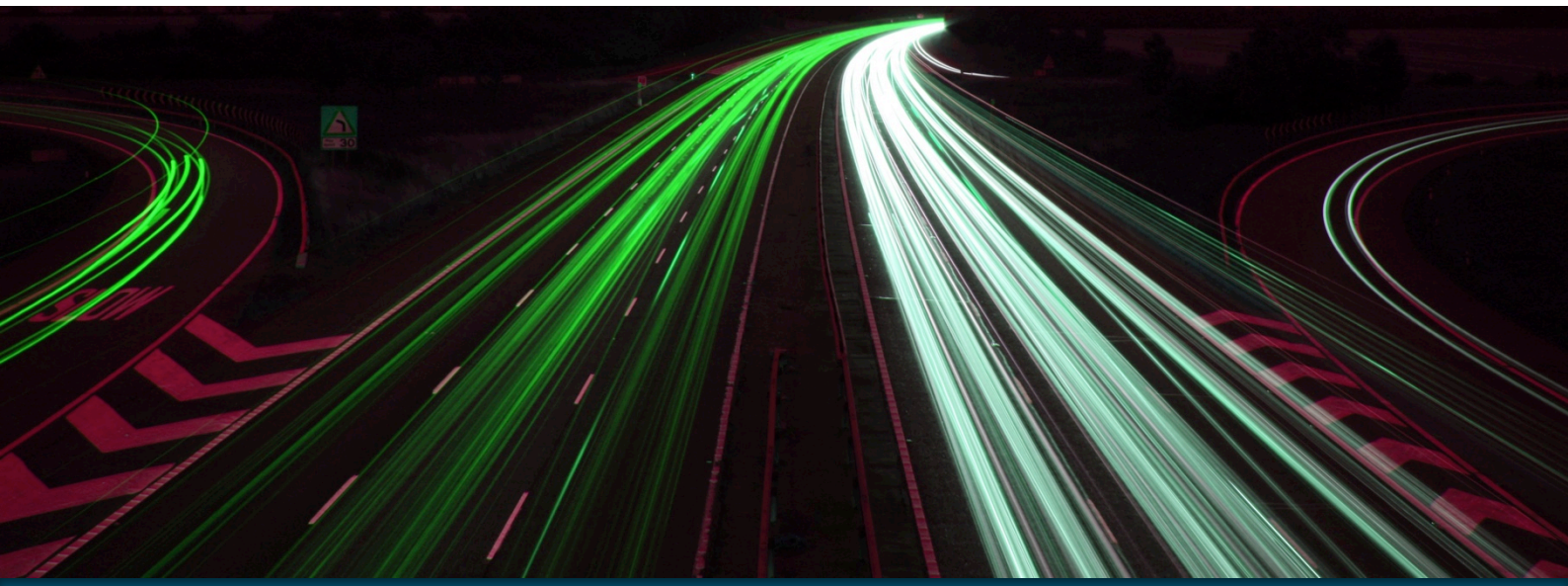


Noise Assessment Report

Report: 4343-R1 – New Plant at Proposed Retail Store, Nanny Marr Road, Darfield, Barnsley, S73 9AD

Client: Ackroyd & Abbott Ellin House, 42 Kingfield Road, Sheffield, S11 9DZ

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Report Revisions	*Date*		
4343-R1	16/11/2020	Initial Report	
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1. Introduction

Clover Acoustics Ltd has been commissioned by Ackroyd & Abbott to undertake a BS4142 noise assessment of a proposed plant area to be installed to service a new food store at Nanny Marr Road, Darfield, Barnsley, S73 9AD. The purpose of the assessment is to assess the potential noise impact of the proposed plant on nearby proposed residential dwellings.

It is understood that currently agreement has been reached with the Local Authority for delivery hours of 8am-6pm Mon-Fri and 8am to 2pm on Saturday, with no deliveries on Sunday.

The purpose of this report is to demonstrate that extended hours could be operated without undue impact on the proposed nearest residential dwellings. The proposed delivery hours are: 8am-8pm Mon-Fri, 8am-4pm Sat and 10am-2pm Sunday. It is considered that of the proposed hours it is reasonable to assume that the proposed Sunday aspect will represent a worst-case situation.

A baseline noise survey has been carried out during a representative period in order to establish the existing background levels. The survey was undertaken during a typical proposed operational hours period. As the site is currently an active building site the background survey was conducted at one monitoring location commencing on Sunday 8th November 2020 which was deemed to be representative of a low background noise scenario in the context of the additional opening hours being addressed in this report.

2. Scope

BS4142:2014 Methods for rating and assessing industrial and commercial sound.

BS4142 gives a method for rating sound from industrial and commercial sources affecting people inside or outside dwellings or premises used for residential purposes. An initial estimate of the significance of the sound from the industrial/commercial nature can be assessed by subtracting the measured background noise level from the rating level (this is the specific sound level of the source with any corrections or penalties for distinctive acoustic characteristics). Typically, the greater the difference, the greater the magnitude of the impact.

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or 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.

3. Site Description

The proposal is for new condenser units to service the proposed retail store at Nanny Marr Road, Darfield. The proposed installation will be located opposite a new build residential area in a plant compound.

The proposal is to install 1 x Mitsubishi (Shop Floor) twin condenser with a performance of 57dB(A)@1m, 2x Mitsubishi units (Sales Floor) with a performance of 51dB(A)@1m and 1x Mitsubishi unit (Cash Office) with a performance of 50dB(A)@1m as per the attached standard pack specification presented in the Appendix. The units are to be installed to the plant compound and delivery area to the north of site as indicated in figure 1 below. The nearest sensitive receiver will be a new residential dwelling approximately 20m to the east of the proposed site. It is proposed that the plant compound be screened with a close boarded 2.2 meter wooden fence

Subjectively, the background noise was dominated by road traffic noise from surrounding area.

Figure 1 shows the site location, background monitoring location and proposed unit location. Figure 2 identifies the site location plan.



Figure 1 – Site Location with Background Monitoring Location



Figure 2 – Proposed Site Location Plan

4. Survey Information

Measurement Instrumentation

The measurement instrumentation used on the survey was as follows:

Equipment	Manufacturer & Type	Serial Number	Calibration Certificate
Sound Level Meter	Norsonic 139	1392706	35949
Acoustic Calibrator	Norsonic 1251	32856	20/1286

The equipment was calibrated to comply with section 4.2 of BS7445:1-2003 before and after the surveys. The calibration was as follows:

Meter	Serial	Before		After	
Norsonic 139	1392706	113.9	-27.0	113.9	-27.0

Measurements & Timescales

As the site is currently an active building site the background survey was conducted at one monitoring location commencing on Sunday 8th November 2020 which was deemed to be representative of a worst-case scenario in the context of the additional opening hours being addressed in this report. Manufacturers technical data will be used for the specific sound source level.

The following measurements are reported: $L_{Aeq,T}$, $L_{A90,T}$, $L_{Amax,T}$

The measurements and their interpretation shall be in accordance with BS 7445: Parts 1 and 2. All sound pressure levels are in dB (re 20µPa).

Meteorology

Wind speed measurements were recorded during the background survey close to the noise monitoring location. The average wind speed measurements were below 5m/s^{-1}.

Temperature was recorded at 6-8°C during the background survey. Conditions were dry throughout the measurement period.

Position of Monitoring Equipment

The equipment was mounted at a location representative of the nearest receiver location. Figure 4 shows the site location plan.

5. Survey Results

Background Summary

The following table shows a summary of the background noise levels monitored. The reported results represent the free field sound pressure levels at the receivers. The lowest background level recorded during the survey was 38dB L_{A90}.

Site: Proposed Retail, Nanny Marr Road, Barnsley, S73 9AD
Table: 1 - Monitoring Position 1
Report: 4343-R1 Survey Date: 08/11/2020

Hourly Summary

Time	LAeq,5min	LA90,5min	LAMax,5min	Comments
10:00	49.0	40.0	60.2	
10:05	47.4	39.4	59.3	
10:10	46.8	39.1	58.0	
10:15	44.4	38.8	47.2	
10:20	43.7	38.6	48.8	
10:25	45.2	38.2	53.6	
10:30	43.7	38.0	49.6	
10:35	46.8	38.0	53.9	
10:40	44.5	38.0	50.0	
10:45	42.7	37.9	46.2	
10:50	42.4	38.2	46.6	
10:55	43.2	38.1	53.4	

LAeq,1hour	Lowest LA90,5min	LAMax,1hour
45.5	37.9	60.2

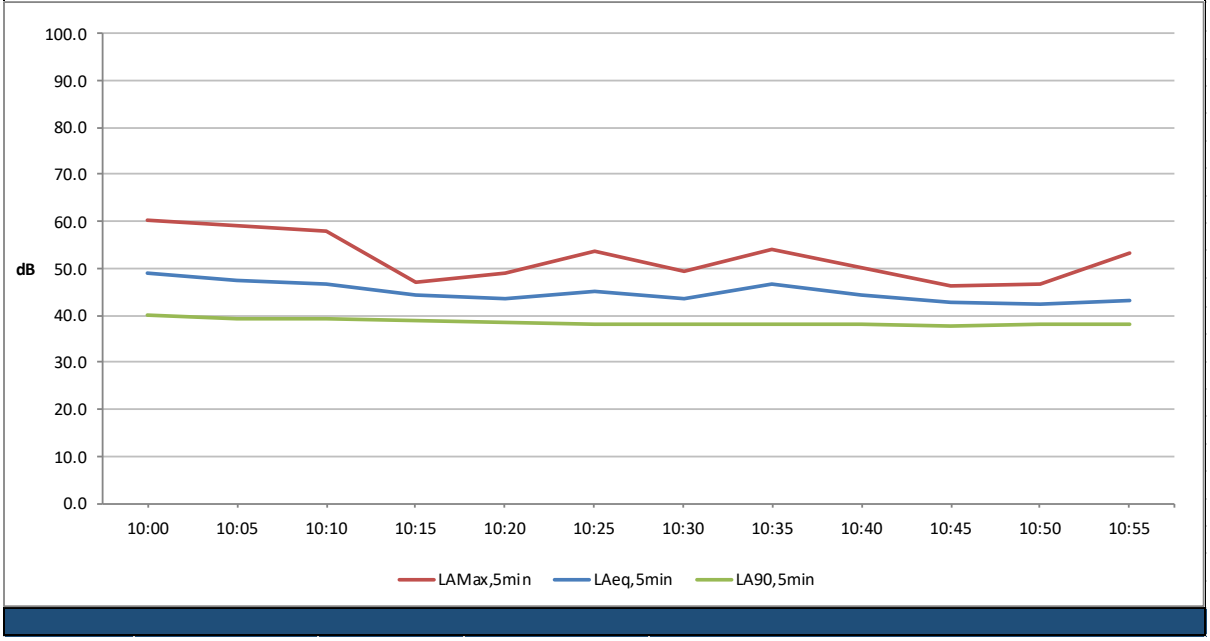


Table 1 – Background Monitoring Summary

6. Noise Assessment

BS4142:2014 – Methods for rating and assessing industrial and commercial sound – External Operation

Specific Source

The proposed outdoor condenser units have been identified as:

- 1 x Mitsubishi (Shop Floor Twin) with a performance of 57dB(A)@1m
- 2x Mitsubishi (Sales Floor) units with a performance of 51dB(A)@1m
- 1x Mitsubishi unit (Cash Office) with a performance of 50dB(A)@1m

The lowest background level monitored during the survey was 38dB $L_{A90,5min}$.

Acoustic Feature Correction

BS4142:2014 allows a character correction to be applied to the specific sound level where acoustic features are present at the assessment location. BS4142 considers that certain acoustic features can increase impact of a new noise source over that expected from a straight comparison between the specific noise level and the background noise level. These features and the penalties applied to calculate a rating level when assessing subjectively as defined by BS4142 are as follows:

Tonality: For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 and +6dB for tonality.

- 2dB for a tone that is just perceptible
- 4dB where it is clearly perceptible
- 6dB 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 change in sound level and the overall change in sound level.

- 3dB just perceptible impulsivity
- 6dB clearly perceptible impulsivity
- 9db highly perceptible impulsivity

Intermittency: Where the specific sound has identifiable on/off conditions the specific sound level should be representative of the time period of length equal to the reference time period which contain the greatest amount of ‘on’ time.

If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

Distinctive: Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive from the residual acoustic environment a 3dB penalty can be applied.

Corrections Applied: No frequency data is available to assess potential tonality of the specific unit, therefore it would in our view be prudent to apply a 4dB penalty for a clearly perceptible tone at the receivers. Typically air handling equipment & condensing units would not be considered impulsive.

In normal operation the equipment would not switch on/off several times within the reference time period and as such would not be considered intermittent.

Context

The proposed unit installations are within a predominantly residential area. Typically condensing units would be seen to be within context for a small supermarket development in a residential area.

Screening Attenuation

Screening of the installations to prevent line of sight to the source would reduce noise levels at the receiver. Screening attenuation will vary depending on the individual source and receiver combinations. For the assessment purposes 5dB screening attenuation has been applied. Calculation sheets are available in the appendix.

Distance Attenuation

The nearest receivers are located approximately ~20m to the proposed units. Distance attenuation for the units has been calculated according to the following formula:

$$L_{p2} = L_{p1} + 20\log\left(\frac{r_1}{r_2}\right) + 3$$

BS4142 Assessment 1

Considering the condenser sources, the predicted specific level of the units at the nearest sensitive receiver gives a predicted rating level of 35dB(A). The lowest measured operational background level was measured at 38dB L_{A90}.

BS4142 Assessment 1	dB(A)
1 x Mitsubishi (Shop Floor Twin) with a performance of 57dB(A)@1m	57
2x Mitsubishi (Sales Floor) units with a performance of 51dB(A)@1m	54
1x Mitsubishi unit (Cash Office) with a performance of 50dB(A)@1m	50
SPL Total	59
Acoustic Feature Correction	4
Distance Attenuation (1/20)	-23
Barrier Attenuation	-5
Rating Level at Receiver	35
Background Level L_{A90}	38
Rating Below Background	-3

According to BS4142:2014, "*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 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*".

Other considerations – Deliveries

The assessment of delivery noise can vary dependent upon vehicle type, delivery methodology and local in store training and internal practices.

Following trials, the Department for Transport published - *Quiet Deliveries Good Practice Guidance – Key Principles and Processes for Retailers* in 2014. The document relates to the introduction of extended delivery hours, but the noise management practices identified within Appendix A of the document are equally applicable in the sensitive noise management of all deliveries and are reproduced in the Appendix.

7. Conclusion

A noise assessment has been carried out at the site of proposed new condensing units to the north of the proposed food store at Nanny Marr Road, Darfield, Barnsley, S73 9AD to assess the existing background sound climate and potential impact on the nearest receivers. A background survey was conducted on Sunday 8th November 2020 at a location representative of the nearest sensitive receivers.

An assessment has been made in accordance with BS4142 which has shown that predicted noise levels from the proposed operations result in a rating level 3dB below the lowest operational background level recorded.

According to BS4142 "*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 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*".



Steve Clow MIOA
Acoustic Consultant

8. Appendix

Glossary of Terms

Specific Noise Source

The noise source under investigation for assessing the likelihood of complaints.

Specific Noise Level, $L_{Aeq,T}$

The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.

Rating Level, $L_{A,T}$

The specific noise level plus any adjustment for the characteristic features of the noise.

Background Noise Level, $L_{A90,T}$

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 % of a given time interval, T.

Residual Noise

The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.

Ambient Noise

Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Reference Time Interval, T

The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.

$L_{Aeq,T}$

The A-weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as the fluctuating sound over a specified measurement period, T.

$L_{A10,T}$

The A-weighted sound level exceeded for 10% of the specified measurement period, T.

L_{Amax}

The highest short duration A-weighted sound level recorded during a noise event.

A-Weighting

The ‘A’ weighting is a correction term applied to the frequency range in order to approximate to the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies.

Octave Band

A frequency band in which the upper limit of the band is twice the frequency of the lower limit.

One-third-octave Band

A frequency band in which the upper limit of the band is 1/3 times the frequency of the lower limit.

Site Plans

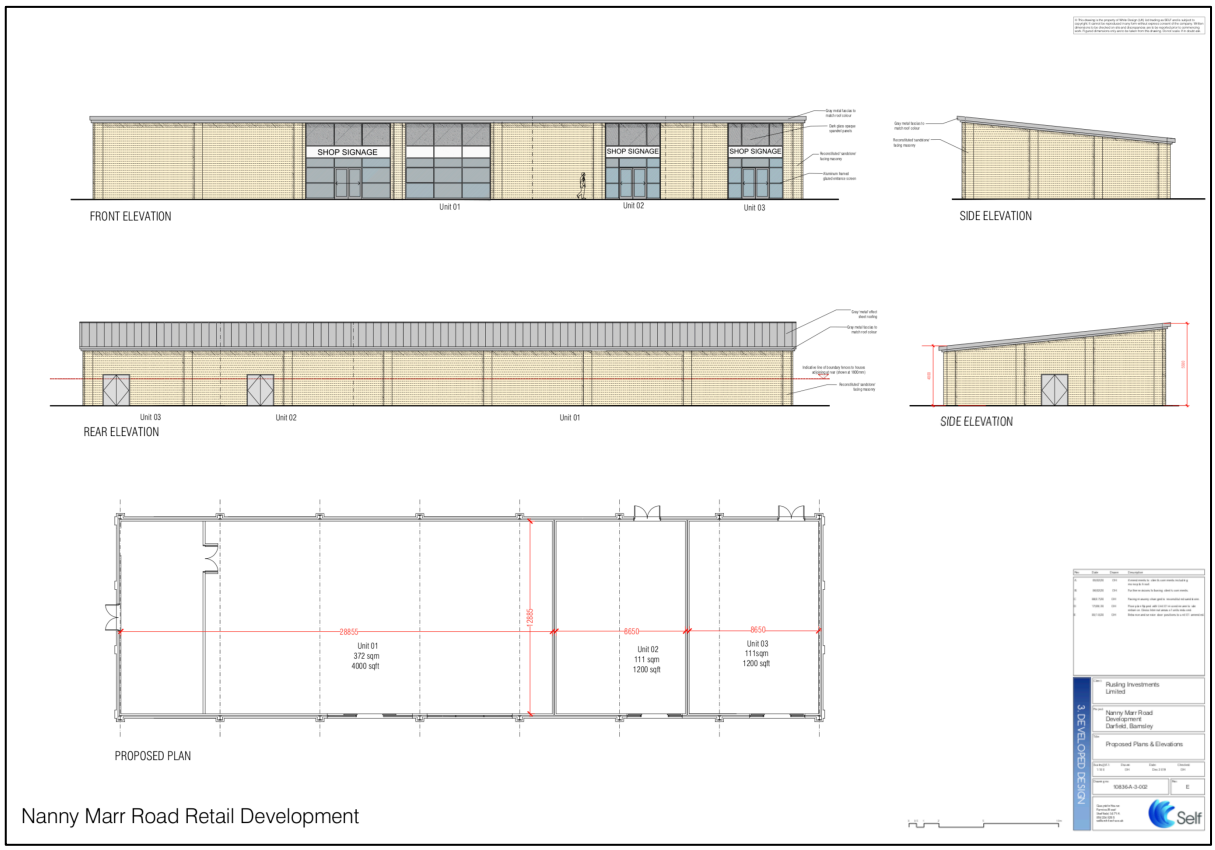
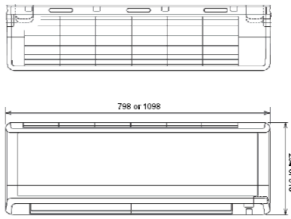


Figure 3 – Site Layout Plan

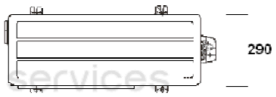
Proposed Unit Specification

Air Conditioning (Cont'd)

Cash office air conditioning units

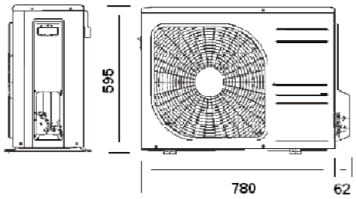


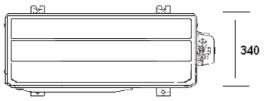
Internal air handling unit



External standard condensing unit

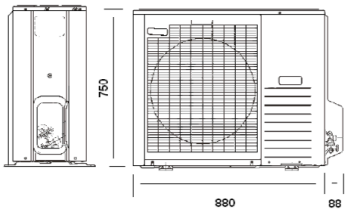






External larger option condensing unit





System	Option	External Unit Dimension (mm)			Weight (kg)	Electrical		Noise dBA @1m
		Width	Depth	Height		Supply (A)	Supply Location	
Cash Office	Interconnecting Services 15m	780(+62)	290	595	38	25 - 1ph	Internal Unit	47
	Interconnecting Services 30m	880(+88)	340	750	59	20 - 1ph	External Unit	50
Shop Floor	2 off Single Units	970	370	845	81	32 - 1ph	External Unit	51
	1 off Twin Unit	970	370	1300	122	25 - 3ph	External Unit	57

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Figure 4 – Proposed Condenser detail

Site: Proposed Condenser Area
Barrier Attenuation
4343-1

Barrier Attenuation

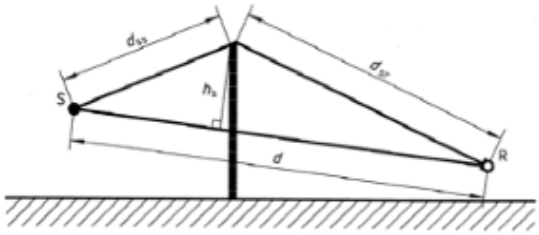


Figure 6 — Geometrical quantities for determining the pathlength difference for single diffraction

from ISO 9613-2:1996

Noise Source				Frequency	Hz	63	125	250	500	1000	2000	4000	8000
Description: AC Plant				Source Spectrum	dB	62.5	55	52.5	50	46.5	43	37.5	30

Barrier Attenuation - Source 1				Frequency	Hz	63	125	250	500	1000	2000	4000	8000
Source to Barrier	1	Receiver to Barrier	18	Barrier Attenuation	dB	5.4	6.0	7.0	8.4	10.4	12.8	15.4	18.2
Source Height	2.27	Receiver Height	4	Effective Attenuation	dB	5.4	6.0	7.0	8.4	10.4	12.8	15.4	18.2
Barrier Height	2			Resultant Spectrum	dB	57.1	49.0	45.5	41.6	36.1	30.2	22.1	11.8
Path Difference	0.068									**Barrier Attenuation**	**dB**		**-6**

Figure 5 - Barrier Calculation

Appendix A

How to introduce a Quiet Deliveries Scheme
Menu of Measures for Retailers and Freight Operators
(based on Transport for London's code of practice for quieter out-of-hours deliveries)

General guidance – activities mainly within your control

- Think about the potential noise impact of any out-of-hours activity on local residents, and review the likely sources and consider how to address these by:
- Using newer and quieter delivery vehicles and equipment, where possible
- Making sure all equipment – both on the vehicle and at the delivery point – is in good working order and maintained or modernised to minimise noise when in operation
- Ensuring all staff involved in delivery activity are briefed and trained appropriately, in accordance with the code of practice
- Ensuring all suppliers and carriers receive copies of the code and are aware of its importance

General guidance – activities that you will need to collaborate on

- Liaising with your local Borough/District Council and contacting the Environmental Health Officer (responsible for noise issues) to explain the plans to manage night-time delivery and servicing activity. This needs to happen in partnership with your key customer/retailer.
- Liaising with your local Borough/District Council and contacting the Planning Department to identify and help address any variations to planning conditions required and the process for carrying this out. This needs to happen in partnership with your key customer/retailer.
- Liaising with clients, colleagues, other local businesses, suppliers and carriers to minimise the likelihood of more than one vehicle arriving at the same time

Ensure all drivers/deliveries/loading/unloading personnel follow the guidance below:

The delivery point

- Ensure delivery bay doors, gates and shutters are well maintained to minimise noise when opening and closing
- Switch off any external tannoy systems
- Avoid using external bells at delivery points
- Switch off the radio when delivery point doors are open
- Ensure the delivery point and surrounding areas are clear of obstructions so vehicles can manoeuvre easily
- Keep doors other than the delivery point closed to ensure noise does not escape
- Where possible, prepare all empty handling units, salvage and returns behind closed doors. Check they are in the correct condition and position and at the

right height before taking them out. This will minimise outdoor activity and unnecessary noise
- Think about how to minimise contact between hard surfaces, particularly metal on metal, during the unloading/loading processes. For example, use rubber matting and buffering material on doors
- Service any delivery equipment in advance to minimise noise
- Make sure the delivery point is ready for the vehicle before it arrives – gates and doors should be open to avoid the vehicle idling
- Make sure the driver knows the precise location of your delivery point and is aware of any local access issues
- Ensure staff do not shout or whistle to get the attention of the driver

The driver

- Plan ahead to ensure you know the location of the delivery point and the appropriate access route
- Adjust or restrict routings for evening/night-time deliveries to avoid housing areas
- If early for your delivery slot, do not wait near residential property and switch off the engine
- As you approach the site and manoeuvre your vehicle into position, remain aware of the effect noise levels can have on local residents
- Do not sound your horn
- Reversing alarms should be switched off or modified for white noise, if not subject to health and safety requirements or localised risk assessment issues (e.g. proximity to a cycle route). Use a qualified banksman instead, if available
- Engines should be switched off immediately when not manoeuvring, however, try to minimise start-ups and avoid over-revving
- Refrigeration equipment should be switched off in advance of arrival at premises
- If the radio is on, ensure the cab windows are closed and switch the radio off before opening the door
- Minimise the frequency of opening and closing vehicle doors, and do so quietly
- Allow extra time if needed to unload as quietly as possible. Take particular care to minimise rattle from metal-on-metal contact when moving roll cages
- Where practical, notify staff at the delivery point in advance of arrival to ensure they are ready for you
- Be aware of how far your voice can carry when talking outside at night
- If opening a gate/cellar flap/roller shutter door to gain access, do so gently and as little as possible
- Lower flaps on tail-lifts carefully and quietly
- Do not whistle or shout to get the attention of store employees
- When moving gates, locks and load restraint bars ensure they are placed gently in their resting position/stowage point – do not drop or drag them on the ground
- When safe to do so, use sidelights rather than headlights while off-road and manoeuvring, to minimise light intrusion
- Minimise excessive air brake noise

- When working in the vehicle load space avoid banging cages into the vehicle walls
- When finished unloading/loading, close up the vehicle quietly
- For keg deliveries, ensure that dropping beds are always used when dropping kegs into and out of the vehicle. If rolling kegs to the delivery point, use rubber matting. Consider using a sack truck with pneumatic tyres to move kegs from the vehicle to the delivery point
- Show the same consideration when leaving the site as when arriving

The full document can be accessed here:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/306853/retailers.pdf