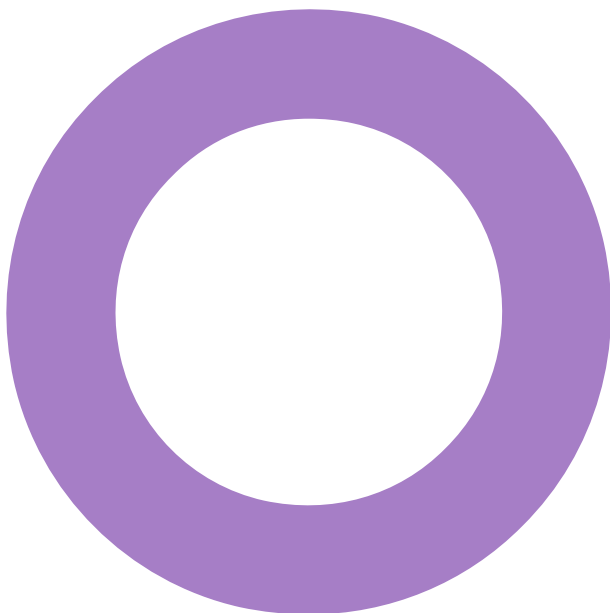


**FP McCann, Brascote Lane,
Cadeby Leicestershire.
Proposed New Fabrication
Workshop.
FP McCann Ltd.**

ACOUSTICS

PROPOSED NEW FABRICATION BUILDING
NOISE IMPACT ASSESSMENT
REVISION 1 – 01 NOVEMBER 2023



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed
0	14/10/2023	Draft Report	AM	
1	01/11/2023	Issued report	AM	AM

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Project number: 10/15105

Document reference: FP McCann Cadeby - New Fabrication Workshop - REP-1015105-AM-20231014-Noise Assessment-Rev1.docx

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1. Introduction.

It is proposed that the existing premises of FP McCann Ltd located off Brascote Lane, Cadeby be extended with a new Fabrication Workshop to provide an additional 900sqm to the existing factory.

The purpose of this report is to determine the likely impact of the proposed new development upon the nearby residential properties located to the south west on the A447 Hinckley Road.

Assessment has been made of typical activity and production noise levels for the existing facility and this report reviews these levels with respect to the existing noise climate at the nearest residential properties.

Recommendations for noise control measures are provided where appropriate.

2. Site Description.

The FP McCann works are located approximately 400 metres east of the village of Cadeby located in the Hinckley and Bosworth district of Leicestershire. It is proposed that a new Fabrication Workshop building be constructed on the south western site boundary as shown in Figure 1 below.

The existing works produce precast concrete structures for the construction industry and comprises a large covered production building and a large yard area used for the storage and handling of materials and concrete products.

Although the existing works can operate on a 24-hours basis, normal operational times are as follows:

Monday to Friday: 2am to 7pm (machinery starting at 4am)

Saturday: 2am to 12:30pm (machinery starting at 4am)

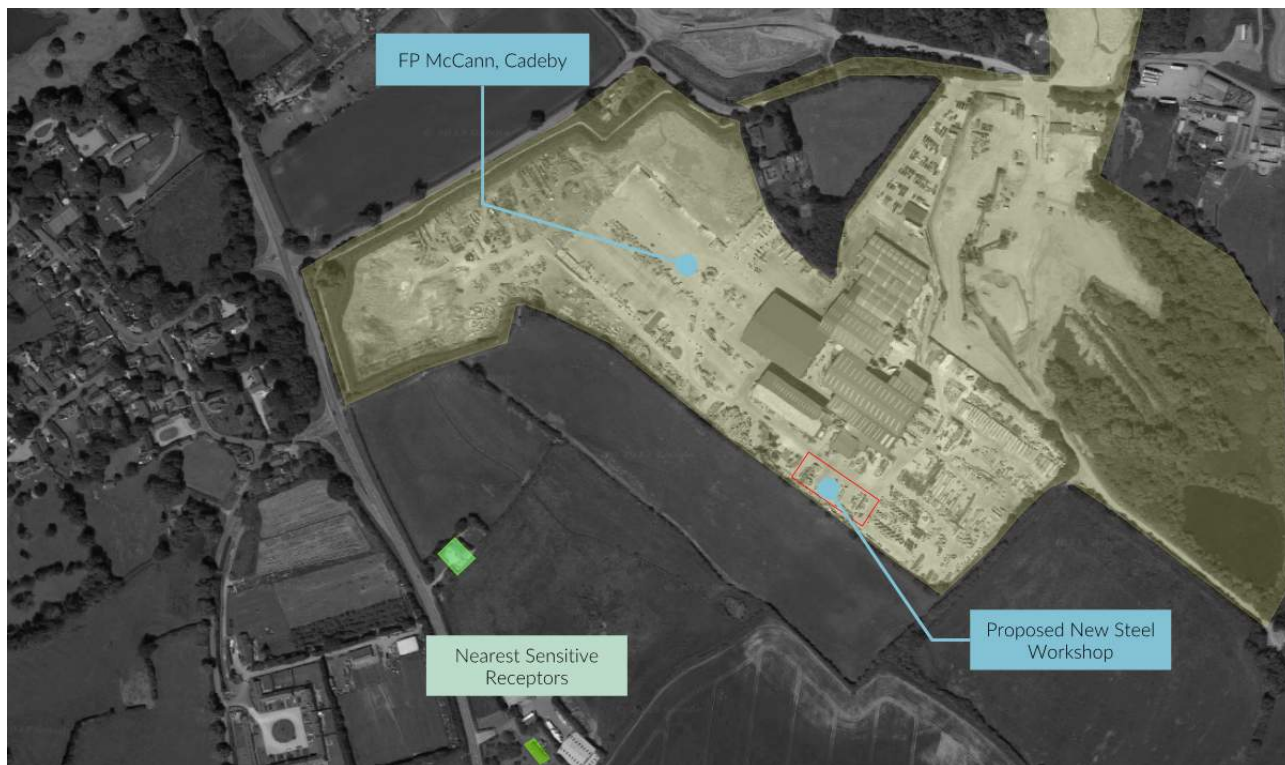
The western works site is bounded to the west by the A447 Ashby Road/Hinckley Road which provides a local traffic route through Cadeby between Ibstock to the north and Hinckley to the south. Traffic flows on the A447 are generally intermittent, fast and free flowing throughout the day and evening.

The majority of the FP McCann works are set back between 200 and 415 metres from the road behind open farm land and farm buildings which are accessed from Ashby Road.

The current site location and the location of the extended plot of land for proposed redevelopment are shown below with an indication of the location of the nearest dwelling to the new Steel Workshop. Other dwellings in the vicinity of the site including Freshfields to the north west and XXX to the north are at significantly greater distance and as such, the impact on these dwellings will be lower. It should be noted that 'Rock Cottage', accessed via Brascote Lane has been acquired by FP McCann as part of the development and, therefore, noise at this location has also not been assessed.

Other dwellings are located at greater distance from the site and at a position significantly closer to Ashby Road where traffic noise provides significantly higher levels of background noise level.

An aerial view of the site indicating the location of the proposed new Fabrication Workshop and the nearest sensitive residential dwellings is provided below.



3. Development Proposals.

It is proposed that a new Fabrication Workshop building be constructed to provide an additional 900sqm of factory space which will primarily house a Link Bending Machine and overhead crane with associated storage area.

The position of the proposed Fabrication Workshop is indicated in Appendix 1 attached to this report. There are two large openings – one on each of the building (north west and south east) which can be closed via a roller-shutter door.

Each door is 5.0 metres wide by 6.0 metres high.

The proposed site layout is shown in Appendix 1.

4. Basis of Assessment.

4.1 National Planning Policy Framework.

The National Planning Policy Framework (NPPF): September 2023 sets out the Government's planning policies for England and how these are expected to be applied. The document seeks to encourage sustainable development subject to all relevant factors.

Section 15: 'Conserving and enhancing the natural environment', paragraph 170, states the following:

'Planning policies and decisions should contribute to and enhance the natural and local environment by:

- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability'.*

Furthermore, paragraph 180 states *'Planning policies and decisions should also 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:*

- mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'*

Paragraph 183, additionally, states *'The focus of planning policies and decisions should be on whether a proposed development is an acceptable use of land, rather than control of processes or emissions (where these are subject to separate pollution control regimes)'.*

NPPF also makes reference to the DEFRA Noise Policy Statement for England (NPSfE) 2010. This latter document is intended to apply to all forms of noise other than that which occurs in the workplace. It includes environmental noise and neighbourhood noise in all forms.

NPSfE advises that the impact of noise should be assessed on the basis of adverse and significant adverse effect but does not provide any specific guidance on assessment methods or limit sound levels. Moreover, the document advises that it is not possible to have *'a single objective noise-based measure...that is applicable to all sources of noise in all situations'.* It further advises that the sound level at which an adverse effect occurs is *'likely to be different for different noise sources, for different receptors and at different times'.*

In the absence of specific guidance for assessment of environmental noise within NPPF and NPSfE, it is considered appropriate to base this assessment on current British Standards and appropriate local or national guidance.

It is noted that NPSfE also advises that the general principle that increases in ambient noise should be 'minimised', needs to be considered in context for each site and, in this regard, states:

'Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as is reasonably practical... the application of the NPSfE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular...development or other activity may not have been given adequate weight when assessing the noise implications'.

4.2 BS8233: 2014.

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' is the current British Standard providing guidance for acoustic requirements within buildings. The Standard advises appropriate criteria and limits for different building types including dwellings.

BS 8233 provides guidance regarding acceptable internal and external noise level criteria for dwellings but does not form any statutory requirement to achieve the guidance values provided therein.

The BS 8233 internal design criteria for dwellings are as follows:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room / Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS 8233 Section 7.2.2 Note 7 advises that where development is desirable or necessary, then 'reasonable' living conditions can be achieved with sound levels up to 5dB higher than those given in the table above.

BS 8233 Section G1 advises that, where windows are open for ventilation, then sound reduction is limited to 15dB. The Standard does, however acknowledge that additional sound reduction will result from room effect. Available site test data for a furnished room indicates that the typical sound reduction from outside to inside is approximately 20dB for mid frequencies when windows are open 100mm.

For gardens and terraces, the Standard states that it is desirable that the steady noise level does not exceed $L_{Aeq,T}$ 50dB whilst a level of $L_{Aeq,T}$ 55dB would be acceptable in noisier environments.

4.3 BS 4142:2014.

BS4142:2014 'Methods for rating and assessing industrial and commercial sound' is the current British Standard providing guidance for assessment of noise impact from industrial and commercial sites. In general, the likelihood of adverse impact for a particular noise is dependent upon factors including the margin by which it exceeds the background noise level, the character of the noise and its occurrence. The Standard recommends the determination of the Rating Level of the specific source and advises a correction factor of between +3dB and +9dB if the sound has a tonal quality, is intermittent or impulsive or has any other distinct characteristics which would make it more noticeable.

The degree of impact is assessed by comparing the measured background level with the Rating Level. Where the Rating Level exceeds the background, the level of impact increases as shown below:

Comparison with background	Assessment
+0 dB or below measured background	Low impact
+ 5 dB	Adverse impact
+ 10 dB or more above measured background	Significant adverse impact

It should be noted that the assessment method applies to free-field external sound levels.

5. Measurements and Results.

5.1 Archive Background Survey Data.

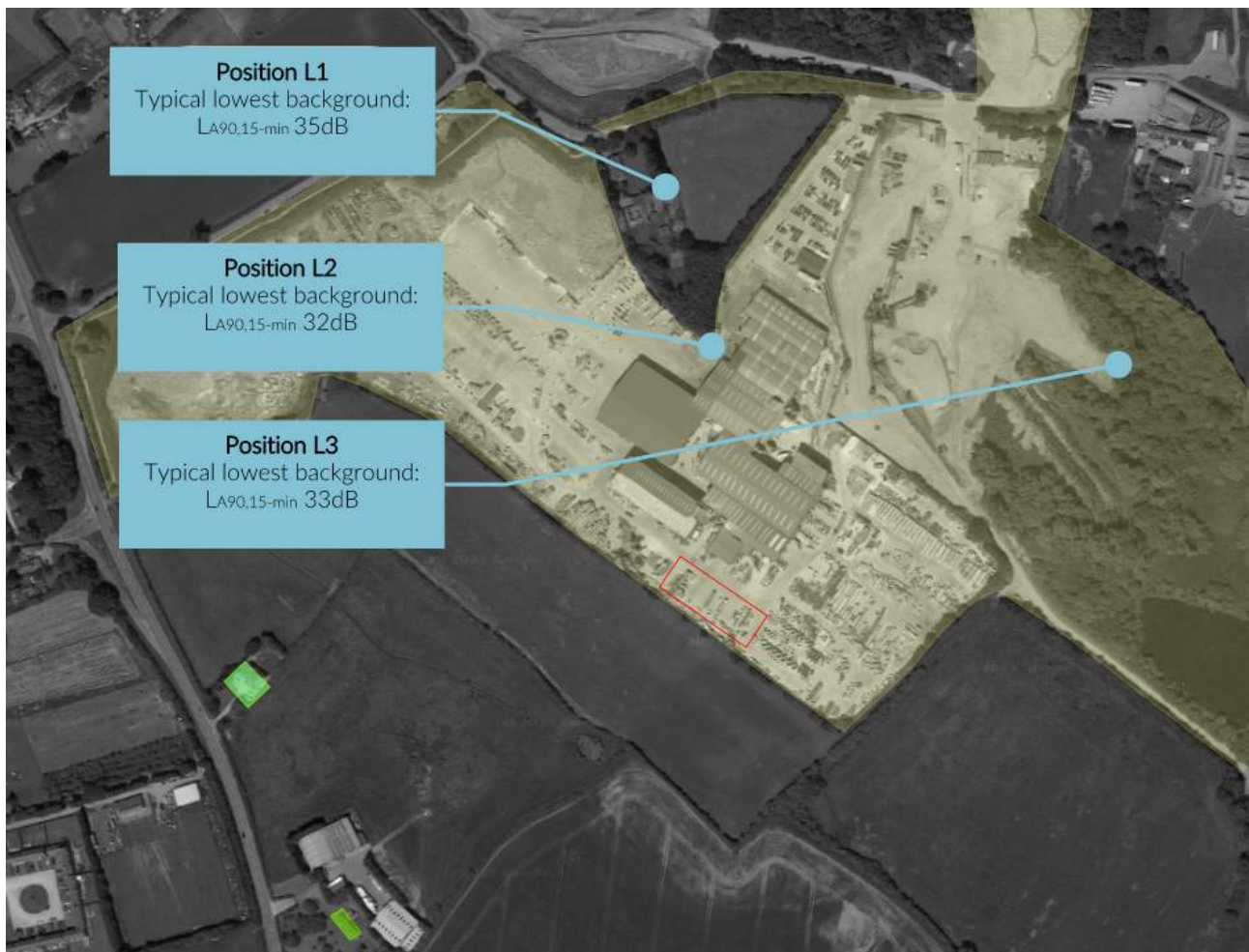
Monitoring at the site has been previously undertaken at three locations across the site to determine the diurnal noise climate.

- Position L1: 27th July 2017 to 1st August 2017 – HLA Report ref 'REP-1011371-05-AM-20190514-Noise Assessment-Rev 1' dated 24th May 2019.
- Position L2: 9th to the 16th October 2020 – HLA Report ref 'REP-1012554-05-AM-20121101-Noise Impact Assessment-Rev 2', dated 20th November 2020.
- Position L3: 9th to the 17th December 2021 - HLA Report ref 'REP-1013818-AM-20220104-Noise Assessment-Rev 2' dated 28th April 2022.

In each instance, levels were recorded continuously in 15-minute samples to determine the equivalent continuous sound level, L_{Aeq} , the short duration level L_{Amax} and also the percentiles L_{A10} and L_{A90} .

It is considered that noise levels at the nearest dwellings to the south west will be marginally higher as a result of increased traffic noise at these locations from Ashby Road the measurement data obtained is representative of the overall noise climate that currently occurs at the nearest residential gardens to the factory extension.

The historic measurement positions along with a summary of the typical lowest measured background noise level in each instance are indicated on the marked-up aerial view below:



All measurements were made with calibrated, precision grade sound level meters in accordance with BS EN 60651 and BS 7445:1993. Details of the equipment used are provided in Appendix 3 – List of Measurement Equipment. All equipment was calibration-checked before and after the survey with no significant drift observed.

Weather conditions over each of the survey periods were dry with no reported period of rain. Wind speeds over the course of each of the surveys were sufficiently low for environmental noise monitoring.

5.2 Pluristar-2BK archive measurements.

The Acad International report dated 7th May 2005 details the results of sound measurements of a Pluristar-2BK unit located at the NCC plant site in Hallstahammar, Sweden within a production hall of approximately 35,000m³. All measurements were recorded within the direct sound field of the noise source in a position representative of the machine operator, at a position 2 metres in front of the bending table as summarised below:

Position	Magazine	Operator Panel
5mm diameter bars	L _{Aeq} 82dB	L _{Aeq} 79dB
8mm diameter bars	L _{Aeq} 88dB	L _{Aeq} 86dB
10mm diameter bars	L _{Aeq} 90dB	L _{Aeq} 90dB

The highest measured noise level was L_{Aeq} 90dB during the production of 10mm iron bars at the magazine position. Given the relatively small building volume and the close proximity of the machinery to the external wall, these are considered to be representative of the highest levels of internal noise for use within the assessment.

Where thinner bars are used, lower levels of noise are shown to be generated and so the highest level noted above is expected to represent a worst-case scenario.

Details of these measured noise levels are attached in Appendix 2 to this report.

6. Calculations.

6.1 Noise Break-out from the New Fabrication Workshop.

Noise break out from the Fabrication Workshop can be calculated using an accepted method as follows:

$$spl_{ext} = spl_{int} - TL - 20logr + 10logs - 14dB$$

...where r is the distance and s is wall area

Noise is expected to break out of each of the facades, the roof and the doors (when open). However, due to the size and position of each of the elements, it is expected that noise break-out from these facades will be reasonably directional and, therefore, those facades which do not directly overlook the adjacent dwellings, such as the openings and roller shutter door on the north west and south east elevations will impact significantly less.

It is understood that the main building fabric will be constructed from steel frame with an outer cladding. As a worst case, it is assumed that this is composite thermal panels with a minimum manufacturer's rated sound reduction of R_w 27/mean 25dB(A).

The resultant noise break-out level at the nearest sensitive dwelling is therefore as follows:

	Dwellings on Ashby Road
spl_{int}	90dB(A)
-TL	-25
-20logr	-49.2 (290m)
+10logs	+26.5 (445m ²)
-14	-14
$spl_{ext} dBA$	28dB

The total noise level at the nearest existing dwellings from the new Fabrication Workshop building with all doors closed at highest levels of internal activity is L_{Aeq} 28dB. The lowest typical background measured across the site is L_{A90} 32dB with ambient noise levels typically significantly higher. Break-out noise levels from the new Fabrication Workshop will therefore be significantly below the ambient noise level at the nearest sensitive dwelling and therefore, low levels of character correction are deemed appropriate. With a character correction of +3 impulsivity, this suggests a highest rating level of 31dB.

	Dwellings on Ashby Road
New Building Noise Level at receiver	28dB
Character Correction: +3 impulsivity	+3
Rating Level	31
Typical lowest L_{A90} , 1-hour	32
Difference	-1
BS4142 Assessment	'Low Impact'

The typical lowest background noise level as measured in the late night / early morning was $L_{A90,15-min}$ 32dB. In accordance with BS4142, this indicates a 'low' level of impact from noise break-out from the new production building, with lower levels throughout the remainder of the day when background noise levels are significantly higher.

In addition to the above, the following factors have not been included in the assessment but will add further attenuation to the noise break-out from the new Fabrication Workshop building:

- Internal Noise Levels: When using bars thinner than 10mm in diameter, internal noise levels will be 2-11dB lower. The assessment also assumes that the machine is operational at all times, whereas, it is understood that a 25-30% standby time can be expected to account for times when the machine will need reprogramming. A nominal on-time of 75% in any one hour will reduce noise levels by an additional 1dB.
- Façade construction: It has been assumed that the main building fabric will be constructed from steel frame with a basic outer cladding of thermal composite panel or single sheet steel. In practice, a higher performance can be expected leading to lower levels of noise break-out.

Inclusion of the factors above will further reduce the level of noise break-out from the Fabrication Workshop which will lead to a corresponding reduction in noise impact when assessed in accordance with BS4142. However, these factors have not been relied upon to enable a level of 'low impact' at the nearest residential dwellings.

Furthermore, it is considered that noise break-out from the new Fabrication Workshop will be similar to or lower than that of the existing production buildings and will, therefore, not constitute a new noise source to the site.

On the basis of the above, no further mitigation measures are deemed necessary for the design and layout of the proposed new Fabrication Workshop building used for housing the new Link Bending Machine.

7. Discussion.

7.1 Existing Noise Climate.

The general ambient noise climate across the site is attributable to traffic flows on the roads in the local vicinity including Ashby Road to the south west. The majority of noise from the roads is attributable to tyre 'roar' which has a characteristic mid-frequency tonal peak. There was audible noise from existing activities associated with the FP McCann site and it is deemed likely that noise from all of these activities would have been accounted for in the baseline noise survey.

7.2 BS 4142 Assessment.

The calculations shown in Section 7 above indicate that a standard building construction using lightweight thermal panels would achieve a BS 4142 condition of 'low impact' at the nearest dwellings at all times of the day and the night. This is applicable to the nearest dwelling on Ashby Road.

In the specific case of noise breakout from the Fabrication Workshop, it is probable that operational noise levels will normally be lower than those assumed in the assessment, which would result in a further reduction in impact upon the dwellings. During the day when background noise levels are significantly higher, the overall impact of the new Fabrication Workshop will be naturally lower as a result.

In all instances, it is noted that the calculated noise breakout sound levels from all activities occurring on site are all particularly low and all are significantly below the early morning (4am to 5am) ambient noise levels. Therefore, noise levels are not expected to be particularly noticeable and will, normally, be masked by traffic noise at all times.

Any noise break-out from the new Fabrication Workshop will be similar to or lower than that of the existing production buildings and will, therefore, not constitute a new noise source to the site.

7.3 BS8233 Assessment.

British Standard BS 8233:2014 provides guidance on acceptable sound levels in and around dwellings and advises a night time internal noise level of L_{Aeq} 30dB. It must be assumed that windows may be open for ventilation and BS 8233 advises that an open window provides a sound reduction of 15dB. Other available measurement data together with Napier University report NAN R116:2013 indicates that mid-frequencies (500Hz-2kHz) will be reduced by a further 5dB for room effect. From this information, the allowable external level to achieve the BS 8233 internal requirement would be L_{Aeq} 50dB.

The highest calculated immission level for break-out from the Fabrication Workshop is L_{Aeq} 28dB at the nearest dwelling. The calculated levels would readily achieve the BS 8233 internal criteria with open windows.

In the case of gardens during daytime, BS 8233 advises a preferred limit level of L_{Aeq} 50dB. All of the calculated noise levels for the development are below this level by a significant margin.

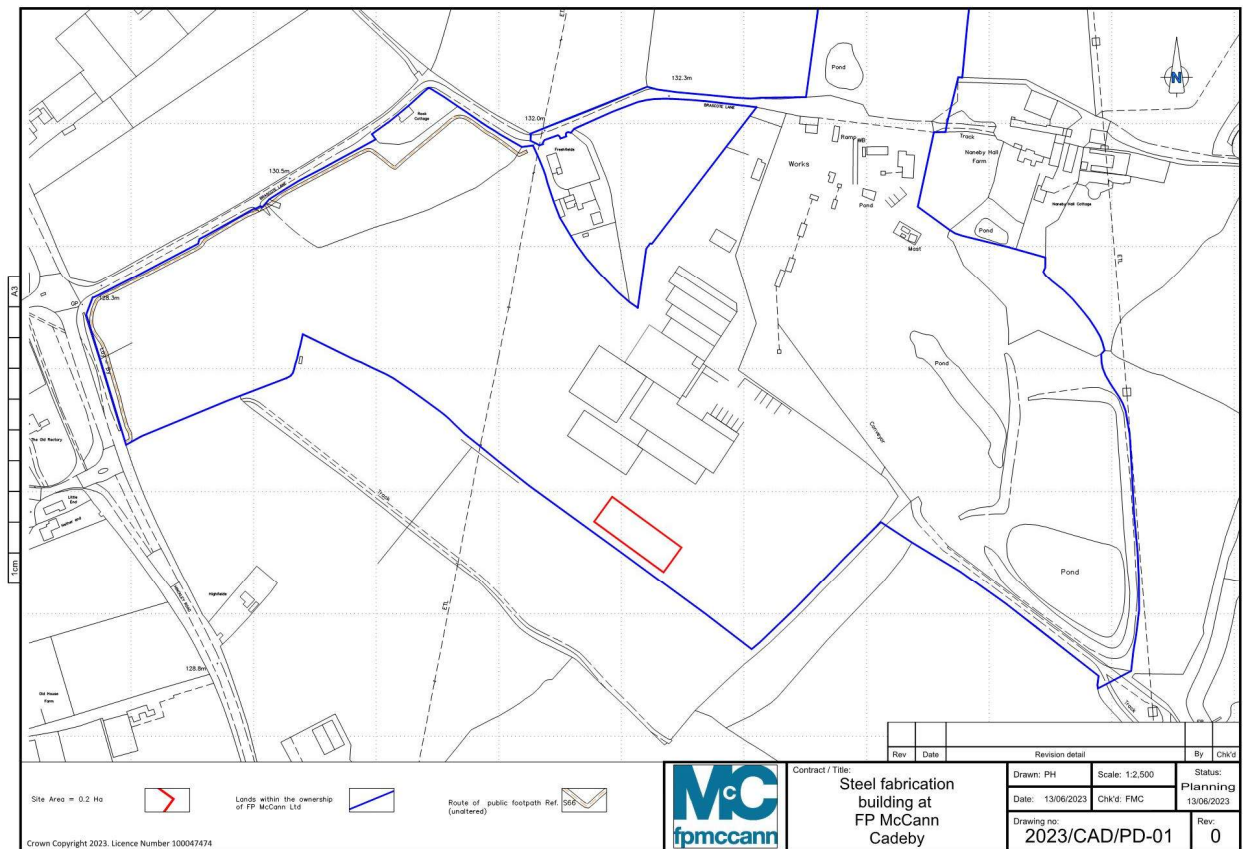
8. Conclusions.

Assessment carried out for this report indicates that the noise climate in the vicinity of the proposed Fabrication Workshop is attributable to road traffic noise in the local area. It is considered that this noise will determine background sound levels at existing dwellings nearest to the site to the south west on Ashby Road.

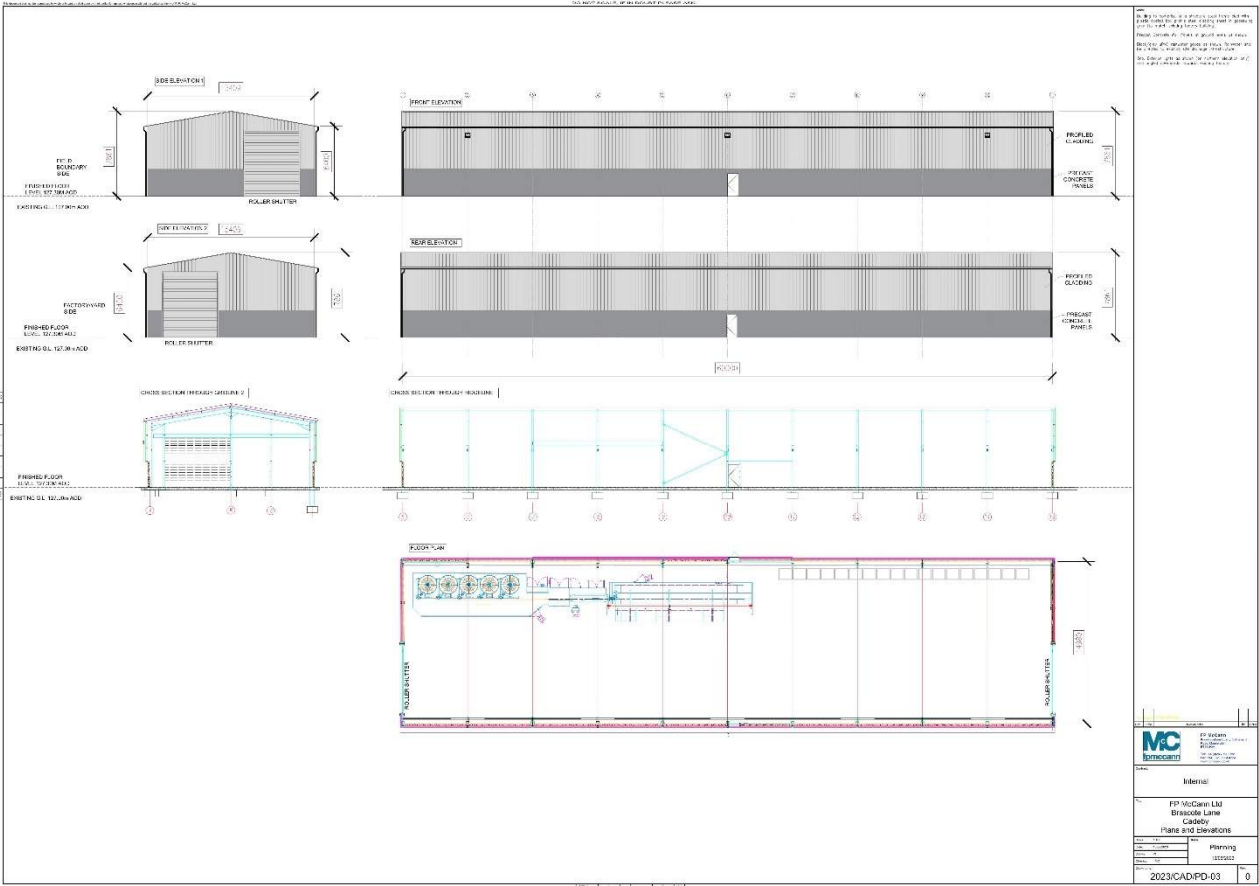
Assessment of activity noise levels for the proposed development indicates that daytime and night time BS 8233 internal criteria would readily be achieved at the nearest residential when windows are open.

Assessment of activity noise levels in accordance with BS 4142 indicates that the noise impact of the proposed Fabrication Workshop would achieve a condition of 'low impact' during proposed operational hours. Furthermore, it is noted that overall noise levels are deemed particularly low in relation to the general ambient noise level in the local vicinity and so noise from the site would be unlikely to give rise to noise disturbance.

Appendix 1 – Proposed Site Layout.







Appendix 2 – Measured Sound Pressure Levels.

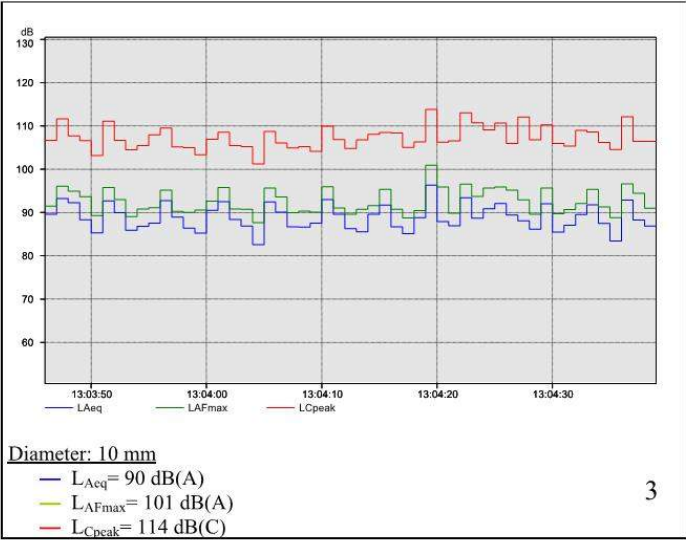
Charlie Fleming Associates Report Table 1(b)

Start hrs:mins	L _{Aeq} dB(A)	L _{Afmax} dB(A)	L _{Af1} dB(A)	L _{Af10} dB(A)	L _{Af50} dB(A)	L _{Af90} dB(A)	L _{Af99} dB(A)	L _{Afmin} dB(A)
24th January 2018								
09:30:25	67.7	79.7	73.0	69.0	67.2	65.6	64.1	63.0
09:50:39	66.9	80.1	72.3	68.2	66.3	64.4	63.0	61.6
10:30:17	68.1	80.7	74.7	69.4	67.2	65.4	64.0	63.3
10:36:02	68.9	76.3	73.4	70.8	68.5	66.4	64.8	64.0
10:42:47	68.2	74.4	72.8	70.0	67.6	66.0	64.9	64.3
10:49:36	69.3	80.0	75.7	70.8	68.3	66.6	65.7	64.8
10:56:49	70.2	82.3	80.1	71.6	68.5	66.0	64.8	64.3
11:05:49	68.4	75.2	73.2	70.6	67.6	65.7	64.5	63.7
11:11:18	67.0	78.6	74.1	68.0	66.4	65.0	63.8	62.7
11:31:07	67.0	79.3	72.1	68.4	66.4	64.9	64.0	63.5
11:46:24	69.6	81.4	77.7	71.2	68.4	66.4	65.3	64.2
11:57:27	67.9	78.8	77.0	68.9	67.1	65.6	64.5	63.3
12:02:33	67.0	71.6	69.6	68.5	66.7	65.3	64.3	63.7
12:07:43	69.1	80.2	78.8	70.0	67.6	65.4	63.9	62.6
12:12:49	66.4	75.9	70.2	67.5	66.1	64.5	62.7	61.6
12:19:24	66.9	74.8	69.6	68.1	66.8	65.3	64.1	63.2
12:28:44	68.2	82.8	78.1	69.4	66.8	64.8	63.6	62.9
12:34:58	68.3	81.5	74.6	69.2	67.4	65.8	64.8	64.0
12:42:12	67.4	80.2	75.4	68.4	66.6	64.9	62.5	60.8
12:58:18	67.3	78.6	74.5	68.5	66.8	64.8	63.4	61.8
25th January 2018								
18:00:00	59.9	76.5	67.5	60.3	58.9	57.6	56.6	55.6
18:15:00	61.3	80.6	72.9	60.2	59.1	57.8	56.8	55.7
18:30:00	61.4	79.2	73.0	60.6	59.1	57.4	55.7	54.5
18:45:00	62.2	80.0	73.9	60.3	58.2	56.5	55.4	54.2
19:00:00	61.7	79.4	74.7	59.9	57.7	55.7	54.2	52.9
19:15:00	57.9	79.1	60.7	58.0	56.1	54.3	51.9	50.5
19:30:00	58.9	78.2	70.2	58.5	56.6	54.7	52.8	50.9
19:45:00	61.6	80.8	76.0	58.9	56.8	54.5	52.7	50.7
20:00:00	59.2	74.8	65.6	60.0	58.2	56.4	54.6	51.3
20:15:00	59.7	80.3	63.6	58.7	56.9	55.1	53.7	52.2
20:30:00	59.5	81.3	72.4	57.2	54.5	52.0	50.5	49.2
20:45:00	58.2	81.7	70.0	54.6	52.6	50.7	49.4	48.4
21:00:00	61.9	80.9	77.1	56.7	53.7	51.3	49.2	47.3
21:15:00	58.1	79.6	66.9	56.3	54.3	52.3	50.9	49.8
21:30:00	59.1	80.6	70.7	55.6	53.3	50.9	48.5	47.2
21:45:00	59.4	78.7	75.7	54.6	52.1	49.9	48.1	46.6
22:00:00	58.7	82.2	71.8	54.8	52.1	49.4	47.4	45.8
22:15:00	58.4	79.8	72.2	55.7	53.2	49.8	47.3	45.5
22:30:00	54.5	73.9	59.3	55.9	53.0	49.5	45.4	44.3
22:45:00	59.7	77.6	74.9	57.3	54.3	50.6	47.1	44.9
1st February 2018								
07:05:23	66.8	77.2	74.9	67.7	66.0	64.5	63.5	62.3
07:24:11	66.3	76.1	72.6	67.1	66.0	64.9	64.1	63.5
07:31:03	66.1	78.4	71.8	67.1	65.6	64.4	63.6	62.6
07:41:11	65.8	76.0	73.4	66.6	65.4	64.2	63.4	62.2
07:51:50	65.8	77.0	74.7	66.3	65.1	64.0	63.2	62.5
08:03:38	66.5	81.3	76.1	66.8	65.0	64.0	63.1	62.1

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Appendix 3 – Glossary of Terms.

Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithm's are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to mimic 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. An 'A' weighted value would be written as dB(A).

$L_{Aeq,T}$

The A-Weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

$L_{A90,T}$

The A-Weighted noise level exceeded for 90% of the specified measurement period (T). This is generally taken to indicate the prevailing background noise level.

L_{Amax}

The highest A-Weighted noise level recorded during a noise event.



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