

SPRATT+HAMER



Noise Impact Report

Project Details

Client	Prime Vendors Ltd.
Client Address	34 Tarbock Road Huyton Liverpool L36 5XW
Site Address	34 Tarbock Road Huyton Liverpool L36 5XW
Reference	22517E

Quality Assurance

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Version	Date	Editor	Notes
V1	27/03/2025	Justyna Lubas	First issue
V2	15/05/2025	Alejo Garcigoy	Update to mitigation measures



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1 Executive Summary

A noise assessment has been conducted for 4 no. newly installed refrigeration condenser units associated with the proposed commercial unit at 34 Tarbock Road, Liverpool, L36 5XW.

The assessment is to be submitted as part of a planning application for the development site to Knowsley Metropolitan Borough Council in response to pre-application advice.

The assessment considers the impact on potentially noise-sensitive neighbouring residential premises in comparison with BS 4142: 2014.

Assessment of noise levels due to noise emissions emanating from the proposed mechanical plant, once the proposed mitigation is implemented, indicates no adverse impact on the amenity of the local community according to BS 4142: 2014 noise criteria.



2 Introduction

Prime Vendors Ltd. instructed Spratt and Hamer Limited to undertake a noise survey to assess the impact of a newly installed 4 no. refrigeration condenser units on nearby occupants.

The proposed development involves the conversion of a former restaurant into a retail unit at 34 Tarbock Road, Huyton L36 5XW. As part of the development, 4 no. new refrigeration condenser units have been installed on the top of the building's roof to support the future operational requirements of retail use. We are informed by the client that the operational hours of the proposed development are from 07:00 to 23:00, Monday to Sunday. The external plant will operate throughout both day and night time periods.

A planning application, under reference 24/00461/FUL, for the conversion of the existing restaurant into a retail unit was submitted to the Local Authority and was granted with conditions in October 2024. Although a noise impact assessment was not initially required for the above application, the proposed use of an external mechanical plant as part of the development has now led to a request for a noise assessment during the pre-application advice stage.

The assessment is to be submitted as part of a planning application for the development site to Knowsley Metropolitan Borough Council.

This report is prepared solely for Prime Vendors Ltd. Spratt and Hamer Limited accepts no responsibility for its use by any third party.

This document has been prepared using the various documents listed within the appendices of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached within this report.

2.1 Environmental Noise Assessment

Spratt and Hamer Limited has undertaken a noise impact assessment at the above site with noise levels measured externally over a 24-hour period, consisting of a 16-hour day (07:00 – 23:00) and an eight-hour night (23:00 – 07:00) in order to establish background levels in the area. The measurements were undertaken from Tuesday to Wednesday.

This report will state the measured noise levels and will refer to guidance relevant to the nature of this survey whilst considering possible Local Planning Authority guidance and conditions.



3 Assumptions, Limitations & Uncertainty

- a. All suggested specifications require a good level of workmanship and for materials to be installed as the manufacture intends. Any poor workmanship may lead to weaknesses in the sound attenuation provided by the building elements.
- b. It is assumed that the sound pressure levels measured on-site during the environmental noise survey are typical of the site.
- c. It is assumed that the technical data provided by plant manufacturers is up to date and correct.
- d. It is assumed that all information supplied by Prime Vendors Ltd. is up to date and correct.



4 Planning Policies, Guidance and Criteria

The planning policies and criteria listed below are taken from associated relevant guidance documents, all of which should be considered for the external and/or internal noise.

4.1 National Planning Policy

The National Planning Policy Framework (NPPF) December 2024 set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which the Local Authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It should contain the following in relation to noise impacts.

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

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.'

198. 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:

'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'

NPPF previously characterised noise by grading and recommending actions and different effect levels as reproduced in Table 1 below.



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Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 1: Noise exposure hierarchy based on likely average response.



4.2 Criteria

4.2.1 Local Planning Authority Criteria

At the time of writing the report, the consultant is unaware of any conditions or specific criteria provided by Knowsley Metropolitan Borough Council; however, Policy CS2 in the Supplementary Planning Document requires consideration to mitigate potential negative impacts of noise. As such, the following noise impact assessment will be undertaken in order to meet the criteria of BS 4142:2014.

4.2.2 BS 4142 Method for rating and assessing industrial and commercial sound

BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound is routinely used by local authorities in assessing noise associated with industrial and/or commercial activity.

In brief, BS 4142 provides a means of assessment whereby noise from industrial and commercial sources (the "specific sound level", $L_{Aeq,t}$) is compared with background noise ("background sound level", L_{AF90}).

The specific sound level may be corrected by a numerical penalty if it includes acoustic features that are considered to be distinctive. The corrected specific sound level is termed a "rating level" ($L_{Aeq,t}$) and is designed to reflect people's subjective reaction to noise characteristics that may be considered annoying.

The rating level is then compared to the background sound level to assess its impact. BS 4142 describes an indication of the impact according to the numerical difference between the rating level and the background sound level. This is shown below in Table 2.

Rating Level – Background Sound Level	Indication of Impact
+ 10dB	Significant Adverse Impact
+ 5dB	Adverse Impact
≤ 0dB	Low Impact

Table 2: BS 4142 Rating Level Impact

4.3 Criteria Summary

In order to meet the anticipated requirements of the Local Authority, the assessment and recommendations will be made in accordance with *BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound* and in reference to Policy CS2 of the LPA Supplementary Planning Document.



5 Site Description

The proposed development consists of an existing single-story building formerly used as a restaurant in Huyton, approximately 9.5km east of Liverpool city centre. The site is situated in a predominantly residential area mixed with scattered commercial properties, such as the site.

Directly to the front of the site runs Tarbock Road (A5080) to the east, providing moderate to high levels of traffic flow. Further to the east across Tarbock Road, we find the nearest neighbouring residential houses. To the north is located a care home and associated car park, whereas Blacklow Brow Primary School boundary is situated approximately 23m to the south. In addition, the railway connecting between Huyton and Roby train stations runs approximately 285m to the north of the proposed development.

The rooftop plant installation consists of four refrigeration condenser units, positioned on the roof behind an approximately 0.8m high parapet. The installed equipment comprises two MAXKOLD NF350DGM units, one MAXKOLD NF250DGM unit, and one COPELAND ZXDE-040E-TFD-454 unit.

The nearest noise-sensitive receptors are the houses located approximately 36m to the north (NSR2) from the plant and 35m to the northeast across Tarbock Road (NSR1), respectively. The ground floor of NSR2 would be shielded by the geometry of the building; therefore, the first floor of the building will be considered within the assessment.

The noise climate in the area is mostly dominated by road traffic mixed with other sources secondary in nature, such as MOT centre activity.

5.1 Subjective Observations

During the site visit, the noise environment was predominantly characterised by road traffic emanating from Tarbock Road, activities at the MOT centre and school-related noise during peak hours, e.g. drop-off times.

5.2 Weather

11-12/03/2025	Tuesday	Wednesday
Temperature (°C)	2.2 – 8.2	2.6 – 6.9
Wind Speed (m/s)	0.0 – 3.5	0.0 – 3.9
Wind Direction	WSW	WNW
Precipitation (mm/h)	0.0 – 0.0	0.0 – 2.6
Damp road/ wet ground	No	Yes
Fog/snow/ice	None	None

Table 3: Weather Conditions

All weather data was taken from www.metoffice.gov.uk from the Millersdale weather station, located at approximately 5.3km southwest of the proposed development.



6 Noise Measurement Procedure

6.1 Survey Dates

Tuesday 11/03/2025 – Wednesday 12/03/2025

6.2 Personnel Present

Jonny Spratt BSc (Hons)

6.3 Survey Equipment Used

Manufacturer	Model	Serial No.	Description
Rion	NL-52	01054205	Integrating Sound Level Meter and Real Time Analyser
Pulsar	Model 105	59964	Acoustic Calibrator

Table 4: Survey Equipment Used

6.4 Calibration

The sound level meter was calibrated with the field calibrator to a level of 94.0 dB @ 1 kHz prior to and on completion of the survey. No significant drift in calibration was observed. The meter used during the survey is precision grade Class 1.

Calibration certificates are available on request.

6.5 Background Sound Measurements

The measurement location chosen during the survey was deemed suitable for the determination of the baseline noise levels of the area. Please note that, due to an access limitation, a nearby surrogate monitoring location in close proximity to the NSRs was used in order to collect representative background noise levels.

The sound level meters were set to measure A-weighted broadband and 1:1 octave frequency bands L_{Aeq} , L_{A90} , in 5-minute periods.

6.5.1 Monitoring Position 1

The monitoring position was situated at a surrogate location in the front garden of a neighbouring residential property, where access was permitted, in close proximity to the noise sensitive receptors.

The sound level meter was placed 1.5m above the ground surface, in free-field conditions and set to measure the complete 24-hour period.

A photo of the monitoring position can be found in the appendix.



6.6 Location Plan of Measurement Positions

The location plan below shows the proposed development and positions of the monitoring equipment and nearest receptors.



Figure 1: Indicative Site Map. Image taken from www.google.com/maps



7 Survey Results and Analysis

7.1 External Background Measurement Results

The plant will likely operate both during the day and at night. The following table presents the measured $L_{A90,1\text{-hour}}$ and $L_{A90,15\text{-minute}}$ background noise results from the monitoring position during the daytime period 07:00 – 23:00 and nighttime period 23:00 – 07:00, respectively.

All values are rounded to integers such that 0.5 is rounded up. Data charts can be found in the appendix.

Monitoring position	Time Period t	$L_{Aeq,t}$ (dB)	Min $L_{A90,t}$ (dB)	Max $L_{A90,t}$ (dB)	Modal $L_{A90,t}$ (dB)
1	Daytime	65.3	45	59	55
	Nighttime	60.1	29	52	36

Table 5: Measurement Results

The following histogram analyses the measured $L_{A90,15\text{minutes}}$ background results during the nighttime period, representing a worst-case scenario.

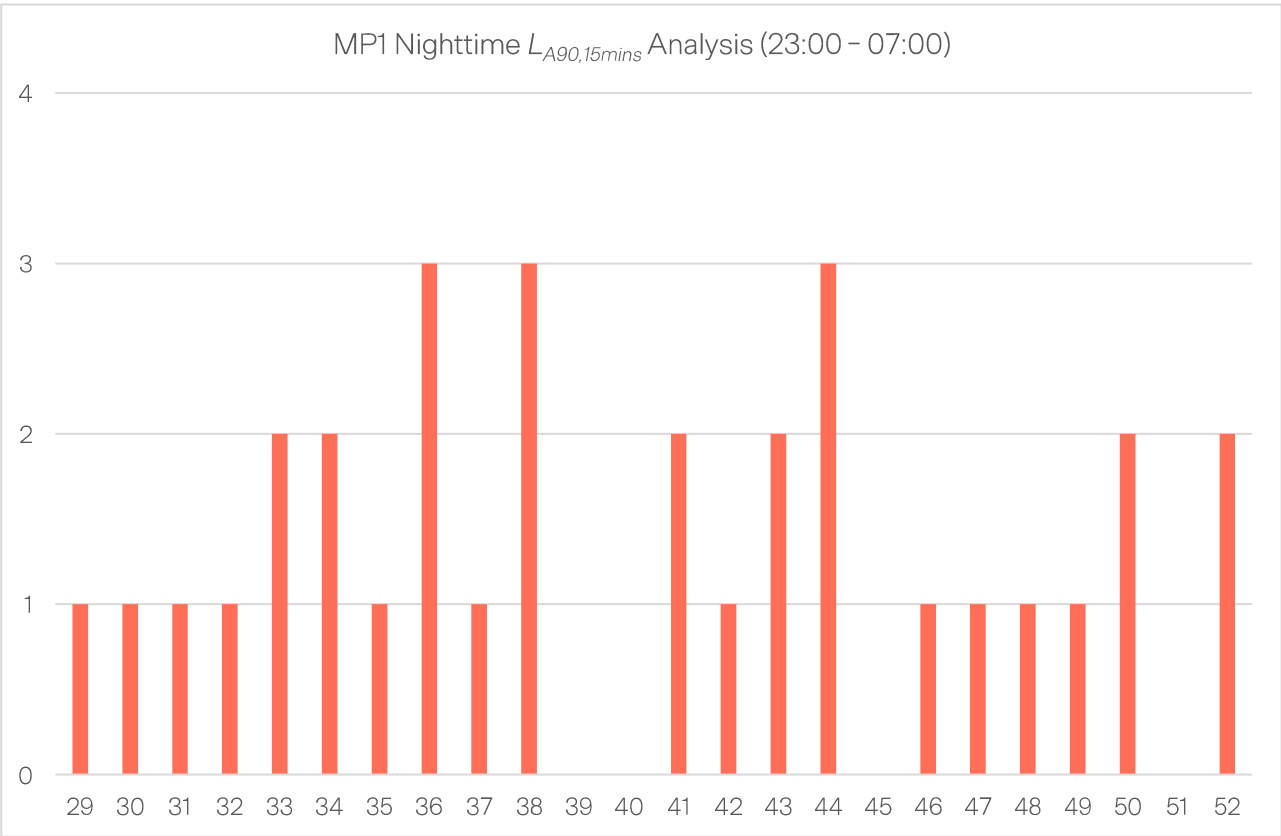


Figure 2: $L_{A90,t}$ Histogram

The nighttime $L_{A90,t}$ levels range from 29 to 52 dB, with 36 dB $L_{A90,t}$ being the lowest statistically most repeated value. Therefore, 36 dB will be used in the assessment, providing a robust approach.



8 Noise Impact Assessment

8.1 Assessment of Mechanical Plant in Accordance with BS4142:2014

The proposed commercial unit incorporates 4 no. refrigeration condenser units located on the flat roof of the building, as outlined in the following table:

Unit no.	Make and Model	Sound Pressure Level (dBA)	@ Distance (m)
1	MAXKOLD NF350DGM	59.5	1
2	MAXKOLD NF350DGM	59.5	1
3	MAXKOLD NF250DGM	57.3	1
4	COPELAND ZXDE-040E-TFD-454	40	10

Table 6: List of installed mechanical equipment

8.2 Subjective Assessment

BS 4142:2014 states that where appropriate, a rating penalty should be established for a sound on a subjective assessment of its characteristics and to correct the Specific Sound Level if a tone, impulse or other characteristics occur e.g. intermittency.

BS4142:2014 says of 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 converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible.”

BS4142 says of tonality:

“... a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible.”

BS4142 says of intermittency:

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

It is understood that the refrigeration condenser units may have a potentially readily distinctive intermittent operation, especially in the nighttime period; therefore, a 3dB penalty will be applied in the assessment for robustness.



8.3 Numerical Assessment

The following assumptions and considerations have been taken into account:

- The sound pressure level has been converted to a sound power level using the following formula:

$$L_w = L_p + 20\log(r) + DI + 11$$
where $DI = 0$, $r = 1\text{m}$ and 11 is a constant that accounts for the conversion from pressure to power and the area of a sphere.
- The plant units are installed on a flat roof, with the Copeland unit having nearby reflecting surfaces of the floor and two walls ($Q=8$). The remaining units have the floor and one wall as reflecting surfaces ($Q=4$), where sound pressure level L_p is calculated using $L_p = L_w + (Q/4\pi r^2)$
- The nearest noise-sensitive receptors are the first floors of the houses located approximately 35m (NSR1) and 36m (NSR2) away.
- NSR 1 will be partially screened by the roof's edge parapet. A -5dB screening attenuation will be applied.
- A 3dB penalty correction for potential intermittency will be applied.
- The lowest statistically most repeated background $L_{A90,15\text{-min}}$ of 36 dB will be used for the assessment during the night-time.

The following table demonstrates the impact of the installed 4no. refrigeration condenser units on the nearest noise-sensitive dwelling NSR 1.

NSR 1	Unit 1	Unit 2	Unit 3	Unit 4
Model	NF350DGM	NF350DGM	NF250DGM	ZXDE-040E- TFD-454
Calculated Sound Power Level L_w	71	71	68	71
Sound Pressure Level $L_{Aeq,t}$ at 1m	66	66	63	69
Distance Attenuation (39/38/36/35m)	-32	-32	-31	-31
Partial Shielding	-5	-5	-5	-5
Sound Pressure Level $L_{Aeq,t}$ at Receptor	29	29	27	33
BS4142 Rating	+3	+3	+3	+3
Rating Sound Level $L_{A,r,Tr}$	32	32	30	36
Cumulative Rating Sound Level $L_{A,r,Tr}$	39			
Background Noise Level L_{A90}	36			
Exceedance	+3			

Table 7: BS4142 Impact Assessment

The table above demonstrates that the noise impact due to plant noise at NSR 1 will exceed by 3 dB the representative background noise level during the night-time period, corresponding to 'Adverse Impact' according to BS 4142 definitions.

The table below demonstrates the impact from plant noise on NSR 2.



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NSR 2	Unit 1	Unit 2	Unit 3	Unit 4
Model	NF350DGM	NF350DGM	NF250DGM	ZXDE-040E-TFD-454
Calculated Sound Power Level L_w	69	69	68	71
Sound Pressure Level $L_{Aeq,t}$ at 1m	66	66	63	69
Distance Attenuation (38m/37m/37m/36m)	-32	-31	-31	-31
Partial / Full Shielding	0	0	0	0
Sound Pressure Level $L_{Aeq,t}$ at Receptor	34	35	32	38
BS4142 Rating	+3	+3	+3	+3
Rating Sound Level $L_{A,r,Tr}$	37	38	35	41
Cumulative Rating Sound Level $L_{A,r,Tr}$	44			
Background Noise Level L_{A90}	36			
Exceedance	+8			

Table 8: BS4142 Impact Assessment

The table above demonstrates that the noise impact due to plant noise at NSR 2 will exceed by 8 dB the representative background noise level during the night-time period, corresponding to 'Adverse Impact' according to BS 4142 definitions.



8.4 Mitigation & Recommendations

The following mitigation measures will need to be implemented in order to minimise the impact on the nearest receptors:

- An enclosure capable of reducing the noise emissions of the plant by at least 8 dB.
- Ensure the acoustic enclosure is designed by the relevant specialist to achieve the required sound reduction while maintaining adequate airflow and thermal management for safe and effective plant operation.
- The make and location of the units should remain unchanged. Any alterations may require further assessment.

Once the proposed enclosure has been incorporated, noise impact due to the proposed external plant associated with the proposed commercial unit will not surpass the representative background noise level at the NSR, corresponding to 'Low Impact' in accordance with BS 4142 definitions and NOAEL (No Observed Adverse Effect Level) in reference to NPPF.

8.5 Context

Noise calculations have been carried out incorporating a conservative approach, taking into account the following considerations:

- Assuming a simultaneous operation of the plant, in conjunction with a maximum load operation.
- The assessment has considered the lowest modal background noise level during the nighttime.
- An additional +3dB penalty rating for 'intermittency' has been incorporated in order to account for any readily distinctive detrimental acoustic features. However, due to distance attenuation, it is likely that this characteristic is not perceptible at the receptor.

Consequently, the likelihood is that the difference between plant noise emissions and background noise is even greater for the majority of time, thus resulting in an even lower level of impact on nearby receptors.



9 Conclusion

The report concludes that, based on the understanding of the manufacturer's data and the location of the units, noise emanating from the 4 no. refrigeration condenser units will have a low impact on the nearby residents provided the proposed mitigation measures are incorporated. Acoustic enclosures will require to be implemented.



10 References

National Planning Policy Framework (NPPF)

BS 4142:2014+A1:2019 Method for rating and assessing industrial and commercial sound

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

Knowsley Metropolitan Borough Council Supplementary Planning Document (SPD)

www.google.co.uk/maps

www.metoffice.gov.uk

10.1 Drawing References

04 - 34 TARBOCK ROAD PROPOSED FLOOR PLAN AND ELEVATIONS

03 - 34 TARBOCK ROAD EXISTING FLOOR PLAN AND ELEVATIONS

02 - 34 TARBOCK ROAD EXISTING AND PROPOSED SITE PLANS

01 - 34 TARBOCK ROAD SITE LOCATION PLAN



Appendix

Figure 1: Photograph showing Monitoring Position 1



Figure 2: Photograph showing installed units



Figure 3: Technical Datasheets

Specifications

Air Flow [m³/s]	1.64
Applications	Medium Temperature
Capacity Range [kW]	5 - 10 kW
Compatible Refrigerants	R-134a R-404A R-407A R-407F R-448A R-449A R-450A R-513A
Compressor	ZBD29KOE-TFD
Condenser/Fan Type	ZXD75E/60 W
Cooling Capacity [kW]	7.58
Frequency [Hz]	50 60
Gross Weight [kg]	104
Height [mm]	1244
Length [mm]	1035
Low/High Side PS [bar] [g]	21/28.8
Maximum Operating Current [A]	7.9
No. of Fans	2
Performances Given At Conditions	-10°C evap. temp; 32°C amb. temp; 20 °C suction gas return for R-404A at 50 Hz
Phase	3
Power Input [kW]	2.96
Product Family	Copeland Outdoor
Receiver Capacity [l]	5.9
Sound Pressure at 10m [dBA]	40
Total Fan Power Input [W]	246
Voltage	380-420 380-420/460 460
Voltage@Hz	380-420 V at 50 Hz, 460 V at 60 Hz
Width [mm]	447



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Condensing Unit Details							
Model	NF350DGM						
Application	Medium Temperature						
Electrical Supply							
	230V/1Ph/50Hz						
Weights & Dimensions							
Width	1050 mm						
Depth	428 mm						
Height	995 mm						
Mounting Dims.	580 mm (W) x 396 mm (D)						
Weight (Dry)	97 kgs						
Compressor Data							
Type	ZB26KQE-PFJ						
Swept Volume	9.9 m³/h						
Oil Charge	1.45 L						
Nom.Current (A)	17.1						
MCC (A)	24						
LRC (A)	97						
Fan Motors							
No.	1						
FLC (A)	0.9						
Condenser Coil							
Type	Fin & Cu Tube						
Volume	4.28L						
Liquid Receiver							
Volume	5.8 L						
Airflow							
Volume	5100 m³/h						
Applicable Refrigerants							
R134a/R404A/R407A/R407F/R448A/R449A/R452A							
Unit Connections							
Liquid	1/2"						
Suction	3/4"						
Sound Pressure Level @ 10m (-10°C/+32°C)							
	38 dB (A)						
Performance Data at -35°C/+32°C Conditions							
	CC (W)	PC (W)	COP	SEPR			
R134a	3440	1830	1.88	3.23			
R404A	6020	3030	1.99	3.44			
R407A	5380	2720	1.98	3.18			
R407F	5840	2910	2.01	3.23			
R448A	5770	2920	1.98	3.17			
R449A	5770	2920	1.98	3.17			
R452A	5940	2990	1.99	3.23			
1/1 Octave Sound Pressure Levels @ 1 meter from the unit							
Frequency							
125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	A (dBA)
59.7	62.5	59.5	51.6	45.8	35.4	33.2	59.5



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Condensing Unit Details	
Model	NF250DGM
Application	Medium Temperature

Electrical Supply	
	230V/1Ph/50Hz

Weights & Dimensions	
Width	1050 mm
Depth	428 mm
Height	995 mm
Mounting Dims.	580 mm (W) x 396 mm (D)
Weight (Dry)	90 kgs

Compressor Data	
Type	ZB19KQE-PFJ
Swept Volume	6.8 m³/h
Oil Charge	1.30 L
Nom.Current (A)	12.9
MCC (A)	18
LRC (A)	61

Fan Motors	
No.	1
FLC (A)	0.9

Condenser Coil	
Type	Fin & Cu Tube
Volume	3.45 L

Liquid Receiver	
Volume	4.2 L

Airflow	
Volume	5600 m³/h

Applicable Refrigerants	
	R134a/R404A/R407A/R407F/R448A/R449A/R452A

Unit Connections	
Liquid	3/8"
Suction	3/4"

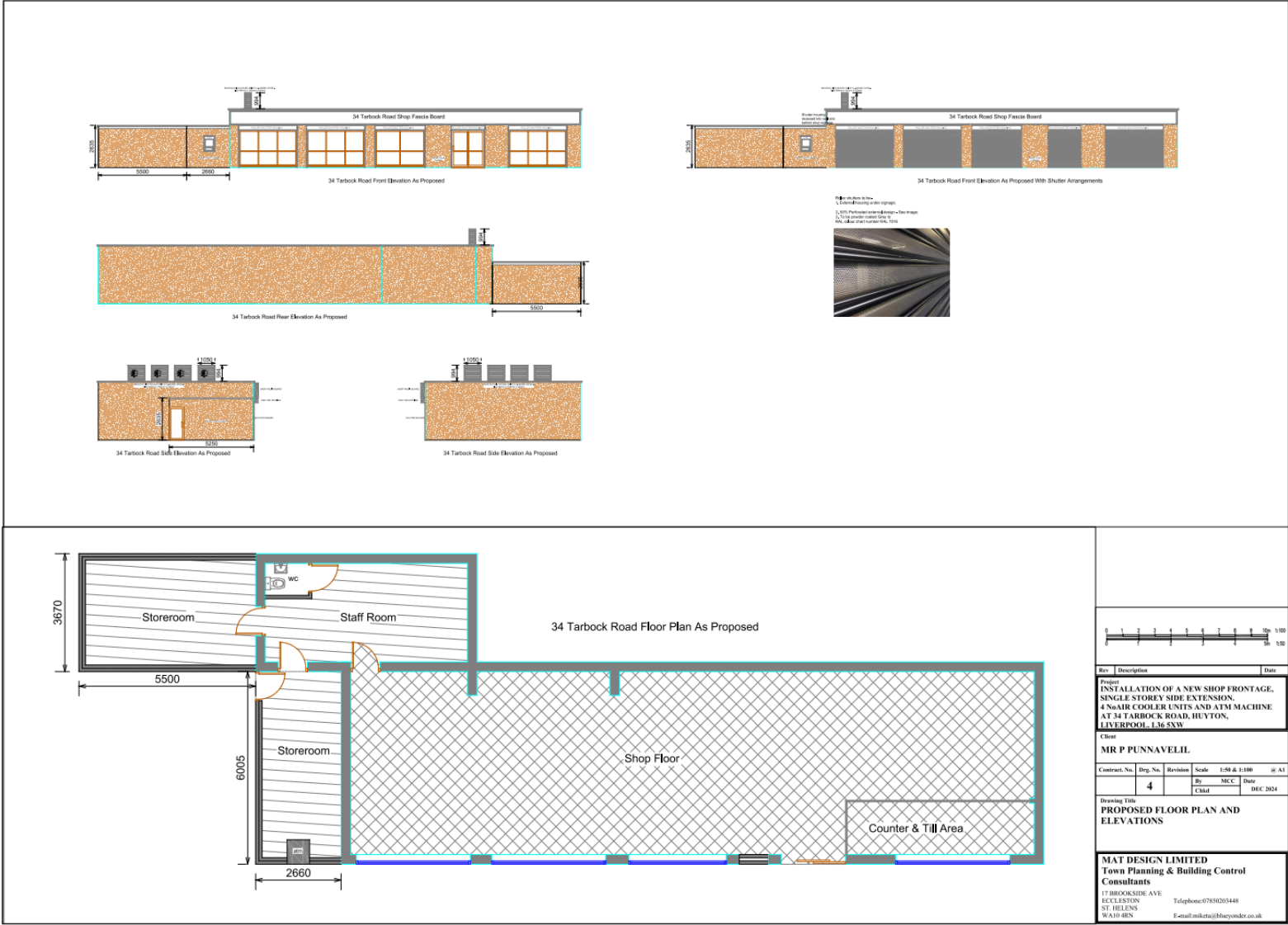
Sound Pressure Level @ 10m (-10°C/+32°C)	
	37 dB (A)

Performance Data at -10°C/+32°C Conditions				
	CC (W)	PC (W)	COP	SEPR
R134a	2350	1250	1.88	n/a
R404A	4120	2070	1.99	n/a
R407A	3540	2030	1.74	n/a
R407F	3840	2170	1.77	n/a
R448A	3760	2080	1.81	n/a
R449A	3760	2080	1.81	n/a
R452A	3970	2120	1.87	n/a

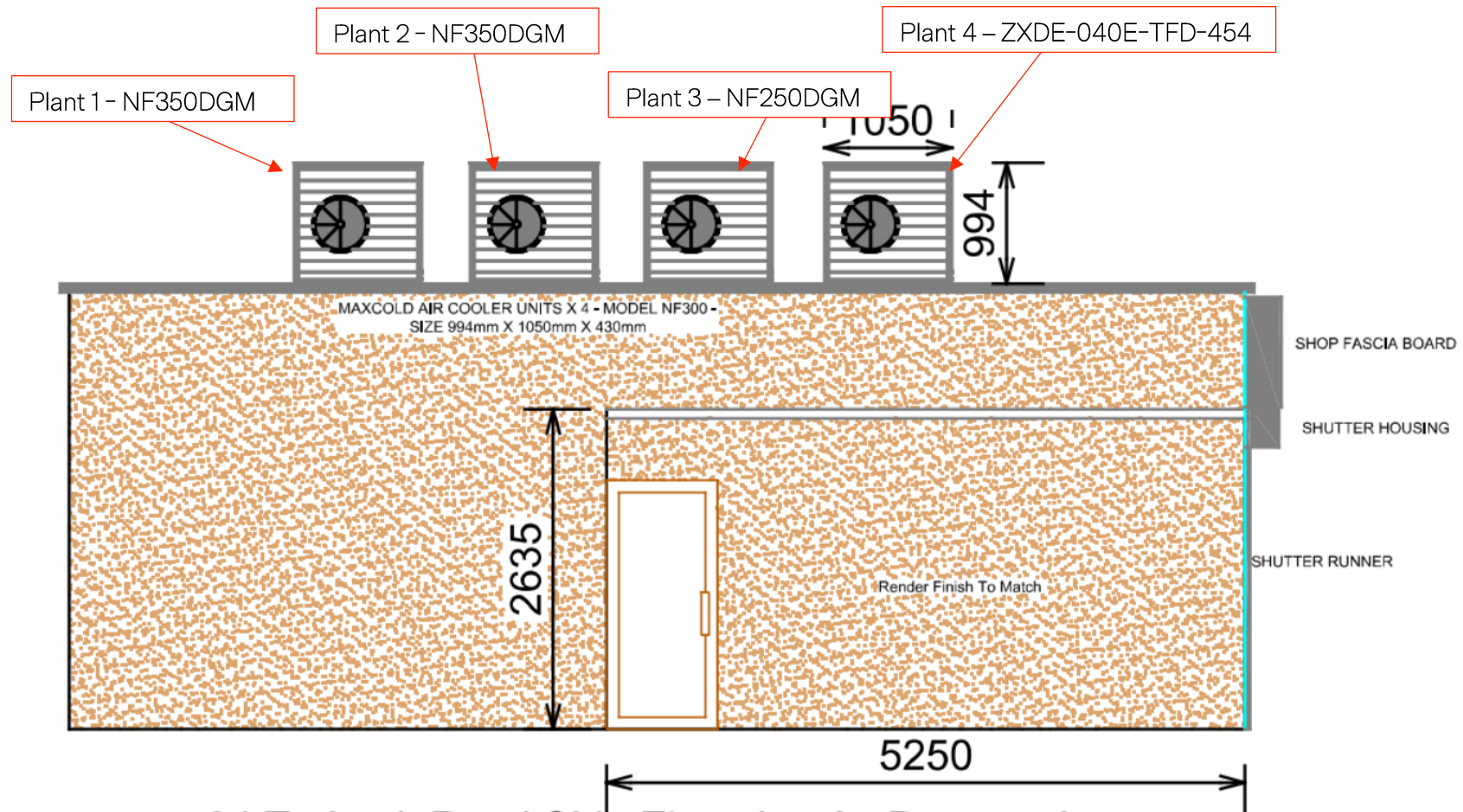
1/1 Octave Sound Pressure Levels @ 1 meter from the unit							
Frequency							
125 Hz	250 Hz	500 Hz	1 k Hz	2 k Hz	4 k Hz	8 k Hz	A (dBA)
57.8	60.1	57.5	49.2	43.6	33.7	31.8	57.3



Figure 4: Site Layout



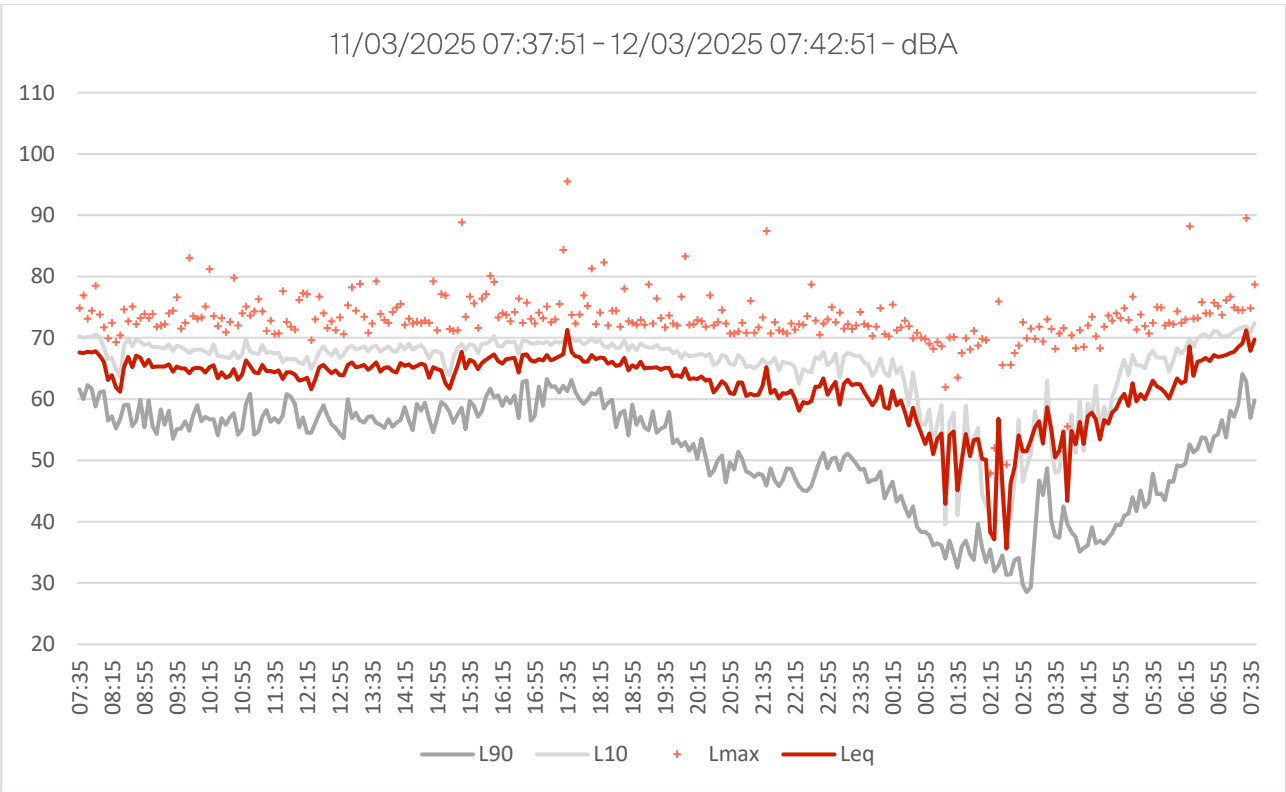
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Measurement Results

Monitoring Position 1

Monitoring position	Time Period	$L_{Aeq,T}(dB)$	$L_{Amax}(dB)$	$L_{A90}(dB)$	$L_{A10}(dB)$
1	Daytime	65.1	69.3 - 95.5	48.5	66.9
	Nighttime	60.1	47.9 - 88.2	33.7	63.0
	Daytime	68.6	73.7 - 89.5	53.7	69.7



Glossary of Acoustical Terms

A-weighting

Noise levels are corrected to represent human response to sound.

L_{Aeq}

This is a continuous equivalent of time varying noise, or effectively the average measured (A weighted) noise level over a defined period of time.

$L_{Aeq,16hour}$

A 16 hour long measurement of the L_{Aeq} over the period between 07:00 and 23:00, also known as a daytime measurement.

$L_{Aeq,8hour}$

An 8 hour long measurement of the L_{Aeq} over the period between 23:00 and 07:00, also known as a night time measurement.

L_{AFmax}

The highest, or maximum A-weighted sound pressure level measured over a specified time period. The 'F' defines a time weighting in Fast.

L_{A90}

The A-weighted noise level or average level which is exceeded for 90 percent of the measured time period. Also known as a background level.

L_{A10}

The A-weighted noise level or average level which is exceeded for 10 percent of the measured time period.

1:1 & 1:3 octave spectrum analysis

A single measurement that is separated into frequency bands to allow for a more detailed analysis of the noise source in question.

R_w

The weighted sound reduction index of a partition or facade. A single number value based on the performance of a partition between two rooms across the frequency range 100Hz to 3150Hz. The level is adjusted for the effects of reverberation and background noise.



$D_{n,e,w}$

The weighted level difference of a partition or façade which takes into account a small element such as a grill or vent.

SEL (sound exposure level)

A measure of A-weighted sound energy used to describe a particular event, such as a train pass. It is the sound energy, which, if occurring over one second would contain the same energy as the event.

Free field sound pressure

Is where the radiation or spread of sound is completely unaffected by the presence of any reflecting surfaces or boundaries.

Low Frequency Noise

A term generally used for sound below a frequency of 100 to 150Hz.





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