

Noise Assessment

Evaluation of Site for Street Food Market

Land off Hosier Street
Reading

Joynes Nash

Acoustics · Environmental · Public Health



Client Blue Collar

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Simon Joynes BSc(Hons), MSc, CEnvH, MCIEH, AMILM, AMIOA

Simon Joynes has over 19 years' experience in both Private Sector and Local Government. He has acted as a senior advisor and has significant experience in the technical aspects and practical application of environmental law, including acting as an expert witness in courts and planning enquiries and the preparation and reviewing of environmental reports and mitigation strategies. (Air Quality, Land Contamination, Acoustics, Water Quality, Odour Management & Industry Regulation). He holds a BSc (Hons) Environmental Health, MSc in Contaminated Land Remediation, the IOA Diploma in Acoustics and Noise Control, Certificates of Competence Environmental Impact Assessments. He also holds affiliations with the Chartered Institute of Environmental Health, the Institute of Acoustics and is an Associate Member of the Institute of Leadership and Management.

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Appendix A Site Plans

Appendix B Noise Units

- 3.1 Relevant guidance and national planning policy is contained within the Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and published Planning Practice Guidance on Noise (PPGN). These documents do not contain guidance in terms of numerical noise levels. Guidance is provided descriptively, which may be transposed to numerical noise levels for site-specific situations, using the methods contained within British Standards. However, there is no specific guidance on this; the research that Defra promoted has apparently been inconclusive and varies by source.

NOISE POLICY STATEMENT FOR ENGLAND

- 3.2 The noise element of the assessment is based on the definition of ‘noise’ and the reference to ‘sound’ contained within the NPSE, which states:

“For the purposes of the NPSE, ‘noise’ includes:

- ‘environmental noise’ which includes noise from transportation sources;*
- ‘neighbour noise’ which includes noise from inside and outside people’s homes; and*
- ‘neighbourhood noise’ which includes noise arising from within the community such as industrial and entertainment premises, trade and business premises, construction sites and noise in the street.*

Furthermore, sound only becomes noise (often defined as ‘unwanted sound’) when it exists in the wrong place or at the wrong time such that it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance. Unlike many other pollutants, noise pollution depends not just on the physical aspects of the sound itself, but also the human reaction to it.”

- 3.3 On this basis, the assessment determines the significance of noise effects on the basis of measured and predicted levels of sound taking into account the context of the levels received at the NSRs as described in the NPSE.
- 3.4 The NPSE aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.
- 3.5 Paragraph 1.6 of the NPSE sets out the long-term vision and aims of Government noise policy:

Noise Policy Vision

Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

Noise Policy Aims

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

3.6 The aims require that all reasonable steps should be taken to avoid, mitigate and minimise adverse effects on health and quality of life whilst also taking into account the guiding principles of sustainable development, which include social, economic, environmental and health considerations.

3.7 With regard to the terms ‘significant adverse’ and ‘adverse’ included in the ‘Noise Policy Aims’, these are explained further in the ‘Explanatory Note’ as relating to established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation which are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on human health and quality of life due to noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

3.8 Defra has then extended these concepts for the purpose of the NPSE to introduce the concept of:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

3.9 The accompanying explanation states:

“It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

- 3.10 With regard to ‘further evidence’, Defra has commissioned research to try and identify the levels at which the above effects occur, but this is not yet in the public domain. However, indications are that this research has been largely inconclusive and varies with source. On this basis, and until further guidance becomes available, and given that there is no specific guidance in the NPPF on noise, there is no justification to vary assessment methods and criteria from those previously adopted from British Standards etc.

NATIONAL PLANNING POLICY FRAMEWORK

- 3.11 The NPPF sets out the Government’s planning policies for England and how these are expected to be applied. The emphasis of the Framework is to allow development to proceed where it can be demonstrated to be sustainable. In relation to noise, Paragraph 180 of the Framework states:

“Planning policies and decisions should 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 the development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.’*

- 3.12 The point ‘a)’ refers to ‘significant adverse impacts’ which relates to the ‘significant observed adverse effect level’ (SOAEL) in the NPSE, though the term ‘effect’ is used instead of the term ‘impact’ although these have been deemed to be interchangeable in this context.

PLANNING PRACTICE GUIDANCE

- 3.13 The planning practice guidance considers noise and provides the following guidance in terms of the effect level hierarchy.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required

Noticeable and not intrusive	Noise can be heard, but does not cause any change in behavior or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behavior and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behavior and/or attitude, e.g. having to keep windows closed most of the time, 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 acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behavior 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, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

BRITISH STANDARD 4142: 2014

- 3.14 The most relevant guidance to carry out an assessment of industrial/commercial sound sources on residential development, is British Standard BS4142. It contains a method whereby the likelihood of complaints arising from an industrial activity can be anticipated.
- 3.15 The basis of the standard is a comparison between the 'background sound level' at representative locations and the 'specific sound level', modified to produce an assessment level generated by the sound source under consideration.
- 3.16 These corrections can be applied to the specific sound source to represent the character of the sound and determine a rating level, as described in Section 9 of the British Standard.
- 3.17 Once all the necessary adjustments have been made, the rating level and background L_{A90T} sound levels are compared and an assessment of the impact conducted.

3.18 However, typically the greater this difference, the greater the magnitude of the impact. A difference of +10dB or more is likely to be an indication of a significant adverse impact. A difference of +5dB 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 or a significant adverse impact. Any assessment is also dependent on the context of the scenario under consideration.

3.19 Whilst BS4142 is the key standard for noise from industrial and commercial operations the standard is based on plant and equipment noise. the scope of the standard is explicit that it is not intended to be used for assessing noise from a number of sources the list of which includes:- recreational activities, music and people.

BRITISH STANDARD 8233: 2014 Sound Insulation and Noise Reduction for Buildings

3.20 BS8233 gives recommendations for the control of noise in and around buildings and suggests criteria and limits for different situations. These criteria and limits are primarily intended to guide the design of new or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise level.

3.21 Table 4 in the standard sets out a range of internal noise level it is desirable not to exceed, these levels are:

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB L _{Aeq} , 16 Hour	-
Dining	Dining room / area	40 dB L _{Aeq} , 16 Hour	-
Sleeping (Daytime Resting)	Bedroom	35 dB L _{Aeq} , 16 Hour	30 dB L _{Aeq} , 8 Hour

3.22 However, it must be considered that notes appended to the table (No. 7) state:

‘Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved’.

3.23 For traditional external areas that are used for amenity space, such as gardens and patios, the British Standard says it is desirable that “the external noise does not exceed 50dB L_{AeqT}, with an upper guideline value of 55dBL_{AeqT}. The Standard also considers situations where such guideline values cannot be satisfied and provides an over-arching consideration of how to treat garden noise in the context of the overall proposal.

World Health Organisation Guidelines for Community Noise

- 3.24 The World Health Organisation guidelines form the basis upon which British Standard 8233 is based. They also contain additional guidance on night time L_{Amax} levels.
- 3.25 With respect to night time L_{Amax} noise levels the WHO guidelines state ‘For a good night’s sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB L_{Amax} more than 10-15 times per night’.

Professional Practice Guidance on Planning & Noise – May 2017

- 3.26 The Professional Practice Guidance on Planning and Noise (ProPG) was published to provide practitioners with guidance on a recommended approach to the management of noise, within the planning system in England.
- 3.27 The primary goal of the ProPG is to assist in the delivery of sustainable development by promoting good health and well-being through the effective management of noise. This is expected to be achieved through the encouragement of good acoustic design in and around proposed new residential development, having regard to national policy on planning and noise.
- 3.28 Its scope is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources, but it is of use when considering wider development issues.
- 3.29 Consideration of other noise sensitive development (such as schools and hospitals), other sources of noise (such as dominant noise from industrial, commercial or entertainment premises) and of ground-borne noise and vibration is outside the scope of the guidance. However, it does offer some guiding principles which may assist in other scenarios.

4 Noise Modelling

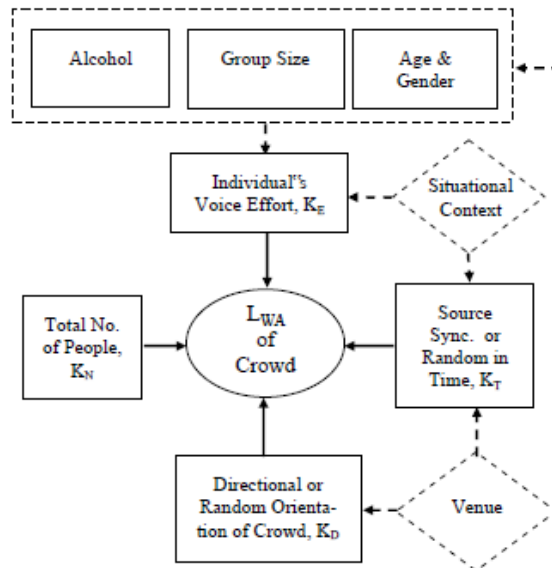
- 4.1 Following a number of visits to the site, A noise model was created in CadnaA, a proprietary noise modelling software by Datakustik. The model uses the widely noise standard ISO 9613 to calculate sound propagation and also incorporates a number of UK and other countries standards for specific uses, such as Calculation of Road Traffic Noise.
- 4.2 The noise model utilised data from Open Street Map to create a basic layout of roads and surrounding buildings including a proposed hotel on Hozier Street and residential development at Broad Street Mall.
- 4.3 The boundary of the proposed development and an area source to present patron’s voices were input into the model. The source data input is described in the following paragraphs. Calculations were made for receptors at first floor level (4m above ground level) with 4 orders of reflection. Ground absorption was 0.0, assuming all areas are acoustically “hard.”

Patron Noise

- 4.4 There are a number of studies into noise from people talking in the open air and often applied to assessments of pub beer gardens and the like. A paper in Proceedings of Acoustics¹ provides useful guidance on calculating noise from small to medium crowds taking into account, the number of people, their age, presence of alcohol among other contributory factors. As shown below in extracts taken from the paper:

FACTORS INFLUENCING CROWD NOISE

A schematic diagram of the factors influencing the sound power level of a crowd is presented in Figure 1.



4.5 **Table 1. Equivalent A-weighted sound pressure levels of speech for different vocal efforts (at 1m)**

Vocal Effort	Speech Level (dB(A))
Whispering	36
Soft	42
Relaxed	48
Relaxed, normal	54
Normal, raised	60
Raised	66
Loud	72
Very loud	78
Shouting	84
Maximal shout	90
Maximal shout (in individual cases)	96

Source: (Lazarus, 1986)

¹ Hayne, M.J., Taylor, J.C., Rumble, R.H. & Mee, D.J. (2011) Prediction of Noise from Small to Medium Sized Crowds. Proceedings of ACOUSTICS 2011. Paper Number 133. Gold Coast, Australia

The A-weighted sound power levels for a crowd size, N , can be approximated by:

$$L_{WAmax} = 11\log N + 81\text{dB(A)} \quad (5)$$

$$L_{WA01} = 11\log N + 77\text{dB(A)} \quad (6)$$

$$L_{WA10} = 15\log N + 67\text{dB(A)} \quad (7)$$

$$L_{WAeq} = 15\log N + 64\text{dB(A)} \quad (8)$$

- 4.6 Using the above formulae, we can calculate the effect of crowd noise as a means of sense-checking the CadnaA noise model. The noise model will utilise an area source to represent 100 individuals with a voice level of 65dB(A) at 1m (i.e. raised voices although likely to be an over-estimation), spread across the proposed location. If 100 people are in the open space, we would expect the following source levels:

$$L_{WAmax} = 11 * \log(100) + 81 = \underline{103\text{dB}}$$

$$L_{WAeq} = 15 * \log(100) + 64 = \underline{94\text{dB}}$$

- 4.7 The boundary at its closest to the façade of the proposed hotel is approximately 43m. As an estimation of receiving level, the following equation can be used to calculate sound pressure level with distance reduction:

$$L_p = L_w - 20\log(r) - 11 \quad (\text{hemispherical point source})$$

Therefore at the hotel façade;

$$L_p = 94 - 20\log(43) - 11$$

$$= 50\text{dB}$$

+3dB façade correction

$$= \underline{53\text{dB LAeq, 1hr}}$$

- 4.8 For the proposed residential development, a distance of 67m from the nearest boundary is inserted into the equation giving the following:

$$L_p = 94 - 20\log(67) - 11$$

$$= 43\text{dB}$$

+3dB façade correction

$$= \underline{46\text{dB LAeq, 1hr}}$$

- 4.9 Similarly, for $L_{Amax(f)}$, we arrive at the following values, 62dB $L_{Amax(f)}$ at the Proposed hotel and 58dB $L_{Amax(f)}$ at the nearest façade of the proposed residential development.

Summary of predictions

Scenario	Façade level at Proposed hotel first floor level.	Façade level at proposed residential development first floor level
100 patrons talking (Hayne et al formulae).	53dB LAeq 1hr 62dB L _A max(f)	46dB LAeq 1hr 58dB L _A max(f)
100 patrons talking (CADNA-A ISO 9613 formulae)*.	53dB LAeq 1hr	48dB LAeq 1hr

*Likely to be over-estimates of omni-directional, continuous sound point sources rather than directional random/sporadic durations.

Figure 1 –Site location and surrounds.

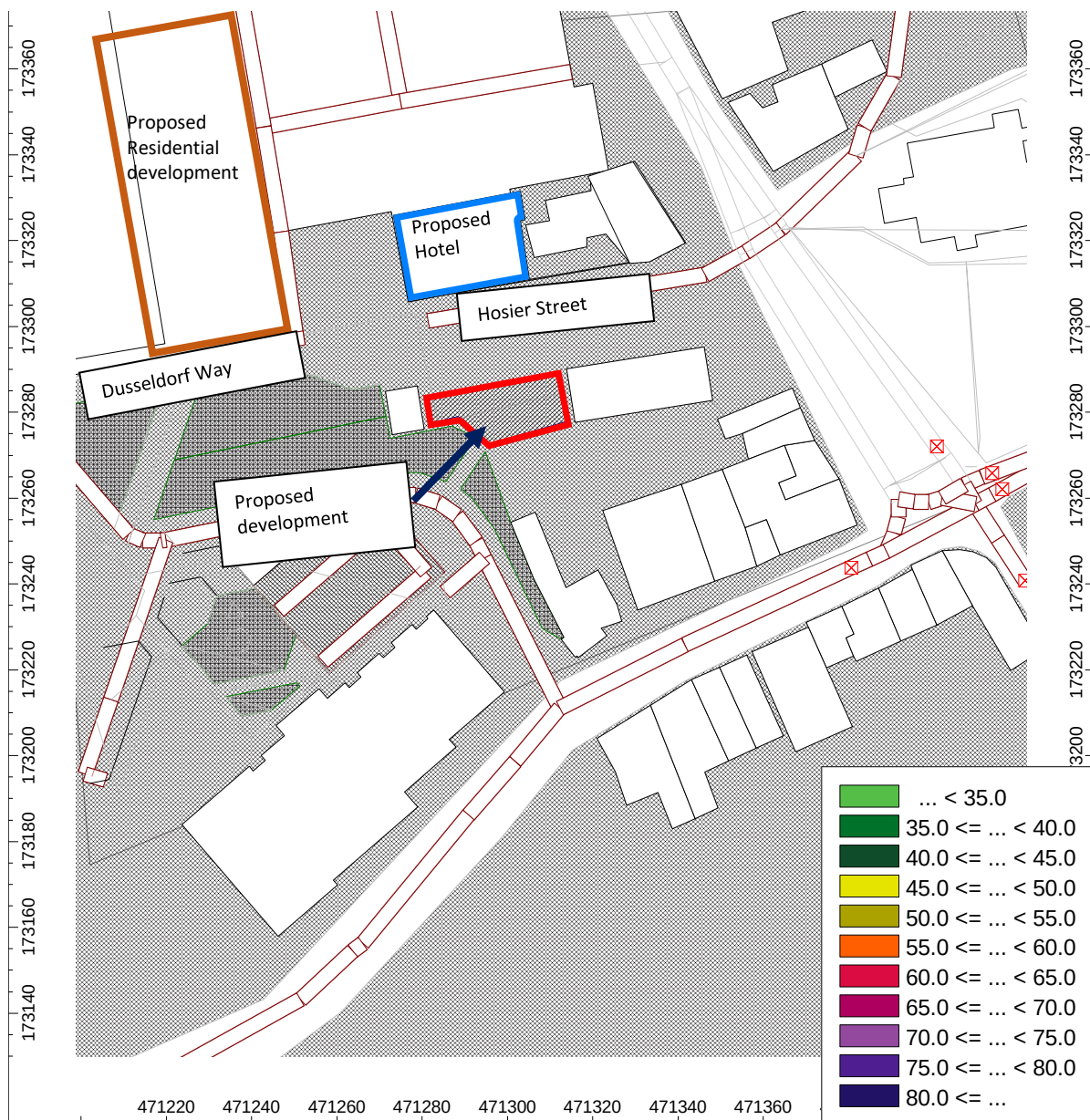
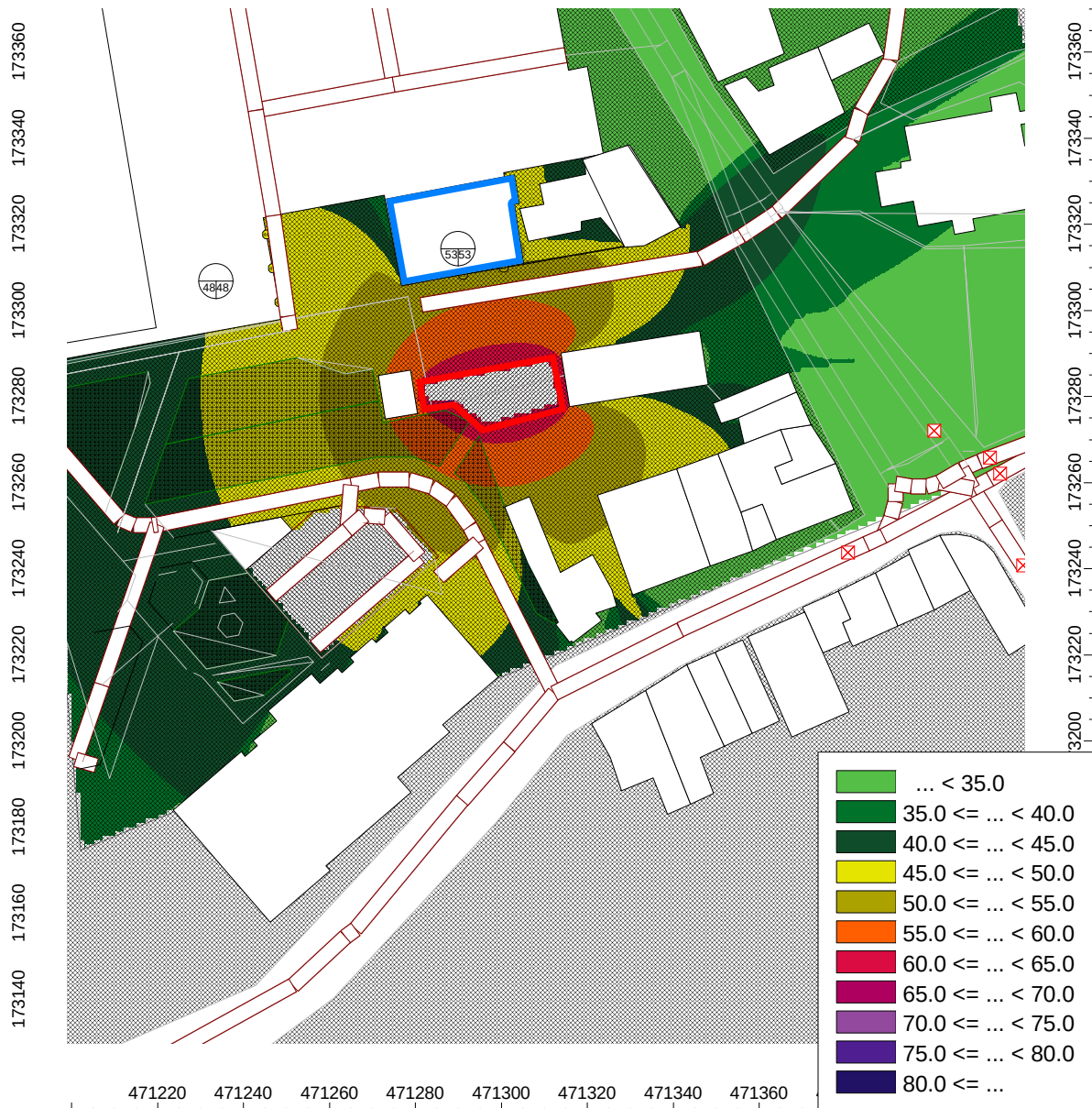


Figure 2 – Cadna-A model showing 100 patrons talking.

Sound level contours at 4m height above ground level, 1m grid spacing.



5 Ambient Noise Levels

- 5.1 At the time of this assessment, a level of concern across the United Kingdom in relation to the spread of the COVID-19 meant that the requirement for home working, along with restricted travel arrangements being enforced by the Government had just eased, however some elements of lockdown still remain and traffic and commercial activities were still some way from typical levels. This is particularly true of entertainment and hospitality venues where stringent restrictions are still in place.
- 5.2 This was widely accepted by the industry and guidance was issued by the Institute of Acoustics on the Practicability and Reliability of Baseline Sound Level Surveying and Provision of Sound & Noise Impact Assessments. This presented alternative methods for competing assessments and determining appropriate robust estimates of baseline conditions, including the use of existing data or undertaking baseline sound predictions whilst limiting the uncertainty in any such assessments.

[joint guidance on the impact of covid.ioa anc v6.pdf](#)

- 5.3 In considering this advice Joynes Nash are evaluating each application on its individuals' merits, considered any available local data and evaluated the uncertainties to make informed judgements.

6 Available Third-Party Data

- 6.1 A search of the Local Authority database revealed two applications which were accompanied by relevant acoustic reports which were considered pertinent to this application in that they presented the necessary baseline data upon which informed judgements could be made.

- 6.2 Application 182054 – 20 Hosier Street, Reading, RG1

Demolition of all existing structures, erection of a part 7, part 8 storey building for use as 101 bed Hotel (Class C1 Use) at Ground - 8th Floor and Restaurant with ancillary Bar (Class A3/A4 Use) at ground floor, with means of access, servicing and associated works

- 6.3 This application included a noise assessment undertaken by Hoare Lea and is of particular relevance as it relates to what is now considered the most noise sensitive premises directly opposite the application site.

- 6.4 Broad Street Mall Broad Street Reading RG1 7QG

Construction of three residential buildings (Use Class C3) ranging in height from 5 to 20 storeys above Broad Street Mall(Site E to provide 42 units, Site B to provide up to 134 Units and Site A to provide up to 148 units) and provision of a podium level amenity area, Construction of a 16 storey building on South Court comprising ground and first floor retail(Use Class A1/A2/A3) and residential overupper floors (Use Class C3, Site C to provide

up to 98 units), Creation of ground floor retail units (Use Class A1/A3/A4) fronting Dusseldorf Way and ground floor retail (Use Class A1/A2/A3) fronting Queens Walk, all necessary enabling and alteration works required

- 6.5 This application was submitted in December 2018 and accompanied by a full Environmental Impact Assessment, including a chapter on noise and vibration. The application is still outstanding however there appears to be no reason to question the validity of the data.
- 6.6 A noise report by Hoare Lea acoustic consultants for the proposed hotel development on Hosier Street provides some useful data. This same data was also used in the Environmental Statement for the proposed residential development on Dusseldorf Way. The report² details baseline measurements in June and October 2018 at three locations identified in Figure 2 of the report and reproduced below.



Figure 2 Aerial photograph indicating unattended measurement positions and survey summary (courtesy of Google Earth)

² Document reference: REP-1010530-LR-20181016-Acoustic planning report-rev03-F

6.7 The report noted that the dominant noise sources consisted of road traffic and pedestrian noise and to a lesser extent, St Mary the Virgin bell chimes. In terms of data points most relevant to this applications, L2 is representative of the proposed residential development façade overlooking the market area. L3 is relevant to the southern façade of the hotel overlooking the market site. Night time noise levels at this location on a Friday and Saturday night were markedly higher suggesting that a greater contribution from pedestrians/revellers was measured.

6.8 Baseline noise data was summarised in tables 3, 3, 5 and 6 in the report and reproduced below:

Table 3 Ambient and maximum sound levels measured during the unattended survey at position L1

Date	Day time (07:00-23:00)	Night time (23:00 - 07:00)	
	L _{Aeq,10hr} (dB)	L _{Aeq,8hr} (dB)	L _A F _{max,15min} (dB)
Wednesday 13/06/2018	68 ^[1]	63	78 to 85
Thursday 14/06/2018	68	64	79 to 86
Friday 15/06/2018	68	69	84 to 94
Saturday 16/06/2018	68	70	83 to 89
Sunday 17/06/2018	64	62	76 to 82

6.9 ^[1] – Measurement not made over full 16 hour daytime period

Table 4 Ambient and maximum sound levels measured during the unattended survey at position L2

Date	Day time (07:00-23:00)	Night time (23:00 - 07:00)	
	L _{Aeq,10hr} (dB)	L _{Aeq,8hr} (dB)	L _A F _{max,15min} (dB)
Wednesday 13/06/2018	58 ^[1]	55	65 to 76
Thursday 14/06/2018	59	52	65 to 81
Friday 15/06/2018	58	52	67 to 77
Saturday 16/06/2018	59	53	69 to 79
Sunday 17/06/2018	58	53	65 to 78

^[1] – Measurement not made over full 16 hour daytime period

Table 5 Statistically representative background sound levels measured during the unattended survey at positions L1 and L2

Position	Typical background level L _{A90,15min} , dB	
	Daytime (07:00-23:00)	Night (23:00-07:00)
L1 – St Mary's Butts	60	50
L2 – Queen's Way	55	47

Table 6 Ambient and maximum sound levels measured during the unattended survey at position L3

Date	Day time (07:00-23:00)	Night time (23:00 - 07:00)	
	L _{Aeq,16hr} (dB)	L _{Aeq,8hr} (dB)	L _A F _{max,1min} exceeded no more than 3 times (dB)
Thursday 04/10/2018	62 ^[1]	56	76
Friday 05/10/2018	62	59	82
Saturday 06/10/2018	61	59	78
Sunday 07/10/2018	61	54	75
Monday 08/10/2018	62 ^[1]	-	-

^[1] – Measurement not made over full 16 hour daytime period

- 6.10 A minimum design standard was proposed for the hotel to ensure a satisfactory internal noise environment were also detailed in table 7 of the report.

Table 7 Recommended performance of façade elements.

Room	Minimum recommended sound insulation performance, R _w (R _w +C _{tr}) (dB)	
	Glazing	External wall elements
Typical Bedrooms	41 (37)	58 (53)

- 6.11 In relation to the proposed residential development, the noise mitigation of external environmental noise relies on a package of standard thermal double glazing along with a whole-dwelling mechanical ventilation system to provide background ventilation and comfort cooling although windows are open-able for purge ventilation³. Table 8.19 taken from the report details the glazing specification below.

³ See ES for Broad Street Mall, Planning Reference No. 182137

Table 8.19 Recommended Minimum Sound Insulation Performance of Façade Glazed Elements

Building	Rooms	Recommended Sound insulation performance, R_w (R_w+C_w) (dB)	
		Single aspect	Double aspect
A	Living rooms	32 (27)	37 (33)
	Bedrooms	37 (33)	-
B	Living rooms	32 (27)	37 (33)
	Studios / Bedrooms	37 (33)	-
C	Living rooms	32 (27)	32 (27)
	Studios / Bedrooms	32 (27)	-
D	Living rooms	37 (33)	37 (33)
	Bedrooms	37 (33)	-
E	Living rooms	37 (33)	37 (33)
	Bedrooms	37 (33)	-

7 Assessment and comparison of baseline data and operational noise at sensitive receptors.

- 7.1 The modelled noise levels for the patron noise from the site, based on a realistic worst case area source model of the site, can then be compared to the baseline data. The comparison is shown in the table below.

Receptor	Baseline data	Predicted patron noise level	Difference
Residential facade	L2 Daytime 58dB LAeq, 16hr	48dB LAeq, 1hr	-10dB
	L2 Night time 53dB LAeq, 8hr	48dB LAeq, 1hr	-5dB
Hotel facade	L3 Daytime 62dB LAeq, 16hr	53dB LAeq, 1hr	-9dB
	L3 Night time 59dB LAeq, 8hr	53dB LAeq, 1hr	-6dB

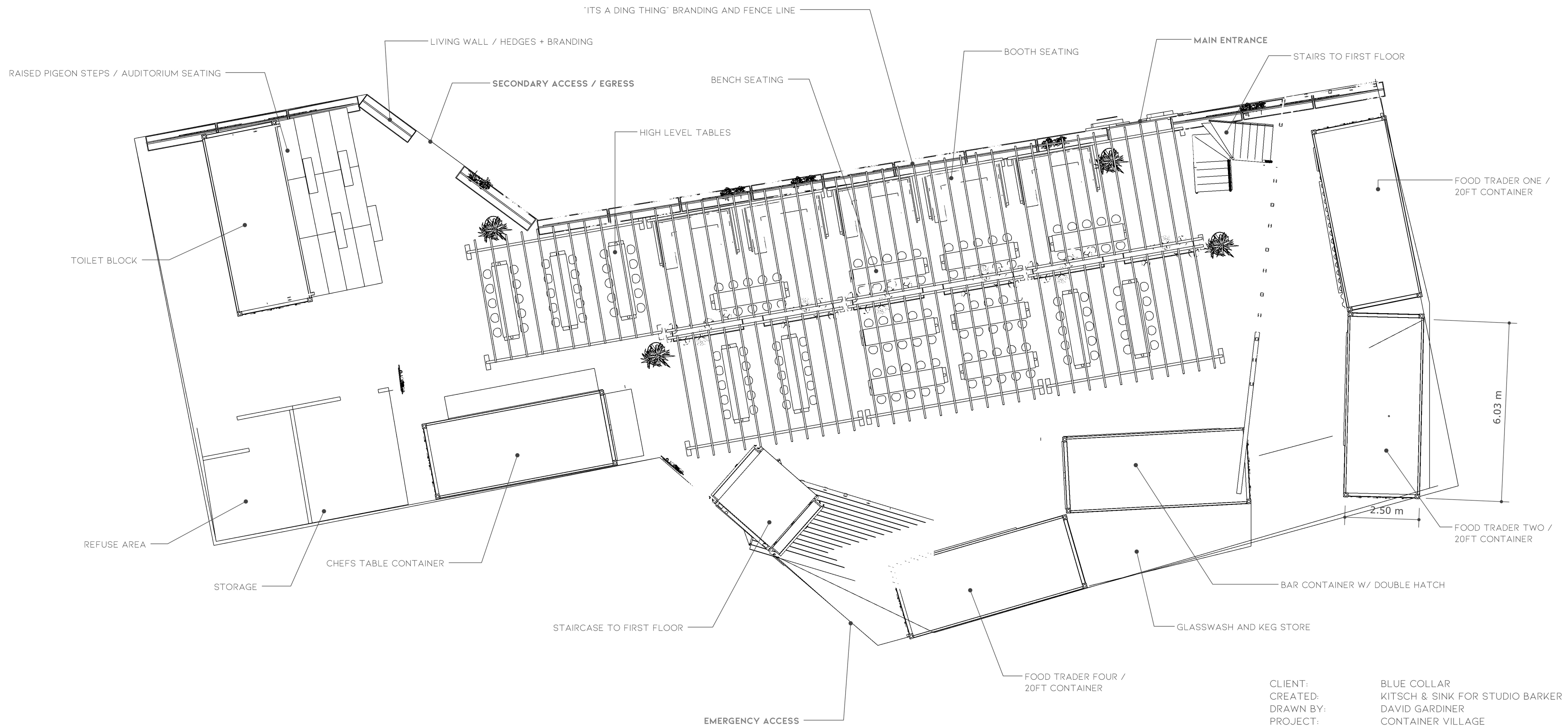
Table 7.1- Comparison of predicted site noise and measured environmental noise in 2018.

- 7.2 A comparative assessment of the proposed market development summarised in figure 3 above suggests that patron noise will be lower than measured environmental noise. Given that higher levels of environmental noise will be sufficiently mitigated via façade treatments outlined in the supporting noise reports for both the proposed hotel and residential developments overlooking the site, it is reasonable to conclude that the market development may operate without creating adverse effects.
- 7.3 Noise from music or plant and equipment noise, is something that sits under the applicants control and should there be any concerns, can be controlled through a suitable condition.

8 Conclusion and Recommendations

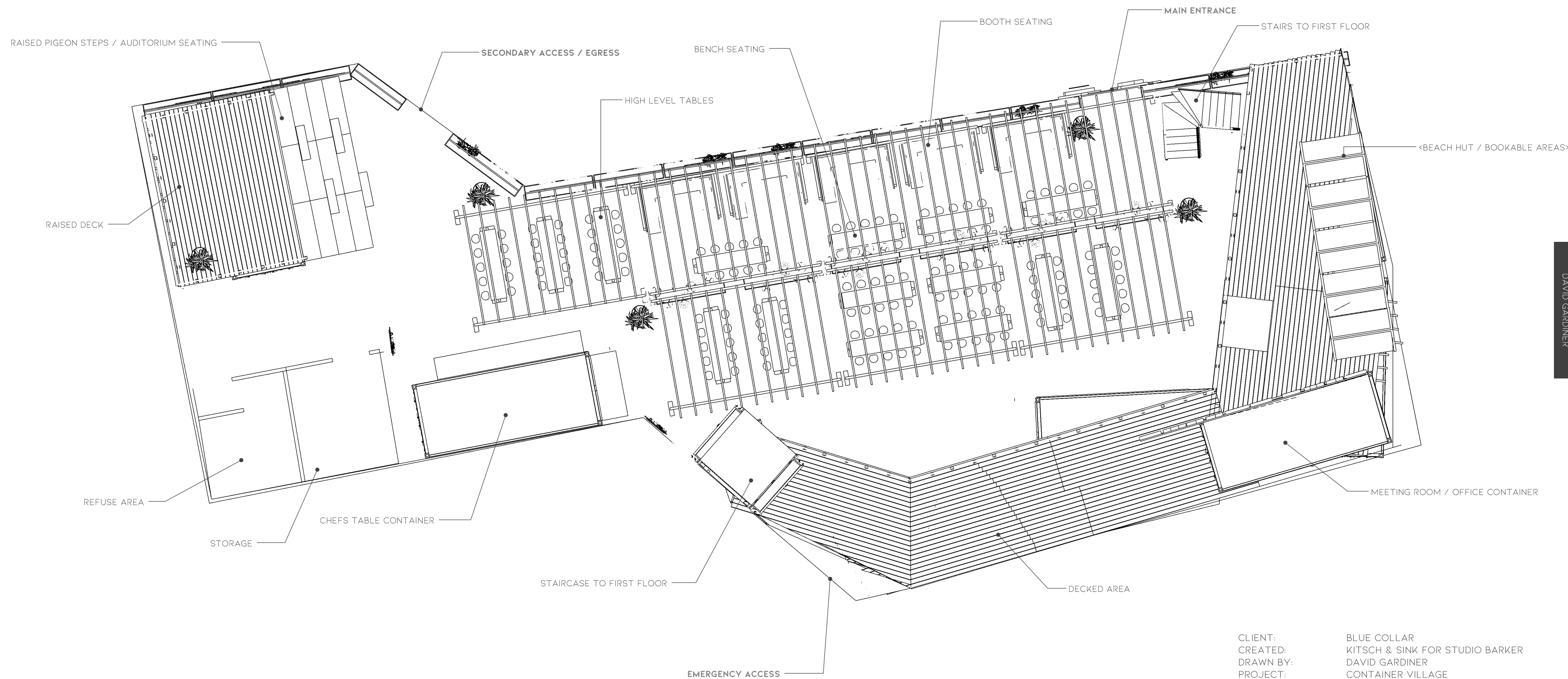
- 8.1 A noise impact assessment has been performed for a proposed commercial development of the site to a Street Food Market.
- 8.2 The assessment has found that when compared to the baseline noise data for the area the noise from patrons utilising the market will be significantly below the baseline ambient noise levels. This applies for the night time period too, however there is no wish to operate past 23:00.
- 8.3 Given the above the impact of the market must be considered low and for the daytime would be considered no observed effect, even for the night time period the impact is in the region of no observed adverse effect.
- 8.4 The residential premises are being designed to mitigate against the existing high ambient noise levels and will have suitable glazing to provide additional protection above and beyond that which would be typical. This will further protect against any noise from the market.
- 8.5 Noise from plant and equipment as well as any background music, can be controlled by condition as they are under the control of the operator.
- 8.6 Given the above, there is no reason for the development to be refused planning permission on noise grounds.

Appendix A – Plans



CLIENT: BLUE COLLAR
 CREATED: KITSCH & SINK FOR STUDIO BARKER
 DRAWN BY: DAVID GARDINER
 PROJECT: CONTAINER VILLAGE
 SITE: READING MARKET QUARTER

TITLE: PLAN VIEW GROUND FLOOR
 SCALE: 1: 100 @ A2
 DATE: 01.03.2021
 VERSION: VERS 2 OF 2



CLIENT: BLUE COLLAR
CREATED: KITSCH & SINK FOR STUDIO BARKER
DRAWN BY: DAVID GARDINER
PROJECT: CONTAINER VILLAGE
SITE: READING MARKET QUARTER

TITLE: PLAN VIEW FIRST FLOOR
SCALE: 1: 100 @ A2
DATE: 01.03.2021
VERSION: VERS 2 OF 2

Appendix B - Noise Units

1. Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB. The frequency response of the ear is usually taken to be about 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.
2. For variable noise sources such as traffic, a difference of 3 dB(A) is just distinguishable. In addition, a doubling of a noise source would increase the overall noise by 3 dB(A). For example, if one item of machinery results in noise levels of 30 dB(A) at 10 m, then two identical items of machinery adjacent to one another would result in noise levels of 33 dB(A) at 10 m. The 'loudness' of a noise is a purely subjective parameter but it is generally accepted that an increase/decrease of 10 dB(A) corresponds to a doubling/halving in perceived loudness.
3. External noise levels are rarely steady but rise and fall according to activities within an area. In an attempt to produce a figure that relates this variable noise level to subjective response, a number of noise metrics have been developed. These include:

LAeq noise level - This is the 'equivalent continuous A-weighted sound pressure level, in decibels' and is defined in BS 7445 [1] as the 'value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time'. It is a unit commonly used to describe community response plus, construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

LA90 noise level - This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during quieter periods. It is often referred to as the background noise level and issued in the assessment of disturbance from industrial noise.

LA10 noise level - This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.