Noico Limited,
Patrick House,
Station Road,
Hook, RG27 9HU
Tel: 01256 766207
Fax: 01256 768413
E-mail: sales@noico.co.uk
Web site: www.noico.co.uk

BB Partnership Ltd.
Studios 33-34
10 Hornsey Street
London
N7 8EL

Date: 15th August 2018
Our Ref: 580633

For the attention of Joe McGowan

Re: 55 Lancaster Grove – External Condensing Units – Noise Reduction Measures

Dear Sirs,

Noico have been asked to design an acoustic solution to control the noise produced by the outdoor condensing units located at the rear boundary of 55 Lancaster Grove.

From the background noise survey performed by Noise and Vibration Partnership in January 2016, the lowest measured night-time background noise level was 35dB(A) (L_{90} dB re $2x10^{-5}$ Pa)

The requirement for new sources of plant noise is to be 10dB(A) below the lowest measured background level, therefore the target noise level for new plant noise is 25dB(A) when measured at 1m from the façade of the nearest property.

The distance from the location of the condensers to the property at the rear of 55 Lancaster Grove, on Lambolle Road was measured by laser to be 21m, however, the distance to the properties adjacent to 55 Lancaster Grove were measured to be 15m from the condensing unit location.

Therefore, for this design the target noise level has been taken as 25dB(A) at a distance of 15m from the condenser location.

Condenser information:

The equipment consists of 2 off LG Multi V condensing units, model ARUM080LTE5
Information obtained from LG states that each condenser produces the following Sound Power Levels when running in Heating Mode:

Octave Band (Hz)	63	125	250	500	1k	2k	4k	8k		dB(A)
Sound Power Level (dB)	-	83	82	78	70	58	49	50		78

The air volume required for each unit to operate is 240m³/m

The available static pressure produced by the condenser unit fans is unknown, but it will be low, hence the pressure drop created by any attenuation system must be kept as low as possible.

Acoustic Calculation

Octave Band (Hz)	63	125	250	500	1k	2k	4k	8k		dB(A)
Sound Power Level of 1 Condensing Unit (dB)	-	83	82	78	70	58	49	50		78
Correction for condensing 2 units		3	3	3	3	3	3	3		
Sound Power Level of 2 Condensing Units (dB)	-	86	85	81	73	61	52	53		81
15 m distance attenuation & free field correction	-	35	35	35	35	35	35	35		
Directivity correction based on vertical discharge	-	2	2	1	1	1	1	1		
Intake & Discharge Attenuators	9	15	26	40	50	50	45	37		
Resultant Sound Pressure Level at nearest property façade		38	26	7	0	0	0	0		24

Mitigation Measures

To install an acoustic enclosure around the two condensing units, with allowance for ventilation and access for plant servicing.

Octave Band (Hz)	63	125	250	500	1k	2k	4k	8k
100mm thick acoustic panel-work Transmission Loss (dB)	21	22	29	38	47	52	54	56
Intake Attenuator 3000 x 1200 x 1200mm long Pressure drop 30 Pascals	9	15	26	40	50	50	45	37
Discharge Attenuator 3000 x 1500 x 1200mm long Pressure drop 20 Pascals	9	15	26	40	50	50	45	37

Overall size of the recommended acoustic enclosure: 3200mm wide x 3000 x 3500mm high
Generally as shown an attached Noico drawings 580663/SK1 & 2

The size of the recommended acoustic enclosure will require the existing concrete plinth to be extended to suit the floor area of the acoustic enclosure.

Construction & Finish

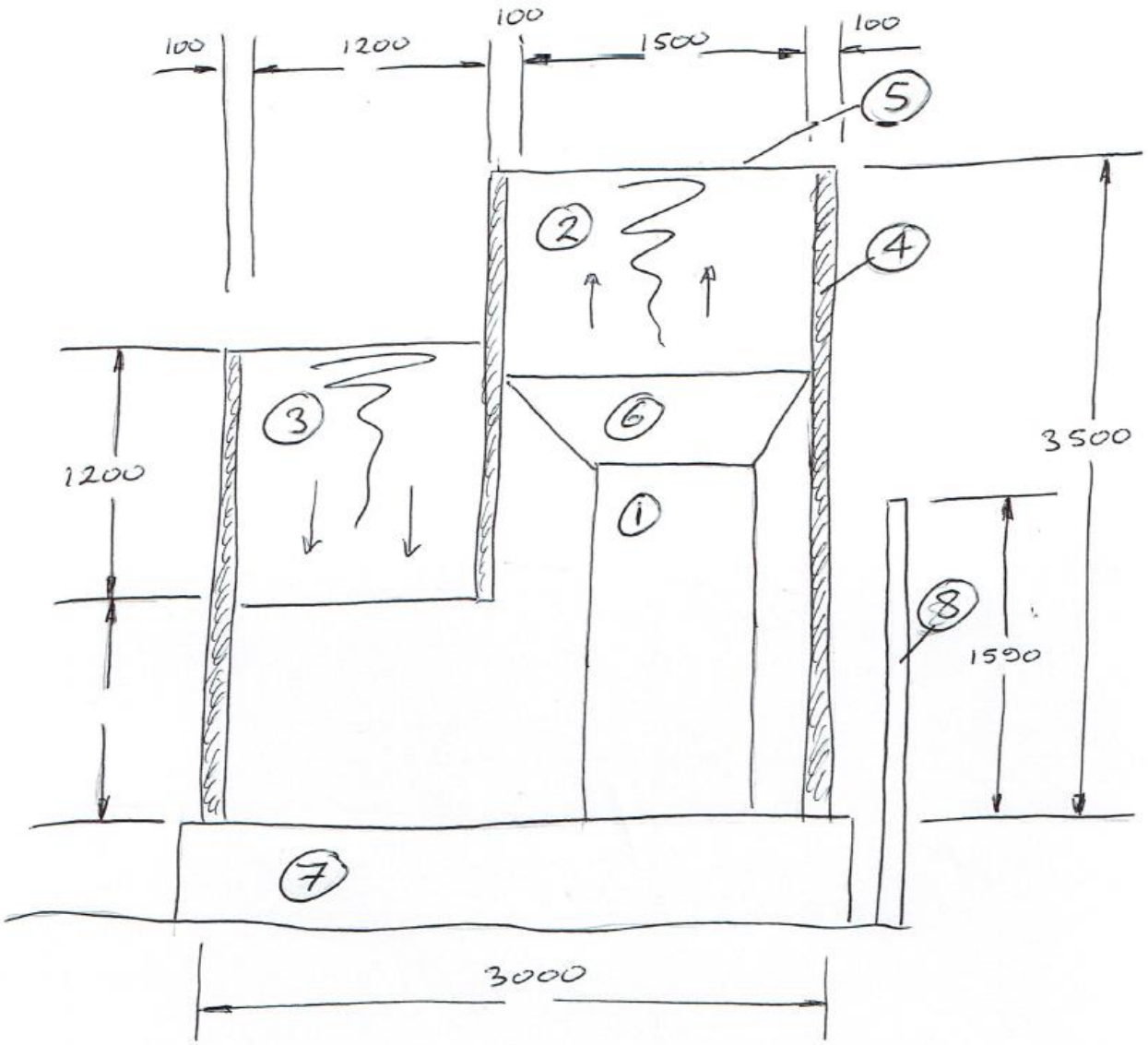
The acoustic panels and attenuators outlined above would be fabricated from pre-galvanised steel sheet, with an external Polyester Powder Coated finish to a standard non-metallic RAL number – exact colour to be agreed.

The acoustic infill will be an inorganic, non-toxic inert mineral fibre complete with a tissue facing. The inner face of the acoustic panel-work and the attenuator splitter faces will be constructed from perforated steel with a galvanised finish – no other finish to be applied. The panels & attenuators will be supplied in suitable modules to ease both manufacture and installation and a steel bird mesh will be fixed to the air connections of the intake and discharge attenuators.

Should you require any further information or have any queries about our proposals please do not hesitate to contact us.

Yours faithfully
For Noico Limited

Andy Hetherington MIOA
Direct Dial: 01256 763956
Mobile: 07469 856824
Email: andy@noico.co.uk



Section through proposed acoustic enclosure

1. 2 off ARUM080LTE5 Condensing Units
2. Discharge Attenuator
3. Intake Attenuator
4. Acoustic Panel work Enclosure
5. Galvanised wire Bird guard
6. Discharge Air Plenum
7. Concrete Plinth
8. Existing Wooden Fence

NOICO Noise Control Engineers	Project: 55 Lancaster Grove	Title: Proposed Acoustic Enclosure
	Dwg No. 580633/SK1	Date: 15th August 2018

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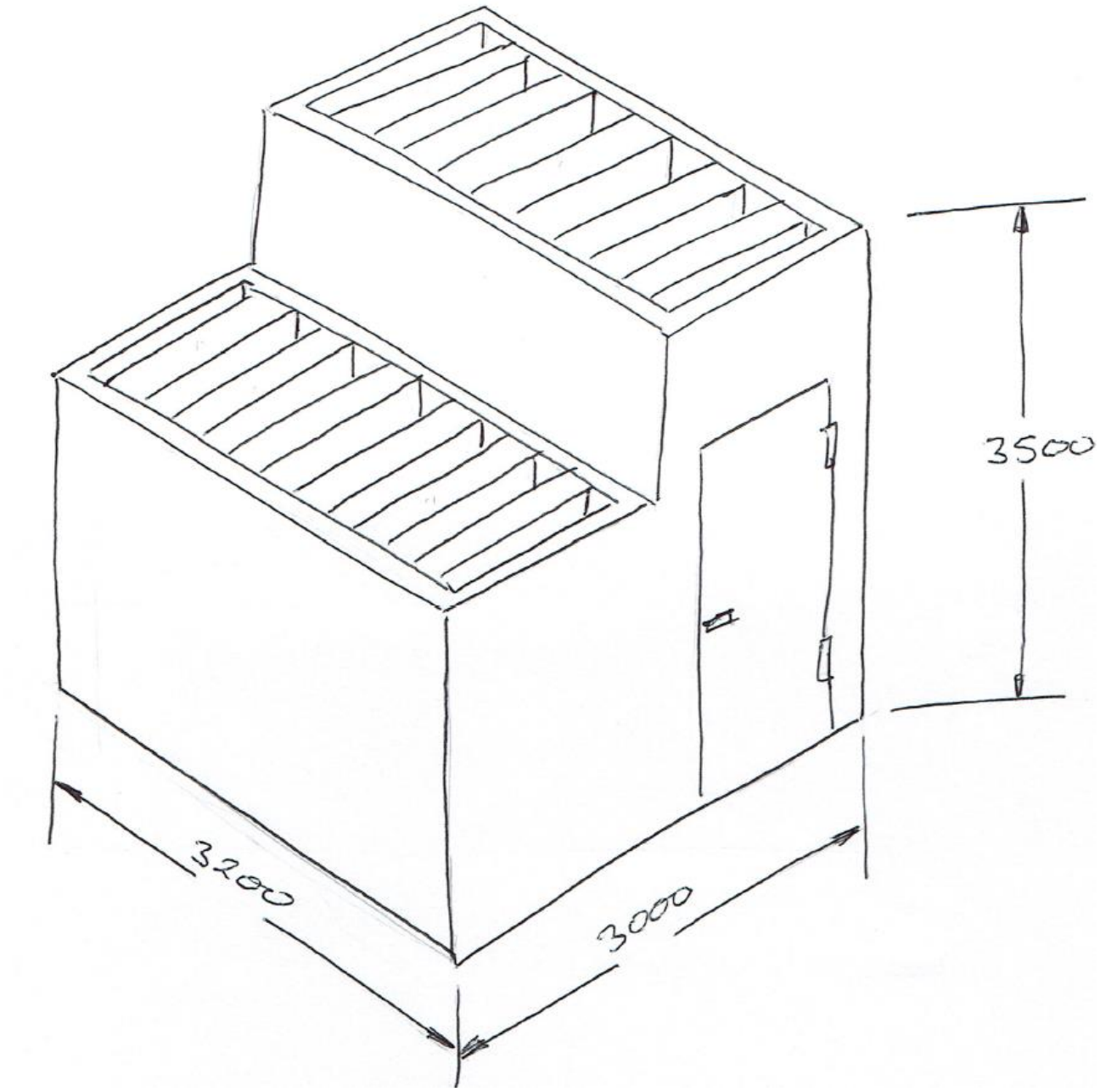

1. Galvanised Construction
2. Painted externally to a standard RAL colour

NOICO Noise Control Engineers	Project: 55 Lancaster Grove	Title: Proposed Acoustic Enclosure
	Dwg No. 580633/SK2	Date: 15th August 2018

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Similar Acoustic Enclosures