

NOISE IMPACT ASSESSMENT REPORT

REDEVELOPMENT OF AN
EXISTING SITE, INCLUDING THE
CHANGE OF USE TO CLASS 3
(FOOD AND DRINK) FOR
ERECTION OF 2 NO.
CAFÉ/RESTAURANT UNITS WITH
ASSOCIATED INFRASTRUCTURE
AND CAR PARKING

STONEWOOD GATE
STONEWOOD PARK
DYCE
ABERDEEN
AB21 7DZ

REPORT PREPARED BY:
GROSLE ENVIRONMENTAL SERVICES



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1.0 BRIEF

- 1.1 To produce a Noise Impact Assessment report that shall be used as a supporting document for a future planning application to be submitted to Aberdeen City Council relating to the redevelopment of an existing site, including the change of use to Class 3 (Food and Drink) for erection of 2 no. café/restaurant units with associated infrastructure and car parking at Stoneywood Gate, Stoneywood Park, Dyce, Aberdeen, AB21 7DZ.

2.0 SUMMARY

- 2.1 Co-City is proposing to redevelop the existing site at Stoneywood Gate, to include the change of use to Class 3 (Food and Drink) for the erection of 2no. café/restaurant units with associated infrastructure and car parking. An assessment of noise from external mechanical plant, noise from customer lane events, customer order display intercom units and car park activity has been carried. The existing noise environment has been measured in the vicinity of the nearest noise sensitive receptor during the proposed operating times of the café/restaurant units.
- 2.2 The British Standard 4142:2014+A1:2019 assessment of the noise impact of the mechanical plant (with the inclusion of acoustic silencers) from the café/restaurant units indicates an excess Rating Level of -5 at the nearest residential home. This result is a positive indication that mechanical plant shall have a low impact at the nearest residential homes surround the development.
- 2.3 The break-in combined specific noise level of the café/restaurant units (customer lane events, customer order display intercom units and car parking vehicle noise) does not exceed the target noise levels contained within Table 4 of British Standard 8233:2014 Guidance on sound insulation and noise reductions for buildings. A point to note, from the background noise survey, is that this area of Dyce is already an area with a high noise environment.
- 2.4 This Noise Impact Assessment report includes several mitigations in relation to noise control that must be implemented during the construction phase to ensure that a statutory noise nuisance does not occur from the various noise sources within the development.

3.0 INTRODUCTION

3.1 Co-City commissioned a Noise Impact Assessment report to support a future planning application relating to the redevelopment of an existing site, including the change of use to Class 3 (Food and Drink) for erection of 2 no. café/restaurant units with associated infrastructure and car parking at Stoneywood Gate, Stoneywood Park, Dyce, Aberdeen, AB21 7DZ. A site plan of the development and photograph of the site are below:



3.0 INTRODUCTION (continued)

- 3.2 The application site is situated in a mixed urban environment; the local noise environment is dominated by traffic on the adjacent Stoneywood Road, and by intermittent aircraft noise from Aberdeen Airport. Adjacent to the site to the south are two residential homes, the closest one to the café/restaurant units is 326 Stoneywood Road. To the North and East of the site are business units and offices.
- 3.3 At this current time in the planning application process, there are no confirmed tenants for the café/restaurant units and the starter units. Therefore, for the purpose of this report, noise data from a previous report produced by Grosle Environmental Services was used (including details of mechanical external plant on the rooftop, customer lane events and car park activity) for a café/restaurant unit located within a busy town in Scotland's central belt and located adjacent to a large retail food store; this food business would be busier in comparison to the development at Stoneywood Gate. It is assumed that the café/restaurant units shall be single-storey with roof-top plant decks (enclosed within an outer roof parapet) housing the kitchen extract, air-conditioning plant and refrigeration condenser units. For the purpose of the report, acoustic attenuation requirements are detailed within the report for the mechanical plant. The applicant is looking for a planning condition to be granted in relation to mechanical plant.
- 3.4 The development will provide 75 parking spaces (including disable and electric charging spaces) for its customers; the site shall be accessed from Stoneywood Park. Vehicle movements on site are one-way flow around the customer lanes, which will run around three sides of the restaurant with customer order display (COD) intercom units located on the South elevations of the restaurant buildings.
- 3.5 For the purpose of the report, the proposed opening times of the café/restaurant units are 06:00 to 23:00 hours Monday to Saturday, and 07:00 to 23:00 hours Sunday. The proposed opening times of the starter units are 08:00 to 18:00 hours Monday to Sunday.
- 3.6 Grosle Environmental Services contacted Aberdeen City Council and submitted a proposed methodology for this report; this is fully detailed in Section 4.0 Noise Impact Assessment Methodology. No response was received to date from Aberdeen City Council, it is assumed that the proposed methodology is accepted.

3.0 INTRODUCTION (continued)

3.7 A point to note is that for the purpose of this Noise Impact Assessment report, break-out noise from the inside of café/restaurant units and starter units, and noise from customers entering and leaving the site by foot, are not considered. The café/restaurant units and starter units may have low-level background music playing inside; however, due to the construction of these buildings, it is assumed that break-out noise is negligible. Customers walking and driving into and out of the development (except for customers using the customer lanes), are considered as such short duration in an already high noise environment and are assumed to be negligible.

3.8 For this report, Sections 4.0 to 7.0 are detailed below with a summary of content:

Section 4.0 – NOISE IMPACT ASSESSMENT METHODOLOGY provides an overview of the assessment methodology used for the mechanical plant that shall be located within the roof-top plant area and the traffic noise from the café/restaurant units. Also, this section details the target noise levels that must not be exceeded inside the nearest residential homes to the South of the development.

Section 5.0 – NOISE IMPACT ASSESSMENT details the predicted traffic usage for the customer lanes and the assessment results for the mechanical plant and the traffic noise.

Section 6.0 – DISCUSSION OF MITIGATIONS AND CONCLUSION highlights the main aspects of this Noise Impact Assessment report and provides the conclusion.

4.0 NOISE IMPACT ASSESSMENT METHODOLOGY

(1) NOISE IMPACT ASSESSMENT METHODOLOGY – MECHANICAL PLANT

- 4.1 For the assessment of mechanical plant in close proximity to the nearest residential homes, the document Planning Advice Note 1/2011: Planning and Noise was referenced to consider the noise aspects of the proposed development. The associated Technical Advice Note: Assessment of Noise, details procedures with a five-stage process. These stages are detailed in Table 1 below:

Stage 1: Initial Process	The identification of sensitive receptors and their sensitivity
Stage 2: Quantitative Assessment	Determining the magnitude of impact in accordance with an appropriate procedure for the type of development considered
Stage 3: Qualitative Assessment	The inclusion of factors that may modify the assigned magnitudes of impact such as frequency characteristics, timing, intermittency
Stage 4: Level of Significance	Determined by considering the magnitude of impact and sensitivity of receptor and is intended to inform the decision-making process
Stage 5: The Decision Process	An overview of the number of receptors that fall within each level of significance, usually set out in a Summary Table of Significance

4.0 NOISE IMPACT ASSESSMENT METHODOLOGY (continued)

- 4.2 Stage 1: Initial Process, this involved the identification of all noise sensitive receptors. There are three levels of sensitivity 'High', 'Medium' and 'Low'. The ranking is primarily based on the relationship between the amenity associated with a noise sensitive receptor and its susceptibility to noise. Noise sensitive receptors which have amenities associated with low noise levels, such as residential properties, are allocated with a 'High' level of sensitivity, whereas nightclubs would be allocated with a 'Low' level of sensitivity.
- 4.3 For Stage 2: Quantitative Assessment, the rating level (mechanical plant within the site boundary) was assessed according to British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound at the nearest residential homes. This standard describes a method for rating and assessing sound of an industrial and/or commercial nature and uses outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes. Table 2 below was used to assess the magnitude of noise impact based on the Royal Environmental Health Institute of Scotland Briefing Note 017 for industrial or commercial noise. The procedure for the assessment and definitions of the acoustical parameters are detailed within APPENDIX A – BS 4142:2014+A1:2019 INFORMATION.

Target Levels	Change in Noise Level [predicted/existing noise – target]	Magnitude of Impact
Rating Level – Background Noise Level [LA90] < 5dB	≥ 5	Major Adverse
	< 5 but ≥ 3	Moderate Adverse
	< 3 but ≥ 1	Minor Adverse
	< 1 but ≥ 0	Negligible Adverse
	0	No Change

4.0 NOISE IMPACT ASSESSMENT METHODOLOGY (continued)

- 4.4 For Stage 3: Qualitative Assessment, Table 3 below was used to determine the effect/perception of mechanical plant within the site boundary on the nearest residential homes.

Table 3: Qualitative Impacts from Noise on Residential Properties

Perception	Criteria of Descriptor for residential dwellings	Qualitative impact
Noticeable (Very disruptive)	Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm.	Major
Noticeable (Disruptive)	Causes an important change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.	Moderate
Noticeable (Mildly intrusive)	Noise can be heard and may cause small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows more often. Potential for non-awakening sleep disturbance. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Minor
Just Noticeable (Non intrusive)	Noise can be heard but does not cause any change in behaviour or attitude, e.g. increasing volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	Negligible
Not noticeable	None	No Impact

4.0 NOISE IMPACT ASSESSMENT METHODOLOGY (continued)

- 4.5 For Stage 4: Level of Significance, Table 4 below was used to assess the likely significance of the noise impact.

Table 4: Significance of Effects

Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor		
	Low	Medium	High
Major	Slight / Moderate	Moderate / Large	Large / Very Large
Moderate	Sight	Moderate	Moderate / Large
Minor	Neutral / Slight	Slight	Slight / Moderate
Negligible	Neutral / Slight	Neutral / Slight	Slight
No change	Neutral	Neutral	Neutral

- 4.6 For Stage 5: The Decision Process, a Summary Table of Significance was compiled which details the noise impact of the mechanical plant within the site boundary at the nearest residential homes that have been allocated a level of significance.
- 4.7 The report shall also demonstrate that the break-in noise from the mechanical plant located within the site boundary shall not exceed Noise Rating Curve 35 (day time) and Noise Rating Curve 25 (night time) internally within the nearest residential properties. These internal levels shall be assumed to be with windows partially opened for ventilation purposes; it shall be assumed a ten-decibel reduction for partially opened windows.

4.0 NOISE IMPACT ASSESSMENT METHODOLOGY (continued)

(2) NOISE IMPACT ASSESSMENT METHODOLOGY – CUSTOMER LANE EVENTS, CUSTOMER ORDER DISPLAY INTERCOM UNITS AND CAR PARK VEHICLE NOISE

4.8 The expected volume of traffic for the customer lane events, customer order display intercom units and car park vehicle noise relating to the number of customers eating in the café/restaurants shall be presented in the report and the specific noise level of these combined activities shall be calculated at the nearest residential home. The report shall demonstrate that the break-in specific noise of these activities shall not exceed the target noise levels contained within Table 4 of British Standard 8233 Guidance on sound insulation and noise reductions for buildings.

4.9 TARGET NOISE LEVELS

4.11.1 In relation to the external mechanical plant, the report shall demonstrate a low impact using British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. In addition, the report shall demonstrate that the internal noise level during the night-time and day-time shall achieve NR25, Leq, 1 hour within the nearest residential houses.

4.11.2 In relation to noise from customer lane events, Customer Order Display Intercom Units and car park vehicle noise relating to the number of customers eating in the café/restaurants, the report shall demonstrate that the break-in specific noise of customer lanes shall not exceed the target noise levels contained within Table 4 of British Standard 8233 Guidance on sound insulation and noise reductions for buildings, as detailed below.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB L _{Aeq, 16hour}	-
Dining	Dining room/area	40 dB L _{Aeq, 16hour}	-
Sleeping (day time resting)	Bedroom	35 dB L _{Aeq, 16hour}	30 dB L _{Aeq, 8hour}

5.0 NOISE IMPACT ASSESSMENT

(1) NOISE IMPACT ASSESSMENT – MECHANICAL PLANT

Stage 1: Initial Process

- 5.1 The key noise sensitive receptor for the purpose of this assessment is 326 Stoneywood Road, Aberdeen, located to the South of the site. The level of sensitivity was determined as high.

Stage 2: Quantitative Assessment

- 5.2 The quantitative assessment for the combined mechanical plant (with acoustic silencers incorporation on the roof-top plant for the café/restaurant Units One and Two) was completed and is detailed in APPENDIX B – SURVEY DETAILS, APPENDIX C – CALIBRATION CERTIFICATES, APPENDIX D – MEASUREMENT LOCATION AND PHOTOGRAPH, APPENDIX E – SURVEY RESULTS and APPENDIX F – BS 4142:2014+A1:2019 ASSESSMENT. The British Standard 4142:2014+A1:2019 assessment is summarised below:

	BS 4142:2014+A1:2019 assessment
Nearest residential house (326 Stoneywood Road, Aberdeen)	-5 dB

- 5.3 The British Standard 4142:2014+A1:2019 assessment indicates that the excess of the rating level over the background sound level is -5 at 326 Stoneywood Road, Aberdeen. A point to note is that a difference of around +10 dB or more is likely to be an indication of a significant adverse impact, and a difference of around +5 dB is likely to be an indication of an adverse impact. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context. These results indicate that noise from the combined mechanical plant shall have a low impact at the nearest residential house.

5.0 NOISE IMPACT ASSESSMENT (continued)

Stage 3: Qualitative Assessment

5.4 Using the criteria in Table 3, the qualitative impact was determined below:

Table 6: Qualitative Impact	
Night Perception	Descriptor for qualitative impact
Just Noticeable (Non intrusive)	Negligible

Stage 4: Level of Significance

5.5 Using the criteria in Table 4, the level of significance was determined below:

Table 7: Level of Significance	
Magnitude of Impact	Level of Significance Relative to Sensitivity of Receptor (High)
Negligible	Slight

Stage 5: Decision Process

5.6 The Summary Table of Significance was compiled as detailed below:

Table 8: Summary Table of Significance	
Level of Significance	Number of Residential Properties
Slight	2

5.0 NOISE IMPACT ASSESSMENT (continued)

- 5.7 In addition to the above British Standard 4142:2014+A1:2019 assessment, to prevent the excessive gradual increase in the background noise level in this area of Dyce over time, it can be confirmed that the rating level of all combined mechanical plant shall achieve a limit of at least 5 dB(A) less than the existing background (LA90) noise level during the night time. Also, the rating level of all combined mechanical plant shall not exceed the existing background (LA90) noise level during the day time. It is therefore not anticipated an excessive gradual increase in the background noise level in this area of Dyce over time.
- 5.8 In relation to the internal noise levels of mechanical plant at 326 Stoneywood Road, using the noise data from page 38, the table below details the calculation for the internal specific noise level of mechanical plant. It can be confirmed that the internal noise level of mechanical plant from the two café/restaurant units shall not exceed Noise Rating Curve 25 target noise level in all the octave bands from 63Hz to 8000Hz.

	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Combined External Noise Levels of Units One and Two (L _{eq})	53	43	36	30	27	26	26	23
Open window attenuation	-10	-10	-10	-10	-10	-10	-10	-10
Combined Internal Noise Levels of Units One and Two (L _{eq})	43	33	26	20	17	16	16	13
NR 25 target values	55	44	35	29	25	22	20	13
Comparison of values	-12	-11	-9	-9	-8	-6	-4	0

- 5.9 At this current time in the planning application process, there are no tenants confirmed for the two café/restaurants. Therefore, for the purpose of this report, the applicant is seeking a planning condition in relation to mechanical plant for Units One and Two as detailed below:

- 5.9.1 For the café/restaurant Unit One, the rating level of the combined mechanical plant, at 326 Stoneywood Road must not exceed the octave band levels below:

	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Cumulative level of all plant at façade of NSR (L _{eq})	48	40	33	27	24	23	23	20

- 5.9.2 For the café/restaurant Unit Two, the rating level of the combined mechanical plant, at 326 Stoneywood Road must not exceed the octave band levels below:

	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Cumulative level of all plant at façade of NSR (L _{eq})	51	40	33	27	24	23	23	20

5.0 NOISE IMPACT ASSESSMENT (continued)

5.10 (2) NOISE IMPACT ASSESSMENT – CUSTOMER LANES, CUSTOMER ORDER DISPLAY INTERCOM UNITS AND CAR PARK VEHICLE NOISE

For the assessment of noise from the café/restaurant units, the following noise sources are considered:

1. Customer lanes (CL)
2. Customer order display intercom unit
3. Car park vehicle noise relating to customers eating in (CP)

5.11 The predicted customer lanes (CL) data and car parking (CP) data is detailed below. This table is based upon prediction data for the busiest weekend nights within the Transport Assessment for a café/restaurant unit located within a busy town in Scotland's central belt and located adjacent to a large retail food store.

Hour beginning	Friday			Saturday		
	Total	CL	CP	Total	CL	CP
06:00	16	10	6	9	5	4
07:00	37	19	18	17	11	6
08:00	40	23	17	28	18	10
09:00	44	22	22	33	17	16
10:00	45	19	26	41	18	23
11:00	60	25	35	56	32	24
12:00	122	76	46	99	58	41
13:00	100	50	50	128	75	53
14:00	78	38	40	114	69	45
15:00	90	59	31	112	50	62
16:00	104	68	36	115	49	66
17:00	119	93	26	112	54	58
18:00	111	64	47	96	50	46
19:00	78	49	29	66	36	30
20:00	77	38	39	44	22	22
21:00	51	30	21	42	21	21
22:00	28	21	7	34	19	15
23:00	52	27	25	37	23	14

5.12 A point to note is that for the purpose of the predicted calculations, noise was considered for three time periods; these were the morning (before 10am), mid day (11:00 to 19:00 hours) and evening (after 19:00 hours) and the highest number of customer lane events (highlighted in yellow) and car parking events (highlighted in blue) are taken from the above table.

5.0 NOISE IMPACT ASSESSMENT (continued)

1. CUSTOMER LANE EVENTS

- 5.13 Typically customer lanes generate relatively low levels of noise, as the vehicles, by necessity, drive very slowly around the circuit and do not open or close doors. Using the data from a noise survey undertaken of vehicles using a similar site, it is possible to objectively assess noise from vehicles using the proposed customer lanes. The specific sound pressure level at a distance of 10 metres for a customer lane event was taken to be 53 dB L_{Aeq} and 60 dB L_{Amax} , the estimated duration of each event was approximately 20 seconds for actual vehicle movement time in the customer lanes (excluding waiting times). The impulsive Maximum of 60 dBA L_{Amax} is not affected by the number of events.
- 5.14 Using the customer lane data (shaded yellow in Section 5.11) and the specific sound pressure level (detailed in Section 5.13), the overall noise level (L_{Aeq}), during a 1-hour reference period can be extrapolated. The table below summarises the predicted noise levels for Units One and Two:

Specific sound pressure level for customer lanes (Unit One) at NSR			
Details	Measurement period		
	Morning	Mid Day	Evening
Customer lane events per hour (from Section 5.11)	23	93	49
Customer Lane vehicle noise at 10 metres	53 dB L_{Aeq} / 60 dB L_{AMAX}		
Extrapolated drive-thru vehicle noise at a distance of 10 metres (dB L_{Aeq} / dB L_{Amax})	44 / 60	50 / 60	47 / 60
Distance correction (39 metres)		-11	
Barrier attenuation		-10	
Level at façade at NSR (dB L_{Aeq} / dB L_{Amax})	23 / 39	29 / 39	26 / 39

Specific sound pressure level for customer lanes (Unit Two) at NSR			
Details	Measurement period		
	Morning	Mid Day	Evening
Customer lane events per hour (from Section 5.11)	23	93	49
Customer Lane vehicle noise at 10 metres	53 dB L_{Aeq} / 60 dB L_{AMAX}		
Extrapolated drive-thru vehicle noise at a distance of 10 metres (dB L_{Aeq} / dB L_{Amax})	44 / 60	50 / 60	47 / 60
Distance correction (17 metres)		-4	
Barrier attenuation		-10	
Level at façade at NSR (dB L_{Aeq} / dB L_{Amax})	30 / 46	36 / 46	33 / 46

5.0 NOISE IMPACT ASSESSMENT (continued)

2. CUSTOMER ORDER DISPLAY INTERCOM UNIT (COD)

- 5.15 For the purpose of the report, it is assumed that there is one (COD) intercom unit situated on the South elevation of each unit. To determine the specific impact at the proposed site, measurements taken at a similar café/restaurant unit was utilised for this report. The specific sound pressure level of the COD intercom unit at a distance of 2 metres was taken to be 64 dB L_{Aeq} and 71 dB L_{Amax} , the estimated duration of customer order was taken to be approximately 20 seconds.
- 5.16 Using the predicted customer lane events and the specific noise level of a typical COD intercom unit use, the overall noise level (L_{Aeq}), during a 1-hour reference period was calculated for the maximum number of customer lane events during the morning, mid day and evening. The impulsive Maximum of 71.7dBA L_{Amax} is not affected by the number of events. The table below summarises the predicted noise levels for Units One and Two:

Specific sound pressure level for COD intercom unit (Unit One) at NSR			
Details	Measurement period		
	Morning	Mid Day	Evening
Customer lane events per hour (from Section 5.11)	23	93	49
COD noise at 2 metres		64 / 71	
Extrapolated COD noise for vehicle numbers and reference period dB L_{Aeq} / dB L_{Amax}	55 / 71	61 / 71	58 / 71
Distance correction (39 metres)		-25	
Barrier attenuation		-10	
Level at façade at NSR (dB L_{Aeq} / dB L_{Amax})	20 / 36	26 / 36	23 / 36

Specific sound pressure level for COD intercom unit (Unit Two) at NSR			
Details	Measurement period		
	Morning	Mid Day	Evening
Customer lane events per hour (from Section 5.11)	23	93	49
COD noise at 2 metres		64 / 71	
Extrapolated COD noise for vehicle numbers and reference period dB L_{Aeq} / dB L_{Amax}	55 / 71	61 / 71	58 / 71
Distance correction (17 metres)		-18	
Barrier attenuation		-10	
Level at façade at NSR (dB L_{Aeq} / dB L_{Amax})	27 / 43	33 / 43	30 / 43

5.0 NOISE IMPACT ASSESSMENT (continued)

3. CAR PARK VEHICLE NOISE RELATING TO EAT IN CUSTOMERS

- 5.17 Sound measurements of typical car movements; arriving and leaving the centre of a car park, including door slams, have been measured (at a distance of 5 metres) during the course of a previous survey of a similar drive-thru. The specific sound pressure level of car park vehicle noise at a distance of 5 metres was taken to be 54 dB L_{Aeq} and 72 dB L_{Amax} , the estimated duration of the event was taken to be approximately 25 seconds.
- 5.18 Using the predicted car park vehicle noise events, the overall specific sound pressure level (L_{Aeq}), during the 1-hour reference morning, mid day and the evening was calculated. The impulsive Maximum of 72 dB L_{Amax} is not affected by the number of events. The table below summarises the predicted noise levels for Units One and Two:

Specific sound pressure level for car park vehicle noise (Unit One) at NSR			
Details	Measurement period		
	Morning	Mid Day	Evening
Car park events per hour (from Section 5.11)	26	66	39
Car park vehicle noise at 5 metres	54 dB L_{Aeq} / 72 dB L_{AMAX}		
Extrapolated car park vehicle noise for vehicle numbers and reference period (L_{Aeq} / dB L_{Amax})	47 / 72	51 / 72	48 / 72
Distance correction (45 metres)	-19		
Impulsive correction (dB L_{Aeq} / dB L_{Amax})	+5 / 0 (door slams impulsive)		
Level at façade at NSR (dB L_{Aeq} / dB L_{Amax})	33 / 58	37 / 58	34 / 58

Specific sound pressure level for car park vehicle noise (Unit Two) at NSR			
Details	Measurement period		
	Morning	Mid Day	Evening
Car park events per hour (from Section 5.11)	26	66	39
Car park vehicle noise at 5 metres	54 dB L_{Aeq} / 72 dB L_{AMAX}		
Extrapolated car park vehicle noise for vehicle numbers and reference period (L_{Aeq} / dB L_{Amax})	47 / 72	51 / 72	48 / 72
Distance correction (25 metres)	-14		
Impulsive correction (dB L_{Aeq} / dB L_{Amax})	+5 / 0 (door slams impulsive)		
Level at façade at NSR (dB L_{Aeq} / dB L_{Amax})	37 / 62	41 / 62	38 / 62

5.0 NOISE IMPACT ASSESSMENT (continued)

- 5.19 The customer lane events, Customer Order Display intercom units and the car parking vehicle noise have been considered individually. The specific noise level of all these activities were logarithmically combined and compared to the target noise levels contained within Table 4 of British Standard 8233:2014 Guidance on sound insulation and noise reductions for buildings.

Combined specific sound pressure level at nearest Noise Sensitive Receptor (326 Stoneywood Road, Dyce, Aberdeen)			
Details	Morning	Mid Day	Evening
Customer lane events – Unit One	23	29	26
Customer lane events – Unit Two	30	36	33
COD Intercom Unit – Unit One	20	26	23
COD Intercom Unit – Unit Two	27	33	30
Car park vehicle noise – Unit One	33	37	34
Car park vehicle noise – Unit Two	37	41	38
Combined specific noise level at façade of NSR	39	44	41
Sound reduction through a partially opened window	-10	-10	-10
Combined specific noise level inside NSR	29	34	31

- 5.20 It can be confirmed from the above table that the break-in combined specific noise level of the café/restaurant units (customer lane events, COD intercom units and car park vehicle noise) does not exceed the target noise levels contained within Table 4 of British Standard 8233:2014. A point to note, from the background noise surveys, is that this area of Dyce is already an area with an elevated high noise environment. During the survey period, road traffic noise and intermittent noise from aircraft at Aberdeen Airport were dominant at the monitoring location.

6.0 DISCUSSION OF MITIGATIONS AND CONCLUSION

DISCUSSION OF MITIGATIONS

6.1 Detailed below are various recommendations in order to mitigate a noise nuisance from the proposed development. These recommendations should be incorporated into the existing design and, also to the operational phase.

6.2 Incorporate into the existing design

6.2.1 NOISE – For the café/restaurant Unit One, the rating level of the combined mechanical plant, at 326 Stoneywood Road must not exceed the octave band levels below:

	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Cumulative level of all plant at façade of NSR (Leq)	48	40	33	27	24	23	23	20

6.2.2 NOISE – For the café/restaurant Unit Two, the rating level of the combined mechanical plant, at 326 Stoneywood Road must not exceed the octave band levels below:

	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Cumulative level of all plant at façade of NSR (Leq)	51	40	33	27	24	23	23	20

6.2.3 NOISE – In relation to the Starter Units A to D, the individual units must not exceed an individual specific sound pressure level of LAeq = 25 dB(A) at the nearest residential homes.

6.2.4 NOISE – Install an acoustic barrier for the customer lanes at Café/Restaurant Unit Two.

6.2.5 NOISE – Install clear signage in the car park asking customers to respect the amenity of the neighbours and not shout or play loud music in cars.

6.3 During the operating phase

6.3.1 NOISE – Impulsive noise from goods vehicles and unloading are varied and not accurately assessable. However, they may be adequately managed by restricting hours of deliveries. It is proposed that deliveries should not take place between 23:00 to 07:00 hours and could be successfully managed by a planning condition.

6.0 DISCUSSION OF MITIGATIONS AND CONCLUSION

- 6.3.2 NOISE – Assign a staff member to regularly patrol the car park in the evening, and when appropriate remind and if necessary, enforce the sentiment of the displayed signage.
- 6.3.3 NOISE – By configuration of the external plant control systems, minimise the use of any air-handling units and air-conditioning condensers when not specifically needed for the comfort of customers and staff, especially during the quietest and most sensitive periods.
- 6.3.4 NOISE – In relation to the customer lane events, the Customer Order Display intercom unit must not exceed a sound pressure level of LAeq 64 dB(A) at a distance of 2 metres. Between the hours of 06:00 to 08:00 and 20:00 to 23:00 hours, the Customer Order Display intercom unit volume must be reduced.

CONCLUSION

- 6.4 This Noise Impact Assessment report includes several mitigations in relation to noise control that must be implemented during the construction phase to ensure that a statutory noise nuisance does not occur from the various noise sources within the development.
- 6.5 The report highlights that noise from the mechanical plant (with acoustic silencers installed) located within the boundary of the development shall have a low impact at the nearest residential homes. It is presumed that if the noise from the mechanical plant within the site boundary is not a problem at these nearest residential homes, it shall not be an issue at homes at greater distances.
- 6.6 The break-in specific noise level of the customer lane events does not exceed the target noise levels contained within Table 4 of British Standard 8233:2014. A point to note, from the background noise survey, is that this area of Dyce is already an area with a high noise environment. During the survey period, road traffic noise and intermittent noise from aircraft at Aberdeen Airport were dominant at the monitoring location.

APPENDIX A – BS 4142:2014+A1:2019 INFORMATION

1 of 2

A1 BS 4142:2014+A1:2019 INFORMATION

The British Standard 4142:2014+A1:2019 describes a range of methods for rating and assessing sound of an industrial and/or commercial nature and uses outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes. In this assessment, the specific sound source is the external rooftop mechanical plant located on the two café/restaurant units. The standard provides the following definitions that are pertinent to this application:

Definitions of British Standard 4142:2014+A1:2019

Specific Sound Level, $L_s = L_{Aeq, T_r}$	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r
Rating Level, L_{Ar, T_r}	Specific noise level plus any adjustments for the characteristic features of the sound
Ambient Sound Level, $L_a = L_{Aeq, T}$	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T . The ambient sound level is a measure of the residual sound and the specific sound when present
Residual Sound Level, $L_r = L_{Aeq, T}$	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T
Background Sound Level, $L_{A90, T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T , measured using time weighting, F , and quoted to the nearest whole number of decibels

APPENDIX A – BS 4142:2014+A1:2019 INFORMATION

2 of 2

A2 BS 4142:2014+A1:2019 INFORMATION

The assessment procedure of British Standard 4142: 2014+A1:2019 is outlined as follows:

1. Determine the Specific Sound Level
2. Determine the Rating Level as appropriate
3. Determine the Background Sound Level
4. Subtract the Background Sound Level from the Rating Level to obtain an assessment of the impacts and consider the following details below:

A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context. A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Acoustical Parameters

L_{Aeq}	is the A-weighted equivalent continuous steady sound level and effectively represents an average value.
L_{A90}	is the A-weighted sound level which is exceeded for 90% of the sample period; used to quantify background noise.
L_{A10}	is the A-weighted sound level which is exceeded for 10% of the sample period; used to quantify traffic noise.
L_{Amax}	is the maximum A-weighted sound level measured during the sample period.
A-weighting	is the process by which noise levels are corrected to account for the non-linearity of human hearing.
	All quoted noise levels are relative to 2×10^{-5}

APPENDIX B – SURVEY DETAILS

1 of 2

B1 SURVEY DETAILS

1 Location

Stoneywood Gate, Stoneywood Park, Dyce, Aberdeen, AB21 7DZ

2 Survey Date and Times

DATE: 18.10.23

TIME START: 05:55

TIME STOP: 23:04

3 Personnel Present

Tanya Grosle

4 Instrumentation

Instrument	Serial No.	Calibration Due
Bruel & Kjaer Type 2260B sound level Meter	2001719	02 – March – 2024
Bruel & Kjaer Type 4189 microphone	2021293	24 – February – 2024
Bruel & Kjaer ZC0026 preamplifier	2001719	02 – March – 2024
Bruel & Kjaer Type 4231 calibrator	2094490	08 – March – 2024

APPENDIX B – SURVEY DETAILS

2 of 2











B2 SURVEY DETAILS

5 Procedure

At location 1, the B&K 2260B Sound Level Meter was located at the monitoring location at a distance of 1.3 metres above ground level. The sound level meter was calibrated before, and the drift was checked at the start and end of the survey periods.


6 Weather conditions

The weather during the survey period on the 18 October 2023, between 05:55 to 23:05 hours, was dry and cloudy. Using a digital anemometer, intermittent wind was observed during the survey period from 2 to 4.2 ms⁻¹. Using a digital thermometer, the temperature range was noted between 8 to 11°C. The cloud cover during the survey period ranged between 6 to 8 oktas.

Symbol	Scale in oktas (eighths)
	0 Sky completely clear
	1
	2
	3
	4 Sky half cloudy
	5
	6
	7
	8 Sky completely cloudy
	(9) Sky obstructed from view

APPENDIX C – CALIBRATION CERTIFICATES

C1 CALIBRATION CERTIFICATES


CERTIFICATE OF CALIBRATION																					
ISSUED BY	Gracey & Associates	BSI CERTIFICATE		FS 25913																	
DATE OF ISSUE	03 March 2022	CERTIFICATE NUMBER	2022-0309																		
DATE OF CALIBRATION	02 March 2022	PAGE 1 OF 1																			
CALIBRATION INTERVAL	24 months	Gracey & Associates Bam Court Shelton Road Upper Dean PE28 0NQ Tel: 01234 708835 www.gracey.co.uk																			
TEST ENGINEER	APPROVING SIGNATORY																				
Jamie Bishop	Greg Rice																				
Equipment	B&K 2260 B, s/n: 2001719																				
Description	Investigator, Hottinger Bruel & Kjaer UK Ltd																				
Customer	Grosle Environmental Services 88 Hamilton Place, Aberdeen, AB15 5BA																				
Standards	Conditions																				
BS EN 60651 / BS EN 60804	Atmospheric Pressure 100.4kPa																				
	Temperature 22.7 °C																				
	Relative Humidity 31.1%																				
Calibration Reference Sources <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Equipment</th> <th style="text-align: left;">S/N</th> <th style="text-align: left;">Last Cal</th> <th style="text-align: left;">Equipment</th> <th style="text-align: left;">S/N</th> <th style="text-align: left;">Last Cal</th> </tr> </thead> <tbody> <tr> <td>Druck DPI 141</td> <td>479</td> <td>06-Aug-20</td> <td>HP 34401</td> <td>3146A16728</td> <td>30-Mar-21</td> </tr> <tr> <td>Vaisala HMP23</td> <td>S2430007</td> <td>03-Aug-20</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Equipment	S/N	Last Cal	Equipment	S/N	Last Cal	Druck DPI 141	479	06-Aug-20	HP 34401	3146A16728	30-Mar-21	Vaisala HMP23	S2430007	03-Aug-20			
Equipment	S/N	Last Cal	Equipment	S/N	Last Cal																
Druck DPI 141	479	06-Aug-20	HP 34401	3146A16728	30-Mar-21																
Vaisala HMP23	S2430007	03-Aug-20																			
Notes We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standard exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%. Copyright of this certificate is owned by Gracey & Associates and may not be reproduced other than in full except with their prior written approval.																					
Gracey & Associates is the trading name of W T Gracey Ltd. Registered in Upper Dean England No 1176412. Est. 1972 Hire and calibration of noise and vibration instruments under a BSI ISO 9001 quality management system, Cert No. FS 25913.																					

APPENDIX C – CALIBRATION CERTIFICATES



C2 CALIBRATION CERTIFICATES

CERTIFICATE OF CALIBRATION

ISSUED BY	Gracey & Associates	BSI CERTIFICATE	FS 25913
DATE OF ISSUE	03 March 2022	CERTIFICATE NUMBER	2022-0310
DATE OF CALIBRATION	24 February 2022		
CALIBRATION INTERVAL	24 months		PAGE 1 OF 2



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Barn Court Shelton Road
Upper Dean PE28 0NQ
Tel: 01234 708835
www.gracey.co.uk

TEST ENGINEER	APPROVING SIGNATORY
Jamie Bishop	Greg Rice
	

Equipment	B&K 4189, s/n: 2021293
Description	Microphone - 1/2" FF 0V, Hottinger Bruel & Kjaer UK Ltd
Customer	Grosle Environmental Services 88 Hamilton Place, Aberdeen, AB15 5BA

Standards BS EN 61094	Conditions Atmospheric Pressure 100.4kPa Temperature 22.7°C Relative Humidity 31.1%
---------------------------------	---

Calibration Data

Sensitivity	-26.1 dB
-------------	----------

Calibration Reference Sources

Equipment	S/N	Last Cal	Equipment	S/N	Last Cal
B&K 4134 L	1935995	08-Oct-21	Druck DPI 141	479	06-Aug-20
HP 34401	3146A16728	30-Mar-21	Nor 1253	22456	08-Oct-21
Stanford DS36	33213	17-Aug-20	Vaisala HMP23	S2430007	03-Aug-20

Notes

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.
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APPENDIX C – CALIBRATION CERTIFICATES

C3 CALIBRATION CERTIFICATES

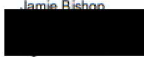
CERTIFICATE OF CONFORMANCE

ISSUED BY	Gracey & Associates	BSI CERTIFICATE	FS 25913
DATE OF ISSUE	03 March 2022	CERTIFICATE NUMBER	2022-0311
DATE OF CALIBRATION	02 March 2022		
CALIBRATION INTERVAL	24 months		

PAGE 1 OF 1



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TEST ENGINEER
Jamie Bishop


APPROVING SIGNATORY
Greg Rice


Equipment

Description

Customer

B&K ZC 0026, s/n: 2001719

Preamplifier - 1/2" - B&K 2260, Hottinger Bruel & Kjaer UK Ltd

Grosle Environmental Services
88 Hamilton Place, Aberdeen, AB15 5BA

Standards

Manufacturer Specifications

Conditions

Atmospheric Pressure 101.4 kPa

Temperature 22.8°C

Relative Humidity 31.7%

Calibration Reference Sources

Equipment	S/N	Last Cal	Equipment	S/N	Last Cal
Druck DPI 141	479	06-Aug-20	HP 34401	3146A16728	30-Mar-21
Vaisala HMP23	S2430007	03-Aug-20			

Notes

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standard exists, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instrument's specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.
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APPENDIX C – CALIBRATION CERTIFICATES

C4 CALIBRATION CERTIFICATES

CERTIFICATE OF CALIBRATION

ISSUED BY	Gracey & Associates	BSI CERTIFICATE	FS 25913
DATE OF ISSUE	08 March 2023	CERTIFICATE NUMBER	2023-0413
DATE OF CALIBRATION	08 March 2023		
CALIBRATION INTERVAL	12 months	PAGE 1 OF 2	



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TEST ENGINEER	APPROVING SIGNATORY
Jamie Bishop <div style="background-color: black; width: 60px; height: 15px; margin-top: 2px;"></div>	Greg Rice <div style="background-color: black; width: 60px; height: 15px; margin-top: 2px;"></div>

Equipment	B&K 4231, s/n: 2094490
Description	Calibrator - Acoustic - Class 1, Hottinger Bruel & Kjaer UK Ltd
Customer	Grosle Environmental Services 88 Hamilton Place, Aberdeen, AB15 5BA

Standards	Conditions
BS EN 60942	Atmospheric Pressure 98.6 kPa
	Temperature 22.0 °C
	Relative Humidity 30.1%

Calibration Data	
Output Level	94.1 dB
Frequency	999.8 Hz

Calibration Reference Sources

Equipment	S/N	Last Cal	Equipment	S/N	Last Cal
B&K 4134 L	1675305	14-Jul-20	Druck DPI 141	479	06-Aug-20
HP 34401	3146A16728	08-Apr-22	Nor 1253	20848	14-Jul-20
Stanford DS36	33213	17-Aug-20	Vaisala HMP23	S2430007	03-Aug-20

Notes

We certify that the above product was duly tested and found to be within the specification at the points measured (except where indicated). Measurements are traceable to reference sources calibrated to National Standards. Where no national or international standards exist, traceability is to standards maintained by the manufacturer. Our Quality Management System has been assessed to comply with BS EN ISO 9001:2015 - BSI Certificate number FS 25913. Tests were carried out in environmental conditions controlled to the extent appropriate to the instruments specification. All relevant test certificates are available for inspection. The uncertainties are for a confidence probability of not less than 95%.
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APPENDIX D – MEASUREMENT LOCATION AND PHOTOGRAPH

D2 MEASUREMENT LOCATION AND PHOTOGRAPH

Location 1 – Carpark area at Stoneywood Gate



APPENDIX E – SURVEY REPORT

1 of 2

E1 SURVEY REPORT

SURVEY REPORT

PERSONNEL PRESENT: Tanya Grosle

ADDRESS: Stoneywood Gate, Stoneywood Park, Dyce, Aberdeen, AB21 7DZ

DATE: 18.10.23

TIME START: 05:55

TIME STOP: 23:05

REASON FOR MONITORING: Noise Impact Assessment relating to the redevelopment of an existing site, including change of use to class 3 (food and drink) for erection of 2no. café/restaurants with associated infrastructure and car parking

Location	Number and Duration	Time	L _{Aeq}	L _{AF90}	L _{AF10}	L _{AFMAX}	
Sound level meter calibrated at 05:55							
-	1 (05 secs)	05:56	94.0	-	-	-	Calibration drift check
Location 1	2 (15 mins)	06:00	59.3	46.4	58.8	81.1	Location 1 – Carpark area inside Stoneywood Gate. Dominant noise source was road traffic noise on Stoneywood Road. Intermittent noise sources were aircraft noise and faint rustling of leaves from nearby trees.
Location 1	3 (15 mins)	06:15	56.8	47.2	59.4	75.3	As measurement number 2
Location 1	4 (15 mins)	06:30	60.1	48.9	61.4	76.1	As measurement number 2
Location 1	5 (15 mins)	06:45	62.1	50.4	64.8	79.7	As measurement number 2
Location 1	6 (60 mins)	07:00	64.2	52.2	68.6	80.2	As measurement number 2
Location 1	7 (60 mins)	08:00	63.8	52.2	67.4	80.3	As measurement number 2
Location 1	8 (60 mins)	09:00	59.6	51.2	60.6	80.0	As measurement number 2
Location 1	9 (60 mins)	10:00	61.9	53.0	62.6	85.9	As measurement number 2
Location 1	10 (60 mins)	11:00	63.3	53.4	63.4	91.8	As measurement number 2
Location 1	11 (30 mins)	12:00	60.9	53.4	61.8	80.2	As measurement number 2.
-	12 (04 secs)	12:30	93.9	-	-	-	Calibration drift check, batteries changed
Sound level meter calibrated at 12:35							
-	13 (05 secs)	12:40	94.0	-	-	-	Calibration drift check
Location 1	14 (60 mins)	13:00	61.0	53.2	61.8	78.6	As measurement number 2

APPENDIX E – SURVEY REPORT

2 of 2

E2 SURVEY REPORT

SURVEY REPORT

Location	Number and Duration	Time	L _{Aeq}	L _{AF90}	L _{AF10}	L _{AFMAX}	
Location 1	15 (60 mins)	14:00	61.8	53.0	61.6	80.4	As measurement number 2
Location 1	16 (60 mins)	15:00	60.9	53.2	61.0	79.0	As measurement number 2
Location 1	17 (60 mins)	16:00	61.3	53.6	62.6	81.5	As measurement number 2
-	18 (04 secs)	17:00	94.0	-	-	-	Calibration drift check, batteries changed
Sound level meter calibrated at 17:05							
-	19 (05 secs)	17:10	94.0	-	-	-	Calibration drift check
Location 1	20 (40 mins)	17:20	61.8	54.2	62.3	81.2	As measurement number 2
Location 1	21 (60 mins)	18:00	61.5	54.0	62.0	81.7	As measurement number 2
Location 1	22 (60 mins)	19:00	60.0	54.8	61.2	79.2	As measurement number 2
Location 1	23 (60 mins)	20:00	60.2	51.6	60.8	80.3	As measurement number 2
Location 1	24 (60 mins)	21:00	59.8	51.5	60.9	80.3	As measurement number 2
Location 1	25 (60 mins)	22:00	56.6	47.0	59.2	75.1	As measurement number 2
-	26 (04 secs)	23:05	93.9	-	-	-	Calibration drift check, batteries changed and comfort break
Sound level meter calibrated at 11:52							

APPENDIX F – BS 4142:2014+A1:2019 ASSESSMENT

1 of 3

F1 BS 4142:2014+A1:2019 ASSESSMENT

Results	Report Section	326 Stoneywood Road, Dyce, Aberdeen	Comments
Specific sound level	See Appendix F	36	Calculated from the roof-top mechanical plant of the two café/restaurant units
Acoustic feature correction	See Appendix F	+2 and +3	Acoustic penalties for tonal noise are added which may be just perceptible and intermittent (+2 dB and +3 dB)
Rating level	See Appendix F	41	
Background sound level L_{A90}	See Appendix E	46	The background sound level is the the lowest L_{A90} measurement at Location One
Excess of Rating Level is likely to be an indication of a low impact.		-5	
Uncertainty of the assessment			In this instance, there may be uncertainty in the rating level due to the fact that this was calculated and not measured. However, this uncertainty has been minimised by using the fan and silencers manufacturer's data. The background sound level measurement was taken under repeatable conditions, and the uncertainty is negligible.

APPENDIX F – BS 4142:2014+A1:2019 ASSESSMENT

2 of 3

F2 BS 4142:2014+A1:2019 ASSESSMENT

BACKGROUND SOUND LEVEL

The background sound level was taken to be the lowest L_{A90} measurement at Location One; the background sound level was L_{A90} 46 dB(A).

COMBINED SPECIFIC SOUND LEVEL OF MECHANICAL PLANT

Detailed below is the assumed roof-top mechanical plant; this noise data is taken from a previous report produced by Grosle Environmental Services for a café/restaurant (with customer lanes) located within a busy town in Scotland's central belt and located adjacent to a large retail food store. It is assumed that the same plant shall be used for the two proposed café/restaurants.

Specific plant noise	Over-all level per unit (@ 1m)	Octave band centre frequency (Hz) (dB Leq)							
	L_{Aeq}	63	125	250	500	1K	2K	4K	8K
Kitchen Extract	84	89	81	89	81	76	72	69	60
AHU S1	74	78	74	78	69	65	64	69	62
AHU S2	73	81	73	74	67	64	64	69	62
AHU-condensers (x3) ⁽¹⁾	64	69	69	64	62	59	55	50	42
Danfoss Chiller Condenser	58	43	43	52	54	55	51	42	37
Danfoss Freezer Condenser	54	60	60	58	49	46	40	41	30
Door Heater Condenser	48	57	55	50	44	43	39	32	27
Managers office – AHU	46	58	51	45	44	40	37	32	31
Cumulative level (all plant)	85	90	83	90	82	77	74	74	66

From the site plans, the distance of the roof-top mechanical plant for the two proposed café/restaurant units to the nearest noise sensitive receptor (326 Stoneywood Road, Dyce, Aberdeen) are 21 metres (Unit Two) and 42 metres (Unit One). It is assumed for the purpose of the calculations that the roof-top plant shall be obscured by plant deck parapet to be located around the boundary of the roof-top and the sound attenuation shall be ten decibels. In addition, the attenuation required for acoustic silencing is also included in the calculation.

APPENDIX F – BS 4142:2014+A1:2019 ASSESSMENT

3 of 3

F3 BS 4142:2014+A1:2019 ASSESSMENT

The table below details the calculation for the combined specific noise level of the mechanical plant from the café/restaurant units at the nearest noise sensitive receptor (326 Stoneywood Road, Dyce, Aberdeen).

Predicted plant noise at NSR from Café/Restaurant Unit One								
	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Cumulative level of allplant at 1m distance (Lleq)	90	83	90	82	77	74	74	66
Acoustic Silencers	0	-1	-15	-13	-11	-9	-9	-4
Shielding from parapet	-10	-10	-10	-10	-10	-10	-10	-10
Distance correction (42 metres)	-32	-32	-32	-32	-32	-32	-32	-32
Cumulative level of all plant at façade of NSR (Lleq)	48	40	33	27	24	23	23	20
Predicted plant noise at NSR from Café/Restaurant Unit Two								
	Octave band centre frequency (Hz) (Leq)							
	63	125	250	500	1K	2K	4K	8K
Cumulative level of allplant at 1m distance (Lleq)	90	83	90	82	77	74	74	66
Acoustic Silencers	-3	-7	-21	-19	-17	-15	-15	-10
Shielding from parapet	-10	-10	-10	-10	-10	-10	-10	-10
Distance correction (21 metres)	-26	-26	-26	-26	-26	-26	-26	-26
Cumulative level of all plant at façade of NSR (Lleq)	51	40	33	27	24	23	23	20
Combined External Noise Levels of Units One and Two (Lleq)	53	43	36	30	27	26	26	23
A-weighting	-26	-16	-9	-3	0	1	1	-1
Combined External Noise Levels of Units One and Two (LAeq)	27	27	27	27	27	27	27	22
The specific sound level of mechanical plant from Units One and Two at the NSR = LAeq = 36 dBA								

RATING LEVEL

Two acoustic penalties are added to the combined specific noise level as the noise from the mechanical plant may be just perceptible and intermittent at 326 Stoneywood Road, Dyce, Aberdeen. The penalties are for tonal noise which may be just perceptible (+2dB) and intermittent noise (+3 dB), these are added to the combined specific sound level to produce a rating level of 41 dB(A) at 326 Stoneywood Road, Dyce, Aberdeen.