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**Plant Noise
Impact Assessment**

On behalf of

ASDA

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Executive Summary

Noise Solutions Limited has been appointed to provide a noise impact assessment for new plant to be installed at the proposed ASDA Express store at the at the new Boorley Green development near Botley.

Air conditioning (AC) plant is to be located internally in a ground-floor plantroom in the south of the building.

The assessment shows that noise from the plant will comply with the local authority's usual requirements and should therefore be acceptable to them.

1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by ASDA Stores Ltd to provide a noise impact assessment for new plant serving the proposed ASDA Express store at the new Boorley Green development near Botley.
- 1.2. Plant noise levels have been predicted at the nearest noise-sensitive premises and assessed against the local authority's usual requirements.
- 1.3. A glossary of acoustic terminology is given in [Appendix A](#).

2.0 Details of development proposals

- 2.1. The planned ASDA Express store is to be located on the ground floor of the local centre in the mixed-use development site. The development is comprised of commercial at ground floor with residential accommodation above.
- 2.2. The new air conditioning (AC) plant is to be located internally in a ground-floor plantroom in the south of the building. Ventilation louvres will also be located around the building.
- 2.3. Airflow will be maintained to the plant room via attenuated louvres along the southern elevation. All plant and associated pipework/ductwork will be fitted with suitable anti-vibration mounts.
- 2.4. The proposed AC plant will potentially operate 24 hours a day, although it should be noted that these units operate as required to meet demand and generally at a reduced capacity at night.
- 2.5. The coldroom ventilation fans will also operate 24 hours a day. All other plant will only operate during store opening hours.

3.0 Nearest noise sensitive receptors

- 3.1. The area surrounding the site will be mainly residential in nature. The nearest noise sensitive properties will be the residential flats (Receptor R1) above the plantroom louvres on the first floor, the residential flats (Receptor R2) at first floor level above the coldroom ventilation louvres and the residential flats (Receptor R3) at first floor level above the intake louvres on the northern elevation.
- 3.2. [Appendix B](#) contains an aerial photograph showing the site and surrounding area.

4.0 Plant noise design criteria

National Planning Policy Framework

- 4.1. A new edition of the NPPF was published in December 2024 and came into effect immediately. The original National Planning Policy Framework (NPPF¹) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2024 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2024 edition.
- 4.2. Paragraph 187 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability."*
- 4.3. The NPPF goes on to state in Paragraph 198:
- "planning policies and decisions should ...*
- a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and 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 ...*
- 4.4. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE²).
- 4.5. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."*
- 4.6. Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed"*.

¹ National Planning Policy Framework, DCLG, March 2012

² Noise Policy Statement for England, DEFRA, March 2010

- 4.7. Paragraph 124 states that *"Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land"*.

Eastleigh Borough Council

- 4.8. Eastleigh Borough council originally granted permission to the development with the Decision Notice to Planning Application reference F/19/86233 which includes Condition 26:

"No fixed plant or equipment shall be installed in or on any commercial premises without prior written consent from the Local Planning Authority. To obtain prior consent a submission shall be made to the Local Planning Authority demonstrating in accordance with the methodology set out in BS4142, that in combination, any fixed plant and equipment permitted under this condition will not emit sound above the following criteria at any residential property:

- *Between 07:00 hours and 23:00 hours: 37dBA L_{Ar} , 1 hour*
- *Between 23:00 hours and 07:00 hours: 32dBA L_{Ar} , 15 minutes*

Fixed plant and machinery for which prior consent has been granted shall be maintained to ensure that sound emission does not change so as to exceed the specified criteria

Reason: In the interests of residential amenity."

BS 4142:2014+A1:2019 'Methods for Rating and Measuring Industrial and Commercial Sound'

- 4.9. British Standard (BS) 4142:2014+A1:2019 describes a method for rating and assessing sound of an industrial or commercial nature, which includes:
- 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, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.
- 4.10. The industrial or commercial sound is assessed outside a dwelling or premises used for residential purposes, upon which sound is incident.
- 4.11. The procedure contained in BS 4142:2014+A1:2019 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15-minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.
- 4.12. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 4.13. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*
- 4.14. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*
- 4.15. The background sound level should be established in terms of the L_{A90} noise index. The standard states that the background sound level should be measured over a period of sufficient length to obtain a representative value. This should not normally be less than 15-minute intervals. The standard states that: *"A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."*
- 4.16. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
- a) *Typically, the greater this difference, the greater the magnitude of the impact.*
 - b) *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
 - c) *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*

d) 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 low impact, depending on the context.

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

4.17. The standard goes on to note that: "*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.*"

4.18. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

4.19. BS 4142:2014+A1:2019 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

4.20. The cumulative noise level for the proposed plant at the nearest residential windows should not therefore exceed the limits shown in the table below:

Table 1 Proposed plant noise emissions level limits at noise sensitive residential receptors

Period	Cumulative plant rating noise level, dB(A)
Daytime (07.00 – 23.00 hours)	37
Night-time (23.00 – 07.00 hours)	32

5.0 Plant noise impact assessment

5.1. The cumulative plantroom louvre noise levels at the nearest noise sensitive receptors have been predicted. Predictions are based on the manufacturer noise data given in [Appendix C](#).

- 5.2. The assessment has considered the reverberant conditions within the plantroom, the aperture size, directivity, any screening between source and receivers and distance attenuation. The predictions have been based on the proposed refrigeration operating at full capacity during both the daytime and night-time periods.
- 5.3. Predictions are inclusive of the following atmospheric attenuators fitted to the plant room louvres:

Table 2 Proposed attenuators to plant room louvres

Attenuator	Insertion loss (dB) at octave band centre frequencies (Hz)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Intake	17	34	45	45	45	45	45	45
VRF discharge	17	34	45	45	45	45	45	45

- 5.4. Predictions are also inclusive of the following atmospheric attenuators fitted to the ventilation fans:

Table 3 Proposed attenuators to ventilation fans

Attenuator	Insertion loss (dB) at octave band centre frequencies (Hz)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
HR01 Intake	6	13	26	41	45	45	43	36
HR01 Discharge	6	13	26	41	45	45	43	36
HR02 Intake	2	2	4	16	28	25	22	14
HR02 Discharge	2	2	4	16	28	25	22	14
EF01 Discharge	15	30	45	45	45	45	45	45
EF02 Discharge	15	30	45	45	45	45	45	45
EF04 Discharge	6	11	21	34	41	41	38	31

- 5.5. Plant is not expected to be tonal and will be inverter controlled such that the operating duty ramps up and down as demand dictates. However, a penalty of 3dB as described in BS 4142:2014 has been applied for the possible presence of "...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment..."

- 5.6. Table 4 summarises the results of the assessment at the most affected receptors. All other nearby receptors benefit from increased distance/screening to the plant. The full set of calculations can be found in [Appendix D](#).

Table 4 Assessment of predicted noise levels at nearest receptors

Receptor	Period	Predicted rating level at receptor, $L_{A,r,Tr}$ (dB)	Proposed design criterion (dB)	Difference (dB)
R1, residential	Daytime (07.00 – 23.00 hours)	31	37	-6
	Night-time (23:00 – 07:00 hours)	31	32	-1
R2, residential	Daytime (07.00 – 23.00 hours)	32	37	-5
	Night-time (23:00 – 07:00 hours)	32	32	0
R3, residential	Daytime (07.00 – 23.00 hours)	34	37	-3
	Night-time (23:00 – 07:00 hours)	6	32	-26

- 5.7. The above assessment demonstrates that the proposed plant will comply with the local authority's requirements.

Assessment of uncertainties

- 5.8. Where possible uncertainty in this assessment has been minimised by taking the following steps:
- Uncertainty in the calculated impact has been reduced by the use of a well-established calculation method.

Internal noise transfer and vibration isolation

- 5.9. All plant and connected ducts/pipes will be resiliently isolated to reduce the risk of vibration entering the building structure.

6.0 Summary

- 6.1. Noise Solutions Ltd (NSL) has been commissioned by ASDA Stores Ltd to provide a noise impact assessment for new plant serving the proposed ASDA Express store at the new Boorley Green development near Botley.

-
- 6.2. The assessment shows that plant noise will comply with the local authority's requirements, inclusive of suitable attenuators being fitted to the plant room apertures and ventilation fans. Noise from fixed plant should not be grounds for refusal of planning permission and Condition 26 of the Decision Notice to Planning Application reference F/19/86233 should be discharged.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Photograph of site showing areas of interest



Photograph 1 Courtesy of Google Earth

Appendix C Plant noise data

Plant	Unit/Model	No. of units	Description	Sound power level (dB) at octave band centre frequencies (Hz)								
				63	125	250	500	1000	2000	4000	8000	dBA (dB)
VRF	Daikin/RYYQ20U	1	Sound power level	96	86	86	88	81	76	75	70	88
HR01 Intake	Daikin/VAM650J8	1	Sound power level	65	68	63	62	58	57	53	41	64
HR01 Discharge	Daikin/VAM650J8	1	Sound power level	65	68	63	62	58	57	53	41	64
HR02 Intake	Daikin/VAM150FC9	1	Sound power level	53	57	54	53	51	46	41	33	55
HR02 Discharge	Daikin/VAM150FC9	1	Sound power level	53	57	54	53	51	46	41	33	55
EF01	Helios/RR EC 315 A	1	Sound power level	87	77	77	78	73	75	69	70	81
EF02	Helios/RR EC 315 A	1	Sound power level	87	77	77	78	73	75	69	70	81
EF04	Nuaire/XS12WA	1	Sound power level	57	63	65	62	64	61	55	48	68

Appendix D Noise level predictions

Summary

Summary of results	R1		R2		R3	
	Day	Night	Day	Night	Day	Night
Intake Louvre	19	19	4	4	-10	-10
VRF Discharge Louvre	31	31	15	15	0	0
Ventilation	14	14	32	32	34	4
Cumulative	31	31	32	32	34	6
Target	37	32	37	32	37	32
Excess	-6	-1	-5	0	-3	-26

Plantroom Daytime and Night-time

Description	Notes	Sound level (dB) at octave band centre frequency								L _{Aeq} (dB)
		63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Plant room										
Intake										
Reverberant level in plant room	Rev L _p	77	65	63	62	50	43	41	34	62
All plant running										
Opening area (m2)	4.83	7	7	7	7	7	7	7	7	
SRI of opening	I.L.	-17	-34	-45	-45	-45	-45	-45	-45	
Inside-outside correction		-6	-6	-6	-6	-6	-6	-6	-6	
L _w of opening	L _w	61	32	19	18	6	-1	-3	-10	35
R1										
Directivity correction	(4200,90° x 1150,0°)	-1	-5	-8	-8	-7	-7	-7	-7	
Distance correction (m)	3	-18	-18	-18	-18	-18	-18	-18	-18	
Screening (d = /m)	-	0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	L _p @ R1	45	13	-4	-4	-16	-22	-25	-32	19
R2										
Directivity correction	(4200,45° x 1150,135°)	-1	-3	-7	-10	-10	-10	-10	-10	
Distance correction (m)	5	-22	-22	-22	-22	-22	-22	-22	-22	
Screening (d = /m)	1	-10	-12	-15	-18	-21	-24	-27	-30	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	L _p @ R2	31	-2	-22	-29	-44	-54	-59	-69	4
R3										
Directivity correction	(4200,0° x 1150,180°)	-1	-2	-6	-8	-8	-8	-8	-8	
Distance correction (m)	14	-31	-31	-31	-31	-31	-31	-31	-31	
Screening (d = /m)	5	-16	-19	-22	-25	-28	-31	-34	-37	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	L _p @ R3	16	-17	-37	-43	-58	-68	-73	-83	-10
Discharge										
VRV Unit Discharge										
Sound power	L _w	91	81	81	83	76	71	70	65	83

End reflection	4.83	-3	-1	0	0	0	0	0	0	
SRI of opening	I.L.	-17	-34	-45	-45	-45	-45	-45	-45	
L _w of opening		71	46	36	38	31	26	25	20	46
R1										
Directivity correction	(4200,90° x 1150,0°)	-1	-5	-8	-8	-7	-7	-7	-7	
Distance correction (m)	2.5	-16	-16	-16	-16	-16	-16	-16	-16	
Screening (d = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	L _p @ R1	57	28	15	18	11	6	5	0	31
R2										
Directivity correction	(4200,45° x 1150,135°)	-1	-3	-7	-10	-10	-10	-10	-10	
Distance correction (m)	5	-22	-22	-22	-22	-22	-22	-22	-22	
Screening (d = /m)	1	-10	-12	-15	-18	-21	-24	-27	-30	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	L _p @ R2	41	12	-5	-9	-19	-27	-31	-39	15
R3										
Directivity correction	(4200,0° x 1150,180°)	-1	-2	-6	-8	-8	-8	-8	-8	
Distance correction (m)	14	-31	-31	-31	-31	-31	-31	-31	-31	
Screening (d = /m)	5	-16	-19	-22	-25	-28	-31	-34	-37	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	L _p @ R3	27	-3	-20	-23	-33	-41	-45	-53	0

HR01 Intake



NSL Ref: **92807**
Project **ASDA Boorley Green**

Compiled by: ACM 24/02/2025

Plant Ref **HR01 Intake**
Plant Description **Daikin/VAM650J8**

Description	Sound level (dB) at octave band centre frequencies (Hz)											dBA
	Notes.	63	125	250	500	1k	2k	4k	8k			
Source noise level (unattenuated)	In-duct L _w	65	68	63	62	58	57	53	41	64		
System losses		-10	-6	-2	-2	-3	-5	-7	-7			
Atmospheric side attenuator	I.L.	-6	-13	-26	-41	-45	-45	-43	-36			
Sound power level leaving terminal		49	49	35	19	10	7	3	-2	34		
Receptor R1	V angle	H angle										
Directivity correction	0	180	500 x 400 (0,180)	-1	-2	-3	-7	-9	-8	-8	-8	
Distance correction	14	m	14 m	-31	-31	-31	-31	-31	-31	-31	-31	
Screening correction	Screened:	20	δ= 6	-17	-20	-23	-26	-29	-32	-35	-38	
Surface corrections etc												
Resultant at Receptor R1			L _p	0	-4	-22	-45	-59	-64	-71	-79	-19
Receptor R2	V angle	H angle										
Directivity correction	0	135	500 x 400 (0,135)	-1	-1	-3	-6	-9	-8	-8	-8	
Distance correction	11	m	11 m	-29	-29	-29	-29	-29	-29	-29	-29	
Screening correction	Screened:	15	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R2			L _p	4	1	-18	-40	-55	-60	-67	-75	-14
Receptor R3	V angle	H angle										
Directivity correction	90	0	500 x 400 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	2	m	2 m	-14	-14	-14	-14	-14	-14	-14	-14	
Screening correction	Screened:		δ= -2	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R3			L _p	35	35	21	5	-8	-14	-18	-23	20

HR01 Discharge



NSL Ref: **92807**
Project **ASDA Boorley Green**

Compiled by: **ACM** 24/02/2025

Plant Ref **HR01 Discharge**
Plant Description **Daikin/VAM650J8**

Description	Sound level (dB) at octave band centre frequencies (Hz)										dBA
	Notes.	63	125	250	500	1k	2k	4k	8k		
Source noise level (unattenuated)	In-duct L _w	65	68	63	62	58	57	53	41	64	
System losses		-10	-6	-2	-1	-2	-4	-6	-6		
Atmospheric side attenuator	I.L.	-6	-13	-26	-41	-45	-45	-43	-36		
Sound power level leaving terminal		49	49	35	20	11	8	4	-1	34	

Receptor R1	V angle	H angle										
Directivity correction	0	45	600 x 400 (0,45)	1	2	2	3	3	4	4	4	
Distance correction	15	m	15 m	-32	-32	-32	-32	-32	-32	-32	-32	
Screening correction	Screened:	21	δ= 6	-17	-20	-23	-26	-29	-32	-35	-38	
Surface corrections etc												
Resultant at Receptor R1			L _p	1	-1	-18	-35	-47	-52	-59	-67	-16

Receptor R2	V angle	H angle										
Directivity correction	0	0	600 x 400 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	12	m	12 m	-30	-30	-30	-30	-30	-30	-30	-30	
Screening correction	Screened:	16	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R2			L _p	5	3	-13	-30	-41	-46	-53	-61	-12

Receptor R3	V angle	H angle										
Directivity correction	0	0	600 x 400 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	2	m	2 m	-14	-14	-14	-14	-14	-14	-14	-14	
Screening correction	Screened:		δ= -2	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R3			L _p	36	37	24	10	2	0	-4	-9	22

HR02 Intake



NSL Ref: **92807**
Project **ASDA Boorley Green**

Compiled by: ACM 24/02/2025

Plant Ref **HR02 Intake**
Plant Description **Daikin/VAM150FC9**

Description	Sound level (dB) at octave band centre frequencies (Hz)									dBA
	63	125	250	500	1k	2k	4k	8k		
Source noise level (unattenuated)	In-duct L _w	53	57	54	53	51	46	41	33	55
System losses		-12	-8	-5	-3	-3	-5	-7	-7	
Atmospheric side attenuator	I.L.	-2	-2	-4	-16	-28	-25	-22	-14	
Sound power level leaving terminal		39	47	45	34	20	16	12	12	38

Receptor R1	V angle	H angle										
Directivity correction	0	180	250 x 400 (0,180)	-1	-2	-3	-7	-9	-8	-8	-8	
Distance correction	14	m	14 m	-31	-31	-31	-31	-31	-31	-31	-31	
Screening correction	Screened:	20	δ= 6	-17	-20	-23	-26	-29	-32	-35	-38	
Surface corrections etc												
Resultant at Receptor R1			L _p	-10	-6	-12	-30	-49	-55	-62	-65	-18

Receptor R2	V angle	H angle										
Directivity correction	0	135	250 x 400 (0,135)	-1	-1	-3	-6	-9	-8	-8	-8	
Distance correction	11	m	11 m	-29	-29	-29	-29	-29	-29	-29	-29	
Screening correction	Screened:	15	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R2			L _p	-6	-1	-8	-25	-45	-51	-58	-61	-14

Receptor R3	V angle	H angle										
Directivity correction	90	0	250 x 400 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	2	m	2 m	-14	-14	-14	-14	-14	-14	-14	-14	
Screening correction	Screened:		δ= -2	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R3			L _p	25	33	31	20	2	-5	-9	-9	24

HR02 Discharge



NSL Ref: **92807**
Project **ASDA Boorley Green**

Compiled by: ACM 24/02/2025

Plant Ref **HR02 Discharge**
Plant Description **Daikin/VAM150FC9**

Description	Sound level (dB) at octave band centre frequencies (Hz)										dBA
	Notes.	63	125	250	500	1k	2k	4k	8k		
Source noise level (unattenuated)	In-duct L _w	53	57	54	53	51	46	41	33	55	
System losses		-10	-6	-3	-2	-3	-5	-7	-7		
Atmospheric side attenuator	I.L.	-2	-2	-4	-16	-28	-25	-22	-14		
Sound power level leaving terminal		41	49	47	35	20	16	12	12	40	

Receptor R1	V angle	H angle										
Directivity correction	0	45	600 x 400 (0,45)	1	2	2	3	3	4	4	4	
Distance correction	15	m	15 m	-32	-32	-32	-32	-32	-32	-32	-32	
Screening correction	Screened:	21	δ= 6	-17	-20	-23	-26	-29	-32	-35	-38	
Surface corrections etc												
Resultant at Receptor R1			L _p	-7	-1	-6	-20	-38	-44	-51	-54	-12

Receptor R2	V angle	H angle										
Directivity correction	0	0	600 x 400 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	12	m	12 m	-30	-30	-30	-30	-30	-30	-30	-30	
Screening correction	Screened:	16	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R2			L _p	-3	3	-1	-15	-32	-38	-45	-48	-8

Receptor R3	V angle	H angle										
Directivity correction	0	0	600 x 400 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	2	m	2 m	-14	-14	-14	-14	-14	-14	-14	-14	
Screening correction	Screened:		δ= -2	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R3			L _p	28	37	36	25	11	8	4	4	29

EF01 Discharge



NSL Ref: **92807**
Project **ASDA Boorley Green**

Compiled by: ACM 24/02/2025

Plant Ref **EF01**
Plant Description **Helios/RR EC 315 A**

Description	Sound level (dB) at octave band centre frequencies (Hz)										dBA
	63	125	250	500	1k	2k	4k	8k			
Source noise level (unattenuated)	In-duct L _w	87	77	77	78	73	75	69	70		81
System losses		-5	-1	0	-1	-3	-5	-7	-7		
Atmospheric side attenuator	I.L.	-15	-30	-45	-45	-45	-45	-45	-45		
Sound power level leaving terminal		67	46	32	32	25	25	17	18		42

Receptor R1	V angle	H angle										
Directivity correction	45	135	1600 x 600 (45,135)	-1	-1	-3	-7	-10	-10	-10	-10	
Distance correction	5	m	5 m	-22	-22	-22	-22	-22	-22	-22	-22	
Screening correction	Screened:	6	δ= 1	-10	-12	-15	-18	-21	-24	-27	-30	
Surface corrections etc												
Resultant at Receptor R1			L _p	34	11	-8	-15	-28	-31	-42	-44	8

Receptor R2	V angle	H angle										
Directivity correction	90	0	1600 x 600 (90,0)	-1	-1	-5	-8	-8	-7	-7	-7	
Distance correction	2	m	2 m	-14	-14	-14	-14	-14	-14	-14	-14	
Screening correction	Screened:		δ= -2	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R2			L _p	52	31	13	10	3	4	-4	-3	26

Receptor R3	V angle	H angle										
Directivity correction	0	100	1600 x 600 (0,100)	1	1	1	-1	-7	-8	-8	-8	
Distance correction	11	m	11 m	-29	-29	-29	-29	-29	-29	-29	-29	
Screening correction	Screened:	15	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R3			L _p	24	0	-17	-22	-38	-42	-53	-55	-2

EF02 Discharge

		NSL Ref: 92807		Compiled by: ACM		24/02/2025	
		Project ASDA Boorley Green					
		Plant Ref EF02					
		Plant Description Helios/RR EC 315 A					

Description	Notes	Sound level (dB) at octave band centre frequencies (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)	In-duct L _w	87.2	77.1	76.6	78.2	73	74.8	69	70.1	81
System losses		-6	-2	-1	-2	-3	-4	-5	-5	
Atmospheric side attenuator	I.L.	-15	-30	-45	-45	-45	-45	-45	-45	
Sound power level leaving terminal		66	45	31	31	25	26	19	20	41

Receptor R1	V angle	H angle										
Directivity correction	45	135	1600 x 600 (45,135)	-1	-1	-3	-7	-10	-10	-10	-10	
Distance correction	5	m	5 m	-22	-22	-22	-22	-22	-22	-22	-22	
Screening correction	Screened:	6	δ= 1	-10	-12	-15	-18	-21	-24	-27	-30	
Surface corrections etc												
Resultant at Receptor R1			L_p	33	10	-9	-16	-28	-30	-40	-42	7

Receptor R2	V angle	H angle										
Directivity correction	90	0	1600 x 600 (90,0)	-1	-1	-5	-8	-8	-7	-7	-7	
Distance correction	2	m	2 m	-14	-14	-14	-14	-14	-14	-14	-14	
Screening correction	Screened:		δ= -2	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R2			L_p	51	30	12	9	3	5	-2	-1	25

Receptor R3	V angle	H angle										
Directivity correction	0	100	1600 x 600 (0,100)	1	1	1	-1	-7	-8	-8	-8	
Distance correction	11	m	11 m	-29	-29	-29	-29	-29	-29	-29	-29	
Screening correction	Screened:	15	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R3			L_p	23	-1	-18	-23	-38	-41	-51	-53	-3

EF04 Discharge

NSLO

Noise Solutions Ltd



NSL Ref: 92807

Project ASDA Boorley Green

Plant Ref EF04

Plant Description Nuaire/XS12WA

Compiled by: ACM

24/02/2025

Description	Notes.	Sound level (dB) at octave band centre frequencies (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)	In-duct L _w	57	63	65	62	64	61	55	48	68
System losses		-11	-7	-2	0	0	0	0	0	
Atmospheric side attenuator	I.L.	-6	-11	-21	-34	-41	-41	-38	-31	
Sound power level leaving terminal		40	45	42	28	23	20	17	17	36

Receptor R1

V angle	H angle											
Directivity correction	0	45	420 x 420 (0,45)	1	2	2	3	3	4	4	4	
Distance correction	15	m	15 m	-32	-32	-32	-32	-32	-32	-32	-32	
Screening correction	Screened:	21	δ= 6	-17	-20	-23	-26	-29	-32	-35	-38	
Surface corrections etc												
Resultant at Receptor R1			L _p	-8	-5	-11	-27	-35	-40	-46	-49	-17

Receptor R2

V angle	H angle											
Directivity correction	0	0	420 x 420 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	12	m	12 m	-30	-30	-30	-30	-30	-30	-30	-30	
Screening correction	Screened:	16	δ= 4	-15	-18	-21	-24	-27	-30	-33	-36	
Surface corrections etc												
Resultant at Receptor R2			L _p	-4	-1	-6	-22	-29	-34	-40	-43	-12

Receptor R3

V angle	H angle											
Directivity correction	45	45	420 x 420 (45,45)	0	1	1	2	2	2	2	2	
Distance correction	3	m	3 m	-18	-18	-18	-18	-18	-18	-18	-18	
Screening correction	Screened:		δ= -3	0	0	0	0	0	0	0	0	
Surface corrections etc												
Resultant at Receptor R3			L _p	22	28	25	12	7	4	1	1	19

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