. LG. UU85*
- *2 No. LG ZUUW301GA1 (UUC1 U40)*

11.2 Manufacturer technical data sheets with noise level data were sourced and can be found in the original Noise Impact Assessment report *(Ref. KD0804218NR Rev 1.0)*.

12. Specific Sound Levels – Phase 1 Cabin Air Conditioning Units

12.1 The Specific Sound Level is denoted L_{As} and is the A-weighted, equivalent noise level at the NSR location. Specific Sound Levels have been calculated using the industry standard acoustic modelling software 'SoundPLAN'. This software uses IS0-9613-2-*Attenuation of sound during propagation outdoors* and the model takes into account the following key factors:

- *Geometric divergence of sound*
- *Atmospheric absorption of sound*
- *Ground absorption*
- *A light downwind correction toward the NSRs*
- *Surrounding structures and objects which may reflect or block sound toward the NSRs*
- *The height of the NSRs (Ground Floor/First Floor)*

12.2 The arrangement of the AC units associated with the Phase 1 Cabin was modelled based on the Site Plans provided by the client. These can be seen in **Appendix G**.

12.3 The Specific Sound levels (L_{As}) of the AC plant for the Phase 1 cabin have been calculated to the most affected floor level of the Noise Sensitive Receptor shown in Figure 1. The resultant sound levels are tabulated below.

NSR Location	Specific Sound Level, dB L_{As}
NSR 1 (F1)	29
NSR 2 (F2)	21
NSR 3 (F2)	20
NSR 4 (F1)	31
NSR 5 (F1)	24

Table 4: Specific Sound Levels

12.4 Noise maps showing external propagation are given in **Appendix F**.

13. 24 – Hour Measurements Comparisons

13.1 The 24-hour measurement data collected at monitoring position M1 will be compared against the 24-hour measurement data collected at monitoring positions M2 and M8. The data is tabulated below.

Measurement	Daytime, $L_{A90,T}$	Night-time, $L_{A90,T}$
M1	44	34
M2	40	32
M8	47	32
Difference Range (dB)	7	2

Table 5: 24-Hour Measurement Comparisons

13.2 By referring to Table 5 it shows that the daytime L_{A90} levels at monitoring position M8 during the operational period are higher than the daytime L_{A90} at positions M1 and M2 during the non-operational period. This is assumed to be due to the existing acoustic environment being louder as a result of the school summer holidays and not the contribution of the data cabin and associated air conditioning units.

13.3 As the denoted NSRs are all residential properties, levels throughout the night-time hours are to be considered when assessing the impact of the noise source over 24 hours.

13.4 Table 5 shows that there was a slight decrease in level during measurements M2 and M8 in comparison to M1 over the night-time period. This may be due to monitoring positions M2 and M8 being situated slightly further away from West Road and Fishersgate Rec, however, no increase in level between the air conditioning unit's non-operational and operational periods were recorded.

14. Specific Sound Level vs Measurement Data

14.1 The measured noise data is to be compared to the Specific Sound Levels displayed in Table 4 in order to identify any differences.

14.2 The resultant data is tabulated below:

Location	Specific Sound Level, L_{As}	Non-operational Period, $L_{A90,T}$	Difference, dB	Operational Period, $L_{A90,T}$	Difference, dB
NSR 1	29	59	+ 30	45	+ 16
NSR 2	21	61	+ 37	44	+ 23
NSR 3	20	62	+ 33	48	+ 28
NSR 4	31	62	+ 30	50	+ 19
NSR 5	24	60	+ 36	49	+ 25

Table 6: Specific Sound Level vs Measurement Data

14.3 Table 6 shows that the L_{A90} levels collected at each of the NSR locations during the non-operational and operational period are higher than the predicted Specific Sound Levels that were modelled in 'SoundPLAN'. This was assumed to be primarily because the Specific Sound Level only models the contribution of the noise source and does not consider environmental noise (e.g., traffic noise).

14.4 Upon visiting the site, the area was busy with frequently passing traffic and residents of the nearby apartment blocks socialising in the shared front external amenity space of the property.

14.5 In accordance with BS4142:2014, the Sound Specific Levels may be corrected for characteristics that make the sound more noticeable such as tonality, impulsivity and intermittency. In this instance, a correction of +3dB would be applied for the intermittent nature of the air conditioning units. Even with this correction, Rating Levels would still be far below the levels displayed in the measured data.

14.6 It should also be noted that the Specific Sound Levels that were modelled using 'SoundPLAN' are below any recorded representative day or night-time background level throughout the assessment.

15. Non–Operating Period (1st Visit) vs Operating Period (2nd Visit)

15.1 The background sound levels of the non-operating period are to be compared to the representative background noise levels of the operating period.

A Sound Rating Level at or below the background noise level is indicative of Low Impact;

A Sound Rating Level that exceeds the background noise level by around +5dB is likely an indication of Adverse Impact, depending on the context;

A Sound Rating Level that exceeds the background noise level by around +10dB is likely an indication of Significant Adverse Impact, depending on the context;

15.2 The indicated noise impact at the identified Noise Sensitive Receptors is summarised below:

Location & Period	Non-operational Period, $L_{A90,T}$	Operational Period, $L_{A90,T}$	Difference, dB	Noise Impact
NSR 1 – 15 mins	59	45	-14	*Low Impact*
NSR 2 – 15 mins	61	44	-17	*Low Impact*
NSR 3 – 15 mins	62	48	-14	*Low Impact*
NSR 4 – 15 mins	62	50	-12	*Low Impact*
NSR 5 – 15 mins	60	49	-11	*Low Impact*

Table 7: Noise Impact

15.3 Table 7 shows the L_{A90} levels measured during the operational period being lower than that of the non-operational period. This result is assumed due to the local area being busier during the first site visit, as residents of the apartment buildings on West Road were seen to be utilising the front outdoor amenity area during this period (NSRs 1 & 2) with more residents and local people utilising Fishergate Rec (NSRs 3, 4 & 5).

16. Judgement and Recommendations

16.1 Although the levels that were collected throughout the attended and unattended measurements were above the predicted Specific Sound Levels in the original report *(Ref. KD0804218NR Rev 1.0),* the contextualising factors indicate that the higher levels are a result of the existing acoustic environment and not primarily due to the data cabin and associated air conditioning units.

16.2 Considering all three methods of measurement verification, the report indicates that the operation of the data cabin and associated air conditioning units will be of a *Low Impact* in accordance with BS4142 and corresponding to the achievement of 'NOEL – *No Observed Effect Level*' in the NPSE, therefore demonstrating compliance with Condition 3 of the Planning Permission issued by Adur District Council.

17. Conclusion

17.1 A Noise Validation Report has been undertaken on behalf of City Fibre at Fishersgate Rec, Brighton in relation to the installation of 1 No. Data cabin with associated air conditioning units.

17.2 The validation testing was conducted in order to identify if the installation of the data cabin and associated air conditioning units has complied with the previous Noise Impact Assessment report *(Ref. KD0804218NR Rev 1.0).*

17.3 Attended measurements of the background noise climate were undertaken from Wednesday 10th – Thursday 11th August 2022 and Monday 5th– Tuesday 6th September 2022 at a position deemed representative of the identified Noise Sensitive Receptors over a 24-hour period (NSRs).

17.4 Unattended measurements of the background noise climate were undertaken on Wednesday 10th August 2022, Monday 5th and Tuesday 6th September 2022 at a position deemed representative of each of the identified Noise Sensitive Receptors (NSRs).

17.5 The nearest or most-affected Noise Sensitive Receptors were identified as the residential dwellings on West Road and Gardner Street.

17.6 The three sets of unattended 24-hour measurement data were compared first, the results showed a slight increase in level during the operational period in comparison to the non-operational period and the levels seen in the original report. However, the results showed no increase in level during the night-time when comparing the non-operational and operational periods.

17.7 The attended measurement data collected at each NSR location was then compared to predicted Specific Sound Levels. The results showed the attended measurement data of both the non-operational and operational periods having higher levels than what was predicted in the noise model at each NSR location.

17.8 The unattended measurements conducted during the non-operational and operational periods were then compared against each other. The results of the comparison showed levels during the operational period being far lower than in the non-operational period.

17.9 Although measured levels were higher than the predicted Specific Sound Levels seen in the original report *(Ref. KD0804218NR Rev 1.0)*, the contextualising factors would indicate that it is a result of the existing acoustic environment and not the contribution of the data cabin and associated air conditioning units.

17.10 After the three different methods of measurement verification, the report indicates that the operation of the data cabin and associated air conditioning units will be of a *Low Impact* in accordance with BS4142 and corresponding to the achievement of 'NOEL – No Observed Effect Level' in the NPSE, therefore demonstrating compliance with Condition 3 of the Planning Permission issued by Adur District Council.

18. Uncertainty

18.1 The background monitoring equipment is subject to a 1dB error margin, however, calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurements.

18.2 Uncertainty can arise in the prediction of noise propagation from and around flat reflective surfaces, such as the surrounding structures present on site. This has been reduced to a minimum by utilising an acoustic modelling software that uses the validated method, ISO-9613-2, as described in BS4142.

18.3 Uncertainty in the calculated specific sound levels is further reduced by utilising manufacturer-given sound power levels.

APPENDIX A – Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A5	25/05/2021	10:10	26/05/2021	10:05
M2	A1	10/08/2022	15:05	11/08/2022	14:55
M3	A2	10/08/2022	15:48	10/08/2022	16:02
M4	A2	10/08/2022	15:31	10/08/2022	15:45
M5	A2	10/08/2022	15:13	10/08/2022	15:28
M6	A2	10/08/2022	16:28	10/08/2022	16:41
M7	A2	10/08/2022	16:10	10/08/2022	16:25
M8	A1	05/09/2022	15:15	06/09/2022	14:55
M9	A2	05/09/2022	15:56	05/09/2022	16:10
M10	A2	05/09/2022	15:38	05/09/2022	15:53
M11	A2	05/09/2022	15:20	05/09/2022	15:35
M12	A2	06/09/2022	14:14	06/09/2022	14:28
M13	A2	06/09/2022	14:31	06/09/2022	14:45

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A1	Sound Meter	Svantek	958	1	34525
A1	Microphone	Microtech Gefell	MK255	1	11561
A1	Pre-Amp	Svantek	SV12L	1	32484
A2	Sound Meter	Svantek	971	1	40305
A2	Microphone	ACO	7052E	1	56663
A2	Pre-Amp	Svantek	SV12L	1	32484
3	Calibrator	Svantek	SV33A	1	43086
A5	Sound Meter	RION	NL-52	1	00219828
A5	Pre-Amp	RION	NH-25	1	00344
A5	Microphone	RION	UC-59	1	18806
A5	Calibrator	RION	NL-75	1	34212936

APPENDIX C - Meteorology Details

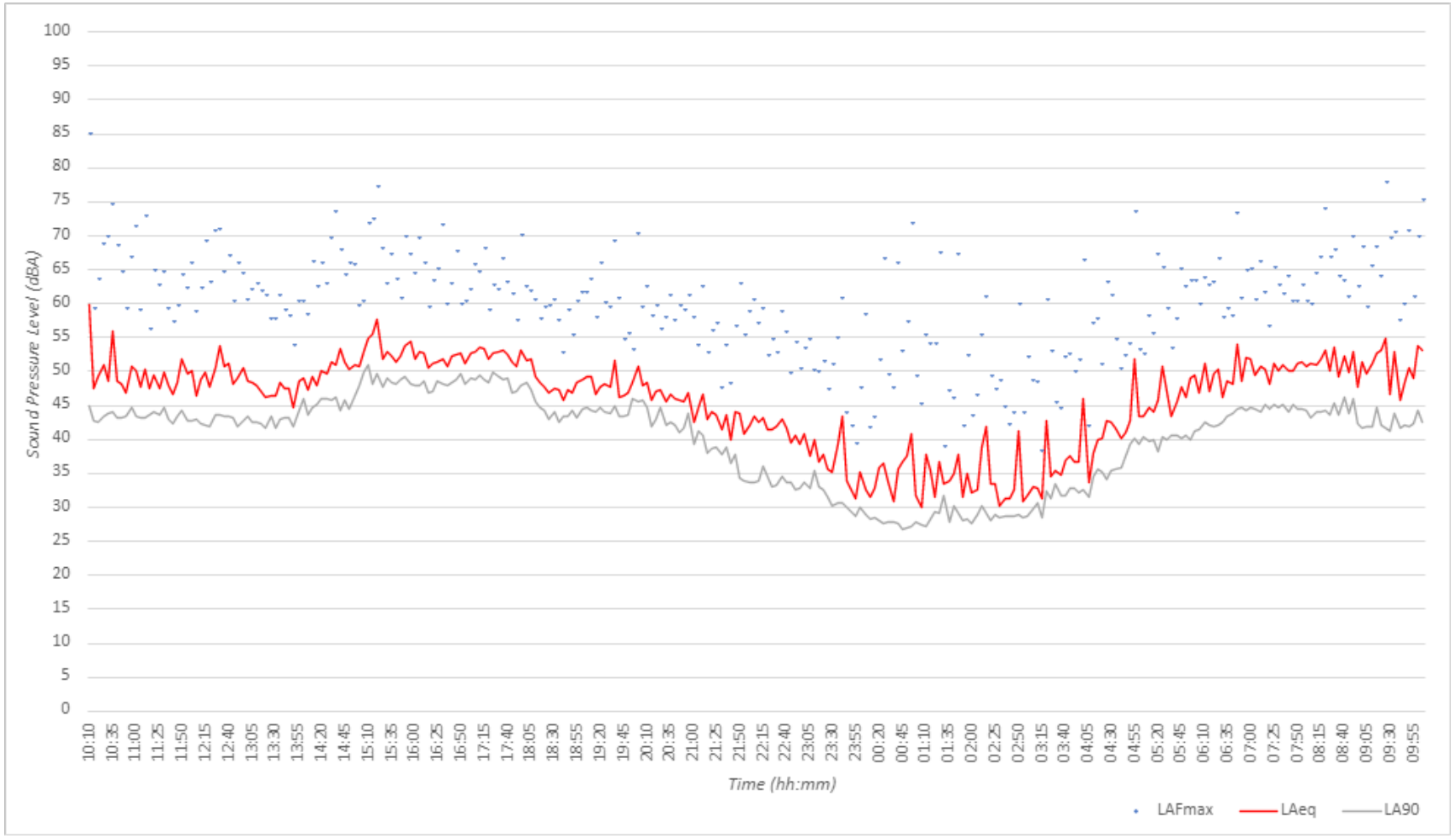
Date	Temp C°	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
10/08/2022	28	3 - 4	NW	47	0.0	0/8
11/08/2022	29	2 - 3	NW	42	0.0	0/8
05/09/2022	22	2 - 3	NW	73	11.0	6/8
06/09/2022	22	5 - 6	N	74	8.0	3/8
25/05/2021	14	4 - 5	W	63	0.0	6/8
26/05/2021	15	3 - 5	WNW	55	0.0	5/8

APPENDIX D - Calibration Details

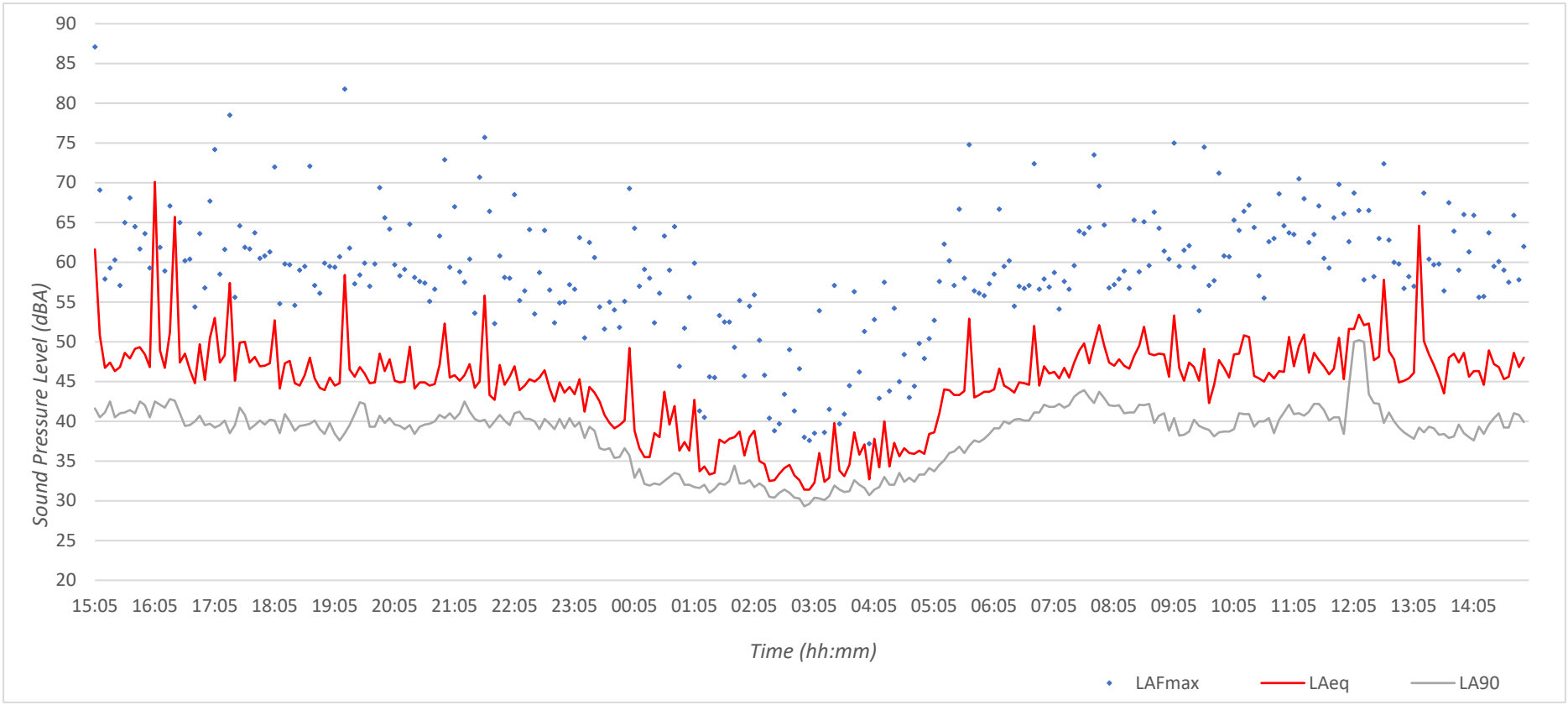
Measurement	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
M1	94.0	0.0	0.1
M2	114.0	0.2	0.1
M3	114.0	1.98	2.09
M4	114.0	1.98	2.09
M5	114.0	1.98	2.09
M6	114.0	1.98	2.09
M7	114.0	1.98	2.09
M8	113.9	0.0	- 0.1
M9	113.9	2.07	2.11
M10	113.9	2.07	2.11
M11	113.9	2.07	2.11
M12	113.9	2.16	2.12
M13	113.9	2.16	2.12

APPENDIX E – Noise Survey Results

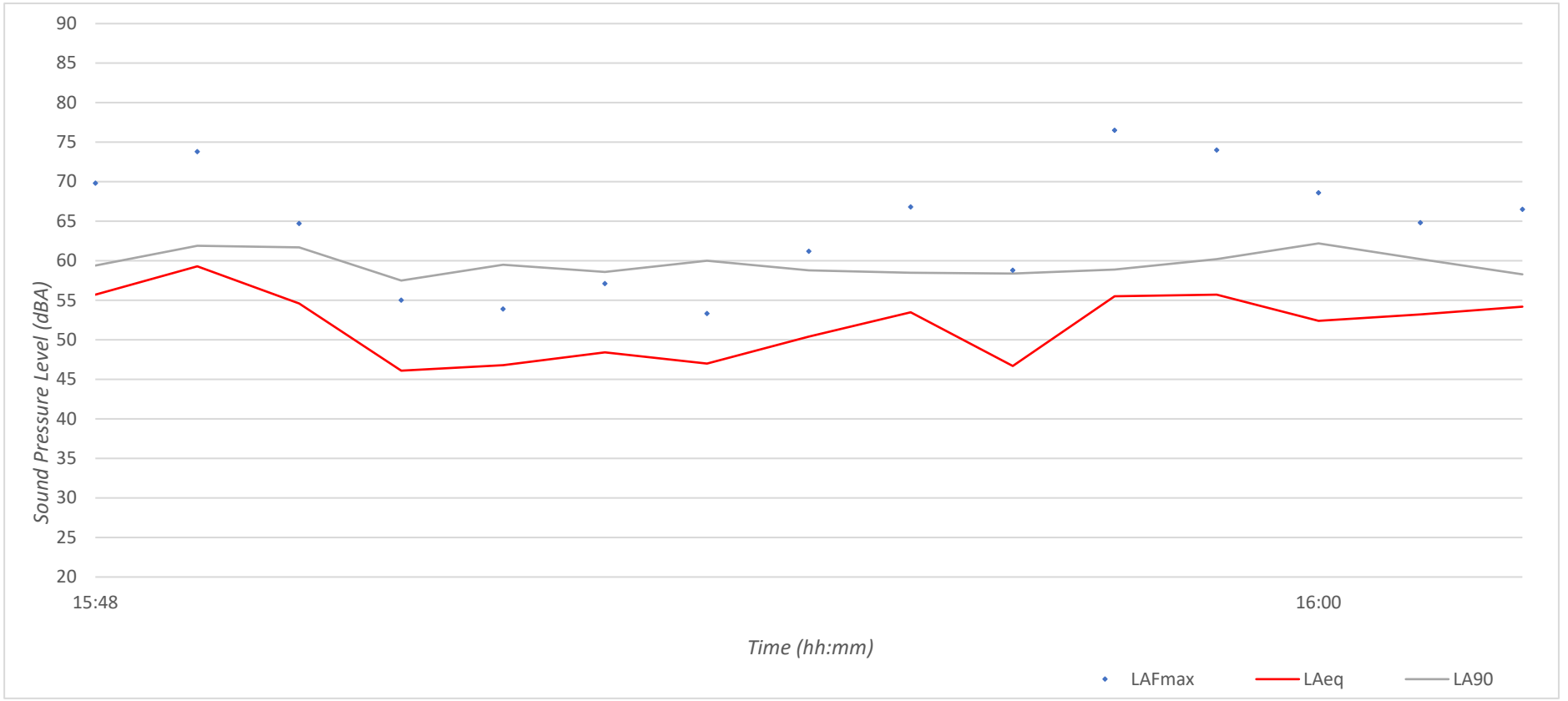
Measured Background Sound Levels Time History (M1): Tuesday 25th – Wednesday 26th May 2021



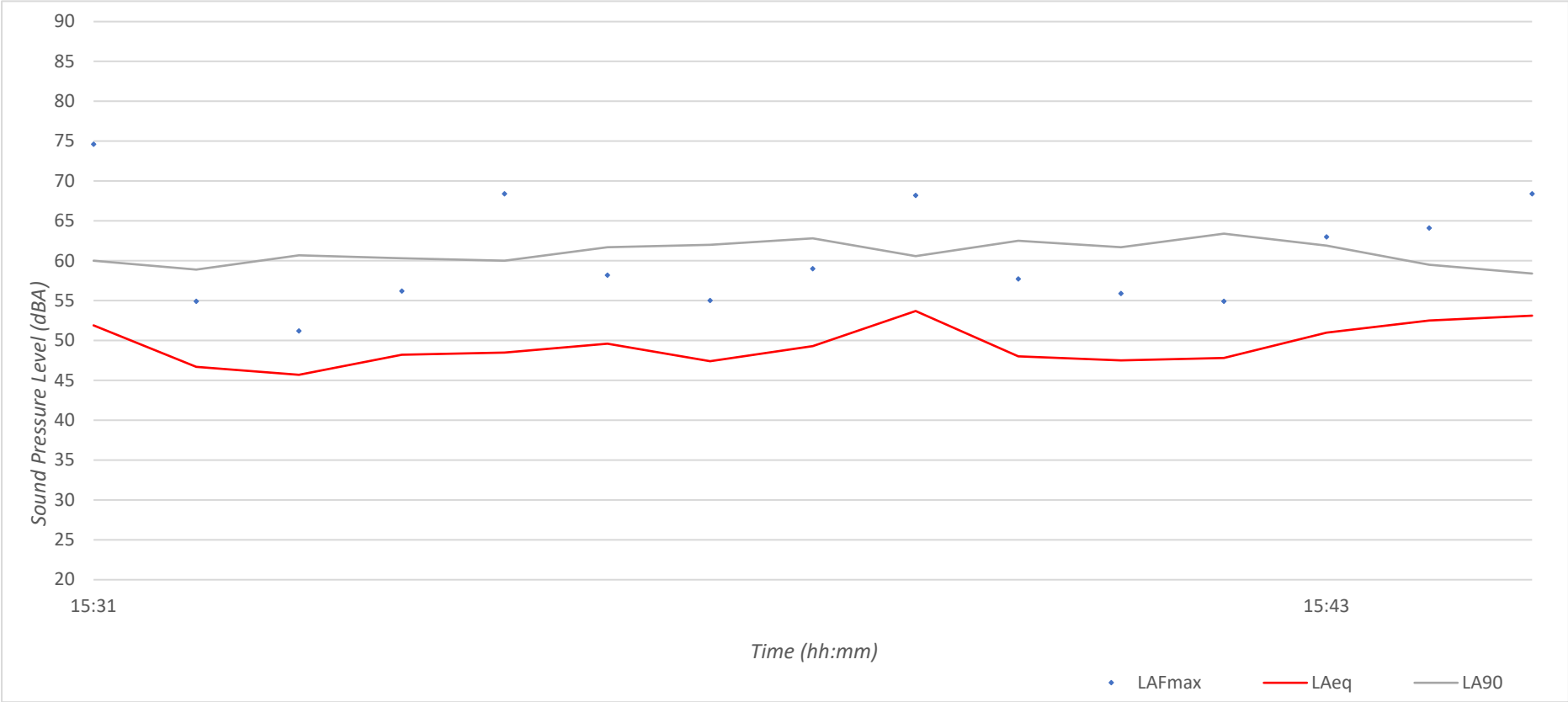
Measured Background Sound Levels Time History (M2): Wednesday 10th – Thursday 11th August 2022



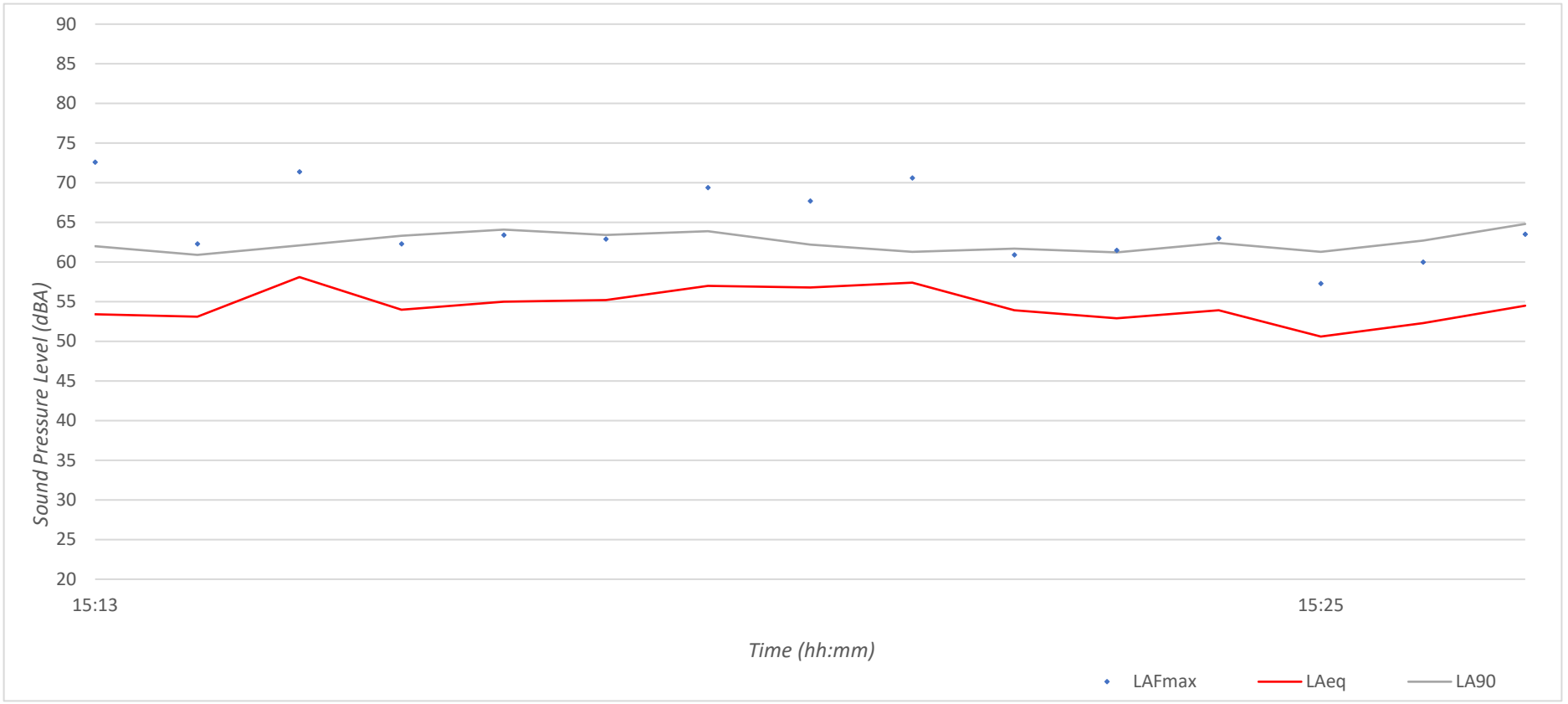
Measured Background Sound Levels Time History (M3): Wednesday 10th August 2022



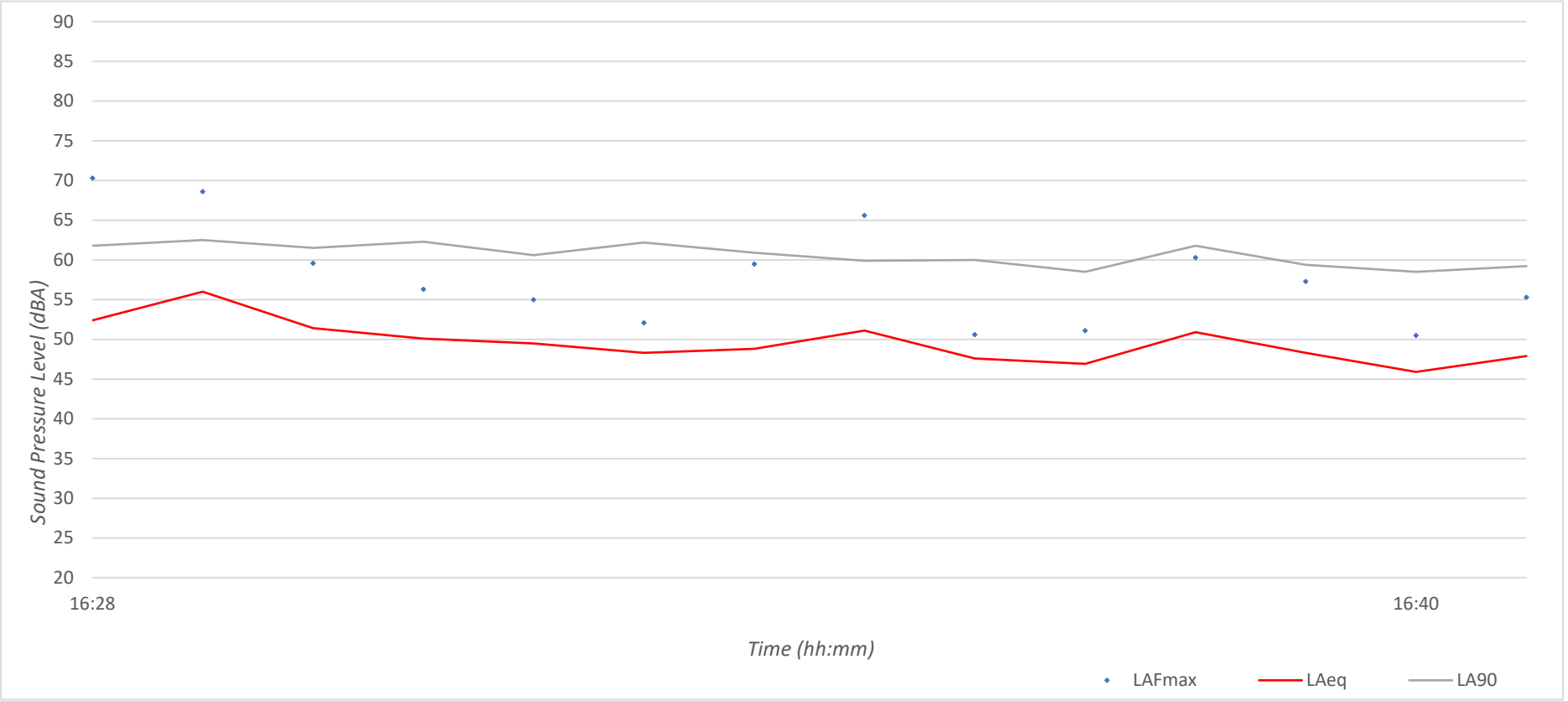
Measured Background Sound Levels Time History (M4): Wednesday 10th August 2022



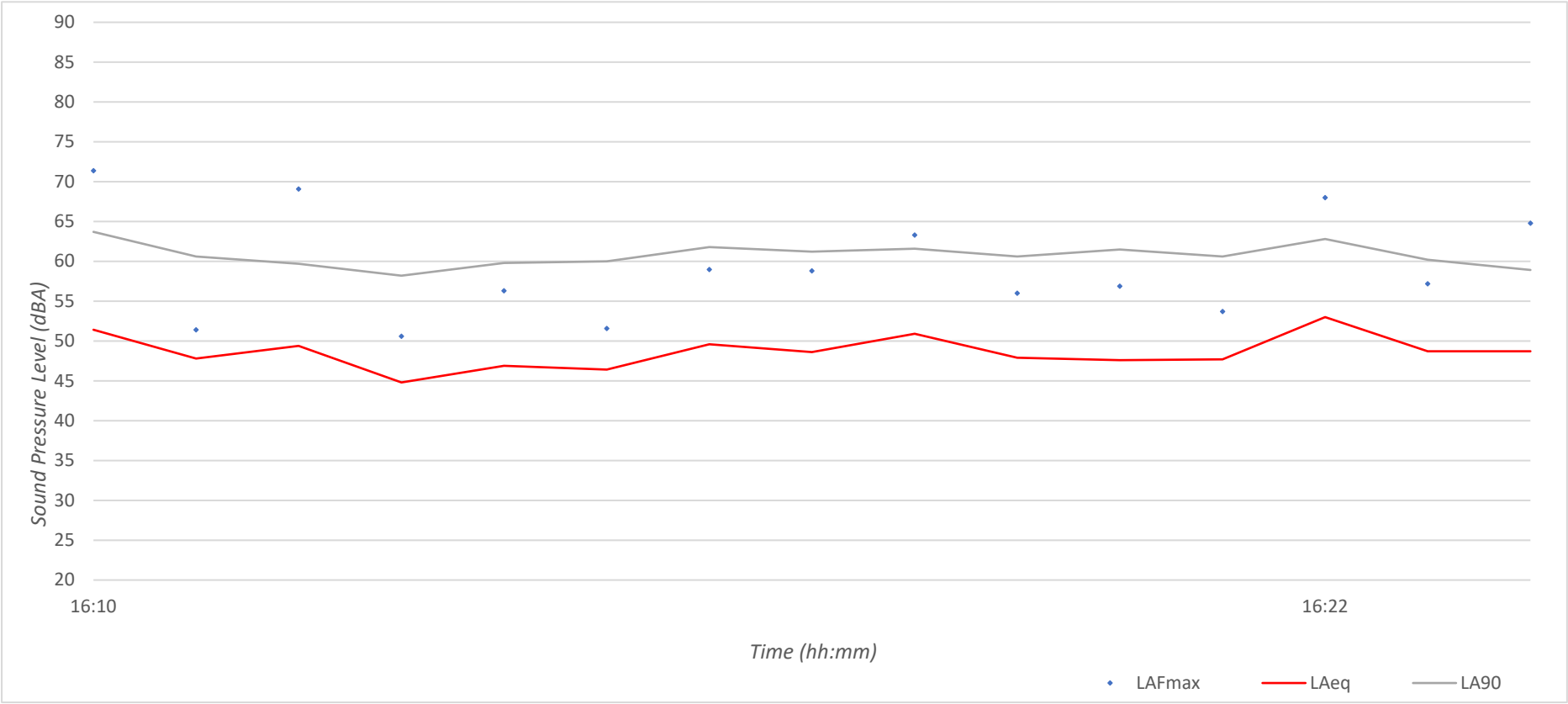
Measured Background Sound Levels Time History (M5): Wednesday 10th August 2022



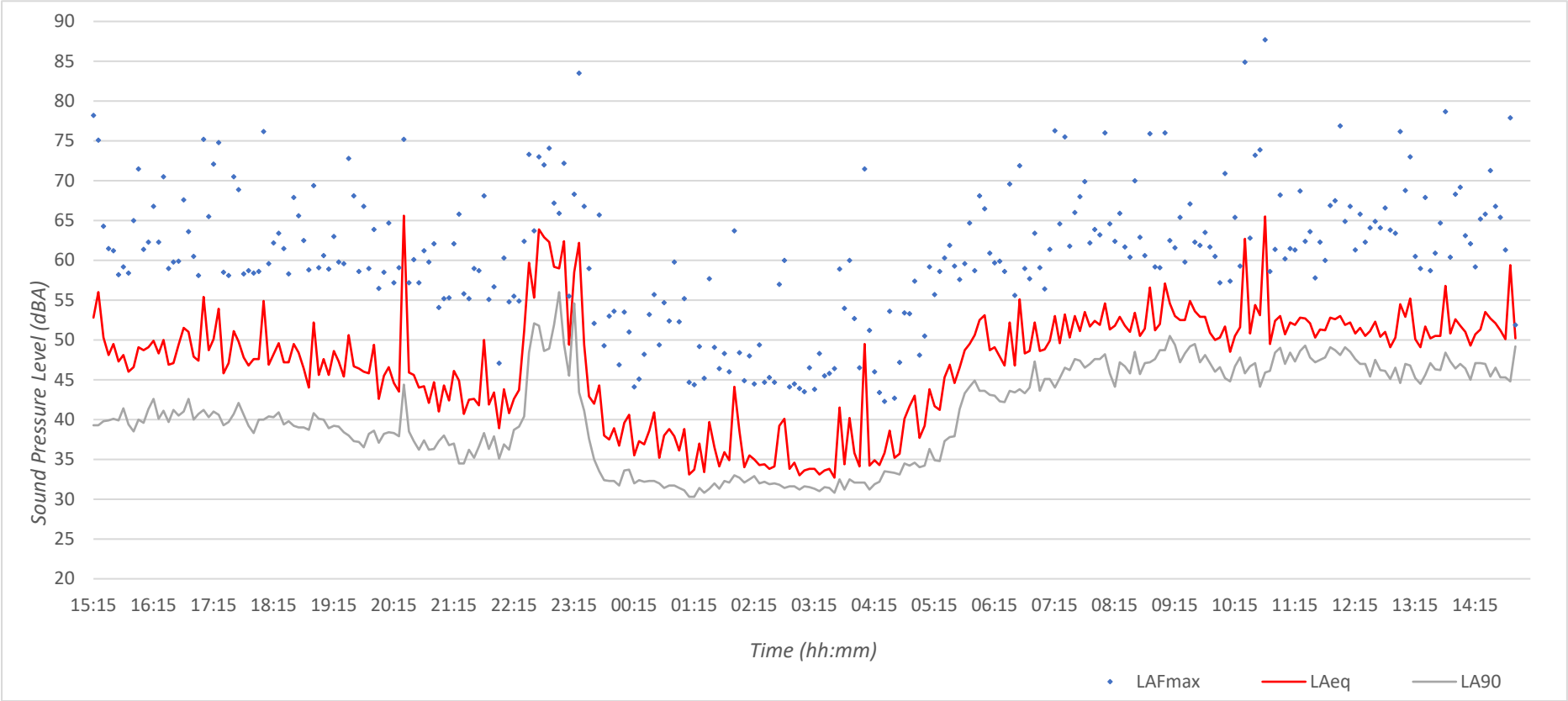
Measured Background Sound Levels Time History (M6): Wednesday 10th August 2022



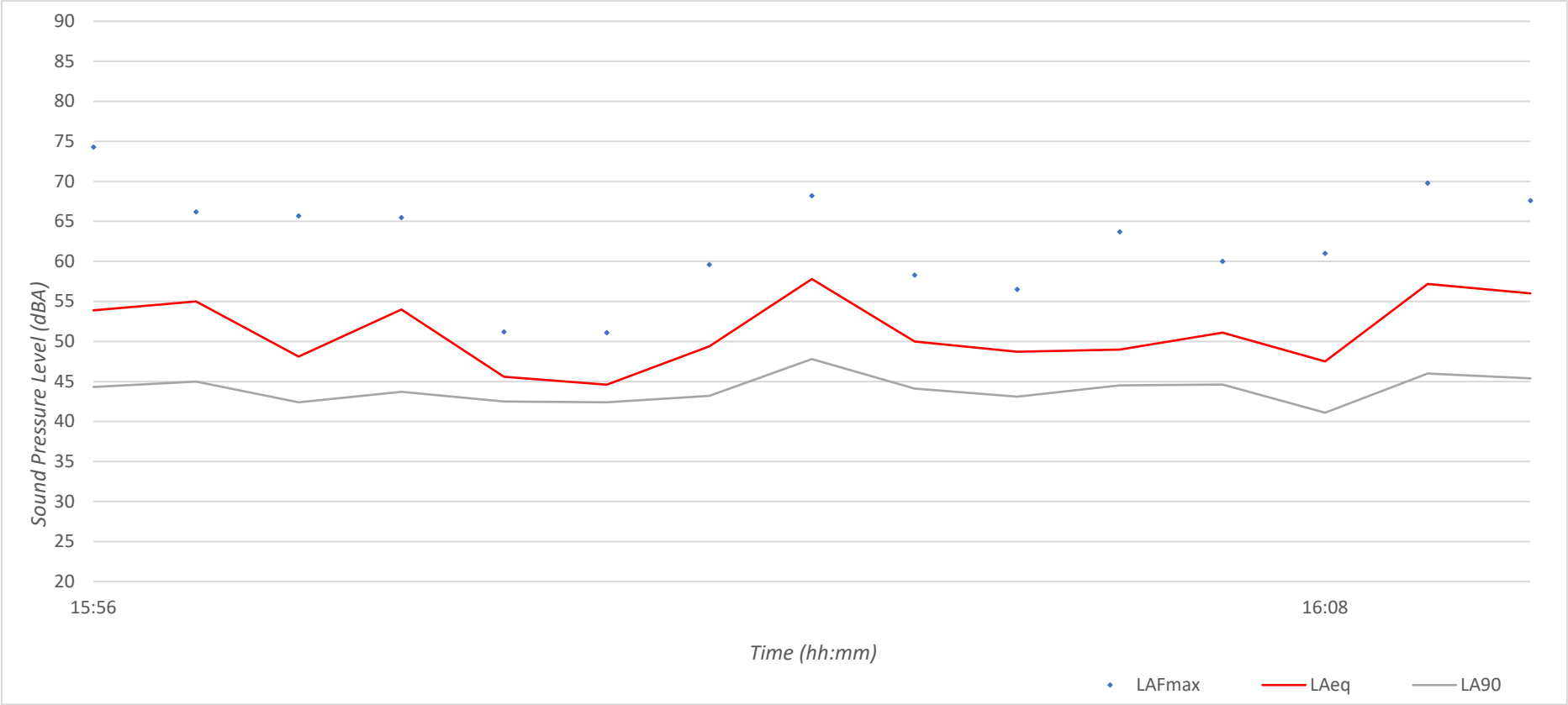
Measured Background Sound Levels Time History (M7): Wednesday 10th August 2022



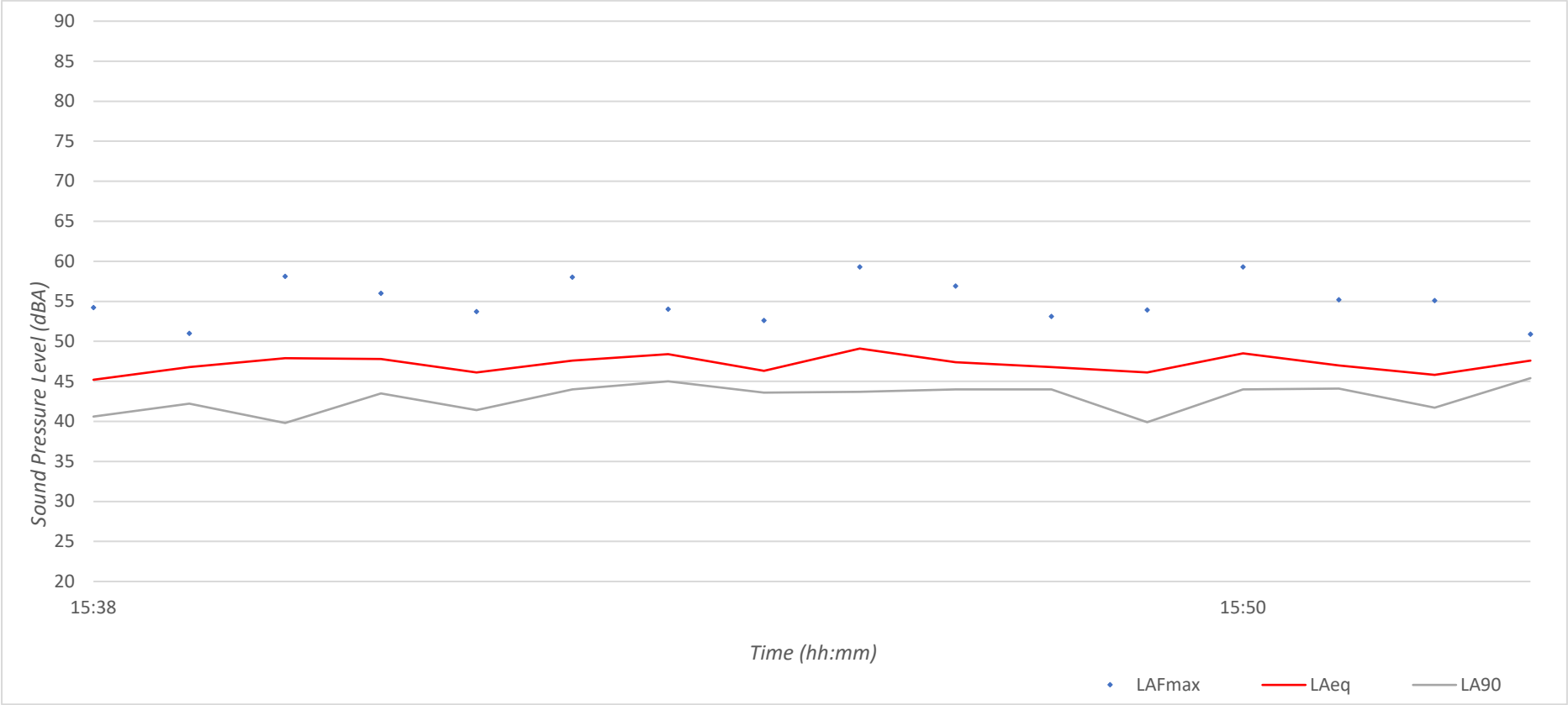
Measured Background Sound Levels Time History (M8): Monday 5th – Tuesday 6th September 2022



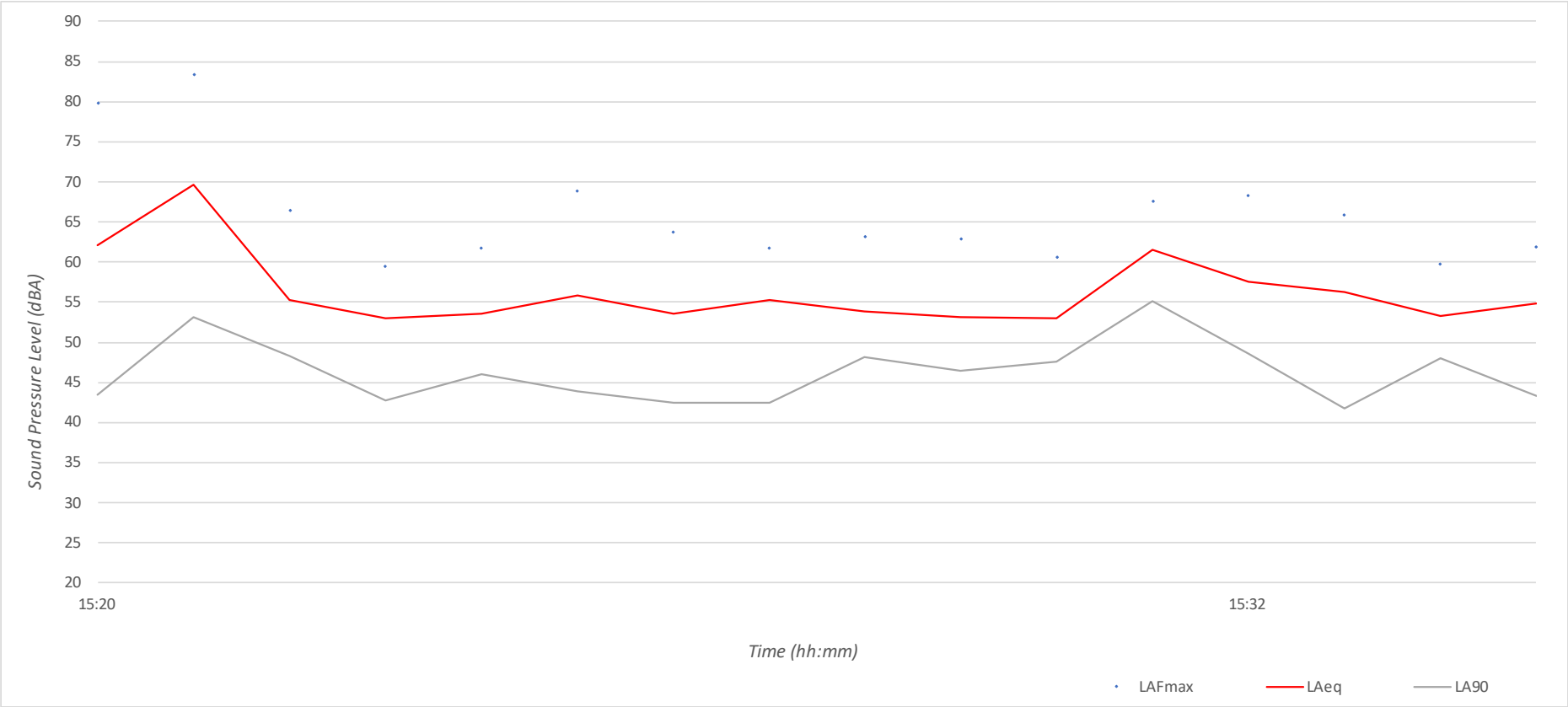
Measured Background Sound Levels Time History (M9): Monday 5th September 2022



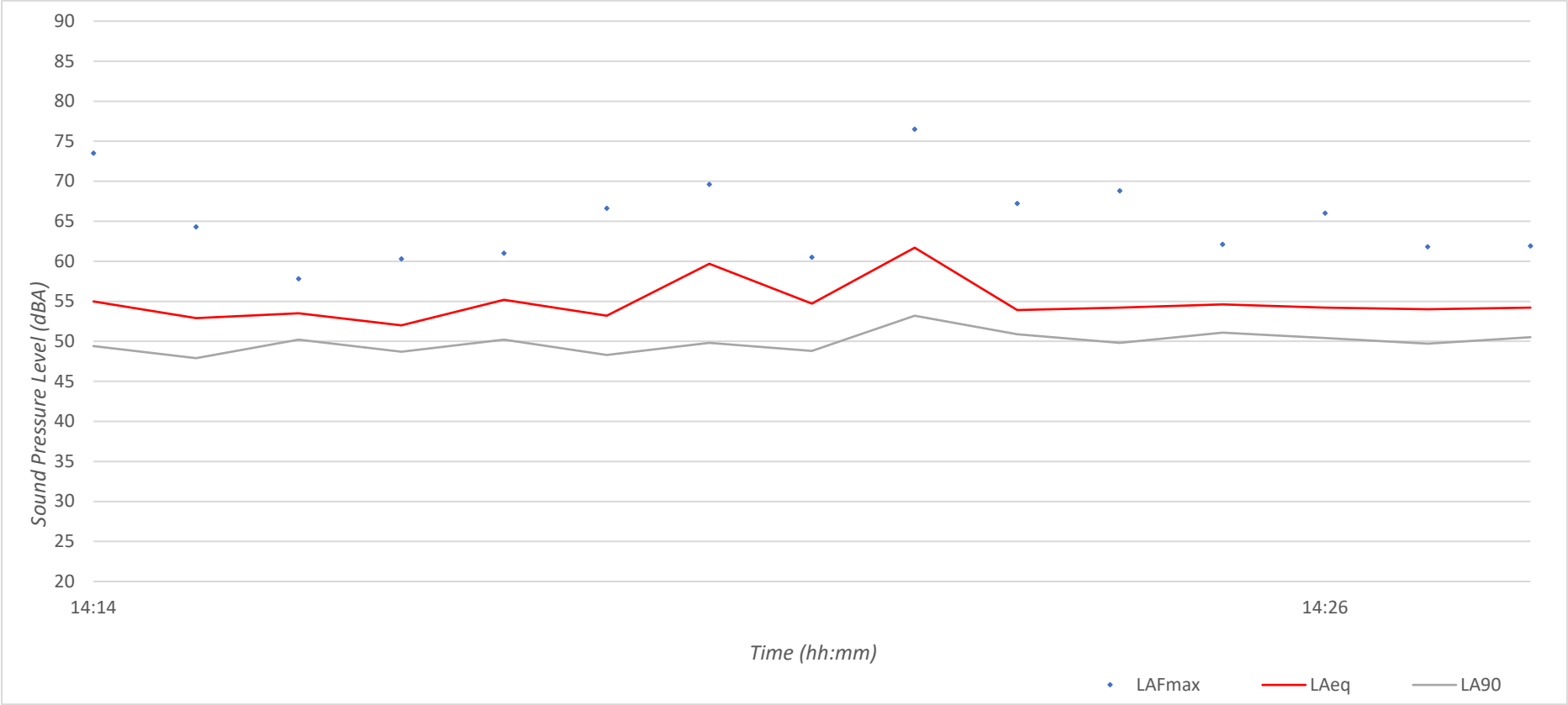
Measured Background Sound Levels Time History (M10): Monday 5th September 2022



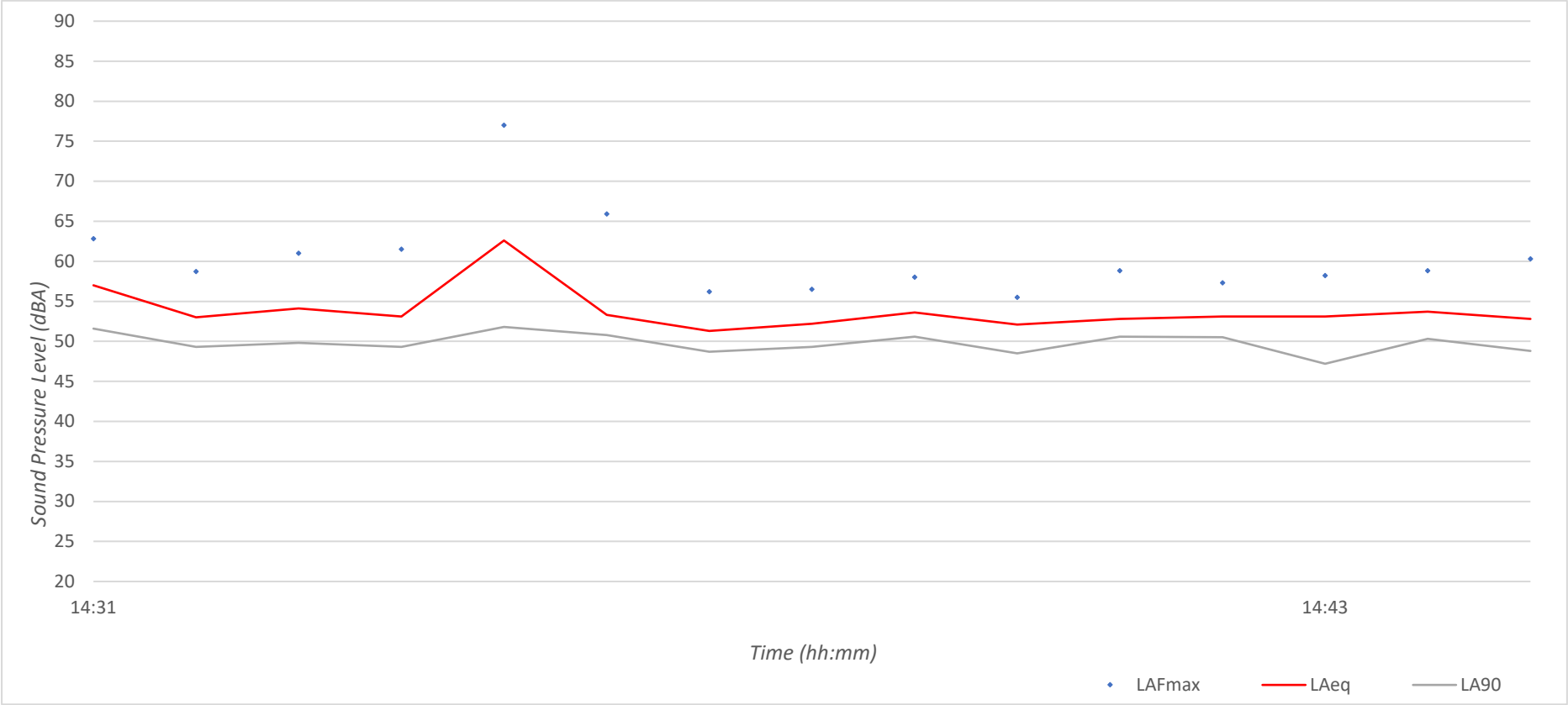
Measured Background Sound Levels Time History (M11): Monday 5th September 2022



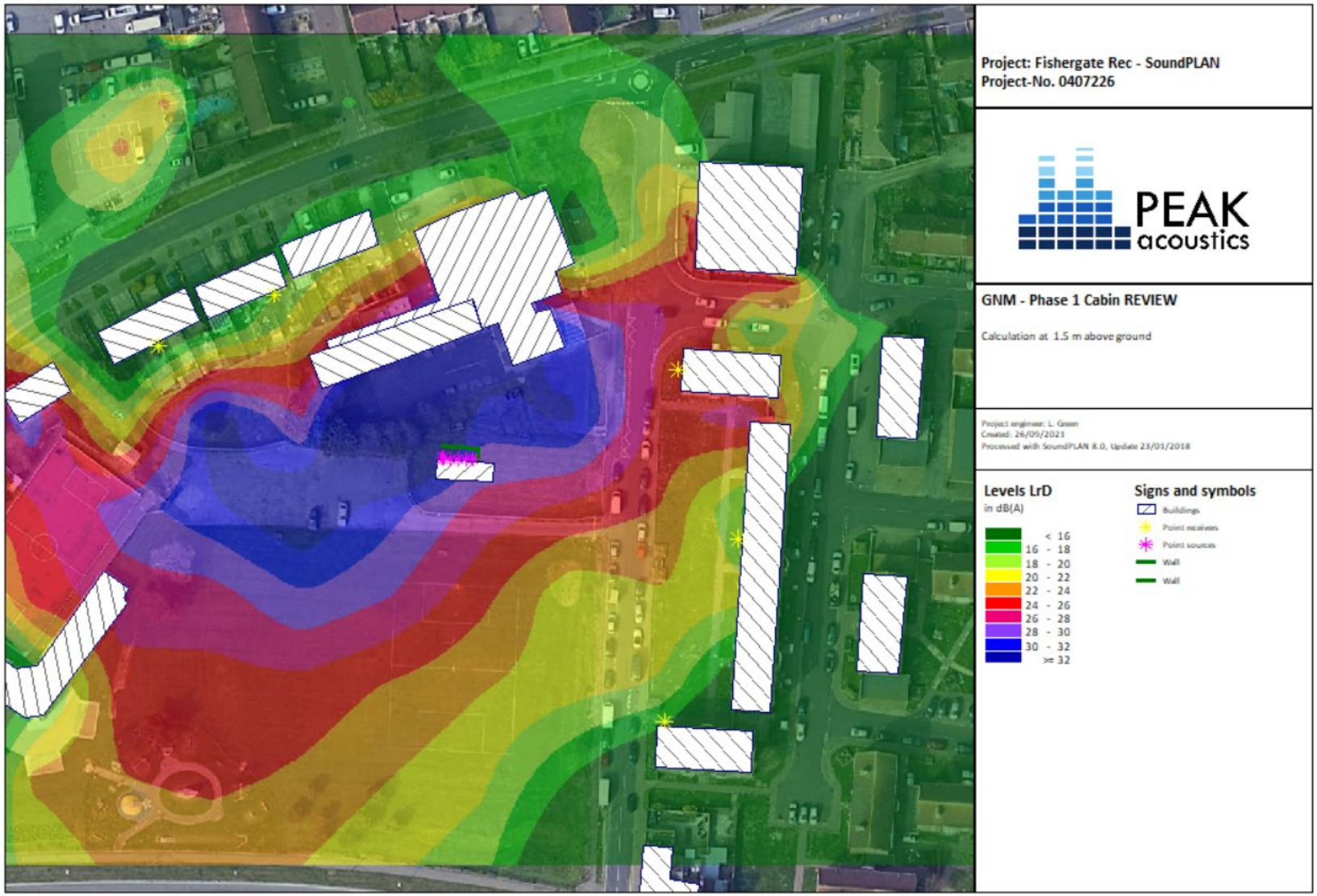
Measured Background Sound Levels Time History (M12): Tuesday 6th September 2022



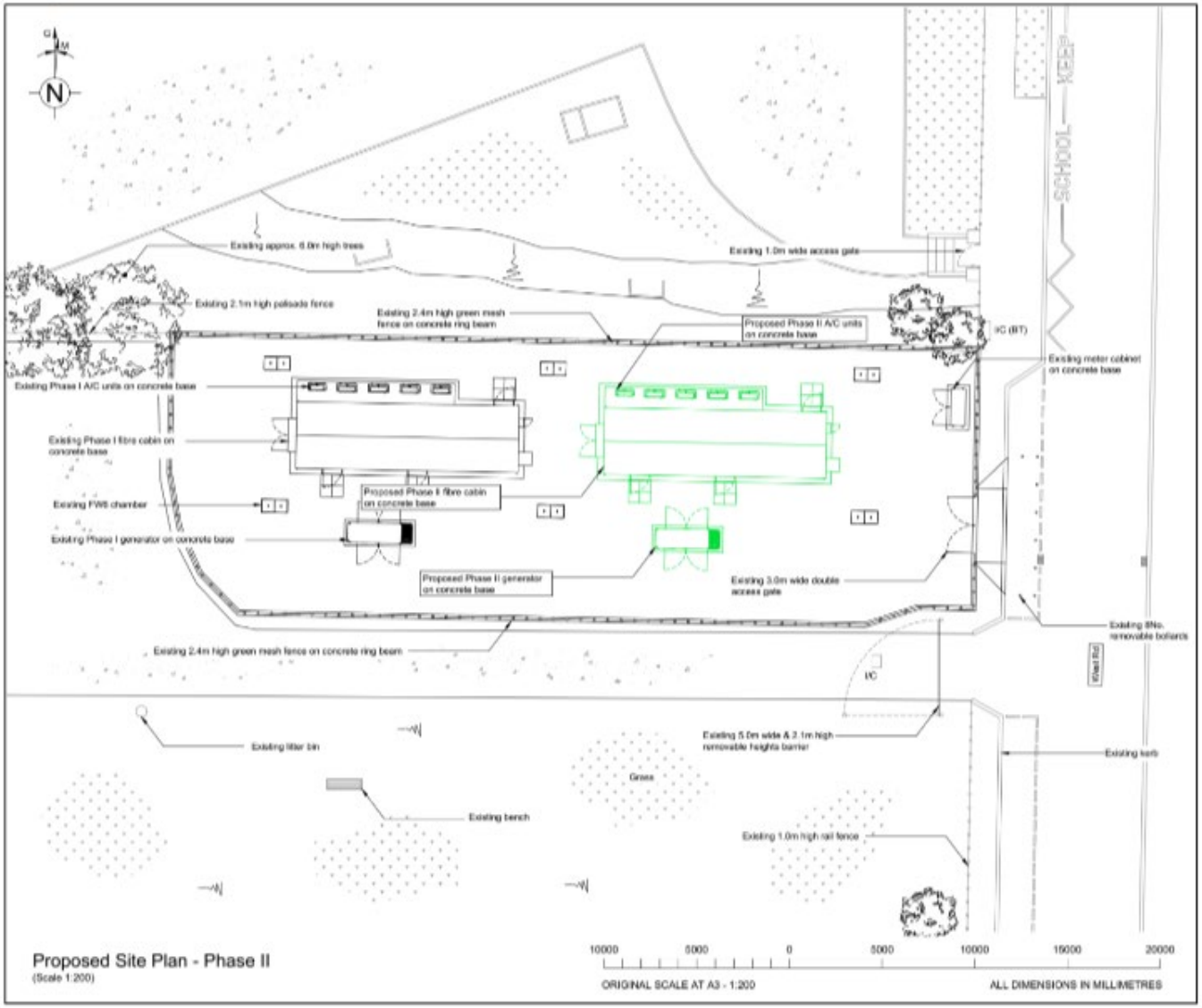
Measured Background Sound Levels Time History (M13): Tuesday 6th September 2022



APPENDIX F – Grid Noise Map



APPENDIX G – Site Plans



APPENDIX H – Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140dB. Here are some examples of common environments and their typical noise levels.

Noise Level	Environment
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 metre away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level ($2x10^{-5}$ Pa – threshold of hearing).

$L_{Aeq, T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level over which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{A90} – The sound level exceeded 90% of the time. Typically used to describe background noise the L_{90} is regarded as the 'average minimum level' and quantifies the common sound level of a fluctuating sound field i.e. the sound level that occurs 90% of the time. Alternatively, L_{10} describes the sound level exceeded 10% of the time and therefore quantifies the 'average maximum level' of sound which is often used during the calculation of road traffic noise.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.