Noise Impact Assessment

Site Address: Stanley Mills, Talbot Road, Penistone, Sheffield, S36 9ED

Client Name: Progressive Architecture

Project Reference No: NP-009927

Authorisation and Version Control			
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Amendment History	
Revision	Summary of Amendments
001	--
002	Error in roller shutter door specification amended.

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Delivering sustainable development by promoting good health and well-being through effective management of noise.

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1. Introduction

NOVA Acoustics Ltd has been commissioned to prepare a noise impact assessment for a new industrial building ('the Proposed Development') on undeveloped land off Talbot Road, Penistone, S36 9ED ('the Site'). The Proposed Development would allow for some existing operations within the Stanley Mills building to be relocated to the new building to allow for a better utilisation of both spaces.

The applicant has submitted a full planning application No. '*2023/0547 – Erection of industrial building*' ('the Application') to Barnsley Metropolitan Borough Council ('the LPA').

A noise survey has been undertaken to establish the prevailing background sound levels at the closest Noise Sensitive Receptors ('NSRs'). The report details the existing background sound climate and the noise emissions associated with the Site. Measures required to mitigate noise impact have been recommended where necessary and assessed in accordance with the relevant performance standards, legislation, policy and guidance.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

1.1 Standards, Legislation, Policy & Guidance

The following performance standards, legislation, policy and guidance have been considered to ensure good acoustic design in the assessment:

- National Planning Policy Framework (2023).
- Noise Policy Statement for England (2010).
- BS4142:2014+A1:2019 – 'Methods for rating and assessing commercial and industrial sound'.

Further information on the legislation can be found in Appendix B.

1.2 Proposal Brief

The proposal is for the erection of a new industrial building. The building will have brickwork up to door head height with profiled cladding above and a profiled cladding roof. The building will be used for manufacturing and will be 6000sq, ft. There will be a large yard to the front which can be used for access, storage and parking.

The following points have been agreed on with the end client:

- No new external plant is proposed.
- The HGV and forklift movements on-site shall not intensify.
- The site is not restricted to any operational hours. It typically begins operations at 05:00 on weekdays, but night shifts would occur if required.

Figure 1 below shows a site layout plan of the proposed development.

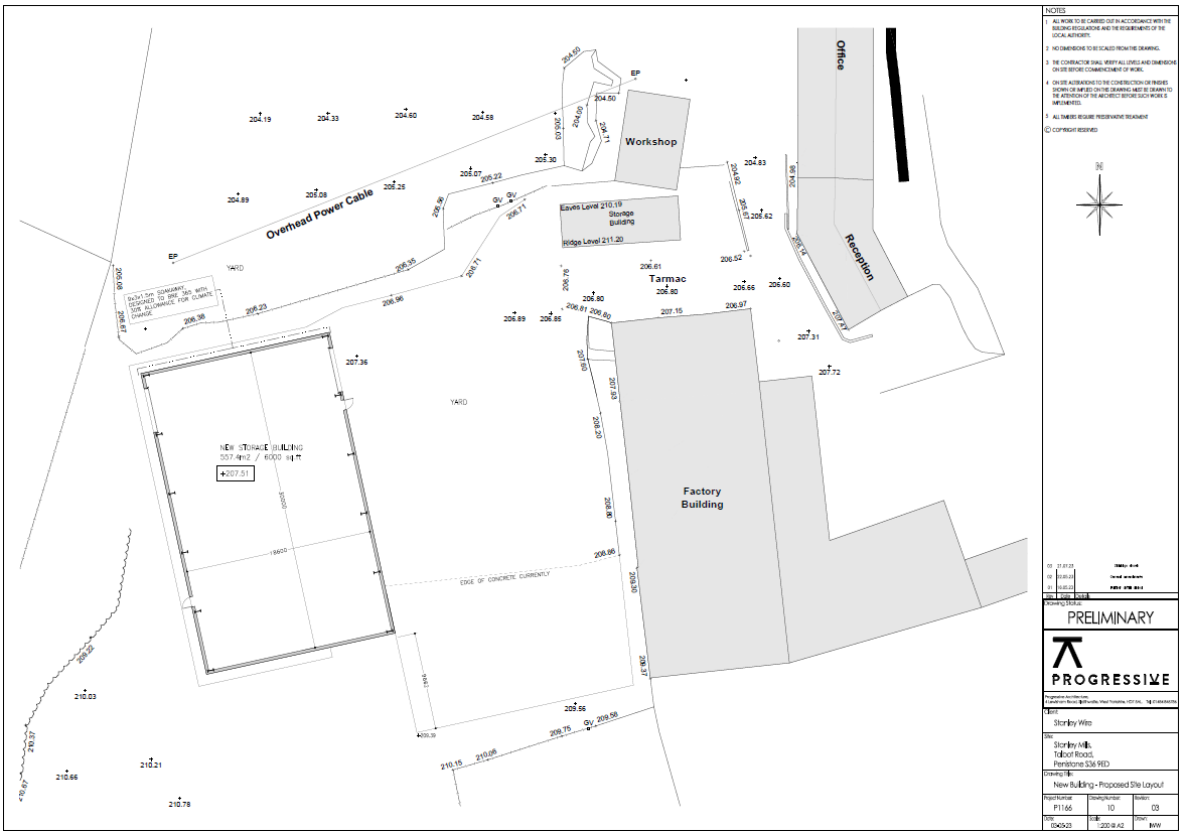


Figure 1 – Site Layout Plan of Proposed Development

2. Environmental Noise Survey

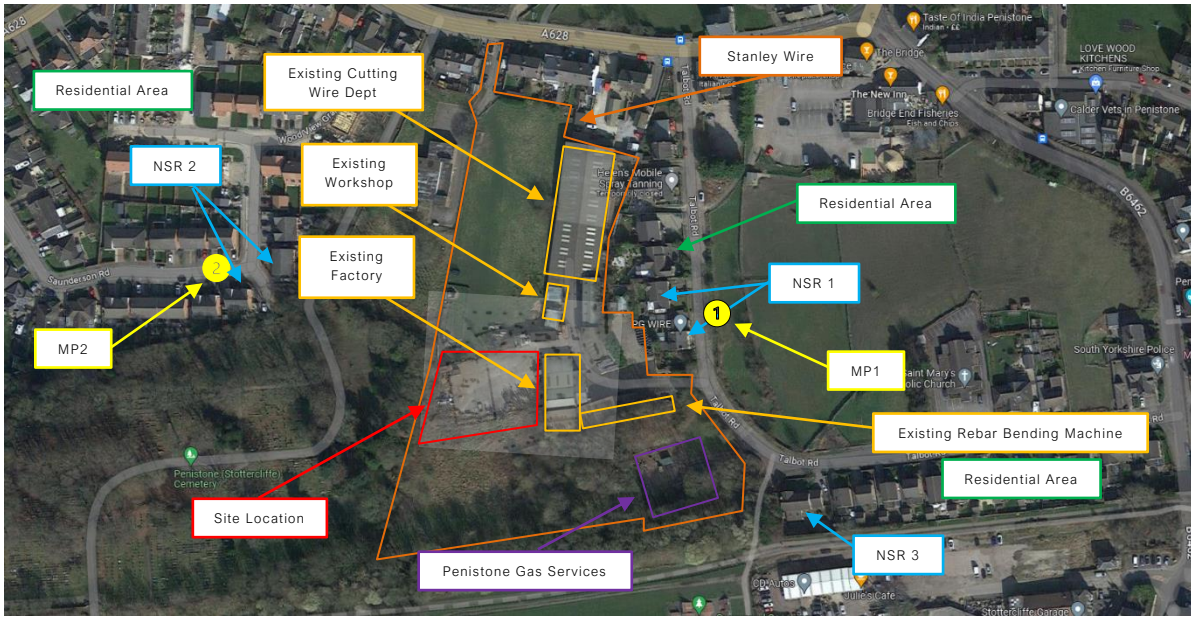
2.1 Measurement Methodology

The following table outlines the measurement dates and particulars. In all instances a 130mm diameter windshield was fitted to the microphone.

Location	Survey Dates	Measurement Particulars
MP1	15-18/09/2023	Equipment affixed to a telegraph pole on Talbot Road, with an approximate measurement height of 4m above ground and at least 3.5m from any other large reflective surface.
MP1	15-18/09/2023	Equipment affixed to a lamppost on Saunderson Road, with an approximate measurement height of 4m above ground and at least 3.5m from any other large reflective surface.

Table 1 – Measurement Methodology

The figure below outlines the site surroundings and measurement locations:



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Figure 2 – Measurement Locations and Site Surroundings

2.2 Context & Subjective Impression

The area surrounding the site is mixed in nature with commercial/industrial premises and residential properties in close proximity. The existing Stanly Mills is surrounded by dwellings to the West, North and East. Penistone Cemetery is located to the southwest and Penistone Show Ground to the south.

Stanley Wire Ltd are a company that has been operating for a number of years (the first related planning application was submitted in 1994 – B/94/00359) and is currently working at capacity on their site. A new building is therefore required to allow for a better utilisation of the spaces.

As can be seen in Figure 2, the current operations include a cutting wire department, workshop, factory and a rebar bending machine among other external activities such as HGV and forklift movements.

During the site visits, the acoustic environment at MP1 (NSR1) was deemed to be low in level and the noise profile was dominated by noise emissions from the current operations of Stanley Wire Ltd; in particular noise from the rebar bending machine and the cutting wire department. When not in operation, the noise profile was dominated by road traffic noise emissions from the surrounding road network, including Burton Road and Thurlstone Road.

At MP2 (NSR2) the acoustic environment was also deemed low in level. The noise profile was dominated by a mixture of noise emissions from existing operations from Stanley Wire Ltd and road traffic noise emissions. Sporadic noise emissions from a lawnmower being used a Penistone Cemetery was also audible at the time of setting up the noise survey equipment.

The table below outlines the closest residential Noise Sensitive Receptors ('NSR') relative to the closest noise source associated with the Proposed Development.

NSR	Approximate Distance (m) from Closest Noise Source
1	32 - 36 Saunderson Road, approximately 85m northwest from the closest façade of the proposed industrial units with direct line of sight
2	61 – 65 Talbot Road, approximately 80m northeast from the closest façade of the Proposed Development, partially shielded by existing industrial buildings
3	31 Talbot Road, approximately 130m southeast from the closest façade of the proposed industrial unit, partially shielded by existing industrial buildings.

Table 2 – NSR Identification

2.3 Environmental Noise Survey Results

Background Sound Level Analysis

The following section outlines the measured background sound levels that have been used as the baseline for the subsequent BS4142 noise assessment. The figures below show histogram graphs of the background sound levels measured during the more sensitive daytime period from 21:00 to 23:00 hours, and night-time period from 23:00 to 05:00 hours. These time periods are when on-site activity was none to minimal and are deemed to present a robust scenario. The complete time history results can be found in Appendix D.

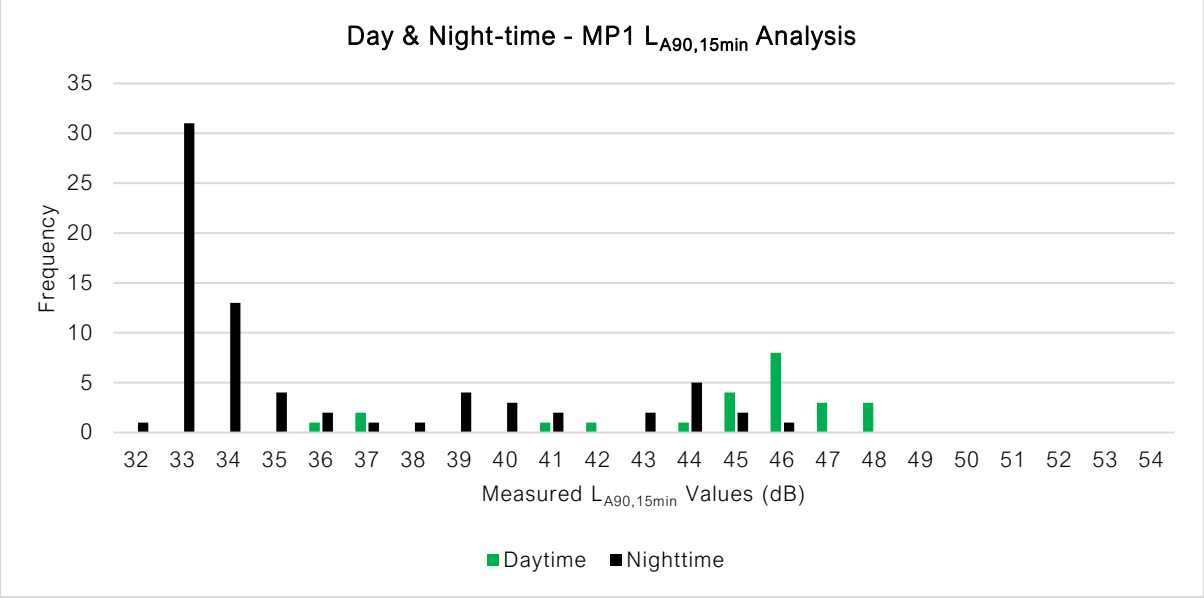


Figure 3 – MP1 Background Sound Level Analysis

As can be seen in the figure above, the modal $L_{A90,15min}$ value measured during more sensitive daytime period (21:00 – 23:00 hours) is 46 dB. During the night-time (23:00 – 05:00 hours), the modal $L_{A90,15min}$ value is 33 dB. It should be recognised that the modal $L_{A90,15min}$ value measured throughout the entire daytime period was 47 dB and there is difference when considering the entire night time period.

This measurement position was deemed to be overly influenced by road traffic noise emissions along Talbot Road which wasn't deemed representative of the sound levels experienced at the rear façades and gardens of the neighbouring NSRs.

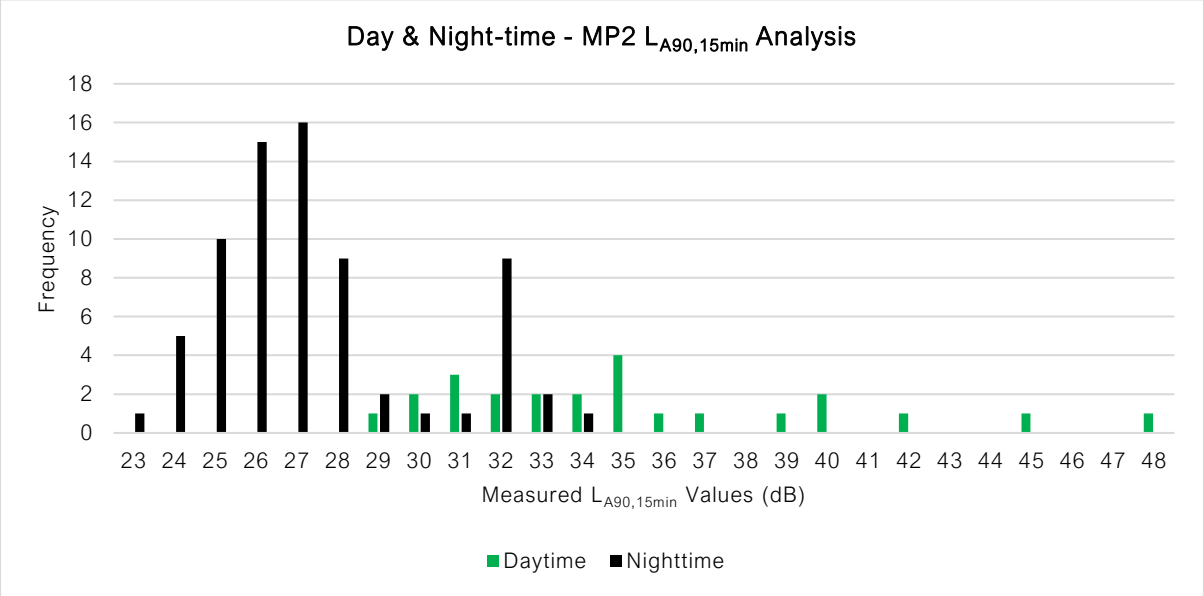


Figure 4 – MP2 Background Sound Level Analysis

As can be seen in the figure above, the modal $L_{A90,15min}$ value measured during the more sensitive daytime period (21:00 – 23:00 hours) is 35 dB, which, based on the distribution of the measured values is considered the representative background sound level used as the baseline for the BS4142 assessment.

During the night-time period (23:00 – 05:00 hours), the modal $L_{A90,15min}$ value is 27 dB and has been used as the baseline for the subsequent BS4142 assessment.

It should be recognised that the distribution of the $L_{A90,15min}$ sound levels measured during the full night time period showed negligible difference to that presented in Figure 4 above. The full daytime distribution does differ and the modal $L_{A90,15min}$ value is approximately 7 dB higher than what is presented in Figure 4 above. At first instance this appears like an overly robust situation, however, given the site may operate throughout the night time period, including those hours more conducive to sleep disturbance, and that internal operations shall not differ between day and night, the assessment of noise impact is largely going to be dictated by those background sound levels measured at night; which showed no influence from the sites existing operations as discussed above.

3. Noise Impact Assessment

In the following section of the report, the impact of the noise emissions generated by the proposed development are assessed.

3.1 Proposed Constructions, Minimum Requirements & Control Measures

NOVA Acoustics has been informed by the applicant that the walls of the proposed building will be constructed from brickwork (lower section up to 2325mm) and composite steel panels above. The roof will be also comprised of composite steel panels and the roller shutters will be standard uninsulated shutters. For the purpose of the assessment, the following table outlines the assumptions have been made regarding the building façade elements.

Description	1/1 Octave Frequency Band (Hz, SRI dB)								Rw (dB)
	63	125	250	500	1k	2k	4k	8k	
Facades Lower Section (200mm brickwork)	41	39	42	50	57	62	67	67	54
Facades Upper Section (Kingspan KS100 AWP/60 + no lining)	15	16	19	23	26	22	39	39*	25
Roof (Kingspan KS100 AWP/60 + no lining)	15	16	19	23	26	22	39	39*	25
Roller Shutter Doors (Steel 0.6mm)	8	10	14	19	24	29	34	34	23

Table 3 – Sound Reduction of Proposed Industrial Building Elements

**Assumed sound reduction based on INSUL 9.0 sound insulation software.*

3.2 Specific Sound Levels & Noise Modelling Data

The proposal seeks to relocate some of the operations including the rebar bending machine that are currently in the existing buildings or outbuilding, into the proposed industrial unit. Therefore, internal spot measurements were carried out on 15/09/23 and 18/09/23 to ascertain the potential noise emissions that will be inside the proposed building. To provide a robust scenario, the cumulative internal noise levels of the cutting department, wire mill area and the noise emissions generated by the rebar bending machine, will be used in the subsequent assessment.

The following table shows the 1/1 octave frequency band internal noise levels of the proposed industrial unit that will be used in the subsequent calculations.

Description	1/1 Octave Frequency Band (Hz, L_W dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Cutting Department	72	74	77	78	75	73	70	67	81
Wire Mill Area	82	81	84	87	84	80	76	71	89
Rebar Bending machine at 1m	82	79	80	80	78	78	77	74	84
Cumulative Internal Ambient Noise Level	85	83	86	88	85	82	80	76	90

Table 4 – Internal Ambient Noise Levels of Proposed Industrial Unit

The following assumptions have been made within the SoundPlan 9.0 noise modelling software:

- To accurately model the land surrounding the Proposed Development, the topographical data has been obtained from the EA's 'National LIDAR Programme' on the DEFRA Data Services Platform.
- For the purpose of the assessment, the ground between the source and receivers is considered to be a mixture of acoustically 'hard' and 'soft' surfaces. These have been modelled depending on the ground type.
- 1/1 octave band source data was used to facilitate noise modelling in accordance with ISO 9613-2. ISO 9613-2 assumes a 'downwind' model to the NSRs.
- The sound map grid height has been set to 1.5m, however, the noise levels used in the assessment have been taken from the most exposed point of each façade.
- The proposed development has been modelled in accordance with Figure 1.
- The noise emissions breaking out of the proposed development are calculated within the noise modelling software in accordance with BS12354 assuming the following:
    - The internal ambient noise levels presented in Table 4,
    - The sound reduction values for each building fabric element presented in Table 3,
    - A -6 dB diffusivity term correction for breakout from solid reflective building structures,
- Any building fabric elements are assumed to behave as area noise sources which is calculated within the SoundPlan software considering the formula: $L_W = L_{P1m} + 10*Log(S)$, where S is the surface area of the building element and L_{P1m} are the external noise levels calculated in accordance with BS12354.
- To provide a 'robust' assessment, all noise sources are assumed to operate continuously, and as such, no on-time correction in accordance with BS4142 has been applied.
- The roller shutter doors will remain closed while noise operations occur.

The sound map showing the specific sound level emissions from the proposed development can be seen in the following figure.

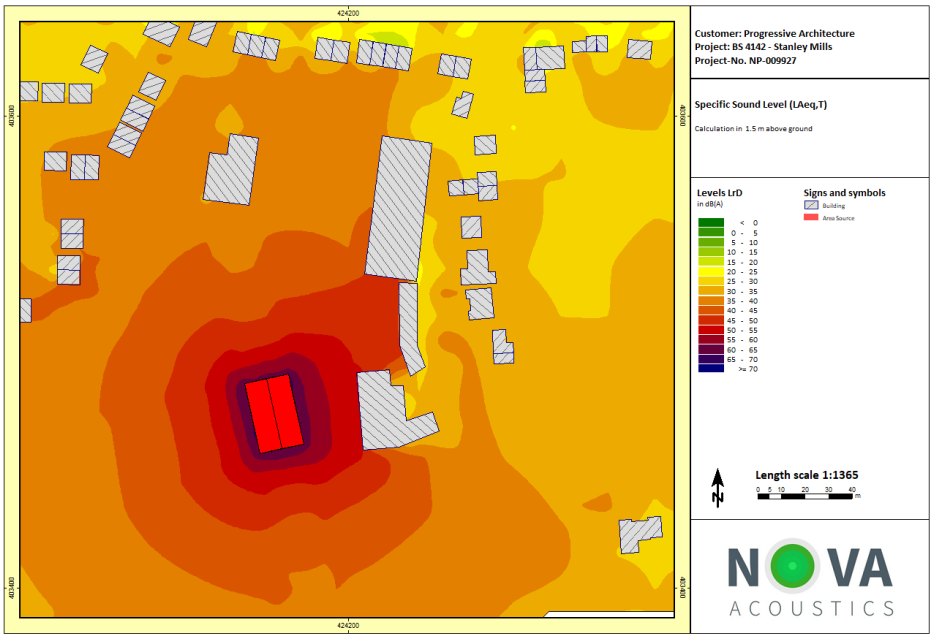


Figure 5 – Specific Sound Level Map

3.3 BS4142 Noise Impact Assessment

The BS4142 noise impact assessments are conducted at the most affected NSRs in the table below.

BS4142 Noise Impact Assessment at NSR1									
Description	1/1 Octave Frequency Band (Hz, dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Specific Sound Level at NSR1	44	41	41	39	33	33	13	2	40
Acoustic Feature Correction	*A rating penalty of +2 dB for tonality is applied as "hum" noise from some of the machines was noticed during the site visits. In addition, a +3 dB penalty is applied to account for the 'just perceptible' impulsive character of metallic sound that could be heard sporadically on site.*								+5
Rating Sound Level ($L_{Ar,T}$)									45
Background Sound Level	Daytime Period (MP2 $L_{A90,15min}$)								35
Exceedance	$L_{Ar,T} - L_{A90,15min}$ (daytime)								+10
BS4142 Assessment Outcome	The assessment indicates the potential for 'Significant Adverse Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'Significant Observed Adverse Effect Level ('SOAEL') in accordance with the NPPF and NPSE.								
Background Sound Level	Night time Period (MP2 $L_{A90,15min}$)								27
Exceedance	$L_{Ar,T} - L_{A90,15min}$ (night time)								+18
BS4142 Assessment Outcome	The assessment indicates the potential for 'Significant Adverse Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'Significant Observed Adverse Effect Level ('SOAEL') in accordance with the NPPF and NPSE.								
Mitigation measures are required to reduce noise impact.									

Table 5 –BS4142 Noise Impact Assessment at NSR1

BS4142 Noise Impact Assessment at NSR2									
Description	1/1 Octave Frequency Band (Hz, dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Specific Sound Level at NSR2	46	38	38	40	34	34	13	1	41
Acoustic Feature Correction	*A rating penalty of +2 dB for tonality is applied as "hum" noise from some of the machines was noticed during the site visits. In addition, a +3 dB penalty is applied to account for the 'just perceptible' impulsive character of metallic sound that could be heard sporadically on site.*								+5
Rating Sound Level ($L_{Ar,T}$)									46
Background Sound Level	Daytime Period (MP2 $L_{A90,15min}$)								35
Exceedance	$L_{Ar,T}$ – $L_{A90,15min}$ (daytime)								+11
BS4142 Assessment Outcome	The assessment indicates the potential for 'Significant Adverse Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'Significant Observed Adverse Effect Level ('SOAEL') in accordance with the NPPF and NPSE.								
Background Sound Level	Night time Period (MP2 $L_{A90,15min}$)								27
Exceedance	$L_{Ar,T}$ – $L_{A90,15min}$ (night time)								+19
BS4142 Assessment Outcome	The assessment indicates the potential for 'Significant Adverse Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'Significant Observed Adverse Effect Level ('SOAEL') in accordance with the NPPF and NPSE.								
Mitigation measures are required to reduce noise impact.									

Table 6 –BS4142 Noise Impact Assessment at NSR2

3.4 Recommendations & Mitigation Measures

As can be seen in the BS4142 assessment, the rating sound level are predicted to significantly exceed the prevailing background sound levels. Further analysis has indicated the main reason for the exceedances is the poor sound reduction provided by some of the building elements. Therefore, the sound insulation performance of the building envelope needs to be improved as per below:

- All the upper sections of the façades need to provide a minimum sound reduction of 43 dB R_w.
- The roof panelling needs to provide a minimum sound reduction of 47 dB R_w.
- The roller shutter located on the eastern façade needs to provide a minimum sound reduction of 53 dB R_w.
- The roller shutter located on the western façade needs to provide a minimum sound reduction of 41 dB R_w.

The following table shows examples of construction elements that would provide the required levels of sound reduction. The manufacturers' datasheets can be found in Appendix E.

Description	1/1 Octave Frequency Band (Hz, SRI dB)								Rw (dB)
	63	125	250	500	1k	2k	4k	8k	
Facades Upper Section (Kingspan KS100 AWP/60 + W15 + F)	17	24	37	45	52	54	65	65*	46
Roof (Kingspan KS100 RW/40 + I + Py)	17	27	39	44	49	57	67	67*	47
Roller Shutter Doors (Soundroll 31)	12*	21	24	24	27	41	40	38*	31

Table 7 – Sound Reduction of Proposed Industrial Building Elements – Mitigation

**Assumed sound reduction based on INSUL 9.0 sound insulation software.*

The sound maps showing the specific sound level emissions considering the proposed mitigation measures can be seen in the figures below.

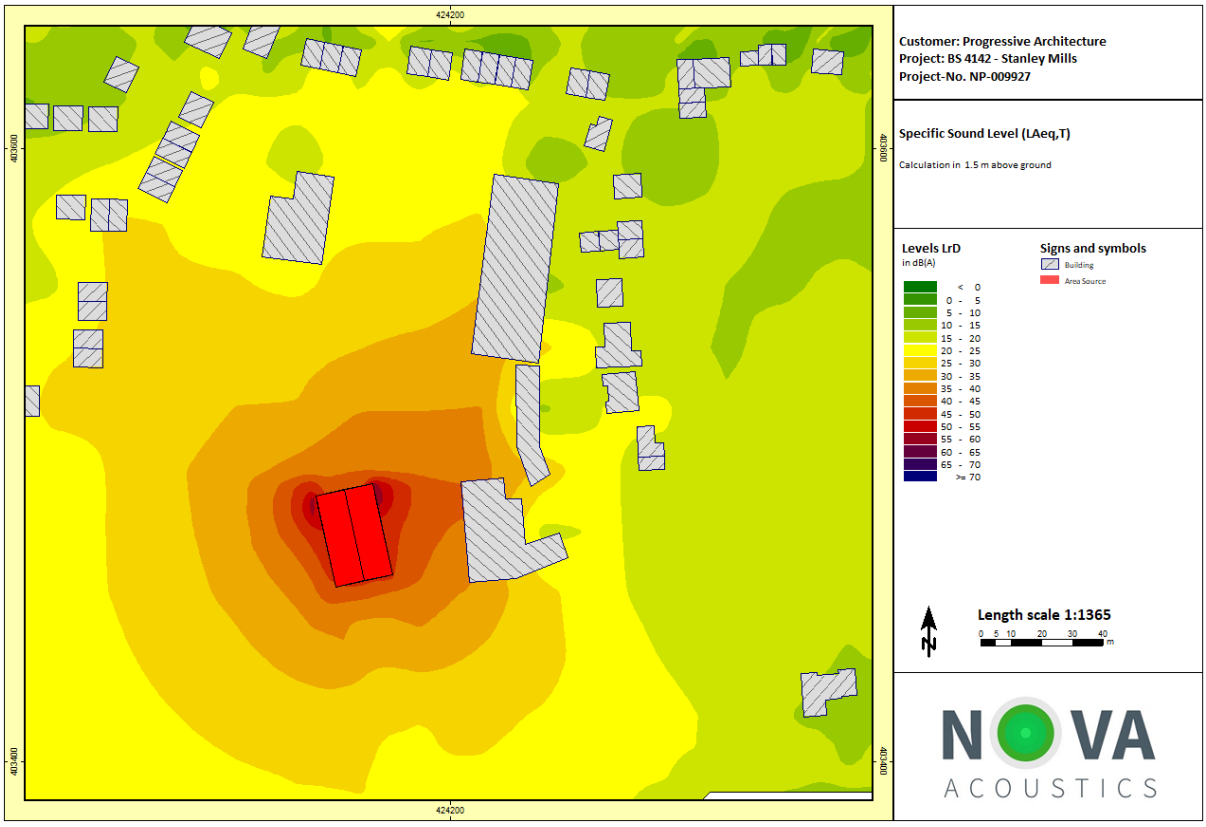


Figure 6 – Specific Sound Level Map (Post-Mitigation)

The BS4142 noise impact assessment considering the proposed mitigation measures is conducted at the most affected NSRs in the tables below.

BS4142 Noise Impact Assessment at NSR1									
Description	1/1 Octave Frequency Band (Hz, dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Specific Sound Level at NSR1	41	31	24	25	21	5	1	-8	26
Acoustic Feature Correction	*No acoustic correction features deemed to be audible given the difference between the specific sound level and representative background sound level during the daytime.* *It is unlikely that the 'just perceptible' impulsive characteristics of the internal noise emissions would be audible given the significant sound reduction provided by the upgraded building fabric. However, it is possible that the just perceptible 'low frequency hum' may at times be slightly audible.*								+2 (night time)
Rating Sound Level ($L_{Ar,T}$)	Daytime								26
Background Sound Level	Daytime Period (MP2 $L_{A90,15min}$)								35
Exceedance	$L_{Ar,T} - L_{A90,15min}$ (daytime)								-9
BS4142 Assessment Outcome	The assessment indicates the potential for 'Low Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'No Observed Effect Level ('NOEL') in accordance with the NPPF and NPSE.								
Rating Sound Level ($L_{Ar,T}$)	Night time								28
Background Sound Level	Night time Period (MP2 $L_{A90,15min}$)								27
Exceedance	$L_{Ar,T} - L_{A90,15min}$ (night time)								+1
BS4142 Assessment Outcome	The assessment indicates the potential for a low level of 'Adverse Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'No Observed Adverse Effect Level' ('NOAEL') to 'Lowest Observed Adverse Effect Level ('SOAEL') in accordance with the NPPF and NPSE.								
No further mitigation measures are deemed necessary (see conclusion).									

Table 8 –BS4142 Noise Impact Assessment at NSR1 (Post-Mitigation)

BS4142 Noise Impact Assessment at NSR2									
Description	1/1 Octave Frequency Band (Hz, dB)								Overall (dBA)
	63	125	250	500	1k	2k	4k	8k	
Specific Sound Level at NSR2	44	29	22	26	21	5	0	-10	26
Acoustic Feature Correction	*No acoustic correction features deemed to be audible given the difference between the specific sound level and representative background sound level during the daytime.* *It is unlikely that the 'just perceptible' impulsive characteristics of the internal noise emissions would be audible given the significant sound reduction provided by the upgraded building fabric. However, it is possible that the just perceptible 'low frequency hum' may at times be slightly audible.*								+2 (night time)
Rating Sound Level ($L_{Ar,T}$)	Daytime								26
Background Sound Level	Daytime Period (MP2 $L_{A90,15min}$)								35
Exceedance	$L_{Ar,T} - L_{A90,15min}$ (daytime)								-9
BS4142 Assessment Outcome	The assessment indicates the potential for 'Low Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'No Observed Effect Level ('NOEL') in accordance with the NPPF and NPSE.								
Rating Sound Level ($L_{Ar,T}$)	Night time								28
Background Sound Level	Night time Period (MP2 $L_{A90,15min}$)								27
Exceedance	$L_{Ar,T} - L_{A90,15min}$ (night time)								+1
BS4142 Assessment Outcome	The assessment indicates the potential for a low level of 'Adverse Impact, dependent on context' in accordance with BS4142 at NSR1.								
NPPF & NPSE Outcome	The assessment outcome would be classed as 'No Observed Averse Effect Level' ('NOAEL') to 'Lowest Observed Adverse Effect Level ('SOAEL') in accordance with the NPPF and NPSE.								
No further mitigation measures are deemed necessary (see conclusion).									

Table 9 –BS4142 Noise Impact Assessment at NSR2 (Post-Mitigation)

4. Conclusion and Action Plan

The Proposed Development has been assessed against the requirements of BS4142:2014+A1:2019 and a scheme of noise mitigation has been recommended to reduce the precited noise impact from the site.

Should the mitigation measures specified within the report be adhered to, the noise emissions from the proposed development are predicted to be at least 9 dB below the background sound level during the more sensitive daytime period. The BS4142 assessment of night time operations has indicated that the rating sound levels are predicted to exceed the prevailing background sound levels by 1 dB at the most affected NSRs. This is an indication of a low level of 'adverse impact, dependant on context' in accordance with BS4142.

The following contextual factors should be considered:

- As noted in BS4142, *"where background sound levels and rating sound levels are low, absolute levels might be as, or more, relevant than the margin by which the rating sound level exceeds the background. This is especially true at night."* Considering this, The World Health Organisation ('WHO') Night Noise Guidelines for Europe may be relevant. The WHO criterion for the avoidance of sleep disturbance is 40 dBL_{night} outside bedroom windows, via open-window transmission. The predicted specific sound level at the most affected NSRs (1 & 2) is 14 dB below this criterion, which is further indication that the proposed development will cause low impact.
- It should be recognised that the proposal seeks to relocate the rebar bending machine that currently exists within the yard of the site, into the proposed industrial unit. This will have a substantially positive effect on the existing acoustic climate within the immediate area.

Due to the outcome of the BS4142 assessments and the aforementioned contextual factors, the noise impact from the proposed development would be classed as 'No Observed Effect Level' ('NOEL') during the daytime and 'No Observed Adverse Effect Level' ('NOAEL') during the night time when assessed in accordance with the NPSE and NPPF.

The following 'Action Plan' is outlined to ensure the design considerations and specifications from this report are duly implemented:

1. The proposed mitigation measures specified in Section 3.4 should be implemented and retained thereafter.
2. In addition to the mitigation measures specified in Section 3.4, the following best working practices should also be implemented:
    a. Plant should be used in accordance with the manufacturer's recommendations.
    b. Plant which may be used intermittently should be shut down between work periods.
    c. Roller shutter doors should remain closed at all times.
    d. It is also advised to ensure all junctions are adequately sealed with a non-hardening sealant and that acoustic door seals are installed throughout.

The findings of this report will require written approval from the Local Authority prior to work commencing.

Appendix A – Acoustic Terminology

A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure given by the following formula in decibels (dBA). $L_{pA} = 10 \log_{10} (pA/p_0)^2$. Where: pA is the A-weighted sound pressure in pascals (Pa) and $p0$ is the reference sound pressure (20 µPa)
Background Sound	Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time
Facade level	Sound pressure level 1 m in front of the facade
Free-field level	Sound pressure level away from reflecting surfaces
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants
Noise Criteria	Numerical indices used to define design goals in a given space
Noise Rating (NR)	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves
Octave Band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit
Percentile Level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting “F”, which is exceeded for N% of a specified time interval
Rating Level, $L_{Ar,Tr}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise
Reverberation time, T	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped
Sound Pressure, p	root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound
Sound Pressure Level, L_p	Quantity of sound pressure, in decibels (dB), given by the formula: $L_p = 10\log_{10}(p/p_0)^{2.}$ Where: p is the root-mean-square sound pressure in pascals (Pa) and $p0$ is the reference sound pressure (20 µPa)
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies

Appendix B – Standards, Legislation, Policy, and Guidance

This report is to be primarily based on the following standards, legislation, policy and guidance.

B.1 – National Planning Policy Framework (2023)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2023. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 174e, it 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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;

Paragraph 185 states:

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

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; and*
c) *Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

B.2 – Noise Policy Statement for England (2010)

Paragraph 185 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision 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.

To achieve this vision the Statement identifies the following three 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;
- Where possible, contribute to the improvement of health and quality of life.

In achieving these aims the document introduces significance criteria as follows:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that "significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development".

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: "all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur."

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. This can be related to the third aim above, which seeks: "where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

The NPSE recognises that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

B.3 – BS4142:2014+A1:2019 – 'Methods for rating and assessing industrial and commercial sound'

Overview

BS4142:2014 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the

specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

Rating Penalty

Section 9 of BS4142:2014 describes how the rating sound level should be derived from the specific sound level, by deriving a rating penalty.

BS4142:2014 states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

a) subjective method;
b) objective method for tonality;
c) reference method."

Due to the nature of the development the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014, which states:

"Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed. Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources."

BS4142:2014 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

a) Tonality

A rating penalty of +2 dB is applicable for a tone which is "just perceptible", +4 dB where a tone is "clearly perceptible", and +6 dB where a tone is "highly perceptible".

b) Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is "just perceptible", +6 dB where it is "clearly perceptible", and +9 dB where it is "highly perceptible".

c) Other Sound Characteristics

BS4142:2014 states that where "the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distance against the residual acoustic environment, a penalty of +3 dB can be applied."

d) Intermittency

BS4142:2014 states that when the "specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time … if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."

Background Sound Level

The background sound level is the underlying level of sound over a period, T, and is indicative of the relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.

To ensure the background sound level values used within the assessment are reliable and suitably represent both the particular circumstance and periods of interest, efforts have been made to quantify a 'typical' background sound level for a given period. The purpose has not been to simply select the lowest measured value. Diurnal patterns have also been considered as they can have a major influence on background sound levels, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night time period for sleep purposes.

Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.

Assessment of Impact

BS4142:2014 states: "The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs". An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- "Typically, the greater this difference, the greater the magnitude of the impact."
- "A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."
- "A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."
- "The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact, depending on the context."

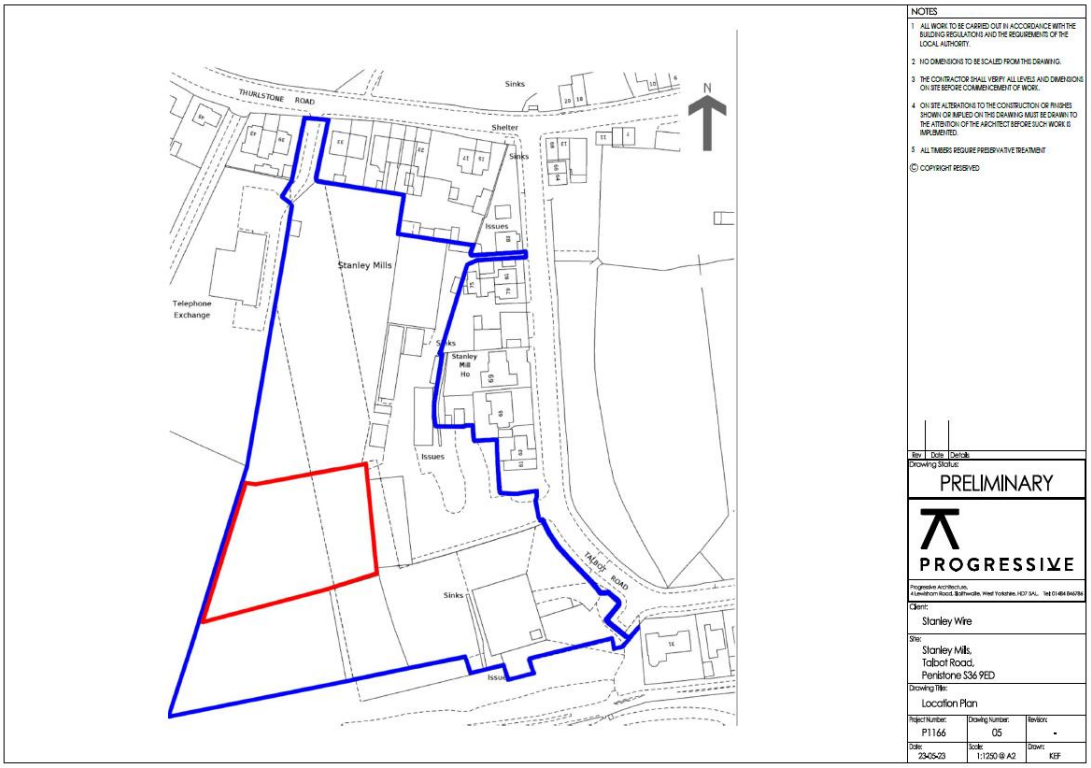
Interpreting the guidance given in BS4142:2014, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

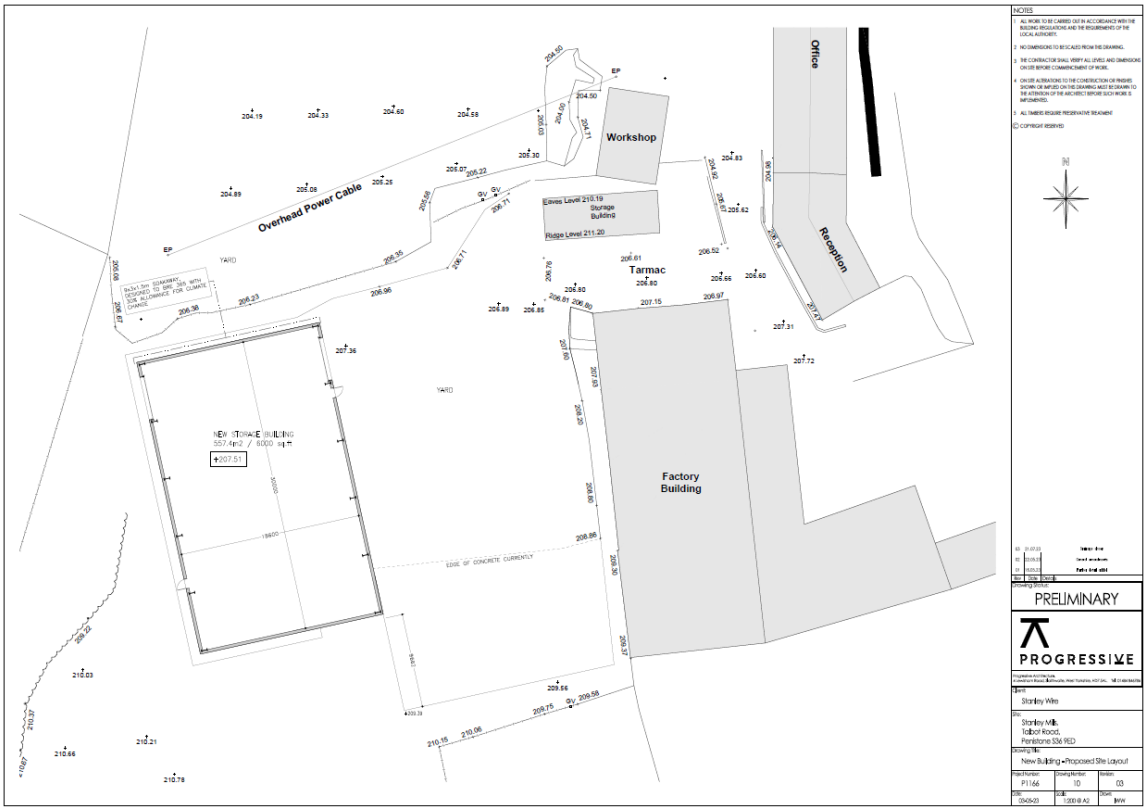
- A rating sound level that is +10 dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level;
- A rating sound level that is +5 dB above the background sound level is likely to be an indication of a Lowest Observed Adverse Effect Level;
- The lower the rating sound level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating sound level does not exceed the background sound level, this is an

indication of the specific sound source having a negligible impact and would therefore classified as No Observed Adverse Effect Level.

During the daytime, the assessment is carried out over a reference time period of 1-hour. The periods associated with day or night, for the purposes of the Standard, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

Appendix C – Site Plans





Appendix D – Environmental Survey

D.1 – Time History Noise Data

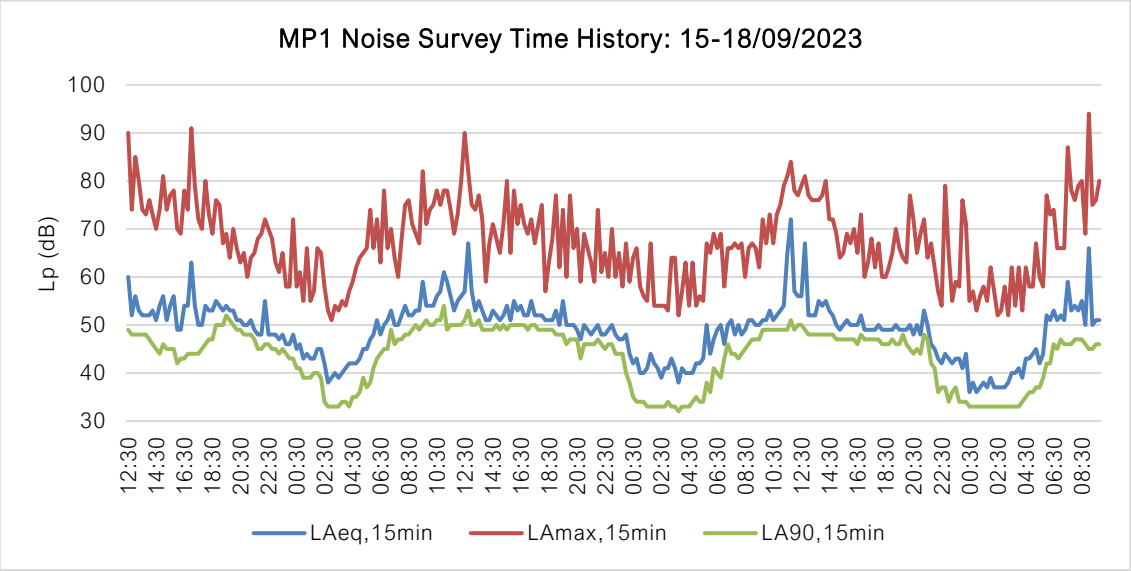


Figure 7 – MP1 Noise Survey Time History

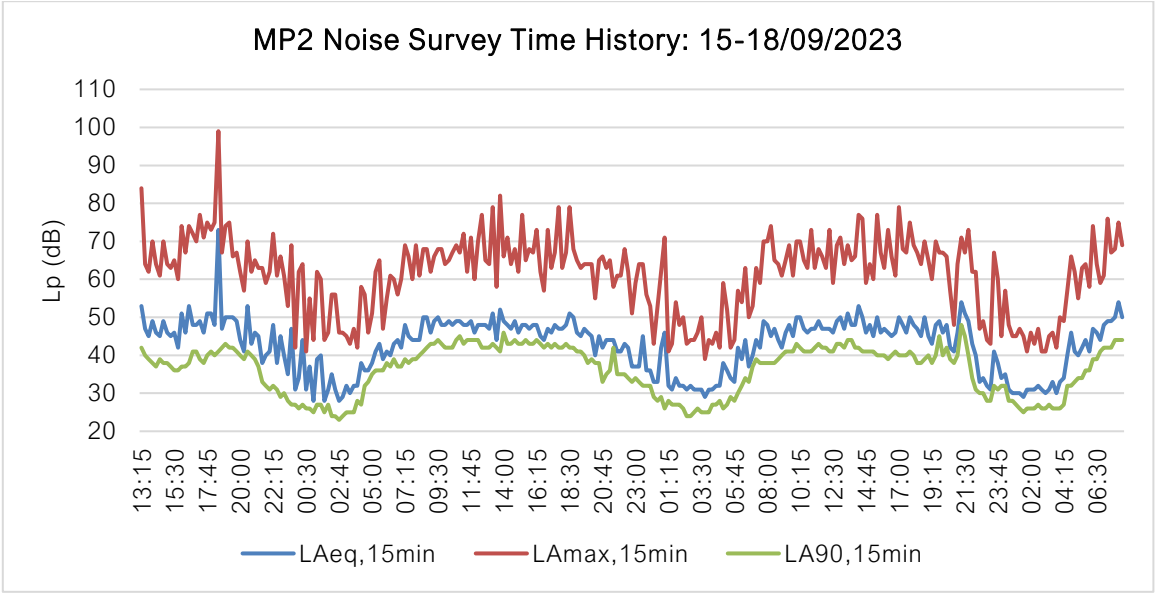


Figure 8 – MP2 Noise Survey Time History

D.2 – Surveying Equipment

Piece of Equipment	Serial No.	Calibration Deviation
CESVA SC250 Class 1 Sound Level Meter	T252915	≤0.1
CESVA CB011 Class 1 Calibrator	T253524	
CESVA SC250 Class 1 Sound Level Meter	T252860	≤0.3
CESVA CB011 Class 1 Calibrator	T253524	

Table 10 – Surveying Equipment

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of ≤0.3 dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period. Calibration certificates can be provided upon request.

D.3 – Meteorological Conditions

As the environmental noise survey was carried out over a long un-manned period no localised records of weather conditions were taken. However, all measurements have been compared with met office weather data of the area, specifically the closest weather station, and the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions – Stocksbridge (Approx. 5.5km SE of Site)				
Time Period	Air Temp (^{0}C)	Rainfall (mm/h)	Prevailing Wind Direction	Wind Speed (m/s)
15/09/23: 00:00 – 23:59	13.1 – 22.3	0.0 – 0.5	SSW	0.0 – 1.1
16/09/23: 00:00 – 23:59	11.7 – 14.4	0.0 – 0.5	ENE	0.0 – 2.8
17/09/23: 00:00 – 23:59	13.0 – 18.7	0.0 – 5.1*	ENE	0.0 – 2.2
18/09/23: 00:00 – 23:59	8.3 – 16.3	0.0 – 1.3	SSW	0.0 – 2.8

Table 11 – Weather Conditions

**Brief shower not deemed to have affected the background sound climate at the environmental noise survey locations.*

Appendix D – Manufacturers' Datasheets



Insulated Panels to the Power of Kingspan®

Insurer Approved FIREsafe Systems

Acoustic Performance Guide



Acoustic Test Results Appendix A - Wall/Facade Panel Construction

Octave Band Sound Reduction Index (R) and Weighted Sound Reduction Index (R_w)

Wall	Panel and Lining	Octave Band Sound Reduction Index R								R_w	C_{tr}	Surface Weight Kg/m²
		63	125	250	500	1k	2k	4k	8k			
1W	AWP/60 + no lining	15	16	19	23	26	22	39	-	25	-3	18
2W	AWP/60 + F	12	19	32	42	50	52	60	-	43	-10	30
3W	AWP/60 + W15	14	17	31	40	48	46	56	-	41	-10	28
4W	AWP/60 + W15 + F	17	24	37	45	52	54	64	-	47	-9	40
5W	AWP/60 + P + W12	16	22	37	45	51	50	63	-	46	-10	41
6W	AWP/60 + P + W12	18	23	35	44	49	50	61	-	45	-8	41
7W	AWP/60 + I + P + W	18	24	37	48	53	55	63	-	48	-10	4
8W	KS1000 RW/40 + I + L	13	14	29	38	40	45	55	-	38	-9	20
9W	KS1000 RW/40 + I + L	12	16	30	40	44	51	64	-	40	-9	20
10W	AWP/70 + no lining	20	15	17	23	18	25	40	46	24	-4	12.5

Key
AWP = Architectural Wall Panel with various profiles (Optimo, MR, EB, FL, MM, CX, WV, Longspan)
F = 10mm dense particle board (11.7kg/m²)
W15 = 15mm plasterboard (10kg/m²)
W12 = 12.5mm wallboard (7.9kg/m²)
P = 19mm dense plasterboard plank (15.2kg/m²)
I = Insulation (see construction description for details)
L = 0.7mm profiled steel liner sheet
The figures after the forward slash refers to the panel thickness in mm (ie AWP/60 = panel thickness of 60mm)

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Acoustic Test Results Appendix B - Roof Panel Construction

Octave Band Sound Reduction Index (R) and Weighted Sound Reduction Index (R_w)

Roof	Panel and Lining	Octave Band Sound Reduction Index R								R_w	C_v	Surface Weight Kg/m²
		63	125	250	500	1k	2k	4k	8k			
1R	KS1000 LP/45 + I + 2 x SB	27	32	47	61	69	69	75	-	58	-11	-
2R	KS1000 RW/40 + I + L	8	17	32	43	48	54	60	-	43	-	2
3R	KS1000 RW/40 + I + L	11	19	36	48	54	61	73	-	46	-	19
4R	KS1000 RW/40 + I + Py	17	27	39	44	49	57	67	-	48	-	31
5R	KS1000 RW/30 + no lining	-	17	20	23	23	23	41	-	25	-3	-
6R	KS1000 RW/30 + I + L	-	18	35	50	55	59	60	-	44	-11	-
7R	KS1000 RW/50 + I + L	-	19	34	48	52	56	63	-	44	-10	-
8R	KS1000 RW/80 + I + L	-	20	36	48	50	66	70	-	46	-11	-
9R	KS1000 RW/80 + no lining	-	18	21	23	20	38	42	-	26	-4	-
10R	KS1000 RW/80 + no lining	20	18	20	24	20	29	39	47	25	-3	-
11R	KS1000 RW/80 + I + PL	18	19	22	29	31	40	58	49	32	-4	-
12R	KS1000 ZIP/90 + no lining	19	18	19	20	17	35	38	44	23	-4	-
13R	KS1000 LP/80 + no lining	19	19	19	22	19	35	39	46	24	-4	-
14R	KS1000 RT + no lining	20	19	21	22	22	32	38	44	25	-2	-
15R	KS1000 TS + no lining	20	16	15	23	29	39	45	53	27	-4	27

Key

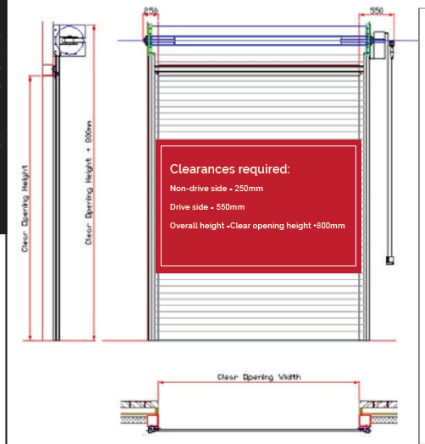
I = Insulation (see construction description for details)
2 x SB = 2 x 12.5mm dense plasterboard (15.2kg/m²)
L = Profiled Steel Liner Sheet
Py = 10mm thick dense particle board (11.7kg/m²)
PL = Profiled Perforated Steel Liner Sheet
The figures after the forward slash refers to the panel thickness in mm (ie LP/45 = panel thickness of 45mm)



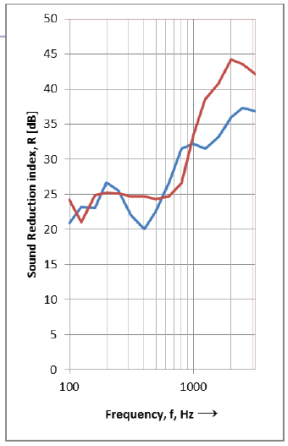
Motor gearbox:	Specifically designed for use on rolling doors with an integrated safety gear with anti-fall device built in
Gearbox features:	Robust low maintenance drive unit with integrated limit switches for accurate positioning. Self-adjusting motor brake
Manual operation:	Low level manual disconnect complete with haul chain for emergency manual operation
Bottom Lath:	With integrated acoustic threshold seal
Standards:	The door complies with the requirements of EN 13241-1

DOC REF: SDS104C

Outline dimensions



Acoustic performance data



SAFE-door Industries Ltd
separating environments through innovation

Frequency f [Hz]	R 1/3 Octave [dB]	R 1/3 Octave [dB]
100	20.8	24.2
125	23.2	21
160	23	24.8
200	26.7	25.2
250	25.5	25.1
315	22	24.7
400	20	24.7
500	22.6	24.3
630	26.6	24.7
800	31.5	26.6
1000	32.2	33.3
1250	31.5	38.6
1600	33.2	40.8
2000	35.9	44.2
2500	37.3	43.6
3150	36.8	42.1
R_w	30	31
C	-1	-1
Ctr	-3	-3


NOVA
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