
CORROSION RESISTANT PRODUCTS LTD

NOISE IMPACT ASSESSMENT REPORT

TODMORDEN ROAD, LITTLEBOROUGH

Client: Corrosion Resistant Products Ltd

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TODMORDEN ROAD, LITTLEBOROUGH

REPORT VERSION CONTROL:

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1 INTRODUCTION

- 1.1.1 By instruction from Corrosion Resistant Products Ltd ('the client'), NoiseAir was commissioned to conduct a noise impact assessment (NIA) to assess the potential operational impacts of the proposed extension of existing industrial units.
- 1.1.2 This report assesses the results of a noise survey in accordance with current guidance and includes recommendations and mitigation, as appropriate.
- 1.1.3 General limitations with respect to this NIA are outlined in **Appendix A**.

1.2 Site Description and Context

- 1.2.1 The site is located on Todmorden Road, Littleborough. The locale is mixed-use, with a number of industrial units/sites to the eastern side of the road, and residential dwellings to the west side of the road.
- 1.2.2 The site comprises an A-road with a steady flow of traffic throughout the daytime.
- 1.2.3 **Figure 1** presents an aerial image of the development site with respect to the local area and its context, indicating the approximate location of the application site and nearby residential dwellings.

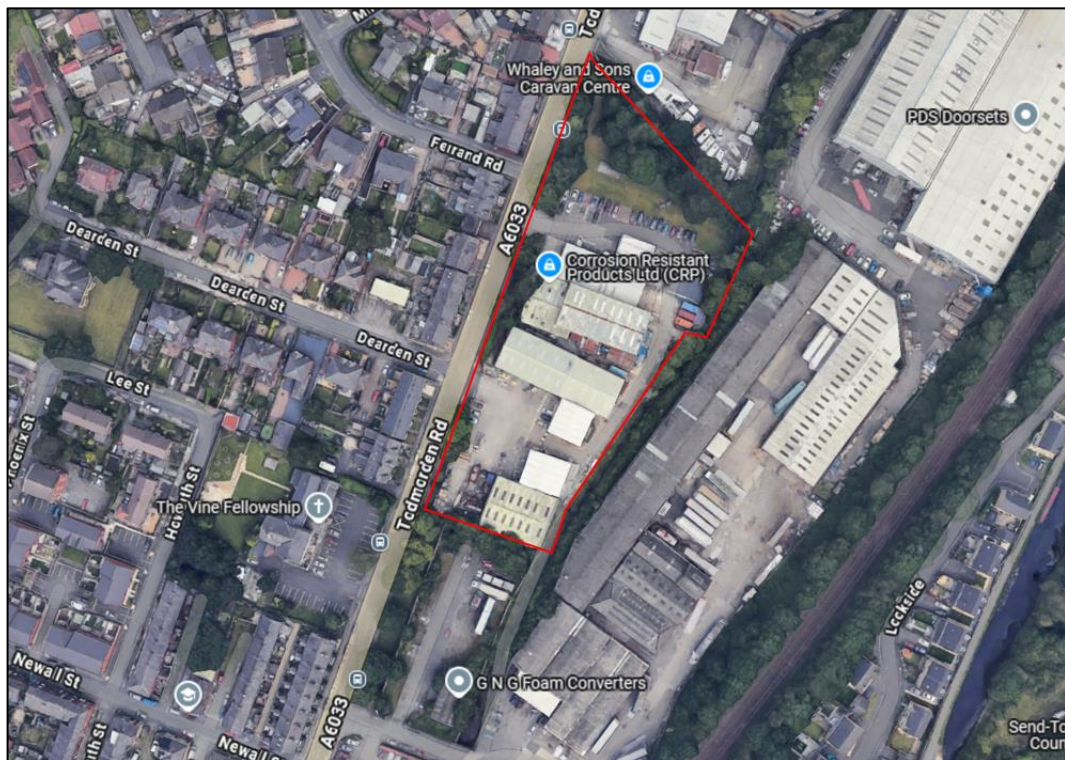


Figure 1: Site aerial image

1.3 Site Proposal

- 1.3.1 The proposal comprises the part demolition of an existing production unit, removal of two temporary storage and manufacturing units, construction of a new two-storey extension to an existing production unit and the construction of a new warehouse extension to an existing warehouse at the site. The proposed site layout is shown in **Figure 2**.
- 1.3.2 We understand that the applicant has two operational sites at present, and the proposals would enable the second site to merge with the site on Todmorden Road.
- 1.3.3 NoiseAir Ltd are not in receipt of detailed proposals regarding the building construction, and have therefore assumed a minimal specification in the form of Kingspan All Weather Panels (AWP) with no internal linings, with a sound reduction of 23 dB R_w+C_{tr} based on laboratory testing commissioned by the manufacturer.
- 1.3.4 Several external noise sources associated with internal processes are operational at the site. At the time of writing, we understand that options for the internal layout are still being reviewed by the applicant, meaning that the location of any external noise sources associated with internal processes has not yet been determined. These sources will need to be assessed at a later date. We also understand that some of these sources operate throughout the night.
- 1.3.5 NoiseAir understand that the existing operational hours and delivery hours would be retained under the proposals.



2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 Scope of Works

- 2.1.1 This assessment addresses the potential noise impact as a result of proposed changes to the site. We understand that operational hours and deliveries would not change as a result of the proposals and have therefore not assessed these items.
- 2.1.2 Assessment of external intakes/exhausts, plant, etc. is not presented in this report, as the locations of these sources are still being determined at the time of writing. These will need to be assessed at a later date, and such assessment would likely be secured by a suitably worded planning condition.
- 2.1.3 This report therefore assesses noise breakout from within the buildings, as a result of the proposals. To demonstrate how breakout noise levels from the site would change, assessments of both the existing and proposed noise are presented.
- 2.1.4 The assessments have been undertaken to BS 4142:2014+A1:2019, a summary of which is provided below.

2.2 British Standard 4142:2014+A1:2019

- 2.2.1 British Standard 4142:2014 - Methods for rating and assessing industrial and commercial sound, sets the methodology for rating and assessing sound of an industrial and commercial nature, which includes sound from fixed installations such as mechanical and electrical plant and equipment.
- 2.2.2 In BS 4142:2014, a noise rating is determined and compared with the existing local background sound level based on several more cumulative acoustic feature corrections to apply where appropriate. For example, if the noise includes a distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristic, then additional cumulative penalties individually ranging from 0 to 9 dB may be applied depending on the type of noise.
- 2.2.3 BS 4142:2014 seeks to determine a “representative” background sound level, stating that “...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.
- 2.2.4 The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS

4142:2014 states that an initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level, while considering the following points:

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

2.2.5 Therefore, a BS 4142:2014 assessment may deduce a low impact where the specific sound level is below the background sound level.

2.2.6 While the standard is ultimately for the assessment of potential impacts based on external sound levels, the 2019 amendments to the standard also introduce the consideration of internal noise levels to the context of assessments during the night-time. Example assessments are provided in the standard showing how this may be undertaken, which show references to BS 8233:2014 and comments on internal character as contextual considerations within the assessment.

3 ACOUSTIC SURVEY

3.1 Background Sound Level Survey

- 3.1.1 Noise monitoring was undertaken at a free-field external location to determine existing background sound levels between Thu 25/03/2025 12:00 – Fri 28/03/2025 09:00 at the location marked on **Figure 3**.



Figure 3: Noise Monitoring Location

- 3.1.2 The noise monitoring location was situated to the south of the site, close to the storage building. This was the area least influenced by operational noise from the applicant site (close to the quieter, storage building). External noise sources associated with the site were not audible at the monitoring position, largely limiting the site influence to short term delivery events during the daytime. The position was also at a similar distance from Todmorden Road as residential dwellings on the opposite side of the road.
- 3.1.1 The noise measurements were conducted using a Class 1, integrating sound level meter (SLM). The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods. Calibration records can be provided on request.
- 3.1.2 The unattended measurement results are summarised in **Table 1** and shown in **Chart 1**.

¹ BS 7445-2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

3.1.3 The lowest background sound levels were measured between Wed 26/03/2025 23:00 – Thu 27/03/2025. Statistical analysis of background sound levels during this monitoring period is shown in **Charts 2-3**.

Table 1: NSR1 Background Sound Level Survey				
Monitoring Location	Time	Measured Noise Level		
		$L_{Aeq,T(16\text{hour}/8\text{hours})}$ (dB)	Mode $L_{AF90,15\text{min}}$ (dB)	$L_{AFmax,15\text{min}}$ Range (dB)
Day	Tue 25/03/2025 12:00 - Tue 25/03/2025 23:00	61.1	51	68-87
Night	Tue 25/03/2025 23:00 - Wed 26/03/2025 07:00	56.8	41	48-81
Day	Wed 26/03/2025 07:00 - Wed 26/03/2025 23:00	61.9	52	70-101
Night	Wed 26/03/2025 23:00 - Thu 27/03/2025 07:00	56.4	39	67-79
Day	Thu 27/03/2025 07:00 - Thu 27/03/2025 23:00	61.2	52	70-93
Night	Thu 27/03/2025 23:00 - Fri 28/03/2025 07:00	57.3	43	60-84
Day	Fri 28/03/2025 07:00 - Fri 28/03/2025 09:00	63.7	53	73-80

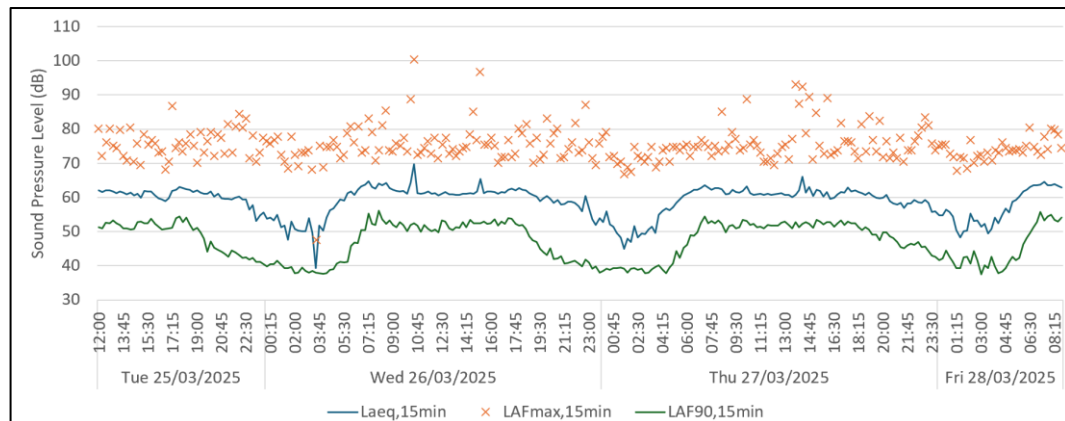


Chart 1: Noise Monitoring Results at ML1

Table 2: Summary of SLM used for survey and associated field calibration						
SLM (Serial Number)	Preamp (Serial Number)	Microphone (Serial Number)	Calibrator (Serial Number)	Start Calibration	End Calibration	Drift
NOR140 (1402867)	NOR1209 (12113)	NOR1225 (38650)	B&K 4231 (2699086)	-25.8	-25.7	0.1

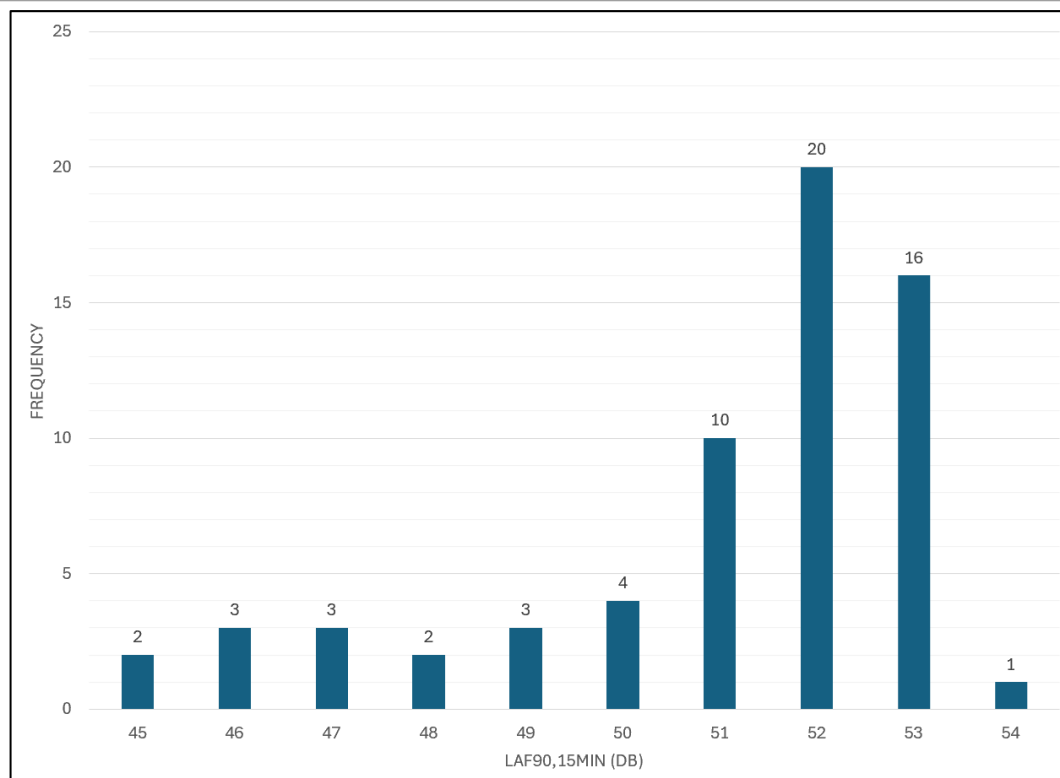


Chart 2: Statistical Analysis of $L_{AF90,15min}$ Daytime Background Sound Levels between Thu 27/03/2025 07:00 – Thu 27/03/2025 23:00

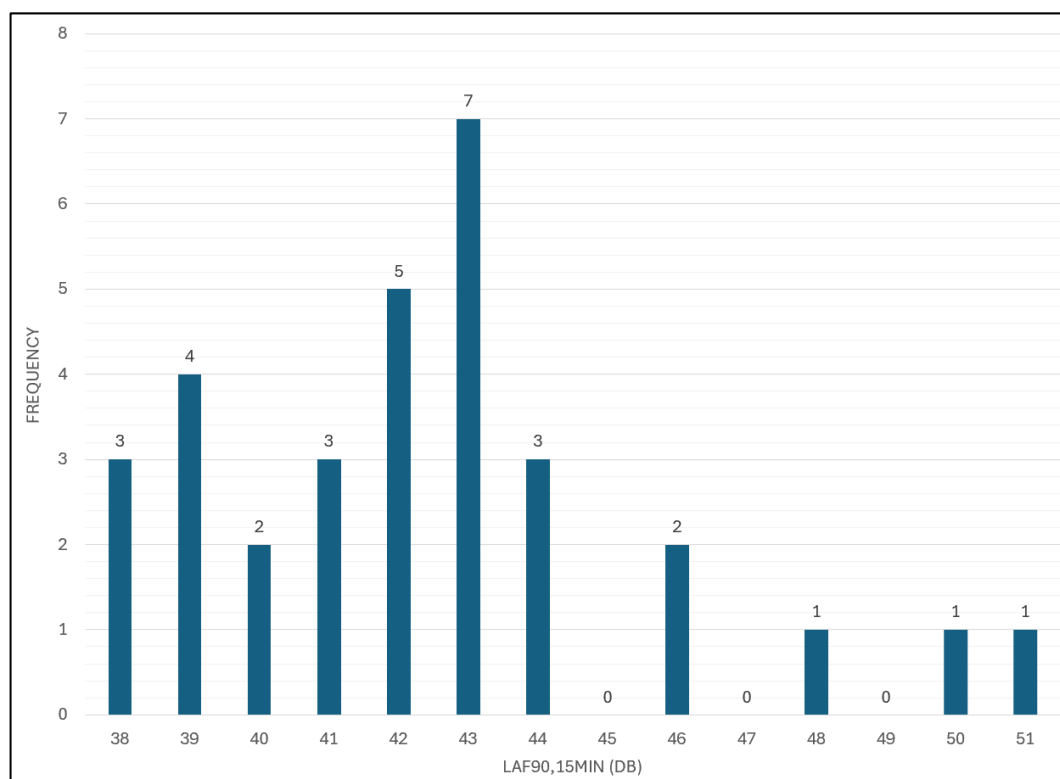


Chart 3: Statistical Analysis of $L_{AF90,15min}$ Night-time Background Sound Levels between Wed 26/03/2025 23:00 – Thu 27/03/2025 07:00

3.1.4 Based on the noise monitoring undertaken, 52 dB $L_{AF90,15min}$ is considered typical for the daytime. During the night-time, 43 dB $L_{AF90,15min}$ was the mode value. However, the distribution shows that a range 38-44 dB $L_{AF90,15min}$ is likely to be considered typical.

3.1.5 For the purposes of this assessment, 42 dB $L_{AF90,15min}$ will be treated as typical during the night-time. Although a lower selection is possible from the range, BS 4142 advises in Section 8.1 that the 'middle of the night' is potentially less important for sleep purposes in terms of the impact on receptors. 42-43 dB may therefore be more relevant range for assessment purposes.

3.2 Internal Noise – Attended Noise Measurements

3.2.1 Prior to the installation of the background sound level survey at ML1, internal reverberant measurements were taken of activities within the existing facilities.

3.2.2 The monitoring equipment consisted of a NOR140 Class 1 sound level meter (SLM) with enhanced windshield and calibrated to traceable standards (certificates are available upon request).

3.2.3 Details of the SLM and associated field calibrations can be found in **Table 3** below:

Table 3: Summary of SLM used for survey and associated field calibration						
SLM (Serial Number)	Preamp (Serial Number)	Microphone (Serial Number)	Calibrator (Serial Number)	Start Calibr ation	End Calibr ation	Drift
NOR140 (1402867)	NOR1209 (12113)	NOR1225 (38650)	B&K 4231 (2699086)	-25.8	-25.8	0

3.2.4 The measurements were used to derive averages of the existing productions areas, and of the existing storage building. The average results are presented in **Table 4**.

Table 4: Surveyed Noise Levels

Noise Source	Octave band Sound Pressure Level in centre frequency (dB)								Broad band Sound Pressure Level
	63	125	250	500	1000	2000	4000	8000	dB(A)
Production Buildings Internal Reverberant Average Level	73.3	71.4	73	75.6	74.2	74	75.3	74.1	81.5
Storage Building Internal Reverberant Level Average	57.8	59.6	59.4	61.1	59	63.6	68.6	51.7	71.4

3.2.5 The noise levels reported above will be used to inform a 3D noise model of the existing site, for comparison with a 3D noise model of the proposed site, provided to give an indication of the likely change in noise levels arising from breakout of internal sources as a result of the proposals.

4 NOISE IMPACT ASSESSMENT

4.1 Introduction

- 4.1.1 Based on the information provided to NoiseAir Ltd, sound power levels for the proposed plant have been determined within the following section of this report. Propagation between the application site and nearby residential dwellings has then been calculated within a 3D noise model of the site utilising the calculation method in ISO 9613-2.

4.2 3D Sound Model

- 4.2.1 A 3D noise model was created in SoundPlan based on the noise levels presented in **Section 3.2**. The sound reduction of the existing and proposed buildings was assumed to be a conservative sound reduction of 23 dB R_w+C_{tr} (see **Figure 4** below).

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/m ²
		63	125	250	500	1k	2k	4k	8k			
1W	AWP/60 + no lining	15	16	19	23	26	22	39	-	25	-3	18

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)

Figure 4: Kingspan Performance Data for General Façade AWP

- 4.2.2 The results are shown in **Figures 5-8** and summarised below:
- **Scenario 1 (Existing Emissions):** 47 dB $L_{Aeq,T}$
 - **Scenario 2 (Proposed Emissions):** 47 dB $L_{Aeq,T}$
- 4.2.3 Enlarged versions of the noise modelling results are shown in **Appendix B**.
- 4.2.4 The results show that the proposals do not result in a change to a Specific Noise Level within a BS 4142 assessment. However, noise levels at some dwellings would increase by 1-2 dB due to the buildings extending further north than their current footprint.

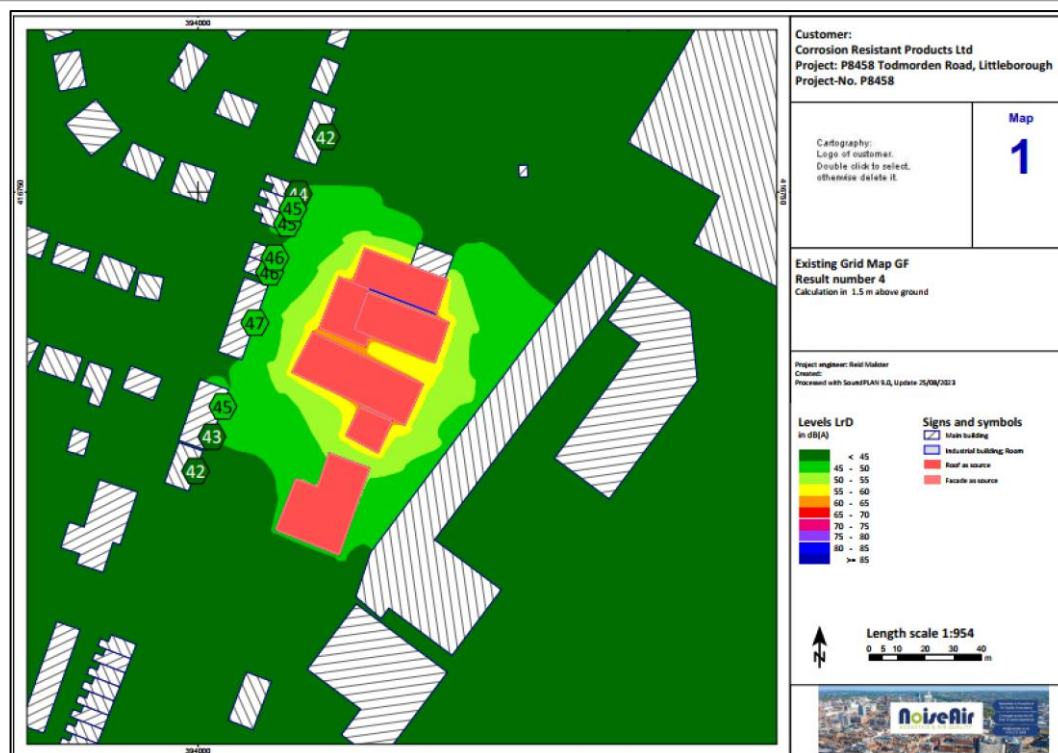


Figure 5: Scenario 1 (Existing Emissions) Noise Modelling Results at 1.5 m Grid Height

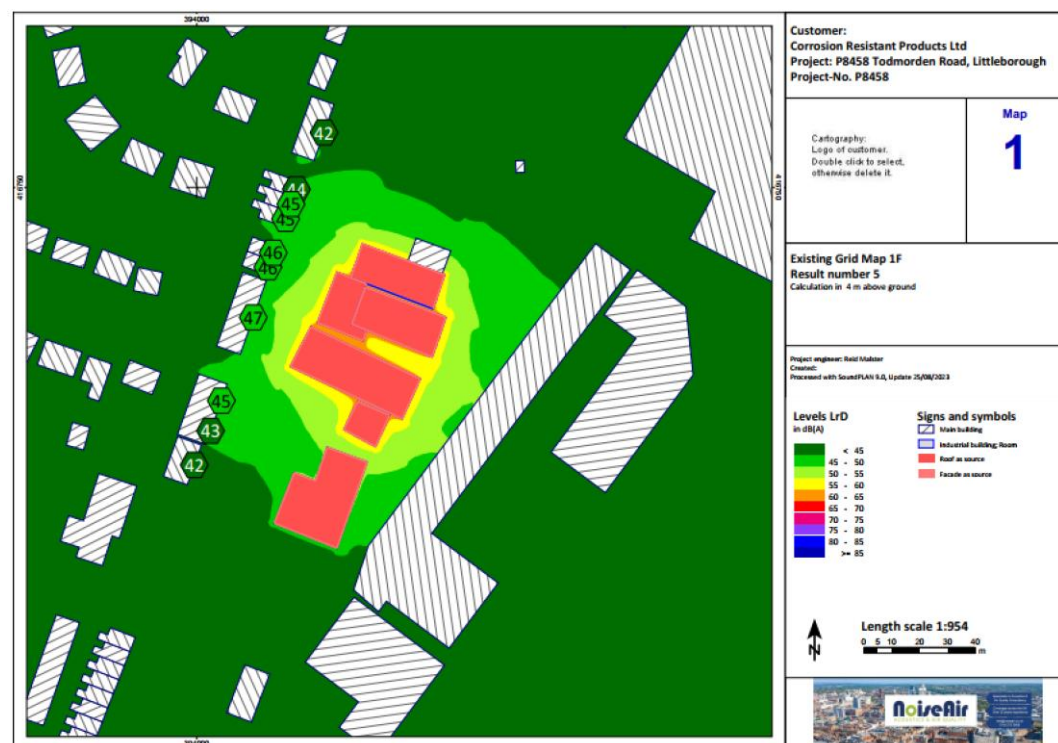


Figure 6: Scenario 1 (Existing Emissions) Noise Modelling Results at 4.0 m Grid Height

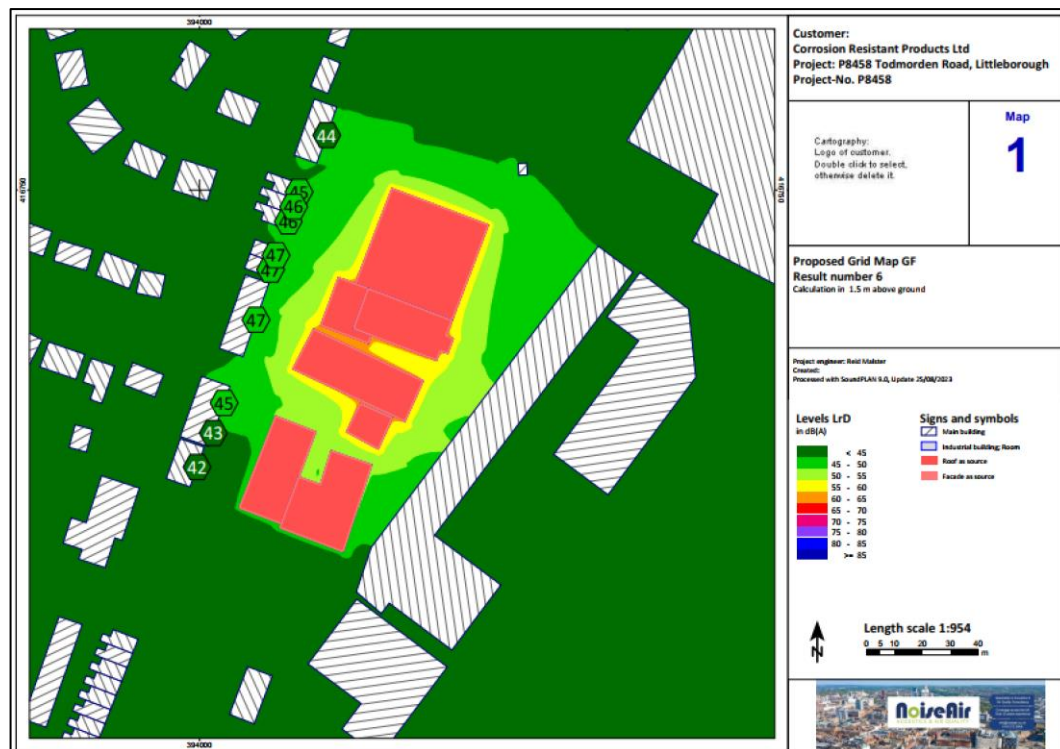


Figure 7: Scenario 2 (Proposed Emissions) Noise Modelling Results at 1.5 m Grid Height

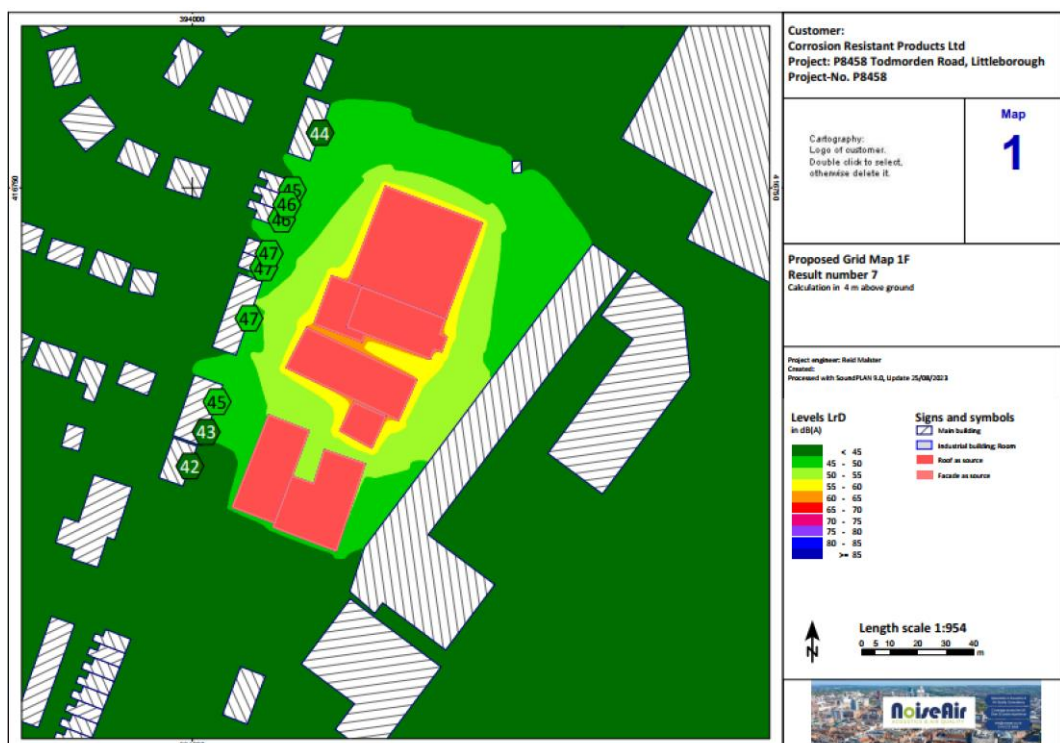


Figure 8: Scenario 2 (Proposed Emissions) Noise Modelling Results at 4.0 m Grid Height

5 BS4142:2014 ASSESSMENT

5.1 Introduction

- 5.1.1 This section assesses the daytime impact of noise breakout arising from the proposal to BS 4142. The Specific Sound Level from the model is used as being representative of both the existing and proposed scenarios, as the highest predicted noise level did not change.

5.2 Background Sound Level

- 5.2.1 The measured background sound levels have been measured and presented within Section 3 of this report.

- 5.2.2 The typical background sound levels for use within the assessment are:

- **Daytime:** 52 dB $L_{AF90,15min}$

5.3 Character Corrections

- 5.3.1 After the installation of the background sound level survey, subjective observations were undertaken on the opposite side of Todmorden Road. Due to the magnitude of traffic noise while on-site (during the daytime), it was difficult to discern general noise from the application site over road traffic noise from Todmorden Road.
- 5.3.2 Occasional aspects of noise were audible during lulls in traffic, but did not fit the descriptions of the tonality, impulsivity or intermittency character corrections.
- 5.3.3 We have therefore applied a +3 dB character correction for 'other acoustically distinguishing characteristics' (a character correction added in the 2019 amendments to BS 4142:2014) on account of the source of the noise being commercial.

5.4 Specific Sound Level

- 5.4.1 The Specific Sound Level for use in this assessment is 47 dB L_{Aeq} .

5.5 BS4142:2014+A1:2019 Initial Assessment

- 5.5.1 A BS4142 assessment is presented in **Table 5** to determine the potential impact of noise breakout from internal activities.

Table 5: BS4142:2014 Initial assessment

Parameter	Sound level (dB)
	Daytime
Typical Background Sound Level, dB $L_{A90,15min}$	52
Specific sound level $L_{Aeq,T}$	47
Character Corrections	+3
Rating Level	50
Excess of Rating Level over Background Sound Level	-2
Initial impact	Low Impact

- 5.5.2 The assessment indicates that noise breakout from the site buildings has a low impact during the day at present. The noise level being below the background sound level corresponds with the observations made on-site on the opposite side of Todmorden Road, suggesting that the assessment is likely to be accurate.
- 5.5.3 The assessment above applies to both the existing and proposed scenarios. This is a good indication that in terms of noise, the proposals are likely to be suitable in principle, subject to further consideration and assessment as the proposals develop.
- 5.5.4 The change brought about by the proposals is that the longer extent of the site means that existing Low Impacts would intensify slightly to some properties, resulting in changes of 1-2 dB. For reference, 2-3 dB approximately the threshold at which human beings start to perceive a change in noise levels.
- 5.5.5 In order for the noise to potentially an 'Adverse Impact' against the measured background sound levels, the noise level would need to increase by approximately 7 dB. For reference, a 6 dB increase would pose a mathematical doubling in sound pressure, and an increase of 6-10 dB is generally perceived to pose a subjective doubling in noise level.
- 5.5.6 The initial information available for assessment therefore indicates that the proposals would be suitable with regards to noise, subject to further design.

5.6 Further Assessment

- 5.6.1 The assessment of internal noise break-out based on the proposed new buildings/changes to building footprints indicates that internal works under the proposals would pose a low impact.
- 5.6.2 However, this does not mean that the site operations as a whole pose a low impact. A number of external noise sources (intakes/exhausts, flue terminations, etc.) would be required as part of the proposals which would increase the noise levels presented in this report.
- 5.6.3 Provided that these are sited appropriately, a Low Impact outcome can be maintained. When reviewing options for floorplans at the site, we recommend that the applicant views these noise sources as a potential design constraint.
- 5.6.4 For example, if a particular floor layout would result in several noise sources to the west of the site, pointing towards houses on the opposite side of Todmorden Road, this could mean that the proposals would not be acceptable in planning terms due to noise impacts to the surrounding residents.
- 5.6.5 While the initial assessment provides a good foundation in terms of the feasibility of the proposals, the final likely impact of the proposals will be dependent on where the external noise sources are sited as part of the proposals.
- 5.6.6 We would recommend that further assessment is secured by a suitably worded planning condition.
- 5.6.7 We also advise the applicant that depending on noise levels from external sources, the noise levels from internal activities presented in this report may need to be reduced. The primary mechanism for this would be to improve the sound insulation of the building. Currently, this is based on corrugated metal all weather panels with no lining at 22 dB R_w+C_{tr} . Different configurations are available with higher sound reduction values. For reference, some example configurations from Kingspan have been provided in **Figure 9** below.

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 _r	Surface Weight Kg/m ²
		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)

Figure 9: Example Wall/Façade Panel Acoustic Performance Specifications

6 CONCLUSIONS

- 6.1.1 NoiseAir conducted a noise impact assessment in relation to the expansion of an industrial and commercial site.
- 6.1.2 At the time of writing, basic information regarding the proposals and building footprints were available for assessment, allowing noise breakout from the units to be assessed. The internal layout, which would inform the location of several external noise sources, has not yet been fixed and therefore cannot be assessed.
- 6.1.3 A noise survey was undertaken at a location representative of nearby noise-sensitive receptors to determine existing typical background sound levels at the application site. Noise measurements were also taken within the existing production and storage buildings.
- 6.1.4 Noise levels from internal activities the site was calculated within a 3D noise model of the site based on measurements taken within the production and storage buildings. The model compared existing activities to proposed activities.
- 6.1.5 The predicted noise levels were assessed against the measured background sound levels to BS 4142:2014+A1:2019, which concluded that noise breakout from internal activities would pose a low impact.
- 6.1.6 The highest predicted noise levels did not increase as a result of the proposals. Due to the increased extent of the production buildings, some dwellings are predicted to experience an increase of 1-2 dB compared to noise levels from current operations, but would still pose a BS 4142 Low Impact.
- 6.1.7 The initial assessment presented in this report demonstrates that the proposals are feasible in terms of noise, however, the final outcome will be dependent on the siting of external noise sources, which may pose a design constraint if located in areas impacting nearby residential dwellings.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Corrosion Resistant Prto may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

Notwithstanding anything to the contrary contained in the report, NoiseAir Limited is obliged to exercise reasonable skill, care and diligence in the performance of the services required by Pennine Refrigeration Services Limited and NoiseAir shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

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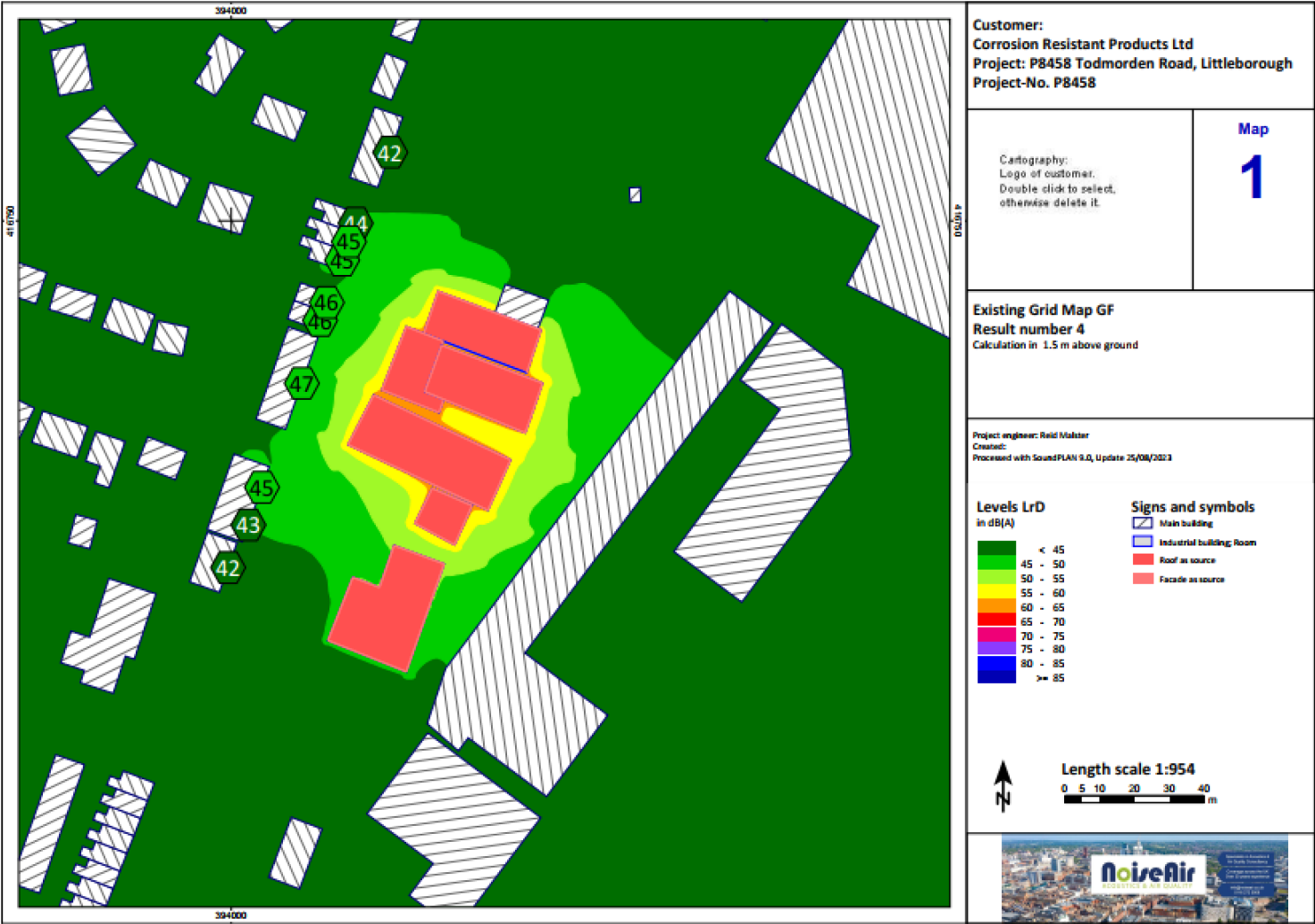
The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from who it has been requested and that such information is accurate. Information obtained by NoiseAir Limited has not been independently verified by NoiseAir Limited unless otherwise stated in the report and should be treated accordingly.

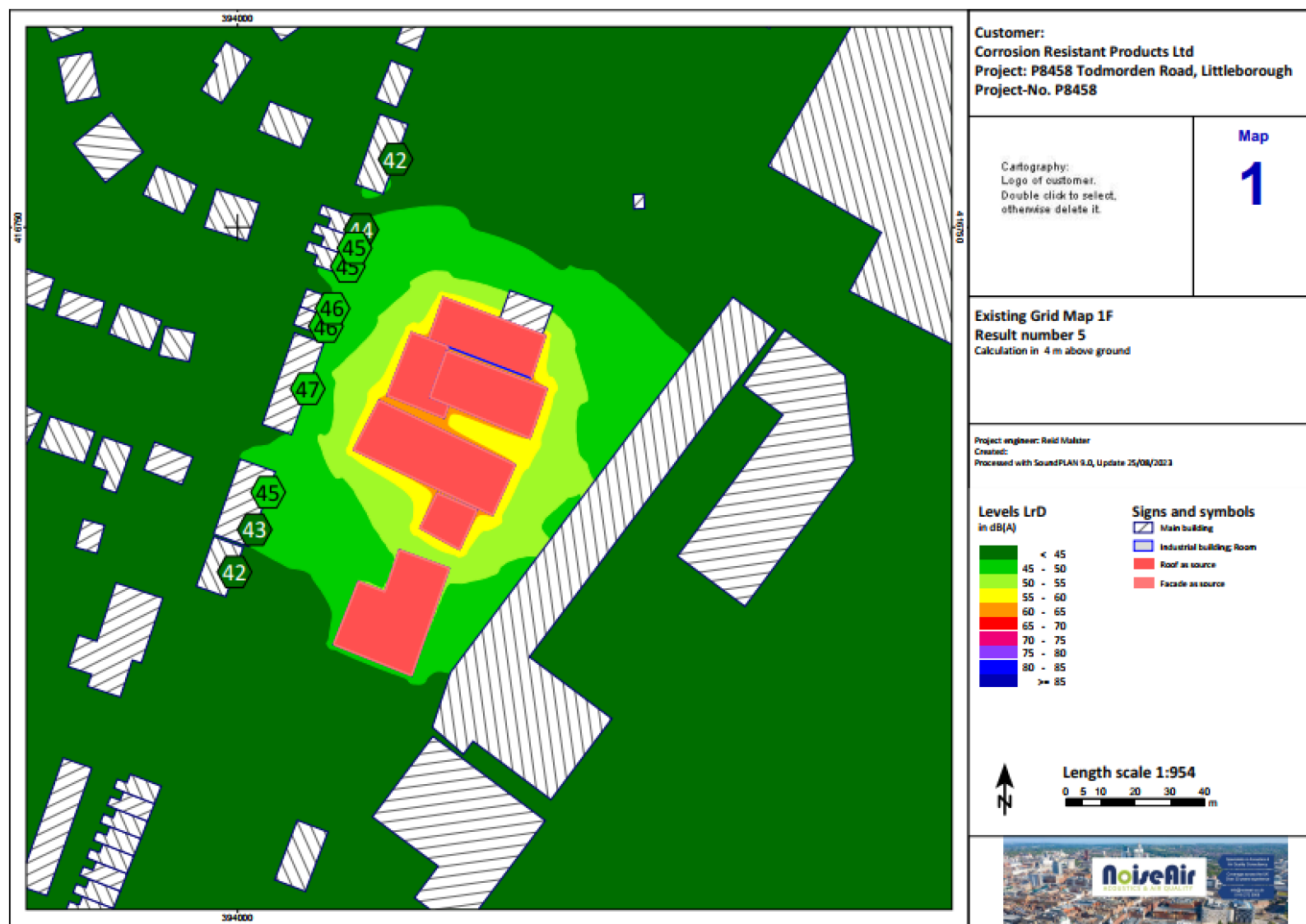
Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

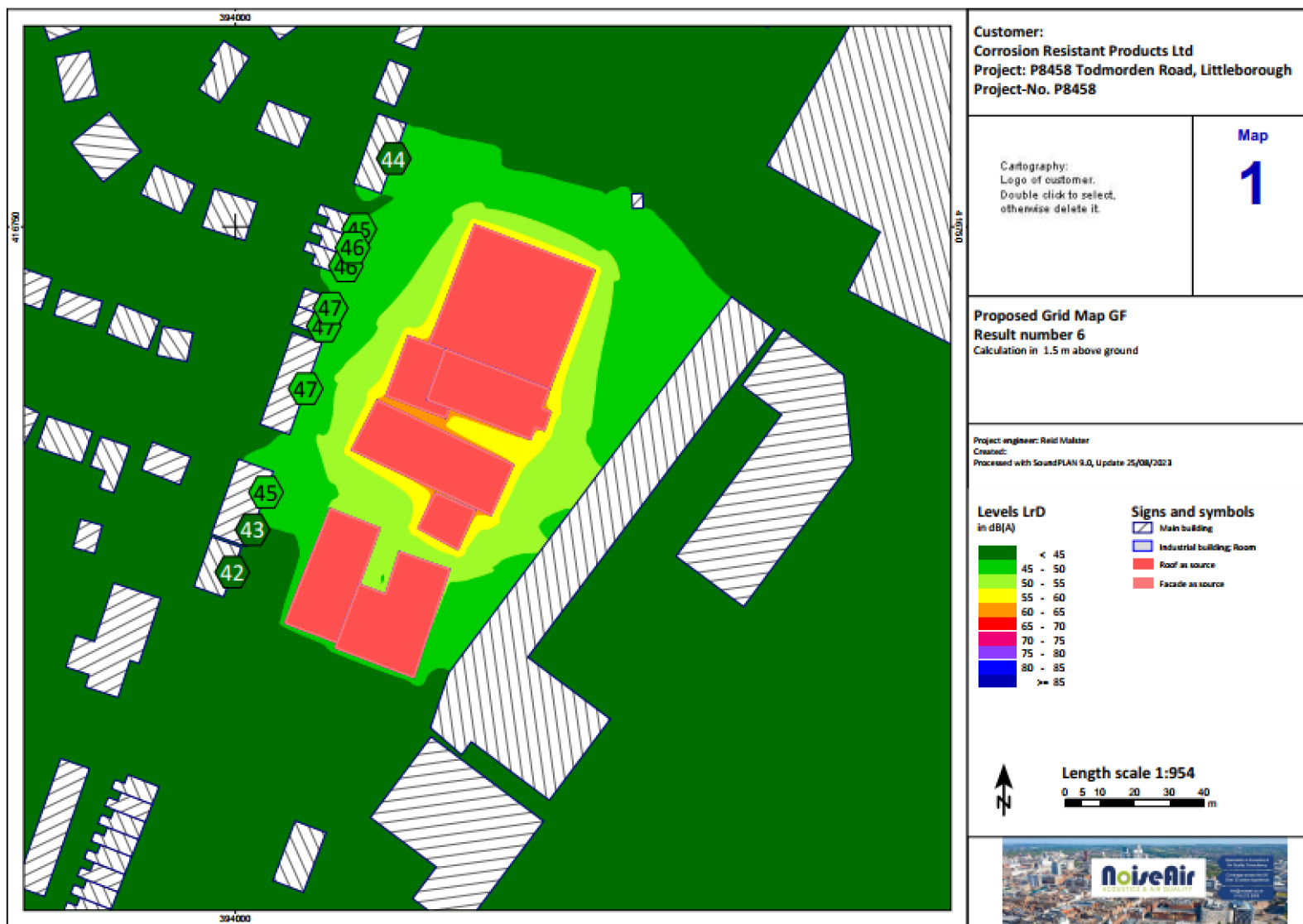
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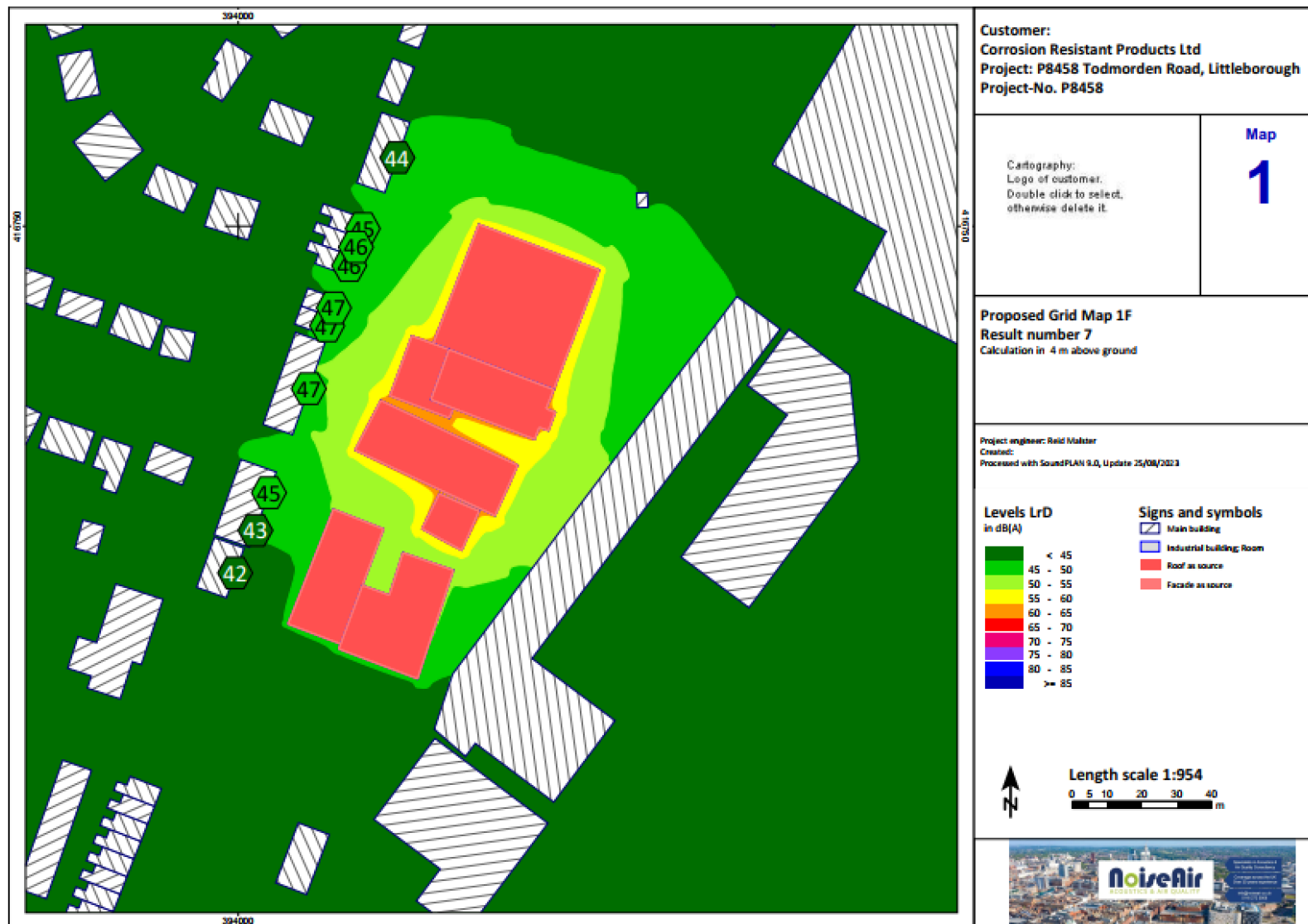
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APPENDIX B – NOISE MODELLING RESULTS









APPENDIX C – GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. <i>NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.</i>
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. <i>NOTE: The ambient sound comprises the residual sound and the specific sound when present.</i>
Ambient sound level, $L_a = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T <i>NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.</i>
Background sound	Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
Background sound level, $L_{A90,T}$ (BS 4142:2014)	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Break-in	Noise transmission into a structure from outside.
Break-out	Noise transmission from inside a structure to the outside.
Cross-talk	Noise transmission between one room and another room or space via a duct or other path.
C_{tr}	Correction term applied against the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$) to provide a weighting against low frequency performance. <i>NOTE: The reference values used within the C_{tr} calculation are based on urban traffic noise.</i>
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.
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ (BS 4142:2014)	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.
Equivalent sound absorption area of a room, A	Hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m ²), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration
Facade level	Sound pressure level 1 m in front of the façade. <i>NOTE: Facade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.</i>
Free-field level	Sound pressure level away from reflecting surfaces. <i>NOTE: Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e., not 3.5 m from the reflecting surface in the direction of the source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.</i>

Impact sound pressure level, L_i	Average sound pressure level in a specific frequency band in a room below a floor when it is excited by a standard tapping machine or equivalent.
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. <i>NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.</i>
Measurement time interval, T_m (BS 4142:2014)	Total time over which measurements are taken. <i>NOTE: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.</i>
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.
Normalised impact sound pressure level, L_n	Impact sound pressure level normalized for a standard absorption area in the receiving room. <i>NOTE: Normalised impact sound pressure level is usually used to characterize the insulation of a floor in a laboratory against impact sound in a stated frequency band.</i>
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.
Reference time interval, T_r (BS 4142:2014)	Specified interval over which the specific sound level is determined. <i>NOTE: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.</i>
Residual sound (BS 4142:2014)	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Residual sound level, $L_r = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T .
Rating level, L_{A,r,T_r}	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise. <i>NOTE: This is used in BS 7445 and BS 4142 for rating industrial noise, where the noise is the specific noise from the source under investigation.</i>
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 exposure level, L_{AE}	Level of a sound, of 1 s duration, that has the same sound energy as the actual noise event considered.
Sound level difference, D	Difference between the sound pressure level in the source room and the sound pressure level in the receiving room.
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).
Sound reduction index, R	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.

Specific sound level, $L_s = L_{Aeq,T_r}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .
Specific sound source (BS 4142:2014)	Sound source being assessed.
Standardised impact sound pressure level, L'_{nT}	Impact sound pressure level normalized to a reverberation time in the receiving room of 0.5 s.
Standardised level difference, D_{nT}	Difference in sound level between a pair of rooms, in a stated frequency band, normalized to a reference reverberation time of 0.5 s for dwellings.
Groundborne noise	Audible noise caused by the vibration of elements of a structure, for which the vibration propagation path from the source is partially or wholly through the ground. <i>NOTE Common sources of ground-borne noise include railways and heavy construction work on adjacent construction sites.</i>
Structure-borne noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements. <i>NOTE Common sources of structure-borne noise include building services plant, manufacturing machinery and construction or demolition of the structure.</i>
Third octave band	Band of frequencies in which the upper limit of the band is 2% times the frequency of the lower limit.
Weighted level difference, D_w	Single-number quantity that characterizes airborne sound insulation between rooms, but which is not adjusted to reference conditions. <i>NOTE Weighted level difference is used to characterize the insulation between rooms in a building as they are. Values cannot normally be compared with measurements made under other conditions (see BS EN ISO 717-1).</i>
Weighted normalised impact sound pressure level, $L'_{n,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or
Weighted standardised impact sound pressure level $L'_{nT,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted standardised level difference, $D_{nT,w}$	Single-number quantity that characterizes the airborne sound insulation between rooms.

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
L_{Ar,T_r}	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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