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SRC RECYCLING LTD – WEST SUSSEX

NOISE ASSESSMENT

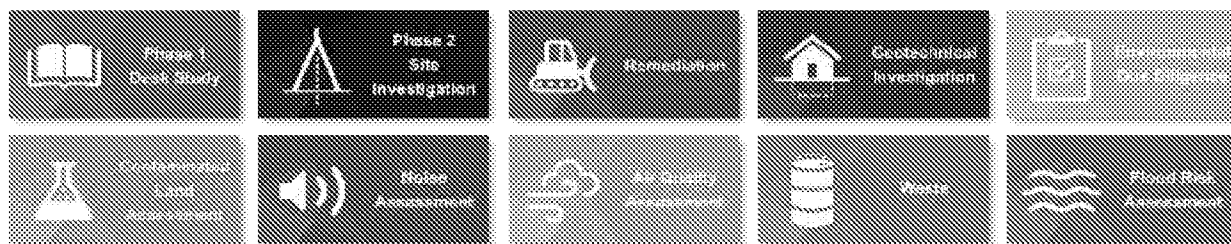


NON-TECHNICAL SUMMARY

SUMMARY	
Site	SRC Recycling Ltd, Fontwell Avenue, Eastergate
Proposed Development	It is understood that proposals involve the clearance of the site and construction of a residential development. The proposed development will comprise 80 residential dwellings and Co-working hub on the site of SRC recycling.
Current Use	The eastern section of the site comprises an operational vehicle spares, salvage, depollution and recycling centre and the western section comprises land, which is currently used for private ad hoc vehicle storage and keeping geese.
Sources of Potential Noise	The noise climate at the site was considered to be dominated by traffic noise from the A29 (Fontwell Avenue), which runs from the east to the south of the site.
Environmental Noise Monitoring Survey	An environmental noise survey was undertaken at the proposed development to assess noise levels affecting the new build site. The results of the noise survey were considered indicative of prevailing climate, taking into account measurement positions and dominant noise and sources.
Recommended Sound Insulation Measures	Based on the noise survey results, calculations have been undertaken to predict noise levels within the dwellings and any external amenity areas, based on the proposed scheme and external façade elements. The calculations, based on the proposed scheme, demonstrate that planning requirements can be achieved through the recommended design parameters set out in the report.



PROJECT RECORD				
PROJECT NAME	EASTERGATE - WEST SUSSEX			
CLIENT	SRC RECYCLING LTD			
REPORT DETAILS				
TYPE	NOISE ASSESSMENT			
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REVISION	DATE	AMENDMENT DETAILS	REVISION AUTHOR	REVISION REVIEWER
A	9/2021	Various updates from EHO comments	NL	NL
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1.0 INTRODUCTION

- 1.1 This Noise Assessment has been prepared for the clearance and development of a site located off Fontwell Avenue, in Eastergate, West Sussex, PO20 3RU by Lustre Consulting Limited (Lustre) for SRC Recycling Ltd (the Client). The assessment has been undertaken in accordance with our fee proposal dated 24/09/2020, which was formally approved by SRC Recycling Ltd on 02/11/2020.
- 1.2 The site, irregular in plan, is centered at National Grid Reference 494377, 105802, and occupies an approximate area of 3.28ha as shown in Figure 1. The site currently comprises a car salvage centre and area of open land and is located within a primarily residential land use area. The Client requires this Noise Assessment to support re-development works at the site. It is understood that proposals involve the clearance of the site and construction of a residential development. The proposed development will comprise 80 residential dwellings and Co-working hub on the site of SRC recycling. Figure 2 illustrates the proposed development scheme.



Figure 1: Site Location Plan (in pink)





Figure 2: Proposed Site Layout

Objective

- 1.3 The objective of this Noise Assessment is to determine the extent and impact of external noise sources that have the potential to affect the site and its proposals, as well as to provide guidance on a scheme of sound insulation to mitigate those impacts. This report presents the methodology and results of the survey, in which proposed mitigation measures are based upon.

Site Setting, Potential Noise Sources

- 1.4 The site is located along Fontwell Avenue, the north east boundary is set back from Fontwell Avenue by around 88 metres. Currently, an earth bund exists along this boundary. The





proposed site is bounded by woodland to the north, new build residential to south and west, along with private gardens to the east with Fontwell Avenue in the distance.

Reliance & Limitations

- 1.5 This report has been prepared using published information and information provided by the Client made available at the time of writing only. Lustre Consulting accepts no liability for any information which has become available since this time.
- 1.6 Lustre Consulting owes no duty of care and has no liability to any Third Party who is not authorised by Lustre Consulting to use this report. Any unauthorised Third parties using information contained in this report do so at their own risk.
- 1.7 Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.
- 1.8 This assessment has been carried out to determine the potential impacts posed to future end users, along with other key receptors, based on the current development. Should revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the impacts and associated mitigation measures should be carried out.

Report Structure

- 1.9 Chapter 2 of the report presents the method of the environmental noise survey undertaken at the site with a description of the survey results in Chapter 3. Chapter 4 highlights the design appraisal and Chapter 5 provides concluding remarks. Supplied in the appendices is supporting guidance and planning policy for the project.





2.0 NOISE SURVEY

Site Description

- 2.1 A noise survey was undertaken at the site between 7:00AM (Sunday:6/12/20) until 7:00AM (Monday:7/12/20). Environmental noise levels were measured in continuous 15 minute samples in 1/1 octave bands.
- 2.2 Additional measurements were undertaken at NMP1 from Friday 4/12/20 until Monday 7/12/20. Details of these additional measurements are provided in the tables below, complete with summary.
- 2.3 From conversations conducted whilst on site, it is understood the site is currently commercially active Monday to Saturday (six days a week). Therefore, measurements were undertaken outside of these operational hours, which would be considered representative of environmental noise conditions following redevelopment.
- 2.4 It was noted during the survey that prevailing noise sources include road traffic from primarily from Fontwell Avenue (A29), which exists approximately 80m from the eastern boundary of the proposed site. Additional road traffic type noise was also noted where Fontwell Avenue meets the B2233 in the form of a roundabout to the south. It was noted on occasion traffic may need to idle at this point, potentially creating a temporary marginal increase in noise levels. Shown in the figure below is the noise survey location. Measurements were undertaken at existing roof level in a free-field position, at Noise Measurement Position 1 (NMP1):





Figure 3: Noise Survey Location

2.5 Whilst on site, the following condition was noted:

- Along the eastern boundary of the site an earth bund currently exists. To ensure validity of survey measurements, the survey equipment was placed at the top of this feature showing a clear line of sight to Fontwell Avenue.

Metrological Conditions

2.6 Meteorological conditions during the measurement period were in line with recommendations for environmental noise surveys, with minimal wind (<5m/s) during the survey. An air temperature between 8°C and 12°C was noted during the survey. The cloud cover was moderate during all measurement periods. The meteorological conditions did not affect the measurement results.

2.7 Acoustic measurement equipment used during the survey conforms to relevant British Standards, namely BS EN 61672-3: 'Electroacoustics: Sound level meters Periodic tests' and BS EN 60942: 'Electroacoustics: Sound calibrators'

2.8 All calibration certificates are available upon request.

2.9 Full acoustic survey data is available upon request.





- 2.10 All environmental sound survey data was measured in accordance with BS7445-1:2003
'Description and measurement of environmental noise.'





3.0 NOISE SURVEY RESULTS

Noise Survey Results

- 3.1 Table 1 provides a summary of the measurement results. The L_{Aeq} values are the logarithmic averages, while the L_{A90} values are arithmetic averages. The L_{Amax} level is presented as a 90th percentile, for robustness of assessment.
- 3.2 All measurements undertaken when SRC recycling was in operational have been removed from the survey data.
- 3.3 All measurements were undertaken in 15 minute continuous samples.
- 3.4 In keeping with appropriate guidance, namely ISO 1996-1:2016 '*Acoustics — Description, measurement and assessment of environmental noise*', day is defined as 07:00 – 23:00 and night 23:00 - 07:00.

Table 1: Summary of Measured Noise Levels (NMP1)

Period	$L_{Aeq15min}$	$L_{Amax15min}$	$L_{A9015min}$
Day	49dB	-	44dB
Night	42dB	57dB	33dB

Table 2: Additional Measured Noise Levels (NMP1) Day

Period	$L_{Aeq15min}$	$L_{Amax15min}$	$L_{A9015min}$
Friday 4/12/20: 17:00-23:00	43dB	-	39dB
Saturday 5/12/20: 7:00-23:00	49dB	-	44dB
Monday 7/12/20: 7:00-9:00	49dB	-	47dB

Table 3: Additional Measured Noise Levels (NMP1) Night

Period	$L_{Aeq15min}$	$L_{Amax15min}$	$L_{A9015min}$
Friday 4/12/20: 23:00 – 7:00	46dB	62dB	34dB
Saturday 5/12/20: 23:00 – 7:00	42dB	59dB	34dB





Table 4: Summary results: Day

L _{Aeq15min}	L _{Amax15min}	L _{A9015min}
43dB	-	39dB
49dB	-	44dB
48dB	-	34dB
49dB	-	47dB

Table 5: Summary results: Night

L _{Aeq15min}	L _{Amax15min}	L _{A9015min}
46dB	62dB	34dB
42dB	59dB	34dB
41dB	57dB	33dB

- 3.5 From the summary figures shown above, a log average of 48dBL_{aeq} and 44dBL_{aeq} for day and night is demonstrated.
- 3.6 During the survey, full consideration was given to the following document '*Joint Guidance on the impact of Covid-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments*', Published by the IoA and ANC (Dated April 2020).





4.0 DESIGN APPRAISAL

- 4.1 The calculations used to assess the building envelope design have been based upon proposed development initial build-ups supplied by the client. The results and requirements for these calculations are outlined below and used to determine the acoustic performance of the proposed components used in the façade.
- 4.2 At the time of writing, it has been assumed all properties are likely to be naturally ventilated throughout. This assumption is based upon the relative noise levels measured during both a weekend and weekday period.

Building Envelope Assessment

- 4.3 The calculations for external building envelope specification have been based upon the following octave spectrum data, as measured during the site noise survey.
- 4.4 The L_{eq} day and night levels are presented in the table below as a logarithmic average. Night L_{Amax} data is presented as the 90th percentile to provide robustness of assessment.

Table 6: Building Envelope Assessment Level Data

Period	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	dB(A)
Day L_{eq}	54	50	45	45	46	39	27	49
Night L_{eq}	48	39	38	38	40	33	19	42
Night L_{max}	71	63	53	48	55	49	45	57

- 4.5 Additional, purge ventilation may be undertaken at the choice of the occupant, via openable windows at the expense of higher internal noise levels.
- 4.6 Summary graph survey data is provided in Appendix D. This level defined glazing performance, which is typical for many developments of this nature. The following table illustrates the required minimum façade acoustic performance based on the assessment data.

Table 7: Building Envelope Specification (Residential)

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	R_w
External Glazing (6/12/6)	20	24	25	29	36	33	34	33
Trickle Vent (Open position)	32	31	34	35	35	31	32	34
External Walls	40	46	48	46	55	65	75	54





Roof	16	21	41	48	53	50	55	45
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- 4.7 The required acoustic performance as detailed in the table above can be achieved by standard façade and roof build-ups.
- 4.8 To ensure compliance, alternative build-ups should be approved by an acoustic consultant prior to construction and following detailed design of the buildings once a decision notice has been granted.
- 4.9 Although not required to be attenuated under guidance for residential development, rain noise during heavy rain fall is likely to be audible in spaces within the roof space. It has been assumed, at this stage, all internal living spaces will reside below the loft area.
- 4.10 At the time of writing, proposed façade and roof buildups were not available. Therefore assumed, typical buildups have been used for preliminary design calculation purposes.

Table 8: Proposed façade build ups (subject to detail design)

Element	Description
Wall	1 x 70 mm Brick (1600Kg/m ³) + Point Connection (90 mm x 45 mm) + 75 mm Fibreglass (22kg/m ³) + 1 x 100 mm Concrete Block (1880Kg/m ³) Total system depth: 260mm (approx.)
Roof	1 x 7 mm Roofing Slates + Solid Joist (144 mm x 47 mm) + 130 mm Fibreglass (22kg/m ³) + 2 x 15 mm Gyproc SoundBloc plasterboard (25kg/m ²) 15mm. Total system depth: 181mm (approx.)

- 4.11 The above proposed construction is intended to support planning only and should be developed appropriately as the project develops in terms of mitigating potential flanking paths.

External Plant

- 4.12 At the time of writing, no plant details were known. Additionally, due to the project being at preplanning stage no planning conditions exist.
- 4.13 It is therefore proposed a target of -5dB below existing background noise levels (expressed as L_{A90}).





- 4.14 Should any new external plant be proposed during the development of the project (e.g. building services), final cumulative levels must comply with the noise limits shown in the table below at the Noise Sensitive Receptor (NSR).

Table 9: Plant noise limits (Proposed)

Day	Night
34dB LAeq	28dB LAeq

- 4.15 Additionally, acoustic penalties may be added to the source level(s), as described below:

- Impulsivity: +9dB
- Tonality: +6dB
- Intermittency: +3dB

- 4.16 These penalties would be applied as defined in BS4142:2014 'Methods for rating and assessing industrial and commercial sound'.





5.0 CONCLUSIONS

- 5.1 This report summaries the details of the onsite survey to measure both noise levels, in line with current guidance.
- 5.2 Assessment of prevailing environmental noise levels has been undertaken when the SRC Recycling site was closed, to ensure measurements were not influenced by current operational activities and representative of the site following redevelopment.
- 5.3 At the time of writing, proposed detailed constructions of both the façade and roofing was unknown, therefore preliminary design calculations to predict both ambient and maximum internal noise levels have been based on typical buildups for residential dwellings.
- 5.4 Additionally, calculations have been based upon typical room sizes for a development of this nature.
- 5.5 As the project progresses, consideration shall need to be given to achieving compliance with Approved Document E '*Resistance to the passage of sound*' both in terms of design and sign-off testing. Lustre Consulting can undertake these works to get the required approvals for sign-off.
- 5.6 The site as it stands, sits largely in the 'No adverse effect' and 'low' descriptor in terms of ProPG.
- 5.7 Concluding results demonstrate compliant internal and external ambient noise levels can be achieved across the site in both living and outdoor amenity spaces, using standard construction, double glazing and natural trickle ventilation.



APPENDIX A: ACOUSTIC TERMINOLOGY

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing (20×10^{-6} Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T This is the sound level that is equivalent to the average energy of noise recorded over a given period.
L_{Amax}	The A-weighted maximum instantaneous noise level
R_w	The weighted (w) sound reduction index (R), a single figure rating of the laboratory airborne sound insulation performance of a construction, usually measured across the frequency range 100-3150Hz. The higher the value, the greater the sound insulation, and the more onerous the requirement.
$D_{n,ew}$	The weighted (w) element (e) normalised (n) level difference (D), an indicator of the ability of a small building element (such as a trickle ventilator) to reduce sound in a particular frequency band. The higher the value, the greater the sound reduction, and vice versa.

**APPENDIX B:
PLANNING AND
POLICY
GUIDANCE
DOCUMENTS**

NOISE POLICY STATEMENT FOR ENGLAND, 2010 (NPSE)

The Noise Policy Statement for England (NPSE) applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace.

The Government recognizes that the effective management of noise requires a coordinated and long-term approach that encompasses many aspects of modern society.

The long-term vision of Government noise policy is set out to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

This long-term vision is supported by three aims:

- 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 NPSE introduces the concept of NOEL, LOAEL and SOAELs, which are described below:
- NOEL – No Observed Effect Level – This is the level below which no observable effect can be detected.
- LOAEL – Lowest Observed Adverse Effect Level – This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant effects on health and quality of life can be detected.

PLANNING POLICY GUIDANCE – NOISE, 2014

This guidance is provided online within the UK Government Planning System. The guidance expands upon the concepts of Observed Effect Levels and the following table is provided.

Table: Planning Policy Guidance - Noise exposure hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Outcome
No Observed Effect Level			
Not Noticeable	No Effect	No Observable Effect	No specific measures required
Noticeable but not Intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area, but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required

Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed / Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

National Planning Policy Framework, 2019 (NPPF)

The National Planning Policy Framework (NPPF) includes the following statements relating to noise and the requirement to take it into account in the planning process.

Section 15, paragraph 170 (e) of NPPF states:

- 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.

Section 16, paragraph 180 of NPPF states:

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

Paragraph 182 of NPPF further elaborates on the consideration of existing businesses, as follows:

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

The NPPF does not provide absolute limits on noise that are acceptable or unacceptable in a given situation. It does, however, set out the “need to ensure that developments do not give rise to significant adverse impacts on health and the quality of life”. In addition, the operations of existing businesses are also protected, with reference to ensuring new developments do not have an adverse effect on their operations.

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise New Residential Development May 2017

The primary goal of ProPG is to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise.

ProPG advocates a systematic, proportionate, risk based, 2-stage, approach. The approach encourages early consideration of noise issues, facilitates straightforward accelerated decision making for lower risk sites, and assists proper consideration of noise issues where the acoustic environment is challenging. It is envisaged that following the guidance contained in this document will increase the likelihood of success of planning applications for new residential development, yet it also provides a clear basis for recommending refusal of new housing development on noise grounds where necessary.

Stage 1: Initial Site Noise Risk Assessment

An initial noise risk assessment of the proposed development site should be conducted by a competent noise practitioner at the earliest opportunity, before any planning application is submitted. The noise risk assessment should provide an indication of the likely risk of adverse effects from noise were no subsequent mitigation to be included as part of the development proposal. It should indicate whether the proposed site is considered to pose a negligible, low, medium or high risk from a noise perspective.

Stage 2: Full Assessment – the four key elements

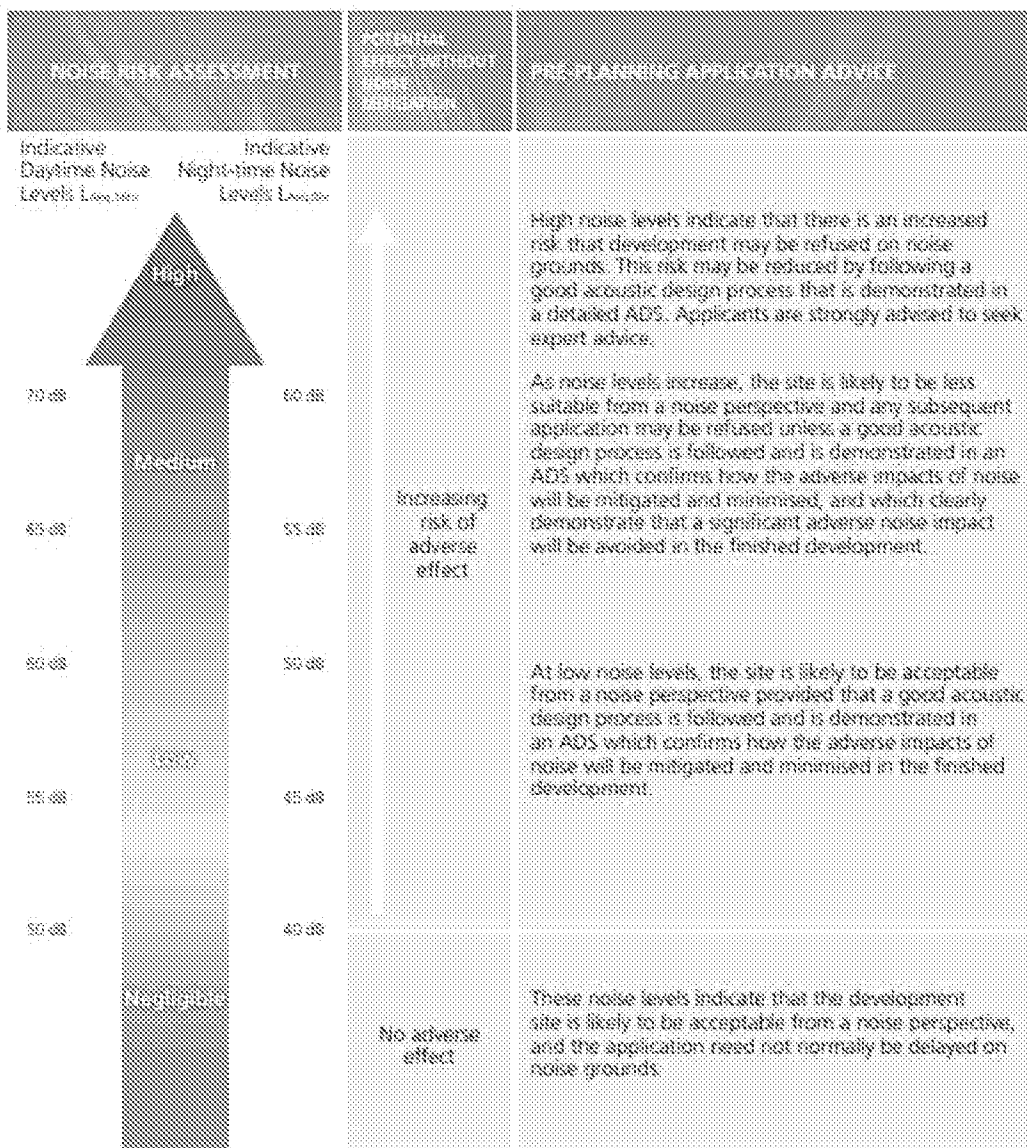
Element 1 – Good Acoustic Design Process Stage 2:

Element 2 – Internal Noise Level Guidelines Stage 2:

Element 3 – External Amenity Area Noise Assessment Stage 2:

Element 4 – Assessment of Other Relevant Issues

Figure: Summary plan for ProPG planning advice.



APPENDIX C: CRITERIA

The following British Standards and Building Regulations have been considered and adhered to in this assessment.

BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

This standard provides information and guidance on sound insulation and noise reduction for buildings. It deals with the control of external noise and outlines recommendations for occupied rooms.

The following table is taken from the document outlining requirements for internal noise levels in residential accommodation.

Table: Indoor Ambient Noise Levels for Dwellings (BS8233:2014)

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35dB $L_{Aeq,16Hr}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16Hr}$	-
Sleeping	Bedroom	35dB $L_{Aeq,16Hr}$	30dB $L_{Aeq,8Hr}$

The noise levels presented are based on existing WHO guideline values. The document further recommends that guideline value may be set in terms of SEL or $L_{Amax,F}$, if systematic individual noise events are happening. The values are depending on the character and number of events per night. Sporadic noise events could require separate values. In this instance a target value of 45 dB L_{Amax} has been established as the average L_{Amax} level not to be regularly exceeded in bedrooms at night.

BS8233:2014 also states the above target levels could be relaxed by up to 5dB and a 'reasonable' standard of IANL will be acceptable.

BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2014 describes methods for determining and assessing noise levels from noise sources with a view to determining the likelihood of adverse impact.

The document has been developed for the purposes of:

- investigating complaints,
- Assessing sound from proposed new, modified or additional sources of sound of an industrial and / or commercial nature; and
- Assessing sound at proposed new dwellings or premises used for residential purposes.

The document is now suitable for the determination of noise nuisance. Furthermore, that standard is not intended to apply to the following sources of noise:

- recreational activities, including all forms of motorsport;
- music or other entertainment;
- shooting grounds;

- construction and demolition;
- domestic animals;
- people;
- public address systems for speech;
- other sources falling within the scopes of other standards or guidance.

The methodology requires the determination of the specific sound level, corrected for characteristic feature in order to produce a rating level. The rating level is then compared against the background noise level (expressed as $L_{A90,T}$), thereby producing an 'excess of Rating over background sound level' figure. This figure is then used for assessment of likelihood of adverse impact.

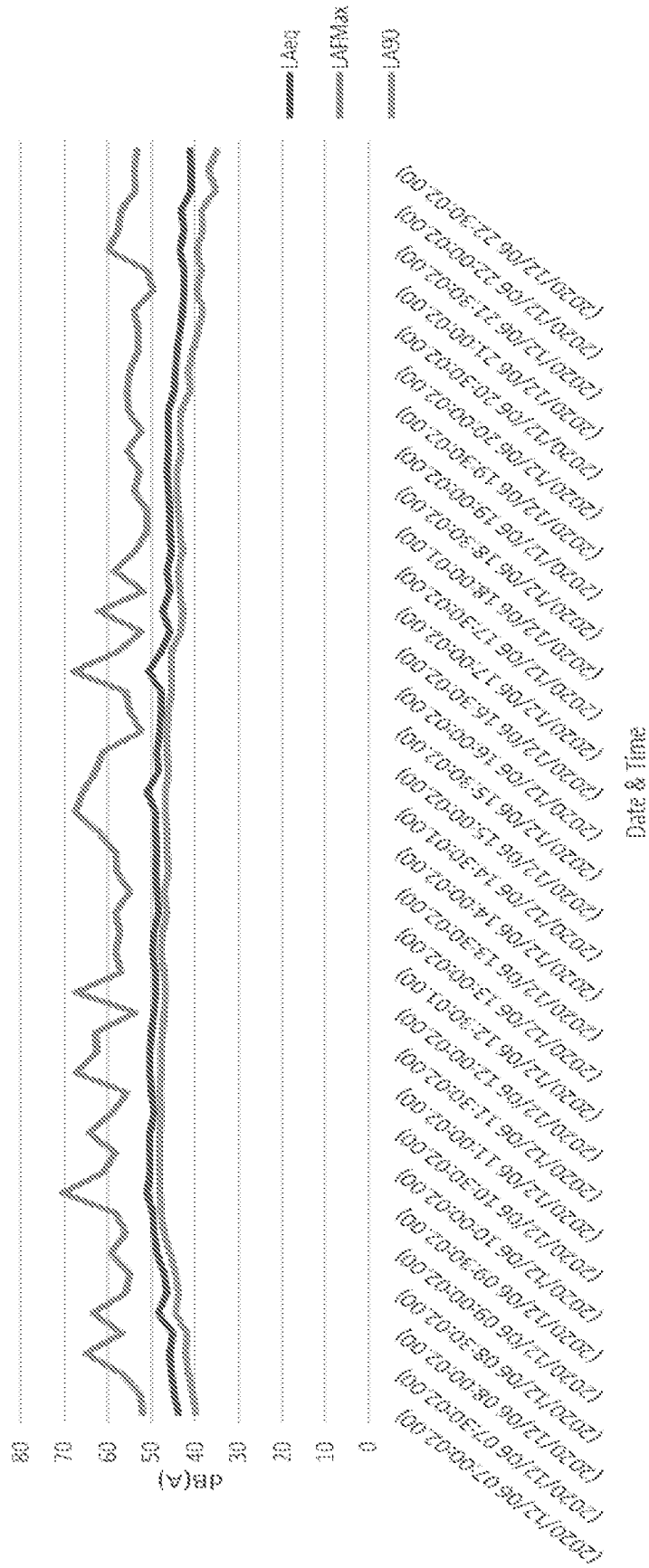
The standard places great emphasis on the context of the sound environment that is being assessed and the development overall. This is an essential part of the assessment process, particularly when predicting likelihood of adverse impact. However, for guidance the following is included in the standard:

- Typically, the greater the difference, the greater the magnitude of the impact;
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;

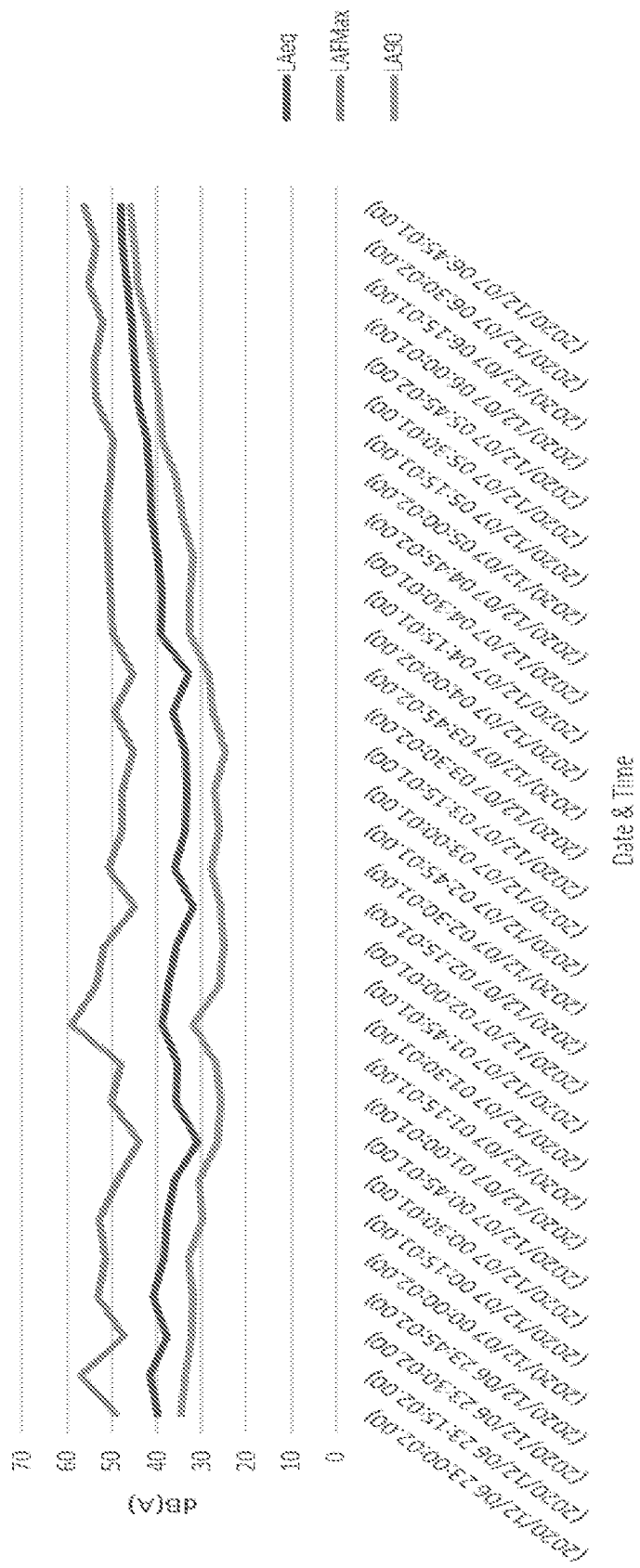
The lower the rating is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. When the rating level does not exceed the background sound level, this is an indication of the specific sound source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

**APPENDIX D:
DESIGN SURVEY
DATA**

Day



Night





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The Historic Dockyard
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