REF: L1050.1 V2

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21st September 2018

RE: STARBUCKS, KENTISH TOWN
PLANT NOISE ASSESSMENT

Dear Mr Naylor,

Following our recent correspondence, we are writing to you with respect to the above project, to provide a summary of a recent noise survey that was carried out at the above site and detailed assessment of noise impact from the selected equipment.

We understand that the site will accommodate the refurbishment of an existing high street shop into a Starbucks coffee shop, which will involve addition of new roof mounted air handling plant.

We have undertaken a noise survey to establish the pre-development external noise levels during daytime hours.

For assessment of noise impact, we have followed the methodology set out in British Standard 4142:2014 *Method for Rating and Assessing Industrial and Commercial Sound*. This is considered to be the most relevant piece of guidance for the situation and our assessment is described in the following sections.

1.0 BS4142 CRITERIA…

BS4142 presents a method for determining the likelihood of complaints arising from noise levels associated with fixed sources. The procedure set out in the standard involves the comparison of two noise levels at a noise sensitive location, these are,

Rating Noise Level: The level of noise produced by the plant equipment when it has been corrected for tonal and temporal components.

Background Noise Level: The background noise measured as an L_{A90} (the noise exceeded for 90% of the time) when the plant equipment is not operating.

If the plant noise has any distinguishing characteristics such as tonal (e.g. whine, hiss, hum etc) or impulsive components (e.g. bangs, clicks, thumps etc), or if the noise is irregular enough to attract attention, then a penalty is applied depending on the severity of the characteristic.

To assess the likelihood of complaints, the difference between the *Rating Level* and the *Background Sound Level* is calculated. A simple comparison of these levels provides the outcome of the assessment as shown in Table 1.

Level Difference (Rating – Background) dB(A)	Assessment Conclusion
Around +10 or more	Likely to be an indication of a significant adverse impact, depending on the context
Around +5	Likely to be an indication of an adverse impact, depending on the context
Zero or less	Indication of the specific sound source having a low impact, depending on the context

TABLE 1: SUMMARY OF BS4142:2014 ASSESSMENT METHOD

The assessment conclusions are all subject to taking into consideration the context of the ambient noise at the site, the character of the specific noise and the sensitivity of the receptors.

Where the assessment takes place prior to the specific source of noise being installed, it is permitted to predict the noise level at the noise sensitive location.

2.0 OTHER DESIGN CRITERIA…

The assessment has considered The London Plan 2011 (with REMA to The London Plan 2013) and The Mayors Ambient Noise Strategy 2004. The key policies affecting the proposed development are understood to be as follows,

The London Plan Policy 7.15: Reducing Noise and Enhancing Soundscapes
Strategic
- *A. The transport, spatial and design policies of this plan will be implemented in order to reduce noise and support the objectives of the Mayor's Ambient Noise Strategy.*

Planning decisions
- *B. Development proposals should seek to reduce noise by:*
  - *a) Minimising the existing and potential adverse impacts of noise on, from, within, or in the vicinity of, development proposals*
  - *b) Separating new noise sensitive development from major noise sources wherever practicable through the use of distance, screening, or internal layout in preference to sole reliance on sound insulation*
  - *c) Promoting new technologies and improved practices to reduce noise at source.*

The above is reiterated in The Ambient Noise Strategy Policy 69.

The assessment has also considered the Camden Local Plan 2017, which prescribes the following targets,

> *A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion).*

In addition, we have also considered BS8233:2014 and the World Health Organisation guidance for noise levels which offer good external amenity. A good standard of external amenity is considered to be 55 dB(A) L_{Aeq} and below.

Furthermore, we would expect neighbouring dwellings to maintain reasonable internal noise levels with windows open for ventilation. The BS8233 guidance for reasonable internal noise during the day within a dwelling is 40 dB(A) L_{Aeq}. We would normally expect 10-15 dB(A) reduction through an open window and hence we would not expect the noise level from new plant equipment to exceed 50 dB(A) L_{Aeq} measured 1 m from the external building façade where there is an opening window.

The most onerous of the available criteria are expected to apply. In this case the assessment has been based on a Rating Level of no greater than 10 dB below Background Sound Level.

3.0 EXISTING BACKGROUND SOUND LEVELS…

There are no restrictions on the minimum duration of measurement of the *Background Sound Level* in BS4142, albeit to say they should represent the "*Typical*" background level when the new equipment will be in operation. We understand the equipment will operate during the opening hours of the shop. We have based our assessment on a day time period of 08:00-22:00 only.

A survey of the pre-development noise environment was undertaken as part of the building design process, in locations which are representative of the pre-development *Background Sound Levels* at the nearest neighbouring properties.

The measurements were taken in a representative location of the nearest noise sensitive receiver in façade level conditions.

These measurements have been carried out continuously with a logging period of 1 second.

The background and ambient sound at site are dominated by road traffic, aircraft and the sound of a pedestrian crossing.

For our assessment at the nearest noise sensitive neighbour, the most commonly measured *Background Sound Level* of 60 dB(A) L_{A90} has been used to represent the day period at façade level.

We have assessed the uncertainty associated with the measurement of the background sound level based on the measurement tolerance of a Class 1 sound level meter which conforms with IEC61672-1:2002. The typical uncertainty based on the frequency spectrum of road traffic noise on the measured background level is ±1 dB(A). We have included the uncertainty in our assessment.

Taking into consideration the measured levels, tolerances and corrections, and the uncertainty, the *Background Sound Level* used in our assessment is 59 dB(A) L_{A90} during the day period at façade level.

4.0 PROPOSED PLANT EQUIPMENT…

We understand that the proposed scheme includes 4 No condenser units and 2 No extractor fans installed within a high-level bulkhead over the front façade . It is understood that these units will only operate during daytime hours.

The proposed locations of the equipment are indicated on a marked-up plan included in the appendix to this letter.

The sound output data, available from the manufacturer for the proposed equipment is summarised in Table 2.

Ref	Make/Model	No Off	Sound Power Level (dB re 1 pW) 1/1 Octave Band Centre Frequencies (Hz)								A
			63	125	250	500	1k	2k	4k	8k	
COND 1/2/3/4	Toshiba RAV-GM801ATP-E (Heating) {Note 1}	4	69	68	68	63	59	53	46	40	65
EF01	Vent Axia ACM150 T Extractor Fan	1	36	48	54	60	58	61	54	46	65
EF02	Vent Axia SLP500EC Extractor Fan	1	78	87	84	83	79	73	69	61	84

TABLE 2: ESTIMATED SOUND POWER OF INSTALLED EQUIPMENT

{Note 1} For input to the modelling calculations the sound pressure data provided by the manufacturers has been approximately converted into a sound power level following the method described in ISO3744 based on the manufacturers' dimensions for the item.

5.0 SPECIFIC NOISE LEVEL…

We have modelled the propagation of sound from the plant equipment using the method described in ISO 9613-2. Further details of the calculation and methodology are given in the appendix.

We have used one assessment location to represent the closest sensitive location as follows,

1. Receiver No 1. Most exposed residential property to the East of the proposed plant location. The address is understood to be residential Flats 1-9 at 268 Kentish Town Road. The assessment location is at first floor level at 1 m from the building façade.

The distance between the nearest source location and the receiver has been estimated using architectural drawings. The distance from the nearest building to each noise sensitive receiver is approximately 15 m.

The calculated *Rating Level* of the proposed equipment at the assessment location is 59 dB(A) L_{Aeq} 1 m from the façade of the receptor. The calculation of this value is described in more detail in the appendix.

The comparison of these noise levels against the target values, and the resulting conclusions are summarised in Table 3.

Survey Location	Period	Background Sound Level dB(A) L_{A90}	Predicted Rating Level dB(A) L_{Aeq}	Difference Rating - BG dB(A)	BS4142 Conclusion
1	Day 08:00 to 22:00	59 (60±1) (Façade)	59	0	Indication of the specific sound source having a low impact, depending on the context

TABLE 3: SUMMARY OF PREDICTED RATING NOISE LEVELS AT RECEIVER 1

The expected noise levels from the proposed equipment do not achieve the local authority's noise targets during the day. The BS4142 outcome is that the noise level is "*low impact depending on the context*".

We have not included a correction for temporal or tonal components. This is considered a reasonable approach on the basis that all the equipment is new and will be installed correctly in accordance with the manufacturer's instructions. Should it transpire that the equipment has an undesirable acoustic characteristic, a penalty would be applied as described in BS4142 dependent on the prominence of the features.

6.0 RECOMMENDATIONS…

The outcome of the assessment suggests that the proposed condenser units and extractor fans are not expected to achieve local planning policy targets and mitigation measures are recommended.

To achieve the local planning policy at Receiver Location No 1, it is necessary to provide attenuation of 10 dB(A) to the proposed plant.

The prediction model provides the noise contribution from each source at the receiver position. We have based our proposals for noise control on the understanding that the main contributor to the exceedance is a result of plant item EF02 and only minor attenuation is thought to be needed to the condenser units.

Table 4 provides a summary of the noise source contribution at the receiver position during the day time period and our recommendations for mitigation.

Assessment Location	Source Ref.	Estimated Contribution dB(A)	Recommendations for Noise Control	Estimated Rating Level Each dB(A)
1	COND 1	39	No reduction necessary	39
	COND 2	39		39
	COND 3	39		39
	COND 4	39		39
	EF01	39		39
	EF02	59	900 mm 45 % Free Area Splitter Silencer	45
			Total Rating Level $L_{A,tr}$	49
			Rating Level minus Background Sound Level	-10

TABLE 4: SUMMARY OF CONTRIBUTING SOUND LEVELS AT RECEIVERS AND MITIGATION

With the above mitigation measures we estimate the resulting *Rating Level* at Receiver Location No 1 could be reduced to 49 dB(A). This would satisfy the local planning policy to be of a level that is no greater than 10 dB below *Background Sound Level*.

We have based our calculations on the use of a generic 900 mm 45% free area splitter silencer with a typical insertion loss performance as summarised in Table 5. It is acceptable to provide alternative means of noise control provided the overall A-weighted reduction is achieved.

Type	No Off	Insertion Loss Performance (dB) 1/1 Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
45% Free Area Splitter Silencer – 900 mm long	1	-2	-5	-11	-17	-20	-19	-12	-10

TABLE 5: GENERIC INSERTION LOSS PERFORMANCE

We further recommend the above proposals are considered by a suitably qualified noise control engineer.

7.0 CONCLUSIONS IN CONTEXT…

The context of the site is an urban location where noise levels generally consist of aircraft and busy traffic.

The proposed mechanical plant is industrial in nature and would not generally be expected to be noticeable in this type of location during the day time hours of operation.

We are of the opinion that a target level that is 10 dB below that of the *Background Sound Level* is an onerous approach for the installation of the proposed plant.

8.0 EFFECTS OF UNCERTAINTY…

Where available we have included uncertainty in our calculations.

We have included the uncertainty in the measured values of *Background Sound Level*.

There are other sources of uncertainty in our assessment, such as, tolerances to be applied to manufacturers data, the variation in *Background Sound Level* on a different day, and the calculation tolerances for the propagation model.

The survey of the *Background Sound Level* has been undertaken in full accordance with BS7445 and ANC Green Book Guidance using laboratory calibrated measurement equipment. These precautions will minimise sources of uncertainty in the survey data. The current site conditions exhibit a low variability in the ambient and background sound levels and our data is considered to be a good representation of the site.

We do not expect the effects of uncertainty to have a significant effect on the outcome of our assessment.

9.0 ASSESSMENT CONCLUSION…

We have undertaken an assessment of the proposed new fixed building plant against the methodology set out in BS4142:2014 and to assess compliance with the local authority planning and requirements.

We have estimated the likely noise levels at the neighbouring property based on manufacturer's data, using a standard noise propagation and mapping tools.

Our assessment has concluded that further noise control measures are necessary to the proposed ventilation equipment to demonstrate compliance with the derived target noise levels.

We have provided an outline specification for noise control measures which if included are expected to reduce the noise experienced at neighbouring property, and achievement of the local authority's target noise levels can be expected at all times.

I trust you find this assessment provides suitable information for consideration by the local authority. Please don't hesitate to contact me if you require anything further.

Yours sincerely,
For Red Twin Limited

[redacted]

Gavyn Bache B.Sc.(Hons) PgD AMIOA
Acoustic Engineer

APPENDIX A – SITE PLANS…

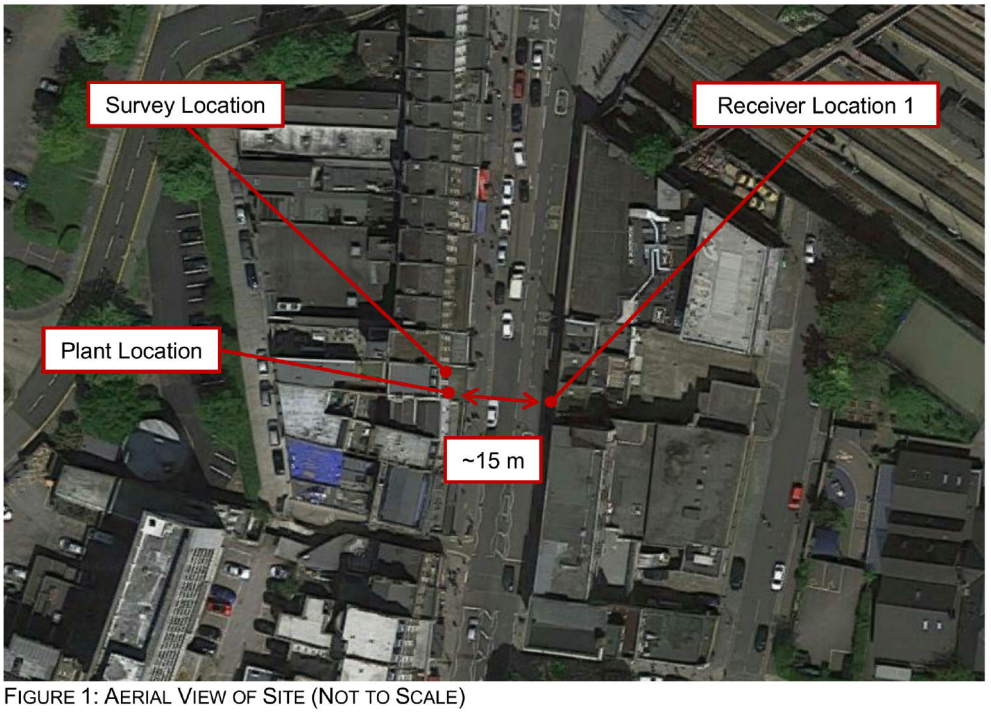


FIGURE 1: AERIAL VIEW OF SITE (NOT TO SCALE)

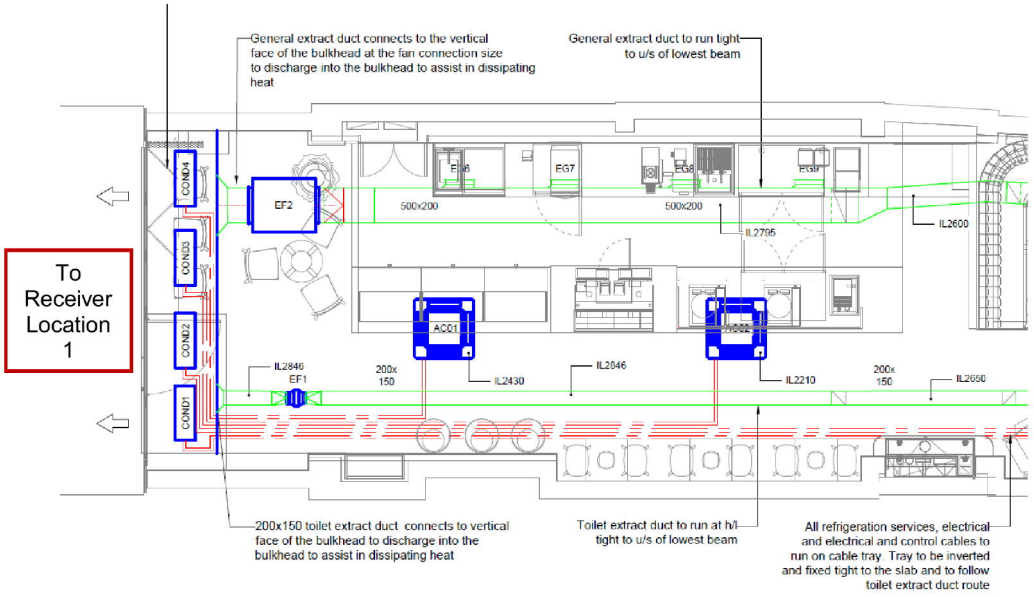


FIGURE 2: PROPOSED PLANT LAYOUT (NOT TO SCALE)

APPENDIX B – NOISE SURVEY DETAILS…

Address:
325 Kentish Town Road, London, NW5 2TJ

Date
Wednesday 19th September 2018

Measurement Locations

1. The microphone location was situated c. 1 m from the Eastern façade of the building proposed for development. The microphone was tripod mounted at c. 1.5m above the ground. The measurement position is considered to be exposed to a representative noise level as the nearest neighbouring receptors.

Personnel
The survey was set up and attended by Gavyn Bache of Red Twin Limited.

Equipment
Brüel & Kjær 2250 G4 hand held analyser, serial No 3012266 with a Bruel & Kjaer Type 4189 Microphone, serial No 3130558. The microphone was fitted with a UA-1650 windshield. The hand-held analyser, microphone and calibrator were laboratory calibrated on 28th November 2017 (Certificate No. CDK1708949). The hand-held analyser calibration was checked before and after the measurements using the calibrator and a drift of 0.03 dB was observed during the survey which is not significant and no adjustments to the measurements have been made to the data.

Weather
The weather was suitable for noise measurement and was in accordance with BS7445 and ANC Green Book Guidelines throughout the survey period with wind speeds of approximately 4.4 m s^{-1} in a North-Easterly direction.

Results
The survey measurements are summarised in the following table. Other parameters can be calculated from the data and the full data set is available upon request.

Survey Comments
The background and ambient sound at site are dominated by road traffic and aircraft.

Location	Start Time	Duration	Parameter dB(A)			
			L_{AFmax}	L_{Aeq}	L_{A10}	L_{A90}
1	19:21:41	00:15:00	94.0	70.8	68.9	60.0
	19:36:41	00:15:00	80.2	66.0	68.5	59.7
	19:51:41	00:15:00	81.7	66.1	68.9	58.1
	20:06:41	00:14:14	83.3	65.7	68.2	60.1
	20:21:41	00:15:00	81.5	65.8	68.2	59.9
	20:36:41	00:15:00	79.3	64.7	67.5	58.8
	20:51:41	00:15:00	75.2	64.6	67.5	58.2
	21:06:41	00:13:30	86.4	66.4	67.9	58.0
	21:21:41	00:03:04	81.6	65.9	68.7	60.5
Total	**19:21:41**	**02:00:48**	**94.0**	**66.7**	**68.2**	**59.1**

TABLE 6: MEASURED NOISE DATA – LOCATION 1 (FAÇADE LEVEL)

FIGURE 3: PHOTOGRAPH OF SURVEY LOCATION 1 LOOKING DUE NORTH

APPENDIX C – CALCULATION OF RATING LEVEL…

The noise output characteristics have been provided by the manufacturer. The attenuation corrections have been based on ISO 9613 *Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method Of Calculation*.

Description	1/1 Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Toshiba RAV-GM801ATP-E (Heating)	69	68	68	63	59	53	46	40	65
Geometric Divergence -20xlog10(r)-11	-35	-35	-35	-35	-35	-35	-35	-35	-35
Floor Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Receiver)	3	3	3	3	3	3	3	3	3
Directivity Attenuation	Not Included								
Atmospheric Attenuation	Not Included								
Ground Effect	Not Included								
Screening Attenuation	0	0	0	0	0	0	0	0	--
Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Additional Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Specific Noise Level (dB)	43	42	42	37	33	27	20	14	39
Correction for Tonality or Temporal Characteristics (dB)	0	0	0	0	0	0	0	0	0
Rating Level (dB)	**43**	**42**	**42**	**37**	**33**	**27**	**20**	**14**	**39**

TABLE 7: CALCULATION OF RATING NOISE LEVEL AT LOCATION NO 1 DUE TO COND1

Description	1/1 Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Toshiba RAV-GM801ATP-E (Heating)	69	68	68	63	59	53	46	40	65
Geometric Divergence -20xlog10(r)-11	-35	-35	-35	-35	-35	-35	-35	-35	-35
Floor Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Receiver)	3	3	3	3	3	3	3	3	3
Directivity Attenuation	Not Included								
Atmospheric Attenuation	Not Included								
Ground Effect	Not Included								
Screening Attenuation	0	0	0	0	0	0	0	0	--
Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Additional Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Specific Noise Level (dB)	43	42	42	37	33	27	20	14	39
Correction for Tonality or Temporal Characteristics (dB)	0	0	0	0	0	0	0	0	0
Rating Level (dB)	**43**	**42**	**42**	**37**	**33**	**27**	**20**	**14**	**39**

TABLE 8: CALCULATION OF RATING NOISE LEVEL AT LOCATION NO 1 DUE TO COND2

Description	1/1 Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Toshiba RAV-GM801ATP-E (Heating)	69	68	68	63	59	53	46	40	65
Geometric Divergence -20xlog10(r)-11	-35	-35	-35	-35	-35	-35	-35	-35	-35
Floor Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Receiver)	3	3	3	3	3	3	3	3	3
Directivity Attenuation	Not Included								
Atmospheric Attenuation	Not Included								
Ground Effect	Not Included								
Screening Attenuation	0	0	0	0	0	0	0	0	--
Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Additional Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Specific Noise Level (dB)	43	42	42	37	33	27	20	14	39
Correction for Tonality or Temporal Characteristics (dB)	0	0	0	0	0	0	0	0	0
Rating Level (dB)	**43**	**42**	**42**	**37**	**33**	**27**	**20**	**14**	**39**

TABLE 9: CALCULATION OF RATING NOISE LEVEL AT LOCATION NO 1 DUE TO COND3

Description	1/1 Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Toshiba RAV-GM801ATP-E (Heating)	69	68	68	63	59	53	46	40	65
Geometric Divergence -20xlog10(r)-11	-35	-35	-35	-35	-35	-35	-35	-35	-35
Floor Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Receiver)	3	3	3	3	3	3	3	3	3
Directivity Attenuation	Not Included								
Atmospheric Attenuation	Not Included								
Ground Effect	Not Included								
Screening Attenuation	0	0	0	0	0	0	0	0	--
Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Additional Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Specific Noise Level (dB)	43	42	42	37	33	27	20	14	39
Correction for Tonality or Temporal Characteristics (dB)	0	0	0	0	0	0	0	0	0
Rating Level (dB)	**43**	**42**	**42**	**37**	**33**	**27**	**20**	**14**	**39**

TABLE 10: CALCULATION OF RATING NOISE LEVEL AT LOCATION NO 1 DUE TO COND4

Description	1/1 Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Vent Axia ACM150 T Extractor Fan	36	48	54	60	58	61	54	46	65
Geometric Divergence -20xlog10(r)-11	-35	-35	-35	-35	-35	-35	-35	-35	-35
Floor Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Receiver)	3	3	3	3	3	3	3	3	3
Directivity Attenuation	Not Included								
Atmospheric Attenuation	Not Included								
Ground Effect	Not Included								
Screening Attenuation	0	0	0	0	0	0	0	0	--
Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Additional Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Specific Noise Level (dB)	10	22	28	34	32	35	28	20	39
Correction for Tonality or Temporal Characteristics (dB)	0	0	0	0	0	0	0	0	0
Rating Level (dB)	**10**	**22**	**28**	**34**	**32**	**35**	**28**	**20**	**39**

TABLE 11: CALCULATION OF RATING NOISE LEVEL AT LOCATION NO 1 DUE TO EF01

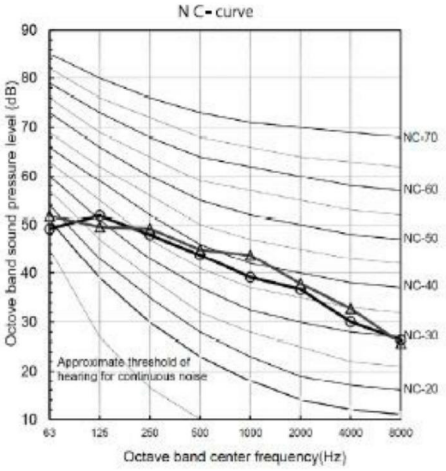
Description	1/1 Octave Band Centre Frequencies (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Vent Axia SLP500EC	78	87	84	83	79	73	69	61	84
Geometric Divergence -20xlog10(r)-11	-35	-35	-35	-35	-35	-35	-35	-35	-35
Floor Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Source)	3	3	3	3	3	3	3	3	3
Wall Reflection (Receiver)	3	3	3	3	3	3	3	3	3
Directivity Attenuation	Not Included								
Atmospheric Attenuation	Not Included								
Ground Effect	Not Included								
Screening Attenuation	0	0	0	0	0	0	0	0	--
Mechanical Attenuation	-2	-5	-11	-17	-20	-19	-12	-10	--
Additional Mechanical Attenuation	0	0	0	0	0	0	0	0	--
Specific Noise Level (dB)	50	56	47	40	33	28	31	25	45
Correction for Tonality or Temporal Characteristics (dB)	0	0	0	0	0	0	0	0	0
Rating Level (dB)	**50**	**56**	**47**	**40**	**33**	**28**	**31**	**25**	**45**

TABLE 12: CALCULATION OF RATING NOISE LEVEL AT LOCATION NO 1 DUE TO EF02 WITH NOISE CONTROL

APPENDIX D – MANUFACTURERS DATA…

RAV-GM561ATP-E/TR (*ATJP-E)

Sound pressure level (dB(A))	Cooling	Heating
	46	48



RAV-GM801ATP-E/TR (*ATJP-E)

Sound pressure level (dB(A))	Cooling	Heating
	48	52

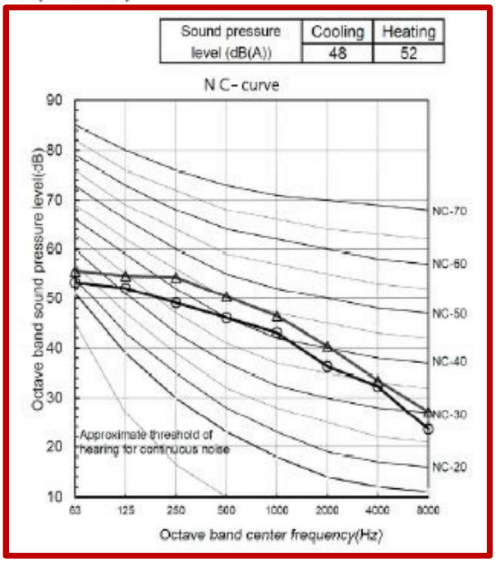
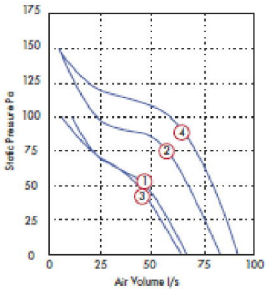
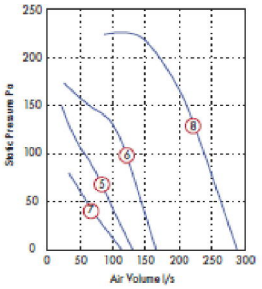


FIGURE 4: COND 1/2/3/4 SOUND PRESSURE DATA

Performance Guide





l/s @ Pa

Dia.	Motor Phase	Speed	r.p.m	IP Rating	Curve Ref.	0	50	100	150	200	Motor kW	F.L.C Amps	dB(A) @ 3m
100	1	Low	1580	IP44	1	70	50	10			0.02	0.09	16
100	1	High	2200	IP44	2	80	70	20			0.02	0.1	22
125	1	Low	1450	IP44	3	60	40	10			0.03	0.1	17
125	1	High	2400	IP44	4	90	80	60			0.02	0.12	24
150	1	Low	1645	IP44	5	130	90	60			0.04	0.17	29
150	1	High	2350	IP44	6	160	140	120	60		0.05	0.21	36
200	1	Low	1845	IP44	7	110	60				0.08	0.48	26
200	1	High	2350	IP44	8	290	260	240	210	170	0.11	0.55	41

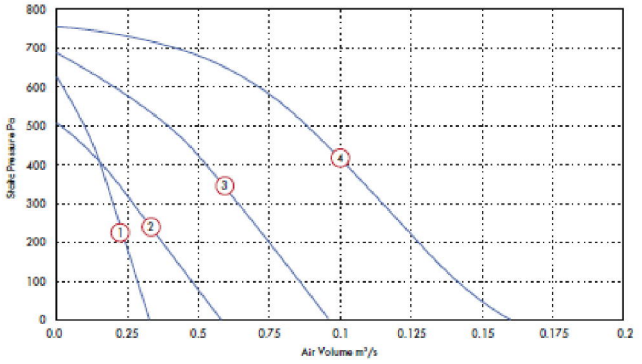
*Medium speed is not shown.

Sound Data

Dia.	Spectrum	63	125	250	500	1k	2k	4k	8k	dB(A) @ 3m
100	Breakout High	32	36	41	39	37	37	28	22	22
100	Breakout Low	30	31	34	36	28	29	23	22	16
100	Inlet High	38	42	57	56	54	46	38	30	37
100	Inlet Low	35	40	49	49	47	37	28	24	30
100	Outlet High	36	41	52	52	53	44	37	28	34
100	Outlet Low	38	41	45	46	45	36	28	24	27
125	Breakout High	32	33	38	41	41	40	33	23	24
125	Breakout Low	27	33	30	39	30	29	24	22	17
125	Inlet High	36	47	53	58	55	53	47	39	39
125	Inlet Low	38	42	45	48	45	41	35	26	29
125	Outlet High	36	47	51	54	55	50	46	37	37
125	Outlet Low	33	41	45	45	44	38	33	25	26
150	Breakout High	26	28	41	45	48	54	41	29	36
150	Breakout Low	21	29	45	49	43	44	32	22	29
150	Inlet High	40	49	59	63	59	63	55	47	46
150	Inlet Low	38	46	52	57	52	54	46	37	38
150	Outlet High	36	48	54	60	58	61	54	46	44
150	Outlet Low	33	45	49	54	54	52	45	36	37
200	Breakout High	38	53	47	47	56	60	44	33	41
200	Breakout Low	26	46	40	34	30	26	18	21	26
200	Inlet High	46	52	54	60	61	63	60	49	47
200	Inlet Low	38	37	40	41	39	35	24	23	22
200	Outlet High	63	68	69	73	70	69	62	54	54
200	Outlet Low	53	54	52	52	48	47	39	28	33

FIGURE 5: EF01 SOUND POWER DATA

Performance Guide



Dia.	Motor Phase	Stock Ref	IP Rating	Curve Ref.		m³/s @ Pa 0	100	200	300	400	500	600	700	S.C. Amps	F.L.C Amps	dB(A) @ 3m
250	1	SLP250EC	IPX2	1	m³/s	0.33	0.28	0.24	0.19	0.15	0.09	0.01		1.38	1.38	42
					kW	0.12	0.14	0.14	0.15	0.14	0.13	0.11				
					W/l/s	0.38	0.48	0.61	0.76	0.99	1.47	7.31				
315	1	SLP315EC	IPX2	2	m³/s	0.57	0.48	0.37	0.26	0.15				1.36	1.36	44
					kW	0.15	0.16	0.16	0.16	0.16						
					W/l/s	0.27	0.34	0.44	0.62	1.07						
400	1	SLP400EC	IPX2	3	m³/s	0.95	0.85	0.75	0.64	0.52	0.38	0.20		2.47	2.47	48
					kW	0.40	0.42	0.44	0.44	0.44	0.42	0.36				
					W/l/s	0.42	0.49	0.58	0.69	0.84	1.09	1.83				
500	3	SLP500EC	IPX2	4	m³/s	1.60	1.41	1.27	1.15	1.02	0.88	0.71	0.41	2.1	2.1	49
					kW	0.74	0.74	0.79	0.84	0.88	0.89	0.85	0.66			
					W/l/s	0.46	0.53	0.62	0.73	0.86	1.01	1.20	1.60			

Sound Power Level Spectra dB (ref 10^{-12} Watts)

Dia.	Motor Phase	Stock Ref	Spectrum	63	125	250	500	1k	2k	4k	8k	dB(A) @ 3m
250	1	SLP250EC	Inlet	68	71	72	80	68	62	59	56	57
			Outlet	68	71	70	78	75	75	68	63	60
			Breakout	61	63	62	62	55	54	52	45	42
315	1	SLP315EC	Inlet	67	78	79	66	61	58	53	45	52
			Outlet	66	78	78	73	70	68	63	55	56
			Breakout	62	69	69	56	53	47	43	36	42
400	1	SLP400EC	Inlet	78	83	87	73	69	66	61	54	59
			Outlet	78	85	92	80	79	75	69	61	66
			Breakout	67	73	76	63	58	50	44	40	48
500	3	SLP500EC	Inlet	77	86	83	77	68	64	58	53	58
			Outlet	78	87	84	83	79	73	69	61	64
			Breakout	70	79	75	66	61	52	47	43	49

FIGURE 6: EF02 SOUND POWER DATA