

**NOISE ASSESSMENT FOR METAL FINISHING
FACILITY IN KNOCKAUNATOUK, GORT, CO.
GALWAY**

Prepared for:

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Knockaunatouk,
Gort,
Co. Galway.**

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1. INTRODUCTION

JRE Ltd. was requested to complete a preliminary assessment of noise impacts at a metal finishing unit located in Knockaunatouk, Gort, Co. Galway. The scope of work of the assessment was to complete preliminary noise measurements at, and in the vicinity of, the sandblasting shed to assess noise levels associated with the site sandblasting operations and their potential impacts on a noise sensitive receptor to the northwest.

The preliminary assessment included the following:

- Complete one noise measurement in the field at the southeast boundary of the noise sensitive receptor located to the northwest of the metal finishing shed when the sandblasting unit fans and motors were operational. The reading was recorded at a distance of approximately 145m from the shed and approximately 10m from the boundary wall. The measurement was completed to provide a reading to assess the impacts the sandblasting operations were having on the noise climate in the vicinity of the noise sensitive receptor.
- Complete one noise measurement in the field to the northwest of the metal finishing shed when the sandblasting unit fans and motors were operational. The reading was recorded at a distance of approximately 90m from the shed. The measurement was completed to provide a reading to assess the impact the sandblasting operations were having on the noise climate between the site and the boundary of the noise sensitive receptor.
- Complete one noise measurement in the immediate vicinity of the metal finishing shed when the sandblasting unit fans and motors were operational. The reading was recorded at a distance of approximately 1m from the shed boundary. The measurement was completed to provide a reading to assess the noise output from the sandblasting operations.

The assessment was a preliminary assessment that consisted of short measurement periods to provide baseline information on the potential impacts from the site sandblasting operations.

1.1. Assessment Limitations

The noise assessment completed was to assess typical noise levels during the operation of the sandblasting operations only. The assessment was not completed over a full working day when other activities such as metal deliveries and loading/unloading was taking place. The timeframes of the readings were limited and were only completed as a preliminary assessment of the potential noise output and impact from sandblasting operations on the site on the noise sensitive receptor to the northwest only. To determine the impacts from the site over a full working day an assessment completed to the requirements of Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' as published by the Environmental Protection Agency may be required.

1.2. Noise Assessment

The monitoring included the following:

- One day-time period of 10 minutes noise monitoring at two selected locations (N1 and NSL1) and one 15 minute reading at the north wall of the sandblasting shed (N2) which was indicated by the owner to be the perceived main noise source at the site during a typical working day.

The site is located in Knockaunatouk, a rural area approximately 3.5 km west of Gort. The area around the site is mainly agricultural land with some one-off residential properties. The site is located on the L4510 local road. The closest residential properties to the site is immediately to the south and northwest (NSL 1 - approximately 90 metres). The main noise sensitive receptor identified for the assessment was the receptor to the northwest (NSL 1) and the measurements completed focused on the potential impacts for the operations on this location only.

The location of the operation in relation to the noise sensitive receptor to the northwest and the other measurement locations are provided in the attached area map and in Table A.

Table A –Baseline Noise Measurement Locations

Location ID	Location Description	Approximate Distance From Noise Source (m)
N1	Immediate Area of Shed Housing the Sandblasting unit	1
NSL 1	Field between Noise Source and Noise Sensitive Receptor	90
NSL 2	Approximately 10m from Noise Sensitive Receptor Wall	145

1.3. Regulatory Framework

The noise survey included the determination of the contribution of natural (e.g., birds, vegetation, people) and anthropogenic (e.g., facility noise emissions, traffic activities) to the noise climate in the area during the measurement periods. The preliminary results were assessed against the limits outlined in Section 4 of the *“Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), EPA 2016”*.

The assessment completed was a limited initial assessment to provide information on typical noise levels at the site and in the vicinity of the noise sensitive receptor located approximately 90m to the northwest, when sandblasting activities were taking place at the site. The readings were time limited and were completed during daytime hours only as it was asserted by the owner that the site was not operational during night time hours. The noise monitoring was conducted on the 30th of May, 2018 in accordance with the ISO 1996: Acoustics- Description and measurement of environmental noise

1.3.1. Tonal Component

The EPA NG4 guidance document provides for identification and application of penalty for a prominent tonal noise source. The use of the simplified methodology for the objective identification of tones that is advocated in Annex D of ISO 1996-2:2007(E) is required, whereby a prominent, discrete tone can be identified if the time-average sound pressure level in the one-third-octave band of interest exceeds the time-average sound pressure levels of both adjacent one-third-octave bands by a constant level difference. The appropriate level differences vary with frequency and are outlined below. For penalties to be applied noise levels should be greater than or equal to the following values in both adjacent one-third-octave bands:

- 15dB in low-frequency one-third-octave bands (25Hz to 125Hz)
- 8dB in middle-frequency bands (160Hz to 400Hz), and;
- 5dB in high-frequency bands (500Hz to 10,000Hz).

2. METHODOLOGY

To ensure the quality of noise measurements recorded as part of the noise assessment the following methodology was used for the monitoring programme.

2.1. Equipment Calibration

Environmental noise measurements were completed using a Larson Davis SoundExpert LxT precision integrating sound level meter that measured the 'A'-weighted equivalent sound level (L_{Aeq}). The calibration certificate for the meter is provided in Appendix I. The statistical sound level meter also calculated the statistical noise measurement parameters including L_{A90} , L_{A5} , L_{A10} , L_{A50} and L_{Aeq} and also contained an integral frequency filter which is used in 1/3 octave frequency analysis. An explanation of relevant acoustical parameters is provided in Appendix II.

2.2. Weather Conditions

For all noise measurements completed on May 30th 2018 the weather conditions were neutral or well within measurement parameters. The weather conditions are summarised in Table B.

Table B – Weather Conditions at Metal Finishing Site, Knockaunatouk, Gort, Co. Galway During Noise Survey

Date	Time	Wind*		Temp (°C)	% Cloud	Rain / Dry
		Speed (m/s)	Direction			
30/05/2018	12:05 – 13:15	0.4 – 0.7	Easterly	22.5	20	Dry

* ≤5m/s – Section 6.4 'Weather Conditions' BS4142:2014

2.3. Sound Level Meter Settings

For all noise measurement recordings, the meter settings were as follows:

- Response : Fast
- Range : 40 – 90 dB
- Weighting : dB (A) – broadband measurements
- dB(Z) – one third octave band measurements

2.4. Noise Measurement Methodology

Measurements were conducted based on procedures outlined in ISO 1996: *Description and measurement of environmental noise*, and, BS4142:1997 *Method for rating industrial noise affecting mixed residential and industrial areas*. All measurements were taken at a distance of 1.2 to 1.5 m above ground level. All measurements were also recorded at a distance not less than 3.0 m from any reflecting surface, excluding ground surface.

2.4.1. Quiet Area Screening

Before completing the noise monitoring investigation, a screening investigation was completed to determine if the site was located in a 'Quiet Area' to ascertain the noise criteria that would be applicable in the area of the site. The screening was conducted as per the EPA guidance "Guidance Note for Noise: Licence Applications, Surveys and Investigations in Relation to Scheduled Activities (NG4)". The results of the initial screening are provided in Table C below.

Table C: Quiet Area Screening Results

	Yes	No
Is the site >3km away from urban areas with a population >1,000 people?	✓	
Is the site >10km away from urban areas with a population >5,000 people?	✓	
Is the site >15km away from urban areas with a population >10,000 people?	✓	
Is the site >3km away from any local industry?		✓
Is the site >10km away from any major industry centre?	✓	
Is the site >5km away from any national primary route	✓	
Is the site >7.5km away from any motorway or dual carriageway		✓
QUIET AREA?		✓

Based on the results of the screening investigation, the Site is not located in a “Quiet Area”

2.5. Low Background Noise Area Assessment

Although not considered to be a Quiet Area under the Environmental Protection Agency definition (see Table E), the site was assessed to determine if it met the criteria to be an area of low background noise as set out in the EPA Guidance Document NG4. To be considered an area of low background noise the following criteria must be met.

- Average Daytime Background Noise Level $\leq 40\text{dB } L_{AF90}$, and;
- Average Evening Background Noise Level $\leq 35\text{dB } L_{AF90}$, and
- Average Night-time Background Noise Level $\leq 30\text{dB } L_{AF90}$.

Because of the limited nature of the assessment there was no baseline noise assessment completed during evening and night time hours at the site when the process was not operational. However, the result for the monitoring completed close to the boundary of the noise sensitive location to the northwest of the site, during daytime hours is provided in Table D.

Table D: Location NSL1 – Daytime Noise Levels To Determine Area of Low Background Noise

Daytime L_{AF90} (dB)	Low Background Noise Area Criteria Satisfied?	
	Yes	No
36.7	✓	

Based on the results of the limited baseline noise assessment the development is located in an area of low background noise and therefore the limits for areas of low background noise set in Section 4.4.2 of NG4, and outlined in Table E below, should be applied.

• Table E: Recommended Noise Limit Criteria for Areas of Low Background Noise

Daytime Noise Criterion, dB $L_{Ar,T}$ (07:00 to 19:00hrs)	Evening Noise Criterion, dB $L_{Ar,T}$ (19:00 to 23:00hrs)	Night-time Noise Criterion, dB $L_{Aeq,T}$ (23:00 to 07:00hrs)
45dB	40dB	35dB

3. SITE NOISE SURVEY RESULTS

The limited noise monitoring programme was completed at the site (i.e., N2 at the edge of sandblasting shed) and at varying distances in the direction of the noise sensitive receptor to the northwest (i.e., N1 and NSL1) and are outlined on the Area Map attached to this report. Noise measurements at the site and in the vicinity of the noise sensitive location were recorded during daytime conditions when the sandblasting operations were running. It should be noted that apart from the sandblasting operations there was little other activity on site (i.e., no painting or loading/unloading of steel taking place that may add to the noise climate when those activities would be taking place). Results for Broadband and 1/3 frequency analysis for the survey measurements completed on May 30th 2018 are provided in Appendix III.

3.1. Location N1 – Field Approximately 90m Northwest of Sandblasting Shed

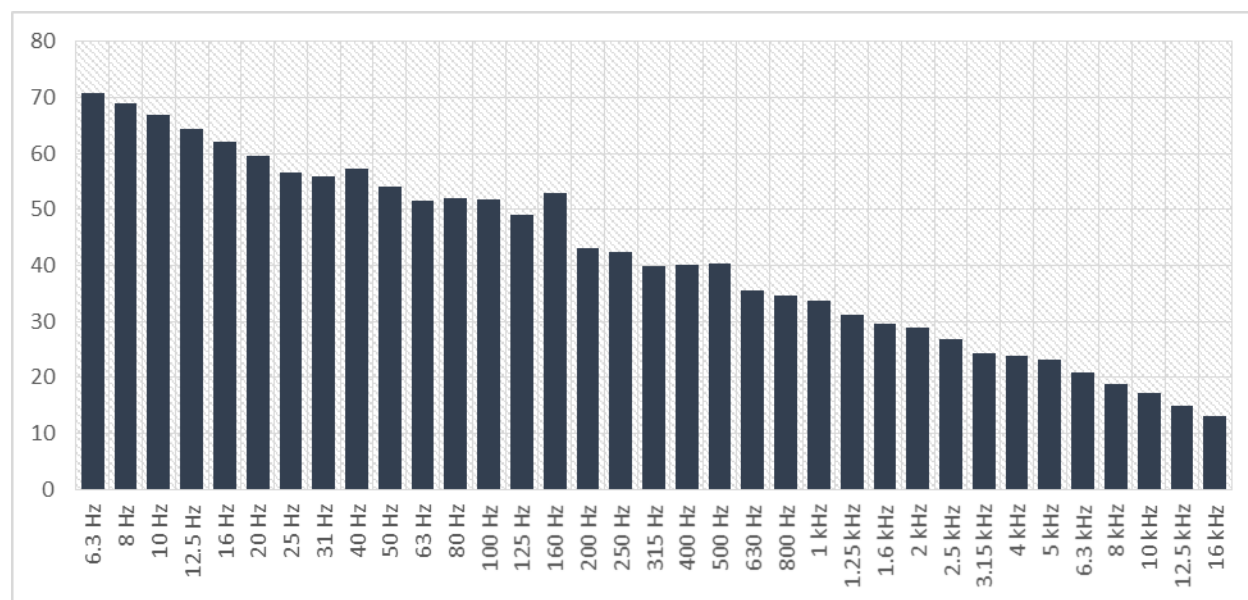
The noise climate in the area was quiet and typical of a rural agricultural setting. The sandblasting operations were audible in the distance and there was influence from intermittent traffic on the L4510 local road to the west.

The measured noise levels during the limited survey period at location N1 are presented in Table F, and the 1/3 octave readings for N1 are presented in Figure 1.

Table F – Noise Measurements at Location N1

Monitoring Period	Monitoring Location	Time	L _{Aeq} (dB)	L _{AF10} (dB)	L _{AF90} (dB)
Daytime					
	N1	11:27-11:37	46.2	49.1	41.9

Figure 1 – Daytime 1/3 Octave Frequency Measurement at Location N1



There was no noted tonal output from the site during the daytime measurement at N1 and the 1/3 octave readings do not indicate any tonal output from the sandblasting operations at N1.

3.2. Location NS1 –Approximately 145m Northwest of Sandblasting Shed

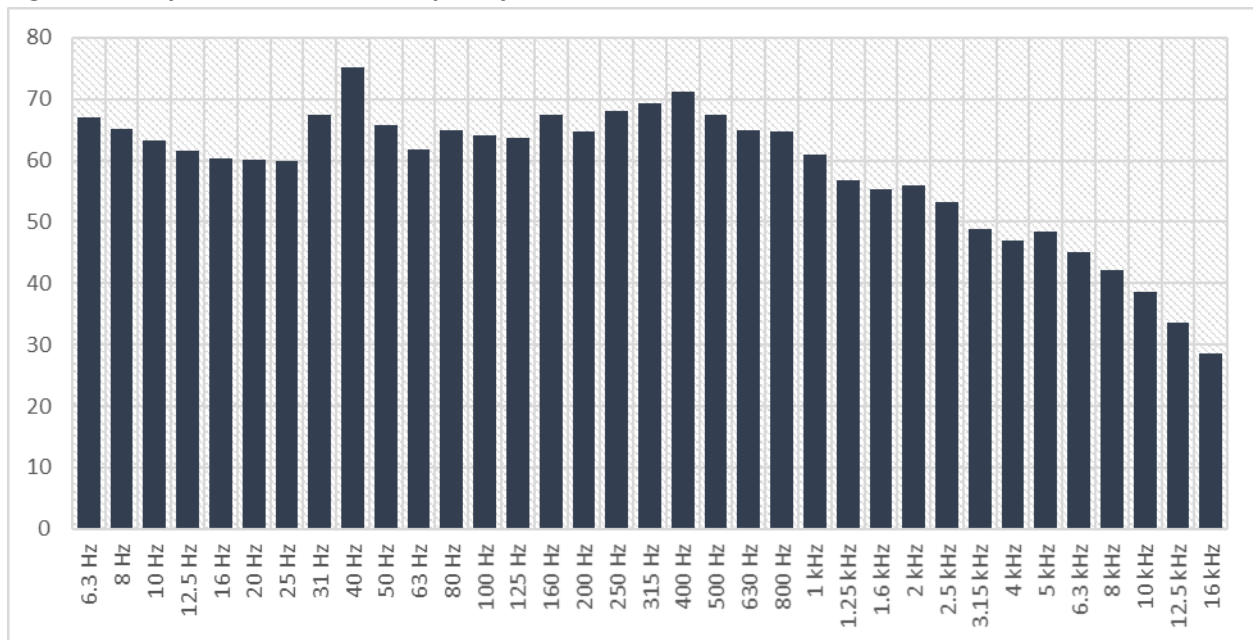
Monitoring location NSL 1 was located approximately 145 meters to the northeast of the sandblasting shed and approximately 10m from the boundary wall with the noise sensitive receptor to the northeast. The sandblasting operation was audible in the distance and there was some influence from intermittent traffic on the L4510 local road to the west and dogs barking in the noise sensitive receptor property.

The measured noise levels during the limited survey period at location NSL1 are presented in Table G, and the daytime 1/3 octave reading for NSL1 is presented in Figure 2.

Table G - Noise Measurement Levels at Position NSL1

Monitoring Period	Monitoring Location	Time	L _{Aeq} (dB)	L _{AF10} (dB)	L _{AF90} (dB)
Daytime					
	NSL1	11:41-11:51	45.4	47.2	36.7

Figure 2 – Daytime 1/3 Octave Frequency Measurement at Location NSL1



There was no noted tonal output from the site during the daytime measurement at NSL1 and the 1/3 octave reading does not indicate any tonal output from the sandblasting operations at NSL1.

3.3. Location N2 – Boundary of Sandblasting Shed

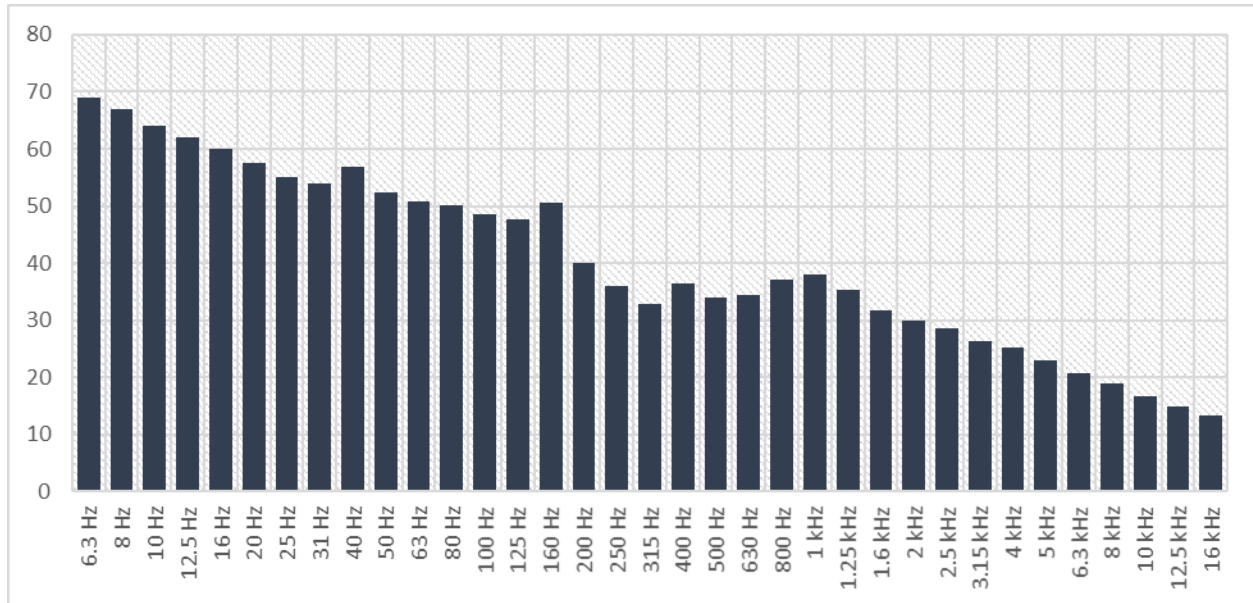
The noise climate in the immediate vicinity of the sandblasting operations was elevated. The northern wall of the shed is open to allow for longer metal pieces being processed to exit the building. Because the northern wall is open it has little noise mitigation when the operation is running. The motors and fans associated with the sandblasting operations were the main noise source during the measurement.

The measured noise levels during the limited survey period at location N2 are presented in Table H, and the 1/3 octave readings for N2 are presented in Figure 3.

Table H – Noise Measurements at Location N2

Monitoring Period	Monitoring Location	Time	L _{Aeq} (dB)	L _{AF10} (dB)	L _{AF90} (dB)
Daytime					
	N2	11:27-11:37	46.2	49.1	41.9

Figure 3 – Daytime 1/3 Octave Frequency Measurement at Location N2



Although the noise levels were elevated at N2 there was no noted tonal output from the operation during the daytime measurement at N2 and the 1/3 octave reading does not indicate any tonal output from the sandblasting operations at N2.

3.4. Conclusions of Limited Noise Survey

The results of the limited noise monitoring programme completed at the site and in the vicinity of the noise sensitive receptor to the northeast on May 30th, 2018 indicated the following:

3.4.1. Location N1 – Field Approximately 90m Northwest of Sandblasting Shed

The daytime L_{Aeq} measurement in the field approximately 90m northwest of the sandblasting shed was 46.2 dB which is only marginally greater than the EPA guideline limit for areas with low background noise. When removing extraneous noise sources (e.g., traffic on the adjacent L4510 road) the L_{A90} measurement was 41.9 dB which is less than the EPA guideline limit for areas with low background noise (i.e., 45 dB $L_{Ar,T}$).

The readings completed indicated no tonal noise impact at N1 from the site operations.

3.4.2. Location NSL1 – Field Approximately 145m Northwest of Sandblasting Shed

The daytime L_{Aeq} measurement in the field approximately 145m northwest of the sandblasting shed and close to the noise sensitive receptor boundary wall was 45.4 dB which is only marginally greater than the EPA guideline limit for areas with low background noise. When removing extraneous noise sources (e.g., traffic on the adjacent L4510 road) the L_{A90} measurement was 36.7 dB which is less than the EPA guideline limit for areas with low background noise (i.e., 45 dB $L_{Ar,T}$).

The readings completed indicated no tonal noise impact at N1 from the site operations.

3.4.3. Sandblasting Shed North Wall Boundary– N2


The daytime L_{Aeq} measurement at the north wall boundary of the sandblasting shed was 72.6 dB which is an elevated output from the site. The noise level was generally consistent throughout the limited survey period with L_{A90} readings of 70.5 dB recorded. The main noise sources in the shed are the motors and fans operating in the shed, however the readings completed indicated no tonal noise output from the motors and fans at N2. Because there is no panelling on the northern wall of the shed (the panelling is not in place to allow for the processing of longer metal pieces) there is no mitigation of the noise from the fans and motors in the shed towards the north of the site.

To mitigate the noise impact from the fans and motors in the sandblasting shed it is recommended that a suitable industrial acoustic curtain barrier be installed along the northern wall of the shed. This would allow for the continued processing of longer metal unit pieces in the shed but would also significantly reduce potential noise impacts from the shed operations to receptors to the north.

DRAWING

- Area Map Showing Noise Measurement Locations



	Client: Coleman Rock	Drawing No: 3282-001	Note: Approximate Noise Measurement Locations. Knockaunatouk, Gort, Co. Galway
	Job No: 3282	Date: 05/06/2018	

APPENDIX I

Calibration Certificate

Calibration Certificate

Certificate Number 2017007719

Customer:

Environmental Measurement

Unit 12

Dublin, 24, Ireland

Model Number LxT SE
Serial Number 0005133
Test Results **Pass**
Initial Condition As Manufactured
Description Sound Expert LxT
Class 1 Sound Level Meter
Firmware Revision: 2.301

Procedure Number D0001.8384
Technician Ron Harris
Calibration Date 20 Jul 2017
Calibration Due
Temperature 23.51 °C ± 0.25 °C
Humidity 50 %RH ± 2.0 %RH
Static Pressure 86.54 kPa ± 0.13 kPa

Evaluation Method **Tested with:** **Data reported in dB re 20 µPa.**
Larson Davis PRMLxT1L. S/N 042864
PCB 377B02. S/N 174133
Larson Davis CAL200. S/N 9079
Larson Davis CAL291. S/N 0203

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.

Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev J Supporting Firmware Version 2.301, 2015-04-30

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001



LARSON DAVIS
A PCB PIEZOTRONICS DIV.

APPENDIX II

Acoustic Parameters

Acoustic Parameters

$L_{Aeq,T}$ is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T). The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources, such as traffic, on the background. the A-weighted equivalent continuous steady sound level and effectively represents an average value.

L_{Amax} is the maximum A-weighted sound level measured during the sample period.

L_{Amin} is the minimum A-weighted sound level measured during the sample period

L_{AF90} is the A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period and will therefore exclude the intermittent features of traffic and is used to describe a background level. Measured using the "Fast" time weighting.

L_{AF10} is the A-weighted sound level which is exceeded for 10% of the sample period; used to quantify traffic noise.

$L_{Ar,T}$ is the Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.

A-weighting is the process by which noise levels are corrected to account for the non-linearity of human hearing.

APPENDIX III

Broadband & 1/3 Octave Band Measurements



Knockaunatouk - May 2018 Noise Assessment Measurements

Noise Measurement at N1 - 90m northwest of Sandblasting Shed - Daytime Operating Hours

Time	Measurement Duration	L _{Aeq}	L _{A5}	L _{A10}	L _{A50}	L _{A90}	L _{Amax}	Comments
11:27-11:37	10 minutes	46.2	50.9	49.1	44.2	41.9	60.6	Motors and fans in shed audible in distance but not considered significant noise. Intermittent traffic on local road.

Measurements were recorded approximately 50m northwest of shed housing the sandblasting operations. The location was in the field between the operation and the noise sensitive receptor to the northwest. Three cars passed on local access road to the west during readings.

Noise Measurement at NSL1 - Field Boundary at Noise Sensitive Location Approximately 145m to Northwest - Daytime Operating Hours

Time	Measurement Duration	L _{Aeq}	L _{A5}	L _{A10}	L _{A50}	L _{A90}	L _{Amax}	Comments
11:41-11:51	10 minutes	45.4	50.3	47.2	40.2	36.7	64.7	Motors and fans in shed audible in distance but not considered significant noise. Intermittent traffic on local road.

Measurements were recorded approximately 75m northwest of shed housing the sandblasting operations. The location was in the field close to boundary of noise sensitive receptor to the northwest. Four cars passed on local access road to the west during readings.

Noise Measurement at N2 - Immediately North of Sandblasting Shed- Daytime Operating Hours

Time	Measurement Duration	L _{Aeq}	L _{A5}	L _{A10}	L _{A50}	L _{A90}	L _{Amax}	Comments
11:57-12:13	15 minutes	72.6	74.6	74.2	72	70.5	84.2	Motors and fans in shed were main noise source. North wall of shed is open and any noise from operations can readily migrate from the building.

Measurements were recorded approximately 1m from open north wall of shed housing the sandblasting operations. The location was in the yard close to potential noise source building.

Measurement Report

Measurement Details

Date and Time: 30/05/2018 11:27
Sound Level Meter Larson Davis SoundExpert LxT

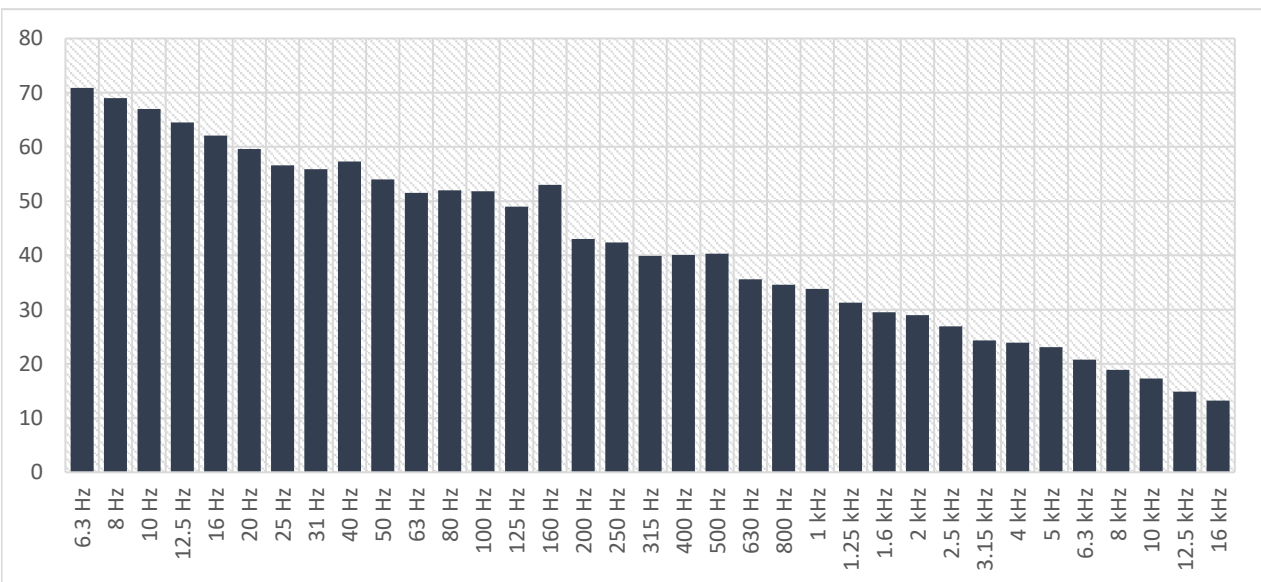
Run Duration 00:10:00
Range 50-110 dB

Location: Metal Treatment Facility in Knockaunatouk, Gort, Co. Galway
N1 - Octave Reading Approximately 90m Northwest of Sand Blasting Shed

Data

Band	LZeq,t	Band	LZeq,t	Band	LZeq,t
6.3 Hz	70.9	100 Hz	51.8	1.6 kHz	29.5
8.0 Hz	69	125 Hz	49	2 kHz	29
10 Hz	67	160 Hz	53	2.5 kHz	26.9
12.5 Hz	64.5	200 Hz	43	3.15 kHz	24.3
16.0 Hz	62.1	250 Hz	42.4	4 kHz	23.9
20.0 Hz	59.6	315 Hz	39.9	5 kHz	23.1
25 Hz	56.6	400 Hz	40.1	6.3 kHz	20.8
31 Hz	55.9	500 Hz	40.3	8 kHz	18.9
40 Hz	57.3	630 Hz	35.6	10 kHz	17.3
50 Hz	54	800 Hz	34.6	12.5 kHz	14.9
63 Hz	51.5	1 kHz	33.8	16 kHz	13.2
80 Hz	52	1.25 kHz	31.3		

Band Leq,t
LAeq 46.2
LCeq 64.6



Measurement Report

Measurement Details

Date and Time: 30/05/2018 11:41
Sound Level Meter Larson Davis SoundExpert LxT

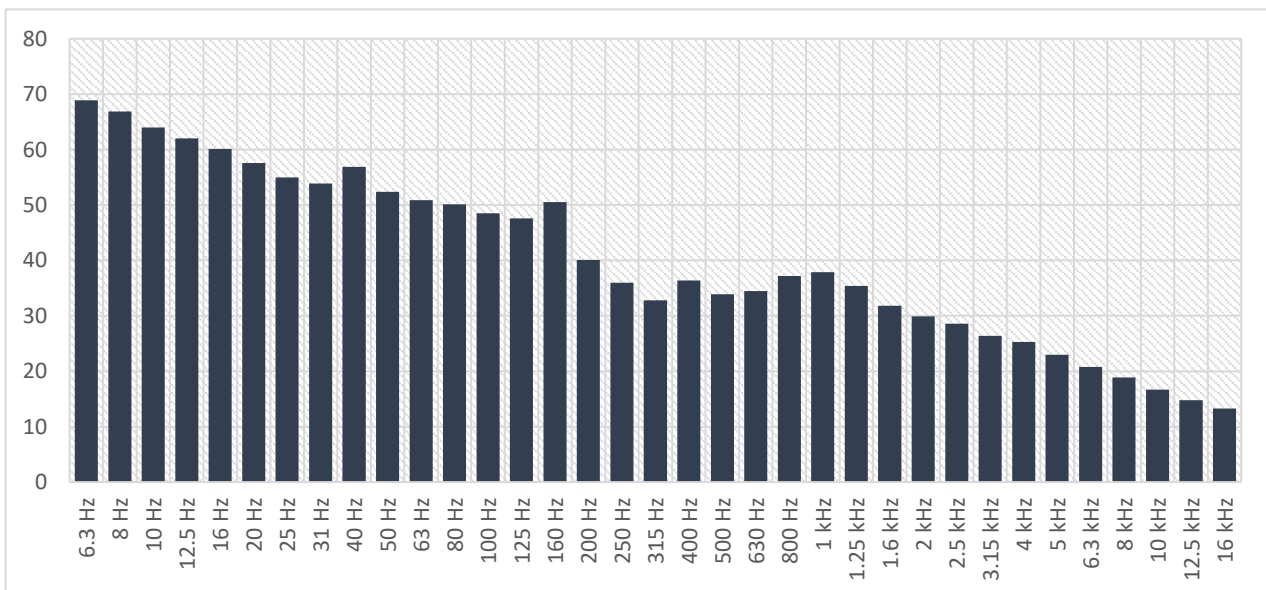
Run Duration 00:10:00
Range 50-110 dB

Location Metal Treatment Facility in Knockaunatouk, Gort, Co. Galway
NSL 1 - Octave Reading Approximately 145m Northwest of Sand Blasting Shed

Data

Band	LZeq,t	Band	LZeq,t	Band	LZeq,t
6.3 Hz	68.9	100 Hz	48.5	1.6 kHz	31.8
8.0 Hz	66.9	125 Hz	47.6	2 kHz	29.9
10 Hz	64	160 Hz	50.5	2.5 kHz	28.6
12.5 Hz	62	200 Hz	40.1	3.15 kHz	26.4
16.0 Hz	60.1	250 Hz	36	4 kHz	25.3
20.0 Hz	57.6	315 Hz	32.8	5 kHz	23
25 Hz	55	400 Hz	36.4	6.3 kHz	20.8
31 Hz	53.9	500 Hz	33.9	8 kHz	18.9
40 Hz	56.9	630 Hz	34.5	10 kHz	16.7
50 Hz	52.4	800 Hz	37.2	12.5 kHz	14.8
63 Hz	50.9	1 kHz	37.9	16 kHz	13.3
80 Hz	50.1	1.25 kHz	35.4		

Band Leq,t
LAeq 45.4
LCeq 62.7



Measurement Report

Measurement Details

Date and Time: 30/05/2018 11:57
Sound Level Meter Larson Davis SoundExpert LxT

Run Duration 00:15:00
Range 50-110 dB

Location Metal Treatment Facility in Knockaunatouk, Gort, Co. Galway
N2 - Octave Reading At North Wall of Sand Blasting Shed

Data

Band	LZeq,t	Band	LZeq,t	Band	LZeq,t
6.3 Hz	67	100 Hz	64.2	1.6 kHz	55.4
8.0 Hz	65.2	125 Hz	63.7	2 kHz	56
10 Hz	63.2	160 Hz	67.4	2.5 kHz	53.3
12.5 Hz	61.5	200 Hz	64.8	3.15 kHz	48.8
16.0 Hz	60.3	250 Hz	68	4 kHz	46.9
20.0 Hz	60.2	315 Hz	69.4	5 kHz	48.5
25 Hz	60	400 Hz	71.3	6.3 kHz	45
31 Hz	67.5	500 Hz	67.4	8 kHz	42.1
40 Hz	75.2	630 Hz	65	10 kHz	38.6
50 Hz	65.7	800 Hz	64.8	12.5 kHz	33.6
63 Hz	61.9	1 kHz	60.9	16 kHz	28.5
80 Hz	65	1.25 kHz	56.8		

Band Leq,t
LAeq 72.6
LCeq 79.5

