



Noise Impact Assessment

Report: 4824-R1 – Proposed Industrial Estate, Northgate, Cleckheaton, BD19 3BN

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1. Introduction

Claver Acoustics Ltd has been appointed by the Fox Architecture on behalf of D & M Middleton to carry out a noise impact assessment at the site of a proposed light industrial development at Northgate, Cleckheaton.

A background noise survey was conducted on Thursday 6th April 2023 to represent the existing background sound levels prior the development of the units.

A noise model prediction has been prepared and assessed against the criteria from BS4142:2014. The purpose of this report is to demonstrate that due consideration for noise affecting neighbouring residential properties has been made and to assess the significance of any noise impact from the installations.

2. Scope

Noise Policy Statement for England

The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is to “promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development”. The aims of the NPSE are to:

- 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.

The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise).

National Planning Policy Framework (NPPF)

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in National Planning Policy Framework. With regard to noise and planning, NPPF contains the following 4 short statements (section 123):

Planning policies and decisions should aim to:

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development.
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions.
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

National Planning Practice Guidance

The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) in March 2014 to support the NPPF and make it more accessible¹. It advises on how planning can manage potential noise impacts in new development. The guidance is regularly reviewed and updated, and noise is listed as a specific category. A summary of the effects of noise exposure (in terms of health and quality of life) associated with both noise generating developments and noise sensitive developments is presented within the PPG and reproduced in table 1.

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 behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	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 behaviour and/or attitude, eg turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported 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 behaviour and/or attitude, eg avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. 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 behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, eg regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, eg auditory and non-auditory	Unacceptable Adverse Effect	Prevent

¹ <http://planningguidance.communities.gov.uk/>

3. Assessment Criteria

BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

British Standard BS4142 provides a method for rating sound from industrial and commercial sources affecting people inside or outside dwellings or premises used for residential purposes. An initial estimate of the significance of the sound from the industrial/commercial nature can be assessed by subtracting the measured background noise level from the rating level (this is the specific sound level of the source with any corrections or penalties for distinctive acoustic characteristics). Typically, the greater the difference, the greater the magnitude of the impact.

- 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 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.

BS8233:2014 - Guidance on Sound Insulation and Noise Reduction for Buildings

Internal Guideline Values

BS8233 gives guidance for internal noise levels within buildings to achieve reasonable or good resting/sleeping conditions within residential properties as follows:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35dB $L_{Aeq,16hour}$	---
Dining	Dining room/area	40dB $L_{Aeq,16hour}$	---
Sleeping	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

BS8233 Guideline Values Table 1

These values are based on World Health Organisation (WHO) publications and assume normal diurnal fluctuations in external noise. They are expected to be achieved based on normal annual data and not in all circumstances.

Garden Criteria

In external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. It is also recognised that these guideline values may not be achievable in all circumstances. In such cases, the lowest practicable levels should be achieved in external amenity areas, but the development should not be prohibited.

Local Authority Requirements – Draft Conditions

9. Before construction work commences a noise assessment report by a suitably competent person shall be submitted to and approved in writing by the Local Planning Authority. The report shall include:

- a) an assessment of all of the noise emissions from the proposed development
- b) details of existing background and predicted future noise levels at the boundary of noise sensitive premises
- c) a written scheme of how the occupants of the above-mentioned noise sensitive premises will be protected from noise from the proposed development including details of all necessary noise attenuation.

The development shall not be brought into use until all works comprised within the measures specified in the approved report have been carried out in full and such works shall be thereafter retained.

Reason: This is a pre-commencement condition as to ensure the proposed development does not cause harmful noise pollution within neighbouring noise sensitive locations, in the interest of amenity, to comply with the aims and objectives of Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy Framework. It is fundamental that the condition be pre-commencement to ensure any potential mitigation measures are incorporated into the construction of the development.

4. Site Description

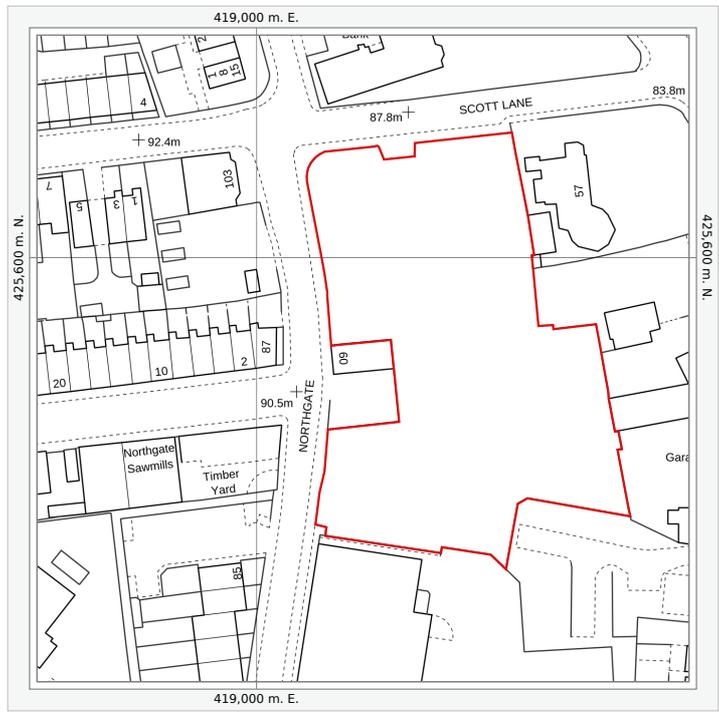
The proposed light industrial development is to be situated on the site of a former dairy and snooker centre, now demolished. The proposal identifies nine light industrial “starter” units on the site. The site is a mixed residential and commercial area adjacent an existing large “Home Bargains” retail unit. It is anticipated that operational hours for typical light industrial starter units will be between 08:00 and 18:00

The nearest sensitive receivers have been identified as the neighbouring residential dwellings on Northgate to the west of site and Scott Lane to the north. Subjectively the background sound climate is moderate with consistent road traffic noise from the surrounding area.

Figure 1 shows the site location and background monitoring locations. Figure 2 shows the site location plan. Figure 3 shows the proposed site footprint.



Figure 1 – Site Location with background locations



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The representation of a road, track or path is no evidence of a right of way.
 The representation of features and lines is no evidence of a property boundary.

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Ground Scale: 1:1250
 Bottom Left: 418952 425507 Top Right: 419094 425649
 Center: 419023 425578
 Area: 141m x 141m

**60, NORTHGATE, CLECKHEATON,
 BD19 3NB**



Figure 2 – OS Site Location Plan

4. Survey Information

Measurement Instrumentation

The measurement instrumentation used on the survey was as follows:

Equipment	Manufacturer & Type	Serial Number	Calibration Certificate
Sound Level Meter	Norsonic 139	1392705	23/1185
Sound Level Meter	Norsonic 139	1392706	22/1652
Acoustic Calibrator	Norsonic 1251	32856	22/1230

The equipment was calibrated to comply with section 4.2 of BS7445:1-2003 before and after the surveys. The calibration was as follows:

Meter	Serial	Before		After	
Norsonic 139	1392705	114.1	-27.3	114.1	-27.4
Norsonic 139	1392706	114.1	-27.1	114.1	-27.1

Measurements & Timescales

During the background survey 15-minute measurements were made during a typical daytime period at a location representative of the nearest sensitive receivers to the proposed development on Thursday 6th April 2023.

The following measurements are reported: $L_{Aeq,T}$, $L_{A90,T}$, $L_{Amax,T}$

The measurements and their interpretation shall be in accordance with BS 7445: Parts 1 and 2. All sound pressure levels are in dB (re 20 μ Pa).

Meteorology

Throughout the measurement period; average wind speed measurements were below 5m/s.

Temperature was noted at 2-16°C during the background survey. No precipitation occurred during the relevant monitoring period.

Position of Monitoring Equipment

The equipment was mounted free field 1.5m from the ground at a location representative of the nearest receiver locations. Figure 1 shows the site location with background monitoring locations.

5. Survey Results

Background Noise Summary

The following tables show the summary of the residual/background sound levels monitored at the background monitoring location. The reported results represent the free field sound pressure levels at the receiver location. The typical average background L_{A90} sound level during operational daytime hours was 51dB $L_{A90,08:00-18:00}$.

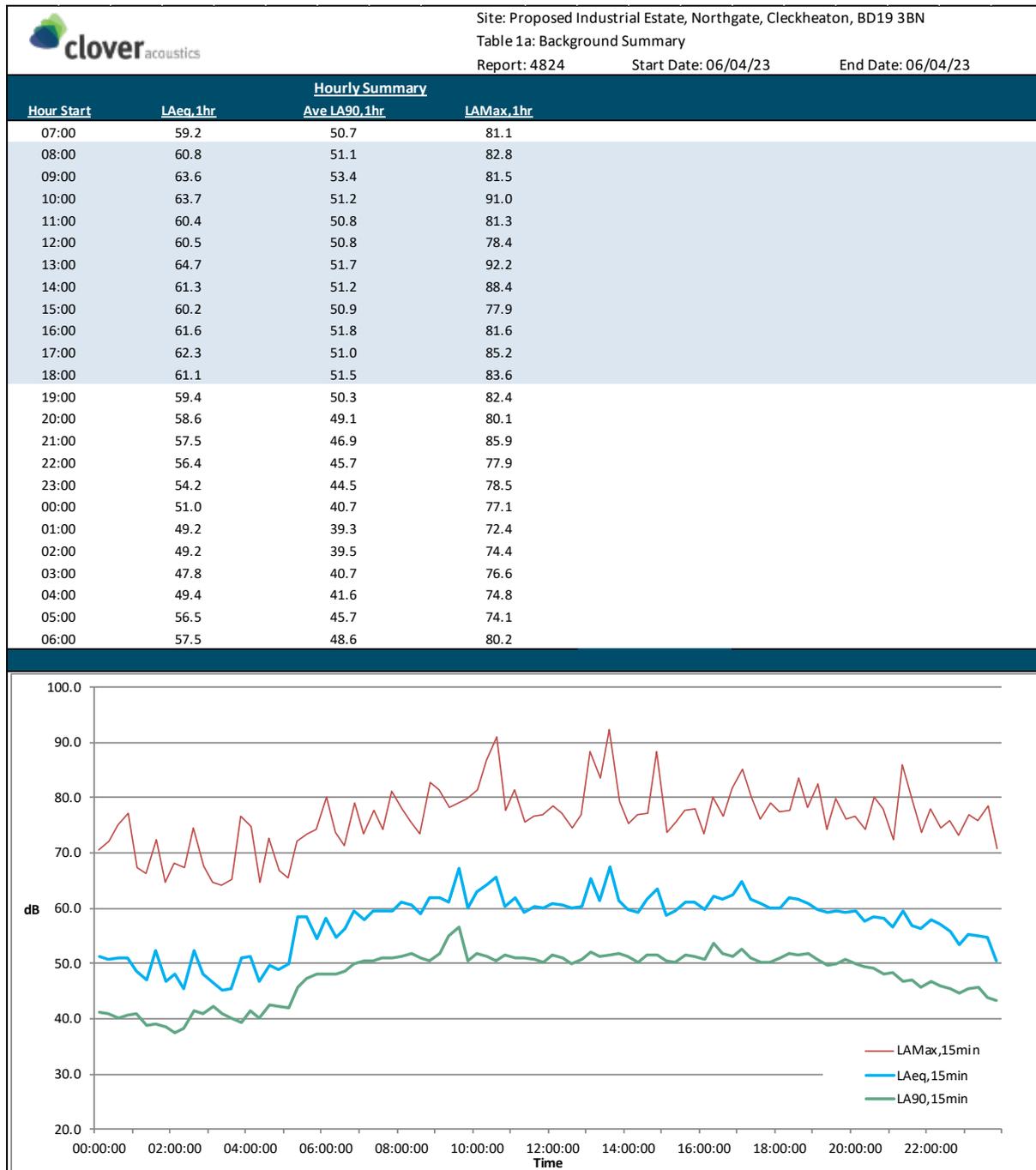


Table 1a – Monitoring Position 1 – Background Noise Monitoring

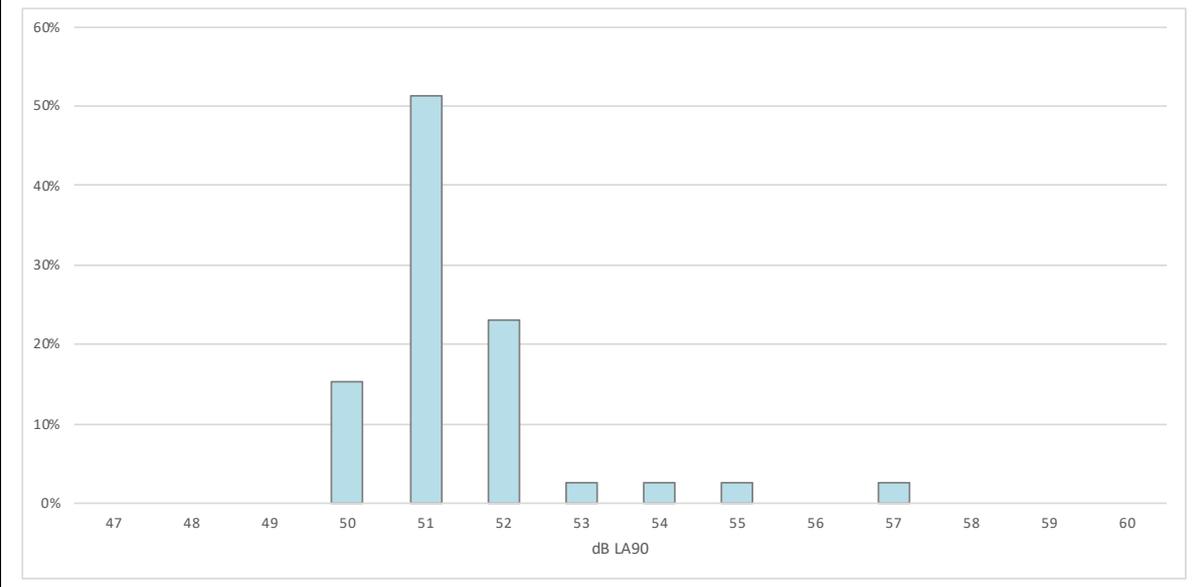


Table 1b – Monitoring Position 1 – Operational Daytime 08:00-18:00 Background LA90 Summary

Hourly Summary			
Hour Start	LAeq,1hr	Ave LA90,1hr	LAMax,1hr
07:00	53.9	50.6	76.6
08:00	56.2	51.0	79.4
09:00	55.3	51.4	71.9
10:00	57.3	50.5	87.7
11:00	57.0	50.8	78.3
12:00	55.8	50.5	82.7
13:00	62.2	50.8	95.4
14:00	56.4	50.1	83.3
15:00	56.3	50.0	89.8
16:00	55.4	49.9	74.5
17:00	56.1	49.9	79.9
18:00	53.7	50.2	76.9
19:00	54.7	49.7	83.1
20:00	54.0	49.2	76.8
21:00	51.0	47.5	74.9
22:00	52.4	46.6	77.0
23:00	51.3	45.8	77.4
00:00	47.3	41.5	73.8
01:00	43.7	40.1	56.4
02:00	44.5	40.3	64.5
03:00	44.3	41.5	57.6
04:00	44.5	41.4	58.5
05:00	49.8	45.0	71.6
06:00	54.0	48.6	82.9

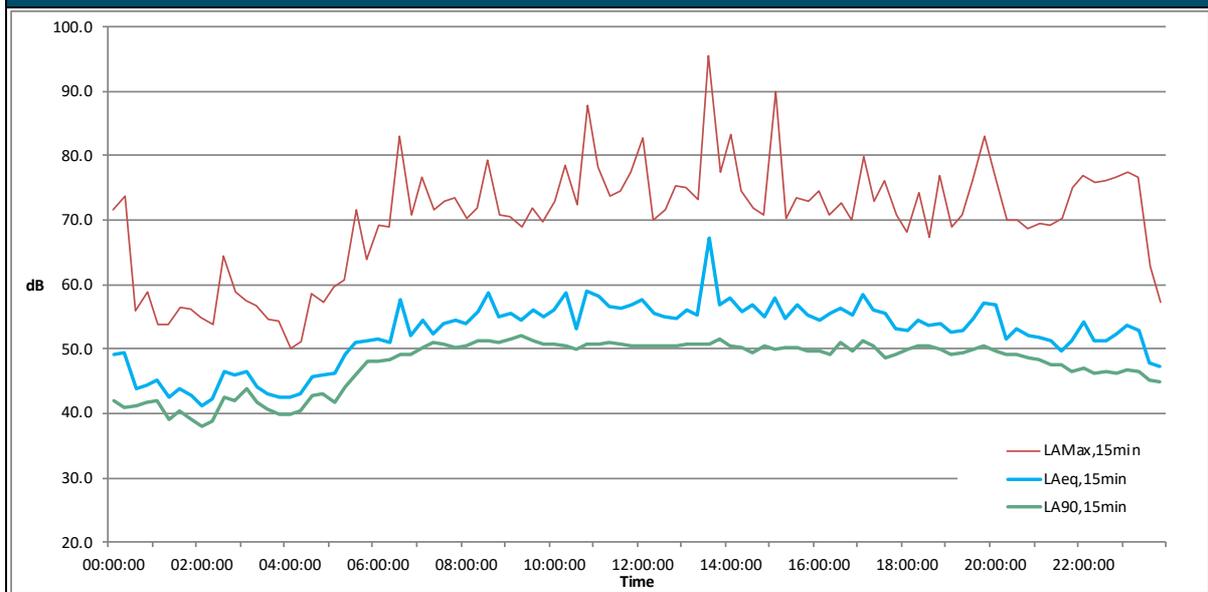


Table 2a - Monitoring Position 2 – Background Noise Monitoring

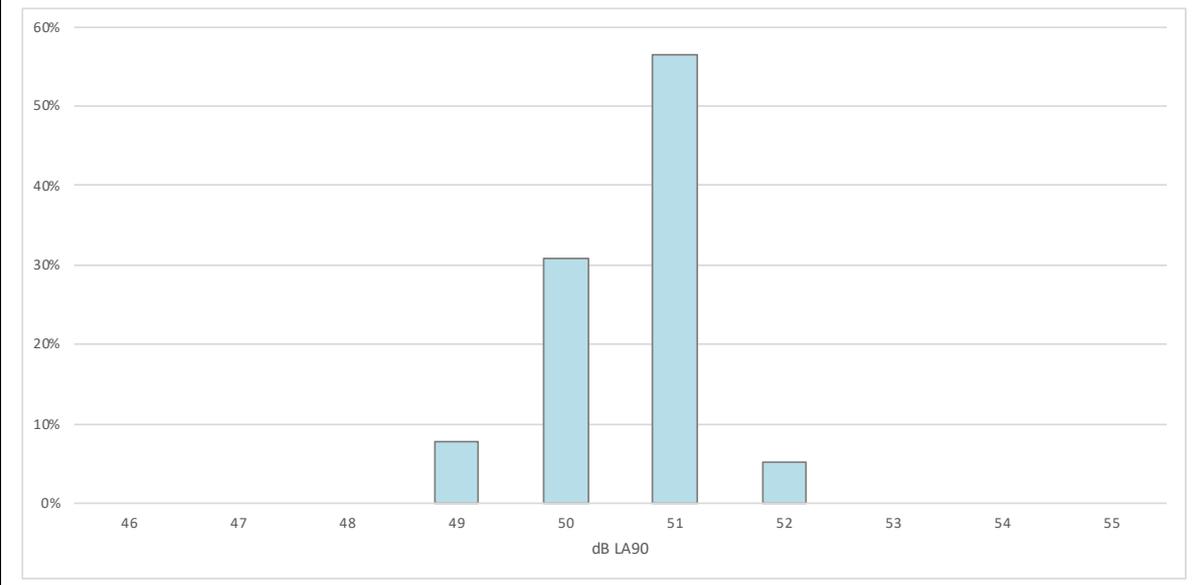


Table 2b – Monitoring Position 2 – Operational Daytime 08:00-18:00 Background LA90 Summary

6. Specific Source Noise Prediction

Noise Model Criteria

A SoundPlan noise model has been produced to establish a suitable limit for noise emissions from the proposed commercial/industrial units. The model undertakes its calculations according to ISO9613-2:1996 "Acoustics - Attenuation of sound during propagation outdoors". To model the area surrounding the proposed facilities, an AutoCAD DXF drawing was imported to SoundPlan, which is based on data provided by the Ordnance Survey. The ground absorption between the facilities and receiver has been modelled as hard ground and building façades modelled as reflective. The noise modelling prediction method is based on ISO9613 where the associated uncertainty is considered +/- 3dB and assumes moderate downwind conditions.

Two scenarios are presented with roller shutter doors *closed* and *open*.

- With roller shutter doors open, the internal noise levels within each proposed unit should be restricted to a reverberant noise level of 68dB(A).
- With roller shutter doors closed, the internal noise levels within each proposed unit should be restricted to a reverberant noise level of 78dB(A).

The main building fabric construction has been modelled on a composite panel arrangement identified as Kingspan QuadCore AWP Wall Panel with a sound reduction performance of 24dB R_w . The roof construction is modelled on a Kingspan QuadCore KS1000RW Roof Panel with a sound reduction performance of 25dB R_w . The elevations identify the rear of Units A,B,C will be a masonry cavity construction which is based on a sound reduction performance of 50dB R_w . Standard roller shutter door performance is typically a sound reduction performance ~22dB R_w .

We would recommend the building fabric construction is upgraded on the identified walls below for Units A, C and D. The Kingspan QuadCore AWP should be augmented with 15mm plasterboard which shows an enhanced performance of 40dB R_w . This identified upgrade has been included within the model.

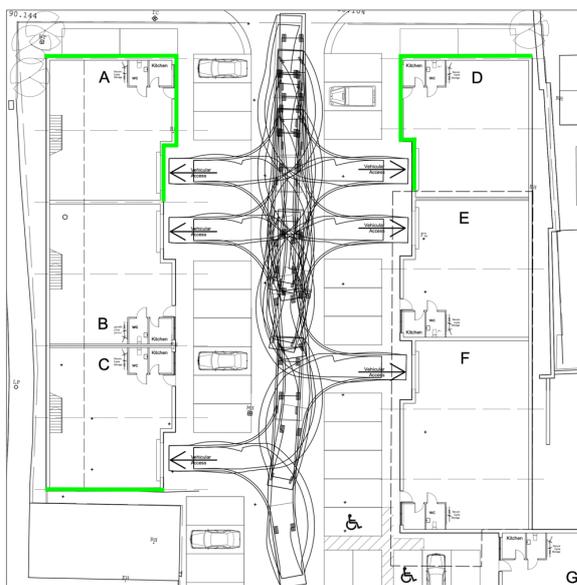


Figure 4 – Recommended Wall Upgrade

BS4142 allows for an on-time correction, the recommended reverberant noise levels are based on an average for the reference 1-hour time period. This should be seen as a worst-case scenario as it is unlikely all units would simultaneously be operating at the noise limit.

The following tables show the predicted receiver levels during the operational daytime period.

Model 1 – Unit Breakout – Predicted Specific Noise Level Summary – Doors Open

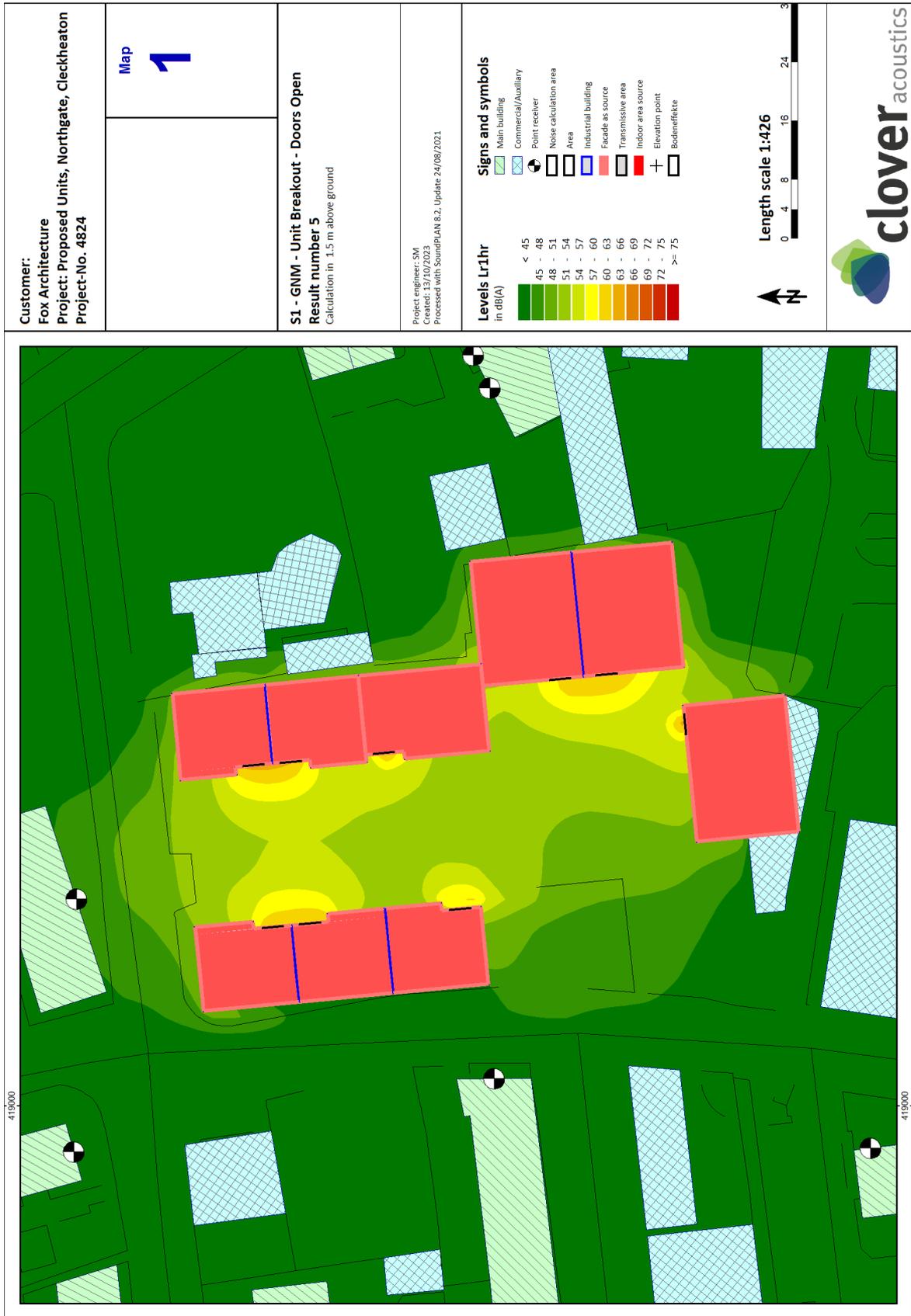
NSR	Description	Usage	Elevation	Floor	dB(A)
1	Elmbank Hostel	Residential	S	F 1	45
2	87, Northgate	Residential	E	F 1	41
3	8-15, Providence Street	Residential	S	F 2	39
4	85, Northgate	Residential	E	F 1	38
5	47-49, Bradford Road Rear Building	Residential	NW	F 1	34

Model 2 – Unit Breakout – Predicted Specific Noise Level Summary – Doors Closed

NSR	Description	Usage	Elevation	Floor	dB(A)
1	Elmbank Hostel	Residential	S	F 1	45
2	87, Northgate	Residential	E	F 1	45
3	47-49, Bradford Road Rear Building	Residential	NW	F 1	44
4	85, Northgate	Residential	E	F 1	40
5	8-15, Providence Street	Residential	S	F 2	39

Specific Noise Level Maps

Figures 5 & 6 shows the SoundPlan model maps with the predicted specific sound level emissions from the proposed operations with roller doors open and closed respectively.



419000

419000

Figure 5 – Grid Noise Map – Predicted Noise Emissions – All Units – Doors Open

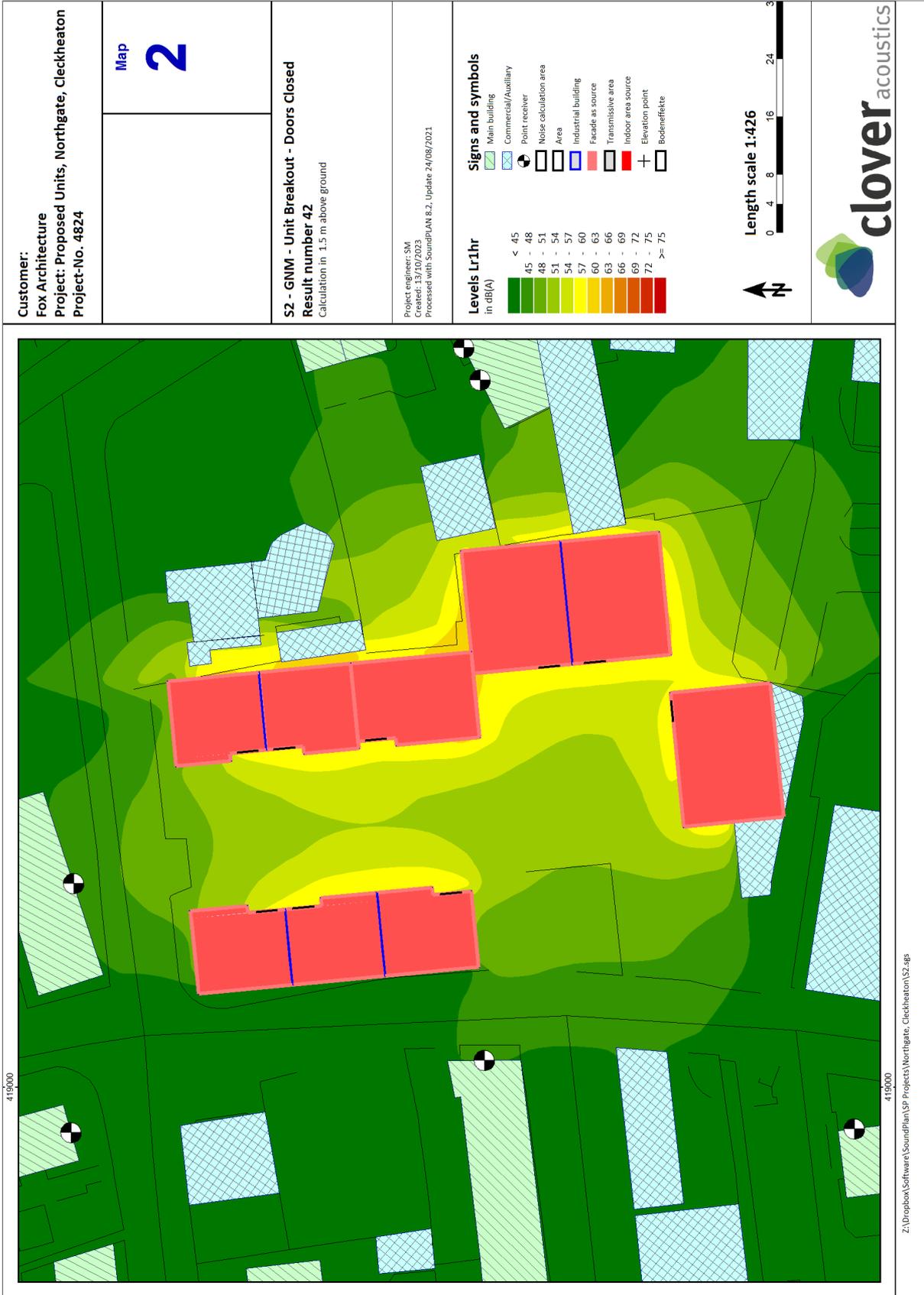


Figure 6 – Grid Noise Map – Predicted Noise Emissions – All Units – Doors Closed

7. Noise Assessment

BS4142:2014 – Methods for rating and assessing industrial and commercial sound

Predicted Specific Source Level Summary

SoundPlan noise prediction models have been calculated at the nearest sensitive receivers. The levels and frequency data for the sources are based on library source data and library data to represent typical usage for the proposed site. The two models predict the noise impact with doors open or doors closed.

- With roller shutter doors open, the internal noise levels within each proposed unit should be restricted to a reverberant noise level of 68dB(A).
- With roller shutter doors closed, the internal noise levels within each proposed unit should be restricted to a reverberant noise level of 78dB(A).

The highest case predicted levels at the receiver are summarised as follows:

Model 1 – Unit Breakout – Predicted Specific Receiver Levels – Doors Open

NSR	Description	Usage	Elevation	Floor	dB(A)
1	Elmbank Hostel	Residential	S	F1	45

Model 2 – Unit Breakout – Predicted Specific Receiver Levels – Doors Closed

NSR	Description	Usage	Elevation	Floor	dB(A)
1	Elmbank Hostel	Residential	S	F1	45

- The typical daytime hours of operation background sound level was 51dB $L_{A90,08:00-18:00}$.

Acoustic Feature Correction

BS4142:2014 allows a character correction to be applied to the specific sound level where acoustic features are present at the assessment location. BS4142 considers that certain acoustic features can increase impact of a new noise source over that expected from a straight comparison between the specific noise level and the background noise level. These features and the penalties applied to calculate a rating level when assessing subjectively as defined by BS4142 are as follows:

Tonality: For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 and +6dB for tonality.

- 2dB for a tone that is just perceptible
- 4dB where it is clearly perceptible
- 6dB where it is highly perceptible

Impulsivity: A correction of up to 9dB can be applied for sound that is highly impulsive, considering both the rapidity of change in sound level and the overall change in sound level.

- 3dB just perceptible impulsivity
- 6dB clearly perceptible impulsivity
- 9db highly perceptible impulsivity

Distinctive: Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive from the residual acoustic environment a 3dB penalty can be applied.

Intermittency: Where the specific sound has identifiable on/off conditions the specific sound level should be representative of the time period of length equal to the reference time period which contain the greatest amount of 'on' time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

Corrections Applied: Typically, some light industrial work processes could be considered impulsive. With the specific source level predicted below background, if impulsive events were to occur, they would likely be just perceptible. In normal operation it may also be evident that operations switch on/off several times within the reference time period and as such would be prudent to include a 3dB penalty for intermittency. Subjectively, the units are considered unlikely to be tonal at the assessment locations. 6dB character correction has been allowed for impulsive and intermittent. If the source was alternatively tonal, the feature correction would allow for this.

Site Context

Subjectively, the background sound level is moderate with road traffic noise from the surrounding area. Historically the area was a dairy and currently has a joiner's unit opposite the proposed site.

BS4142 Assessment

Considering the modelled limits of internal reverberant field levels of 68dB(A) doors open and 78dB(A) doors closed and with the proposed wall panel upgrades as specified, the predicted specific level at the receiver gives a predicted rating level of 45dB(A) during the daytime period. The typical daytime background level is 51dB L_{A90} .

BS4142 Assessment 1	dB (A)
<i>Assessment Period</i>	<i>Daytime</i>
Predicted Specific Sound Level at Receiver	45
Acoustic Feature Corrections	6
Rating Level at Assessment Location	51
Daytime Background Noise Level L_{A90}	51
Rating Equal Background	0

Assessment Context

With the proposed mitigation scheme adopted the predicted levels at the assessment location can achieve a rating level in line with the existing typical background levels.

According to BS4142:2014, "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 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".

The assessment is based on a worst-case scenario with all the proposed starter units in simultaneous continuous operation over the assessment period. This should be seen as a "worst case" assessment. Context should consider the likeliness of all units operating simultaneously, and at the identified noise limit levels.

There is also existing industrial usage on Northgate in close vicinity to the proposed site and the nearest receivers and could be considered in context with the mixed usage of the area.

8. Conclusion

A BS4142 noise assessment has been carried out at the site of a proposed light industrial starter unit estate at Northgate, Cleckheaton, BD19 3NB to consider a suitable noise limit and to assess the impact of the units at the nearest sensitive receivers.

A mitigation strategy has been proposed to maximise unit insulation on identified units, and consideration of noise limits has been made for doors open and doors closed operation. A prediction assessment has been made in accordance with BS4142:2014 +A1:2019 and has shown a rating level at the nearest receivers to be in line with the daytime operational hours background level.

According to BS4142:

- *“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 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”.*
- *“A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context”.*
- *“A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context”.*



Steve Clow MIOA
Acoustic Consultant

9. Appendix

Glossary of Terms

Specific Noise Source

The noise source under investigation for assessing the likelihood of complaints.

Specific Noise Level, $L_{Aeq,T}$

The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.

Rating Level, $L_{A,T}$

The specific noise level plus any adjustment for the characteristic features of the noise.

Background Noise Level, $L_{A90,T}$

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 % of a given time interval, T.

Residual Noise

The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.

Ambient Noise

Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

Reference Time Interval, T

The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.

$L_{Aeq,T}$

The A-weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as the fluctuating sound over a specified measurement period, T.

$L_{A10,T}$

The A-weighted sound level exceeded for 10% of the specified measurement period, T.

L_{Amax}

The highest short duration A-weighted sound level recorded during a noise event.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to approximate to the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies.

Octave Band

A frequency band in which the upper limit of the band is twice the frequency of the lower limit.

One-third-octave Band

A frequency band in which the upper limit of the band is 1/3 times the frequency of the lower limit

Plans & Elevations

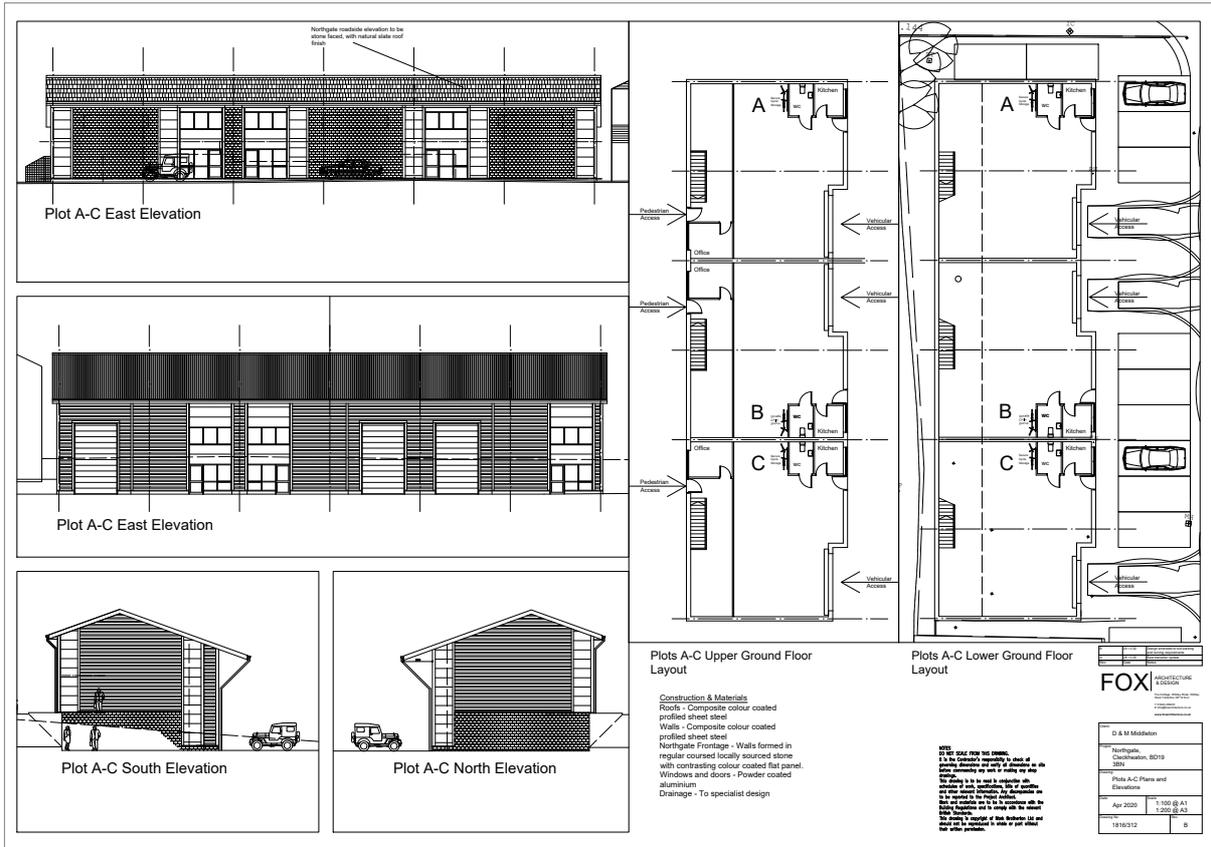


Figure 7 – Floor Layout/Elevation – Units D-F

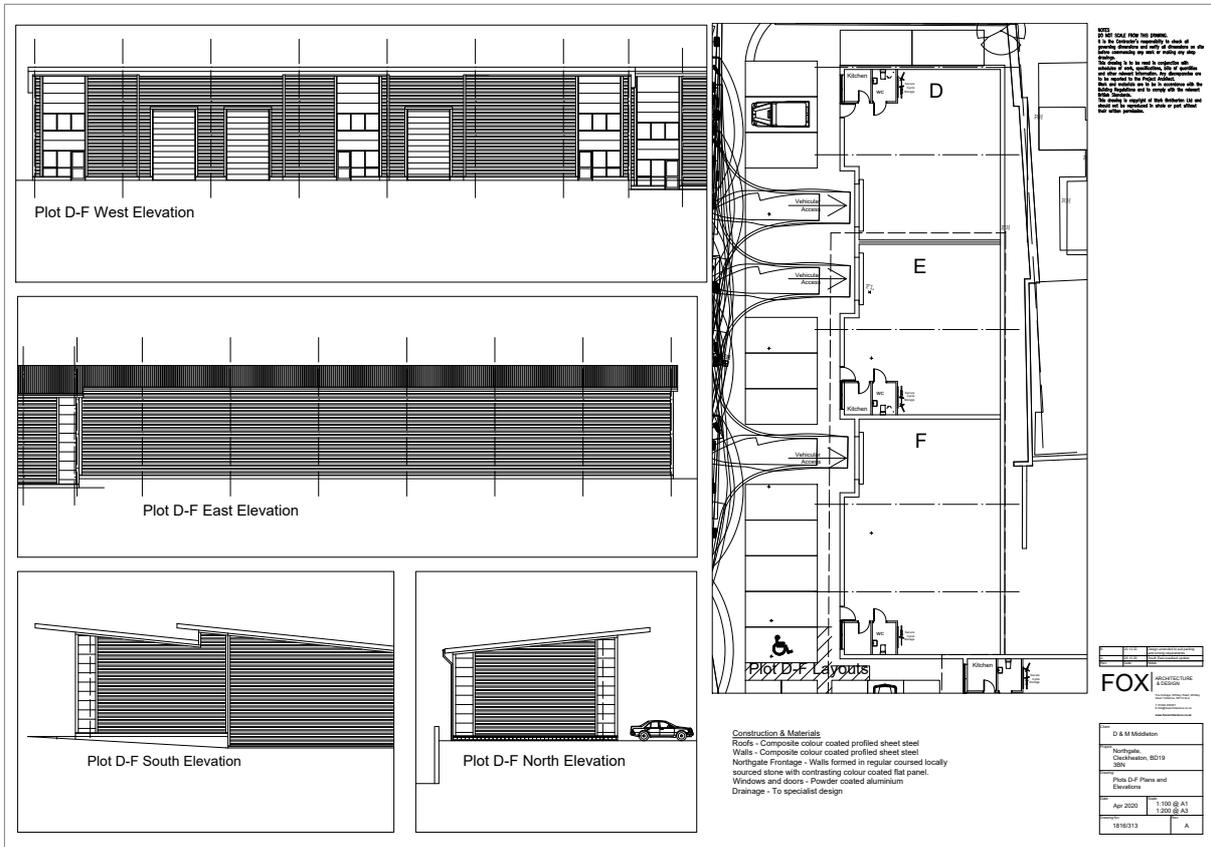


Figure 8 – Floor Layout/Elevation – Units D-F

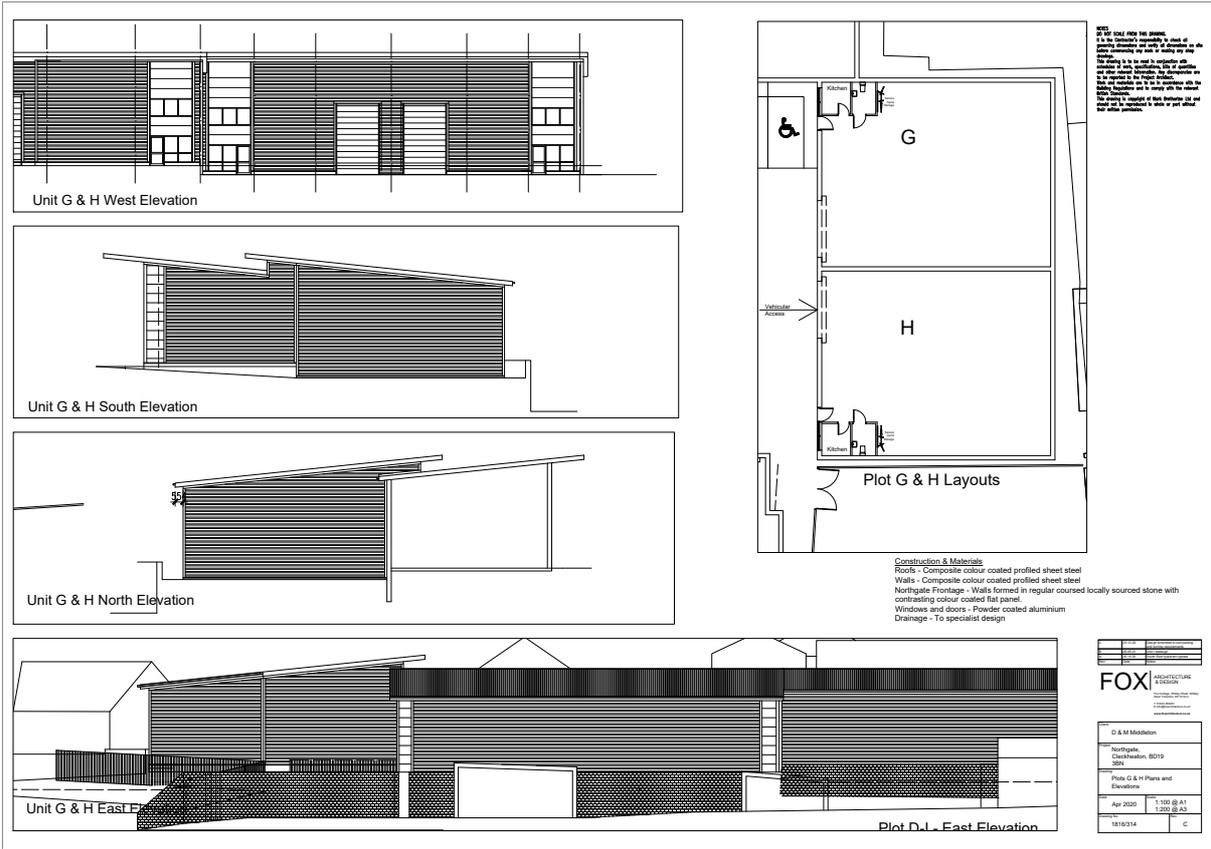


Figure 9 – Floor Layout/Elevation – Units G-H

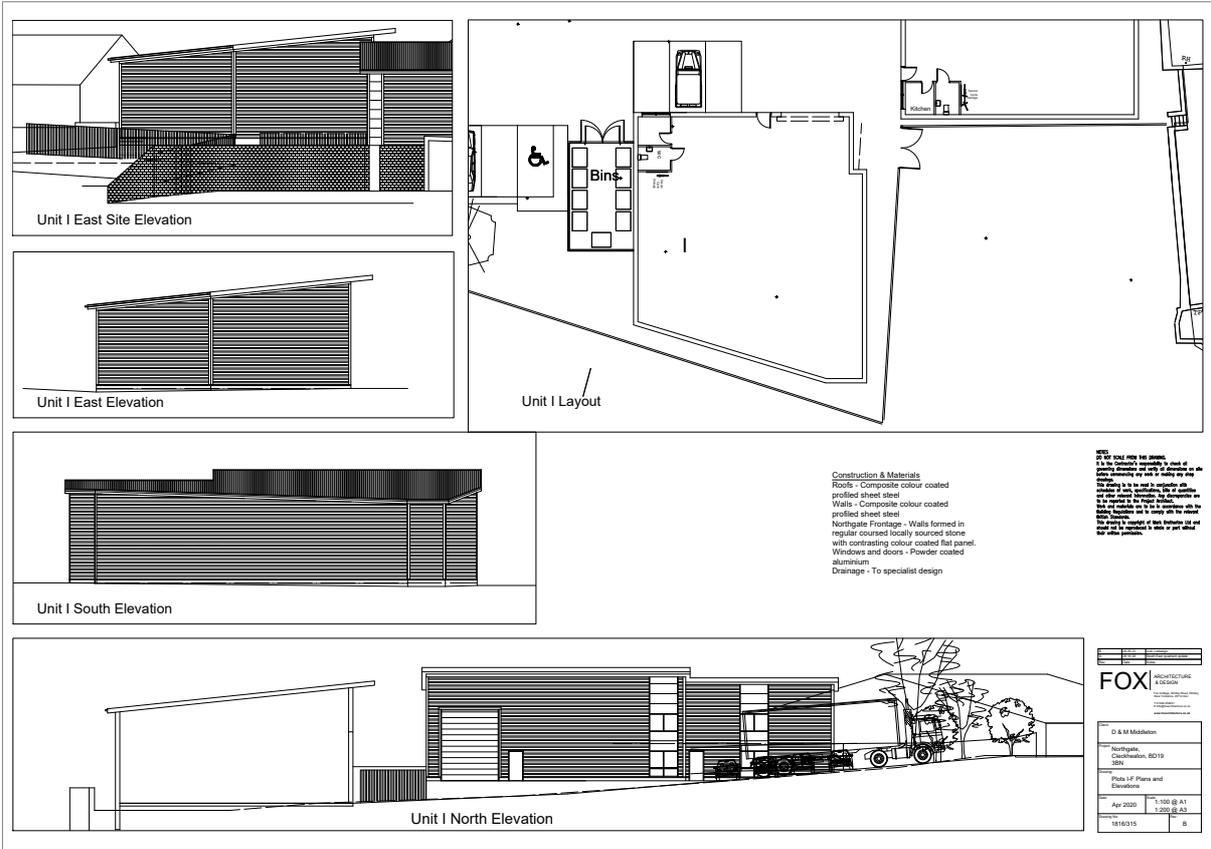


Figure 10 – Floor Layout/Elevation – Units I

Construction Specifications

QuadCore® AWP Wall Panel
Product Data Sheet

Product Data

Certification and Testing

Reaction to Fire

QuadCore® AWP Wall Panel is classified B-s1,d0, when tested on the internal face of the product, according to the European Reaction to Fire classification system (Euroclasses) EN 13501-1:2018 under the certified name AWP Product Family when using the following internal liners:

- CLEANsafe 15, CLEANsafe 25, CLEANsafe 55, CLEANsafe 120 and AQUAsafe 55.

Please contact Kingspan Tech-eXchange for information relating to the external face.

Fire Resistance

Fire resistance classifications are subject to panel thickness, orientation, method of assembly, and steel coating. Please contact Kingspan Tech-eXchange for project specific details.

Insurer Approvals

QuadCore® AWP Wall Panels are tested to:

- LPS 1181 Part 1: Issue 1.2 Requirements and tests for built-up cladding and sandwich panel systems for use as the external envelope of buildings certified to:
 - LPS 1181-1 Grade EXT-B under the certified name Kingspan QuadCore® KS600 – 1200 AWP, MR, FL, FL-S, EB, WV, MM, CX, PL, KS1000 TL for thicknesses 45 – 150mm.
 - LPS 1181-1 Grade EXT-A30 under the certified name Kingspan QuadCore® KS1000 AWP for thicknesses 80 – 150mm.
- FM 4880 approval standard for class 1 fire rating of building panels or interior finish materials for thicknesses 45 – 150mm and panel widths of 900mm and 1000mm.
- FM 4881 approval standard for class 1 exterior wall systems for thicknesses 45 – 150mm and panel widths of 900mm and 1000mm.
- FM 4882 approval standard for class 1 interior wall and ceiling materials or systems for smoke sensitive occupancies for thicknesses 45 – 150mm and panel widths of 900mm and 1000mm.

FM approvals are subject to the following certified names:

- For 1000mm widths: KS1000 AWP, KS1000 MR, KS1000 MM, KS1000 EB, KS1000 TL, KS1000 PL, KS1000 FL, KS1000 FL-S, KS1000 CX, KS1000 WV.
- For 900mm widths: KS900 AWP, KS900MR, KS900MM, KS900 EB, KS900 TL, KS900 PL, KS900 FL, KS900 FL-S, KS900 CX, KS900 WV.

Insurer approvals are large scale testing regimes that provide objective third-party testing, which is underpinned by quarterly, bi-annual and annual factory surveillance audits (depending on the region) to verify compliance. Insurer approvals are subject to panel thickness, cover width, orientation, method of assembly, steel coating and manufacturing facility. Please contact Kingspan Tech-eXchange for further information.



Environmental

Kingspan Insulated Panels produced in the UK are certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Very Good'. QuadCore® Insulated Panel systems have Environmental Product Declarations in accordance with the requirements of EN 15804:2012+A1: 2013 for 100mm thickness.

All Kingspan Insulated Panels manufacturing facilities across the UK and Ireland are 100% Net Zero Energy. In addition, facilities located in Kingscourt, Holywell and Sherburn generate renewable energy onsite which contributes to that sites energy mix.

Kingspan Insulated Panels procure steel that is made from 15 – 25% recycled content. Kingspan insulated panels directly contribute to BREEAM® / LEED® credits.

Air Leakage

An air leakage rate of 3m³/hr/m² at 50Pa or less can be achieved when using Kingspan insulated roof and wall panels.

For information on detailing required to achieve lower air leakage rates please contact Kingspan Tech-eXchange.

Acoustic

Sound Reduction Index (SRI)

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
SRI (dB)	20	15	17	23	18	25	40	46

QuadCore® AWP Wall Panel has a single figure weighted sound reduction $R_w = 24$ dB. Results are based on panels of similar profile and core material.

Figure 11 – QuadCore® AWP Wall Panel

Insulation Core

QuadCore® KS1000RW Roof Panels are manufactured with an HCFC, CFC and HFC free QuadCore® insulation core.



Certification and Testing

Reaction to Fire

QuadCore® KS1000RW Roof Panels are classified B-s1,d0, when tested on the internal face of the product, according to the European Reaction to Fire classification system (Euroclasses) BS EN 13501-1: 2007+A1: 2009 under the certified name KS1000/2000 RW QuadCore® and BS EN 13501-1:2018 under the certified name KS1000RW when using the following internal liners:

- CLEANsafe 15, CLEANsafe 25, CLEANsafe 55, CLEANsafe 120 and AQUAsafe 55.

Please contact Kingspan Tech-eXchange for information relating to the external face.

Roof Applications

QuadCore® KS1000RW Roof Panels are tested to:

- B_{ROOF}(t4) to BS EN 13501-5: 2016 under the certified name KS1000RW for panel thicknesses 40 - 150mm and roof pitch of 0° - 10°.
- B_{ROOF}(t4) to BS EN 13501-5: 2016 under the certified name KS1000RW for panel thicknesses 40 - 150mm and roof pitch of >10°.

Fire Resistance

Fire resistance classifications are subject to panel thickness, orientation, method of assembly, and steel coating. Please contact Kingspan Tech-eXchange for project specific details.

Insurer Approvals

QuadCore® KS1000RW Roof Panels are tested to:

- LPS 1181 Part 1: Issue 1.2 Requirements and tests for built-up cladding and sandwich panel systems for use as the external envelope of buildings certified to:
 - LPS 1181-1 Grade EXT-B under the certified name QuadCore® KS1000RW (Roof Panel) for thicknesses 40 - 150mm.
- FM 4471 approval standard for class 1 roof panels under the certified name KS1000RW for thicknesses 80 - 150mm.
- FM 4880 approval standard for class 1 fire rating of building panels or interior finish materials under the certified name KS1000RW for thicknesses 40 - 150mm.

- FM 4882 approval standard for class 1 interior wall and ceiling materials or systems for smoke sensitive occupancies under the certified name KS1000RW for thicknesses 40 - 150mm.

Insurer approvals are large scale testing regimes that provide objective third-party testing, which is underpinned by quarterly, bi-annual and annual factory surveillance audits (depending on the region) to verify compliance. Insurer approvals are subject to panel thickness, cover width, orientation, method of assembly, steel coating and manufacturing facility. Please contact Kingspan Tech-eXchange for further information.



Environmental

Kingspan Insulated Panels produced in the UK are certified to BES 6001 (Framework Standard for the Responsible Sourcing of Construction Products) 'Very Good'. QuadCore® Insulated Panel systems have Environmental Product Declarations in accordance with the requirements of EN 15804:2012+A1: 2013 for 100mm thickness.

All Kingspan Insulated Panels manufacturing facilities across the UK and Ireland are 100% Net Zero Energy. In addition, facilities located in Kingscourt, Holywell and Sherburn generate renewable energy onsite which contributes to that sites energy mix.

Kingspan Insulated Panels procure steel that is made from 15 - 25% recycled content. Kingspan insulated panels directly contribute to BREEAM® / LEED® credits.

Air Leakage

An air leakage rate of 3m³/hr/m² at 50Pa or less can be achieved when using Kingspan insulated roof and wall panels.

For information on detailing required to achieve lower air leakage rates please contact Kingspan Tech-eXchange.

Acoustic

Sound Reduction Index (SRI)

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
SRI (dB)	20	18	20	24	20	29	39	47

QuadCore® KS1000RW Roof Panels have a single figure weighted sound reduction R_w = 25dB. Results are based on panels of similar profile and core material.

Figure 12 – Kingspan QuadCore KS1000RW Roof Panel

Acoustic Test Results Appendix A - Wall/Facade Panel Construction

Octave Band Sound Reduction Index (R) and Weighted Sound Reduction Index (R_w)

Wall	Panel and Lining	Octave Band Sound Reduction Index R								R _w	C _r	Surface Weight Kg/m ²
		63	125	250	500	1k	2k	4k	8k			
1W	AWP/60 + no lining	15	16	19	23	26	22	39	–	25	-3	18
2W	AWP/60 + F	12	19	32	42	50	52	60	–	43	-10	30
3W	AWP/60 + W15	14	17	31	40	48	46	56	–	41	-10	28
4W	AWP/60 + W15 + F	17	24	37	45	52	54	64	–	47	-9	40
5W	AWP/60 + P + W12	16	22	37	45	51	50	63	–	46	-10	41
6W	AWP/60 + P + W12	18	23	35	44	49	50	61	–	45	-8	41
7W	AWP/60 + I + P + W	18	24	37	48	53	55	63	–	48	-10	4
8W	KS1000 RW/40 + I + L	13	14	29	38	40	45	55	–	38	-9	20
9W	KS1000 RW/40 + I + L	12	16	30	40	44	51	64	–	40	-9	20
10W	AWP/70 + no lining	20	15	17	23	18	25	40	46	24	-4	12.5

Key

AWP = Architectural Wall Panel with various profiles (Optimo, MR, EB, FL, MM, CX, WV, Longspan)

F = 10mm dense particle board (11.7kg/m²)

W15 = 15mm plasterboard (10kg/m²)

W12 = 12.5mm wallboard (7.9kg/m²)

P = 19mm dense plasterboard plank (15.2kg/m²)

I = Insulation (see construction description for details)

L = 0.7mm profiled steel liner sheet

The figures after the forward slash refers to the panel thickness in mm (ie AWP/60 = panel thickness of 60mm)

Figure 13 – Kingspan AWP/60 + W15

Photo Appendix



Figure 14 – View from Northgate to Scott Lane Receiver



Figure 15 – View from Northgate across site to the east