



PLANNING NOISE ASSESSMENT

SPITFIRE HOUSE, 141 DAVIGDOR ROAD, HOVE

STICKLAND WRIGHT

MARCH 2024

PLANNING NOISE ASSESSMENT
SPITFIRE HOUSE, 141 DAVIDGOR ROAD, HOVE

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1 INTRODUCTION

Anderson Acoustics Ltd was commissioned by Stickland Wright in March 2022 to undertake a noise assessment to support the application for permitted development a Class MA prior approval application of conversion of the ground (partial), first and second floor to residential units at Spitfire House, 141 Davigdor Road, Hove.

The application will be made under Class MA of The Town and Country Planning (General Permitted Development) (England) Order 2021.

This report presents the results of an environmental noise survey undertaken at the site and provides guidance on appropriate façade elements to ensure that an acceptable internal noise environment is capable of being achieved.

This report is technical in nature and, as such, a summary of noise units and acoustic terminology can be found [here](#) for reference.

2 NOISE POLICY AND STANDARDS

2.1 Policy Appraisal

The scheme falls under *Class MA – offices to dwellinghouses* of The Town and Country Planning (General Permitted Development) (England) Order 2021 [1], which allows “Development consisting of a change of use of a building and any land within its curtilage from a use falling within Class E (commercial, business and service) of Schedule 2 to the Use Classes Order to a use falling within Class C3 (dwellinghouses) of Schedule 1 to that Order.”.

Relevant to the topic of noise, therefore, the GPDO states that:

Before beginning development under Class MA, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to—

...(d) impacts of noise from commercial premises on the intended occupiers of the development;

With regards to permitted development applications The Planning Noise Advice Document: Sussex March 2021 [2] details in Table 1 of the document, that “*Noise assessment shall be required for some permitted development notifications, for certain change of use classes..... Although, not always a legal requirement of permitted development, it is advised that all potentially disturbing noise sources are assessed so that they do not adversely impact on the proposed use.*”

Sections 6.5 and 6.6 of The Planning Noise Advice Document: Sussex March 2021 provides the following guidance in relation to *Design Criteria for Noise Sensitive Development* and *New Noise Sensitive Development Near to Existing Industrial/Commercial Noise Sources*:

6.5.2 – Design control measures should aim to meet the recommended standards set out in Table 4 of BS 8233:2014 and regular night-time noise events such as scheduled aircraft or passing trains which can cause sleep disturbance shall be minimized and assessed as (L_{AFmax}), as recommended in the WHO's Night Noise Guidelines for Europe (2009), unless there are particular reasons why this is not considered appropriate. In such cases, a clear explanation of the reasons should be provided.

6.5.3 – As the standards for BS 8233:2014 and the WHO relate only to anonymous noise, eg distant road traffic and noise without characteristics such as impulsivity, low frequency content or tones then, if these are present, additional discussion will be required with the LPA for the purpose of establishing suitable assessment techniques and standards to be achieved eg BS 4142:2014+A1:2019 for delivery noise.

6.5.4 – While noise mitigation can be used to achieve suitable internal sound levels, preference is to be given to criteria based on windows being partially open.

6.5.5 – Where the property is at risk of overheating an overheating assessment shall be conducted in accordance with Acoustics Ventilation and Overheating (AVO) Residential Design Guide (January 2020) and CIBSE's Design Methodology for the Assessment of Overheating Risk in Homes (TM59:2017).

2.2 Relevant Standards

British Standard BS 8233:2014: *Sound insulation and noise reduction for buildings*[3] provides guideline values for internal noise levels within a number of building types including residential dwellings.

In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in

Table 2-1:

Table 2-1: British Standard 8233 Indoor Noise Levels

Activity	Location	Daytime	Night-time
Resting	Living room	35 dB $L_{Aeq, 16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq, 16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16hour}$	30 dB $L_{Aeq, 8hour}$

Note

Daytime assessment period – 07:00 to 23:00 hrs

Night-time assessment period – 23:00 to 07:00 hrs

2.2.1 British Standard 4142: 2014+A1: 2019

Guidance on the rating of noise from fixed installations and sources of an industrial nature is provided in British Standard (BS) 4142 [4]. This standard has been updated in 2019, which provides a procedure for the measurement and rating of noise levels outside dwellings in mixed residential and industrial areas. A methodology for predicting the likelihood of adverse impact is also provided in this document although the assessment of nuisance explicitly falls outside the scope of this British Standard.

Relevant to this development, this standard can be used for assessing the impact of sound at the proposed new residential dwellings from existing fixed plant.

The rating level (L_{A,r,T_r}) is defined in BS 4142 is used to rate the industrial source (known as the specific noise source) outside residential dwellings. This level is obtained by adding a correction of between 0 and 6 dB for tonal noise sources and between 0 and 9 dB for impulsive sources. Additionally, corrections of 3 dB can be made for other sound characteristics and intermittency of the noise source.

Reference time intervals, T_r , of 1 hour and 15 minutes are specified for the determination of rating levels during the day and night, respectively.

The method for predicting the likelihood of complaints is based on differences between the rating level and the background $L_{A9,0,T}$ noise level. The Standard states that:

“

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10dB 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 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 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.”

2.2.2 World Health Organisation Guidelines

The following guideline values for community ambient noise levels in specific environments are presented in the World Health Organization (WHO) Guidelines for Community Noise [5].

Table 3.2: WHO Guideline Noise Values

Specific Environment	Critical Health Effect(s)	dB $L_{Aeq,T}$	Time Base hours	dB $L_{Amax,F}$
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45

The 45 dB $L_{Amax,F}$ criterion applies to “single sound events” within bedrooms at night. This guideline is generally interpreted as the value that individual noise events should not normally exceed more than 10-15 times a night. The more recent WHO “Night Noise Guidelines for Europe” 2009 [6] advises sufficient evidence is available of waking up in the night/too early with a threshold of 42 dB $L_{Amax,F}$ inside bedrooms at night. This guideline value has been adopted as night-time criteria, as recommended in Sussex’s Planning Noise Advice Document.

3 SITE DESCRIPTION

3.1 Existing Site

The site is located on a 4-way junction linking Holland Road, Cromwell Road and Davigdor Road. Alongside road traffic noise, a train line is located approximately 95 m to the north of the site. Rail traffic was noted to be slightly audible at the norther receiver location.

The premises is a three-storey building currently in use as an office across all floors with cavity masonry construction and double glazing.

A number of commercial premises are located to the north and northeast of the site including a Wickes, Tapi Carpets & Floors, Grahams Plumbing Merchant, Toolstation and Howdens. The Palmeira Pub is located to west of the site beyond Holland Road. A small external seating area is used by the pub.

During site visits, an existing plant compound (containing multiple heat pumps) serving the building was observed to be located towards the north of the site.

An aerial view of the site location is shown in Figure 3-1, which highlights the proposed site and surrounding area.

Figure 3-1: Site Location



3.2 Proposed Development

The project involves the conversion of all floors from office to residential use. Under the rules of a Class MA development, the external appearance must not change, therefore the existing glazing will be retained throughout.

Figure 3-2 below shows the existing front elevation and Figures 3-3 to 3-5 shows the ground to second floor plans

Figure 3-2: Existing Front Elevation

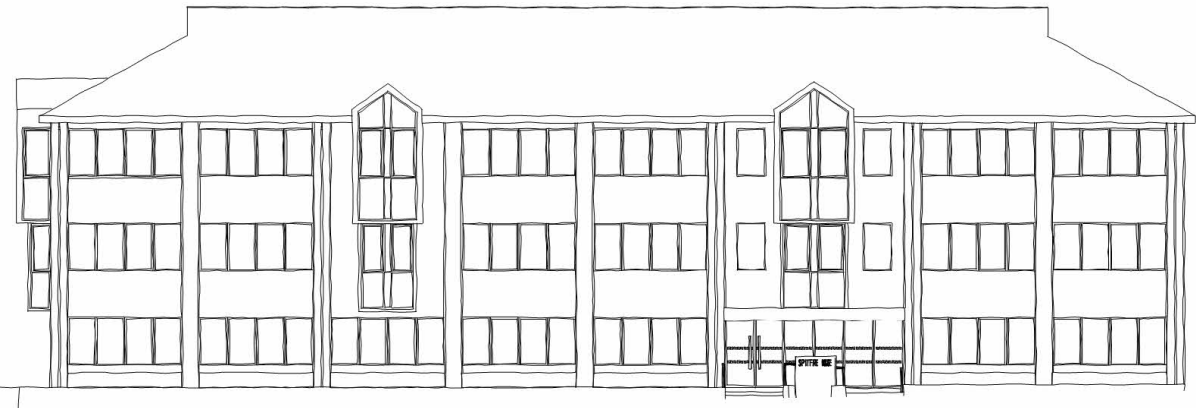


Figure 3-3: Proposed Ground Floor Plan



Figure 3-4: Proposed First Floor Plan

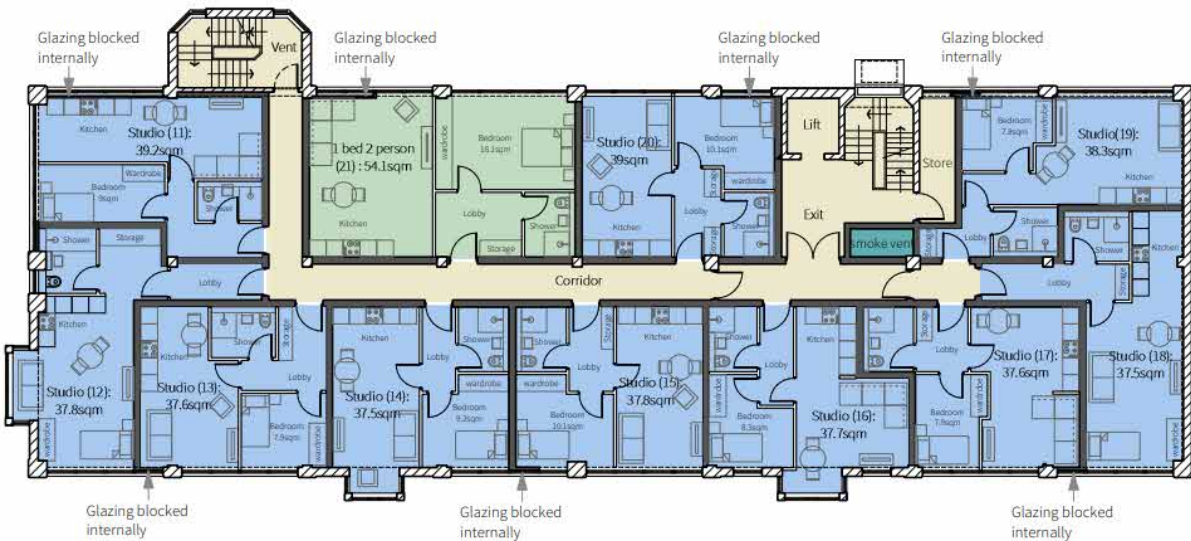
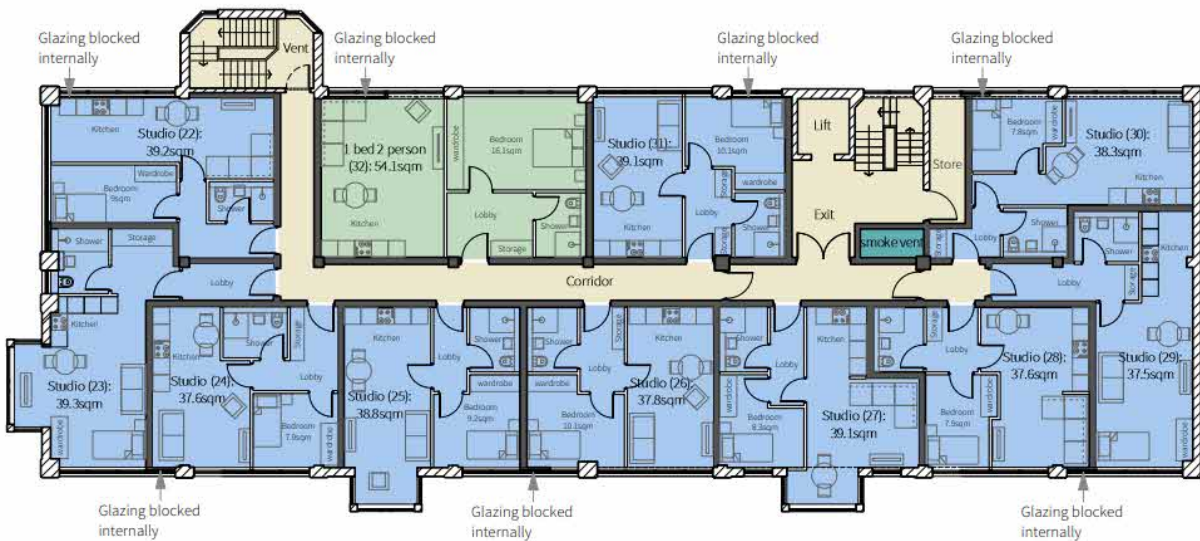


Figure 3-5: Proposed Second Floor Plan



4 NOISE SURVEY

The prevailing noise conditions at the development have been determined by an unattended environmental noise survey. The survey was undertaken over a 5-day period at two measurement locations, between Thursday 3rd and Tuesday 8th March 2022, in order to determine the environmental noise at the front and rear of the development site. Measurement locations are shown in detail in Figure 3-1.

Furthermore, simultaneous attended measurements were taken in the interior and exterior of the building to determine the performance of the existing glazing.

4.1 Instrumentation

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring. All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672 [7]. A full inventory of this equipment is shown in Table 4-1 below. All equipment's calibration certificates are available on request.

Table 4-1: Inventory of Measurement Equipment

Measurement type	Equipment	Make and Model	Serial Number	Calibration Date ¹
Unattended MP1	Sound Level Meter	Svantek SV 307	104938	03/11/2021
	Microphone	Svantek ST30A	107140	
Unattended MP2	Sound Level Meter	Svantek SV 307	100972	03/09/2020
	Microphone	Svantek ST30A	101474	
Interior Attended	Sound Level Meter	Rion NL-52	0610202	22/12/2020
	Preamplifier	Rion NH-25	10611	
	Microphone	Rion UC-59	17093	
Exterior Attended	Sound Level Meter	Rion NL-52	00732147	18/12/2020
	Preamplifier	Rion NH-25	32175	
	Microphone	Rion UC-59	05339	

¹ Calibration certificates available on request

The noise measurement equipment used during the survey was calibrated at the start and end of each measurement. The calibrator used had itself been calibrated by a UKAS accredited calibration laboratory within the twelve months preceding the measurements. No significant drift in calibration was found to have occurred.

4.2 Unattended noise survey

Continuous unattended noise measurements were undertaken to the southwest of the building overlooking the crossroads where Davidgor Road meets Holland Road (MP1), and to the rear (MP2). The measurements at MP1 were undertaken at a height of 6 m above ground level and under façade conditions and MP2 was undertaken at a height of 3m under free field conditions. Spectral measurements were undertaken at MP1 in order to obtain the frequency content of the noise impacting on the proposed development, needed to determine the sound insulation performance requirements of the building envelope.

During site visits, road traffic noise was considered to be dominant at the front of the building. To the rear, plant serving the existing offices was dominant along with some contribution from vehicle movements on surrounding roads and within the neighbouring commercial car parks. It is understood the existing plant serving the commercial premises is to be removed.

4.3 Weather Conditions

Weather conditions during the survey period have been obtained from www.wunderground.com for a weather station at Gatwick Airport, which indicates conditions were dry with some periods of moderate wind. Noise survey results indicate that measurements are unlikely to have been affected by periods of adverse weather.

At the time of setting up the monitors, conditions were noted to be clear and dry with light wind. At the time of collecting the monitors, conditions were noted to be overcast and dry with light wind.

4.4 Attended Noise Survey

Daytime measurements were undertaken on Wednesday 9th March 2022 between 13:54 and 14:09 hours to understand the performance of existing glazing and inform the need for additional measures (e.g. secondary glazing)

With traffic movements as the source, simultaneous 1-minute measurements were undertaken over a period of 15 minutes at an external position 1 m from the façade at 1st floor level and internally within the existing building.

Windows in the existing room were kept closed during these measurements. No ventilation openings were present in the façade.

4.5 Results

4.5.1 Unattended noise survey

Consecutive 5-minute measurements of $L_{Aeq,T}$, L_{Amax} and $L_{A90,T}$ noise indices were obtained using the 'Fast' time weighting. A summary of the daytime ambient $L_{Aeq,16hr}$ and night-time ambient $L_{Aeq,8hr}$ noise levels measured is presented below along with the derived night-time L_{AFmax} level. Full time history results are shown in Appendix C.

To establish a L_{AFmax} value from which to calculate internal noise levels, the eleventh highest measured value was identified on a night-by-night basis, in line with the recommendations detailed in ProPG: Planning & Noise [8]. An average of all octave band frequencies with a night-time L_{AFmax} event equal to the eleventh highest value was then calculated to provide a representative spectrum at the front and rear of the proposed development.

The modal $L_{A90,5min}$ value measured at the measurement position has been presented for both daytime and night-time periods.

Since the heat recovery units (HRUs) to the rear are to be removed and not replaced, the reported measured data at MP2 is higher than would be expected once the development is completed. To account for this, periods where it appears that the plant is on, the $L_{A90,15min}$ has been subtracted from equivalent $L_{Aeq,15min}$ (since the level of plant noise is generally constant and therefore the LA90 can be considered representative of the plant noise). Periods where this has been applied is shown in Figure C-2.

4.5.2 Unattended Position 1 (MP1)

Table 4-2: Daily results of the unattended noise survey at MP1 (façade levels)

Date	Period	Ambient Noise Level $L_{Aeq, T}$, dB	Night-time Noise Level $L_{Amax, F}$ dB (Top 10 excluded)	Modal Background Noise Level $L_{A90, 5min}$ dB
Thursday 03/03/2022	Daytime (10:25-23:00)	67	79	55
	Night-time (23:00-07:00)	59		30
Friday 04/03/2022	Daytime (07:00-23:00)	68	78	57
	Night-time (23:00-07:00)	61		41
Saturday 05/03/2022	Daytime (07:00-23:00)	67	79	56
	Night-time (23:00-07:00)	60		38
Sunday 06/03/2022	Daytime (07:00-23:00)	65	79	54
	Night-time (23:00-07:00)	60		34
Monday 07/03/2022	Daytime (07:00-23:00)	67	79	57
	Night-time (23:00-07:00)	59		40

Table 4-3: Summary results of unattended noise survey at MP1 (façade levels)

Period	Ambient Noise Level $L_{Aeq, T}$, dB	Typical Night-time Noise Level $L_{Amax, F}$ dB (Top 10 excluded)	Modal Background Noise Level $L_{A90, T}$ dB
Daytime	67	79	56
Night-time	60		38

An average L_{AFmax} spectrum has been established using L_{AFmax} 79 dB across the survey period.

Table 4-4: Typical night-time $L_{Amax, F}$ noise level and associated spectrum, dB (façade levels)

L_{AFmax}	63Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8kHz
79	80	73	74	72	76	71	66	64

4.5.3 Unattended Position 2 (MP2)

Table 4-5: Daily results of the unattended noise survey at UP2 (free-field levels)

Date	Period	Ambient Noise Level $L_{Aeq, T}$, dB	Night-time Noise Level $L_{Amax, F}$ dB (Top 10 excluded)	Modal Background Noise Level $L_{A90, 5min}$ dB
Thursday 03/03/2022	Daytime (10:25-23:00)	58	64	56
	Night-time (23:00-07:00)	56		55
Friday 04/03/2022	Daytime (07:00-23:00)	59	67	57
	Night-time (23:00-07:00)	57		62
Saturday 05/03/2022	Daytime (07:00-23:00)	59	76	64
	Night-time (23:00-07:00)	60		64
Sunday 06/03/2022	Daytime (07:00-23:00)	61	-	61
	Night-time (23:00-00:00)	64		62

Table 4-6: Summary results of unattended noise survey at MP2 (free-field levels)

Period	Ambient Noise Level $L_{Aeq, T}$ dB	Typical Night-time Noise Level $L_{Amax, F}$ dB (Top 10 excluded)	Modal Background Noise Level $L_{A90, T}$ dB
Daytime	60	69	64
Night-time	59		55

4.5.4 Attended Noise Survey

Table 4-7 sets out the measured indicative level difference which can be used to estimate the sound reduction performance provided by the glazing.

Table 4-7: Indicative sound reduction performance (dB) for the existing glazed elements per octave band frequency

D_w	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
26	22	25	23	25	30	25

5 COMMERCIAL NOISE ASSESSMENT

There are two parts relevant to assessing external fabric of the building with respect to commercial noise. The first is to determine whether the existing glazing is sufficient to achieve the internal noise guidelines as set out in Section 2 and, if not, what measures should be taken to ensure the target levels are met.

Once the plant shown below in Figure 5-1 is removed, the dominant source of commercial noise incident on the rear of the premises will be vehicles serving the car parks in the industrial estate to the north. An attempt has been made to address the reduction in noise level once the plant has been removed (Section 4.5.1).

Figure 5-1: Fixed plant compound to the rear of Spitfire House.



5.1 Existing Glazing

It is understood that existing glazing is to be retained. Based on the indicative level difference of the existing façade, estimated internal levels have been calculated in Table 5-1. Results have been presented with windows open and closed. It is assumed a partially open window provides 13dB attenuation.

Table 5-1 shows that all target internal noise levels would be exceeded if the existing glazing were to be retained.

Table 5-1: Predicted internal levels at the second floor of the northern facade

Metric	Target	Level difference D_w	Measured External Level	Estimated Internal Level (closed window)	Diff.	Estimated Internal Level (open window)	Diff.
$L_{Aeq,16hr}$ (day)	35	26	60	34	-1	47	+12
$L_{Aeq,8hr}$ (night)	30	26	59	33	+3	46	+16
L_{AFMax} (night)	42	26	69	43	+1	53	+11

Since the original glazing is to be retained, we recommend a secondary pane of glass be introduced behind the existing system. This should be formed with the introduction of a 6 mm pane of toughened glass, allowing a 100 mm cavity between the inner and outer pane. This would ensure BS8233 internal noise levels are met.

6 TRAFFIC NOISE ASSESSMENT

Although not required under a permitted development application, an assessment of sound insulation to the proposed dwellings overlooking Davidgor Road and Holland Road has been undertaken for information purposes.

6.1 Existing Glazing

As with the commercial noise assessment, the performance of the existing glazing has been analysed. Estimated internal levels have been calculated in Table 6-1. Results have been presented with windows open and closed; it is assumed a partially open window provides 13dB attenuation. All target internal noise levels would be exceeded if the existing glazing were to be retained.

Table 6-1: Predicted internal levels at the second floor of the southern and western facade

Metric	Target	Level difference D_w	Measured External Level	Estimated Internal Level (closed window)	Diff.	Estimated Internal Level (open window)	Diff.
$L_{Aeq,16hr}$ (day)	35	26	67	41	+6	54	+19
$L_{Aeq,8hr}$ (night)	30	26	60	34	+4	48	+18
L_{AFMax} (night)	42	26	79	53	+11	66	+14

In order to meet the target internal levels, the same recommendations should be followed as presented in Section 5.1.

7 VENTILATION AND OVERHEATING

Given both the assessments of commercial noise along the northern façade and traffic noise along the southern and western façades show that target internal noise levels will be exceeded with windows open by up to 22dB, it is necessary to provide an alternative means of ventilation with windows closed.

It is understood that it is preferable to install an MVHR system throughout. The ventilation system should be specified to ensure that guideline noise levels detailed within Section 2 of this report are not exceeded. A 25 dB L_{Aeq} mechanical services noise limit is recommended throughout.

It should be noted that windows should still be openable for purge or rapid ventilation, as requested by ADF. Internal noise level guidelines are generally not applicable under these exceptional events, which should only occur occasionally (i.e. to remove odour from painting, cooking etc.).

8 CONCLUSION

Anderson Acoustics were commissioned by Stickland Wright in March 2022 to undertake a noise assessment to support the application for permitted development a Class MA prior approval application of conversion of all floors to residential units at Spitfire House, 141 Davigdor Road, Hove.

Based on the approach followed within this report, it can be concluded that the existing glazing by itself is not suitable to be used in this residential development. Secondary glazing should be installed according to the details given in Section 5.1.

Open windows are not a viable option for providing ventilation. Therefore, an alternative means of ventilation will be required with windows closed. The appropriate method of ventilation will need to be developed alongside a thermal assessment to prevent overheating.

Provided that the mitigation measures proposed in this report are followed, it is considered that appropriate internal noise levels can be achieved in this development. Therefore, it is considered that planning permission should not be refused on noise grounds.

9 REFERENCES

- [1] UK Government, "The Town and Country Planning (General Permitted Development) (England) Order 2021 - Class MA," [Online]. Available: <https://www.legislation.gov.uk/ukxi/2021/428/article/6/mad>
- [2] "Planning Noise Advice Document: Sussex," 2021.
- [3] The British Standards Institution, *BS 8233:2014 - Guidance on sound insulation and noise reduction for buildings*, 2014.
- [4] The British Standards Institution, *BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound*, London: BSI, 2014.
- [5] World Health Organization, "Guidelines for Community Noise," Geneva, 1999.
- [6] WHO, Night Noise Guidelines for Europe., 2009.
- [7] The British Standards Institution, *BS 61672 - Electroacoustics. Sound level meters. Specifications*, 2013.
- [8] Acoustics & Noise Consultants, Institute of Acoustics, Chartered Institute of Environment Health, *Professional Practice Guidance on Planning & Noise*, London: Acoustics & Noise Consultants, Institute of Acoustics, Chartered Institute of Environment Health, 2017.
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- [10] HM Government, "The Building Regulations 2010 Approved Document F - Means of Ventilation," 2013.
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- [12] The British Standards Institution, *ISO 717-1:2020 - Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation*, BSI, 2013.

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APPENDIX A

NOISE SURVEY RESULTS

Figure C-1: Noise survey time history (south-western façade)

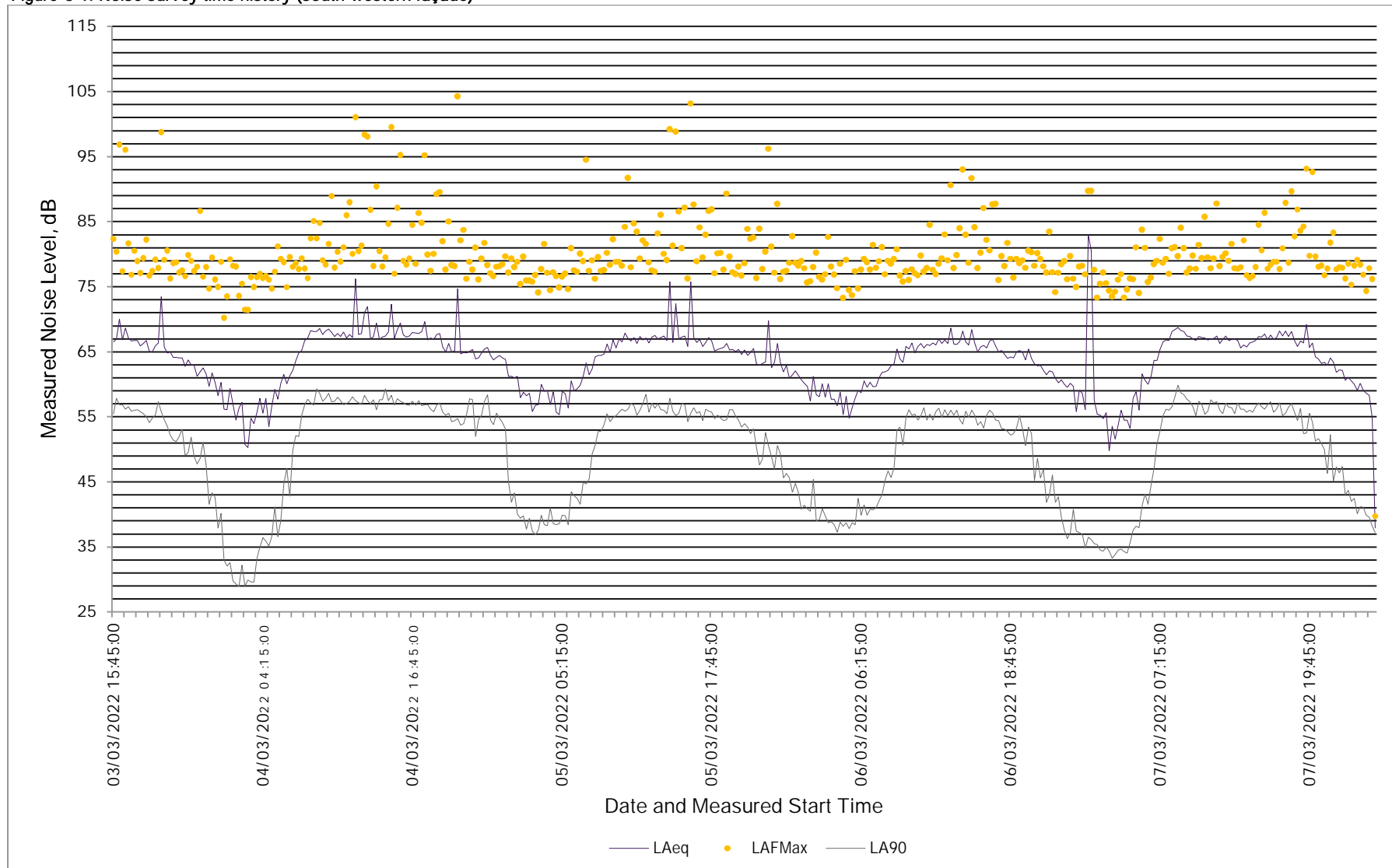


Figure C-2: Noise survey time history (northern façade)

