

Greyfriars Church, Reading

Plant Noise Assessment

Report 18/0717/R3

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Greyfriars Church

Friar Street
Reading
RG1 1EH

Revision	Description	Date	Prepared	Approved
0	1 st Issue	15 th November 2019	Alex Stronach	Adam Sharpe

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Plant Noise Assessment

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19/0717/SP1

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19/0717/PNS1

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■ End of Section



Plant Noise Assessment

1 Introduction

- 1.1 It is proposed to re-develop the existing Greyfriars Centre at the existing Greyfriars Church site in Reading. Cole Jarman have provided acoustic consultation on phase one and two of the scheme.
- 1.2 Phase one of the scheme will see the construction of a new entrance lobby to the main worship hall as well as extensions to constructed onto existing properties.
- 1.3 Phase two of the scheme proposed to demolish of the existing Greyfriars centre and a similarly-sized community centre take its place. This new building will feature an additional floor with a significant number of new meeting rooms and office spaces constructed at each level.
- 1.4 Cole Jarman have been instructed to undertake an assessment of the impact of noise from mechanical services elements associated with phase two to existing nearby residential receptors.
- 1.5 The report details an evaluation of noise emissions from the proposed plant strategy to the nearest noise sensitive areas. Where necessary, mitigation measures have been set out with performance requirements for the various elements specified.

2 Site Description

2.1 Existing Site

- 2.1.1 The site, located at Friar Street, Reading, RG1 1EH, sits on the corner of Friar Street and Greyfriars Road and features a large 14th century church and a two storey community centre building on the western and eastern sides of the site respectively. The central area of the site is occupied by its car park.
- 2.1.2 The area to the north of the site is occupied by a mixture of two and three storey residential terraces either side of Sackville Street. The property on the south-eastern end of Sackville Street bordering the site (nos. 2 and 4) are also occupied by the Church, and is also intended to be renovated as part of the redevelopment works.
- 2.1.3 Beyond Friar Street to the south of the site sits a large three storey department store premises on the corner of Cheapside and Friar Street, with associated loading bay to the west, beyond which are several mixed use properties featuring ground floor commercial units with two storeys of residential properties above.
- 2.1.4 The area to the east of site across Greyfriars Road is occupied by a large six storey student accommodation premises above a ground floor commercial unit, beyond which are several more substantial mixed use properties along Friar Street.



Plant Noise Assessment

- 2.1.5 The site's western extent borders the A329 and its junction connecting the dual carriageway to Friar Street and Chatham Street beyond the highway to the west.
- 2.1.6 Due to the site's close proximity to the A329, traffic around the site is typically regular, with vehicles regularly stopped along Friar Street due to several crossings in the immediate vicinity of the site.
- 2.1.7 The site falls within the jurisdiction of Reading Borough Council.

3 Background Noise Survey

3.1 Methodology

- 3.1.1 An unattended noise survey was undertaken at the site commencing at 1130 hours on Thursday 10th January, concluding at 1145 hours on 14th January 2019.
- 3.1.2 Measurements of background noise levels were taken from positions on the flat roof areas of the Church building and existing Greyfriars Centre. This has been illustrated in attached site plan 18/0717/SP1 and are described below:
- MP1: Roughly 1.2 m above the northern flat roof area of Greyfriars Church.
 - MP2: Roughly 4.0 m above the central flat roof area of the Greyfriars Centre, overlooking the residential properties to the north on Sackville Street.
- 3.1.3 These positions were selected to quantify existing noise levels from the local noise climate, most notably traffic noise from the A329, as well as representative noise levels at the nearest residence to the site, immediately to the north on Sackville street.
- 3.1.4 Measurements of the L_{Aeq} , L_{Amax} and L_{A90} indices were recorded over consecutive 15-minute periods for the duration of the survey using the equipment listed within table T1 (see attached Glossary of Acoustic Terms for an explanation of the noise units used).

Item	Manufacturer	Type
Sound Level Analyser	Rion	NL-52
Acoustic Calibrator	Rion	NC-74
Weatherproof windshield	Rion	WS-15

T1 Equipment used during unattended noise survey.

- 3.1.5 The microphones were fitted within weatherproof enclosures, and the sound level meters calibrated before and after the survey in order to confirm an acceptable level of accuracy. No significant drift was noted to have occurred.



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- 3.1.6 The weather conditions when setting up the noise monitoring equipment were overcast and cold with dry roads and some breeze. These conditions are deemed acceptable and are not considered to have affected the measurement results.

3.2 Results

- 3.2.1 The results of the noise measurements are presented in attached time history figures 19/0717/TH01 & 19/0717/TH02 for positions MP1 and MP2 respectively.
- 3.2.2 The noise climate perceived onsite was noted to be dominated by traffic noise from the nearby A329. Some distant construction noise was noted during collection of the unattended survey, thought to be emanating from the north/west.
- 3.2.3 The representative background noise levels recorded during the day and night time measurement hours during the survey duration are set out in table T2 below:

Location	Representative Background Noise Level, dB(A)	
	Daytime (0700-2300 only)	Night time (24-hour)
MP1 – Greyfriars Church flat roof	55	43
MP2 – Existing Greyfriars Centre flat roof	54	44

T2 Representative background noise levels, L_{A90} .

4 Plant Noise Limits

- 4.1 The likelihood of an adverse noise impact from fixed items of plant at any nearby residential buildings can be assessed based on guidance contained in BS4142:2014. Details of BS4142 are contained in attached Appendix A.
- 4.2 We understand that the local authority typically recommends that plant noise at existing residences should be designed to a rating level 10dB below the existing representative L_{A90} background noise levels recorded during the relevant time period.
- 4.3 Taking in to account the guidance set out above, and the representative background noise levels measured during the course of our unattended noise survey, the plant noise emission limits to apply at all nearby existing residential receptors are as follows:



Plant Noise Assessment

Location	Noise Emission Limit, dB	
	Daytime (0700-2300 only)	Night time (24-hour)
Nearby residential receivers represented by MP1	45	33
Nearby residential receivers represented by MP2	44	34

T3 Plant noise emission limits at the nearest residential properties.

- 4.4 Any future mechanical services plant equipment will be cumulatively designed to the above noted limits to nearby noise sensitive receivers, as assessed in accordance with BS4142:2014. With a commitment to adopt the above limits, all local and national policies in relation to potential noise disturbance will be met.

5 Plant Noise Assessment

5.1 Proposed Installation

5.1.1 The proposed external units ducted to atmosphere are as follows:

- AHU1: *Systemair* Geniox 22;
- AHU2: *Systemair* TOPVEX SC08 HW-R-CAV.

5.1.2 Both units are to be located on the roof of the proposed Greyfriars centre within a louvered enclosure. All atmospheric ductwork terminations associated with the units are also to be located at roof level.

5.1.3 The proposed operating hours for the centre are not currently known at the time of writing. As a result, we have assessed the units against the night time noise limits in order to provide as robust an assessment as possible.

5.1.4 The datasheet provided for AHU1 indicates that a silencer is to be provided for both the extract and the outdoor air duct routes. The insertion losses for this are provided within table T4 and are included within our assessment.



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Silencer	Insertion Loss at							
	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
AS-1 AHU1 <i>Systemair</i> quoted silencer	5	11	17	25	36	39	36	28

T4 AHU1 *Systemair* quoted silencer insertion losses.

5.2 Methodology

- 5.2.1 Our assessment has used manufacturer's noise data for each plant item as shown in the attached schedule 19/0717/PNS1. The noise data suggests that no tonality correction need be applied.
- 5.2.2 The nearest noise sensitive receivers to the proposed plant installation are described below and illustrated on the attached site plan 19/0717/SP1.
- AP1: First-floor, south-facing window on Sackville Street closest to site.
 - AP2: Fourth-floor, south-facing window on corner of Sackville Street and Caversham Road.
- 5.2.3 The noise levels generated by all mechanical services elements have been calculated by correcting the plant noise levels for distance and radiation losses, façade reflections and screening where appropriate.
- 5.2.4 Details of our calculations are set out on attached sheets 19/0717/CS1-CS12.

5.3 Results

- 5.3.1 The results of our assessment indicate that mitigation of noise emissions from both units will be required in order to meet the planning condition's noise emission limits.
- 5.3.2 Regarding AHU1, our calculations indicate that the silencers provided by *Systemair* will be sufficient in mitigating noise emissions from the unit to nearby residences.
- 5.3.3 In addition, the following insertion losses set out within table T5 will be required to mitigate noise emissions from the AHU2 Exhaust fan.



Plant Noise Assessment

Silencer	Insertion Loss at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
AS-2 AHU2 Exhaust	1	2	7	10	11	9	8	7

T5 Required silencer insertion losses for AHU2 exhaust.

5.3.4 The silencers should be located close to the fans so that noise breakout from their associated ductwork is also reduced. We would expect the insertion losses required for the silencers set out above to be achieved with the following configurations:

- AS-1: As referenced in data sheet;
- AS-2: 600mm length, 50% free area.

5.3.5 The air handling units must be installed on suitable steel spring mounts to control structure-borne sound transmission. These should achieve a static deflection of $\geq 10\text{mm}$.

5.3.6 The plant area air discharge louvres should be sized at a face velocity of not more than 2 m/s.

5.3.7 The rating noise levels calculated with the mitigation measures specified above are shown in table T6.

Assessment Position	Rating Noise Level, dB(A) (Limit)
AP1: First-floor, south-facing window on Sackville Street closest to site.	25 (33)
AP2: Fourth-floor, south-facing window on corner of Sackville Street and Caversham Road	24 (34)

T6 Plant noise emission levels at assessment positions.

6 Conclusions

- 6.1 It is proposed to re-develop the existing Greyfriars Centre at the existing Greyfriars Church site in Reading. Cole Jarman have provided acoustic consultation on phase one and two of the scheme.



Plant Noise Assessment

- 6.2 Noise mitigation measures have been recommended on the basis of a subsequent assessment of the proposed units and it has been shown that the limits would be met at all times.
- 6.3 The introduction of these silencers result in noise levels below the specified limits and leaves room within these limits for further units associated with Phase one of the development, and if necessary, during subsequent construction phases.

■ End of Section



Plant Noise Assessment

Glossary of Acoustic Terms

L_{Aeq} :

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq} .

L_{Amax} :

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the “fast” sound level meter response.

L_{A10} & L_{A90} :

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly, L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n .

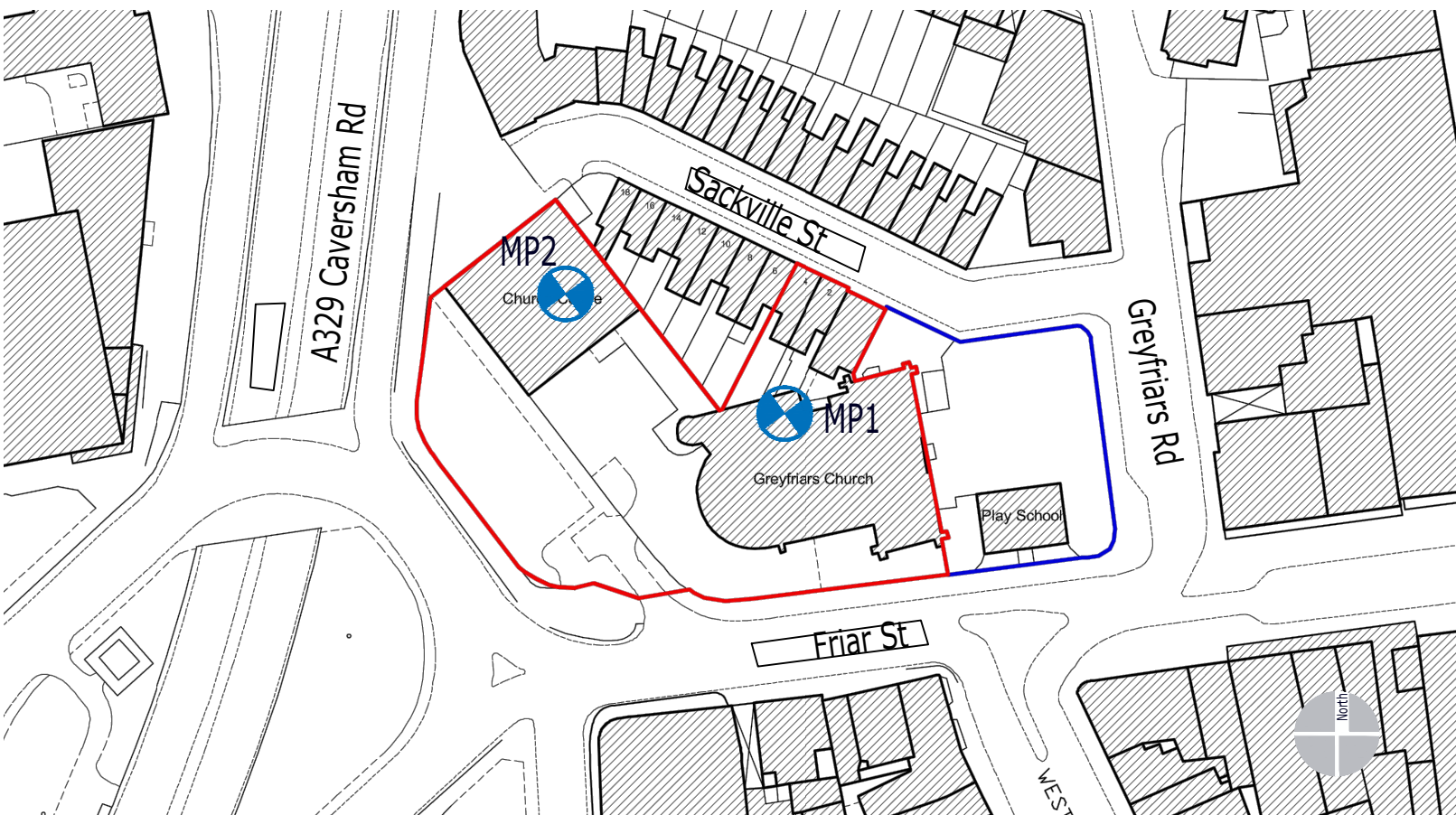
L_{AX} , L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

■ End of Section

Figure 18/0717/SP1

Title: Site plan illustrating unattended measurement and assessment positions



Project: Greyfriars Church, Reading

Date: March 2019

Scale: Not to scale



Figure 18/0717/TH01

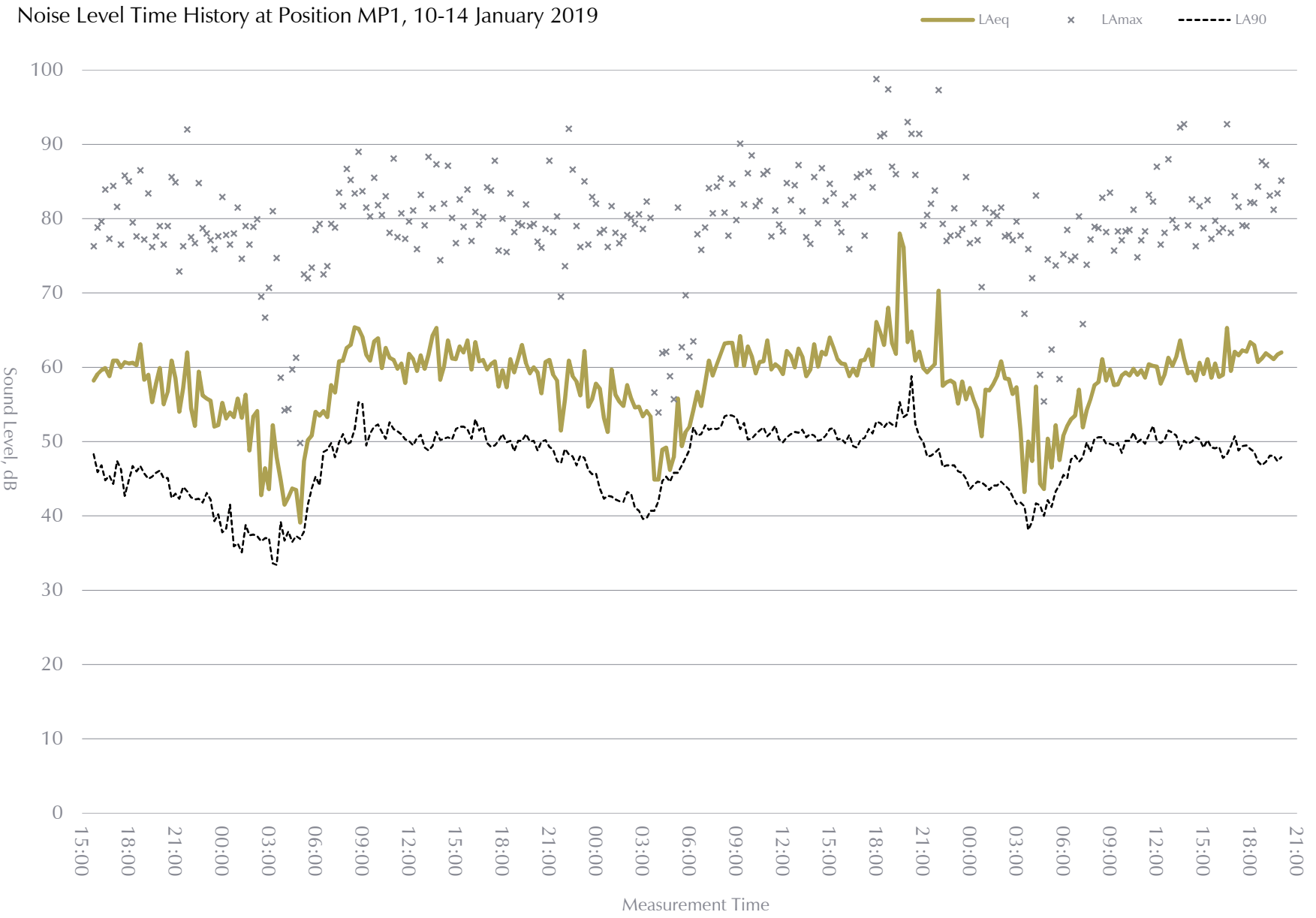
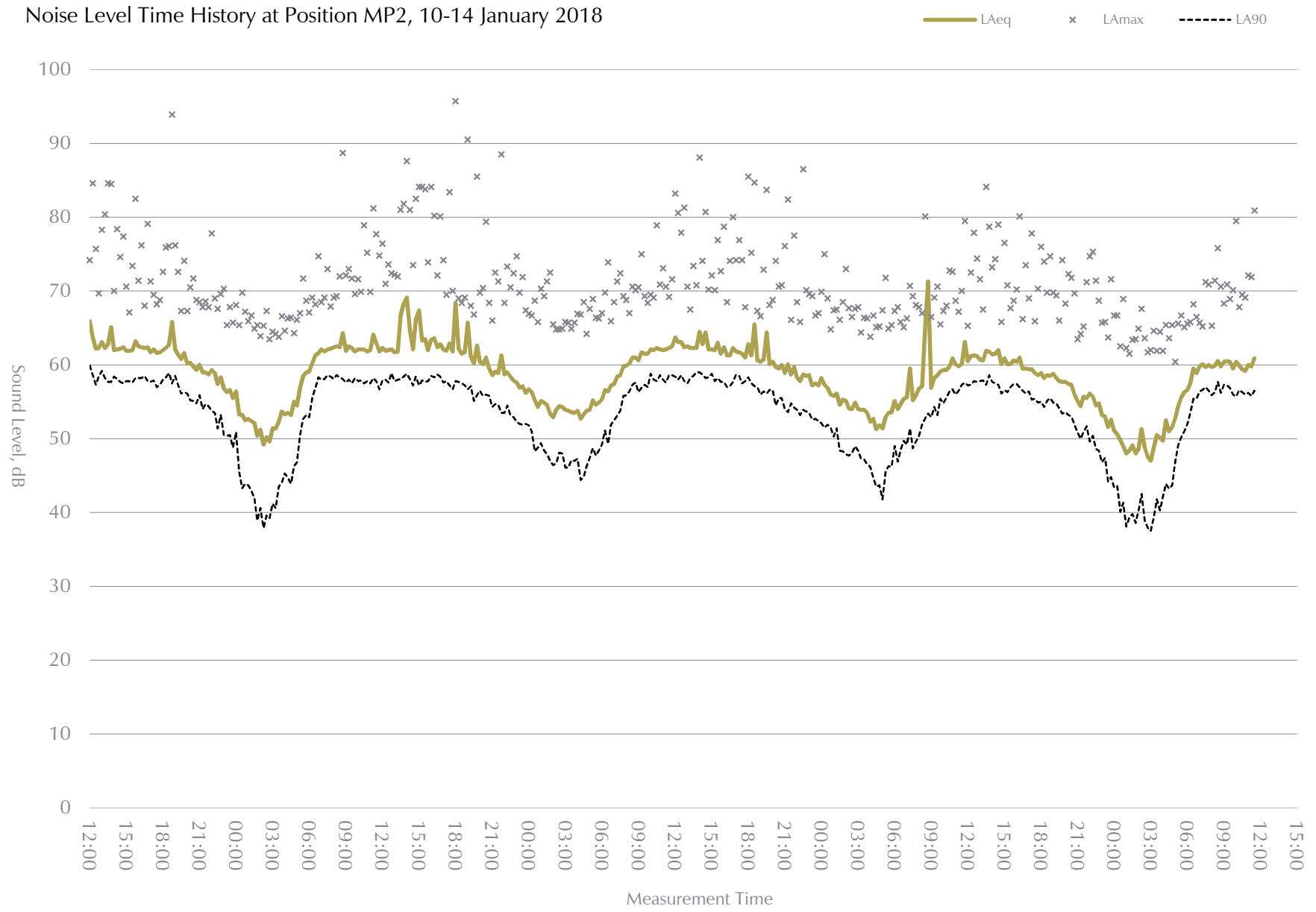




Figure 18/0717/TH02





Schedule of Plant and Air Handling Equipment Sound Levels, dB

Reference	Description	Data Source ¹	Noise Level Type	Noise Levels (dB)							
				63	125	250	500	1k	2k	4k	8k
AHU1 Outdoor level		Emp	Sound Power, Lw	73.0	76.0	77.0	71.0	63.0	59.0	52.0	43.0
AHU1 Exhaust level		Emp	Sound Power, Lw	80.0	84.0	86.0	85.0	84.0	81.0	77.0	71.0
AHU1 Breakout		Man	Sound Power, Lw	68.0	67.0	57.0	54.0	54.0	50.0	43.0	28.0
AHU2 Outdoor Level		Man	Sound Power, Lw	75.0	64.0	68.0	58.0	45.0	49.0	41.0	32.0
AHU2 Exhaust Level		Man	Sound Power, Lw	86.0	81.0	80.0	80.0	78.0	74.0	70.0	67.0
AHU2 Breakout		Man	Sound Power, Lw	70.0	65.0	70.0	54.0	50.0	48.0	41.0	45.0

Notes

1 - Man refers to data supplied by the equipment manufacturer or supplier, Emp refers to data calculated using empirical formulae, and Meas refers to data measured by Cole Jarman

Schedule

18/0717/PNS1



18/0717/CS1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0.5								
Height (m)	0.6								
Vertical (°)	45								
Horizontal (°)	60								
		0	0	0	0	0	0	0	0
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	22								
		-27	-27	-27	-27	-27	-27	-27	-27
Maekawa Screening Loss									
Path Difference (m)	0.3								
		-7	-9	-11	-13	-16	-19	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp		15	18	17	5	-10	-20	-22	-20 10 dBA



18/0717/CS2

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	2.2								
Height (m)	1								
Vertical (°)	45								
Horizontal (°)	120								
		-1	-2	-5	-10	-10	-10	-10	-10
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	22								
		-27	-27	-27	-27	-27	-27	-27	-27
Maekawa Screening Loss									
Path Difference (m)	0.3								
		-7	-9	-11	-13	-16	-19	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp		10	9	4	-17	-40	-51	-56	-57 -3 dBA



18/0717/CS4

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0								
Height (m)	0								
Vertical (°)	45								
Horizontal (°)	45								
		0	1	1	2	2	2	2	2
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	21								
		-26	-26	-26	-26	-26	-26	-26	-26
Maekawa Screening Loss									
Path Difference (m)	0.3								
		-7	-9	-11	-13	-16	-19	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp		31	29	27	22	12	4	0	-2 23 dBA



18/0717/CS5

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0.6								
Height (m)	0.3								
Vertical (°)	45								
Horizontal (°)	120								
		-1	-1	-2	-5	-10	-10	-10	-10
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	21								
		-26	-26	-26	-26	-26	-26	-26	-26
Maekawa Screening Loss									
Path Difference (m)	0.3								
		-7	-9	-11	-13	-16	-19	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp		17	11	16	1	-23	-21	-31	-40 9 dBA



18/0717/CS7

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0.5								
Height (m)	0.6								
Vertical (°)	20								
Horizontal (°)	20								
		1	2	3	3	4	5	5	5
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	28								
		-29	-29	-29	-29	-29	-29	-29	-29
Maekawa Screening Loss									
Path Difference (m)	0.192								
		-6	-8	-9	-12	-14	-17	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP2									
Sound Pressure, Lp		15	18	19	8	-7	-15	-19	-17 12 dBA



18/0717/CS8

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0.6								
Height (m)	0.3								
Vertical (°)	20								
Horizontal (°)	150								
		-1	-2	-3	-8	-9	-8	-8	-8
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	28								
		-29	-29	-29	-29	-29	-29	-29	-29
Maekawa Screening Loss									
Path Difference (m)	0.192								
		-6	-8	-9	-12	-14	-17	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP2									
Sound Pressure, Lp		9	9	5	-15	-39	-49	-56	-57 -2 dBA



18/0717/CS10

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0.4								
Height (m)	0.3								
Vertical (°)	20								
Horizontal (°)	80								
		0	0	0	0	-2	-5	-5	-5
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	26								
		-28	-28	-28	-28	-28	-28	-28	-28
Maekawa Screening Loss									
Path Difference (m)	0.192								
		-6	-8	-9	-12	-14	-17	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP2									
Sound Pressure, Lp		30	28	26	20	9	-3	-9	-11 21 dBA



18/0717/CS11

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
External Grille Directivity									
Width (m)	0.6								
Height (m)	0.3								
Vertical (°)	20								
Horizontal (°)	150								
		-1	-2	-3	-8	-9	-8	-9	-8
Point Source Radiation Loss									
Radiation - Hemispherical									
		-8	-8	-8	-8	-8	-8	-8	-8
Point Source Distance Loss									
Start Distance (m)	1								
End Distance (m)	26								
		-28	-28	-28	-28	-28	-28	-28	-28
Maekawa Screening Loss									
Path Difference (m)	0.192								
		-6	-8	-9	-12	-14	-17	-20	-20
Facade Reflection									
Reflection (dB)	3								
		3	3	3	3	3	3	3	3
External Receiver									
External Receiver - AP2									
Sound Pressure, Lp		16	10	15	-2	-22	-20	-31	-40
		7 dBA							

Appendix A

Subject:	Mechanical Services Noise Guidance		
Project:	Greyfriars Church, Reading		
Date:	15 November 2019	Prepared:	ASt
Revision:	0	Approved:	ASh

This document sets out the standards and guidance upon which the design advice relating to mechanical services noise emissions has been based.

A1 BS 4142:2014

A1.1 Regarding noise impact from a commercial or industrial source, BS 4142:2014 provides an assessment methodology and criteria relating to:

- a) sound from industrial and manufacturing processes;
- b) sound from fixed installations which comprise mechanical and electrical plant and equipment;
- c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- d) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

A1.2 The application of the standard is detailed below:

"This standard is applicable to the determination of the following levels at outdoor locations:

- a) rating levels for sources of sound of an industrial and/or commercial nature; and*
- b) ambient, background and residual sound levels,*

for the purposes of:

- 1) investigating complaints;*
- 2) assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and*
- 3) assessing sound at proposed new dwellings or premises used for residential purposes."*



Mechanical Services Noise Guidance

- A1.3 The rating level of noise from the facility is calculated, over a set period, at each of the nearest noise sensitive locations. This rating level is then compared with the existing background sound level.
- A1.4 The standard recommends the following reference time period T_r over which the specific sound should be evaluated, for each of the day and night periods:
- $T_r = 1$ hour during the day; and
- $T_r = 15$ minutes during the night.
- A1.5 The standard states that daytime is typically between 07:00h and 23:00h. Accordingly, night-time is between 23:00h and 07:00h.
- A1.6 The reason for the shorter night time assessment period of 15 minutes is identified in the standard as follows:
- “The shorter reference time interval at night means that short duration sounds with an on time of less than 1 h can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.”*
- A1.7 The rating level of noise for the assessment periods, L_{A_r, T_r} is the calculated noise level at the nearest receiver location, adjusted depending on the acoustic characteristic of the noise source. Adjustment factors are based on any tonality, impulsivity, intermittency and other characteristics present in the resultant sound at the receiver position. The level or appropriateness of any penalty will depend both on the type of noise source and the context in which it is perceived. Similarly, in accordance with BS 4142, the period of time for which an individual noise source is active during the relevant reference time period will also be considered in establishing the rating level.
- A1.8 It will also be necessary to consider the existing noise climate and what sound sources contribute to it. For example, where a noise generating activity is proposed adjacent to an existing similar noise generating site, the impact of the new noise source would be less than if it were to be planned in a location where its character and type is different to and more noticeable than any existing noise source nearby.
- A1.9 With regard to the background sound level against which the rating level is compared, the standard states the following:
- “In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”*
- A1.10 The periods of interest over a 24 hour day are usually related to day time activities (07:00-23:00h) and night time (23:00-07:00h). However the standard makes the following statement:



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“Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods.”

A1.11 Therefore, the periods of time which are typically considered ‘waking up’ and ‘falling asleep’ stages, for example 06:00h to 07:00h and 23:00h to 24:00h, may need to be considered independently. Alternative periods may also be identified where breakdown beyond the standard day and night time analysis will be necessary, for example where background sound levels are shown to be regularly elevated. Similarly, both weekend and weekday periods may need to be considered separately, with criteria set for both. The requirement to analyse specific time periods should be considered for each site individually.

A1.12 Once the rating level at each receptor has been calculated, reference can be made to the following commentary in BS 4142 in relation to conducting an initial assessment of the impact, based on the difference between the rating level of the noise source and the pre-existing background sound level.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (see Clause 8) from the rating level (see Clause 9), and consider the following.

NOTE 1 More than one assessment might be appropriate.

a) Typically, the greater this difference [between industrial site noise rating level and baseline background level], the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

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

NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

A1.13 It can be seen that the likelihood of a significant adverse impact occurs once the rating level is at least 10 dB greater than the representative background sound level (depending on context).

A1.14 In addition to the above, BS 4142 also states:



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“For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.”

■ End of Section

