

CSG

acoustics

**Walker Sime Ltd
The Corner House
Fourth Avenue
Trafford Park
Manchester
M17 1DB**

25th March 2021

Our Ref: C1806-T1Rev01

Emailed to: ggeraghty@walkersime.co.uk

For the attention of Georgina Geraghty

Dear Georgina

Re: Heron House Plant Noise Planning Condition Discharge – Revision 1

Further to installation of external rooftop plant at Heron House, Manchester, a noise verification report is required to demonstrate noise criteria is achieved. Planning permission decision notice **125070 condition 4(b)** requires post-completion testing to confirm compliance with the relevant noise criteria.

CSG Acoustics have been commissioned to carry out this post completion noise survey and assessment to support the planning condition discharge. This letter details the planning condition requirements, noise survey results and assessment of noise levels to allow the discharge of this condition.

Revision Notes: Following review by MCC Environmental Health this revised document addresses comments received.

The following table addresses each comment and clarifies queries. If any further clarification is required please contact CSG Acoustics.

Yours Sincerely



Andy Ryan BSc (Hons) MIOA
Associate Acoustic Consultant

London Office

83 Victoria Street, London, SW1H 0HW
T: 0207 084 6346

Manchester Office

Design House, 23 Copperas Street, Manchester, M4 1HS
T: 0161 300 9691

www.csqacoustics.co.uk

CSG Acoustics Ltd. Company Reg No 08284671

Responses to EHO comments:

Comment 1	<i>1. The plant rating table needs to include the calculated reduction used for distance in the table</i>
Response 1	Noise reduction (dB) used in the calculation has been added into Table 1. Notes describing elements also added. See Appendix for example of a full calculation.
Comment 2	<i>2. What reduction was applied for the noise barrier? This should also be included within the rating table to demonstrate how the final rating was established</i>
Response 2	No reduction was used for the barrier. All predictions are based on noise measurements on the receiver side of the barrier, therefore barrier noise reduction is included in the measurement data.
Comment 3	<i>3. We will need confirmation that the noise barrier has been installed as recommended in terms of location, construction, height, materials and acoustic performance along with confirmation there are no gaps. The applicant may have to supply the specification and details of the acoustic barrier installed</i>
Response 3	See appendix for details of the noise barrier specification details, photos showing location and detail. The screens heights average between 2.45m and 2.65m. Note there is slight variation in screen height due to roof undulation.

Planning Condition and Noise Limits

Planning Condition 4(b):

Upon completion of the development and before any of the external plant is first operational, a verification report will be required to validate that the work undertaken confirms to the above noise criteria.

The report shall give the results of post-completion testing to confirm that the proposed noise limits are being achieved once the plant and any mitigation measures have been installed. Any instances of non-conformity with the above criteria shall be detailed along with any measures required to ensure compliance. These measures shall be approved in writing by the City Council as Local Planning Authority and the development shall be implemented in full in accordance with the approved details before the plant is first brought into use.

The noise criteria referenced is based on the following:

Any externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.

In order to achieve this, the development hereby approved shall be carried out in accordance with the recommendations within the Noise Impact Assessment from dBX Acoustics, ref. 18064 Heron House BS 4142 R02A, dated 31 October 2018.

Plant Noise Limits

dBX Acoustics Ltd noise planning report details the plant noise limits at identified noise sensitive receptor locations. The following table is taken from the dBX report and is used to assess plant noise levels.

***Figure 1: Plant Noise Limits and Sensitive Receptors
(taken from dbX Acoustics report)***

Table 5 – Free-field Rating Level limits at each receptor

Receptor	Office Hours (07:00 – 18:00 hrs)
	Rating Level Limit
Commercial Union	46 dB LAeq, 1hour
Lloyd Street	47 dB LAeq, 1hour
Queen Street	46 dB LAeq, 1hour
Town Hall	48 dB LAeq, 1hour
Heron House Courtyard Elevations*	60 dB LAeq, 1hour

*based on acceptable internal level of 45 dB LAeq,1hr and 15 dB loss for open window.

Noise Survey and Assessment

CSG Acoustics Ltd visited site on 7th January 2021 and carried out noise measurements on the rooftop of Heron House. Due to the nature of this type of noise survey i.e. the plant noise levels should be below the existing ambient noise levels at the sensitive receiver, measuring the compliant plant noise levels at the sensitive receiver is not directly possible.

To facilitate an assessment of noise levels at the sensitive receivers, plant noise levels at the building edge of Heron House have been measured and predictions made at the sensitive receivers to allow direct comparison against the planning condition criteria.

Table 1 below summarises the measured noise levels at the rooftop edge, predicted noise level at receptors and the planning condition plant noise criteria. Full survey details can be found appended to this letter.

Table 1: Plant Noise Assessment Summary

Assessment / Roof Edge Measurement Location	Noise Measurement* L _{Aeq,T} , dB	Plant to Sensitive Receptor Distance (m)	Noise Reduction** dB	Predicted Plant Noise Level at Receptor L _{Aeq,T} , dB	Plant Noise Criteria L _{Aeq,T} , dB	Compliant with Planning Condition
Queen Street	51	16	8	44	46	Yes
Lloyd Street	54	22	11	43	47	Yes
Commercial Union (Brazenose St)	54	26	13	41	46	Yes
Town Hall (Albert Square)	51	113	15	35	48	Yes
Heron House courtyard elevations	54	11	3	51	60	Yes

*Noise measurements were taken outside of plant enclosure with all plant operational

**Combination of distance loss and 'barrier effect correction'. Note that the 'barrier effect correction' is not a reduction due to barrier screening. It is a correction applied to account for the reduced screening seen at greater distances than the measurement position. Measurements were taken close to the barrier and therefore measurement data has slightly increased barrier screening (shadowing).

Plant noise prediction calculations are based on geometric divergence ($20 \times \log(\text{distance})$), taking account of the measurement distances in relation to plant and receptor. Measurements were taken close to the noise barriers (~1m), therefore a correction has been applied to account for the reduced barrier effect at greater distances.

As seen in Table 1 the measurements and predictions show that the planning condition is met at all the noise sensitive receptors and therefore based on this assessment the requirements of the planning condition are met.

Appendix

Noise Survey Data

The following table and figure details all measurement data and positions.

Table 2: All Measurement Data

Rooftop Measurement Position		L _{Aeq, T} , dB	Plant On/Off	Position
Queen Street	Inside enclosure	43	Off	1
Queen Street	Outside Enclosure	49	Off	2
Queen Street	Inside enclosure	71	On	1
Queen Street	Outside Enclosure	51	On	2
Queen Street	Outside Enclosure	57	On	9
Lloyd Street	Inside enclosure	43	Off	3
Lloyd Street	Outside Enclosure	48	Off	4
Lloyd Street	Outside Enclosure	54	On	4
Lloyd St	Inside enclosure	70	On	3
Commercial Union (Brazennose St)	Inside enclosure	71	On	5
Commercial Union (Brazennose St)	Inside enclosure	66	On	6
Commercial Union (Brazennose St)	Outside Enclosure	54	On	8
Commercial Union (Brazennose St)	Inside enclosure	42	Off	5
Commercial Union (Brazennose St)	Inside enclosure	42	Off	6
Commercial Union (Brazennose St)	Outside Enclosure	50	Off	8
Town Hall (Albert Square)	Outside enclosure	51	On	7
Town Hall (Albert Square)	Outside Enclosure	51	Off	7

Figure 1: Measurement Positions (1 to 9)

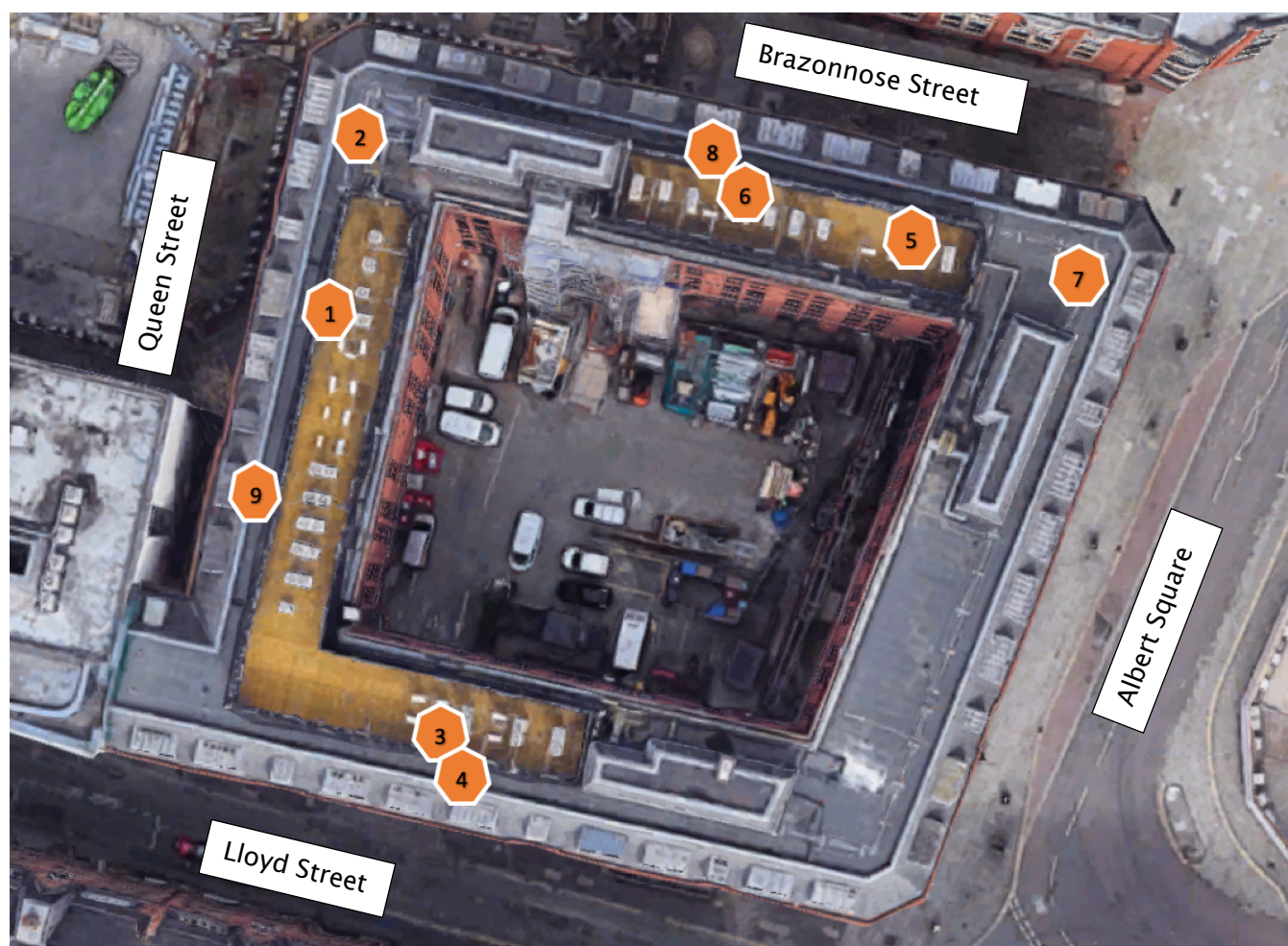


Table 3: Full Noise Level Calculation Example

Assessment/Measurement Location (position No.)		Distance – measurement position to Sensitive Receptor (m)	Distance - measurement position to plant (m)	Plant Noise Measured $L_{Aeq,T}$	Barrier effect correction	Distance loss dB $20 \cdot \log(d1/d2)$	Plant Noise Level at Receptor*
Queen Street	Roof edge outside enclosure (2)	12	4	51.3	+2.0	$20 \cdot \log(12/4) = 9.5$	$51.3 + 2 - 9.5 = 43.8 \text{ dB}$



ACOUSTIC BARRIERS/SCREENS

Acoustic Barriers and Screens can be installed when acoustic screening is required at a site. The acoustic screen is manufactured of a significant mass to ensure noise does not penetrate the barrier, and is faced with an acoustically absorptive medium to reduce reflected noise.

Typical Applications:

- Remove acoustic "line of sight" between noise source and receptor
- For use where a full enclosure is not necessary
- As part of a wider noise control design

Options

Galvanised Steel or Aluminium construction available. Polyester Powder coated (PPC) to any standard RAL colour (RAL xxxx). Supporting steelwork for standalone applications designed to suit each job.

Acoustic Performance

Octave band C frequency	63	125	250	500	1k	2k	4k	8k
Transmission Loss (dB): 50mm Panel	14	15	21	33	42	52	61	60
Transmission Loss (dB): 100mm Panel	20	21	27	39	48	58	67	66

Absorption Coefficients

Octave band C frequency	63	125	250	500	1k	2k	4k	8k
Absorption coefficient: 50mm Panel								
Absorption coefficient: 100mm Panel		0.89	1.2	1.16	1.09	1.01	1.03	0.93

Specification

Barrier panel manufactured from sheet metal. Internal face manufactured from perforated sheet metal with an inert, acoustically absorptive infill.

Nominal weight of panel: Steel 20kg/m², Aluminium 15kg/m²

Steel supports designed to suit application, but typically mild steel I-beam or box section construction.

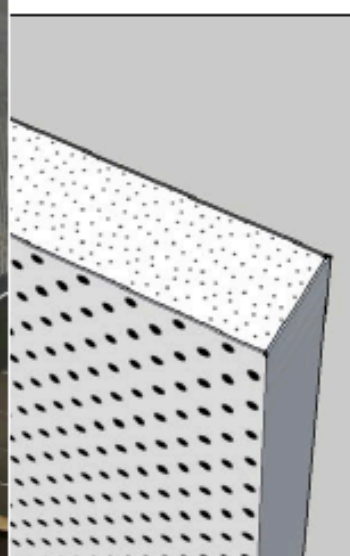
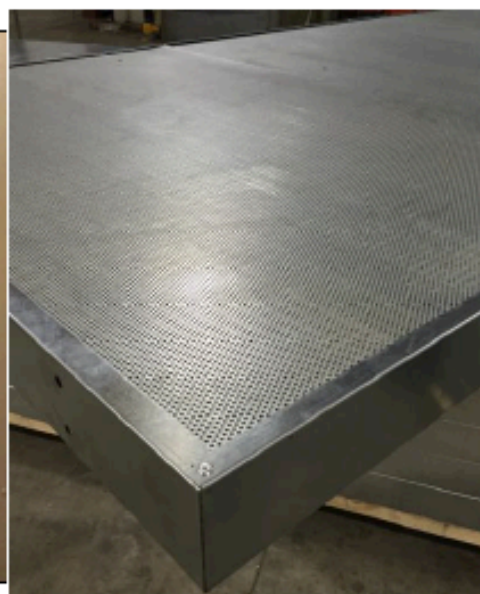
Ordering

All Barriers designed and manufactured to order.

Barriers are manufactured to standard sheet metal tolerances of ± 2 mm.

Dimensions listed on a Certified Dimension Schedule are as manufactured.

Flanges, cleats, supporting steelwork, flashing, mastic or other such items are not included unless specified.



Brazennose Street (Courtyard side) –

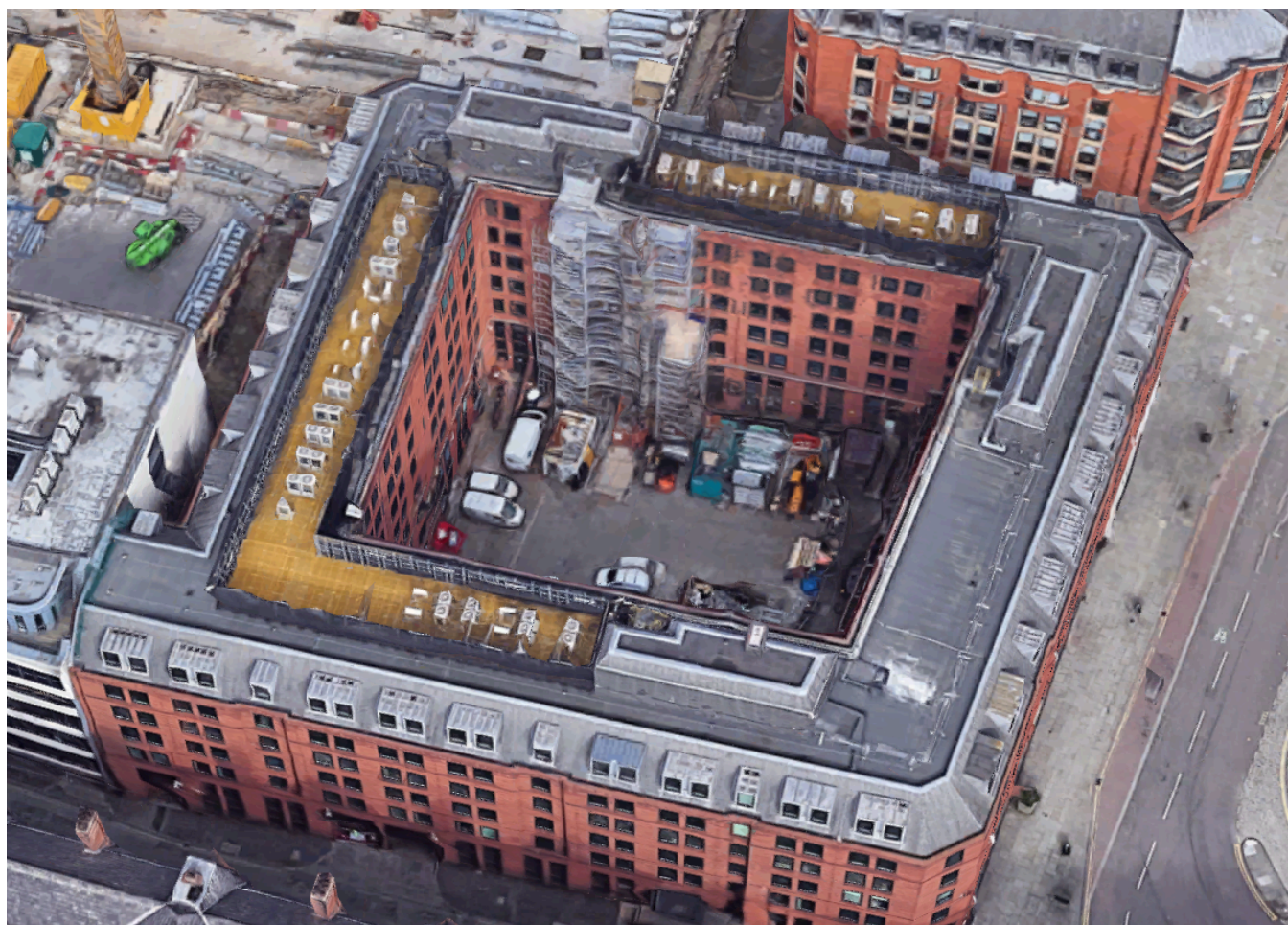
Barrier showing how no gaps ensured by use of flashing across all panel joints



Queen Street and Lloyd Street (Courtyard side)



Enclosure layout





Operating and Maintenance Instructions Acoustic Panel Screen / Doors

- AHL acoustic panels have no moving parts and therefore require no lubrication or routine maintenance
- All acoustic panels are furnished rigidly constructed, well made and free of any defects in materials or workmanship. To ensure continuing proper operation, the screen should be visually inspected at least once a year to verify that:
 - Acoustic Panels are undamaged and remain true and parallel
 - The holes in the perforated steel are open and free of dust or other foreign objects.
- In the event that debris must be cleaned or wiped clean from the perforated metal, the expamet should be vacuum cleaned or wiped clean with a cloth dampened in a mild detergent solution. In no event should solutions be used to clean the acoustic panels that might affect the galvanised or painted protection on the steel.
- The occurrence of white rust (zinc oxide) on galvanised acoustic panels or fixing channels is a normal event and not a maintenance item. It occurs when zinc in the galvanising reacts electrolytically with moisture to protect the steel.
- Where Doors are fitted in screens the following checks should be undertaken on a monthly basis:
 - Check all fixings are secure
 - Lubricate door hinges – light machinery oil
 - Wash surface of door and frame with a warm soapy water or mild detergent and wipe dry
 - Lubricate Locking points and cylinder if supplied

