Ref: MDR/J4963a

28th March 2022

Wellan Ltd

Wellan House

Aylesmore

Shipston-on Stour

Warwickshire

CV36 5EJ

For the attention of Mr M Walker BSc CEng MICE

Dear Sirs

Re: New House At 13 Blackwood Place, Bodicote, Banbury, OX15 4BD - Proposed Residential Development - Environmental Noise Assessment

Further to your recent instruction an environmental noise assessment was undertaken at the proposed residential development site; our report is as follows:-

Brief

The proposed dwelling to be located at the rear of the site will be adjacent to Oxford Road on the east site boundary and there will be a road traffic noise impact. The planning authority has requested a noise assessment for submission and approval. The noise criteria normally advised is as the BS8233:2014 good standard, with the enhancement of a night time bedroom L_{Amax} criteria:-

- Day 07.00hrs-23.00hrs living rooms & bedrooms 35dB $L_{Aeq\ 16hr}$

- Night 23.00hrs-07.00hrs bedrooms 30dB $L_{Aeq\ 8hr}$ & 45dB $L_{Amax\ 1hr}$

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Using the data from an environmental noise measurement survey at the site we will define the day and night period L_{Aeq} & L_{Amax} levels for comparison with the BS8233:2014 requirements and advise mitigation as may be appropriate for the habitable rooms.

Noise Survey Method

Measurement of L_{Aeq} & L_{Amax} with 1-hour recording intervals, were taken in the middle of the rear garden just in front of the façade line of the proposed house, representing the noisiest location for the habitable room windows in the proposed residential building. Please see attached site plans.

The instrumentation used for the noise measurement survey was a Rion NL-52 precision grade real time analyser/sound level meter, serial number 00620802. The RTA was calibration checked before and after the measurement periods. A copy of the instrumentation certificate of calibration is attached.

Recorded Measurement

The noise measurement survey was undertaken from 10.00hrs 24/3/22 to 10.00hrs 25/3/22, to define the typical environmental noise levels for the day 07.00hrs-23.00hrs period and night 23.00hrs-07.00hrs period, under satisfactory weather conditions at the site location.

The day $L_{Aeq\ 16hr}$ level for recorded was 51.5dB

The night $L_{Aeq\ 8hr}$ level recorded was 52.8dB

The average night $L_{Amax\ 1hr}$ level recorded was 69.4dB

The environmental noise measured was primarily the noise from the passing road trqaffic on Oxford Road.

Please see the attached graph for the survey period for L_{Aeq} & L_{Amax} with 1 hour recording intervals.

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Noise Mitigation

Given the levels of environmental noise day and night measured at the site location to achieve the good standard advised in BS8233:2014, the habitable rooms will require windows to be normally closed to achieve the room background noise criteria. The windows specification for the building should be 4/12/4mm format double-glazing, or a close equivalent. When closed, the windows will provide very satisfactory noise insulation, more than capable of ensuring the habitable room background noise levels as advised by BS8233:2014 can be achieved.

With windows normally closed, room ventilation would be achieved by alternative means to meet the requirements of Building Regulations Part F.

To illustrate the room noise levels that would be achieved by the advised mitigation we attach three design sheets that predict the background noise level for bedroom 1 on the 1st floor, representative of the habitable rooms with the highest noise impact, with typically 10m2 of external masonry brick wall & 1.25m2 of double-glazed window area, closed for the day & night periods, based on windows with 4/12/4mm format glazing.

The calculated day room noise level is 20dB $L_{Aeq\ 16hr}$ (criterion 35dB)

The calculated night room noise level is 16dB $L_{Aeq\ 8hr}$ (criterion 30dB)

The calculated night room noise level is 32dB $L_{Amax\ 1hr}$ (criterion 45dB)

Conclusion

The noise assessment undertaken demonstrates that for the proposed development, a good standard of habitable room background noise levels advised in BS8233:2014 can be achieved, when the existing, original single glazed windows are closed during the day and night. Room ventilation would be by alternative means to achieve the requirements of Building Regulations Part F.

With windows normally closed to control background noise, the control of air quality within the rooms can be efficiently achieved by using typically, mechanical ventilation, MVHR systems or passive ventilation, to meet Part F requirements. If considering passive ventilation the typical "through the wall" acoustic ventilators should have a noise insulation performance of at least 20dB $D_{n,e,w}$.

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We trust the report meets with your satisfaction, however, should you have any queries, please do not hesitate to contact us. Assuring you of our close co-operation at all times we remain

Yours faithfully

M D Randall BSc(Eng) CEng MCIBSE MIOA

FSB MEMBER

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CERTIFICATE OF CALIBRATION

0653

Date of Issue: 10 January 2022

Certificate Number: UCRT22/1032

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Approved Signatory [redacted]
K. Mistry

Customer	ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL
Order No.	ANV MS HIRE
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

Manufacturer	*Instrument*	*Type*	*Serial No. / Version*
Rion	Sound Level Meter	NL-52	00620802
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	20862
Rion	Microphone	UC-59	03628
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 05 January 2022 ANV Job No. UKAS22/01005

Date Calibrated 10 January 2022

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	*Dated*	*Certificate No.*	*Laboratory*
	11 January 2021	UCRT21/1057	0653

CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number UCRT22/1032

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	Sound Level Meter NL-42 / NL-52		
SLM instruction manual ref / issue	11-03		
SLM instruction manual source	Manufacturer		
Internet download date if applicable	N/A		
Case corrections available	Yes		
Uncertainties of case corrections	Yes		
Source of case data	Manufacturer		
Wind screen corrections available	Yes		
Uncertainties of wind screen corrections	Yes		
Source of wind screen data	Manufacturer		
Mic pressure to free field corrections	Yes		
Uncertainties of Mic to F.F. corrections	Yes		
Source of Mic to F.F. corrections	Manufacturer		
Total expanded uncertainties within the requirements of IEC 61672-1:2002	Yes		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Lab Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	14 December 2021		
Calibrator cert. number	UCRT21/2515		
Calibrator cal cert issued by	0653		
Calibrator SPL @ STP	94.04	dB	Calibration reference sound pressure level
Calibrator frequency	1001.94	Hz	Calibration check frequency
Reference level range	25 - 130	dB	

Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests	Start	End		
Temperature	23.34	23.20	± 0.30	°C
Humidity	40.0	37.8	± 3.00	%RH
Ambient Pressure	100.80	100.81	± 0.03	kPa

Response to associated Calibrator at the environmental conditions above.

Initial indicated level	94.2	dB	Adjusted indicated level	94.0	dB
The uncertainty of the associated calibrator supplied with the sound level meter ±				0.10	dB

Self Generated Noise — This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than	N/A	dB	A Weighting
Uncertainty of the microphone installed self generated noise ±	N/A	dB	

Microphone replaced with electrical input device - UR = Under Range indicated

Weighting	A			C			Z		
	12.7	dB	UR	16.8	dB	UR	22.6	dB	UR
Uncertainty of the electrical self generated noise ±							0.12	dB	

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: B. Bogdan R 2

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

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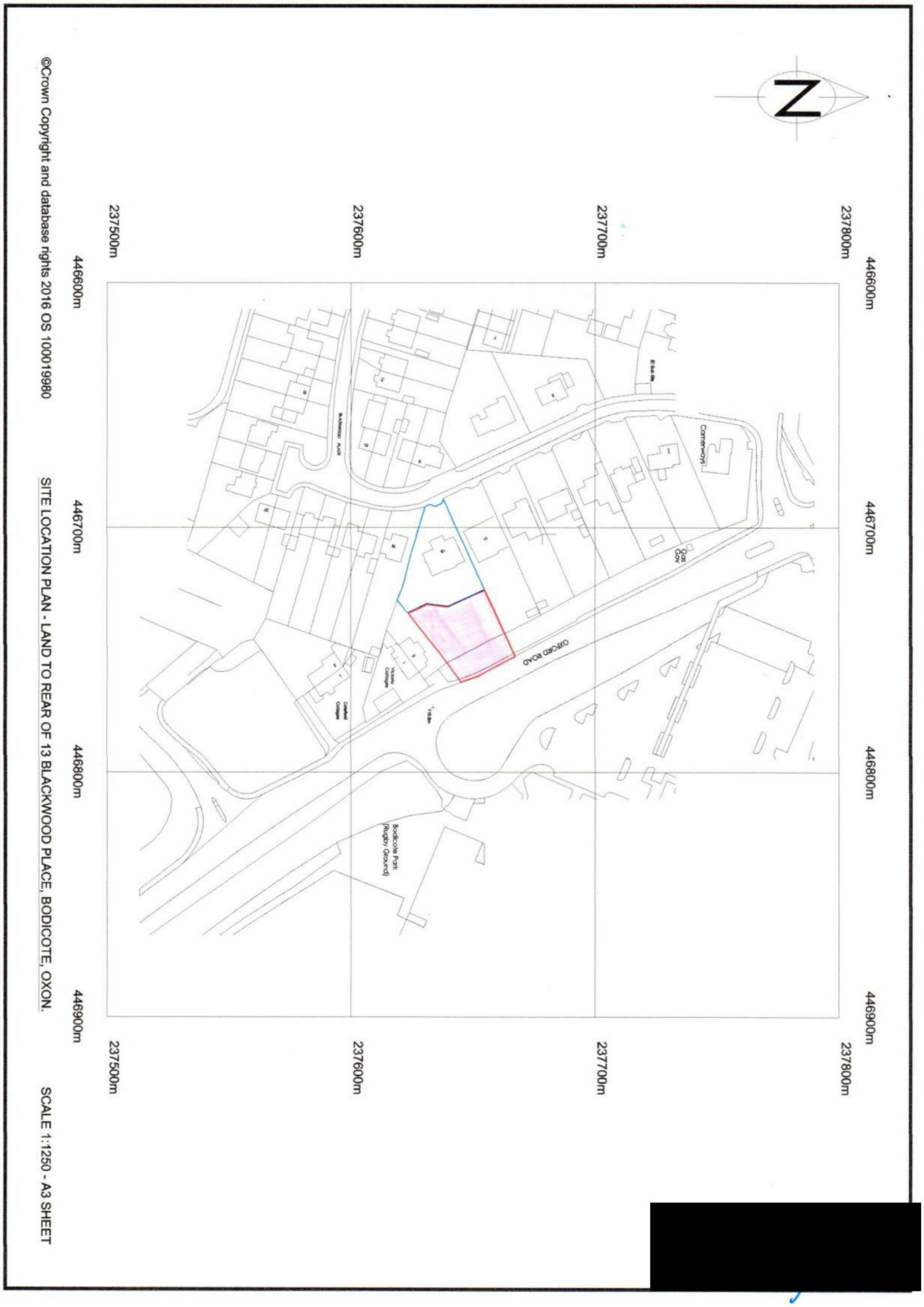

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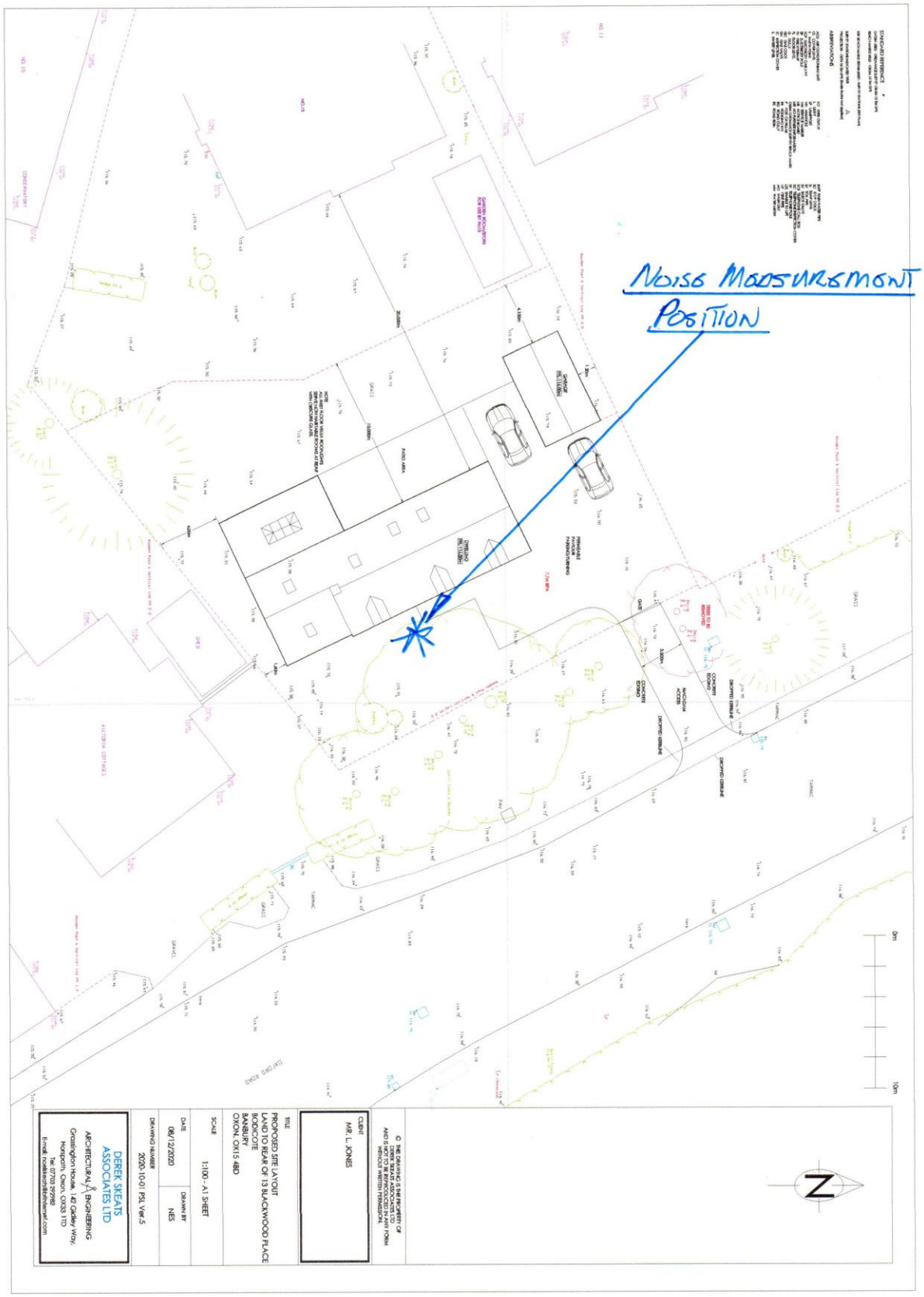

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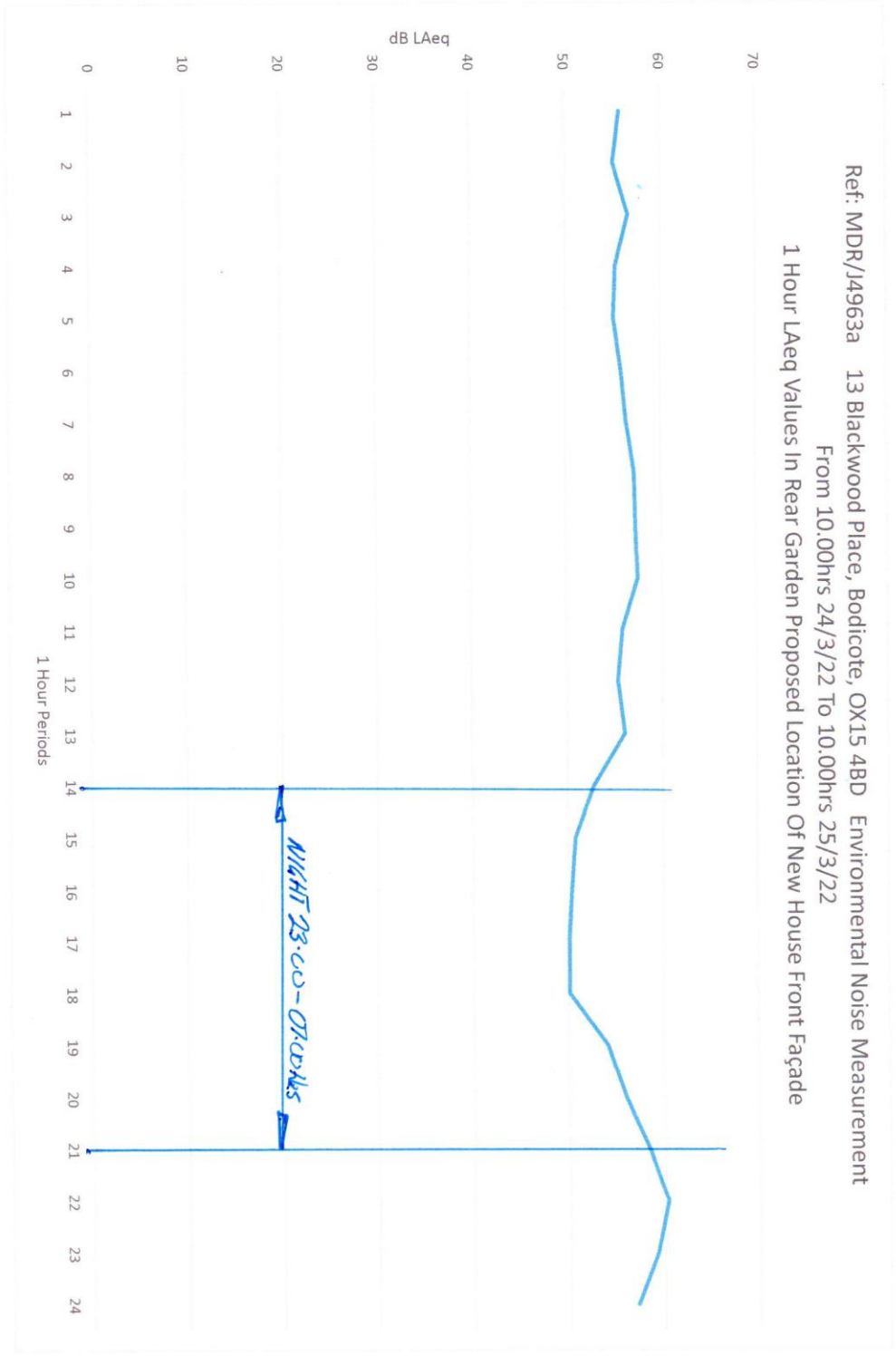

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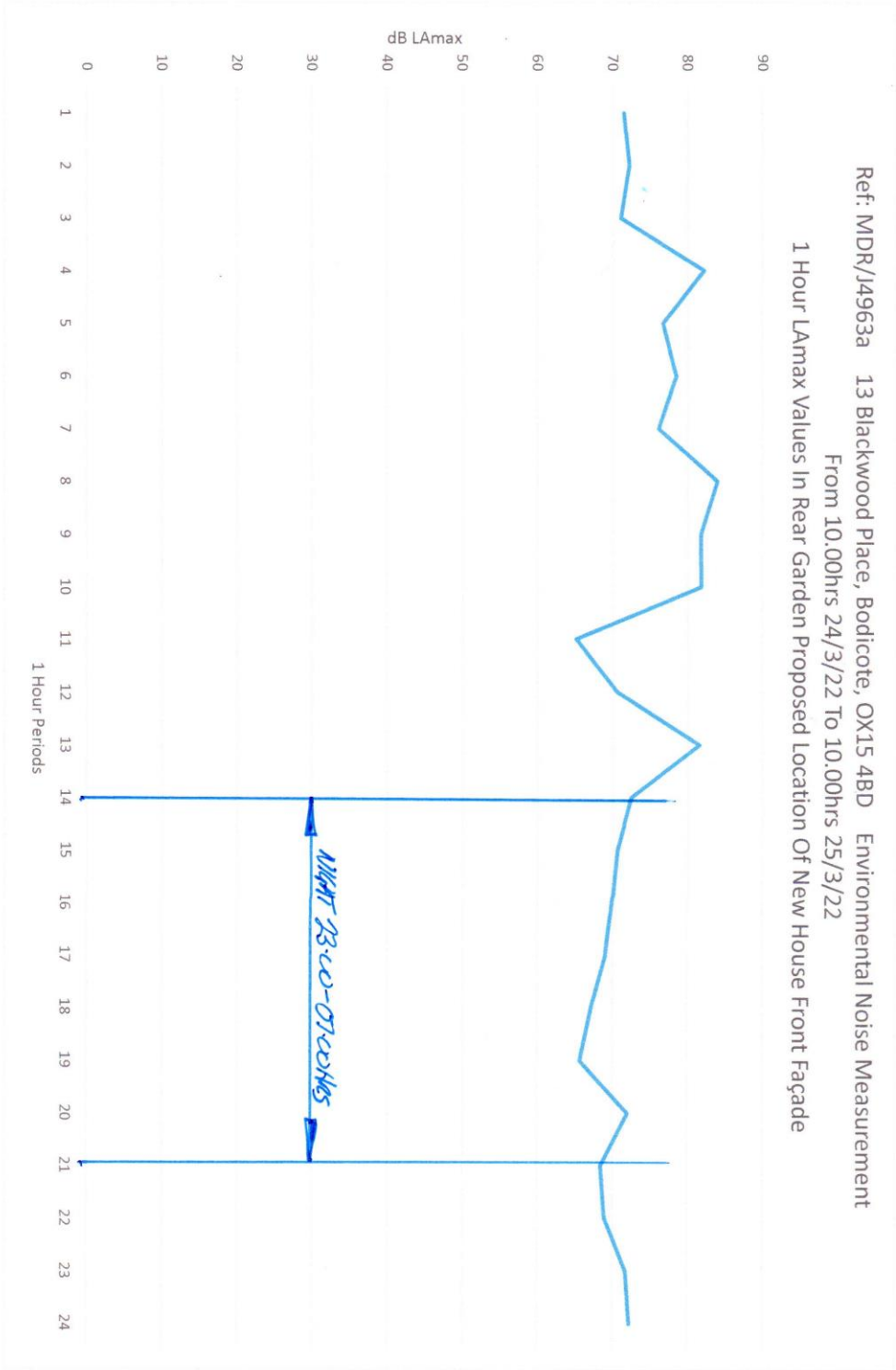

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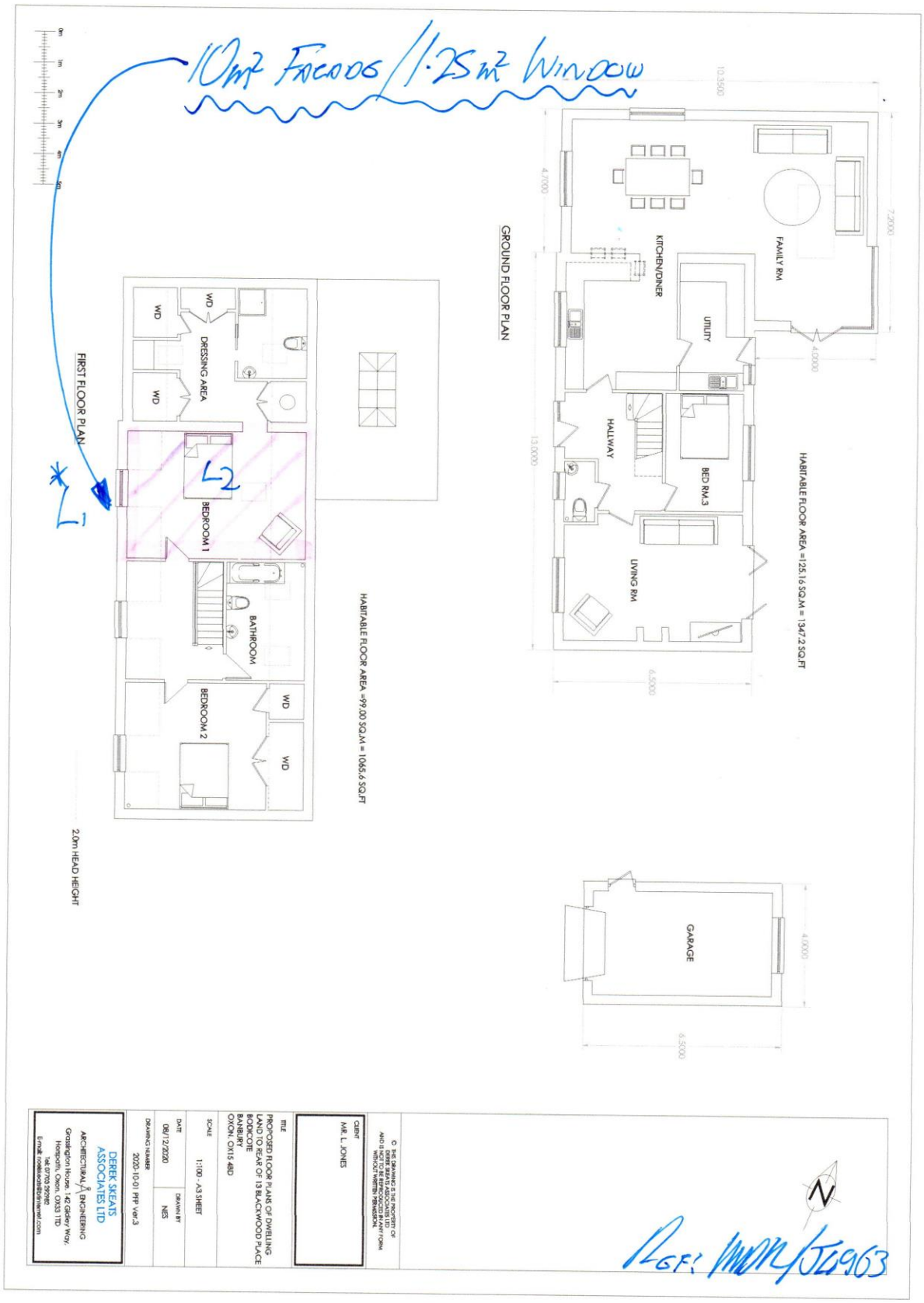

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Design Sheet 1

New House At 78 Blackwood Place, OX15 4BD — 1st Floor Bedroom

Night L_{Amax} (Window Closed)

		L(A)	63	125	250	500	1k	2k	4k	8k
L_1	External Noise		/	50	46	65	66	56	/	/
R_1	External Cavity Brick 10m²		/	34	36	40	56	73	/	/
R_2	Double Glazed Window 1.25m² 4/12/4mm Formantt 31dBRw		/	24	20	25	35	38	/	/
	Insulation Difference		/	10	14	15	21	35	/	/
R_3	Insulation Difference 1:8		/	3	6	7	11	25	/	/
R_4	Composite (R_1-R_2)		/	31	28	33	45	48	/	/
	Wall Area S=10m²									
	Room Absorption Area A m²		/	8	10	13	15	13	/	/
	Room Noise Level Lz = L_1 + 10log S - R_4 - 10log A									
	L_1		/	50	46	65	66	56	/	/
	+10log S		/	10	10	10	10	10	/	/
	$-R_4$		/	31	28	33	45	48	/	/
	-10log A		/	9	10	11	12	11	/	/
			/	20	18	31	19	7	/	/
					22		31	7		
					22		31			
*	Resultant Room Noise Level					32dBA				*

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Design Stage 2

New House At 18 Blackwood Place, OX15 4BD – 1st Floor Bedroom

		L/A	63	125	250	500	1k	2k	4k	8k
	DNT Dep (Window Closed)									
L_1	External Noise 51dB A	/		44	41	49	54	51	/	/
	(As Design Stage 1)									
	Room Noise Level L_2 = L_1 + 10log S − R_L − 10log A									
	L_1	/		44	41	49	54	51	/	/
	+ 10log S	/		10	10	10	10	10	/	/
	− R_L	/		31	28	33	45	48	/	/
	− 10log A	/		9	10	11	2	11	/	/
		/		14	13	15	7	1	/	/
					17		16	1		
					17		16			
★	Resultant Room Noise Level						20dB A			★

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Design Stage (3).

New House At 78 Blackwood Place, 6x5 4BD – 1st Floor Bedroom

		L/A	63	125	250	500	1k	2k	4k	8k
	Night LAeq (Window Closed)									
L_1	External Noise 52dBA	/		39	39	46	50	43	/	/
	(As Design Stage (1))									
	Room Noise Level L_2									
	$= L_1 + 10\log S - R_2 - 10\log A$									
	L_1		/	39	39	46	50	43	/	/
	$+10\log S$		/	10	10	10	10	10	/	/
	$-R_2$		/	31	28	33	46	48	/	/
	$-10\log A$		/	9	10	11	12	11	/	/
			/	9	11	12	3	0	/	/
					13		13	0		
					13		13			
*	Resultant Room Noise Level					16 dBA				*

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Table 2 – Pilkington **Insulight** ™

Thirdoctaveband Centre Frequency (Hz)	Sound Insulation (dB) for Glass Thickness (mm)											
	4/12/4		6/12/6		6/12/6.4 PVB		10/12/4		10/12/6		10/12/6.4 PVB	
100	25		17		19		23		27		27	
125	24	24	26	20	24	21	28	25	27	26	28	27
160	23		22		21		26		24		26	
200	21		18		19		19		24		26	
250	21	20	18	19	19	20	23	22	29	27	30	29
315	19		24		24		26		31		32	
400	22		27		28		31		33		34	
500	25	25	29	29	32	31	33	33	34	34	36	36
630	30		33		34		36		37		40	
800	33		37		38		39		39		41	
1000	36	35	39	38	40	39	41	40	41	40	42	41
1250	38		39		40		41		41		41	
1600	40		39		39		41		39		41	
2000	41	38	34	36	35	37	45	43	37	38	42	42
2500	35		37		39		45		40		44	
3150	31		42		44		42		43		49	
4000	40	35	47	45	49	47	44	44	47	46	53	52
R_m (dB)	29		30		31		34		34		36	
R_w (dB)	31		33		34		36		38		40	
R_{TRA} (dBA)	25		26		27		29		32		34	

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