

Ms Harriet Pitney
Barratt David Wilson Southampton
Tolbar House
Tolbar Way
Hedge End
Southampton
SO30 2UH

By email only

Date: 6th November 2019
Reference: R7263-1 Rev 0

Dear Harriet

**RE: APP/18/00724 Land at Sinah Lane, Hayling Island
Noise Impact of Substation**

Further to our recent correspondence I am pleased to provide our assessment of the noise impact associated with the operation of the substation at the above site.

We understand that the environmental health officer is requesting the following planning condition.

- 2) *An acoustic report to assess the noise from the substation, and its potential impact on nearby dwellings shall be submitted to and approved by the Local Planning Authority in writing before the development commences. Any works which form part of the noise protection recommendations to protect dwellings shall be completed before any dwelling is occupied, unless an alternative period is agreed in writing by the Local Planning Authority. Such noise protection measures shall thereafter be maintained and operated in accordance with the approved scheme.*

Reason – In the interests of the amenity of the area.

Figure 1 below shows the location of the proposed substation relative to dwellings within the development.



Substation

Figure 1: Substation Location

The substation proposed will be a Schneider 500 kVA transformer which will be constructed and operate to BS EN 60067:2007 and IEC 20067:2000 with a 6-way CAB. The substation building is to be constructed from a cavity masonry construction with a tiled roof. Access will be provided via double louvred doors at the front of the building which will be constructed from either steel or GRP. Two louvred vents (each with a surface area of 0.4 m²) will be installed on the building façade adjacent to the switchgear- either the side façade or end façade.

Figure 2 below provides drawings of the proposed building (providing a number of roof options).



Figure 2: Proposed Substation Construction

24 Acoustics has substantial experience of noise emission from similar substations on other sites. Experience dictates that the noise emission from a substation is relatively tonal, dominating at 100 Hz. A noise data sheet for a Schneider Electric 800 kVA substation is appended to the rear of this note. It is considered that the noise emission from the proposed 500 kVA substation will be no greater.

This indicates the following sound power level.

Overall	Octave Band Frequency (Hz) and Sound Power Level							
A	63	125	250	500	1k	2k	4k	8k
55	68	68	58	47	35	30	26	25

Table 1: Scheider Electric 800 kVA Substation Sound Power Levels

Calculations have been undertaken to determine the noise level from the substation at the nearest proposed properties assuming the source sound power level shown in Table 1 above and taking into account the acoustic properties of the substation building. The calculations are appended to the rear of this note and the calculated noise levels shown below.

Receptor	Overall A	Octave Band Noise Level, dB	
		63 Hz	125 Hz
Plot 87	10	27	24
Plot 88	5	22	19

Table 2: Calculated Substation Noise Levels at Receptors

The calculations indicate that the noise level from the substation at the nearest properties will be extremely low (negligible). Background noise levels have not been surveyed but at this location at night are unlikely to fall below 30 dB LA90. On this basis, even when taking into account the tonal low frequency nature of the noise, it can be expected that the substation noise will be inaudible or nearly inaudible at the receptor locations.

I trust you will find the above satisfactory. Should you have any queries please do not hesitate to contact me.

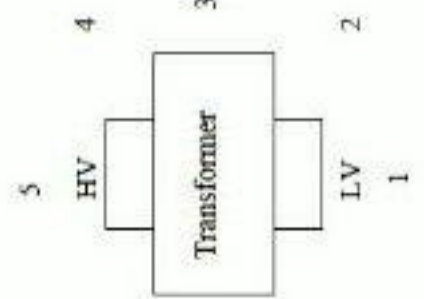
Yours sincerely
For 24 Acoustics Ltd



Reuben Peckham BEng MPhil CEng MIOA
Director & Principal Consultant

Transformer Sound Level Measurement Certificate

Customer	EDF Energy	Serial Number	100738276
Transformer Type	ESD - Ground Mounted	Location	Transformer Test Area, Leeds
kVA rating	800	Date & Time of Test	4/10/09 between 5am & 6am
HV Voltage	11000V	Test Standard	BS EN 60076-10:2001 / IEC 60076-10:2001
LV Voltage	433V	Transformer Outline Drawing	LK5109700
Tap Position	3	Notes	Breather cap removed

Microphone Position (See Sketch)	Ambient Noise Before Test	Transformer Energised Measured Noise Level	Ambient Noise After Test	Microphone Positions Plan View	Octave Filter Frequency Hz	Transformer Energised - Measured Values taken at Point 1
1	37.7	46.5	36.4		31.5	53.8
2	38.4	43.1	35.8		62.5	59.6
3	38.5	43.2	35.6		125	59.6
4	38.1	42.8	36.2		250	50.0
5	39.2	43.0	36.0		500	39.4
6	37.5	41.9	36.6		1000	27.0
7	35.5	44.0	37.3		2000	21.6
8	36.1	45.1	37.0		4000	17.5
Average Values	38	44	36	Measurement Distance from Transformer = 0.3m	8000	16.5
Difference Between Maximum Background Noise and Lpa = 6					16000	17.1
Correction = 1 dB(A)					A	44.4
Corrected Sound Pressure = Lpa = 43dB(A)						
Transformer Height = 1.533m						
S=1.25hLm = 11.94						
Lwa = Lpa+10logS						
Lwa = 43+10.77 = 53.77dB(A)						
Sound pressure	43dB(A)	Transformer Sound Power Level	54dB(A)	Guarantee Sound Power Level	55dB(A)	
Tested by	Graham Fletcher	Neil Dransfield	Andy cockill	Witnessed By	Jesse Garcia of EDF Energy	
Signature				Signature		

Schneider Electric Limited.
 Merlin Gerin Transformers, 123 Jack Lane, Leeds, LS10 1BS
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ISO 9001:2008 ASTA cert no 11830
 ISO 14001:1996 ASTA cert no 13848

Registered in England 1407228
 Registered Office: Stafford Park 5, Telford TF3 3BL

Sinah Lane, Substation Noise Calculations									
	A	63	125	250	500	1k	2k	4k	8k
Lp spectrum	46.6	60	60	50	39	27	22	18	17
Guaranteed Lw	55	68	68	58	47	35	30	26	25
Building dimensions									
length	3.8	m							
width	4	m							
height	2.75	m							
Absorption									
	Area	Absorption coefficient							
Walls- blockwork	42.9	0.1	0.2	0.45	0.45	0.4	0.4	0.4	0.4
Floor- concrete	15.2	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.04
Roof (concrete tiles)	15.2	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.04
Absorption, Sabines									
Walls- blockwork		4.29	8.58	19.31	19.31	17.16	17.16	17.16	17.16
Floor- concrete		0.15	0.15	0.15	0.15	0.30	0.30	0.61	0.61
Roof (concrete tiles)		0.15	0.15	0.15	0.15	0.30	0.30	0.61	0.61
Total absorption		4.59	8.88	19.61	19.61	17.77	17.77	18.38	18.38
Rev level in space	50.7	67.8	64.9	51.5	40.5	28.9	23.9	19.8	18.8
Front louvres									
Total area	2.55	m2							
Estimated SRI		6	6	6	6	3	3	3	3
Lw, front louvres	42.8	59.8	57.0	43.5	32.5	24.0	19.0	14.8	13.8
Rear louvres									
Total area	0.8	m2							
Estimated SRI		6	6	6	6	3	3	3	3
Lw, rear louvres	37.7	54.8	51.9	38.5	27.5	18.9	13.9	9.8	8.8
Calc to side/ front façade of Plot 87									
Lw, front louvre	42.8	59.8	57.0	43.5	32.5	24.0	19.0	14.8	13.8
screening/ directivity		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
distance	20								
Lp	10.0	27.1	24.2	10.8	-0.2	-8.8	-13.8	-17.9	-18.9
Lw, rear louvre	37.7	54.8	51.9	38.5	27.5	18.9	13.9	9.8	8.8
screening/ directivity		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
distance	31								
Lp	-10.1	7.0	4.1	-9.3	-20.3	-28.9	-33.9	-38.0	-39.0
Total Lp, front façade of Plot 87	10.1	27.1	24.3	10.8	-0.2	-8.7	-13.7	-17.9	-18.9
Calc to side/ rear façade of Plot 88									
Lw, front louvre	42.8	59.8	57.0	43.5	32.5	24.0	19.0	14.8	13.8
screening/ directivity		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
distance	22								
Lp	4.2	21.3	18.4	5.0	-6.0	-14.6	-19.6	-23.8	-24.8
Lw, rear louvre	37.7	54.8	51.9	38.5	27.5	18.9	13.9	9.8	8.8
screening/ directivity		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
distance	22								
Lp	-5.8	11.2	8.4	-5.1	-16.1	-24.6	-29.6	-33.8	-34.8
Total Lp, front façade of Plot 87	4.6	21.7	18.8	5.4	-5.6	-14.2	-19.2	-23.3	-24.3