

Noise Assessment

Plant Noise Assessment

Land off Hosier Street
Reading

Joynes Nash

Acoustics · Environmental · Public Health



Client Blue Collar

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Simon Joynes has over 20 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

- 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.

BRITISH STANDARD 4142: 2014

- 3.13 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.

- 3.14 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.
- 3.15 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.
- 3.16 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.
- 3.17 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.
- 3.18 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.

PLANNING PERMISSION 210540

- 3.19 The planning permission granted for the use of the site contains the following condition (Condition 11):-

No mechanical plant shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by the Local Planning Authority. The assessment shall be carried out for in accordance with BS4142:2014 methodology. The predicted specific sound level ($L_{Aeq,TR}$) (with reference to BS:4142) as measured at a point 1 metre external to the nearest noise-sensitive facade shall be at least 10dB below the pre-existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation. The predicted rating level, $L_{Ar,Tr}$ (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise-sensitive facade (habitable window of a dwelling) shall not exceed the pre-existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation. The plant shall thereafter only be installed in accordance with the assessment and shall thereafter be maintained so that it operates to the same standard

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 recognised international 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 Model inputs:-

Kitchen extract fans as a vertical area source 2m high a.g.l 60dB(A) @1m
Refrigeration compressor 67dB(A) @1m
Ground absorption G=0.0 (i.e. hard ground)
4 orders of reflection
Container kitchens 2.5m high a.g.l
Decked area above containers 3m a.g.l

Results

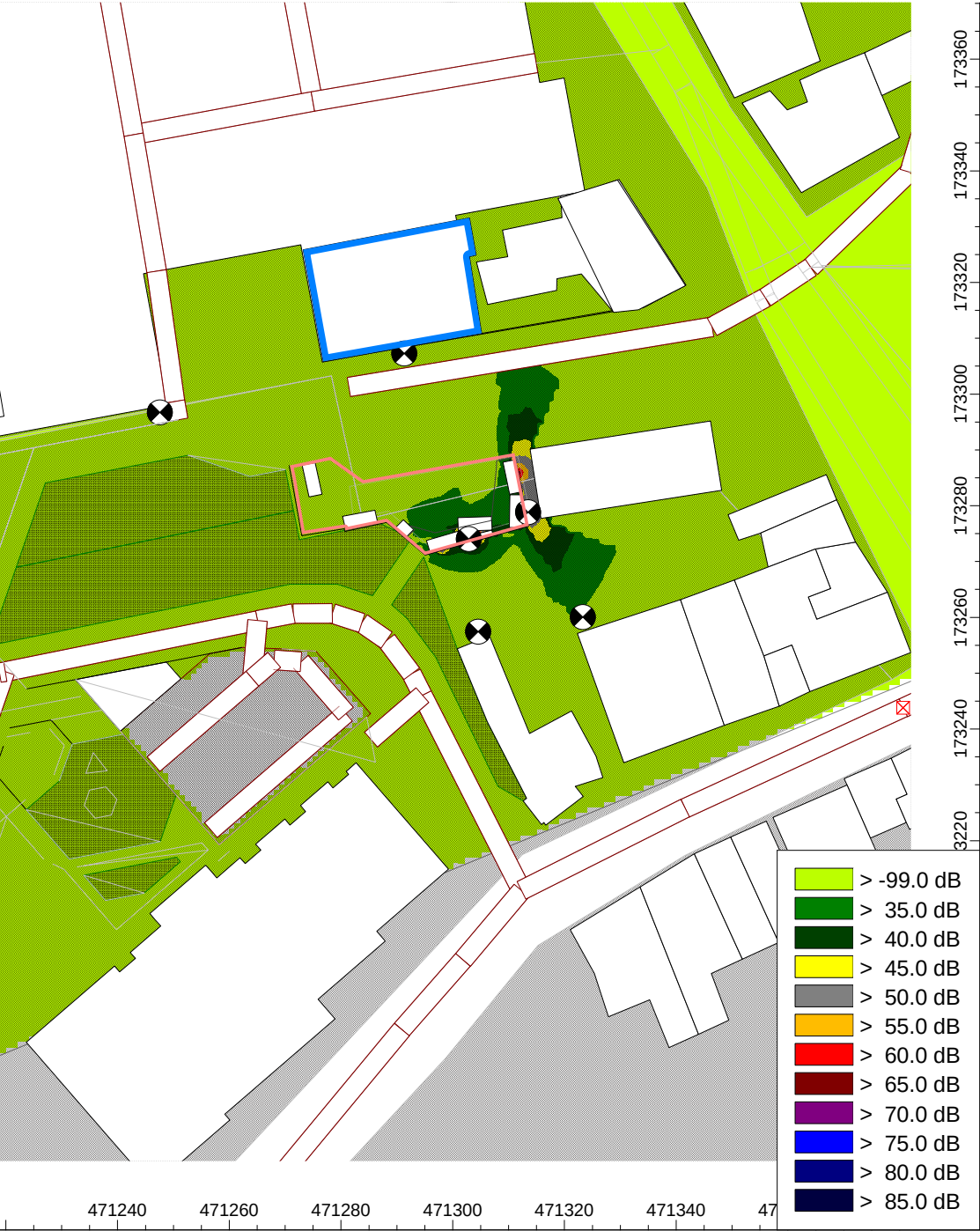
Kitchen extracts and refrigeration unit operating

Receptor	LAeq, freefield	Height (m)	Coordinates	
	(dBA)		X (m)	Y (m)
Proposed hotel Hozier St	27.1	4	471291.4	173307.3
Proposed residential Dusseldorf Way	23	4	471247.6	173296.7

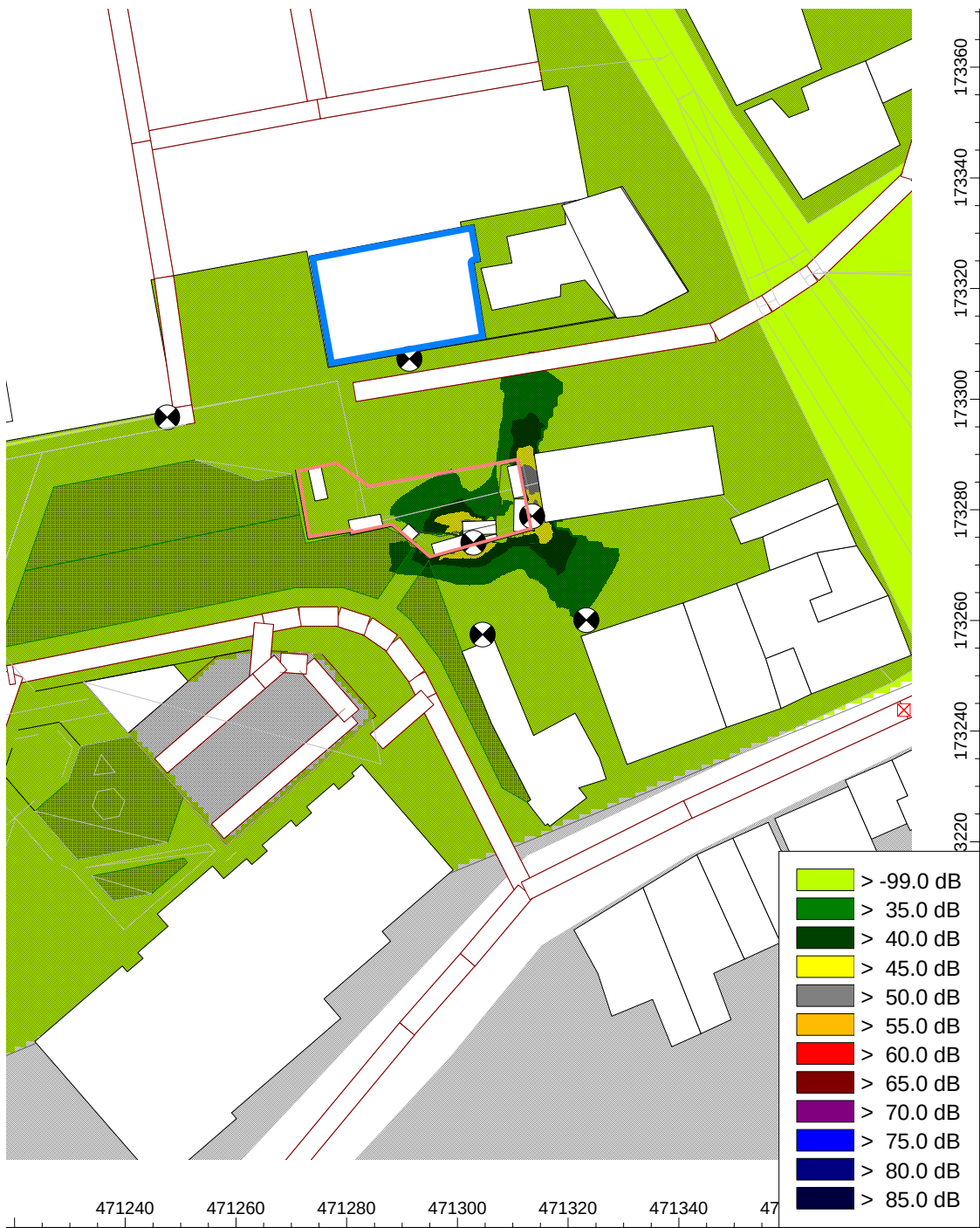
Refrigeration unit only operating

Receptor	LAeq, freefield	Height (m)	Coordinates	
	(dBA)		X (m)	Y (m)
Proposed Hotel Hozier St	25.4	4	471291.4	173307.3
Proposed residential Dusseldorf Way	22.6	4	471247.6	173296.7

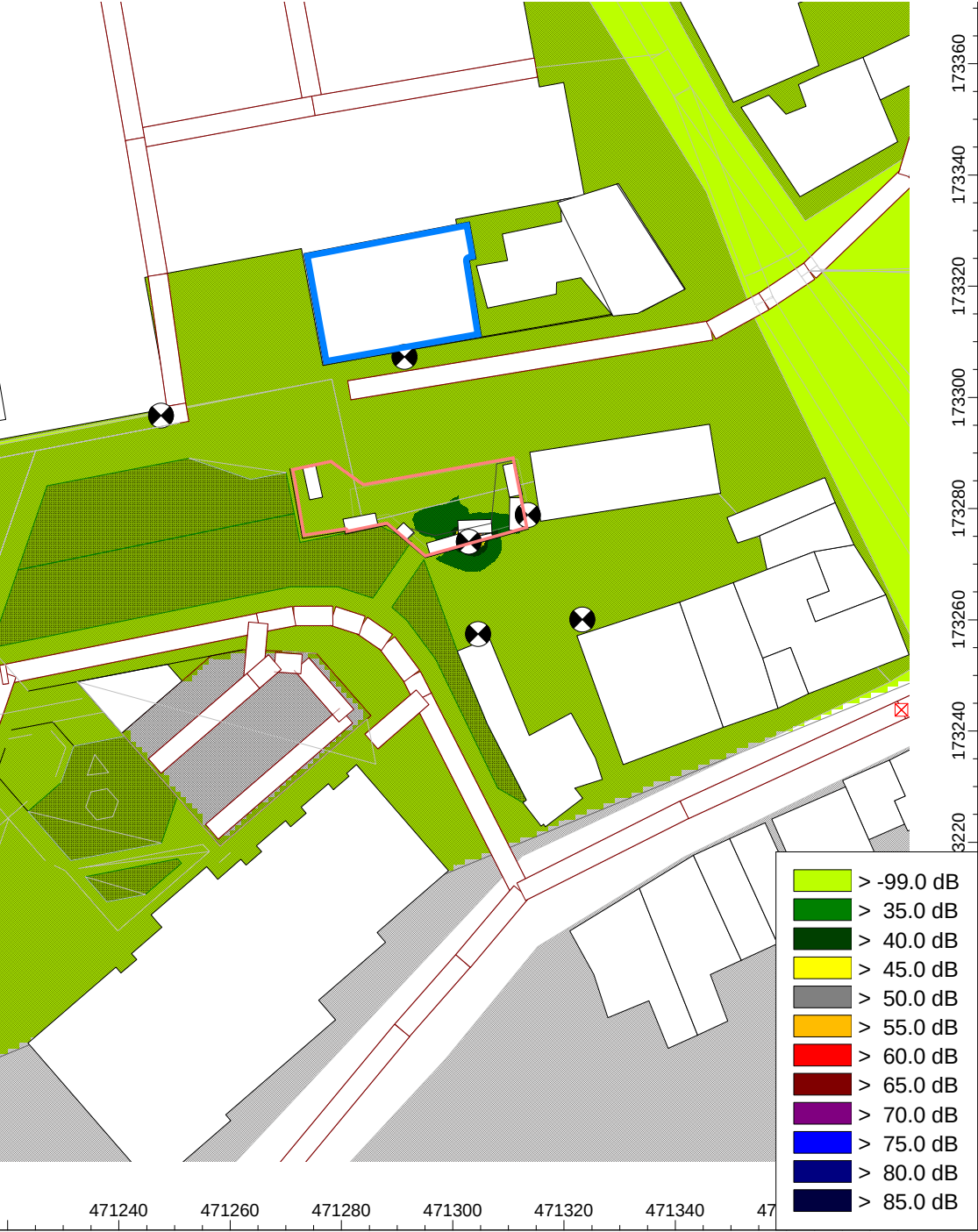
Model 1- Kitchen extraction units and refrigeration unit operating. 1.5m a.g.l.



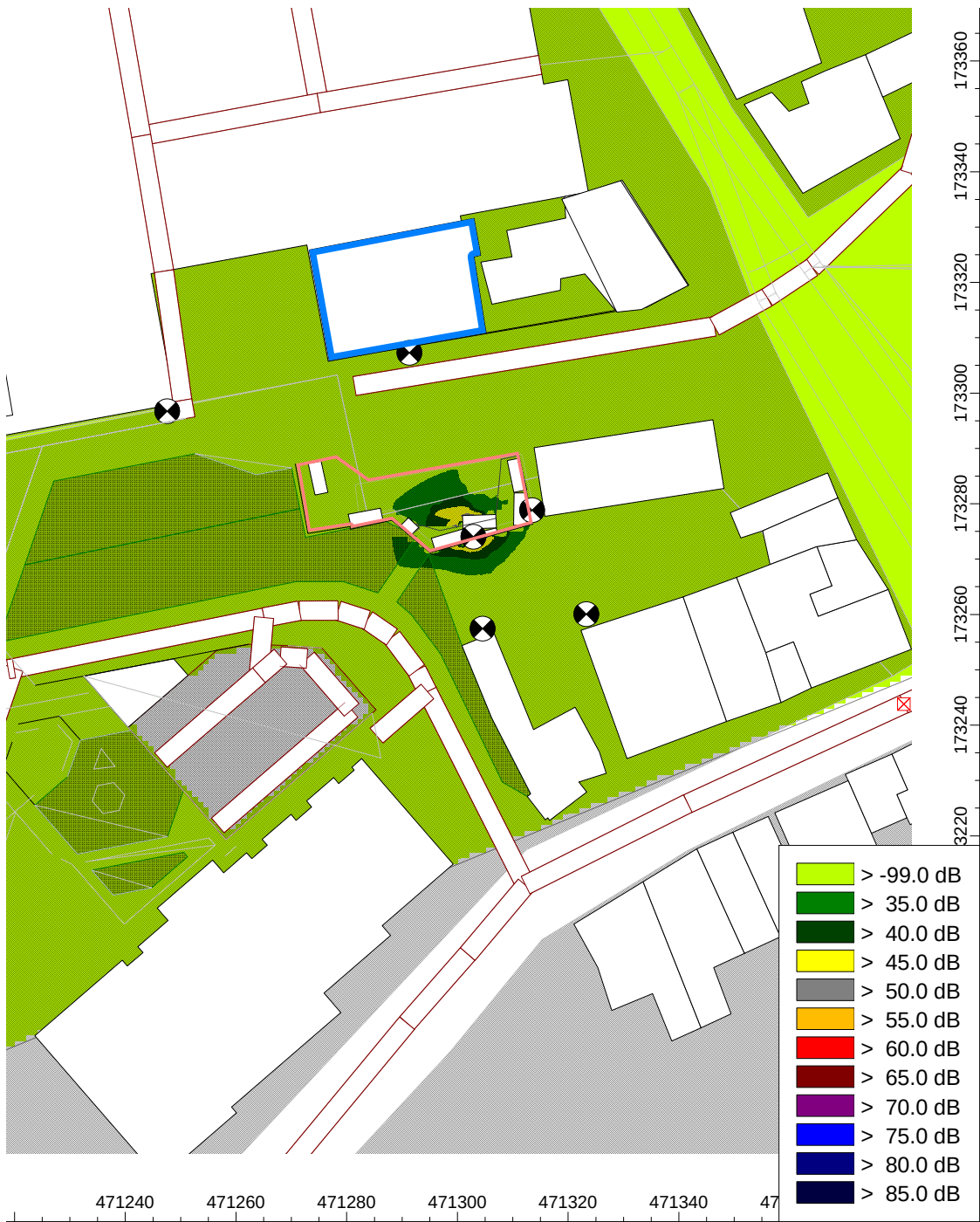
Model 2- Kitchen extraction units and refrigeration unit operating. 4.0m a.g.l.



Model 3- refrigeration unit only operating. 1.5m a.g.l.



Model 4- refrigeration unit only operating. 4.0m a.g.l.



5 BS4142 Assessment

The area background noise levels have previously been established for the area, and those utilised for the noise report accompanying the initial application are shown below.

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

Position	Typical background level LA90,15min, dB	
	Daytime (07:00-23:00)	Night (23:00-07:00)
L1 – St Mary's Butts	60	50
L2 – Queen's Way	55	47

- 5.1 When assessed in line with BS4142 with a worst-case receptor and lowest daytime and Night background noise levels the following results arise

Assessment Project: 07.00 to 23.00hrs	Extract and chiller noise
Source Noise @ receptor	27 dBL _{Aeq}
On Time Correction (Assumed Constant)	0dB
Rating Level Correction (more than 10dB below background so no characteristics audible at receptor)	0dB
Resultant Rating Level (1 hour)	27dB
Background Noise	55
Excess of Rating Over Background	- 28dB
LOW IMPACT	

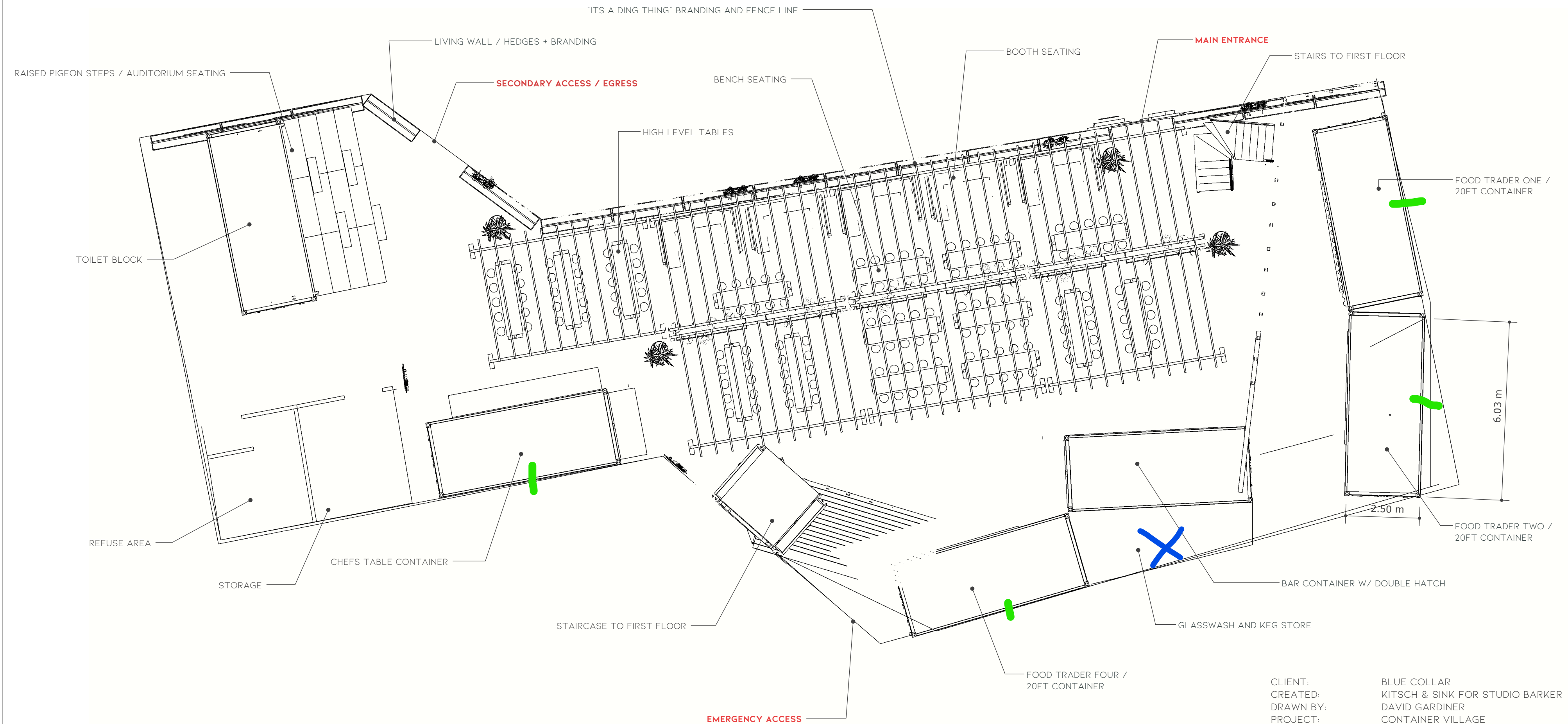
Assessment Project: 23.00 to 00.00hrs	Chiller Noise
Source Noise @ receptor	25 dBL _{Ae}
On Time Correction (Assumed Constant)	0dB
Rating Level Correction (more than 10dB below background so no characteristics audible at receptor)	0dB
Resultant Rating Level (1 hour)	25dB
Background Noise	47
Excess of Rating Over Background	- 22dB
LOW IMPACT	

6 Conclusion and Recommendations

- 6.1 A noise impact assessment has been performed for the proposed plant noise associated to the commercial development of the site to a Street Food Market.
- 6.2 The assessment has found that when compared to the baseline noise data for the area the noise from plant will be significantly below the baseline background noise levels. This applies for the night time period too for the chiller units that will operate 24/7.

- 6.3 Condition 11 of planning permission 210540 actually sets two different levels that must be met by the plant noise, 10dB below the Background noise level and not above the background noise level. In this case the plant noise levels will be significantly below both levels and as such the condition can be fully complied with.

Appendix A – Plans



 Extract Locations on each unit

 Chiller Position

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