



PREPARED: 14 March 2025

CHICHESTER STREET WTS, ROCHDALE

SOUND IMPACT ASSESSMENT

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Project Ref:	AS13808	Project Name:	Chichester Street WTS, Rochdale
Report Ref:	AS13808.250303.R1	Report Title:	Sound Impact Assessment
Client Name:	SUEZ		
Project Manager:	Alec Korchev		
Report Author:	Alec Korchev		
Clarke Saunders Acoustics Winchester SO22 5BE		This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.	

1.0 INTRODUCTION

- 1.1 Planning approval is sought for extended operational hours of the Chichester Street Waste Transfer Station (the Site).
- 1.2 Clarke Saunders Acoustics (CSA) has been appointed by SUEZ to undertake a sound impact assessment of the site operations under the proposed operational hours.
- 1.3 This report describes the survey and assessment undertaken, including acoustic calculations, and its findings.
- 1.4 A glossary of technical terminology relevant to this report is presented in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The site is located in an industrial area in the north-east portion of Rochdale within the Rochdale Metropolitan Borough Council area. A wooded area flanks the Site to the north with residential receptors along Kellett Street beyond, industrial sites surround the site to the east and south, and Roch Vale Caravan Park flanks the Site to the west. As the Roch Vale Caravan Park is nearest and most exposed to sound emissions from the Site, it forms the focus of this assessment. Receptors along Kellett Street to the north have nevertheless been considered as part of this assessment, and a qualitative review is presented in section 5.0
- 2.2 The site operations include: lorries entering and exiting the Site; articulated lorries manoeuvring around the Site; lorries depositing and collecting material; shovelling material around the Site.
- 2.3 With reference to the conditional consent for Application 09/D52305, the following conditions restrict onsite activity:

“1) There shall be no reception or dispatch of waste materials to or from the site except between the hours of 07:00 and 18:00 from Monday to Sunday unless otherwise agreed in writing by the Local Planning Authority.

Reason: In order to safeguard the amenities of the area and to prevent nuisance arising.”

“2) No handling of waste materials shall take place on the site except between the hours of 06:00 and 22:00 from Monday to Saturday and 07:00 to 18:00 on Sundays unless otherwise agreed in writing by the Local Planning Authority.

Reason: In order to safeguard the amenities of the area and to prevent nuisance arising.”

“3) Noise from the plant and equipment used in conjunction with it, when measured within the curtilage of sensitive premises shall not exceed:

- 44 dB(A) leq 1hour to the west of the site
- 42 dB(A) leq 1hour to the north of the site
- 41 dB(A) leq 1hour to the south and east of the site

Between the hours of 07:00 and 19:00 Monday to Saturday;

- 40 dB(A) leq 1hour to the west of the site
- 35 dB(A) leq 1hour to the north of the site
- 36 dB(A) leq 1hour to the south and east of the site

Between the hours of 07:00 and 19:00 on Sunday;

At all other times, noise shall not exceed:

- 40 dB(A) leq 5mins to the west of the site
- 35 dB(A) leq 5mins to the north of the site
- 36 dB(A) leq 5mins to the south and east of the site

The plant shall be operated in accordance with the measures set out in the Noise Impact Assessment that formed Section 12 (pages 119-112) of the Environmental Statement submitted with application D50867.

Reason: In order to safeguard the amenities of the area and to prevent nuisance arising”

2.4 The rationale of condition 3 appears to be rooted in a noise impact assessment produced by others at the time of the initial application. This condition does not consider the current, existing sound levels in the area, nor their likely considerable rise over the past 16 years. This condition is, therefore, ineffective in determining magnitude of impact on nearby receptors. A more current and practical assessment approach is proposed, based on British Standard BS4142:2014+A1:2019.¹

2.5 It is proposed to extend the hours of reception / dispatch of waste materials via HGV associated with the Site and handling of waste materials to 06:00 to 22:00 hours Monday to Sunday (including bank holidays).

2.6 COMPETENCE

2.6.1 The author of this report is a Senior Specialist Consultant at CSA with over 6 years' experience in acoustics consulting. Alec holds a MSc in Architectural and Environmental Acoustics and is a corporate member of the Institute of Acoustics (MIOA).

2.6.2 The report adheres with the principles required by the Institute of Acoustics in their Code of Conduct, and the work is within the author's own area of knowledge and expertise. Where opinions have been expressed these represent true and complete professional opinions on the matters to which they refer.

2.6.3 CSA is a full member of the Association of Noise Consultants (ANC).

3.0 ASSESSMENT METHODOLOGY

3.1 BRITISH STANDARD BS4142:2014+A1:2019

3.1.1 British Standard BS4142:2014+A1:2019 considers the sound from proposed specific sound sources in the context of the existing background sound climate to determine magnitude of impact. The methodology provides guidance on the potential interpretation of impact and is a reasonable methodology to identify the need for noise mitigation measures.

3.1.2 A summary of the BS4142:2014+A1:2019 methodology is presented in Appendix B.

¹ British Standard BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*

4.0 ENVIRONMENTAL SOUND SURVEY

4.1 PROCEDURE & EQUIPMENT

- 4.1.1 A survey of existing noise levels was undertaken at the location shown in the attached indicative site plan AS13808/SP1.
- 4.1.2 Measurements of consecutive 5-minute L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were taken between 09:00 hours on Thursday 6 February and 15:00 hours on Thursday 13 February 2025.
- 4.1.3 The following equipment was used during the course of the survey:
- 1 no. Rion data logging sound level meter type NL52; and
 - 1 no. Rion sound level field calibrator type NC74.
- 4.1.4 The calibration of the monitoring equipment was verified before and after use. No significant calibration drift was detected over the course of the survey period.
- 4.1.5 Measurements were made following procedures in BS7445-2:1991² and BS4142:2014 + A.1:2019.
- 4.1.6 The weather during the survey was generally dry with light winds, which made the conditions suitable for the measurement of environmental sound. Some short periods of light rainfall were identified, but a review of the noise survey data suggests this had a negligible effect on the results.

4.2 RESULTS

- 4.2.1 Figures AS13808/TH1-TH7 show the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels as time histories at the measurement positions.
- 4.2.2 Table 1 provides a summary of the measured background and average sound levels at the monitoring location during the survey. The typical background sound pressure level is derived from the lowest 10th percentile of the L_{A90} dataset per period.
- 4.2.3 For the purposes of this exercise, the measured data for Sunday is expected to be suitably representative of Bank / Public holiday sound levels.

PERIOD	TYPICAL BACKGROUND $L_{A90,5mins}$	AVERAGE SOUND LEVEL $L_{Aeq,5mins}$
06:00 to 07:00hrs Monday to Sunday	46 dB	55 dB
18:00 to 22:00hrs Monday to Sunday	44 dB	54 dB
06:00 to 07:00hrs Sunday	45 dB	53 dB
18:00 to 22:00 Sunday	46 dB	54 dB

² British Standard BS 7445-2:1991 *Description and measurement of environmental noise Part 2 Acquisition of data pertinent to land use*

Table 1: Summary of typical background and average noise levels

[dB ref. 20µPa]

5.0 PREDICTED SOUND IMPACT

5.1 OPERATIONAL SOUND LEVELS

- 5.1.1 CSA library data alongside data from BS5228-1:2009+A1:2014³ has been used to assess the sound emissions of each of the activities at the Site. A summary of the data used for this assessment is presented in Table 2.

ACTIVITY	LEVEL	REFERENCE DISTANCE
HGV Arrival	L _{Aeq} 70 dB	3m
HGV Departure	L _{Aeq} 72 dB	3m
RCV Unloading* ^Δ	L _{Aeq} 86 dB	10m
Roll-on roll-off skip Loading* ^Δ	L _{Aeq} 86 dB	10m
Wheeled Loader Operation ^Δ	L _{Aeq} 71 dB	10m
Wheeled loader shovelling into Articulated HGV ^Δ	L _{Aeq} 79 dB	10m

Table 2: Operational sound levels

[dB ref. 20µPa]

* Data representative of tipping glass to demonstrate absolute worst-case

^ΔActivity is expected to be undertaken inside the shed only

5.2 PREDICTIONS

- 5.2.1 Activities have been confirmed by the Site operators along with their regularity of occurrence. This is detailed as follows:

06:00 to 07:00 hours

- Up to 4no. HGVs entering Site;
- Up to 4no. HGVs leaving Site;
- Up to 4no. HGVs tipping inside shed;
- Up to 1no. Roll-on, roll-off skip loading;
- Up to 2no. Wheeled loader in operation inside shed; and
- Up to 1no. Wheeled loader shoveling material into HGV.

18:00 to 22:00 hours

- Up to 5no. HGVs entering Site;
- Up to 5no. HGVs leaving Site;
- Up to 5no. HGVs tipping inside shed;
- Up to 1no. Roll-on, roll-off skip loading;
- Up to 2no. Wheeled loader in operation inside shed; and
- Up to 1no. Wheeled loader shoveling material into HGV.

³ British Standard BS 5228-1: 2009+A1-2014 *Code of practice for noise and vibration control on construction and open sites Part 1 Noise*

- 5.2.2 Activity during the 06:00 to 07:00 hours period falls within the night-time period, and therefore this review targets a 15-minute assessment period, as per the guidance provided in BS4142:2014+A1:2019.
- 5.2.3 Activity during the 18:00 to 22:00 hours period falls within the daytime period, and therefore this review targets a 1-hour period, as per the guidance provided in BS4142:2014+A1:2019.
- 5.2.4 For both assessment periods, rather than simply dividing the hourly activity by four, a view has been taken on the activity counts and durations that can reasonably be expected within the assessment period. Details of these assumptions are presented in the attached Appendix C.
- 5.2.5 The exact construction of the external building envelope for the waste handling shed is unknown. Based on previous experience with such sites, it is expected that the sound insulation of the shed would be sufficient to suitably control sound breakout, in principle. The weak point in such layouts is often the entrance areas that may remain open for extended periods of times at some sites. This is typically more relevant for sites that face entrances in the direction of nearby noise sensitive receptors, which is not the case for this Site. Nevertheless, for the purposes of this robust review, an assessment of sound breakout through the front entrances has been undertaken. For both robustness and simplicity, the calculation models assume that the sources are located around the entrance way, allowing for distance and screening effects. In reality, additional losses can be anticipated relating to directivity, sound absorption within the sheds (with a stock of material), and minor distance losses between the activity location and the entrance.
- 5.2.6 The activity schedule has been used, alongside the library activity sound level data to calculate the typical 1-hour and 15minute Specific Sound Level (for daytime and night-time periods, respectively) at the nearest noise sensitive receptors along Alder Root and Lucerne Close.
- 5.2.7 The Specific Sound Levels for vehicle movements have been calculated according to each proposed use using the activity sound level data for daytime and night-time period proposals.
- 5.2.8 A character correction of +3dB for impulsivity has been applied to the RCV unloading and to the roll-on, roll-off skip loading on the basis that these activities could be just perceptible at the nearest noise sensitive receptors. The results of the calculations are summarised in Table 3. Detailed calculations are presented in Appendix C.

PERIOD / ACTIVITY	RATING LEVEL	BACKGROUND SOUND LEVEL	ASSESSMENT LEVEL
HGV Movements in and out of Site			
06:00 to 07:00 hrs Monday to Sunday	L _{Ar,Tr} 38 dB	L _{A90} 46 dB	-8
18:00 to 22:00 hrs Monday to Sunday	L _{Ar,Tr} 38 dB	L _{A90} 44 dB	-6
Transfer Loading Station Activity			
06:00 to 07:00 hrs Sunday	L _{Ar,Tr} 42 dB	L _{A90} 45 dB	-3
18:00 to 22:00 hrs Sunday	L _{Ar,Tr} 40 dB	L _{A90} 46 dB	-6

PERIOD / ACTIVITY	RATING LEVEL	BACKGROUND SOUND LEVEL	ASSESSMENT LEVEL
Total Sunday Extension			
06:00 to 07:00 hrs Sunday	L _{Ar,Tr} 42 dB	L _{A90} 45 dB	-3
18:00 to 22:00 hrs Sunday	L _{Ar,Tr} 41 dB	L _{A90} 46 dB	-4

Table 3: Summary of BS4142 assessment

[dB ref. 20µPa]

5.2.9 This exercise demonstrates that in all cases levels are below the representative Background Sound Level, and therefore a low probability of adverse impact is expected, depending on context.

5.3 CONTEXT

5.3.1 The nearby receptors at Roch Vale Caravan Park are subject to a number of sound sources including road traffic along the local road network and miscellaneous commercial activity throughout the neighbouring industrial spaces.

5.3.2 As evidenced by the time histories appended to this report in the attached AS13808/TH1-TH5, no clear 'on' and 'off' periods are readily associable with the existing Site operation. Therefore, it would not be unreasonable to suggest that the sound field at the nearby receptors is predominantly dominated by other sources unrelated to the Site.

5.3.3 Furthermore, the highest contribution in the assessment is due to the RCV unloading and roll-on, roll-off ski loading. The source levels adopted for this activity are based on tipping of glass material. Typical operation is unlikely to be entirely dominated by such activity, and therefore this assessment represents a suitable 'worst-case,' resulting in typical sound levels expected to be lower still.

5.3.4 Receptors to the north along Kellett Street are circa 260m away from the main shed at the Site, circa 130m further than the receptors at Roch Vale Caravan Park and will benefit from the increased distance and ground absorption effects at such distances, however, may be subject to some noise breakout from the front entrances of the shed. The benefit of the increased distance is expected to be tempered in part by the orientation of the entrances relative to the receptor. Existing noise levels along Kellett Street are not expected to be markedly different from those measured representing the Roch Vale Caravan Park, and therefore a similar level of impact would be anticipated, albeit slightly lower.

5.3.5 On the basis of the above, the expectation of a low probability of adverse impact on the basis of the proposals remains.

6.0 UNCERTAINTY

6.1 As per the requirements of BS 4142:2014, the uncertainty in the assessment is considered and reported. This is not an indication of error but an acknowledgment of possible variability of the factors contributing to the assessment.

6.2 Use of a calibrated type 1 sound level meter is considered to reduce measurement instrument error to insignificant levels as compared with environmental variations.

- 6.3 Access to the premises of the nearby noise sensitive receptors was not possible. Measurements were therefore taken at an acoustically equivalent location to the assessment position.
- 6.4 The baseline sound level is based on measurements captured using a 5-minute sampling time. This higher degree of resolution offers a more robust appraisal of the 'typical' background sound level over 15-minute and 1-hour time periods used in the BS4142 assessment.
- 6.5 Due to the variance in demand on the Site, there is uncertainty regarding the exact regularity of individual activities included in the operational scenarios. Where reasonable to do so, pessimistic assumptions have been made in any areas of uncertainty to provide a suitably robust assessment.

7.0 CONCLUSIONS

- 7.1 A sound impact assessment has been undertaken by Clarke Saunders Acoustics for the proposed amended operational times of Chichester Street WTS in Rochdale.
- 7.2 The assessment has been undertaken at the most affected residential receptors considering the cumulative noise of each proposed operational scenario.
- 7.3 Results of an environmental sound survey have established the current background noise climate representative of the nearest noise sensitive receptor.
- 7.4 Following procedures in BS4142:2014+A1:2019, the sound impact assessment shows that adverse impacts are unlikely to occur as a result of the proposals.



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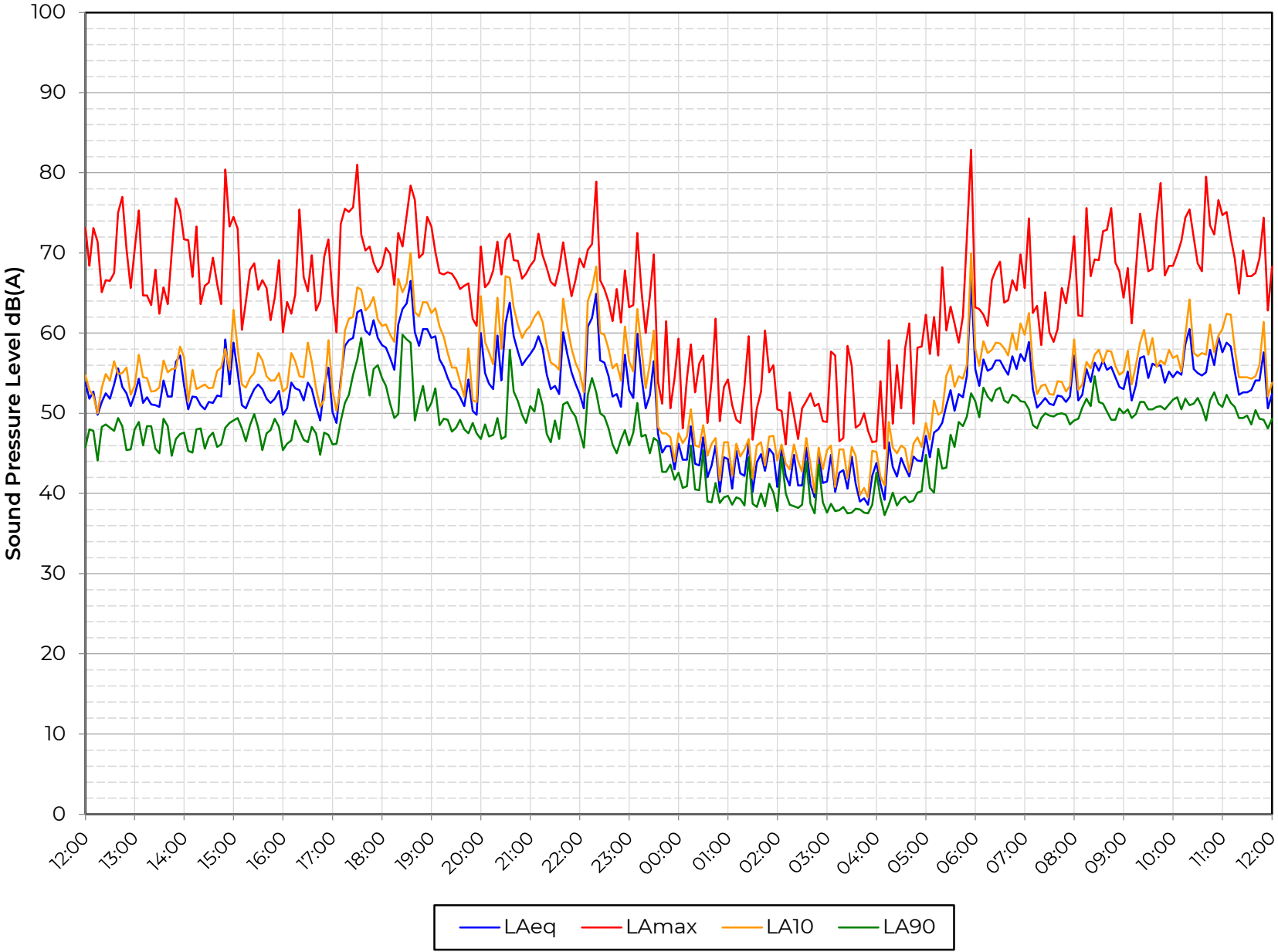


Indicative Site Plan

Figure AS13808/SP1

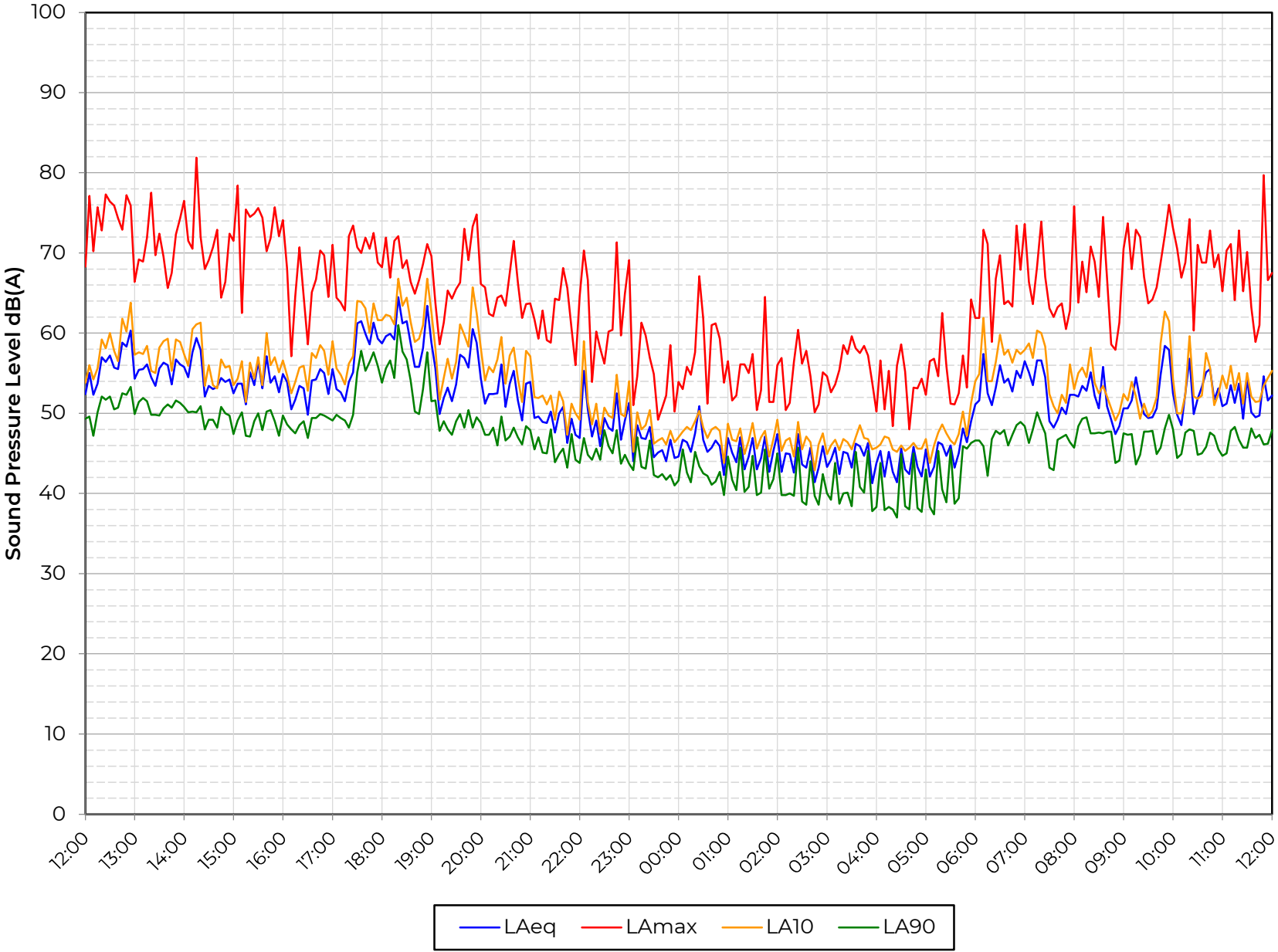
Chichester Street WTS, Rochdale

Position 1



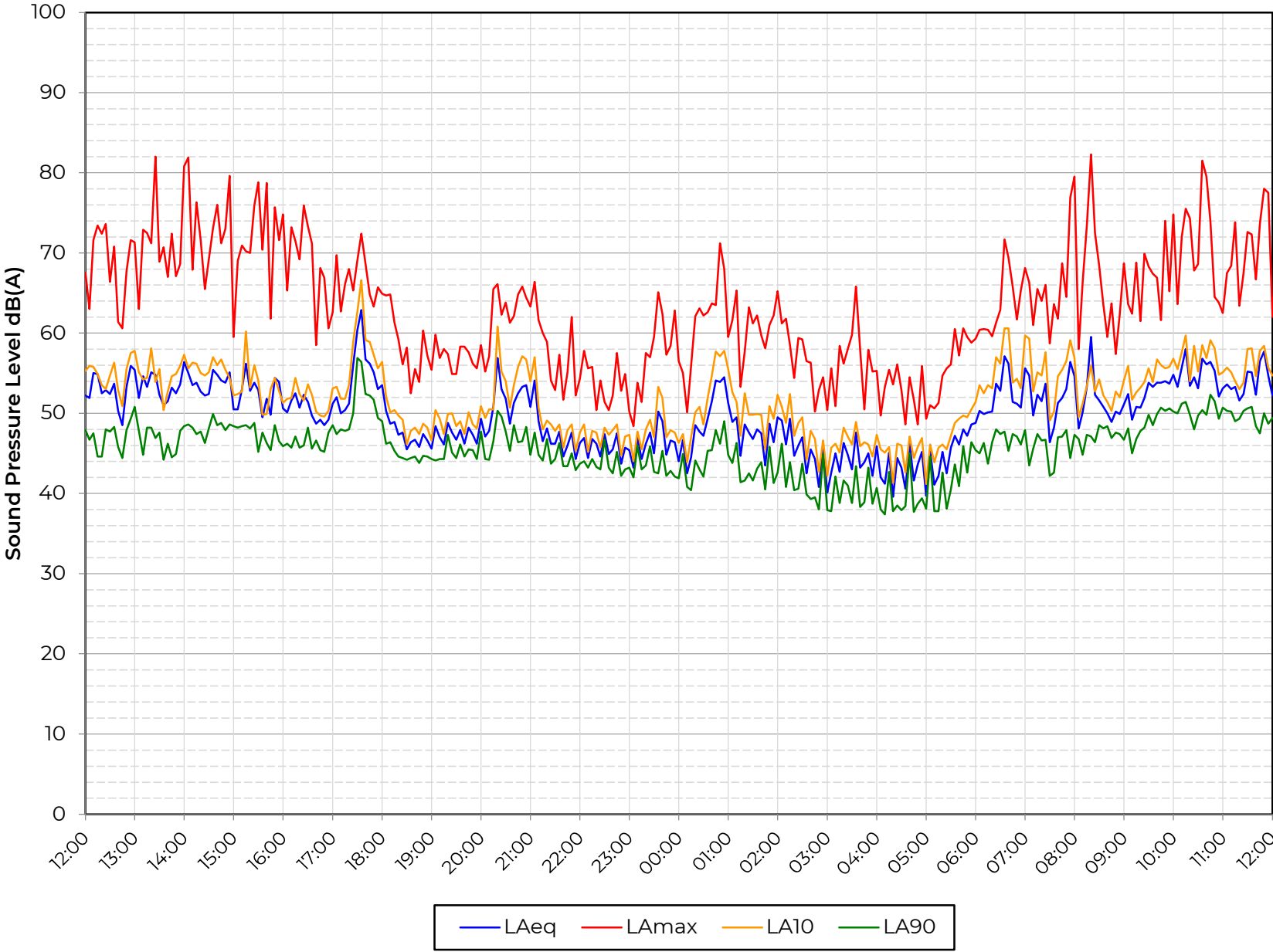
Chichester Street WTS, Rochdale

Position 1



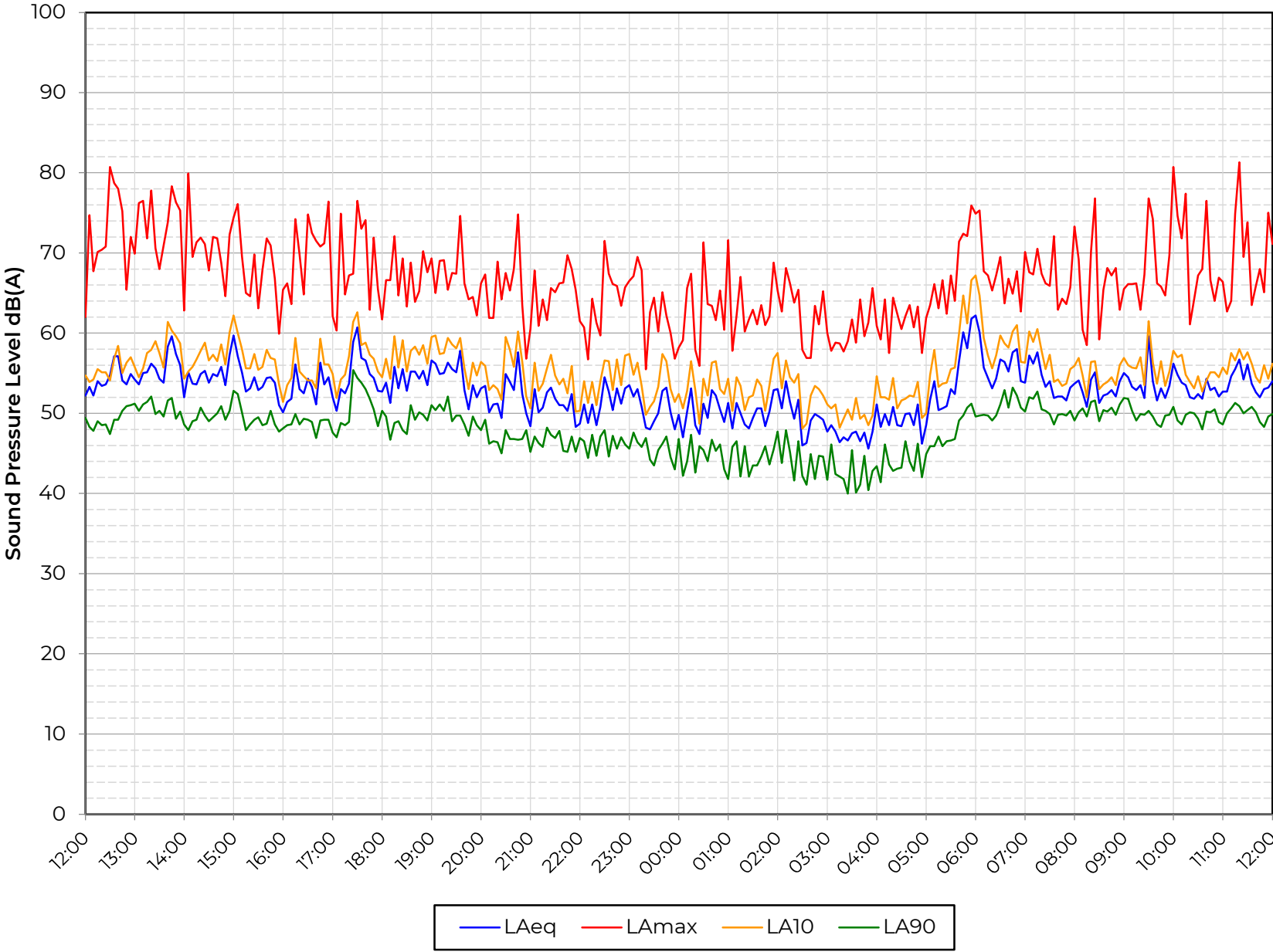
Chichester Street WTS, Rochdale

Position 1



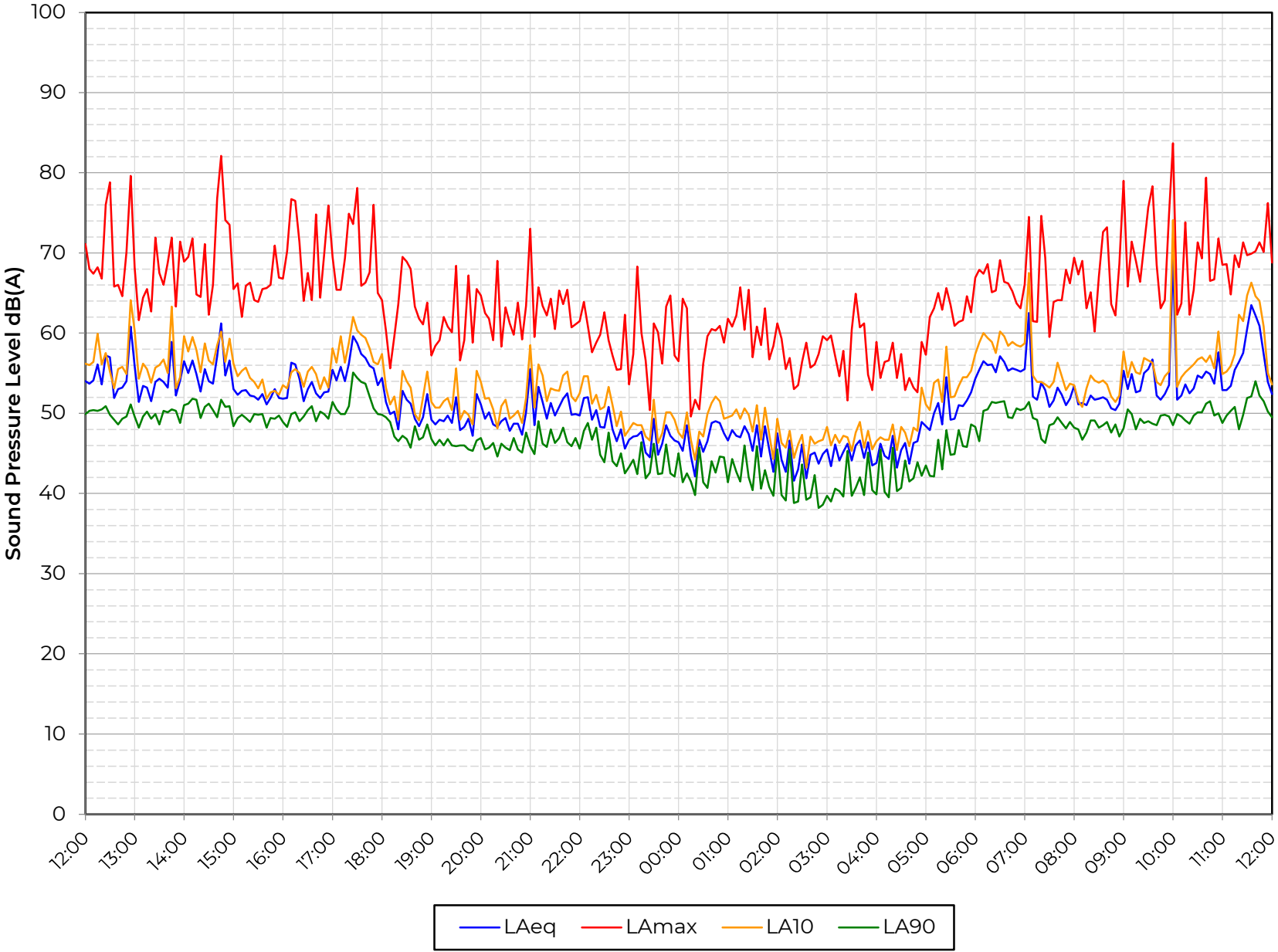
Chichester Street WTS, Rochdale

Position 1



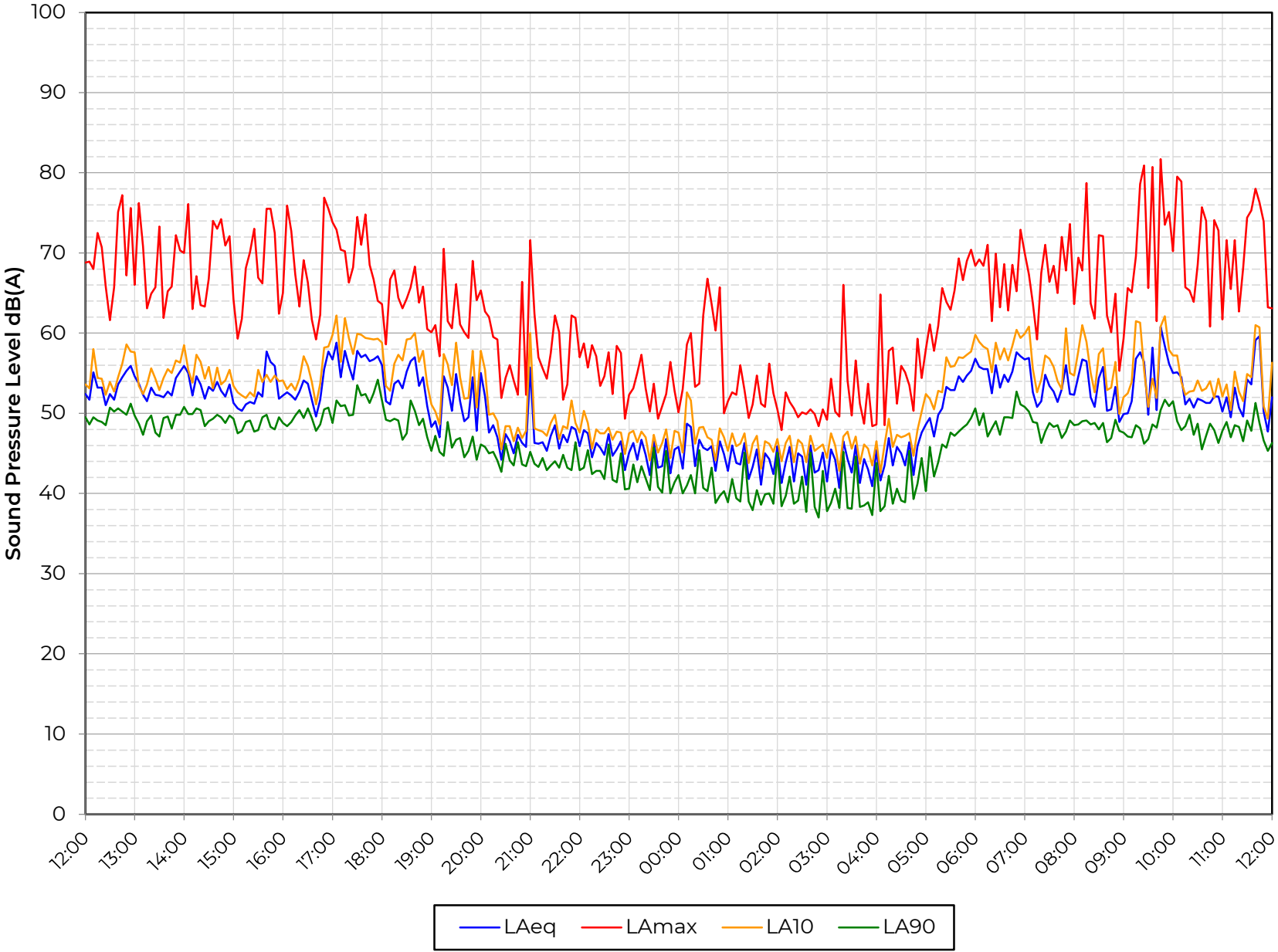
Chichester Street WTS, Rochdale

Position 1



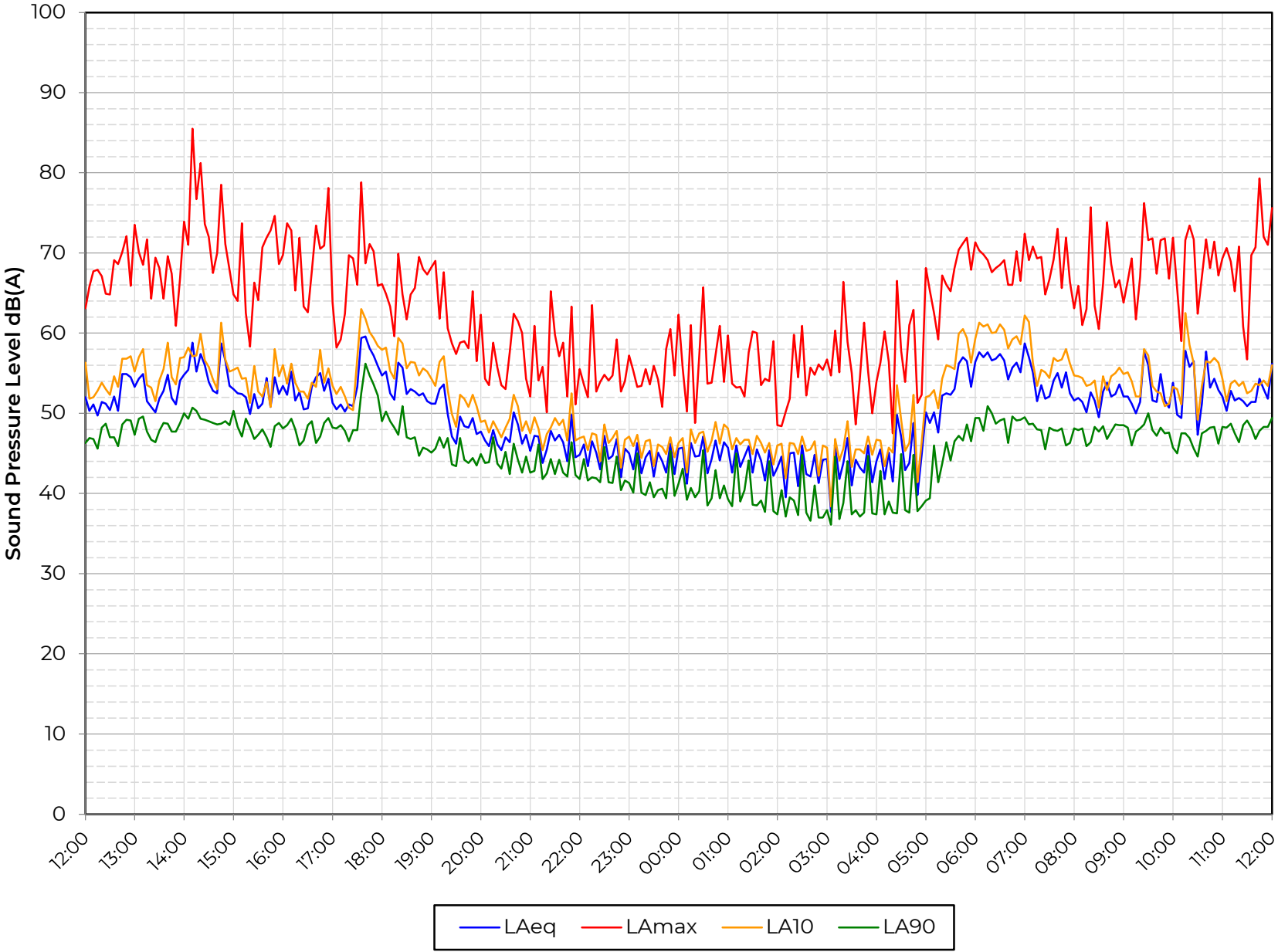
Chichester Street WTS, Rochdale

Position 1



Chichester Street WTS, Rochdale

Position 1



Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A .
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90}:	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max}:	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band.

In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
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Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.

BS4142 is designed to allow contextual assessment of impact from commercial, or industrial sound on sensitive receptors. Examples covered by the Standard include:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

In brief, the assessment procedure involves establishing sound levels from the items or processes of interest, (the specific sound source(s)), corrected for any acoustic features to derive the Rating Level, (L_{Ar,T_r}), at the relevant assessment position(s). The Rating Level is compared against the existing Background Sound Level, ($L_{A90,T}$), to provide an initial estimate of impact. The Standard offers the following guidance with regard to the significance of estimated impact:

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

Where relevant, the initial estimate should then be modified by accounting for contextual aspects of the operation of the specific sound source and / or the context of the character of the area.

Other Assessment Parameters and Guidance on Character Corrections

The Specific Sound Level (L_s) is expressed in terms of an L_{Aeq} for a reference time interval, (T_r) of one-hour during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours). The Rating Level is also expressed in terms of the reference time interval, T_r .

The Specific Sound Level can be determined by various means, which can include prediction based on manufacturer's data and accompanying propagation calculations to the assessment position(s). This method could be used, for instance, where the specific sound source is not yet in-situ, or is in-situ but not yet operational.

Where the specific sound source is already operational and in-situ, measurements of the sound climate resulting from both the specific sound source and all other contributing sources, (known as the Ambient Sound Level, $L_a = L_{Aeq,T}$) should be measured over a representative time period, ideally at the assessment position(s).

Depending on the relative contribution of other sources not related to the specific sound, (known as the residual sound), the Specific Sound Level can be derived by logarithmically subtracting the Residual Sound Level, $L_r = L_{Aeq,T_r}$, from the Ambient Sound Level.

With justification, representative proxy locations can be used for the measurement of the ambient and/or residual sound climate. Where these measurement locations are not fully representative of the assessment position(s), measurement can be supplemented with calculation.

The Background Sound Level should ideally also be measured at the assessment position(s) but can be measured at representative proxy locations where suitable reasons can be provided. The Background Sound Level should be measured over a period which is suitable to characterise the background sound climate during the period of interest and should normally be at least 15 minutes.

When deriving the Rating Level from the Specific Sound Level, consideration is given to the character of the sound. The Standard provides several methods for deriving appropriate character corrections, offering the following advice for subjective assessment:

Tonality

For sound ranging from not tonal to prominently tonal, the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be allocated as a penalty of 2 dB for a tone which is just perceptible at the sound receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9dB can be applied for sound that is highly impulsive considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be allocated as a penalty of 3dB for impulsivity which is just perceptible at the receiver, 6dB where it is clearly perceptible and 9dB where it is highly perceptible.

Other sound characteristics

Where the specific sound contains characteristics that are neither tonal nor impulsive, but are otherwise startling, disturbing or incongruous with the residual acoustic environment, a penalty of +3dB can be applied.

Intermittency

When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3dB can be applied.

APPENDIX C

ACOUSTIC CALCULATIONS

Commercial sound impact to receptors at Roch Vale Caravan Park

06:00 to 07:00hrs Monday to Sunday	No. of occurrences	Duration (s)	Distance (m)	SPL (A)	Ref. Distance	Accumulation (dB)	On-time (dB)	Propagation (dB)	Screening (dB)	Specific Sound Level (dBA)	Character	Rating Level (dBA)
HGV Arrival	2	30	80	70	3	3	-15	-29	0	30	0	30
RCV Unloading	2	10	128	86	10	3	-20	-22	-14	33	3	36
HGV Departure	2	30	80	72	3	3	-15	-29	0	32	0	32
Total										36		38

18:00 to 22:00hrs Monday to Sunday	No. of occurrences	Duration (s)	Distance (m)	SPL (A)	Ref. Distance	Accumulation (dB)	On-time (dB)	Propagation (dB)	Screening (dB)	Specific Sound Level (dBA)	Character	Rating Level (dBA)
HGV Arrival	5	30	80	70	3	7	-21	-29	0	28	0	28
RCV Unloading	5	20	128	86	10	7	-23	-22	-14	34	3	37
HGV Departure	5	30	80	72	3	7	-21	-29	0	30	0	30
Total										36		38

APPENDIX C

ACOUSTIC CALCULATIONS

06:00 to 07:00hrs Sunday	No. of occurrences	Duration (s)	Distance (m)	SPL (A)	Ref. Distance	Accumulation (dB)	On-time (dB)	Propagation (dB)	Screening (dB)	Specific Sound Level (dBA)	Character	Rating Level (dBA)
HGV Arrival	2	30	80	70	3	3	-15	-29	0	30	0	30
HGV Departure	2	30	80	72	3	3	-15	-29	0	32	0	32
Sub total										34		34
RCV Unloading	2	10	128	86	10	3	-20	-22	-14	33	3	36
Roll-on roll-off skip Loading	10	1	128	86	10	10	-30	-22	-14	30	3	33
Wheeled Loader Operation	1	135	128	71	10	0	-8	-22	-14	26	0	26
Wheeled Loader Operation	1	1800	128	71	10	0	3	-22	-14	37	0	37
Wheeled loader shovelling into Articulated HGV	1	135	128	79	10	0	-8	-22	-14	34	0	34
Sub total										41		42
Total										41		42

18:00 to 22:00hrs Sunday	No. of occurrences	Duration (s)	Distance (m)	SPL (A)	Ref. Distance	Accumulation (dB)	On-time (dB)	Propagation (dB)	Screening (dB)	Specific Sound Level (dBA)	Character	Rating Level (dBA)
HGV Arrival	5	30	80	70	3	7	-21	-29	0	28	0	28
HGV Departure	5	30	80	72	3	7	-21	-29	0	30	0	30
Sub total										32		32
RCV Unloading	5	20	128	86	10	7	-23	-22	-14	34	3	37
Roll-on roll-off skip Loading	10	1	128	86	10	10	-36	-22	-14	24	3	27
Wheeled Loader Operation	1	540	128	71	10	0	-8	-22	-14	26	0	26
Wheeled Loader Operation	1	1800	128	71	10	0	-3	-22	-14	31	0	31
Wheeled loader shovelling into Articulated HGV	1	540	128	79	10	0	-8	-22	-14	34	0	34
Sub total										38		40
Total										39		41