

Rebuttal Proof of Evidence on Noise

Prepared by Rhys Scrivener of KR Associates (UK) Ltd
for Reading Borough Council

TOWN AND COUNTRY PLANNING ACT 1990
(AS AMENDED BY THE PLANNING AND COMPENSATION ACT 1991)

PROPOSED RESIDENTIAL DEVELOPMENT
55 VASTERN ROAD, READING

RHYS MICHAEL SCRIVENER MSC MIOA

15th October 2021

Version 1.2

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1 Introduction

I, Rhys Scrivener declare that:

Reason for Rebuttal

- 1.1 The Rebuttal Proof of Evidence has been prepared in response to the Proof of Evidence produced on behalf of the Appellants by Ruben Peckham of 24 Acoustics Ltd.
- 1.2 This is not expected to be an exhaustive rebuttal and this document only deals with certain points where it is considered appropriate and helpful in responding in writing at this stage. Where a specific point has not been dealt with, this does not mean that these points are accepted, and these other points may be addressed further at the enquiry.
- 1.3 In section 2, I will deal with the new information provided by SSE, the raw data from the background noise survey undertaken by Mr Peckham between Monday 23rd August 2021 and Monday 30th August 2021 and the assessment of external and internal noise levels.
- 1.4 In section 3, I will deal with the meaning of Significant Adverse Impact in terms of the context of British Standard 4142: 2014 + A1: 2019 and the comparison to the 1997 version of the standard.
- 1.5 In section 4, I will deal with some minor issues relating to my site visit, low frequency noise and BS 4142, assessment of industrial noise to BS 8233 and the background noise levels.
- 1.6 In section 5, I confirm the details of the meeting on Friday 8th October which I attended at the request of Mr Peckham to investigate if more items could be added to the Statement of Common Ground.

- 1.7 In section 6, I deal with Mr Peckham's statements regarding the assessment of noise with the windows open and closed.

- 1.8 Section 7 provides an Errata for my Proof of Evidence correcting some minor typing errors in my original Proof of Evidence. These should be seen as the correct position.

- 1.9 In section 8 I provide a brief summary of this Rebuttal due to its length and complexity.

2 Operation and Assessment of the SSE Transformer Fans

The Importance of the SSE Transformer Fans

- 2.1 The Reading Town substation at Vastern Road operated by Scottish and Southern Electricity Network (SSE) provides electricity for a large part of Reading City which according to the SSE website has a transformer rated 90 MVA with a maximum load of 67.94 MW converting the incoming 132 kV Fleet Bramley distribution supply to a 33 kV supply. The smaller transformers rated at 60 MVA then convert the 33 kV supply to 11 kV for distribution around Reading to the smaller substations located around Reading which convert the supply to 415V or 240V for use by the customers.
- 2.2 The Director of operations at SSE Richard Gough confirmed in his email of 8th October 2021 (attached at Appendix A) that the fans on the larger 90 MVA transformers need to run to ensure the temperature of the main transformer windings, or the oil used to coil the core of the transformer does not exceed 65 – 75°C.

“Fan operation is triggered once a temperature threshold is crossed, measured by winding temperature or top oil sensors. Usually this is in the range 65 – 75 deg C. Ambient temperature is not measured by the related sensors, but it will typically influence the transformer tank, oil and winding temperature and as such in hot weather fans are expected to operate more often, particularly if one of the transformers is out of service.”

- 2.3 The fans on the main SSE Transformers need to operate when the load increases, as a result of higher ambient temperatures or one of the transformers is out of service due to maintenance or failure. The Transformers need to operate to ensure the continuance of the electricity supply for central Reading.

- 2.4 The noise from the fans on the main transformers are significantly higher than any other noise source impacting the site. Mr Peckham confirms the sound power level of $L_{W(A)}$ 95 dB for A1MP fan set and $L_{W(A)}$ 96 dB(A) for the A2MP fan set and the tone within the 50 Hz $1/3^{\text{rd}}$ octave band tone in both fans of around L_p 99 dB within his original noise report. These high source noise levels and low frequency tone can not in my opinion be adequately attenuated, even with the enhanced glazing specification proposed by Mr Peckham at section 6.7 of his PoE.

“The glazing tested comprised a Velfac proprietary sealed unit triple glazed system (9.5 mm glass, 6 mm airgap, 4 mm glass, 14 mm airgap and 4 mm glass) with a 200 mm airgap and a 8.8 mm acoustic laminate secondary glazed unit.”

How the SSE Fans Operate

- 2.5 The noise report submitted by 24 Acoustic Ltd reference R8220-2 Rev O (draft) referenced the *“Noise from the SSE Cooling Fans”* at section 5.7 but did not give any indication of how and when they would operate. The report provided the overall sound power levels in Table 3 of section 5.7 and the $1/3^{\text{rd}}$ octave band data within Appendix B and only stated that the figures were under full load.
- 2.6 At section 6.2 of the original noise report, no reference was made to the cooling fans turning on and off and therefore no correction for intermittency was included within the feature correction for the British Standard 4142: 2014 + A1: 2019 assessment.

Proof of Evidence

- 2.7 Additional information has been provided by Mr Peckham at section 2.6 of his PoE which confirms when the SSE cooling fans operated between 21st May 2021 and 20th September 2021:

- For 3 hours 45 minutes between 12:00 and 15:45 on 26th June 2021.
- For 3 hours 10 minutes between 09:25 and 12:35 on 29th June 2021.

2.8 Mr Peckham at section 2.7 of his PoE confirms that the SSE engineer thought the *“fans were probably operated on the June dates as part of a routine maintenance which occurs 4 times per year.”*

2.9 Upon request, Mr Peckham then provided details of the text message he received from the SSE Engineer he referred to in his PoE at section 2.7.

“Reuben: Fri 10 Sep, 10:08

Paul another thing – I have a record of the coolers operating on 26 and 29 June this year. I wondered if you know if there was any particular reason why they ran at that time – it wasn’t an overly warm day. Could it be a power outage elsewhere? Thanks Reuben.

SSE Engineer: Sat 11 Sept, 15:18

Hi Reuben, the chances are that it was part of a routine inspection, this should happen four times a year.”

2.10 Mr Peckham provides in Appendix A of his PoE a copy of two separate letters received from SSE on 16th July 2021 which confirm the following key points.

“Given the future need to increase the capacity of the Electricity Distribution System to accommodate new demands such as electric vehicles and electric heating in the local community, the strategic requirement for the site is highly unlikely to change in either the short or long term.”

“The fans are used to cool the circulating insulating oil in each transformer when the combination of system load and ambient temperature reaches a set trigger point. These fans run infrequently and usually during hot weather periods.”

Information Received from SSE

- 2.11 I wrote to SSE and asked them to clarify how and when the SSE Transformer fans would operate, and they responded on 8th October 2021 and confirmed the following points.

Maintenance Run of Fans

- 2.12 SSE confirmed how often the fans would run for maintenance purposes once per month.

“Under normal conditions when both transformers are in service, the fans might run on average for 10 minutes per month, to keep them functioning.”

Servicing of Transformers

- 2.13 SSE confirmed that when the SSE Transformers were serviced approximately once every 4-years the fans would run for 2 - 3 days.

“Maintenance outages would typically take place once every four years for a period of 2-3 days (this includes both transformers out of service one after the other).”

Transformer Failure

- 2.14 SSE confirmed that if one of the transformers was to fail the other transformer would need to take the load of both transformers forcing the fans to operate more continuously.

“With one transformer out of service for maintenance, or in the unlikely situation of a transformer failure, the fans could operate depending on load during peak demand times between 8am and 6pm.”

Future Operation of SSE Transformers

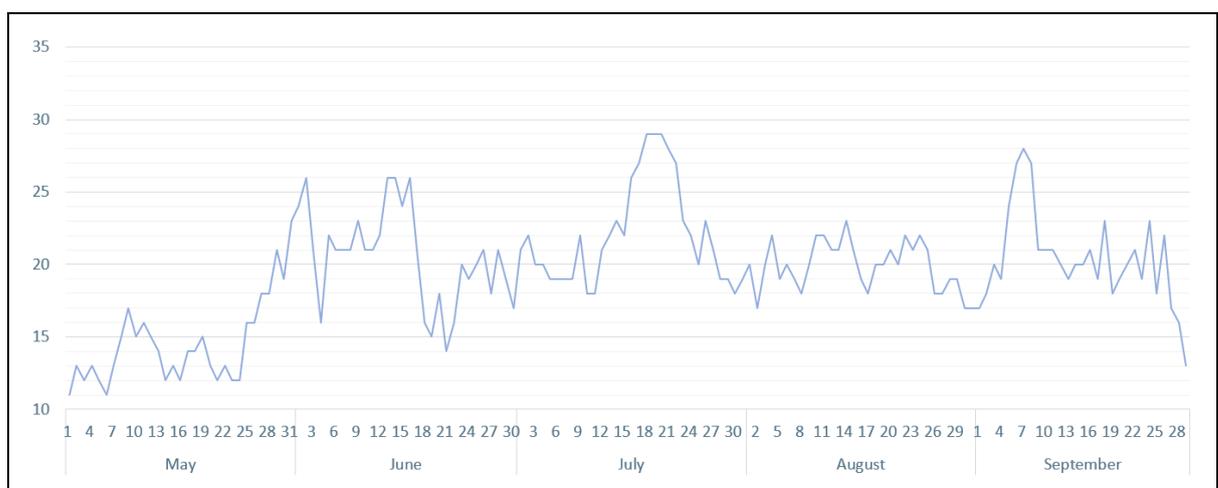
2.15 SSE confirmed they expected the load on the transformers to increase and therefore the operation of the fans would increase.

“We do expect demand to increase, which in-turn will increase the frequency and duration of fan operation when one unit is out of service.”

2.16 The information provided by Mr Peckham does not align with the information provided by Richard Gough, Director of SHE and Systems Operations at SSE. I can only conclude the operation of the transformer fans for over 3-hours on 26th and 29th June 2021 were not the monthly 10-minute maintenance run of the fans but for some other reason. I can also conclude that Mr Peckham must have unfortunately missed the running of the fans each month for 10-minutes for maintenance purposes during his analysis of the recordings he made between May and September 2021.

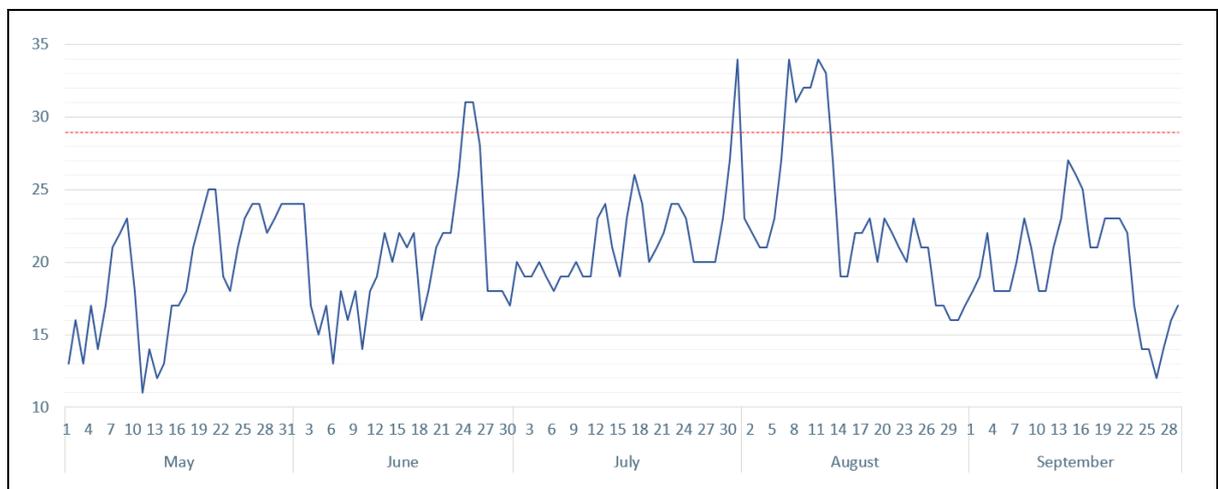
Cooling Fans Operation due to External Ambient Temperature

2.17 The following graph shows the maximum daily ambient temperature at the Reading site between 1st May 2021 and the 30th September 2021. It can be clearly seen that the ambient temperature does not exceed 29°C.



2.18 Mr Peckham explains in his PoE at section 2.7 that the transformer fans only operated between 1st May 2021 and 20th September 2021 for two periods at the end of June 2021 and that the fans did not operate in the hot temperatures recorded during July. Mr Peckham has not provided any evidence of what will happen when the ambient temperature exceeds 29°C as SSE have confirmed that the fans are more likely to run when the ambient temperature is higher.

2.19 The following graph shows the ambient temperature for the same period the year before in 2020 when the ambient temperature exceeded 29°C on at least 8 days.



2.20 With climate change it is likely that the number of days the maximum temperature exceeds 29°C is likely to increase and therefore the cooling fans are likely to operate far more frequently than the 0.2% of the time proposed by Mr Peckham.

Cooling Fans Operation due to Load

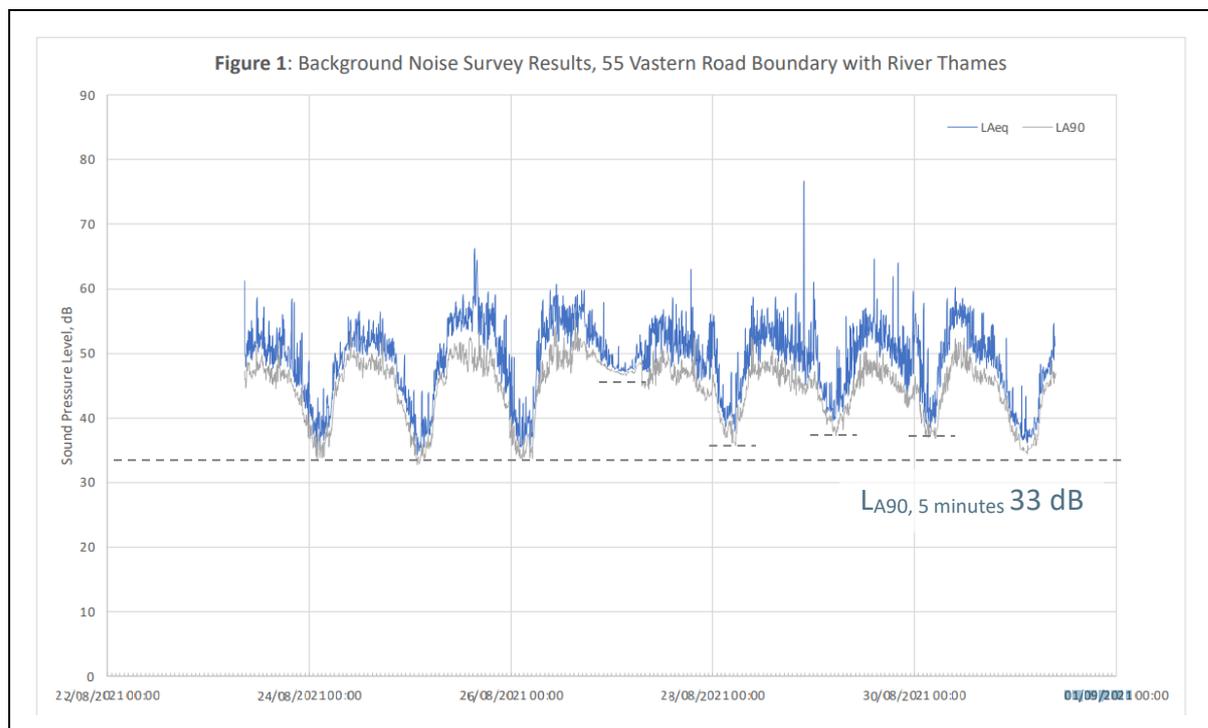
2.21 Furthermore, the period between May and September 2021 is post lock down when the occupancy of the city centre buildings had not returned to normal post pandemic levels. I am therefore of the view that as people return to working in the centre of Reading the load on the SSE Transformers is more likely to increase than decrease due to the general demand going up from AC units, electric heating and office equipment etc.

Background Data Provided by Mr Peckham

2.22 Prior to the meeting with Mr Peckham on Friday 8th October 2021 which is detailed below in section 5, I was provided with the raw data set for the background measurements he undertook between Monday 23rd August 2021 and Monday 30th August 2021.

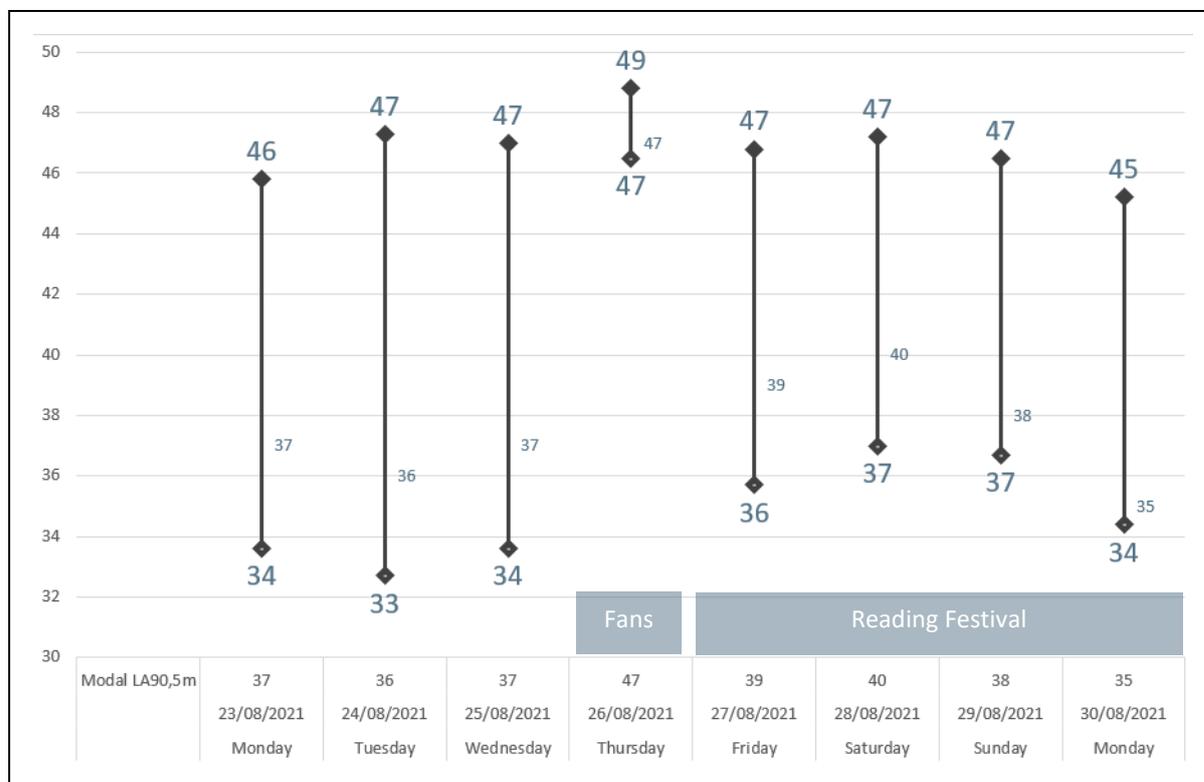
2.23 Mr Peckham presented the background noise levels he recorded over the week-long period at Figure 2 on page 41 of his PoE. A closer inspection of the results indicates that there is a significant anomaly between 23:00 on Thursday 26th August 2021 and 07:00 on Friday 27th August 2021 and the night time background noise levels are elevated over Friday, Saturday, and Sunday night.

2.24 For ease of reference this can be seen within Table 3 at section 5.7 and figure 2 of Mr Peckham’s PoE which is replicated below. I have highlighted the periods in question.



2.25 I have therefore used the raw data supplied by Mr Peckham to produce a graph of the 5-minute background noise levels. The graph shows the minimum, maximum and modal LA90, 5-minute background noise levels for each evening period. This highlights the issue of the

period between 23:00 on Thursday 26th August 2021 and 07:00 on Friday 27th August 2021 and the night times levels between 23:00 and 07:00 over Friday, Saturday, and Sunday night.



2.26 Mr Peckham has provided no explanation of the anomaly within his PoE. I have checked the weather for the period and there are no indications that the wind speed, precipitation, or other weather anomaly could have caused these elevated levels.

Reading Festival – Elevated Levels on Friday, Saturday, and Sunday Night

2.27 The music on the main stage of Reading Festival started at mid-day on Friday 27th August 2021 and continued through until the evening of Sunday 29th August 2021. The music on the main stages finished at mid-night each night but there was music played at a lower level through to 3:00am. There was also the general noise of campers during the night time periods who camped over-night on the Friday, Saturday, and Sunday night.

2.28 The following is a map showing the location of the Reading Festival, the main stage and the Vastern Road Site where Mr Peckham undertook the background noise levels between Monday 23rd August 2021 and Monday 30th August 2021.



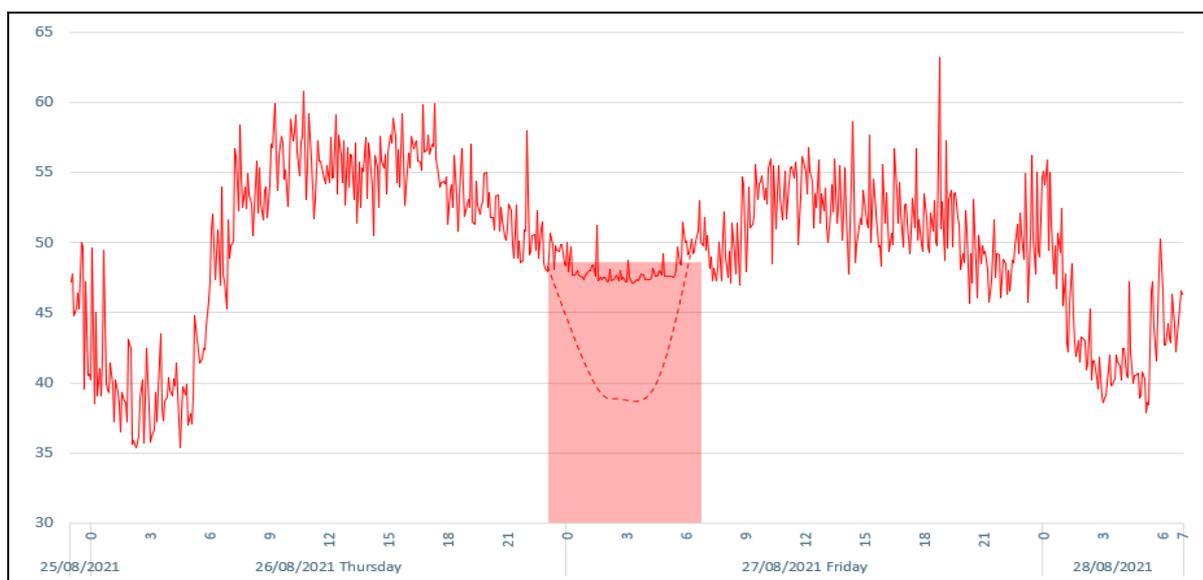
2.29 I am of the professional opinion that the rise in the minimum background noise levels was caused by the background music and over-night campers on Friday, Saturday, and Sunday night from the Reading festival. Therefore, I believe Mr Peckham is incorrect to include these night time periods within his calculation of the night time background noise levels.

Continuous Noise on Thursday Night

2.30 In terms of the significantly elevated background noise levels on Thursday night I have checked the schedule from Reading Festival and there was only a sound check between 18:00 and 20:00 hours. The Reading Festival is open to campers prior to the performances starting on the main stages around mid-day on Friday but there is no way this could have resulted in a constant level detected in the background noise levels.

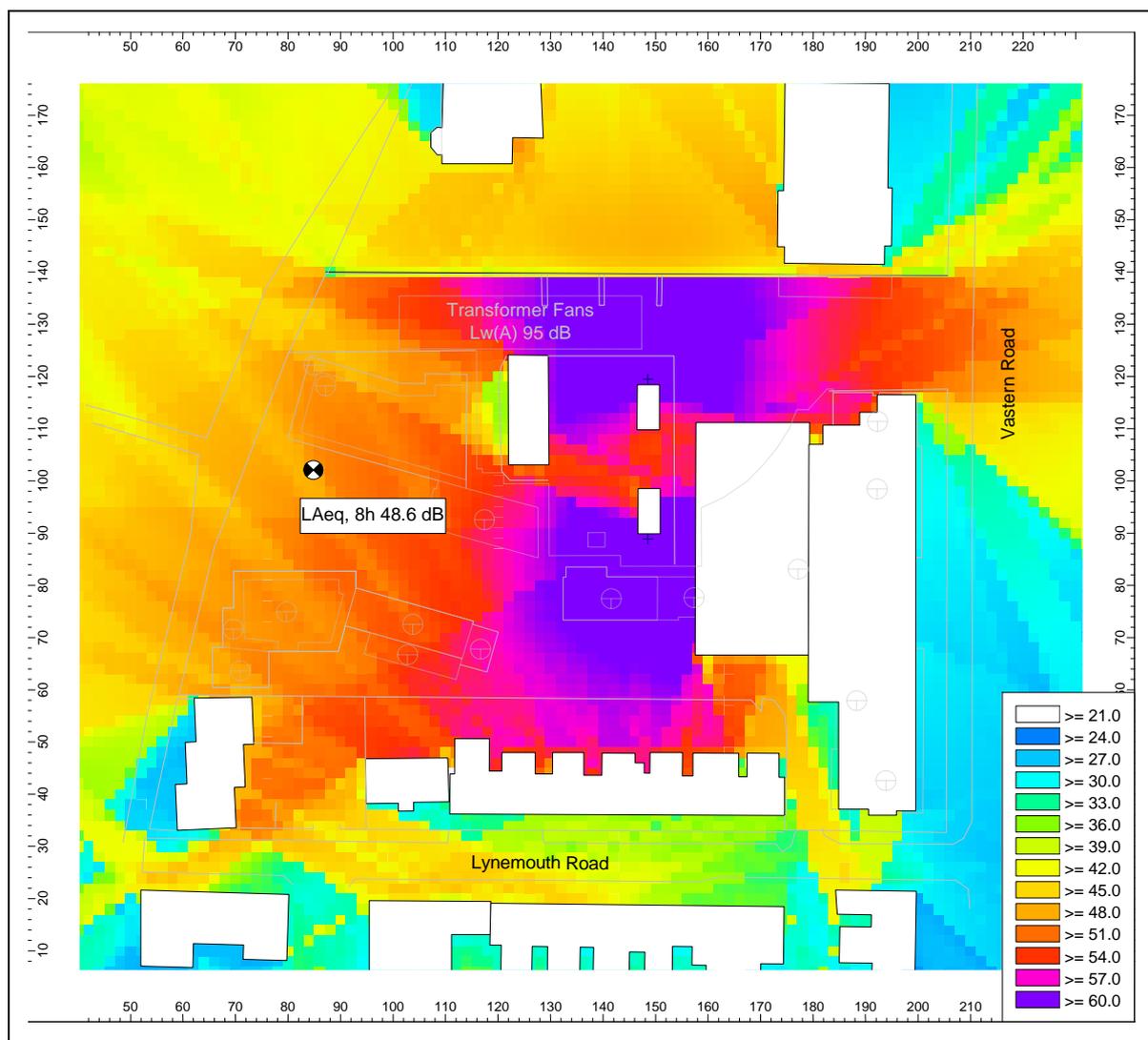
2.31 I have therefore looked at the provided raw data and established that the noise was from a constant source as the range of the background noise measurements detailed above is only 2 dB. Furthermore, I have calculated the average noise levels from the data set for the 8-hour period which results in an equivalent continuous level of $L_{Aeq, 8 \text{ hours}}$ 48.6 dB.

2.32 The following graph shows the 5-minute L_{Aeq} value over three nights from 23:00 on 25th August 2021 to 07:00 on 28th August 2021. It can be clearly seen that between 23:00 on Thursday 26th August 2021 and 07:00 on Friday 27th August 2021 the background noise level does not fall to its usual level but indicates that there was a continuous and steady state noise in operation for the period which prevented the background noise level falling below $L_{A90, 5 \text{ minutes}}$ 47 dB.



3D Noise Map of SSE Transformer Fans

2.33 I have re-run the 3D noise map with the existing buildings in place and a measurement position at the same position as Mr Peckham’s measurements between Monday 23rd August 2021 and Monday 30th August 2021 with the SSE transformer fans running. The results of my 3D noise map indicate that if the SSE transformer fans were both running, they would have produced an 8-hour L_{Aeq} of 48.6 dB.



2.34 I am of the professional opinion that on the balance of probabilities that the fans associated with the SSE Transformer were running for much of the period between 23:00 on Thursday 26th August 2021 and 07:00 on Friday 27th August 2021 as they are very similar to the levels that the above 3D noise map calculated.

External Impact of Fans

2.35 Mr Peckham has undertaken two assessments of the external outdoor sound levels from the operation of the SSE transformer fans, first in the noise report which accompanied the original planning application and secondly within his PoE.

Mr Peckham’s First Assessment

2.36 In the original noise map Mr Peckham establishes a suitable assessment criterion under British Standard 4142: 2014 + A1: 2019 and provides an assessment that will meet this criterion providing a noise map at the end of his report at Figure 4 which shows where this criterion would be exceeded, and the developers should not construct balconies.

Assessment	British Standard 4142: 2014 + A1: 2019 Assessment					
	Specific L _{Aeq, t}	Feature	Rating L _{Aeq, t}	Background L _{A90, t}	Assessment	Conclusion
<u>Day Time (07:00 to 23:00)</u> Original Noise Report R8220-2 Rev 0 (draft) 2020	41 dB	+4 dB	45 dB	40 dB	+5 dB	Adverse Impact

2.37 The 3D noise map at Figure 4 of the original report is very confusing as for some reason it has coloured all the individual blocks red. I think the colour of the buildings should be ignored and only the colour taken outside the building which means there should be no balconies on the rear of Block BC, the rear and side elevations of Block D and the rear and side elevation of Block EFG.

2.38 Mr Peckham’s Second Assessment

Mr Peckham undertakes an additional assessment at section 5.16 using background noise levels that are 5 dB higher than the background noise levels used within his original noise report. Mr Peckham states:

“The maximum noise impact on any balcony will be +13 dB and the maximum noise level (without rating correction – The BS4142 specific source level) 55 dB LAeq.”

2.39 The following table is a summary of an assessment of the outdoor sound levels impacting the proposed residential dwellings undertaken by Mr Peckham. It should be noted that the noise from the fans will be the same during the day and night time periods and therefore I have used Mr Peckham’s background noise levels to derive a night time assessment of the outdoor levels.

Assessment	British Standard 4142: 2014 + A1: 2019 Assessment					
	Specific L _{Aeq, t}	Feature	Rating L _{Aeq, t}	Background L _{A90, t}	Assessment	Conclusion
<u>Day Time (07:00 to 23:00)</u> Mr Peckham Proof of Evidence 5.16	55 dB	+3 dB	58 dB	45 dB	+13	Significant Adverse Impact
<u>Night Time (23:00 to 07:00)</u> Mr Peckham Background Levels 6.9	55 dB	+3 dB	58 dB	37 dB	+21	Significant Adverse Impact

2.40 If I assume the day time background noise levels that I measured and Mr Peckham used within his original noise report are correct i.e., L_{A90, 1 hour} 40 dB, the assessment of the outdoor noise level impacting a residential façade with a balcony has gone from +5 dB to +18 dB. It should be noted that the above noise levels are not the highest noise levels that will impact the residential facades with windows but just the windows that have an associated external amenity space.

2.41 For ease of comparison I have replicated the British Standard 4142: 2014 + A1: 2019 assessment I undertook of the outdoor sound levels impacting the residential facades at section 5.30 of the PoE.

Assessment	British Standard 4142: 2014 + A1: 2019 Assessment					
	Specific L _{Aeq, t}	Feature	Rating L _{Aeq, t}	Background L _{A90, t}	Assessment	Conclusion
<u>Day Time (07:00 to 23:00)</u> Proof of Evidence 5.30	62 dB	+4 dB	66 dB	40 dB	+26	Significant Adverse Impact
<u>Night Time (23:00 to 07:00)</u> Proof of Evidence 5.30	62 dB	+6 dB	68 dB	33 dB	+35	Significant Adverse Impact

Internal Assessment of Noise

2.42 Mr Peckham has undertaken two assessments of the internal noise levels from the operation of the SSE transformer fans, first in the noise report which accompanied the original planning application and secondly within his PoE.

Mr Peckham's First Assessment of Internal Noise

2.43 Mr Peckham provides at section 6.6 in Table 4 of his original noise report the glazing specification which he confirms at section 6.5 were calculated to meet the required internal criterion with the windows closed.

“Calculations have been undertaken to determine the acoustic specification for glazing systems on each building façade to ensure that the development complies with the acoustic criteria set in Section 3 above. [Figure 7] Table 4 shows our recommendations relating to the type of glazing likely on each façade in the vicinity of the SSE site.”

2.44 The Appellant detailed their proposed mitigation measures to provide suitable internal noise levels for future residents in terms of the Type 3 glazing specification detailed within table 4 of section 6.6 of the original noise report.

- Double glazed unit (4mm float, 16mm airgap and 4mm float).
- Secondary glazed panel of 6mm glass with a 150mm airgap.
- The overall weight of the glass is 34 Kgm⁻².

Reason for Refusal Number 4

2.45 Reading Borough Council refused planning permission with Reason for Refusal Number 4 stating the mitigation measures submitted would not be sufficient to provide a suitable quality of accommodation for future occupiers.

Mr Peckham's Second Assessment of Internal Noise

2.46 Mr Peckham provides details at section 6.7 of his PoE of mock up testing which was undertaken on site to prove that the proposed mitigation measures can result in compliance with NANR 45 within the 100 Hz octave band. However, the mitigation measures were significantly increased almost doubling the weight of the glass proposed within the glazing system.

2.47 To show compliance with the specification Mr Peckham has proposed the following enhanced specification of glazing.

- Triple glazed unit (9.5mm laminated – 6mm airgap – 4mm float – 14mm airgap – 4mm float).
- Secondary glazed panel of 8.8mm laminated glass with a 200mm airgap.
- The overall weight of the glass is 62 Kg^m-².

Compliance at 50 and 100 Hz 1/3rd Octave Bands

2.48 The following table demonstrates the difference in Mr Peckham’s position in terms of the glazing specification required to ensure the noise from the SSE Transformers comply with the NANR 45 requirement internally within the proposed residential dwellings.

Glazing Specification	Original Glazing Specification Type 3 (4-16-4-150-6)		Revised Glazing Specification 9.5-6-4-14-4-200-8.8	
	50 Hz	100 Hz	50 Hz	100 Hz
Appellants Position	Not considered	Complies	Not considered	Complies
My Position	Doesn’t Comply	Doesn’t Comply	Doesn’t Comply	Complies

Compliance at 50 Hz

2.49 My calculations indicated that between the outer pane of glass in the triple glazed unit and the 8.8mm laminated secondary glazing spaced by 200mm the mass-air-mass frequency would be exactly 50 Hz. I raised this concern within section 6.7 of my Proof of Evidence about a Mass Air Mass Frequency equalling the dominant tone incident on the window. In my professional experience it is unlikely that even the significantly heavier glazing proposed by the Appellants will meet the criterion of NANR 45 at 50 Hz.

Area of Glazing

2.50 Within my original Proof of Evidence I confirmed that my calculations assumed that the area of glazing to the area of the façade did not exceed the ratio 1:4 as this relationship of the relative areas significantly impacts the calculations of internal noise.

2.51 The Appellants did not refer to the ratio of the area of glazing to the area of the façade but within their Proof of Evidence they make a passing reference to the area of the glazing in ratio to the area of the façade at section 7.6 where they state:

“In order to achieve an acceptable internal noise environment, it will be necessary for some windows in a relatively small proportion of the site to be closed at some times.”

Type 3 Original Glazing Specification

2.52 I am surprised that the original glazing specification which led Reading Borough Council to refuse the planning application was not tested within the mock up test room on site. I can only draw the conclusion that Mr Peckham now believes the original Type 3 glazing specification was not adequate as he has proposed a significantly enhanced glazing specification which nearly doubles the weight of the glass. This proves that Reading Borough Council were right to refuse planning permission on the basis that the mitigation proposed by the applicant had failed to demonstrate that the internal noise levels would result in acceptable living conditions for future residents.

3. Significant Adverse Impact within BS 4142

3.1 Mr Peckham makes the following comment at section 3.22 of his PoE.

“It is my understanding that when BS 4142 was updated in 2014 the descriptors ‘adverse’ and ‘significant adverse’ were introduced in order to provide unity with the PPG. It is my professional opinion that these descriptors are unfortunately worded and, at face value, imply an impact greater than the reality. It is worthy of note that the previous version of the standard, BS 4142:1997, described an impact of +5 dB as ‘of marginal significance’. My subjective experience, from over two decades of assessing the noise from a wide variety of different types of industrial sites, is that a 5dB difference between the BS 4142 rating and background sound levels is indeed subjectively marginal and that a +10 dB difference should not necessarily be regarded as significantly adverse.”

3.2 The revision of British Standard 4142: 2014 + A1: 2019 from the earlier 1997 version was undertaken by Committee EH/1/3 entitled *“Residential and Industrial Noise”*, which is made up of the Institute of Acoustics, The Association of Noise Consultants, The University of Salford, and various other distinguished experts in the field of acoustics.

3.3 I am of the professional opinion that in addressing the likely effects on people who might be inside or outside a residential building based on the outside sound levels, the reference in section 11.b of British Standard 4142: 2014 + A1: 2019 to *“significant adverse impact”* has no other meaning than significant adverse impact.

Comparison to former 1997 Version

3.4 Mr Peckham tries to justify his assertion that significant adverse impact does not mean significant adverse impact in planning terms by referring to the previous 1997 version of BS 4142.

3.5 The former 1997 version of BS 4142 defines the reference time-period for the assessment of the Specific Noise Level at section 6.2 as 1-hour during the day time and 5-minutes during the night-time.

3.6 If I use the background noise data referenced in my Proof of Evidence recorded between the 8th and 13th September 2021 during the night time period and assess the noise from a mechanical piece of equipment that has a low frequency tone and intermittent operation, I can compare the assessments from the 1997 and the 2014 + A1: 2019 version of BS 4142.

Item	BS 4142: 1997	BS 4142: 2014 + A1: 2019
Specific Noise Level	L _{Aeq} , 5 minutes 35 dB	L _{Aeq} , 15 minutes 35 dB
Correction	+5 dB	+6 dB for Tonality +4 dB for Intermittency
Rating Noise Level	L _{Aeq} , 5 minutes 40 dB	L _{Aeq} , 15 minutes 45 dB
Background Noise Level	L _{A90} , 5 minutes 28 dB	L _{A90} , 5 minutes 33 dB (Modal)
Assessment	+12 dB	+12 dB
Conclusion	Complaints Likely	Significant Adverse Impact

3.7 I believe in the above case that a conclusion of *“Complaints Likely”* under the 1997 version of BS 4142 confirms that there will be a *“Significant Adverse Impact”* on people inside or outside the dwellings under the 2014 + A1: 2019 version of the standard.

3.8 I can find no technical reasons and I am not aware of any case law that stipulates that the words *“significant adverse impact”* within British Standard 4142: 2014 + A1: 2019 does not mean significant adverse impact in terms of the effect on people who might be inside or outside the building.

3.9 Furthermore, if there was a difference in the meaning of significant adverse impact then I would have thought this would have been corrected in the recent update to the NPPF in 2019 and 2021.

Avoid Significant Adverse Impact

- 3.10 Mr Peckham continues his argument about significant adverse impact at section 3.23 of his PoE and makes the following statement:

“Furthermore, it should be noted that the planning system does not prohibit an adverse or indeed a significant adverse noise impact. As stated above in Table 1 an impact greater than ‘significant adverse’ should be ‘avoided’ but not prevented.”

- 3.11 I believe that it is incorrect to make the statement that in some way a significant adverse impact is not prohibited within the context of the planning system. Paragraph 185 of the National Planning Policy Framework that significant adverse impacts should be avoided. I believe the word avoid means prevent from happening in this context.

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

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;”

- 3.12 In terms of the Reason for Refusal Number 4, I think it is unacceptable that noise from an industrial and or commercial source could result in a conclusion of *“Significant Adverse Impact”* to people who may be inside or outside of the building upon which the sound is incident.

4. Other Outstanding Issues

My Visit to Site

- 4.1 I visited the site with Mr Ross Jarvis of Reading Borough Council on 3rd September 2021 to familiarise myself with the site and the surrounding area. I confirmed in my PoE that SSE are planning a “£70m upgrade over 8-years as the demand group is approaching 1m500 MW so they need to split the group” from the details posted on the SSE website. I can confirm the SSE Transformer fans were not operating during my visit to the site but that there was a significant number of contractor vans parked within the car park.
- 4.2 Mr Peckham points out that he believed that my assumption regarding the operation of the SSE Fans was incorrect in section 2.5 of his PoE. However, my assumption was that the SSE Transformer Fans were not operating. Mr Peckham does confirm that as per my observation there was construction work being undertaken on site with a significant number of contractor vans parked throughout the site.

“SSE have advised that in August and September of this year they replaced the power supply cable to each transformer.”

- 4.3 Mr Peckham undertook his background noise levels between Monday 23rd August 2021 and Monday 30th August 2021 when according to section 2.5 of his PoE there was construction works on site but make no reference to this within his PoE.

Absolute Noise Levels

- 4.4 As detailed above, Mr Peckham arrives at a position where the outdoor sound from the SSE transformer fans are +13 dB above the background noise level of $L_{A90, 1 \text{ hour}}$ 45 dB and +18 dB above his original background noise level of $L_{A90, 1 \text{ hour}}$ 40 dB on the residential facades with balconies. In accordance with British Standard 4142: 2014 + A1: 2019 this external sound level impacting the facades indicates a significant adverse impact on people who may be inside or outside the dwellings.

- 4.5 However, at section 5.20 of his PoE, Mr Peckham appears to abandon the assessment of significant adverse impact from the BS 4142 and instead relies on the absolute guidance within section 7.7.3.2 of BS 8233. This criterion relates to people who will be outside the dwelling and the impact from sources without character as Mr Peckham correctly points out at section 5.22 of his PoE. However, the justification that the infrequent nature of the fans associated with the transformers makes this an acceptable absolute criterion is incorrect.
- 4.6 Furthermore, Mr Peckham has misunderstood the criterion within section 7.7.3.2 of BS 8233. The background noise levels within the day time are relatively low, and therefore I would not consider the environment to be noisy. Therefore, the absolute noise levels on the balconies should not exceed $L_{Aeq,T}$ 50 dB not the higher level of $L_{Aeq,t}$ 55 dB.
- 4.7 Mr Peckham has reached a conclusions that the outdoor sound levels create a significant adverse impact on people outside the building upon which the sound is incident. Therefore, I can find no reason why Mr Peckham should not have reached the conclusion that the same external sound levels would have a significant adverse impact on people inside the building upon which the sound is incident.
- 4.8 Mr Peckham then tries to justify the significant adverse impact from the outdoor sound levels affecting people who may be outside or inside the building by making reference to section 3(v) within the section entitled “Element 3 – External Amenity Area Noise Assessment” within ProPG at section 5.24 of his PoE. The important section states:

“Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to

“a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or”

- 4.9 Mr Peckham at section 5.24 of his PoE tries to state that as there is a public space at Christchurch Meadow a full 5-minutes walk across the bridge on the other side of the river then the significant adverse impact should be fully offset and ignored. This is not the case as ProPG states the external space must be nearby and for the sole use of a limited number of residents and that the significant adverse impact should only be partially off-set. Therefore, I strongly agree with Mr Peckham’s assumption that his own assessment of a significant adverse impact under BS 4142 should be ignored.

Low Frequency Noise and BS 4142

- 4.10 Mr Peckham makes some assumptions about the scope of British Standard 4142: 2014 + A1: 2019 at section 5.2 of his PoE. I have made it clear in my PoE that the scope of BS 4142 specifically states:

“The method described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling... upon which the sound incident.”

- 4.11 Mr Peckham states that *“BS 4142 does not apply to the assessment of low frequency noise”* and then appears to use this as an excuse not to follow the clear scope of the standard. To be clear BS 4142 contains the following:

“The standard is not applicable to the assessment of low frequency noise.”

- 4.12 BS 4142 does not require you to assess the noise first and then only undertake an assessment using the standard if there is no low frequency noise. What the standard is implying is that you undertake an assessment to BS 4142 but even if you get a favourable assessment of say “low impact” and there is a low frequency content to the outdoor sound impacting the building you should use an alternative assessment such as NANR 45.

Assessment of Industrial Noise to BS 8233

- 4.13 As stated in my Proof of Evidence I believe you should not use British Standard 8233: 2014 for the assessment of Industrial / Commercial noise. Section 6.5.2 of BS 8233 entitled *“Assessment of Industrial Noise”* states that you should use British Standard 4142: 2014 + A1: 2019 for the assessment of outdoor noise and its impact on people who may be inside or outside the building.

Background Noise Levels

- 4.14 As stated above in section 2 I believe Mr Peckham is relying on background noise levels that were impacted by the Reading Festival, the Operation of the main SSE Transformer Fans and possibly the construction works being undertaken on site. The background noise levels I recorded at an equivalent position match exactly to background noise levels within the day time used by Mr Peckham in his original noise report. I believe the background noise levels are as follows:

- Day Time (07:00 to 23:00) $L_{A90, 1 \text{ hour}}$ 40 dB
- Night Time (23:00 to 07:00) $L_{A90, 15 \text{ minutes}}$ 33 dB

5. Meeting with Mr Peckham

5.1 At the request of Mr Peckham, I attended a meeting at his office on Friday 8th October 2021, to discuss the inclusion of the following within the Statement of Common Ground.

- Agree the Background Noise Levels.
- Agree Noise levels from SSE Transformer fans impacting each building.
- Provide further details of the mock-up-tests undertaken on site.
- Agree Inclusion of the 50Hz tone within the SoCG.
- Confirm Assessment of internal noise levels with the windows closed.

Background Noise Levels

5.2 At the meeting I agreed with Mr Peckham that in the day time the typical background noise levels on the façade of the rear of Block A and BC and the sides of Block D and EFG would be $L_{A90, 1 \text{ hour}} 45 \text{ dB}$. However, since the meeting I have undertaken a detailed analysis of the raw data and I am now of the opinion that in the day time as well as the night time background noise levels have been impacted by the Reading Festival and the operation of the SSE Transformer Fans. I am now of the professional opinion that Mr Peckham is using background noise levels that are not representative and are too high within his assessment.

Noise from SSE Transformer Fans

5.3 At the meeting Mr Peckham would not agree that my 3D noise map which is relied upon within my PoE was accurate. However, the analysis of the anomalies within Mr Peckham's background noise level between 23:00 on Thursday 26th August 2021 and 07:00 on Friday 27th August 2021 has in my opinion provided clarification that my noise map is accurate.

Further Details of Test

5.4 Despite the assurance of Mr Peckham at the meeting at the time of writing I have not received the details of the mock up tests undertaken by Mr Peckham and relied upon within his PoE.

50 Hz Tone

- 5.5 At the meeting Mr Peckham was unable to agree that the SSE fans have a distinct 50 Hz tone despite the clear graph I produced in my PoE at section 5.4. There is clearly a tone in the sound power levels provided by Mr Peckham within his original noise report and I am unable to determine any technical reason why Mr Peckham would not consider the 50 Hz tone to be present.

6. Mr Peckham Assessment with Open Windows

Incorrect Policies

- 6.1 Mr Peckham make an incorrect statement at section 3.1 of his PoE relating to policies EN16 and CR6 which were referenced on the Reason for Refusal Number 4.

“These policies form part of the Reading Borough Local Plan (adopted November 2019) and relate to ‘New development in a historic context’ and ‘Accessibility and intensity of the development respectively’. As such they do not relate to noise and these aspects of reason for refusal 4 are not considered within this proof of evidence.”

- 6.2 I have had a quick look at the Local Plan, and I believe Mr Peckham has incorrectly referenced policy EN6 which is entitled *“New Development in a Historic Context”* instead of policy EN16 which is entitled *“Pollution and Water Resources”* and policy CC6 entitled *“Accessibility and the Intensity of Development”* instead of policy CR6 which is entitled *“Living in Central Reading”*.

- 6.3 I stated in my Proof of Evidence that below policy CR6 paragraph 5.3.25 of the Local Plan stated that in Central Reading in some cases it may be acceptable to assess the internal noise levels with the windows closed. It should be noted that this paragraph should be read in conjunction with the paragraph above 5.3.24 which talks about residential dwellings in close proximity to the *“busy evening economy”*.

“In some cases, in order for the internal noise levels to be reasonable and not adversely affect health it would be necessary to provide a system of ventilation that entirely removes the necessity to open windows, even in very hot weather.”

- 6.4 Mr Peckham is very clear in his PoE Evidence at paragraph 3 of his Summary on Page 2 that *“I have been involved with this site, on Berkeley Homes’ behalf, since September 2018...”*. I believe does not appear to appreciate that in Central Reading paragraph 5.3.25 applies in

some cases. Accordingly, the various Appeal decision and documents relating to the assessment of noise with the windows closed between sections 6.16 and 6.23 within Mr. Peckham's PoE are not relevant.

- 6.5 I am of the professional opinion that the site is in central Reading and as such Policy CR6 applies and that in this case the assessment of internal noise levels should be undertaken with the windows closed.

7. Conclusion

Operation of SSE Fans

- 7.1 I am of the professional opinion that as the load on the SSE transformers and the ambient temperature increase the fans will operate during the day and night time periods.

Background Noise Levels

- 7.2 I am of the professional opinion that the background noise levels measured by Mr Peckham between Monday 23rd August 2021 and Monday 30th August 2021 were significantly impacted by the Reading Festival, the operation of the main SSE Transformer fans and possibly by the construction works being undertaken on site by SSE. The daytime background noise levels of LA90, 1 hour 45 dB used by Mr Peckham in his PoE are 5 dB above the background noise levels used by Mr Peckham in his original noise report.
- 7.3 The increase in the background noise levels used by Mr Peckham in his PoE for the assessment of outside sound hitting the residential facades with balconies reduced the assessment from +18 dB to +13 dB. The background noise levels I measured at an alternative position within the day time of LA90, 1 hour 40 dB matched exactly the background noise levels used by Mr Peckham in his original noise report submitted with the application.

External Noise Levels

- 7.3 The assessment by Mr Peckham in his original noise report which supported the planning application indicated that residential facades with balconies would experience an assessment under BS 4142 of +5 dB. However, the assessment undertaken by Mr Peckham in his PoE indicates that this assessment has increased to +13 dB. If an assessment is undertaken against the original background noise levels used by Mr Peckham which match the background noise levels I measured at an equivalent position, then the assessment would increase to increase by 5 dB to +18 dB.

Internal Noise Levels

- 7.4 Mr Peckham undertook calculations within his original noise report which stated that the Type 3 Glazing would result in acceptable internal noise levels. In his PoE he has had to significantly upgrade the glazing to show compliance with the NANR 45 requirements at 100 Hz. However, I believe even the enhanced glazing will not meet the requirements at 50 Hz.

8. Errata to Proof of Evidence

- 8.1 Section 6 of the Rebuttal Proof of Evidence provides the errata for my Proof of Evidence. These should be seen as the correct position and read in place of the original sections within the Proof of Evidence.

Minor Spelling and Grammar Corrections

- 8.2 The following are minor spelling and grammar corrections to version 1.1 of my PoE.
- 5.26 change “+2dB” to “+0dB” on the 3rd line.
 - 5.27 change “+2” to “+4 dB” on the 3rd line.
 - 5.30 change “ BS4142 Recommendations” to “Night Time Assessment Levels” in figure 27.
 - 5.36 remove the word “Internal” from the title above this section.

A Appendix A – Email from SSE dated 8th October 2021

From: Gough, Richard
Sent: 08 October 2021 18:43
To: Rhys Scrivener
Cc: Jackson, Wendy
Subject: RE: SSE Transformers at 55 Vastern Road
Importance: High

Hi Rhys,
As promised; please see responses positioned against each of your questions below using green text. I trust this is helpful and you'll not hesitate to contact me if you wish to discuss this matter further.
Best regards.

Richard Gough | Director of SHE & System Operations

A: No1 Forbury Place, 43 Forbury Road, Reading, RG1 3JH
T: [07833 992 222](tel:07833992222)
W: www.ssen.co.uk



From: Gough, Richard
Sent: 08 October 2021 07:57
To: Rhys Scrivener <rhys.scrivener@kra.uk.com>
Cc: Jackson, Wendy <Wendy.Jackson@sse.com>
Subject: RE: SSE Transformers at 55 Vastern Road

Morning Rhys.
I'm still waiting for information from a colleague but no alarm bells currently.
I'll either send you the information today, or at least an update (hopefully the information you've requested subject to my colleague follow-up on their commitment).
Best regards.

Richard Gough | Director of SHE & System Operations

A: No1 Forbury Place, 43 Forbury Road, Reading, RG1 3JH
T: [07833 992 222](tel:07833992222)
W: www.ssen.co.uk



Richard Gough
Scottish and Southern Electricity Networks

Electricity Distribution System at 55 Vastern Road, Reading.

Dear Sir,

I am working on behalf of Reading Borough Council as their noise consultant reviewing the proposed development adjacent to your transformers at 55 Vastern Road.

When the Transformer Fans Operate...

We are trying to better understand how the cooling fans on the two large transformers are likely to operate now and in the future so we can ensure they do not have the potential to disturb the future residents of the nearby proposed flats.

1. Previous Operating...

As the fans are designed to protect the transformer core from over-heating do you have any historic data of when the fans have previously operated. Can you confirm how often the fans would be run each year for maintenance purposes.

Under normal conditions when both transformers are in service, the fans might run on average for 10 minutes per month, to keep them functioning. With both transformers in service, the load would be shared between them and temperatures would remain below the threshold at which fan operation would be triggered. With one transformer out of service for maintenance, or in the unlikely situation of a transformer failure, the fans could operate depending on load during peak demand times around 8am and 6pm. Maintenance outages would typically take place once every four years for a period of 2-3 days (this includes both transformers out of service one after the other).

2. Set Point for Operation...

We assume the fans will start to operate when a specific temperature setpoint is exceeded either in the core of the transformer or the oil cooling system. Is it possible for this setpoint to be reached at slightly lower ambient air temperatures if the transformer operating load is high enough and can you provide details of the exact set-point in terms of load and ambient temperature.

Fan operation is triggered once a temperature threshold is crossed, measured by winding temperature or top oil sensors. Usually this is in the range 65-75 deg C. Ambient temperature is not measured by the related sensors but it will typically influence the transformer tank, oil and winding temperature and as such in hot weather fans are expected to operate more often, particularly if one of the transformers is out of service.

3. Operation of the Transformer in the Future...

We note from your website that these transformers are subject to a “£70m upgrade over 8-years as the demand group is approaching 1,500 MW so they need to split the group”. Do you expect the load on these Transformers to increase in the future with increased use of electric cars / climate change and will this be likely to impact how often the Transformer cooling fans operate.

We do expect demand to increase, which in-turn will increase the frequency and duration of fan operation when one unit is out of service.

4. Mitigation Measures

Are there any standard mitigation measures that could be applied to the transformer cooling fans to reduce their noise levels i.e. variable speed control, cylindrical silencers, larger quieter fans etc.?

Yes; such measures include noise barriers and retrofitting quieter fans.

Your help in this matter would be very much appreciated.

Best regards

Rhys

Mr. R. M. Scrivener - KR Associates (UK) Ltd

Direct: [07966 398969](tel:07966398969) Southampton: 02380 55 04 55

Quietly confident...

Rhys

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