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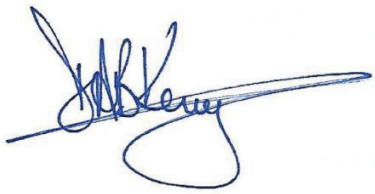
NOISE ASSESSMENT
PROPOSED RESIDENTIAL USE
BRITANNIA WORKS
WEST STREET, LEEK ST13 8AF

Report Date: 20th February 2018
Ref: 20180220 8091 Leek SI.doc
Site Visited by: M A Kenyon
Site Visit: 12th February 2018

Prepared by: M A Kenyon MSc BSc MIOA

Checked by: D A B Kenyon BSc Hons. CIEH MIOA



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1.0 INTRODUCTION

On the instructions of Ian Wooliscroft, Martec Environmental Consultants Ltd carried out a noise assessment at Britannia Works, West Street, Leek ST13 8AF in connection with an application for the change of use of the building from industrial to residential.

This report details the results of a site inspection and predictions of the noise impact of an adjoining industrial use on the proposed dwellings.

Acoustic terminology is explained at Appendix 1 of this report and the author's qualifications and experience are described in Appendix 2, with copy correspondence from both the adjoining industrial use and the local authority at Appendix 3 and plans of the building at Appendix 4.

2.0 SITE DESCRIPTION & BACKGROUND TO THE ASSESSMENT

The proposal would be to convert part of Britannia Mill [owned by Mr Wooliscroft] from an industrial use into three terraced houses; the remaining and adjoining part of Britannia Mill, under the ownership of Mr Heath, would remain as an industrial use.

Mr Heath objects to the proposed conversion of Mr Wooliscroft's section of the building, on the grounds that any new residents could complain about noise from the remaining "industrial" section of the

building.

It can be seen from Appendix 3 that whilst Mr Heath objects to the application, so far facilities have not been made available to Martec in order to investigate the matter; particularly no internal access has been given to the "industrial" side of the Mill owned by Mr Heath.

I am instructed, by Wooliscroft, on the following matters regarding Mr Heath's business:

1. It is a furniture restoration business
2. The powered woodworking machinery is located on the ground floor of the building and consists of:
    a. A Planer
    b. A Table Saw
    c. A Band Saw
    d. Presumably there would also be hand-held drills and powered sanders.
3. The premises are restricted to operate between 8am and 5pm Monday to Friday and 8am to 1pm on Saturday.

Appendix 4 contains plans of the development, and Mr Heath's premises has been marked on the Elevations of the building. If we compare the Elevations and the plans, it can be seen that

1. the ground floor of Mr Heath's premises, where the larger woodworking machines are located, is adjacent to non-habitable rooms in the development [a garage in one instance and utility rooms & W.C.'s elsewhere].
2. The first floor of Mr Heath's premises would share a party wall with
    a. A cupboard in a hallway for the central apartment
    b. The lounge of the northernmost house.
    c. No party wall at this level for the southernmost house.
3. At third floor level, there is no party wall between the two premises for any of the houses.

3.0 SITE VISIT

I visited site on the morning of 12th February 2018 and was able to look in at the ground and first floor windows of the building. The building appeared to contain a very significant quantity of stored materials, which often obstructed the view, but in general terms, it confirmed points 1 and 2 above, although the wood-working machinery was not clearly visible.

If we consider the other findings of the site visit. Figure 1 is a photograph of the "join" between the two halves of Britannia Mill:

Figure 1: Join between two “halves” of Britannia Mill

It can be seen that the constructions are markedly different, which will mean that one of the “halves” will have been built onto the other, and that originally the separating wall will have been an exterior wall, i.e. the base construction of the separating wall is probably 9-inch brickwork.

From an examination of Mr Wooliscroft’s “half” of the building, it appears that, at ground floor level, large parts of the original wall have

been removed to form an open plan space [when the whole building was under single ownership] and subsequently replaced with blockwork when the building[s] were re-divided.

At first floor level the original wall is more intact, with the original windows/openings having been in-filled with blockwork.

Figure 2: First Floor Wall between two "halves" of Britannia Mill

From both the plans and the site visit, it is clear that there are not outdoor or external areas where residents of the proposed development would be affected by noise from Mr Heath's premises; any noise would be experienced solely internally.

4.0 NOISE ASSESSMENT CRITERIA

As outlined above, the sole noise issue is whether the introduction of

new residents adjacent to Mr Heath's premises would lead to noise complaints and restrictions as to how the premises might be used. Mr Heath takes the view that any assessment should be based not on the existing business [machines in use, hours of operation etc] but on how the premises could be used in future.

The National Planning Policy Framework (NPPF) 2012 provides some general guidance to local authorities on taking noise in to account in planning policies and decisions. This includes guidance that "*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*".

It can be seen from the above, that in the Government's view the starting point for an assessment is the existing business.

4.1 Local Authority's View

Appendix 3 contains copy of the local authority's consultation on the proposed residential development, and it seeks a *"site specific noise assessment"* and that the assessment should use "*BS4142, BS8233 and the new ProPG: Planning noise Noise*".

If we consider the three standards mentioned by the local authority:

BS4142:2014 in its scope states "*The standard is not intended to be*

applied to …the assessment of indoor sound levels." Consequently, it cannot be used under these circumstances.

ProPG: Planning & Noise at Section 1.3 states that *"…detailed consideration of …other sources of noise (such as dominant noise from industrial …premises) …is outside the scope of this document."* Section 2.53 states that where the industrial noise is dominant then BS4142 should be used. The standard offers no guidance if the industrial noise falls outside the scope of BS4142.

BS8233:2014 states at Section 6.5.2 *"Where industrial noise affects residential or mixed residential areas, the methods for rating the noise in BS 4142 should be applied."* The standard offers no guidance if the industrial noise falls outside the scope of BS4142; however, BS8233 does provide guideline internal noise levels for noise without a specific character but states at 7.7.1 that:

"*NOTE Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."*

Accordingly, it is proposed to use the guideline noise levels of BS8233 and to "correct" the noise for a specific character elements as per BS4142, effectively lowering the noise limits.

4.2 British Standard 8233:2014

The latest version of BS8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' recently published (February 2014) supersedes the 1999 version and states the following:

"In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values in Table 4.

Table 4: Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 LAeq,16hr	--
Dining	Dining Room/Area	40 LAeq,16hr	--
Sleeping (daytime resting)	Bedroom	35 LAeq,16hr	30 LAeq,8hr

Table 1: Noise Limits from BS8233:2013 [Table 4 of the Standard]

5.0 MEASUREMENT RESULTS

5.1 Measurements of Joinery Workshop noise.

For this project the machinery to be used has not been accessible, so it

is necessary to use representative measurements made elsewhere.

In connection with a project for the relocation of a large joinery workshop, measurements of internal reverberant sound pressure levels were made at a facility in Settle on 6th November 2009 using appropriate instrumentation. The results are as shown in Table 2 below.

Description	Octave Band Centre Freq [Hz]					LAeq
	125	250	500	1000	2000	
Dominion 12" surfacer	81.3	82.7	81.3	77.8	74.2	82.8
Dust Extract Alone	75.4	72.8	70.4	66.5	64.8	72.4
Dominion 24" surfacer ****	76.8	85.4	87.9	84.9	75.1	88.4
SCM TBDN/ Tenoner	75.4	72.7	73.1	71.4	66.8	75.2
Sedgewick Tenoner	77.1	74.9	73.5	80.9	79.6	84.1
SCM TBDN Spindle Molder	74.7	78.4	76	74.2	78	81.4
Stromab Cross Cut	65.1	64.7	70.9	67.2	73.6	76.2
Dominion Circular Saw	59.9	57.9	73.6	77	83	85.1
Sander Sbf by ING Stafani	63.9	64.2	66.7	66.8	68	72
Dominion Morticer	53.2	59.1	61.8	60.3	68.2	70.3
Makita Chop Saw	54	57.1	70.9	71.3	74.5	77.5
SCM Minimax 545N Band Saw	49.4	58.9	62	64.8	68.2	71
**** Not being relocated						

Table 2: Joinery Workshop Measurements - Elsewhere

5.2 Predicted Noise Levels in Neighbouring Property

It can be seen from Table 2 that the loudest machine was the Dominion 24" surfacer; which wasn't being relocated for the Settle project; it being too large for that company's requirements. Given that Mr Heath's business is a significantly smaller operation, it is considered using the next loudest machine, the Dominion Circular [Table] saw, in the

predictions and assuming it were to operate constantly, is considered likely to over-estimate the actual impact **very significantly**.

Again it was not possible to measure the sound insulation of the existing wall; Martec has previously measured the sound insulation of a 9 inch Brick Wall and the difference in levels between the source and receiver rooms [$D_{nT,w}$] from the tests can be combined with the derived source noise levels in Section 5.1 above, to predict the Resultant noise levels inside the proposed property [first floor living room northernmost house].

For the purposes of the predictions [Table 3 below], it has been assumed that the Table Saw is relocated from the ground floor to the first floor, i.e. immediately adjacent to the habitable room]; should the machinery remain on the ground floor the sound insulation [DnT,w] would be greater.

Freq	125	250	500	1000	2000	LAeq
Dominion Circular Saw	59.9	57.9	73.6	77	83	**85.1**
DnT,w 9" brick wall	37.4	44.0	48.3	52.3	54.8	
Resultant	22.5	13.9	25.3	24.7	28.2	**31.3**

Table 3: Predictions of Noises – DnTw from Elsewhere

6.0 DISCUSSION OF RESULTS

The predicted noise level inside the only adjoining habitable room would be 31 LAeq,1hr [See Table 3 above]. Use of the saw could be tonal, although whether It would discernible as tonal once the sound has passed through the wall, is not definite; however, as a worst-case assumption an allowance for "Clearly tonal" as per BS4142 [+4dB] could be made, producing an overall rated noise level of 35 LAeq, which complies with BS8233:2014's requirements.

7.0 CONCLUSION & RECOMMENDATIONS

There is only one habitable room that shares a separating wall with the woodworking premises, which is at first floor level. The larger machine all appear to be on the ground floor.

Predictions have been assumed that the noisiest machine likely to be used, is moved upstairs, operates continually and is perceived as clearly tonal. It is considered that this is likely to **significantly overestimate** the true impact of the noise.

The predictions indicate compliance with the noise limits of BS8233. Nevertheless, as an extra precautionit is recommended that the separating wall at first floor level be additionally treated. The best

treatment for would be Wall Treatment 1 from Approved Document E of The Building Regulations, which will be sent under separate cover. In addition to the standard treatment, for this wall [in the living room of the northernmost house]:

1. The specified minimum mass for the two panels of plasterboard of 20 kg/m2 should be increased to 28 kg/m2 by using two layers of 15mm Soundbloc plasterboard.
2. A non-hardening viscoelastic damping compound should be used between the two layers of plasterboard; this would be "Green Glue" or "Quiet Glue Pro" [**and no others**] following the manufacturer's instructions very carefully.
3. The specified minimum gap between the new frame and the original wall should be increased from 10mm to 50mm.

It is considered unlikely that noise would break out of the roof of Mr Heath's premises and affect the proposed development; however, asa precaution it is considered that any windows of habitable rooms overlooking the roof should be non-opening and glazed with upgraded thermal glazing of the form [10mm glass/12mm air/6mm glass].

Overall it is considered with with the recommended steps above, that "*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*" and planning consent could be granted.

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A).**

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus, most people cannot distinguish between, say 30 and 31 dB(A).

If a noise varies over time then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.

The following table gives an indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	30	Very Quiet
Quiet office	40	
Rural background noise	45	
Normal conversational level	60	
Busy restaurant	65	
Typewriter @ 1m	73	
Inside suburban electric train	76	
Alarm clock ringing @ .5m	80	
Hand clap @ 1m	80	
HGV accelerating @ 6m	92	Very Loud

APPENDIX 2

QUALIFICATIONS AND EXPERIENCE OF M.A. KENYON

My full name is Melville Alexander Kenyon. I am the principal of the firm of Martec Environmental Consultants Ltd, a consultancy company that specialises in environmental noise assessment and control. I graduated in 1982 with a Bachelor's degree in Engineering and subsequently a Master's degree in Environmental Acoustics. I have been a corporate member of the professional body for noise and vibration specialists, the Institute of Acoustics, since 1988, and have sat on the British Standards Committee dealing with noise in buildings [BS.8233:1999].

I have lectured at Liverpool John Moores University on the Diploma of Acoustics course and at Manchester Metropolitan University on their Environmental Health degree course.

The firm of Martec Environmental Engineering was formed in the 1970's and joined The Association of Noise Consultants in 1996. The company is now known as Martec Environmental Consultants Ltd.

Since its formation, Martec has advised many groups of both residents and developers about the problems of noise and vibration in the environment.

APPENDIX 3

COPY CORRESPONDENCE

A3.1 With Adjoining Industrial Use [Mr Heath]

Subject: Re: [8091] Sound Insulation Tests - Britannia Mill
Date: Tue, 30 Jan 2018 01:02:35 -0800
From: Jonathan H <mrjcheath@gmail.com>
To: mak@martecenviro.co.uk <mak@martecenviro.co.uk>

Mr Kenyon , I am working away on business at very irregular hours for the next 2 weeks upon my return I will contact you ,my preferred method of contact is via email Regards mr heath

On Friday, January 26, 2018, Mel Kenyon <mak@martecenviro.co.uk> wrote:

Dear Sir

Many thanks for this afternoon's chat.

I understand that you operate a business at the premises adjacent to Britannia Mill and you are concerned that any future residents could complain about noise from your premises. You are concerned that any study should take account of any future machines that could be used at the premises; therefore, you do not wish us to measure the noise produced by your existing machinery.

What we would like to do is measure the sound insulation of the separating wall between your premises and Britannia Mill. We could then predict the noise level produced inside Britannia Mill by a machine within your premises. The results would then indicate whether or not residential development would be appropriate at Britannia Mill.

The tests would take around 2 hours; hopefully you would be able to grant access sometime next week.

Please can you let us know your decision as soon as is convenient.

--
Mel Kenyon MSc BSc MIOA
Martec Environmental Consultants
www.martecenviro.co.uk
01524 222000

A3.2 Environmental Health Department

Subject: FW: SMD/2017/0291 Britannia Works,
Date: Tuesday, 1 August 2017 at 11:15:05 British Summer Time
From: Colgan, Denis
To: 'Rob Duncan (rob@robduncanplanning.co.uk)' (rob@robduncanplanning.co.uk), Jackson, Lisa

Dear Both,

Re: Further advice received

The advice from the applicant (below) is in clear contradiction to that of the attached objection. I am happy that Building Regulations will account for the change of use and noise transmission between proposed units but it will not adequately take account of transmission of noise between Mr Heath's industrial/commercial units and the proposed residential units through the boundary. Failure to adequately insulate the residential units will inevitably compromise the viability of Mr Heath's commercial units and the amenity of future occupiers and that is on the assumption this can be reasonably completed. I would expect a noise risk assessment to be submitted to determine if there is potential for this site to be used for residential development and if so then a sound insulation scheme should be submitted.

Thank You,
Denis

Mr Denis Colgan
Pollution Officer (Specialist)
Environmental Health
Staffordshire Moorlands District Council / High Peak Borough Council
01538 395400 ext 4404 or 07713189069

Hi Denis

Further to our conversa1on yesterday a4ernoon, I've spoken with the applicant and he has advised that the adjacent unit has previously been used as a joiners workshop at ground floor with storage at first floor. It has not however been used for a number of years to his knowledge. Given that the ground floor of our proposal is to be used for garaging and u1lity rooms, I would agree with you that the Building Regula1ons would be sufficient to cover any poten1al noise implica1ons. Could you please confirm your agreement in this regard?

Kind Regards

Rob

From: Colgan, Denis
Sent: 19 July 2017 09:12
To: Jackson, Lisa
Cc: Mccrory, Daniel
Subject: SMD/2017/0291 Britannia Works,

Hello Lisa,

This development appears to be proposed on a site part of which is currently is used for commercial/industrial operations. If this is the case then I would expect a comprehensive site specific noise assessment to be completed. The assessment should be undertaken in consideration of BS4142, BS8233 and the new ProPG: Planning & Noise – New Residential Development. As it stands there is insufficient information provided to properly assess this application.

Thank You,

Denis
Mr Denis Colgan
Pollution Officer (Specialist)
Environmental Health
Staffordshire Moorlands District Council / High Peak Borough Council
01538 395400 ext 4404 or 07713189069

APPENDIX 4

BUILDING PLANS