East Street

Noise Assessment

October 2022

DOCUMENT CONTROL SHEET

Report Reference	**NA/ESOSB/20221014-RK**
Revision	**A**
Issue Purpose	**For Issue**
Report Prepared for:	**TriCaptial Investments**
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Date of Issue	**14th October 2022**

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EXECUTIVE SUMMARY

This report provides a noise assessment carried out at the planning stage for the proposed development at 62 – 63 East Street & 52 Old Steine, Brighton. The noise assessment has been carried out to determine suitable building envelope sound insulation in order to protect the future residents from environmental noise.

Reference to the National Planning Policy Framework, national guidance and local planning policy has been made to derive reasonable design targets.

The building envelope proposals outlined within this report would result in compliance with recommendations of national guidance. Acoustic requirements for the glazing and ventilation elements have been determined that would result in compliance with BS8233. Example glazing systems have been provided to either retain the existing glazing system or provide a replacement glazing system.

In our opinion, noise intrusion should not constrain the granting of Prior Approval.

INTRODUCTION

This report has been prepared to provide a planning stage noise assessment for the development of four residential flats, at a site on the second and third floors of 62 – 63 East Street & 52 Old Steine, Brighton. The assessment has been carried out on behalf of TriCapital Investments.

A noise survey has been carried out and a summary of the survey methodology and measured levels are presented in this report.

The recommended target internal noise levels within BS 8233: 2014 have been used with the calculation methodology to estimate the required sound insulation of the building envelope.

Local planning policy requirements and national guidance for internal noise levels due to environmental noise sources are discussed in the following section.

Site Description

The site is currently vacant and was formally used as retail storage space. The site is vertically adjacent to the occupied retail space on the first floor and horizontally adjacent to the second and third floors of 64 East Street. To the north, the site is bound by Avenue (a pedestrian only alleyway), to the east there is private car park attached to 52 Old Steine and the highway of Old Steine (A23 & A270) beyond. To the west the site is bound by East Street. The area is of mixed use with commercial, retail and residential properties occupying the nearby buildings.

Assessment Criteria

National Planning Policy Framework

In March 2012 the Department for Communities and Local Government published the National Planning Policy Framework[1] (NPPF); an updated version was published in July 2021, with little change to the policy framework. The document sets out the Planning Policies for England and how these are to be applied.

The NPPF replaces many of the existing Planning Policy documents including Planning Policy Guidance 24: Planning and Noise (PPG24). PPG24 gave guidance on the control of noise to sensitive developments and has been used as the basis of assessment in all Local Authorities in England. The Framework allows local people and their council to produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

It is stated that Planning Policies and decisions should contribute to and enhance the natural and local environment by:

- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

With regards to noise the Framework states that Planning Policies and decisions should also ensure that new development is appropriate for its location, taking into account the likely effects of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or wider area:

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

*NPPF 2021 refers to The Noise Policy Statement for England, published by DEFRA in March 2010.

[1] National Planning Policy Framework, Department for Communities and Local Government, July 2021

Noise Policy Statement for England

The aim of the Noise Policy Statement for England[2] (NPSE) is to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion. The NPSE applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

Noise Policy Vision: Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

Noise Policy Aims: Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The Noise Policy Statement for England does not provide any numerical limits for residential developments. It is considered the discretion of the Local Planning Authority to decide on what is deemed acceptable.

Brighton & Hove Council Policy

The Brighton & Hove Local Plan 2005[3] provides the Local Plan Policies Retained on Adoption of the Brighton & Hove City Plan Part One and is dated March 2016. Policy SU10 of the Local Plan, requires that:

"Proposals for new development will be required to minimise the impact of noise on the occupiers of proposed buildings, neighbouring properties and the surrounding environment"

And that:

"Developments likely to generate significant levels of noise will be permitted only where appropriate noise attenuation measures are incorporated which would reduce the impact on the surrounding land uses, existing or proposed, to acceptable levels in accordance with government guidance"

The policy states that planning conditions will be imposed where necessary in regard to noise and that permission will not be granted for noise sensitive uses if its users would be affected adversely by noise from existing uses that generate significant levels of noise.

BS 8233: 2014 Sound Insulation and Noise Reduction for Buildings – Code of Practice

The scope of BS 8233: 2014 includes the provision of recommendations for the control of noise in and around buildings. It suggests appropriate design guide noise limits for different situations, which are primarily intended to guide the design of new or refurbished buildings. For steady external noise source, it is desirable that the internal ambient noise levels do not exceed the guideline values in Table 2 of BS 8233: 2014. This information has been reproduced below in Table 1 for ease of reference.

Table 1: *BS 8233: 2014 internal noise targets for domestic uses*

Activity	Location	07:00 to 23:00	23:00 to 07:00
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 $L_{Aeq, 8hour}$

[2] Noise Policy Statement for England, Department for Environment Food and Rural Affairs, March 2010
[3] Brighton & Hove Local Plan 2005, Brighton & Hove City Council, Brighton & Hove Local Plan Policies Retained on Adoption of the Brighton & Hove City Plan Part One, March 2016

It is stated in BS 8233: 2014 that regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ dB, depending on the character and number of events per night. Sporadic noise events could require separate values.

The guideline values in Table 1 above are based on annual averages with normal diurnal fluctuations in external noise levels. A shorter averaging period may be used where external levels are atypical due to local activity. The guideline values are for internal ambient noise levels with an appropriate level of ventilation provided. An estimate of the ventilation provision will be made for the purpose of acoustic assessment. It is assumed that the appropriate level of ventilation required by Part F of the Building Regulations will be determined by a ventilation engineer.

Where a development is considered necessary or desirable, BS 8233: 2014 suggests that if the internal target levels are increased by 5 dB reasonable internal conditions will still be achieved.

The internal target level should include noise from mechanical ventilation systems but exclude other domestic building services plant.

With respect to the night time L_{AFmax} dB noise criterion, the WHO Guidelines for Community Noise Exposure[4]presents further clarity, stating: 'For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night'.

Noise Level Measurements

Noise level measurements of the acoustic conditions at the site have been made by an unattended survey on Thursday 29th September and Friday 30th September 2022. The purpose of the survey was to provide sufficient acoustic information to establish the prevailing environmental noise levels across the site and the ambient background noise levels at the surrounding uses to the site. Environmental noise levels were measured at 8.5 metres above ground at the second floor window of 62 – 63 East St and internally. Further measurements were made at 1.5 metres above the second floor and 2 metres from the balcony doors facing Old Steine highway.

All noise level measurements were undertaken by a consultant certified as competent in environmental noise monitoring and in accordance with the principles of BS 7445: 2003[5]. The noise measurement instrumentation used conforms to the accuracy requirements of Type 1 as defined by BS EN 61672-1: 2013[6] and an inventory of all equipment used is given in Table 2 below.

Table 2: *Inventory of measurement equipment*

System	Position	Item	Make & Model	Serial Number	Last Laboratory Calibration
1	4	Sound Level Meter	Sinus Tango	0001113	15/01/2021
1	4	Preamplifier	Sinus 907144.5	20005	15/01/2021
1	4	Microphone	BSWA Tech MP201	4502376	15/01/2021
2	3	Sound Level Meter	NTi XL2	A2A-08541-E0	08/11/2021
2	3	Microphone & Preamplifier	BSWA OM261	154220	08/11/2021
3	1	Sound Level Meter	NTi XL2	09754	15/01/2021
3	1	Preamplifier	NTi MA220	3424	15/01/2021
3	1	Microphone	NTi MC230	9042	05/01/2021
5	2	Sound Level Meter	Svan SV307	104975	28/04/2021
All	All	Acoustic Calibrator	Larson Davis Cal 200	9535	04/02/2022

The logging sound level meters were set to automatically average 5-minute periods measuring parameters L_{Aeq} dB, L_{Amax} dB, L_{A10} dB and L_{A90} dB. Data was also logged in 10-second periods for the L_{Amax} dB parameter. The Calibrator CAL-200 producing nominal 114 dB at 1000 Hz was used to check the sensitivity of the measurement systems at the start and end of the survey. There was no observed drift in sensitivity.

[4] Guidelines for Community Noise, World Health Organization, April 1999
[5] BS 7445-1: 2003 'Description and measurement of environmental noise – Part 1: Guide to quantities and procedures'
[6] BS EN 61672-1: 2013: 'Electroacoustics. Sound level meters. Specifications.', BSI, December 2013

Meteorological conditions were mild throughout the survey period, with no wind and the temperature varied between 17 Celsius at night and 25 Celsius during the day. Just after the survey ended there was a rainstorm. Measurements were made with the hand-held Skywatch Xplorer and data from a nearby publicly accessible weather station is shown in Appendix B.

At location 1 (outside), voices from pedestrians using East Street was the dominant noise source. There were also contributions from occasional vehicles on East Street and the wider road network. Some construction noise from the adjacent building was audible at times. Location 1 was 8.5 metres above ground on a second floor window facing East Street.

At location 2 (outside), vehicles using Old Steine road were the dominant sources of noise at location 2. There were some contributions from construction works on the adjacent building and nesting birds. Location 2 was 8.5 metres above ground and 2.8 metres from the balcony door facing Old Steine.

At location 3 (inside), the same observations as location 1 were made, with the addition of music noise from the retail space on the first floor below.. Location 2 was 1.5 metres above second floor level and 2 metres from the window facing East Street.

At location 4 (inside), the same observations as location 2 were made, with the addition of music noise from the retail space on the first floor below.. Location 4 was 1.5 metres above second floor level and 2 metres from the balcony door facing Old Steine road.

A Google Earth image indicating the measurement locations is given below in Figure 1 and photographs of the measurement positions are shown in Appendix C.

***Figure 1**: Measurement Locations*

A summary of the results is given in Table 3 below, with the L_{Aeq} dB noise levels for location 1 logarithmically averaged over the measurement duration stated. The L_{Afmax} dB noise levels are the 10th highest of the 10-second period results and L_{A90} dB noise levels are the lowest measured. Road traffic on the local network was considered normal with no reported incidents or events.

***Table 3:** Summary of noise level measurements*

Position	Period	Duration [hh:mm:ss]	$L_{Aeq,T}$ dB	L_{AFmax} dB	L_{A10} dB	L_{A90} dB
1: Outside East St	Day	16:24:40	62.6	97.8	63.9	53.6
1: Outside East St	Night	8:00:00	61.9	86.0	64.4	48.6
2: Outside A23	Day	17:18:20	60.5	85.6	61.4	54.6
2: Outside A23	Night	08:00:00	56.0	75.3	58.5	51.5
3: Inside East St	Day	16:42:50	42.3	74.4	38.2	32.1
3: Inside East St	Night	08:00:00	35.6	58.4	36.2	28.9
4: inside A23	Day	16:00:00	45.4	70.1	39.5	34.3
4: inside A23	Night	8:00:00	36.2	55.0	37.3	32.1

A graph of the 5-minute noise level measurements at both positions is shown in Appendix A.

Measurements were made in octave bands at both locations, using linear Z weighting filter. The $L_{Zeq\,T}$ dB noise levels logarithmically averaged over the measurement duration stated from 63 Hz to 4 kHz octave bands are shown in Table 4 below.

***Table 4:** Summary of octave band $L_{Zeq\,T}$ dB noise level measurements*

Position	Period	Duration	L_{Zeq} dB						
		[hh:mm:ss]	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
1	Day	16:24:40	67.2	64.1	61.2	59.6	58.8	53.3	48.4
1	Night	8:00:00	64.4	61.9	59.2	58.6	58.3	53.1	48.9
2	Day	17:18:20	63.3	60.3	57.2	55.3	55.1	53.4	51.3
2	Night	08:00:00	65.5	55.9	53.8	52.8	52.0	48.3	42.6
4	Day	16:00:00	59.6	61.2	64.5	68.4	65.5	62.8	57.6
4	Night	8:00:00	55.7	54.3	51.7	44.6	44.3	45.2	44.7

The octave band L_{zFmax} dB noise levels unlikely to be exceeded more than 15 times per night from 63 Hz to 4 kHz are shown in Table 5 below. As the levels shown are the 10th largest of each octave band, the A-weighting of these levels is different to the 10th largest L_{AFmax} dB noise level in the dataset.

***Table 5:** Summary of octave band L_{zFmax} dB noise level measurements*

Position	Period	Duration	L_{ZFmax} dB						
		[hh:mm:ss]	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
1	Night	08:00:00	88.2	83.7	81.2	82.2	83.1	77.5	73.8
2	Night	08:00:00	73.9	63.1	59.6	56.6	56.1	55.4	53.1
4	Night	08:00:00	60.1	58.5	56.0	47.7	49.2	50.1	47.5

Predicted External Noise Levels

The measured noise levels have been used to digitise a computational noise model in the software Lima Predictor V2022 of the existing site layout. The measurement positions have been replicated in the model and the output result calibrated to the measured noise levels. The software has executed the Calculation for Road Traffic Noise[7] (CRTN) methodology with Transport Research Laboratory (TRL) end correction to output L_{Aeq} dB noise levels, as shown in document st/05/91/AGG04442[8].

The proposed site layout as shown in plan drawing 'Second Level Floor Plan' and 'Third Level Floor Plan' has been used to digitise the proposals and predicted noise levels across the site. Google Earth has been used to digitise the wider area. The model has also been used to predict free field noise levels at the proposed façade locations at the second and third floor, for each of the residential units. These predicted values have been used in calculation of the predicted internal noise levels.

[7] [7] Calculation of Road Traffic Noise, Department of Transport, 1988
[8] Method for converting the UK road traffic noise index $L_{A10,18hr}$ to the EU noise indices for road noise mapping, TRL and Casella Stanger, January 2006

Traffic flow levels have been entered into the road that provide noise levels at location 3 to within 0.1 dB of the measured noise levels. Figure 2 below shows day time noise levels at 8.5 metres above ground, which corresponds to second floor level of the building.

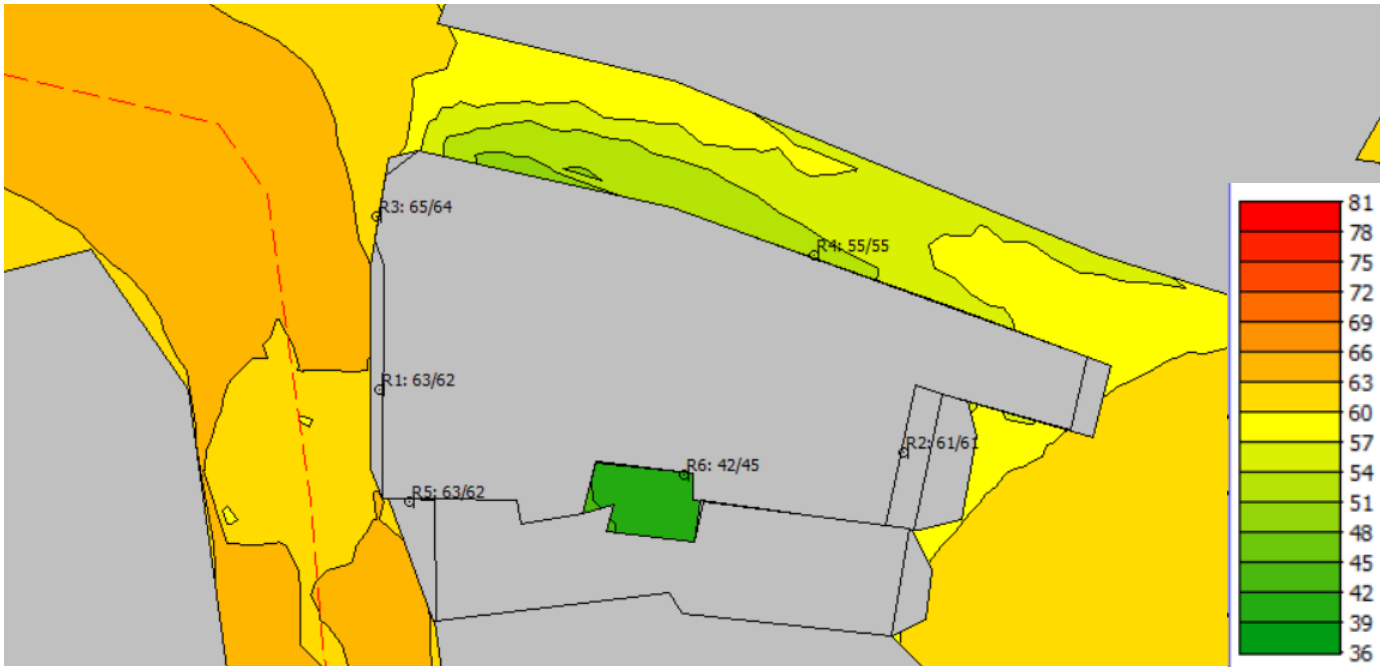


***Figure 2**: Day time noise level contours $L_{Aeq\ 16hr}$ dB at 8.5 metres above ground*

Figure 3 overleaf shows night time noise levels at 8.5 metres above ground.

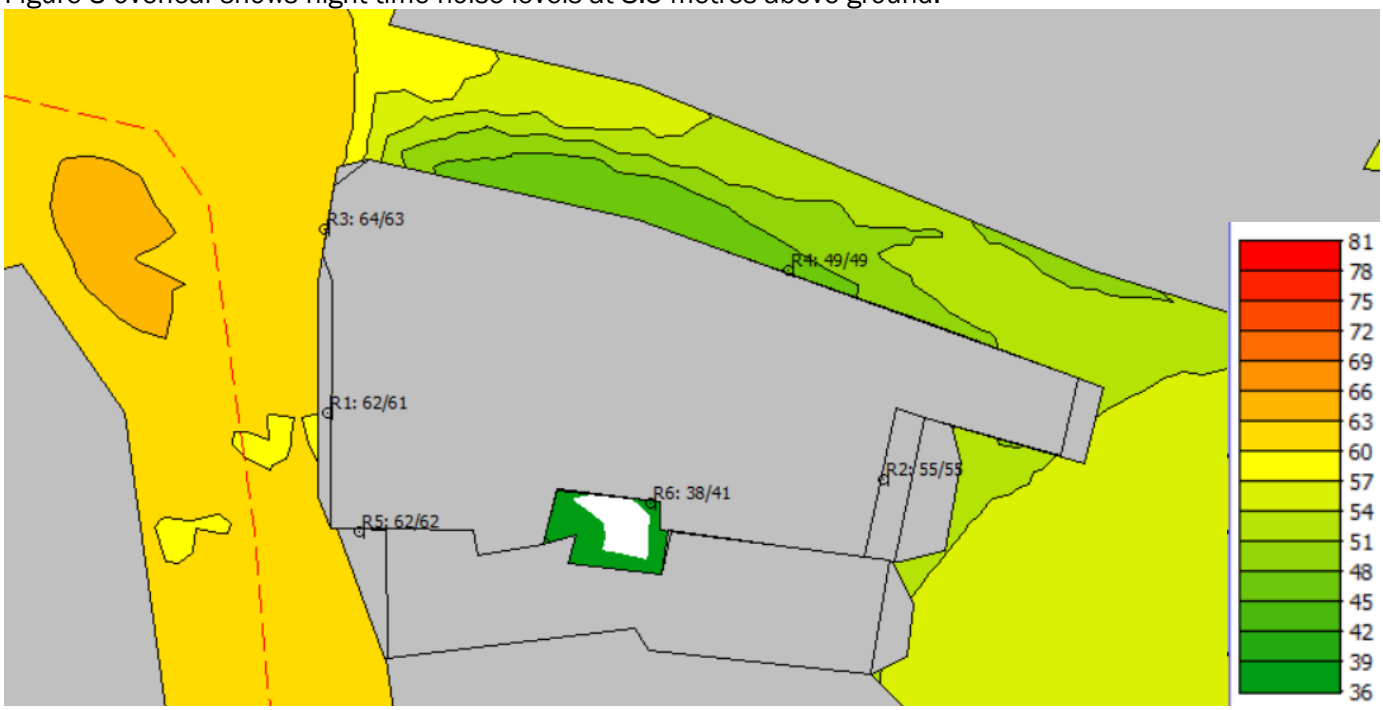


***Figure 3**: Night time noise level contours $L_{Aeq\ 8hr}$ dB at 8.5 metres above ground*

Noise Exposure Categories

In accordance with Brighton and Hove City Council Policy SU10, the Noise Exposure Categories for the site have been assessed. The NEC's from PPG 24 for different noise sources are defined in Annex 1 of the withdrawn guidance document. This is reproduced below in Table

***Table 6:** PPG24 Noise Exposure Categories*

Noise Levels[0] Corresponding To The Noise Exposure Categories For New Dwellings $L_{Aeq,T}$ dB				
	Noise Exposure Category			
Noise Source	A	B	C	D
road traffic				
07.00 - 23.00	<55	55 - 63	63 - 72	>72
23.00 - 07.00[1]	<45	45 - 57	57 - 66	>66
rail traffic				
07.00 - 23.00	<55	55 - 66	66 - 74	>74
23.00 - 07.00[1]	<45	45 - 59	59 - 66	>66
air traffic[2]				
07.00 - 23.00	<57	57 - 66	66 - 72	>72
23.00 - 07.00[1]	<48	48 - 57	57 - 66	>66
mixed sources[3]				
07.00 - 23.00	<55	55 - 63	63 - 72	>72
23.00 - 07.00[1]	<45	45 - 57	57 - 66	>66

The predicted façade noise levels are compared with the NEC boundaries by subtraction of 3 dB (A) and are shown in Table 7 below.

Table 7: *Site NEC's using measured and predicted free field noise levels*

Receptor Name	Predicted Day noise level $L_{Aeq,\ 16hr}$ dB (free field)	Predicted Night noise level $L_{Aeq,\ 8hr}$ dB (free field)	Day NEC	Night NEC
R1 2nd Floor	59.7	58.8	B	C
R1 3rd Floor	59.1	58.1	B	C
R2 2nd Floor	57.5	51.6	B	B
R2 3rd Floor	57.6	51.6	B	B
R3 2nd Floor	62.0	61.1	B	C
R3 3rd Floor	60.9	59.9	B	C
R4 2nd Floor	52.2	46.1	A	B
R4 3rd Floor	52.4	46.4	A	B
R5 2nd Floor	60.4	59.5	B	C
R5 3rd Floor	59.5	58.5	B	C
R6 2nd Floor	39.3	34.8	A	A
R6 3rd Floor	42.4	37.7	A	A

Guidance in PPG24 defines each NEC in terms of mitigation required and planning permission approval, as reproduced in Table 8 below.

Table 8: *PPG24 guidance for each NEC*

NEC	
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

The elevation facing East Street is considered to be in NEC B during the day time and NEC C during the night time. According to PPG24, for this elevation, "conditions should be imposed to ensure a commensurate level of protection against noise"

The elevation facing Old Steine road is considered to be in NEC B during the day and night time. According to PPG24, for this elevation "conditions should be imposed to ensure a commensurate level of protection against noise"

Elevations facing the small internal atrium are within NEC A during the day time and night time. This means that according to PPG24, noise need be a determining factor in granting planning permission.

According to PPG24, the elevation facing the avenue is in NEC A during the day and NEC B during the night. According to PPG24, for this elevation "conditions should be imposed to ensure a commensurate level of protection against noise"

Adequate noise mitigation measures are discussed in the following section.

Noise Level Assessment

Internal Noise Levels

Guidance in BS 8233: 2014 recommends that noise levels from steady broadband sources are not greater than 35 dB $L_{Aeq\ 16hr}$ in living rooms and bedrooms during the day time and not greater than 30 dB $L_{Aeq\ 8hr}$ in bedrooms at night time. In order to calculate a prediction of the internal noise levels, the sound insulation of each of the building envelope elements needs to be considered.

Where an open window is used for background ventilation, a level difference from outside to inside of 13 dB (A) is expected. For natural ventilation, internal L_{Aeq} dB noise levels during the day time and night time are allowed to be 5 dB (A) higher than the BS 8233: 2014 Table 2 values. However, the L_{Amax} dB noise level limit for bedrooms at night time should not be relaxed.

The guidance in BS 8233: 2014 allows for a simplistic calculation using A-weighted values, where the resultant internal noise is at least 5 dB (A) lower than the target noise level. As further recommended by the guidance document, BS EN 12354-3 has been used for a more rigorous calculation. Noise levels in octave bands have been used to calculate the minimum required acoustic performance for each building envelope element.

It is not feasible to use an open window for background ventilation on the facades facing either East Street, Old Steine or Avenue. Assessment of predicted road traffic noise levels suggests that, use of an open window for background ventilation purposes would be feasible for the windows of Flat 4 and Flat 7 that open onto the atrium between buildings. However, noise level measurements were not possible in the atrium as at the time of survey the windows were not operable. It is possible that mechanical service plant noise may make use of the atrium for ventilation not feasible.

An alternative means of background ventilation to an open window is recommended for all dwellings. Trickle ventilator acoustic requirements are suggested on the following pages, to be used with Mechanical Extract Ventilation (MEV). It should not be necessary to use a mechanical supply and extract ventilation system for environmental noise intrusion purposes.

The acoustic requirements for the windows and trickle ventilators is shown for the second floor, in Figure 4 below.

***Figure 4**: Glazing and ventilation requirements for the second floor*

Figure 5 below shows the glazing and ventilation requirements for the third floor.

***Figure 5**: Glazing and ventilation requirements for the third floor*

There are two different glazing requirements and three different ventilation requirements.

The ventilation requirements could be met with the following example products:

- Ventilator – D_{new} 44 dB – tested acoustic trickle vent – Duco 20 Largo
- Ventilator – D_{new} 33 dB – tested acoustic trickle vent – Duco 20 MiniMax
- Ventilator – standard slot trickle vent

The glazing systems could be met with the following example products:

- R_w 30 dB - Replacement double glazing system - - 4mm float glass, 20mm cavity, 4mm float glass
- R_w 30 dB – Renovated existing single glazing using Ventrolla system
- R_w 30 dB – Existing glazing system (as is) with 200mm cavity and Selectaglaze 4mm secondary glazing
- R_w 42 dB – Replacement double glazing system - - 8mm float glass, 20mm cavity, 12.8mm acoustic laminated glass
- R_w 42 dB – Renovated existing single glazing using Ventrolla system with 200mm cavity and Selectaglaze S80 6.8mm acoustic glass

It was observed that the existing glazing system consisted of single glass panes in timber frames. There appeared to be no brush seals and the openers did not fit tight to the frame in many locations.

It maybe possible to renovate the existing timber glazing by using Ventrolla Perimeter Sealing System and repairing all sections of timber frame as necessary. This renovation is likely to give the window system a sound reduction of R_w 30 dB. Further details of the Ventrolla system is shown in Appendix D.

Without upgrading the timber frames or seals, it is possible to install a secondary glazing system. With a 200mm cavity between the primary and secondary panes, this is likely to give the window systems a sound reduction of R_w 30 dB.

Renovation of the existing timber windows using the Ventrolla system and a secondary glazing system could give a windows system with sound reduction of R_w 42 dB. The Selectaglaze horizontal sliding system S80 with 6.8mm acoustic laminated glass and 200mm cavity between the panes may be a feasible solution. Further details of the Selectaglaze system are shown in Appendix D.

Alternatively, replacement timber or uPVC framed double glazing can cover both the R_w 30 dB and R_w 42 dB acoustic requirements.

The existing external walls appeared to be brick construction consisting of:

10mm external render
103 mm brick
50mm cavity
103 mm brick
50mm timber stud in a clear cavity
9mm plasterboard

It is estimated that the wall construction provides R_w 52 dB and is not expected to be required to be upgraded for sound insulation against environmental noise.

The roof system appears to be a pitched roof with slate tiles. It is likely to have a quantity of mineral wool insulation, timber joists and plasterboard ceilings. The existing system is likely to be rated R_w 42 dB to R_w 47 dB. The ceiling and roof build up is likely to be sufficient for sound insulation.

It is assumed that the bedrooms and living rooms would be furnished and the standardised acoustic absorption correction has been applied, based on reverberation times of 0.5 seconds, as required by the calculation methodology.

With the above provisions it is expected that internal L_{Aeq} dB noise levels in living rooms and bedrooms will not be greater than 35 dB (A) during the day and 30 dB (A) during the night. It is expected that L_{Afmax} dB noise levels in bedrooms will typically be up to 43 dB (A) and will not regularly exceed 45 dB (A) at night based on assessment of the 10th highest measured values.

In our opinion, if the building envelope elements and external wall build up are chosen to meet or exceed the acoustic performance values shown, then the internal noise levels in all rooms should meet the guidelines of BS 8233: 2014.

The mechanical extract ventilation systems are to be selected so that the combined environmental and services noise levels do not exceed the target internal noise levels. The building services noise emission limits to atmosphere combined should be controlled to not cause disturbance to neighbouring uses. Typically, the use of low noise domestic extract and supply fans with termination either through wall or at roof levels should be sufficient.

Noise Transfer Assessment

The floor partition between the first floor retail space and the second floor proposed residential use is likely to be of timber construction. It is estimated that the build up is:

22mm timber floorboards
200mm x 45mm timber joists at 450mm centres
20mm lathe and plaster ceiling

During the noise survey the existing retail space on the first floor was in use. The background music from the retail space was audible within the second floor space. Measurements made at first floor level and second floor level indicate that the existing floor construction offers a level difference of approximately 20 dB (A).

The floor build up would be required to comply with the requirements of Approved Document E[9] of the Building Regulations[10]. Compliance with Building Regulations should provide an adequate level of sound insulation that would satisfy local planning policy relevant to permitted development. It is assumed the developer will carry out a detailed design exercise for sound insulation of partitions following the granting of Prior Approval.

[9] Approved Document E, Resistance to the passage of sound, HM Government, April 2015
[10] Building and Buildings, England and Wales, The Building Regulations 2010, Statutory Instruments, The Secretary of State, October 2010

CONCLUSION

This report has presented the findings of an assessment of likely intrusive environmental noise levels, for the proposed development at 62 – 63 East Street and 52 Old Steine, Brighton. The assessment has been carried out for TriCapital Investments.

The results of a noise survey carried out by NRG Consulting on Thursday 29th September and Friday 30th September 2022 have been used to establish the prevailing noise levels at the proposed residential façades. The measured noise levels have been used with the design targets of BS 8233: 2014 to estimate the required external wall and glazing performance. Examples glazing systems have been provided to demonstrate that the acoustic requirements can be met whilst retaining the existing timber framed glazing or can be met with a replacement glazing system.

With the minimum acoustic requirements shown, all of the bedrooms and living rooms would achieve the internal noise level recommendations of BS 8233: 2014 during the day time and night time. The L_{Afmax} dB noise levels in bedrooms at night time are predicted to be lower than WHO guidance.

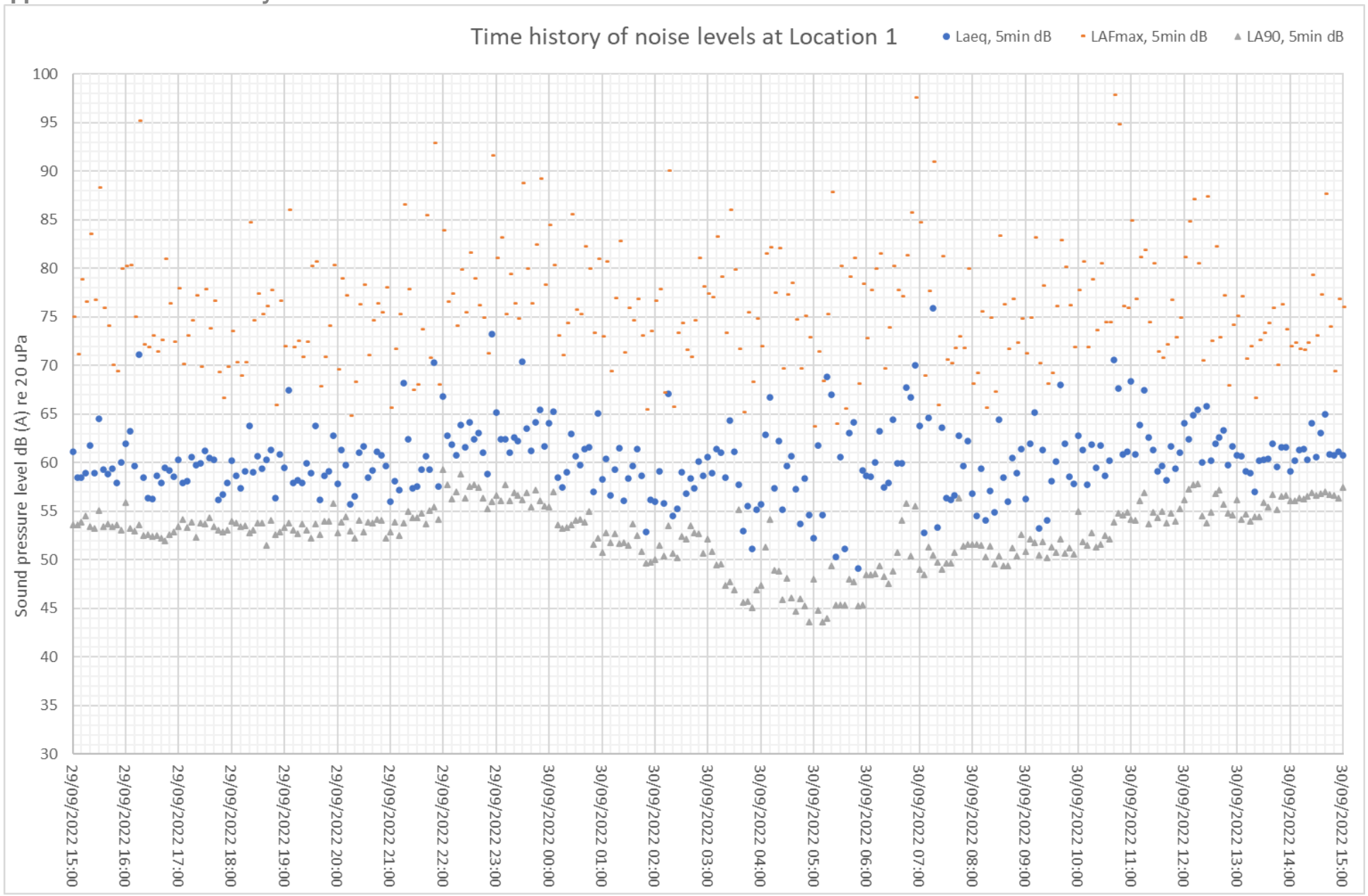
Compliance with BS 8233: 2014 recommendations should be sufficient to satisfy the requirements of NPPF 2021 for environmental noise intrusion. The facades fall within NEC B and NEC C. Adequate mitigation measures for the control of noise have been presented.

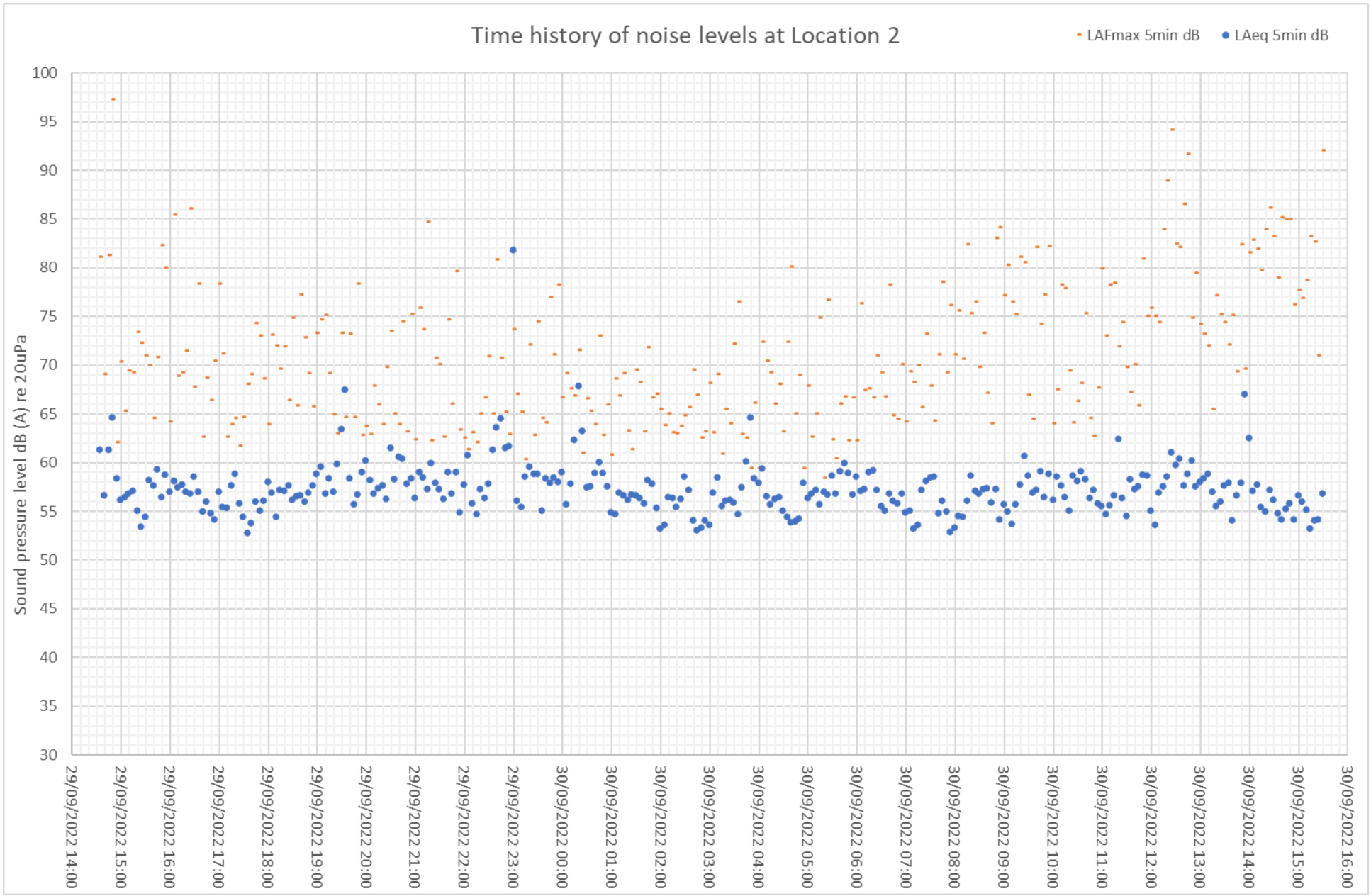
In our opinion, environmental noise intrusion should not be a constraint to the granting of Prior Approval.

Music noise from the retail space was observed on the second floor during the survey. Compliance with Building Regulations should provide an adequate level of sound insulation, that would satisfy local planning policy relevant to permitted development. It is assumed the developer will carry out a detailed design exercise for sound insulation of partitions following the granting of Prior Approval.

In our opinion, noise transfer should not be a constraint to granting Prior Approval.

Appendix A – Time history of noise levels




Time history of noise levels at Location 2
LAFmax 5min dB
LAeq 5min dB
Sound pressure level dB (A) re 20uPa
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
29/09/2022 14:00
29/09/2022 15:00
29/09/2022 16:00
29/09/2022 17:00
29/09/2022 18:00
29/09/2022 19:00
29/09/2022 20:00
29/09/2022 21:00
29/09/2022 22:00
29/09/2022 23:00
30/09/2022 00:00
30/09/2022 01:00
30/09/2022 02:00
30/09/2022 03:00
30/09/2022 04:00
30/09/2022 05:00
30/09/2022 06:00
30/09/2022 07:00
30/09/2022 08:00
30/09/2022 09:00
30/09/2022 10:00
30/09/2022 11:00
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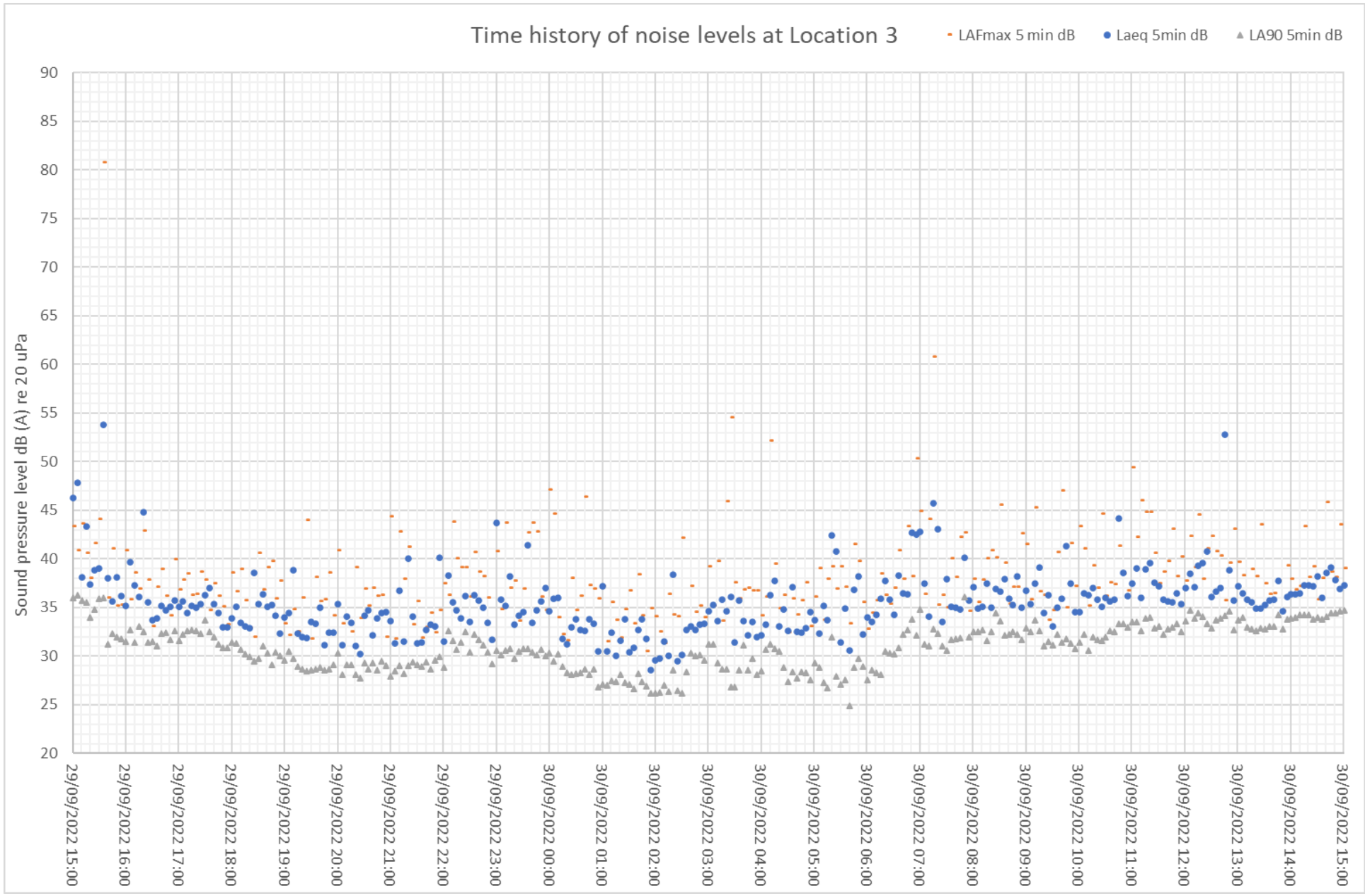
30/09/2022 15:00
30/09/2022 16:00


Time history of noise levels at Location 3
LAFmax 5 min dB
Laeq 5min dB
LA90 5min dB
Sound pressure level dB (A) re 20 uPa
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
29/09/2022 15:00
29/09/2022 16:00
29/09/2022 17:00
29/09/2022 18:00
29/09/2022 19:00
29/09/2022 20:00
29/09/2022 21:00
29/09/2022 22:00
29/09/2022 23:00
30/09/2022 00:00
30/09/2022 01:00
30/09/2022 02:00
30/09/2022 03:00
30/09/2022 04:00
30/09/2022 05:00
30/09/2022 06:00
30/09/2022 07:00
30/09/2022 08:00
30/09/2022 09:00
30/09/2022 10:00
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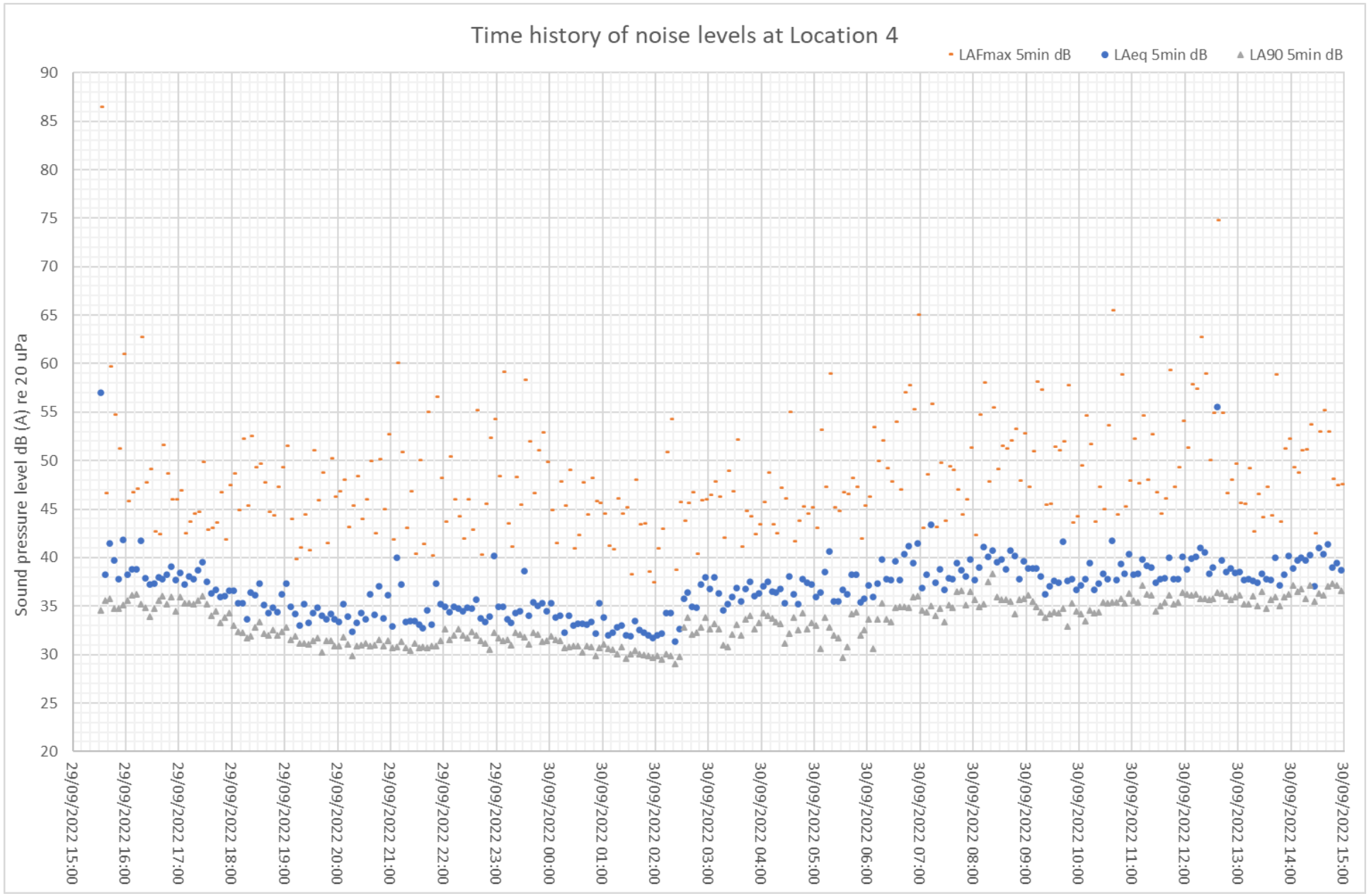
30/09/2022 14:00
30/09/2022 15:00


Time history of noise levels at Location 4
LAFmax 5min dB
LAeq 5min dB
LA90 5min dB
Sound pressure level dB (A) re 20 uPa
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
29/09/2022 15:00
29/09/2022 16:00
29/09/2022 17:00
29/09/2022 18:00
29/09/2022 19:00
29/09/2022 20:00
29/09/2022 21:00
29/09/2022 22:00
29/09/2022 23:00
30/09/2022 00:00
30/09/2022 01:00
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30/09/2022 05:00
30/09/2022 06:00
30/09/2022 07:00
30/09/2022 08:00
30/09/2022 09:00
30/09/2022 10:00
30/09/2022 11:00
30/09/2022 12:00
30/09/2022 13:00
30/09/2022 14:00
30/09/2022 15:00

Appendix B – Weather history

Weather History for IBRIGH57

Previous | Daily Mode | September | 29 | 2022 | View | Next

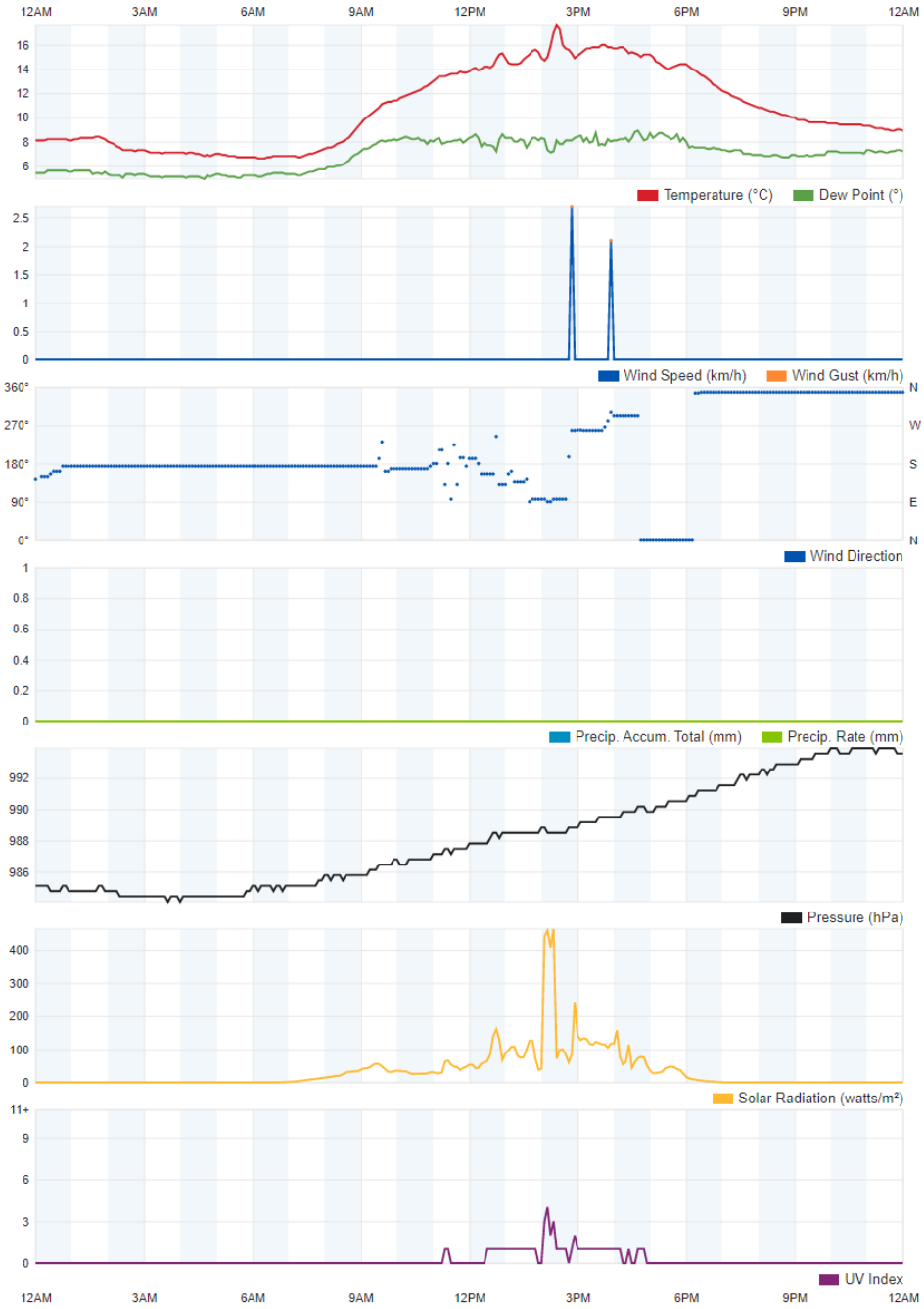
Summary
September 29, 2022

	High	Low	Average
Temperature	17.6 °C	6.6 °C	10.6 °C
Dew Point	8.9 °C	4.9 °C	6.7 °C
Humidity	91 %	51 %	78 %
Precipitation	0.00 mm	--	--

	High	Low	Average
Wind Speed	2.7 km/h	0.0 km/h	0.0 km/h
Wind Gust	2.7 km/h	--	0.0 km/h
Wind Direction	--	--	West
Pressure	993.91 hPa	984.08 hPa	--

Graph | Table

September 29, 2022



Weather History for IBRIGH57

Previous | Daily Mode | September | 30 | 2022 | View | Next

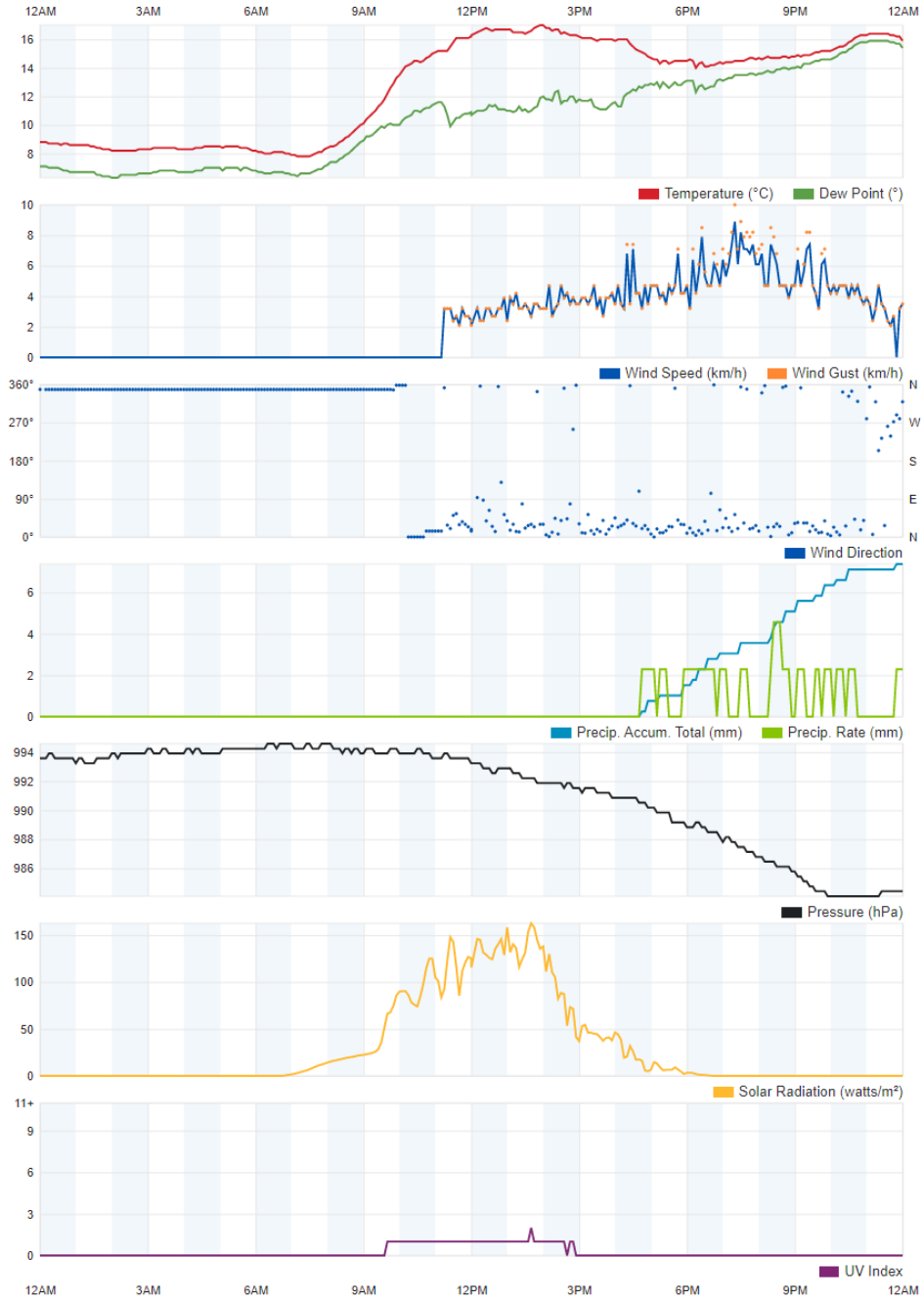
Summary
September 30, 2022

	High	Low	Average
Temperature	17.0 °C	7.8 °C	12.6 °C
Dew Point	15.9 °C	6.3 °C	10.3 °C
Humidity	97 %	68 %	87 %
Precipitation	7.37 mm	--	--

	High	Low	Average
Wind Speed	8.9 km/h	0.0 km/h	1.2 km/h
Wind Gust	10.0 km/h	--	1.2 km/h
Wind Direction	--	--	NNE
Pressure	994.58 hPa	983.75 hPa	--

Graph | Table

September 30, 2022



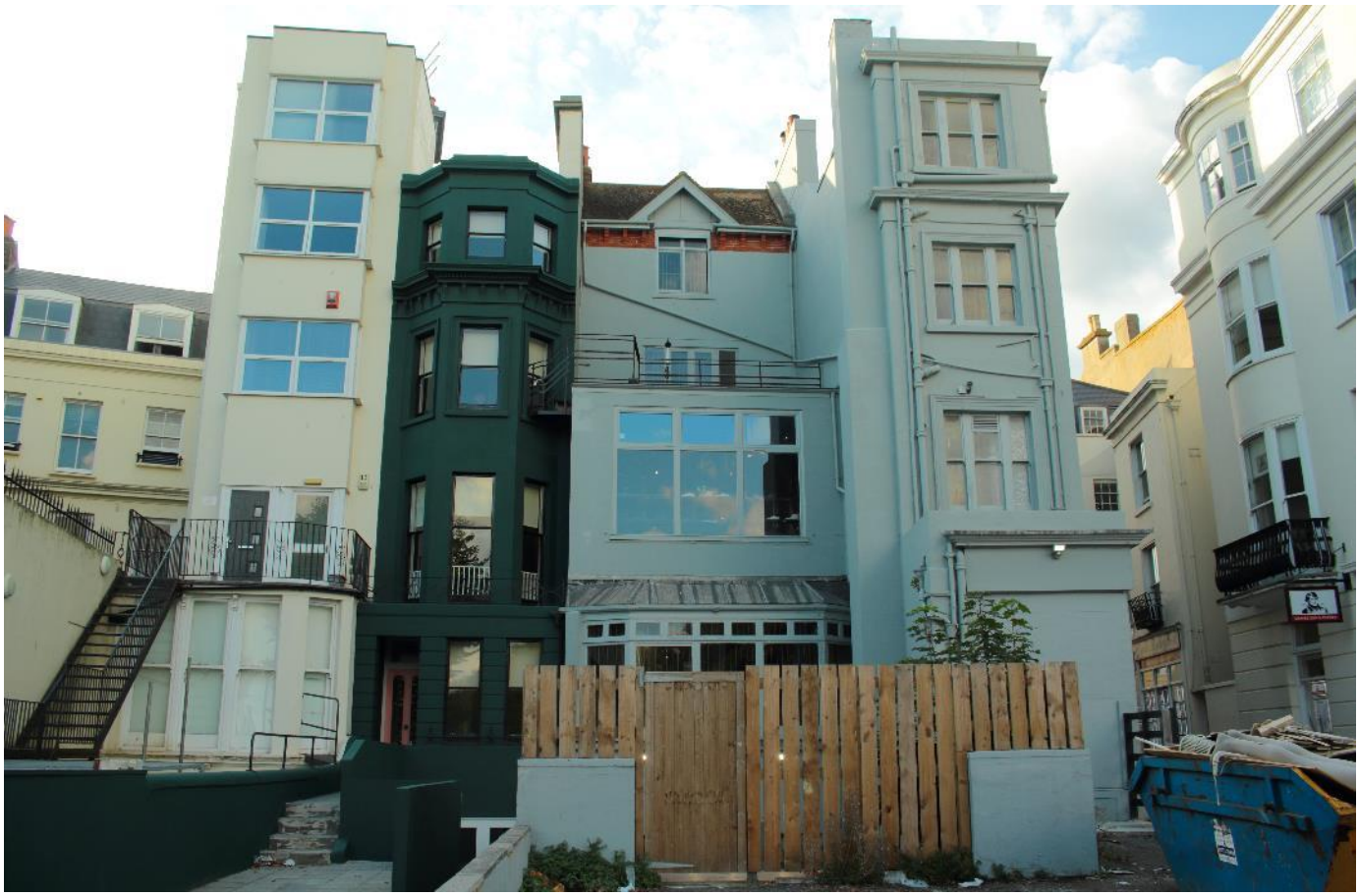
Appendix C – Photographs of measurement positions

From Location 1 - looking south-west

From Location 1 looking north-west

Looking north along East St at Location 1

Location 2 – 1.5 metres above the 2nd floor, looking east towards Old Steine



Looking west towards Location 2 from the boundary of the private car park and Old Steine

Location 3 – 1.5 metres above the 2nd floor, 2 metres from the inside of the window facing East St

Location 4 – 1.5 metres above the 2nd floor, 2 metres from the inside of the window facing Old Steine

Appendix D – Product Information

Ventrolla Specification

The Ventrolla system consists of two parts. The first phase is the renovation process, which treats the wood and ensures the window is fully operational. The second phase provides the performance upgrade.

Ventrolla System

Phase 1 - Window Renovation

Ventrolla have developed a unique Wood Repair System (VR90) that has been designed to extend the life of wooden windows and doors.

Application

VR90 wood repair is a two part epoxy resin designed to impart the original strength to tenon joints and to fill cavities in sills, which it achieves through bonding with the original timber.

The system's core benefits are:
- It retains the majority of the original timber
- Provides long lasting repairs
- Fast acting so minimises standing time
- Reduces Carbon Footprint of repair
- Enables existing profile to be matched

In the event of excessive deterioration, or if beyond economical repair, we replace the timbers as required.

Phase 2 - Performance Upgrade

The Ventrolla Perimeter Sealing System (VPSS) has been specifically designed to be installed into wooden windows and doors.

Application

The system upgrades the performance of original wooden windows and doors without affecting either their appearance or character.

As shown in Diagram A overleaf, the system is installed to provide a seal on all faces and becomes an integral part of the window or door.

The system's core benefits are:
- Virtually eliminates draughts
- Eradicates sash rattle
- Improves Window's Energy Rating by up to 30%
- Helps reduce noise ingress
- Ensures smooth operation of the window
- Recognised by English Heritage and CADW

Independent Testing

- VPSS achieved the highest requirement of BS6375-1 2004 Class 3
- VPSS provides up to a 30% improvement in a Windows Energy Rating (WER)
- Air change rates reduced to 0.4 air changes per hour
- Noise reduction levels of up to 6-10 dB(A) range

Noise Control

There is misrepresentation that double glazing provides sound insulation due to the two panes of glass. In fact, it is the seal that offers the improvement, which as Diagram B overleaf shows, is equalled by the Ventrolla system.

Environmental Issues

Because the Ventrolla system retains much of the original material its Carbon Footprint is significantly less than replacement windows. The Green Facts are:

- Replacement windows consume up to 40 times the energy of renovation
- Renovation retains the invested energy within the original window
- Minimal waste is sent for recycling or to landfill
- Window Energy Rating is improved by 30%

If you would like further information about the Ventrolla Sash Window Renovation Service call 0800 0277 454 or visit our website www.ventrolla.co.uk

Ventrolla. Ventrolla House, Crimple Court, Hornbeam Business Park, Harrogate, North Yorkshire, HG2 8PB. T: 01423 859323 F: 01423 859321 E: info@ventrolla.co.uk

Ventrolla®
SASH WINDOW RENOVATION SPECIALISTS

RIBA NETWORK CPD PROVIDERS

Cl/SfB
(31.44) X (W5)
April 1999

Technical data sheet 1

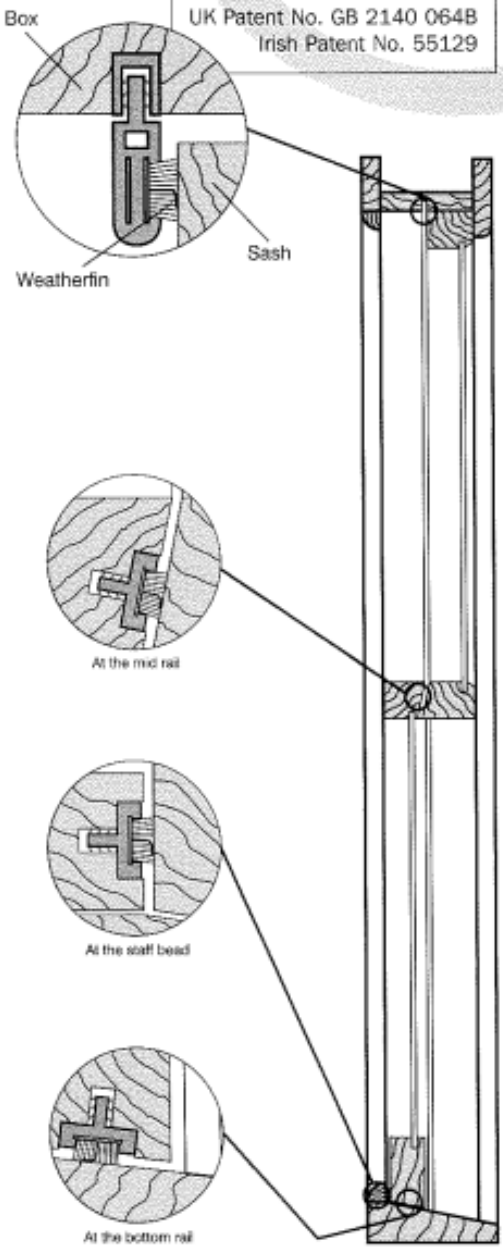
The **Ventrolla** Perimeter Sealing System

The Ventrolla Perimeter Sealing System is designed to be installed into original sliding sash windows by Ventrolla trained operatives; this service is available throughout the UK and Ireland. The System upgrades the performance of sash windows to levels of performance comparable with uPVC replacement windows, but retains the appearance of the original windows. The System significantly reduces noise levels (up to 10dB), virtually eliminates draughts and dust ingress, ensures efficiently sliding sashes and eliminates sash rattle, while meeting the highest requirements (Class C) of BS 6375 Part 1 1989 in respect of air leakage. The result is improved comfort levels and the potential for reduced energy consumption. Subsequently both sashes can be removed internally for painting, cleaning and maintenance.

Two Piece Parting Bead

At the heart of the System is **Ventrolla's** patented two piece parting bead. The U shaped section is screwed into the original parting bead groove. The pile carrier is snapped into the U section but is detachable to allow for subsequent removal of sashes. The height of the Weatherfin pile weatherstripping is optimised to eliminate air infiltration while giving low friction sliding. Grooves are routed at the sash mid rail and sash bottom rail, after which pile carriers are installed and Weatherfin is selected to accommodate the varying widths of gaps. Existing staff bead is replaced by **Ventrolla's** staff bead, which incorporates pile carriers and Weatherfin.

TWO PIECE PARTING BEAD
UK Patent No. GB 2140 064B
Irish Patent No. 55129



A BRITISH DESIGN COUNCIL AWARD-WINNING SYSTEM

Design Council Awards are presented annually to British companies for products that stand head and shoulders above the normal run of design and industrial production in this country. Each year, 500 or so products are submitted but only about 25 are selected by the judges - independent panels of distinguished experts - for an award. They look for the very best innovation and design in production. Inevitably this means not only the best in Britain, but in many cases, the best in the world. Naturally, **Ventrolla** was delighted to win one of these coveted awards in 1986. When selecting the Ventrolla System for an award, the judges took into account 'the nation-wide scale of the problems solved'. They believed that **Ventrolla's** innovative design 'offers a realistic alternative to double-glazing and the opportunity to preserve original sliding sash windows in old buildings'.

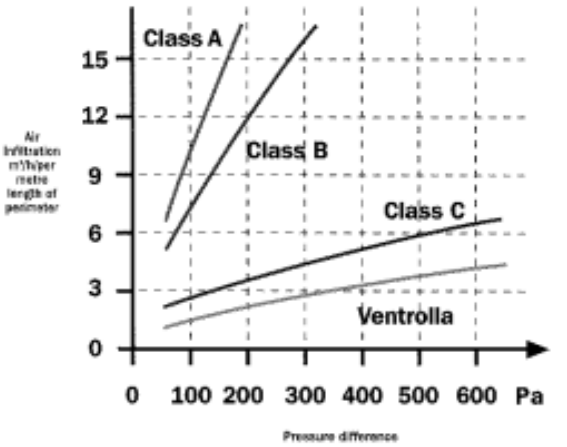
Ventrolla Perimeter Sealing System - Performance

Air Infiltration

BS 6375 Part 1 1989 is the most rigorous standard for measuring the air infiltration performance of double-glazed replacement windows. Independent testing by a NAMAS approved laboratory has shown that **Ventrolla's** Perimeter Sealing System meets the highest requirements of BS 6375, achieving even better results than Class C; a copy of the test report is available.

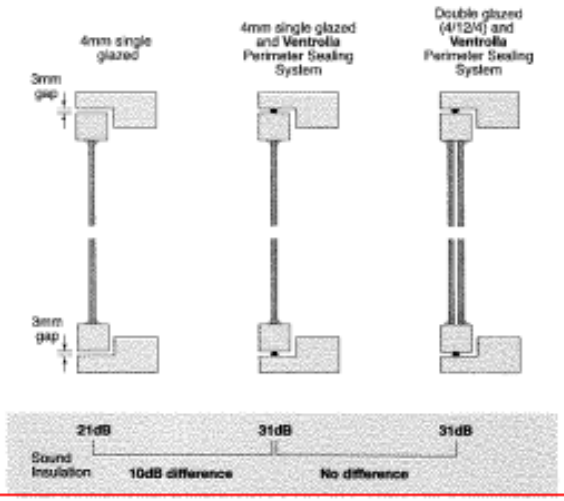
BS 7386 is a much less demanding standard than BS 6375. Its highest air infiltration classification only equates to Class B of BS 6375 and only measures air infiltration up to a maximum pressure differential of 100 Pa compared with 600 Pa in BS 6375. **Ventrolla's** Perimeter Sealing System therefore exceeds BS 7386 by a very large margin.

GRAPH SHOWING CLASSIFICATION OF AIR INFILTRATION IN BS 6375



Noise Reduction

Sliding sash windows normally have at least 3mm of perimeter gap to slide properly. In an average sized window of 1.2m x 1.8m the aggregate gap area would be 15cms x 15cms, amounting to 1% of the area of the window. BS 8233 indicates that such an air gap would lose 10dB of sound insulation. The **Ventrolla** Perimeter Sealing System eliminates this air gap and therefore would achieve a 10dB improvement in sound insulation, which is equivalent to reducing noise ingress by 50%. There is no difference between the sound insulation of 4mm single glazing and 4/12/4 double glazing.

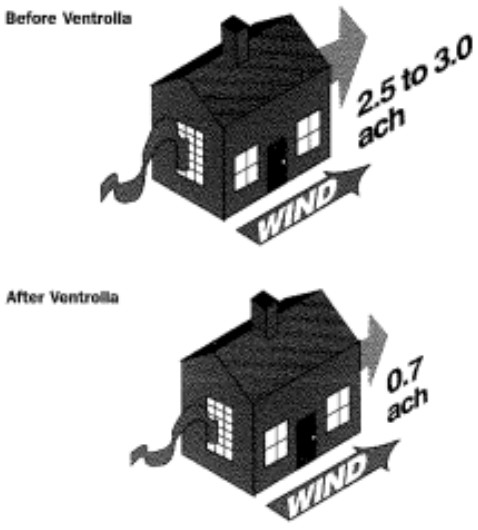


Comfort and Energy Savings

Comfort level improvements and energy savings experienced after fitting double-glazed replacement windows are achieved largely due to the weatherseals fitted into the replacement windows. Very little comfort and energy savings are generated by the improvement in the 'u' value of the glazing. When **Ventrolla's** Perimeter Sealing System is fitted into original sash windows the comfort benefits experienced are identical to those achieved with double-glazing while the potential for energy saving is approximately 85% of that offered by double-glazing.

A building having sliding sash windows and situated in an exposed position could have 2.5 - 3.0 air changes per hour (a.c.h.). The **Ventrolla** Perimeter Sealing System reduces the natural ventilation rate to the building's adventitious ventilation rate - typically 0.7 a.c.h. Reducing a building's natural ventilation rate by 2 a.c.h. gives much improved comfort levels and a great potential to reduce energy consumption.

AIR CHANGES PER HOUR



Anatomy of Selectaglaze secondary glazing

selectaglaze

Framing
Sections are designed and extruded from aluminium alloy. This strong, lightweight material can be formed to create the slender, complex shapes needed to accommodate seals, fixings and specialist hardware.

Forming
Selected sections can be curved and shaped to match the primary window.

Finishes
Framing is available in two types of finish:

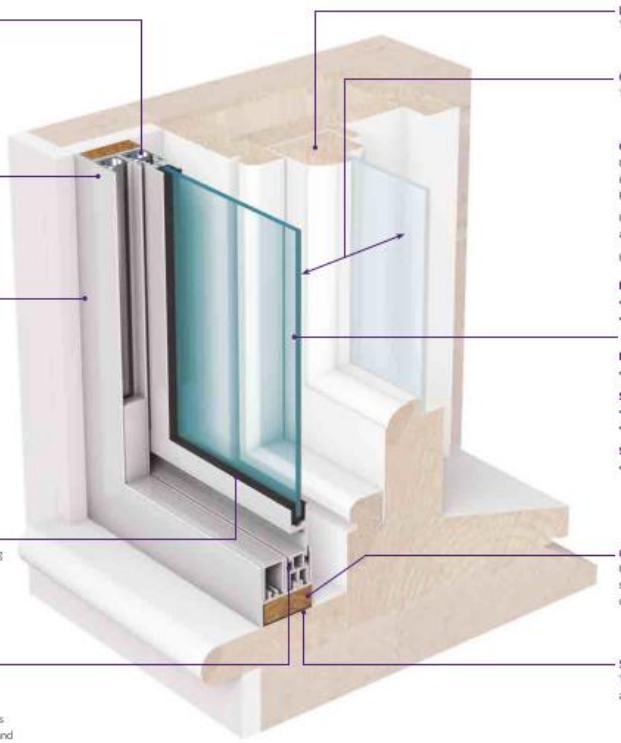
1. **Polyester powder paint coated** Standard colour is HIPCA White semi-gloss; other RAL colours in flat, metallic or textured finishes, to order, including wood grain effect.
2. **Anodised** In natural silver, bronze and a limited range of other colours.

Both paint and anodised finishes are very durable with long life expectancy and minimal maintenance.

Gaskets
Glazing is held in position by specialist gaskets or bonding tapes. They are available in black and white.

Weatherseals
Sliding units are fitted with twin silicone-treated, grey polypropylene pile seals.

Hinging units are fitted with high performance Q-Lon seals (in white or black). This material has excellent 'memory' and will retain its original shape for years, maintaining optimum sealing and acoustic performance.



Primary window
The outer or existing window frame.

Cavity
The gap between the primary and secondary windows.

Glazing
Glazing complies with BS 6262: 2005, the Code of Practice for glazing in buildings, and meets the requirements of Building Regulations Parts N1 and N2.

Glass thickness varies from 4mm to 28mm depending on the product and application.

Other glazing options include:

Enhanced thermal
- low emissivity (hardcoat)
- sealed glass unit (various specifications)

Enhanced acoustic
- acoustic laminates

Safety
- toughened
- laminated

Solar control
- body tinted

Privacy
- patterned
- opaque laminate
- screen printed or etched
- switchable glass
- sealed glass unit with integral blind

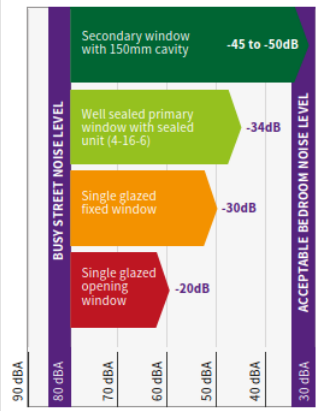
Clarity
- anti-reflective glass
- low iron glass

Security
- anti-bandit laminates
- polycarbonate sheet
- glass/polycarbonate composites

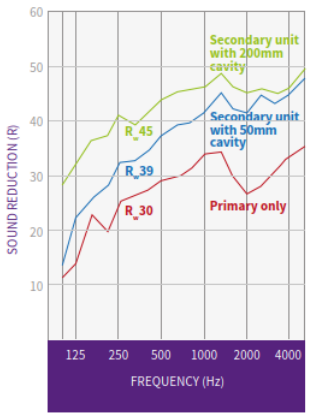
Grounds and sub-frames
Custom made timber grounds can accommodate splayed or out of shape openings. All timber gounds and sub-frames are made from certified timber products.

Sealants
Timber grounds, sub-frames and aluminium frames are bedded on an acrylic sealant to provide a lasting perimeter seal.

Acoustic performance of windows



Effect of cavity



Notes

Sound is measured as a pressure and expressed in dB (decibels) which is a logarithmic scale. 0dB represents the threshold of hearing and 120 dB the onset of pain. To the human ear a change of 3dB is just about noticeable whereas an increase of 10dB approximates to a doubling of loudness.

Cavity is the space between the existing primary windows and the secondary glazing. Performance improves as the cavity increases with an optimum of about 200mm.

Glass type and thickness have a direct impact on performance. Thicker glass has greater mass, so will provide better acoustic results. Ideally the secondary glass should be of different thickness to the primary window glass to avoid sympathetic resonance which will increase noise transmission. Acoustic laminate glass helps improve performance at higher frequencies.

Reveal linings are acoustic absorbent lining materials which can be fitted to the reveals, normally at the head and jambs. These raise insulation levels by 1 to 2dB and are used when external sound levels are very high.

Testing and certification

The product range has been tested against single glazed primary windows with 50mm, 100mm, 150mm and 200mm cavities. Testing was carried out by Taylor Woodrow Technology in accordance with Standard BS EN ISO 140-3: 1995 'Laboratory measurement of air-borne sound insulation of building elements'. Results were reviewed and interpolated by Hann Tucker Associates.

Please visit our website for performance figures. Summary tables are on page 50.

HORIZONTAL SLIDER (HS)

RECOMMENDED APPLICATION

Ideal where easy access is a priority; sashes slide within the frame so no problems with blinds or curtains; large and ribbon windows can be accommodated by linking units.

SERIES 10	**Page 20**

Slimline versatile framing system in 2, 3 or 4 pane options that provides easy access to the outer window.

SERIES 15	**Page 21**

Mid-range discrete framing system in 2 or 3 pane options for larger windows; also accepts thicker glass to achieve higher noise insulation.

SERIES 80	**Page 22**

Heavy duty framing system in 2, 3 or 4 pane options for very large windows. 2 and 3 pane versions accredited to Secured by Design.

SERIES 85	**Page 23**

High security framing system in 2 panes only, providing significant levels of intruder resistance and blast mitigation.

VERTICAL SLIDER (VS)

RECOMMENDED APPLICATION

Ideal for treating sash windows; operates with spring balances which support the weight of the sash in all positions.

SERIES 20	**Page 24**

Slimline framing system ideal for treating traditional sash windows often found in heritage properties.

SERIES 25	**Page25**

Mid-range framing system with higher capacity balances for larger windows, supports thicker glass to achieve higher noise insulation; accredited to Secured by Design.

SERIES 90	**Page 26**

Heavy duty framing system with specialist balances that allows very large sash windows to be treated and is accredited to Secured by Design.

SERIES 95	**Page 27**

High security framing system capable of providing significant levels of intruder resistance and blast mitigation.

SERIES 60	**Page 28**

Specialist framing system allowing individual panes to tilt inwards on safety stays to assist with cleaning.

HINGED CASEMENT (HC)

RECOMMENDED APPLICATION

Offers full and easy access to an outer window or door. Neat and unobtrusive with single casements having no mullions or transoms to impede the view.

SERIES 45	**Page 30**

Slimline framing system suitable for treating many types of window and standard sized doors. When fitted to traditional sash windows new sight lines are avoided. Single casements accredited to Secured by Design.

SERIES 41	**Page 31**

Heavy duty framing system suitable for large windows and doors; supports thicker glass for higher noise insulation and both single and double casements accredited to Secured by Design.

SERIES 50	**Page 32**

High security framing system capable of treating very large windows and doors; provides significant levels of intruder resistance and blast mitigation.

SERIES 47	**Page 33**

Specialist framing system with very slim profiles to allow installation within the staff bead of smaller, traditional sash windows.

NRG CONSULTING