



Noise Impact Assessment

Client: Adam Watson - Parkinson

Site: Rochdale Jobcentre, 2 Fleece Street, Rochdale, OL16 1LT

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Executive Summary

A Noise Impact Assessment has been undertaken at Rochdale Jobcentre, 2 Fleece Street, Rochdale in relation to the proposed installation of an external boiler exhaust flue.

Measurements of the background noise climate were undertaken from the 5th – 6th February 2024 at a position deemed representative of the identified Noise Sensitive Receptors (NSRs).

The nearest or most-affected Noise Sensitive Receptor has been identified as the 1st floor rear window of 7 South Parade.

The flue system is a passive stack, and the proposed boilers are expected to have negligible noise output into the flue system. As an example, a worst-case noise output of 60dB has been considered which would remain significantly below background levels at NSR1.

A further Contextual Assessment was undertaken where potential noise levels from the site have been assessed to the existing noise climate along with other relevant factors and deemed no mitigation necessary as a 'Low Impact' is likely to be achieved corresponding to achievement '*NOEL – No Observed Effect Level*' in the NPSE.

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1. Introduction

Overview

A Noise Impact Assessment has been undertaken at Rochdale Jobcentre, 2 Fleece Street, Rochdale, in relation to the proposed installation of an external flue associated with new internal boilers.

The client has advised that 3 new boilers will be installed within the site which will share a common exhaust flue for the venting of exhaust gases to above roof level externally. The proposed boilers are 'Potterton Commercial – Sirius 3 50kW'.

Manufacturer technical data sheets do not provide noise level data for the boilers. The proposed external flue is a passive system with no fan or other noise generating elements.

An assessment of the proposed plant equipment is to be undertaken to determine whether residents are likely to suffer a loss of amenity as a result of noise from the proposals. Mitigation will be given should any potential loss of amenity be indicated.

Scope & Objectives

The scope of the noise assessment can be summarised as follows:

- Baseline sound monitoring survey to evaluate the prevailing background sound levels at the Noise Sensitive Receptor ('NSR') in accordance with BS7445 - *'Description and Measurement of Environmental Noise'*;
- Detailed sound modelling, acoustic calculations and analysis to predict sound levels at the NSR using industry-standard acoustic modelling software 'SoundPLAN'. This software uses ISO-9613-2 - *Attenuation of sound during propagation outdoors*;
- A contextual assessment for the suitability of the site, in accordance with relevant standards in respect of sound from the proposed sources; and
- Recommendation of mitigation measures where necessary, to comply with the requirements of the National Planning Policy Framework (2021), Noise Policy for England (2010) and British Standard BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound.
- The local authority have requested a noise impact assessment be undertaken.
- Further information on the legislation can be found in **Appendix G**.

2. Environmental Noise Survey

Measurement Methodology

To establish the existing environmental noise levels on site, a noise survey was conducted from the 5th – 6th February 2024. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 5-minute intervals in accordance with BS7445 - *'Description and Measurement of Environmental Noise'*.

The unattended monitoring location (M1) was positioned near to the Western façade of the Job Centre at a height of approximately 2 metres. A -3dB correction has been applied to measured data to account for proximity to the building façade.

The monitoring position is deemed representative of sound levels at 'NSR 1' during the typical operational periods of the proposed development.

Further detail of the measurement along with site pictures is given in **Appendix A**.

Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.

Equipment was calibrated before and after use and no significant drift occurred during measurements. Up-to-date calibration certification can be provided upon request. Full calibration details are provided in **Appendix C**

Daytime temperatures during the survey were noted as between 6 - 9°C with wind speeds typically between 4 - 6m/s; deemed suitable for conducting environmental noise monitoring. Detailed meteorological information can be found in **Appendix D**.

The site, proposed noise source and NSR locations are shown in **Figure 1**.

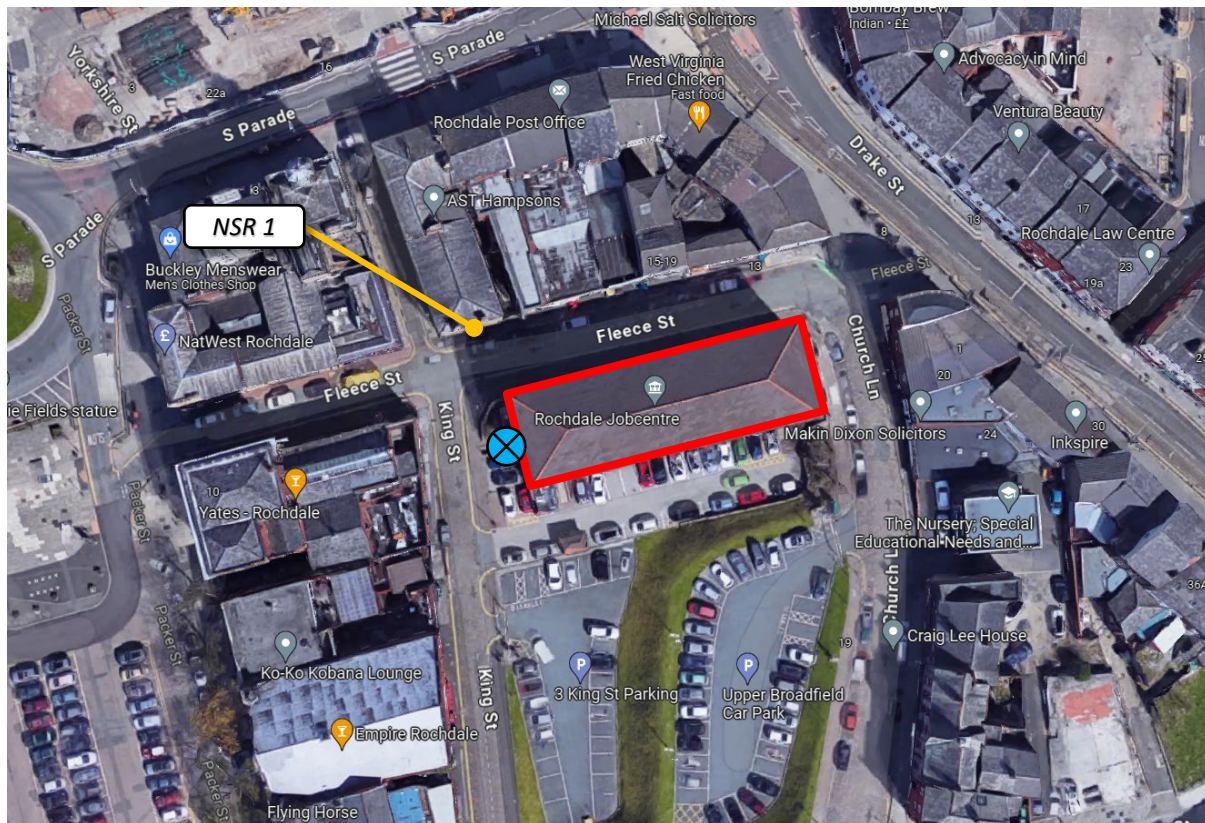


Figure 1: Site, Source & NSR Locations - <https://google.co.uk/maps>

-  Site Boundary (Approx.)
-  Noise Sensitive Receptor (NSR)
-  Background Monitoring Location M1 & Proposed Flue Location

Site Description

The site is Rochdale Jobcentre, a 3-storey commercial building located in Rochdale town centre. To the North, East and West of the site are a mixture of commercial properties including banks, bars, restaurants and offices. To the South of the site is King St and Upper Broadfield Car Park and 'Empire Rochdale', which is a live music venue.

Context and Subjective Noise Climate

Noise Source	Description	Time of Observation	Photo
Groundworks	Workers repairing road nearby. Hand tools and mini digger	Intermittent	
Existing Plant	Vents and external plant to the side and rear of the site including 12 AC units and extract system vents	Constant	

Table 1: Subjective Summary of Noise Sources

Non-Representative Noise Sources

The road works taking place near to the site would not normally be present however this did not go on overnight and does not affect the low night-time background noise level.

Noise Sensitive Receptors

The nearest and most exposed buildings surrounding the site do not appear to have residential uses. For the purpose of the assessment, 1st floor windows to the rear of 7 South Parade have been considered as NSR1.

3. Environmental Noise Survey Results

Measurement Results

The boiler flue is to serve the 3 proposed internal boilers and therefore has the potential to operate at any time of the day or night.

The day and night-time background sound levels from measurement M1 are summarised below.

Measurement	Date(s)	Period	$L_{Aeq,T}$	$L_{A90,T}$
M1	5 th & 6 th February 2024	Daytime (07:00 – 23:00)	60	53
	5 th – 6 th February 2024	Night-time (23:00 – 07:00)	54	52

Table 2: M1 Background Noise Survey Results

A full-time history of the survey data is shown in **Appendix E**.

For the derivation of a representative night-time background sound level, data from the whole night-time period (23:00 – 07:00) has been statistically analysed.

A graph of the statistical analysis for M1 night-time data is given below:

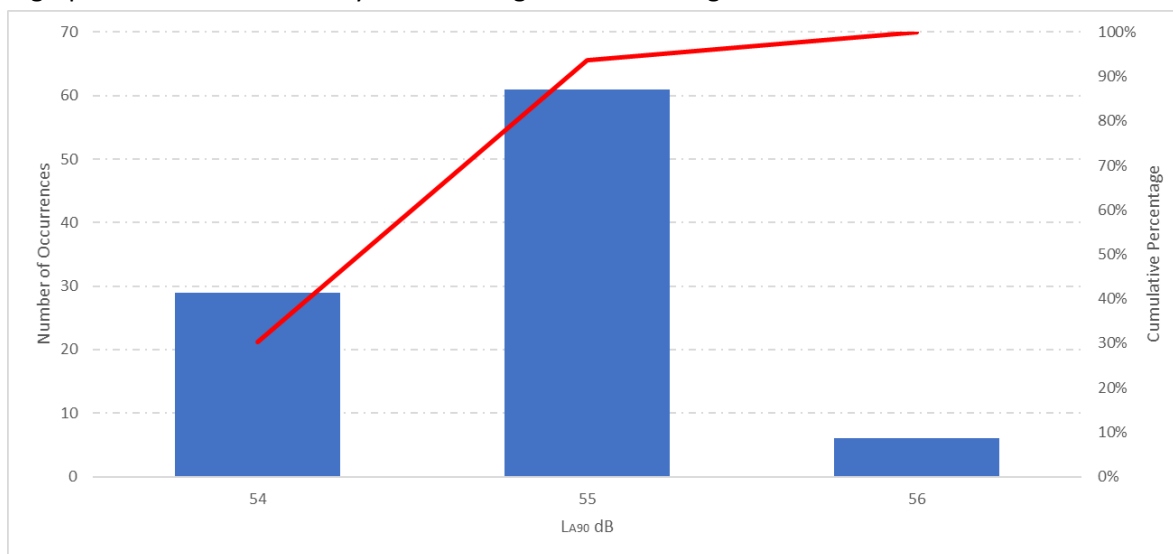


Figure 2: M1 Background Statistical Analysis

From the statistical analysis of the M1 measurement, **52 dB L_{A90}** has been selected as the representative background sound level for the BS4142:2014 assessment at the NSR locations. This takes into account the -3dB correction discussed in section 2.

4. BS4142:2014 Initial Impact Assessment

Source Noise Levels

Noise data is not provided within the manufacturers data for the boilers that are proposed for the site. The units are not dissimilar to a typical domestic condensing boiler. These generally produce a low level of noise within the unit casing which will be contained within the internal plant room/installation area within the site. Review of similar units is also inconclusive for noise output by a boiler into a flue exhaust system.

Information available online gives an approximate range of noise output from boilers of 30 – 60dB in relation to noise levels close to the boiler unit itself.

Taking a worst-case level of 60dB from the boiler into the flue system, which is 11m long and 180mm wide, the noise level output at the flue termination would be ~4dB lower based on a ductwork calculation including a single 90 degree bend.

The assumed NSR is 20m laterally from the site which would give a received level of 34dB at NSR1 using a basic distance attenuation calculation.

The received noise level would therefore be significantly lower (-18dB) than the measured night-time background noise level. Application of rating penalties to the source would still equate to a 'Low Impact' in accordance with BS4142 with rating levels 10dB or more below the existing background noise level.

5. BS4142:2014 Contextual Assessment

Aspects of absolute level

An absolute level of 60dB output by the system has been used as an example in the initial impact assessment. Noise output by the flue is expected to be negligible, similar to a standard domestic condensing boiler with very low noise output externally.

Aspects of character

The site has multiple existing external plant items which were observed to be in constant operation. These are expected to completely mask any noise output by the flue system. Character corrections may be applicable to the flue noise output however these are not expected to change the overall noise impact.

Aspects of the receptor

Nearby NSR's are assumed to be used to the existing external plant items operating at the site. The boiler flue would not be considered as a new type of noise for the area and is not likely to be audible over existing sources.

Contextual recommendations

After analysis of the existing site use in relation to the proposed boiler and flue installation, it is not considered that any mitigation is necessary. Noise output from the system is expected to be very low, with a high level of existing noise masking and distance attenuation to nearest noise sensitive

receptors. It is noted that confirmation of the assumptions made in this report would require noise data to be provided either by specification sheet or verification survey.

6. Conclusion

A Noise Impact Assessment has been undertaken at Rochdale Jobcentre, 2 Fleece Street, Rochdale in relation to the proposed installation of an external boiler exhaust flue.

Measurements of the background noise climate were undertaken from the 5th – 6th February 2024 at a position deemed representative of the identified Noise Sensitive Receptors (NSRs).

The nearest or most-affected Noise Sensitive Receptor has been identified as the rear 1st floor of 7 South Parade.

The flue system is a passive stack and the internal boilers to be installed are expected to have negligible noise output into the flue system. As an example, a worst-case noise output of 60dB has been considered which would remain significantly below background levels at NSR1.

A further Contextual Assessment was undertaken where potential noise levels from the site have been assessed to the existing noise climate along with other relevant factors and deemed no mitigation necessary as a 'Low Impact' is likely to be achieved corresponding to achievement 'NOEL – No Observed Effect Level' in the NPSE.

7. Uncertainty

The background monitoring equipment is subject to a 1dB error margin, however, calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurements.

Uncertainty can arise in the prediction of noise propagation from and around flat reflective surfaces, such as the surrounding structures present on site. This has been reduced to a minimum by utilising an acoustic modelling software that uses the validated method, ISO-9613-2, as described in BS4142.

Uncertainty in the calculated specific sound levels is further reduced by utilising manufacturer-given sound power levels.

As no noise data has been provided for the proposed sources, assumptions have been made based on similar and comparable units. Where specific noise data becomes available, this assessment should be updated accordingly. A verification survey may be necessary to confirm the assumptions made within this report once the system has been installed and is operational.

APPENDIX A - Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A8	05/02/2024	10:05	06/02/2024	09:50

Table 3: Measurement Dates



Figure 3: Site Location Measurement Pictures

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A8	Sound Meter	Svante	977	1	45494
A8	Pre-Amp	Svante	SV12L	1	49995
A8	Microphone	ACO	7052E	1	72673
2	Calibrator	Svante	SV33	1	83715

Table 4: Measurement Equipment Details

APPENDIX C - Calibration Details

Measurement	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
M1	113.80	0.03	0.33

Table 5: Calibration Details

APPENDIX D - Meteorology Details

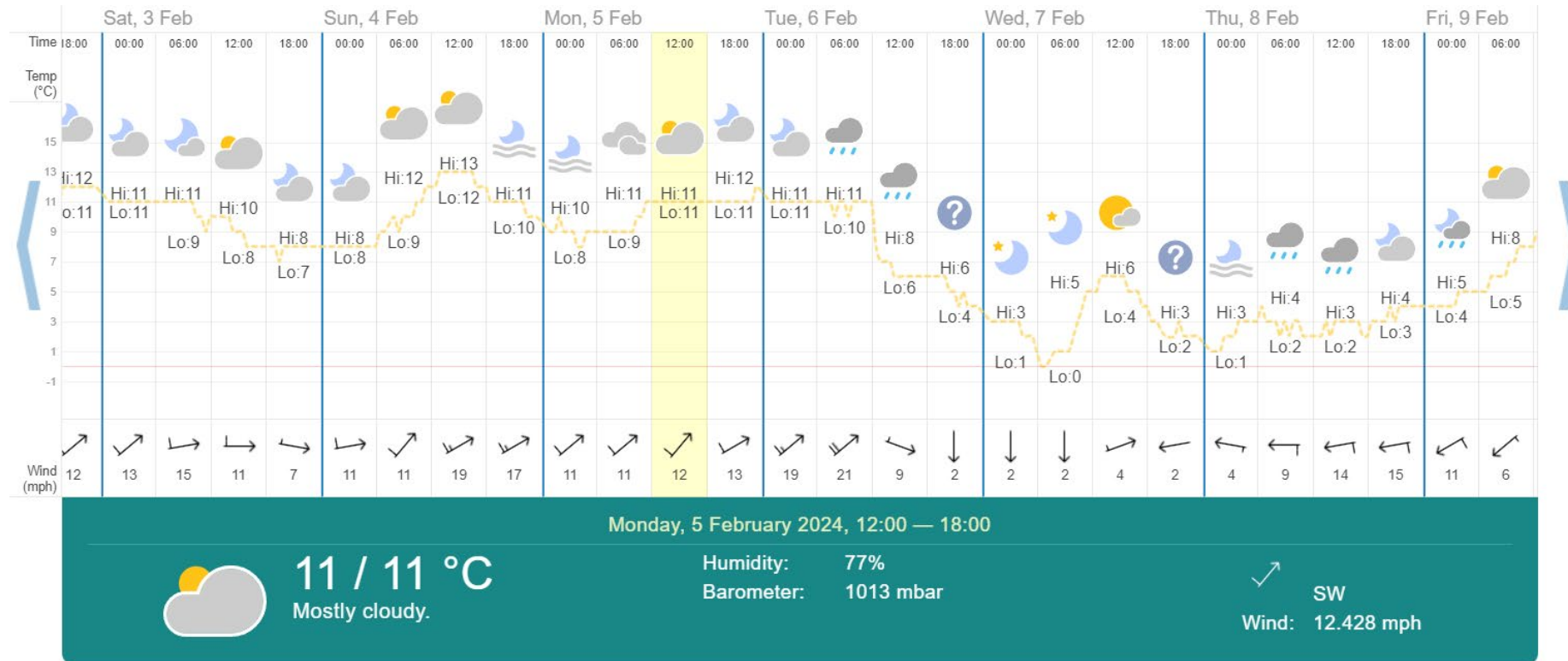


Figure 4: Meteorology Data - <https://www.timeanddate.com/weather>

APPENDIX E - Noise Survey Results

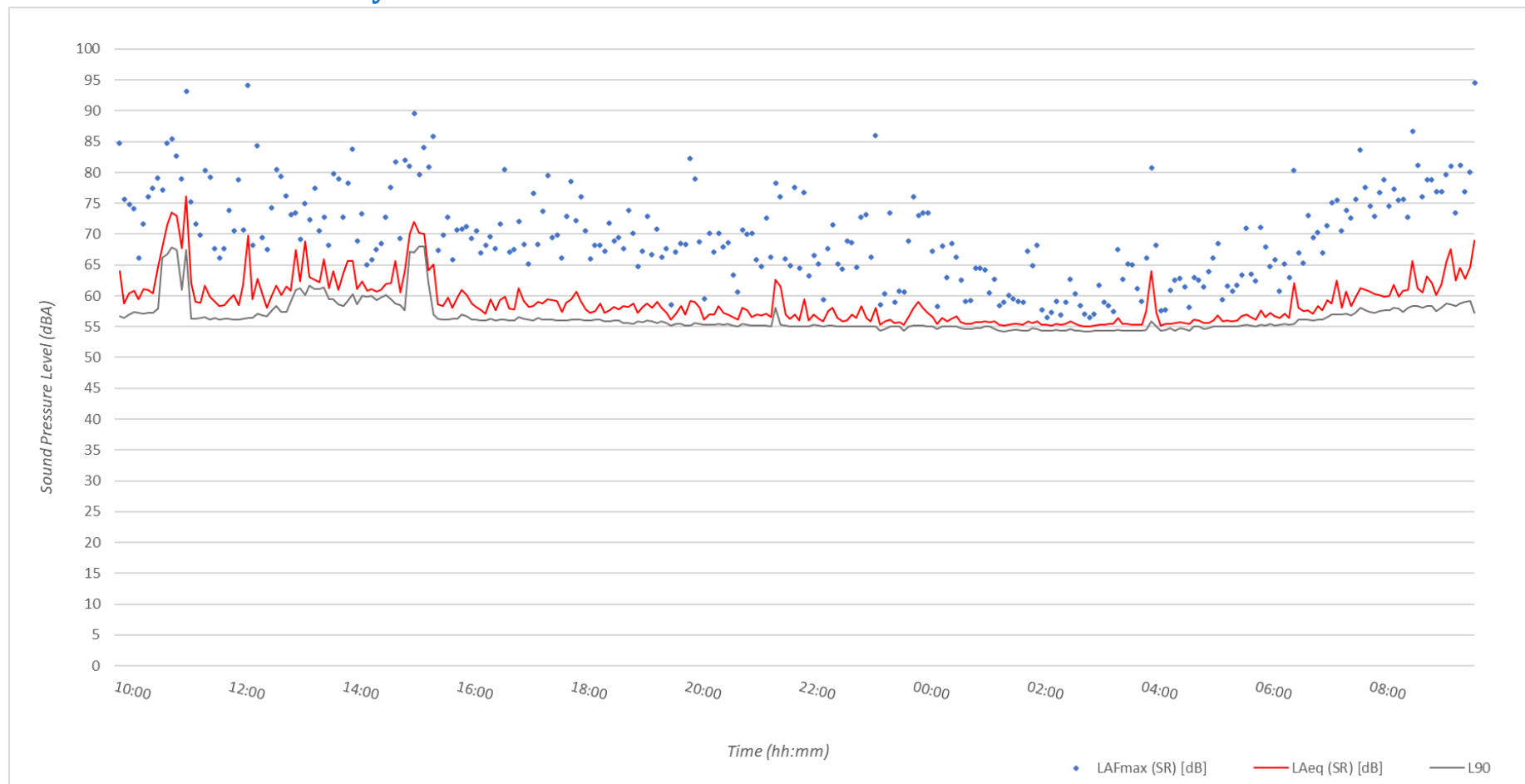


Figure 5: Measured Background Sound Levels Time History (M1): 5th – 6th February 2024

APPENDIX F - Manufacturer Technical Data Sheet

POTTERTON
COMMERCIAL

Totally dependable.

Technical Specification

Sirius three WH 50-150kW

Wall-hung stainless steel condensing boilers

Compact and lightweight, Sirius three WH condensing boilers offer an impressive modulation ratio of up to 9:1 and come with weather compensation as standard, ensuring high seasonal efficiency all year around.



Features

Wide range of outputs: 50, 60, 70, 90, 110, 130, 150kW
Lightweight stainless steel heat exchanger
Modulation ratio of up to 9:1
Gross seasonal efficiency up to 97.3%
Low NOx under 24.7mg/kW
Supplied with the latest Siemens controls
QA75 Twist Knob Controller
0-10 volt connection
Integrated Cascade function
Very compact design
1" flow and return connections (50-70kW)
Can be programmed to work with solar thermal, biomass and buffer tanks
Commissioning by Potterton Commercial engineers and service plans are available
5 year parts and labour warranty*

Benefits

Suitable for a wide range of commercial applications
Reliable and energy efficient heat transfer
Wide modulation ratio reduces constant on/off cycling to improve efficiency and boiler longevity
Reduced energy consumption
Minimises impact on the environment
State of the art PCB offering improved control options
Simple descriptive display and easy to use advanced programming functions
Provides a quick and simple interface with BMS
Up to 16 boilers can be managed by the Siemens controller
130kW and 150kW in the same footprint as 110kW
Avoids major pipework modification
Sustainable, energy efficient solution across complete range
On-going support for the boiler
For complete peace of mind

*Terms and conditions apply. Please visit www.pottertoncommercial.co.uk for details.

www.pottertoncommercial.co.uk

Sirius three WH 50-150kW

Specification

Performance	Fuel Type		Sirius three WH 50	Sirius three WH 60	Sirius three WH 70	Sirius three WH 90
Output @ 80/60°C	NG	kW	45.1	55.0	65.1	85.1
Output @ 50/30°C	NG	kW	48.6	59.4	70.3	91.8
Input (Gross) Maximum	NG	kW	51.4	62.8	74.3	97.0
Input (Net) Maximum	NG	kW	46.3	56.6	66.9	87.4
Output @ 80/60°C	LPG	kW	45.1	55.0	65.1	85.1
Output @ 50/30°C	LPG	kW	48.6	59.4	70.3	92.2
Input (LPG) (Gross) Maximum	LPG	kW	51.4	62.8	74.3	97.0
Input (LPG) (Net) Maximum	LPG	kW	47.3	57.8	68.4	89.3
Efficiency	Value %					
Efficiency @ 80/60°C - 100% Load	% Gross		87.8	87.6	87.6	87.7
Efficiency at 50/30°C - 100% Load	% Gross		94.61	94.61	94.61	95.06
Efficiency @ 30% Load	% Gross		97.1	96.8	96.5	96.9
Current Building Regulations - Part L2 Seasonal Efficiency	% Gross		96.6	96.4	96.1	96.5
ErP efficiency rating			A	A	A	N/A
Gas						
Gas Consumption (Natural Gas)	m³/h		4.90	5.98	7.07	9.25
Gas Consumption (LPG)	Kg/h		3.60	4.40	5.20	6.60
Inlet Gas Pressure (Natural Gas - G20)	m/bar			17 - 25		
Inlet Gas Pressure (LPG - G31)	m/bar			27 - 45		
Gas Connection Size	inch		¾	¾	¾	1
Gas Connection Type				Male Thread		
Flue						
Flue Gas Volume at 80/60°C (NG)	m³/h at STP		67.6	82.6	97.7	127.6
Flue Gas Volume at 50/30°C (NG)	m³/h at STP		62.8	76.5	90.5	117.7
Flue Gas Volume at 80/60°C (LPG)	m³/h at STP		61.5	75.2	88.9	114.1
Flue Gas Volume at 50/30°C (LPG)	m³/h at STP		57.1	69.6	82.4	105.2
Max Flue Gas Pressure @ Outlet (B23)	pa		270	270	270	200
Hydraulic						
Water Flow Rate @ 15°C ΔT	l/s		0.72	0.88	1.04	1.36
Water Flow Rate @ 20°C ΔT	l/s		0.54	0.66	0.78	1.02
Water Flow Rate @ 30°C ΔT	l/s		0.36	0.44	0.52	0.68
Hydraulic Resistance @ 15°C ΔT	kPa		85	92	45	35
Hydraulic Resistance @ 20°C ΔT	kPa		48	55	30	22
Hydraulic Resistance @ 30°C ΔT	kPa		22	24	18	10
Water Content	litres		4	5	6	9
Flow & Return Connection Size	inch		1"	1"	1"	1½"
Flow & Return Connection Type				Male Thread		
Flue Connection Size	mm		80/125	80/125	80/125	110/160
Maximum Boiler Operating Pressure	bar			4		
Minimum Boiler Operating Pressure	bar			1		
Maximum Flow Temperature	°C			85		
General						
Appliance Dry Weight	Kg		40	40	50	83
NOx Level (Dry @ 0% O₂)	mg/kWh		29	31	31	31
CO₂ Content - Natural Gas	%		8.5 - 9	9	8.5 - 9	8.5 - 9
CO₂ Content - LPG	%		9.5 - 10	9.4 - 10.1	9.5 - 10	9.9 - 10
High Level Ventilation (BS 6644)	cm²		93	113	134	175
Low Level Ventilation (BS 6644)	cm²		185	226	268	350
Electrical						
Power consumption	W		80	95	95	130
Nominal Supply Voltage	V/Hz			230 v 1 Ph 50 Hz		

Figure 6: Data sourced from pottertoncommercial.co.uk

APPENDIX G - Legislation, Policy & Guidance

Guidance for the assessment of noise affecting new residential development is given in the National Planning Policy Framework (NPPF). Section 15 of the NPPF states:

“174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of...noise pollution.”

Section 185 further states:

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

- A. Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- B. Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

Section 187 states:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

To avoid and mitigate adverse noise effects on health arising from and impacting new development, the NPPF makes reference to NPSE. The Noise Policy Statement for England (NPSE) was published in March 2010 and covers all forms of noise other than occupational noise.

The Noise Policy Statement for England (NPSE) states the following aims in paragraph 2.2.

NOEL – No Observed Effect Level.

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level.

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level.

This is the level above which significant adverse effects on health and quality of life occur.

The NPSE does not define the SOAEL numerically, stating in paragraph 2.22:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the "NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

There is no local or national guidance on how the three terms should be defined numerically, it is for the assessor to collate and interpret appropriate guidance on noise, such as may be found in British Standards, and correlate the guidance with the concepts of NOEL, LOAEL and SOAEL.

BS4142:2014+A1:2019

The common standard for the assessment of industrial and commercial sound is '**BS4142 – Methods for rating and assessing industrial and commercial sound**'. The industrial noise assessment method in BS4142 is based on the difference between the measured 'background sound level' (L_{A90}), and the 'Rating Level' of the industrial source, at a noise-sensitive location (NSR). BS4142:2014 states:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs."

An estimation of the impact of the specific sound can be obtained by the difference between the rating sound level and the background sound level whilst considering the following:

"A Sound Rating Level at or below the background noise level is indicative of Low Impact;

A Sound Rating Level that exceeds the background noise level by around +5dB is likely an indication of Adverse Impact, depending on the context;

A Sound Rating Level that exceeds the background noise level by around +10dB is likely an indication of Significant Adverse Impact, depending on the context;"

BS4142 further states:

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

Achievement of a *Low Impact* in accordance with BS4142 along with a contextual assessment can be deemed to correspond to '*NOEL – No Observed Effect Level*' in the NPSE.

BS8233:2014

BS8233:2014 - *Guidance on sound insulation and noise reduction for buildings* suggests indoor ambient noise levels for dwellings in Table 4, Section 7.7.2. These are summarised below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS8233 states that the guideline values given above are for 'noise without character', further stating:

"Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

Table 4 of BS8233 also has accompanying notes that were subject to additions in ProPG. The relevant notes with the additions of ProPG are given below.

"NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events."

"NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

APPENDIX H - Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140dB. Here are some examples of common environments and their typical noise levels.

Noise Level	Environment
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 metre away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level (2×10^{-5} Pa – threshold of hearing).

$L_{Aeq, T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level over which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{A90} – The sound level exceeded 90% of the time. Typically used to describe background noise the L_{90} is regarded as the ‘average minimum level’ and quantifies the common sound level of a fluctuating sound field i.e. the sound level that occurs 90% of the time. Alternatively, L_{10} describes the sound level exceeded 10% of the time and therefore quantifies the ‘average maximum level’ of sound which is often used during the calculation of road traffic noise.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.