PHILIP MILSON ASSOCIATES LTD

SHEPLEY STREET,
OLD GLOSSOP

NOISE ASSESSMENT

14 June 2012

AEC REPORT: P2511/R1/PJK

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1.0 INTRODUCTION

1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Philip Millson Associates Ltd, to provide a noise assessment in relation to a new residential development on land adjacent to Shepley Street, Old Glossop.

1.2 This report details the ambient and background noise levels measured on site and discusses guidance with regards to the planning permission being sought.

1.3 Acoustic terminology is presented in brief in Appendix A.

2.0 BACKGROUND

2.1 The scheme is to develop 43 houses, on a disused section of the Firth Rixson Metal industrial complex and existing waste ground, a plan of which is identified on Figure 1.

2.2 In order to determine the potential noise issues at the site, contact was made with Peter Hollingsworth, an Environmental Health Officer with High Peak Council, when it was confirmed that Firth Rixson Metals had recently undertaken a BS4142 assessment with regards to noise associated with the main areas of the site (refer to Figure 2 at the back of this report).

2.3 It is important to note the this assessment was undertaken in relation to ongoing complaints from residents on Water Street and Hope Street (refer to Figure 2), both of which, are significantly closer to the main Firth Rixson building than the proposed development will be.

2.4 As a result, Peter Hollingsworth indicated that consideration should be given not only to this previous BS4142 assessment, but also road traffic on Shepley Street and any processes on the Firth Rixson Metal site which may not have been assessed as part of the original assessment.

3.0 SITE DESCRIPTION

3.1 The proposed development site is located adjacent to Shepley Street, a quiet road, which separates the site from a river which flows from east to west. To the south of the river is farm land (refer to Figure 2).

3.2 The Firth Rixson Metals industrial complex is located to the east and south east of the site.

3.3 The nearest remaining building on the Firth Rixson Metals site to the proposed residential development would be the office block (a larger building is due to be demolished (as indicated on Figure 2). To the north east of the office block, approximately 80m from the nearest housing on the eastern boundary of the proposed site, is a loading and unloading area which is used by HGV's for manoeuvring into position to load and unload into the main factory building. This area also houses four skips and a waste compactor. Proposed properties located on the northern section of the site would largely be screened from this area by the retaining wall of the Mill Pond.

3.4 To the southeast of the site is the Distribution Building which would be approximately 130m from the nearest housing on the southern boundary.

3.5 The western boundary of the site backs on to the gardens on Wesley Street, including the Mossey Lea Cottages which are adjacent to the southern section of the proposed site.

3.6 The northern section is currently waste ground, with housing to the north and west and the Mill Pond directly to the east. Hope Street, to the north, is accessed through a gap between two houses.

4.0 NOISE MEASUREMENTS

General

4.1 As agreed with High Peak Council, in order to determine existing noise levels, due to both road traffic and industrial activities, noise measurements were undertaken by AEC on Tuesday 13 March 2012 between 1400 and 1730h, and on Tuesday 20 March 2012 between 2300 and 0100h. Full details of the measurement procedure are included in Appendix B with noise level data presented in Tables B1 to B2.

4.2 General ambient and background noise levels were measured at three locations around the site. Location A, as identified on Figure 1, was selected to represent the nearest residential houses to Shepley Street and the Firth Rixson Metal industrial complex, which were identified as the major noise sources in the area.

4.3 Locations B and C were selected to measure the noise levels affecting the northern section of the site. Location B was in full view of Hope Street, while Location C was shielded from all surrounding roads. A summary of the measured noise levels for all these locations is presented in Table, below.

TABLE 1: Summary of the Measured Noise Levels

Location	Period	Noise Level, dB			
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	$L_{Amax,T}$
A	Daytime	54-56	55-58	50-51	74-76
	Night-Time	48	48-49	48	58-59
B	Daytime	44-46	47-49	39-40	60-64
	Night-Time	36-45	36-49	34-37	53-60
C	Daytime	44-46	46-49	40-42	58-66
	Night-Time	37-47	39-51	35-37	55-65

4.4 The dominant noise sources noted at Location A during the daytime was road traffic on Shepley Street with building services plant associated with the Office Block and Distribution Building on the adjacent Firth Rixon Metals site and the river also audible. At night, at this location, the main noise sources were the river and distant plant from the Distribution Building.

4.5 The main sources around the rest of the site during both the daytime and night-time periods was distant road traffic with some noise from Firth Rixson and distant aircraft noise.

Noise from Firth Rixson Metal Industrial Unit

4.6 In order to assess the potential noise impact from the adjacent Firth Rixson Metal industrial site on the proposed development, AEC has used noise levels measured on site for activities which were operating during the site visit. For activities not witnessed on site typical data obtained previously on a variety of projects has been used.

4.7 During the site survey, noise levels were measured of the fixed building services plant associated with the Office Block, the extract plant on the northern elevation of the southern Distribution Building, the waste compactor located in the loading and unloading area to the south of the Mill Pond and a single fork lift truck pass by. The measured data is presented in Table 2 below.

4.8 Table 2 also includes noise level data previously obtained by AEC on other sites for other sources that are known to occur on the site but were not measured at the time of the survey as they did not occur.

TABLE 2: Noise Source Data for Firth Rixson Metals

Location	Item	Distance, m	Noise Level	
			dBL_{Aeq}	Single Event Level, dBL_{AE}
Office Block, North	Extract Fan	1	65	-
Office Block, South	Extract Fan	1	62	-
Office Block, South	Extract Fan	1	72	-
Distribution Building, North	Extract Fan	5	72	-
Area south of Mill Pond	Waste Compactor	2	-	89
Area south of Mill Pond	Fork Lift	3	-	86
Previously measured data	HGV Manoeuvring	10	-	88
	HGV Departing	10	-	85
	Skip being Collected	10	69	84
	Skip being Delivered	5	72	92

5.0 BASIS OF ASSESSMENT

General

5.1 As discussed above, the dominant noise sources affecting the proposed development are road traffic noise on Shepley Street and industrial noise from Firth Rixson Metals. Below are relevant standards relating to the types of noise sources are discussed.

5.2 Previously the appropriate guidance for the assessment of proposed housing developments was Planning Policy Guidance PPG 24 '*Planning and Noise*' issued by the Department of the Environment in 1994. This guidance was withdrawn in March 2012, however, the absence of any other appropriate guidance with regards to planning policy, this assessment has been based on the guidance presented in PPG24.

Road Traffic Noise

5.3 Paragraph 8 of PPG 24 states "*this guidance introduces the concept of Noise Exposure Categories (NECs), ranging from A-D, to help local planning authorities in their consideration of applications for residential development near transport-related noise sources. Category A represents the circumstances in which noise is unlikely to be a determining factor, while Category D relates to the situation in which development should normally be refused. Categories B and C deal with situations where noise mitigation measures may make development acceptable.*"

5.4 Paragraph 9 of PPG 24 states "*the table in Annex 1 contains a recommended range of noise levels for each NEC covering day and night-time periods. However, in some cases it may be appropriate for local planning authorities to determine the range of noise levels which they wish to attribute to any or each of the NECs. For example, where there is a clear need for new residential development in an already noisy area some or all NECs might be increased by up to 3dB(A) above the recommended levels. In other cases, a reduction of up to 3dB(A) may be justified*." AEC are not aware of any relaxation by High Peak Council in this respect.

5.5 Annex 1 of PPG 24 states "*when assessing proposal for residential development near a source of noise, local planning authorities should determine into which of the four noise exposure categories (NECs) the proposed site falls, taking account of both day and night-time noise levels*." Advice is then given depending on which NEC the site falls. The advice and noise exposure categories are given in Appendix B of this report. It should be noted that the NECs are based on free-field noise levels.

5.6 The noise exposure categories are presented for various types of noise source. Annex 3 of PPG 24 identifies how noise from different sources, including transportation, should be assessed and advises that any significant operational changes should be determined. In relation to noise from road traffic the Department of Transport's CRTN is identified as the appropriate guidance for a road traffic noise assessment and it also refers to the Noise Insulation Regulations.

5.7 PPG 24 acknowledges the importance of mitigation measures to reduce and control exposure to noise. Paragraph 13 identifies traditionally accepted measures, such as the use of purpose-built barriers, screening by other buildings and specifying an acceptable noise limit.

5.8 Advice on the sound insulation of buildings is given in Annex 6 of PPG 24 and advises that *"guidance on suitable internal noise levels can be found in BS8233:1987*". BS 8233 *'Sound insulation and noise reduction for buildings – Code of practice'* was updated in 1999. BS 8233:1999 gives a design range for indoor ambient levels in living rooms and bedrooms as presented in Table 3.

TABLE 3: Indoor Ambient Noise Levels – Design Range

Area	Design Range $dBL_{Aeq,T}$	
	Good	Reasonable
Living Room	30	40
Bedrooms *	30	35

*for a reasonable standard in bedrooms at night,
individual noise events should not normally exceed $45dBL_{Amax}$ (fast response).

5.9 The WHO document "*Guidelines for Community Noise*" proposes guideline values for noise both inside and outside dwellings. These are to achieve acceptable internal noise levels to avoid annoyance and sleep disturbance. Inside dwellings, the noise level should not exceed $30dBL_{Aeq,\ 8\ hour}$ and $45dBL_{Amax}$ at night and $35dBL_{Aeq,\ 16\ hour}$ during the day. These are generally in line with the guidance provided in BS8233 to achieve a good standard and will form the basis of the assessment.

5.10 In addition, the WHO document also states that attenuation of external to internal noise levels provided by a window partially open for ventilation is up to 15dB, which relates to allowable external levels of $55dBL_{Aeq}$ outside habitable rooms during the daytime, as well as $45dBL_{Aeq}$ and $60dBL_{Amax}$ during the night-time.

5.11 WHO propose that noise levels should not exceed 55dBL_{Aeq} for external areas, to protect the majority of people from being moderately annoyed during the daytime.

Industrial Noise

5.12 In relation to Industrial Noise Annex 1 identifies that "*where industrial noise is present but not dominant*", the noise climate should be assessed as a mixed noise source. Annex 3, Paragraph 19 of PPG24 states that *"the likelihood of complaints about noise from industrial developments can be assessed, where the standard is appropriate, using guidance in BS4142".* BS4142 describes a method for determining noise levels from industrial premises and assessing its potential impact by comparing predicted noise levels of the proposed plant with existing background noise levels.

5.13 BS4142, in paragraphs 8.1 an*d 8.2,* identifies that *"certain acoustic features can increase the likelihood of complaint over that expected from a simple comparison between the specific noise level and the background noise level. Where present at the assessment location, such features are taken into account by adding a correction of 5dB to the specific noise level to obtain the rating Level*". A 5dB correction should be applied *"if one or more of the following features occur, or are expected to be present for new or modified noise sources:*

- *The noise contains a distinguishable, discrete, continuous note (whine, hiss, hum etc.)*
- *The noise contains distinct impulses (bangs, clicks, clatters, or thumps);*
- *The noise is irregular enough to attract attention*

The likelihood of complaints is indicated by the difference between the background noise level and the rating level. The greater this difference the greater the likelihood of complaints.

- *A difference of around +10dB or more indicates that complaints are likely*
- *A difference of around +5dB is of marginal significance.*

If the rating level is more than 10dB below the measured background noise level then this is a positive indication that complaints are unlikely."

5.14 In addition, where the dominant noise source in gardens is due to industrial noise, AEC suggest an external noise level in gardens due to industrial noise should not exceed 50dBL_{Aeq} to due to any potential character associated with the noise sources. This is based on guidance in BS8233, WHO and BS4142.

6.0 ASSESSMENT OF PROPOSED DEVELOPMENT

6.1 The assessment of the proposed residential development is based on noise sources identified during the noise surveys and operational information provided by Firth Rixson Metals. As indicated above, not all the potentially noisy processes on the Firth Rixson Metals site were in operation during the measurement period and as such, these have been considered based on noise level data previously measured for these sources.

6.2 An assessment of the different noise sources are assessed separately below along with comments on the previous BS4142 assessment that undertaken in relation to noise complaints from properties north of the main Firth Rixson building.

Comments on Previous Industrial Noise Assessment

6.3 Based on an environmental noise assessment report produced by CTI Environmental relating to December 2009 to June 2010 (Cti Ref:113737), it is understood that, with regards to noise from the Firth Rixson site, there have been previous complaints from local residents on Water Street and Hope Street, which are located north of the main Firth Rixson building, as identified on Figure 2).

6.4 The report was produced with regards to satisfying the requirements of the Environmental Regulations 2007 and providing information for the ongoing management of noise from the site. Section 3 of the report, Complaint History, notes that:

"*The occasional noise complaint has been received in the past from local residents living on Water Street and Hope Street to the north of the site. However, the Lidkoping grinding machine, which was the cause of these annoyances, has now been decommissioned and removed from site. The Autopullit grinder, also thought to be the source of occasional complaint, has also been removed*".

6.5 In Section 5, Initial Risk Assessment, it states "*A walk around the site still suggests that the Water Street boundary is the most significant as far as the receiving of site noise emission at receptors is concerned. The noise signature at the Mossy Lea Cottages, following the 2" cutting and grinding relocation, was proved to be insignificant in the last report, and it is fairly obvious that this should still be the case*".

6.6 The conclusion of the Environmental Noise and Vibration Assessment states:

"The site noise measured on Water Street is still far in excess of background noise levels predominantly due to the furnace extraction and furnace cooling. This area, as well as some residence close by on Hope Street, are the only concern as far as receptor susceptibility to noise is concerned"

6.7 As clearly indicated above, the predominant noise from the site is due to the Furnace With regards to the previous assessment undertaken by CTI Environmental, this assessment indicated that the predominant noise from the site is due to the Furnace extraction and cooling systems, which are located to the north and the east of the main building, as indicated on Figure 2. The only concern as far receptor susceptibility to noise was with regards to residences on Hope Street and Water Street. These locations are situated directly to the north of the main Firth Rixson building some 40m away and the proposed housing will be situated some 180m away. As such, noise levels from these sources will be significantly lower at the proposed housing. In addition to this, during AEC's measurements, noise from the main building was not audible at any point. Based on this, with regards to historical complaints regarding noise, these would not apply to the proposed site.

6.8 However, the development will site houses closer to operations on the Firth Rixson Site which are currently screened by the existing disused factory building in the proposed southern section of the site and it is these sources which have been assessed below.

Road Traffic Noise

6.9 The dominant noise source on the southern boundary of the site, overlooking Shepley Street, was road traffic. However, as the road traffic on Shepley Street was intermittent it is not appropriate to undertake a CRTN assessment on this location. Therefore, based on the measured noise levels, the ambient noise level on southern elevation of the houses facing

Shepley Street has been assumed to be 56dB$L_{Aeq, 16h}$, which was the noise level measured during the worst-case hour at location A.

6.10 Comparing this external noise level against the PPG24 Noise Exposure Categories, presented in Appendix B, indicates that the daytime habitable rooms on the southern elevation of the houses facing Shepley Street will be in NEC B.

6.11 In relation to NEC B, PPG24 advises, "*Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise*".

6.12 Therefore, mitigation measures are required to control the internal noise levels in living rooms on the southern elevation of the properties facing Shepley Street.

6.13 Externally, it is understood gardens will be located to the north of all the houses facing Shepley Street and due to the screening provided by the houses noise levels from traffic would be below the WHO guidance requirement of 55dBL_{Aeq}.

Industrial Noise

6.14 Based on operational information provided by Firth Rixson Metals and on-site observations the main processes identified which may impact on the proposed development site are building services plant associated with the Office Block and the Distribution Building, and activities in the area to the south of the Mill Pond. These activities include the movement of HGV's, the collection and delivery of skips, the use of a waste compactor and the movements of a fork lift truck.

6.15 The potential impact form these various sources are discussed below.

Mechanical Services Plant Noise

6.16 As discussed above the only building services plant which may potentially impact on the proposed development is that serving the Office Block and the extraction fans serving the Distribution Centre. It was noted during the site survey that the building services plant on the southern and northern elevation of the Office Block operates during the daytime only, whereas the extract fans serving the Distribution Centre operated 24 hours a day.

Daytime

6.17 The only potential receptors in relation to the building services plant on the southern elevation of the Office Block and the northern elevation of the Distribution Building are the houses on the southern boundary of the site. However, as mitigation measures are required to control internal noise levels from road traffic on Shepley Street during the daytime this location has not been discussed further.

6.18 Therefore, the only building services plant identified as potentially being an issue are the extract flue to the north of the Office Block and the extract fans on the Northern Elevation of the Distribution Building on the proposed houses on the eastern boundary of the southern section of the proposed site. Table 4, presents the calculated specific noise levels of the building service plant, taking into account distance attenuation and the screening provided by the Office Block to the Distribution Centre at the properties on the eastern boundary.

Table 4: Overall Daytime Specific Noise Level

Source	'Specific Noise Level', $dBL_{Aeq, 1h}$	Distance, m	Distance to Receiver	Distance Correction, dB	Screening Attenuation, dB	'Specific Noise Level' at Receiver $dBL_{Aeq, 1 hr}$
Extract Flue Office Block	65	1	40	-32	0	33
Extract Fan Distribution Centre	72	5	150	-30	-15	27
					Overall Total	34

6.19 Based on the overall total specific noise level presented in Table 4 above, a daytime BS4142 assessment for the plant affecting the rear of the properties on the Eastern Boundary is presented in Table 5 below. The background noise level is based on the measured background at Location C, which is shielded from road traffic on Shepley Street and the noise from the river.

Table 5: Daytime BS4142 Assessments From Mechanical Services Plant

Description	BS4142 Assessment (Daytime, 1 hour period)
Specific noise level at housing	$34dBL_{Aeq, 1hour}$
Rating level (+5dB for character)	39dB
Background	$40dBL_{A90}$
Excess of rating over background	-1dB
Likelihood of complaints based on BS4142	Below levels were the likelihood of complaints would be marginal

6.20 As identified in Table 5, the resultant noise levels generated by the building service plant during the daytime would be below levels were the likelihood of complaints is a marginal situation and as such, the noise levels should be considered acceptable. In addition, the resultant noise level is significantly below AECs recommended external noise level in gardens of $50dBL_{Aeq}$.

Night-Time

6.21 As identified above the only building service plant which operates at night, which may impact the proposed development are the extract fans associated with the northern elevation of the Distribution Block.

6.22 The nearest proposed properties to the Distribution Building are those located on the southern and eastern boundaries, which are some 140 and 150m away respectively. The properties on the southern boundary would have direct line of sight of the plant whereas the properties on the eastern boundary are screened by the office block.

6.23 Based on the measured plant noise level, and taking into account attenuation due to distance and the screening provided by the Office Block, the specific night-time $dBL_{Aeq, 5min}$ level at each property is presented in Table 6 below along with the night-time BS4142 assessment. The background noise level measured on the southern boundary during the survey period included the noise from the river. Based on the assumption that the river does not flow at this rate all year round, the background noise level at both locations is based on the measured level further into site and screened from the river.

Table 6: Night-Time BS4142 Assessment of Plant Noise affecting the Southern and Eastern Boundaries

Description	BS4142 Assessment (Night-Time, 5 minutes)	
	Southern Boundary	Eastern Boundary
Specific noise level at housing	$43dBL_{Aeq, 5 min}$	$27dBL_{Aeq, 5 min}$
Rating level (+5dB for character)	48dB	32dB
Background	$35dBL_{A90}$	$35dBL_{A90}$
Excess of rating over background	+13dB	-3dB
Likelihood of complaints based on BS4142	Positive indication that complaints are likely.	Below levels were the likelihood of complaints would be marginal

6.24 The above assessment demonstrates that at properties on the eastern boundary, noise levels are below a level at which the likelihood of complaints would marginal. In relation to the properties on the southern elevation the excess of rating level over background is 13dB. Therefore, mitigation measures would be required to rooms on the southern elevation of the first row of properties to the south of the site.

Loading and Unloading Area to South of the Mill Pond

6.25 Due to the screening provided by the retaining wall of the Mill Pond, the most noise sensitive properties to this area are the proposed residential properties on the eastern elevation of the southern section, approximately 80m away.

6.26 During the site visit it was noted that the only fixed external plant in this area was the waste compactor which is sited 70m from the nearest proposed housing. In addition, it was noted that there were a number of waste skips. The only other activity witnessed was the use of a fork lift truck, which was used for transporting goods around the entire Firth Rixson Metals site, it should be noted that the fork lift truck did not operate continuously.

6.27 In addition, based on information provided by Firth Rixson Metals, it is understood that there will be between three and four HGV movements in this area a week, and all of these will occur between the hours of 0800 and 2100h. In regards to the skips, it is understood that collections occur weekly between 0900 and 1700h. Therefore, based on discussions with site staff it is understood that all these activities only occur during the daytime period with the exception of the fork lift truck which also operates at night.

6.28 BS4142 identifies a 1 hour daytime assessment period. For a '*worst case*' assessment, it has been assumed that the waste compactor will operating 4 times, there will be 10 fork lift truck movements, there will be a single HGV manoeuvring and departing, 1 skip being collected and 1 being delivered, and the fork lift would make 10 movements.

6.29 Using the measured data measured presented in Table 2, the specific $dBL_{Aeq, 1h}$, noise level in the garden of the nearest house has been calculated due to activities in the area to the south of the Mill Pond. The equation used is presented below and the calculated overall specific noise level at the nearest residential properties is presented in Table 7:

$$dBL_{Aeq, T} = L_{AE} + 10log(t/T) - 20log(rr/rs) + 10log(n)$$

where $L_{Aeq, t}$ = Average noise level over a specific time period
L_{AE} = sound energy from a single event due to sound source relating to a 1 second period
t = 1 second
T = Seconds in 1 hour (i.e. 3600)
rr = Distance to receiver, i.e 80m
rs = Distance at which source noise levels measured, i.e. 10m
n = Number of events in 1 hour

Table 7: Overall Daytime Specific Noise Level at Houses on the Eastern Boundary

Activity	Single Event Level, dBL_{AE}	Source Distance, m	Distance to Receiver	Attenuation, dB			Specific Noise Level, dBL_{Aeq}, 1h
				Time, (T)	Distance	Events in 1 Hour (n)	
Waste Compactor	89	2	70	-36	-31	6	28
Fork Lift	86	3	80	-36	-29	10	31
HGV Manoeuvring	88	10	80	-36	-18	0	34
HGV Departing	85	10	80	-36	-18	0	31
Skip being Collected	84	10	80	-36	-18	0	30
Skip being Delivered	92	5	80	-36	-24	0	32
Overall Noise Level							40

6.30 Based on the overall worst-case hour specific noise level with all the sources operating, presented in Table 7 above, a daytime BS4142 assessment of the activities in the area to the south of the Mill Pond affecting the nearest properties on the eastern boundary is presented in Table 8 below.

Table 8: Daytime BS4142 Assessments on Southern Elevation

Description	BS4142 Assessment (Daytime, 1 hour period)
Specific noise level at housing	$40dBL_{Aeq, 1hour}$
Rating level (+5dB for character)	45dB
Background	$40dBL_{A90}$
Excess of rating over background	+5dB
Likelihood of complaints based on BS4142	At a level were the likelihood of complaints would be marginal

6.31 As identified in Table 8, the resultant noise levels generated by the worst case usage of the area to the sound of the Mill Pond during a worst case hour, would be below levels were the likelihood of complaints is a marginal situation and as such, the noise levels should be considered acceptable.

Night-Time Activities

6.32 As noted above, the only activity in this area which occurs at night is the transportation of goods around the site by fork lift trucks. During the night-time period, BS4142 assesses the noise level over a 5 minute period, therefore, a worst case internal noise level over a 5 minute period has been calculated based level provided in Table 9 above. Assuming that there are only two movements during the 5 minute period the external noise level at the nearest noise sensitive properties has been calculated as 36dB$L_{Aeq, 5mins}$.

6.33 To assess the night-time fork lift truck noise levels in terms of BS4142, a character correction of 5dB has been added to the external noise level, thus, the 'rating' noise level is 41dB$L_{Aeq, 5mins}$. Comparing the "*rating*" noise level to the background noise level of 36dBL_{A90} indicates there will be a difference of 5dB which BS4142 states is of marginal significance.

7.0 MITIGATION MEASURES

7.1 As identified above, mitigation measures are only required to the habitable rooms on the proposed southern boundary of the site, in order to control internal noise levels to due to road traffic noise on Shepley Street during the daytime and plant noise from the Distribution Building at night.

7.2 With regards to road traffic noise, based on the external noise levels at the proposed properties facing Shepley Street, windows to living rooms would need to remain closed and as such alternative means of ventilation would need to be allowed for to provide ventilation when windows are closed. As noise levels are not significant, it has been assumed at this stage that trickle ventilation would be an appropriate means of providing ventilation, however, this will need to be agreed with the Local Authority.

7.2 To achieve the internal noise levels in living rooms in line with WHO guidance standary thermal glazing and standard trickle vents, achieving 28dB$D_{n,e,w}$, would be satisfactory acoustically. Ideally, due to the location of the development, trickle vents would be provided to all habitable rooms to provide background ventilation it the resident chooses to close windows as a result of temporary changes in noise levels.

7.3 With regards to plant noise from the distribution centre, provided that windows to bedrooms were closed and the glazing and the ventilation achieved the performance indicated above, noise levels from this source should be controlled to no greater than 15-20dBL_{Aeq} in the bedrooms, which should be deemed acceptable. However, ideally, Firth Rixson should mitigate the extract fans at source by providing appropriate attenuators.

7.4 Windows can be openable, however, it is important that all seals and associated window framework does not downgrade the required sound insulation performance. This element requires confirmation from the manufacturer.

7.5 In addition, to the sound insulation scheme for glazing and ventilation, it is recommended that the external walls and roofs should achieve a minimum sound insulation performance of

45dBR_w. This would be achieved by standard cavity masonry walls, and a tiled roof with a loftspace including mineral wool insulation.

8.0 CONCLUSIONS

8.1 Noise levels have been measured around the proposed residential site at Shepley Street, Glossop. The site is bounded to the south by Shepley Street, and to the east by the Firth Rixson Metals site. Based on conversations with Peter Hollingsworth of High Peak Council, in addition to a PPG24 assessment of the proposed development site, a BS4142 assessment was undertaken on the potential noise sources which may impact on the proposed housing development, with consideration given to a previous noise assessment undertaken by CTI Environmental in relation to the Firth Rixson site.

8.2 With regards to the previous assessment undertaken by CTI Environmental, this assessment indicated that the predominant noise from the site is due to the Furnace extraction and cooling systems, which are located to the north and the east of the main building, as indicated on Figure 2. The only concern as far receptor susceptibility to noise was with regards to residences on Hope Street and Water Street. These locations are situated directly to the north of the main Firth Rixson building some 40m away and the proposed housing will be situated some 180m away. As such, noise levels from these sources will be significantly lower at the proposed housing. In addition to this, during AEC's measurements, noise from the main building was not audible at any point. Based on this, with regards to historical complaints regarding noise, these would not apply to the proposed site.

8.3

8.4 Based on the measured daytime noise levels from road traffic on Shepley Street these properties fall in to NEC B. Therefore, mitigation measures are required in order to control internal noise levels in the living rooms of these properties

8.5 In relation to the Firth Rixson Metals site, BS4142 assessments were undertaken on the building services plant serving the Office Block and the Distribution Building and of activities undertaken in the area to the south of the Mill Pond.

8.6 The BS4142 assessment indicates that mitigation measures are only required to control break in noise to the bedrooms on the southern boundary of the proposed site.

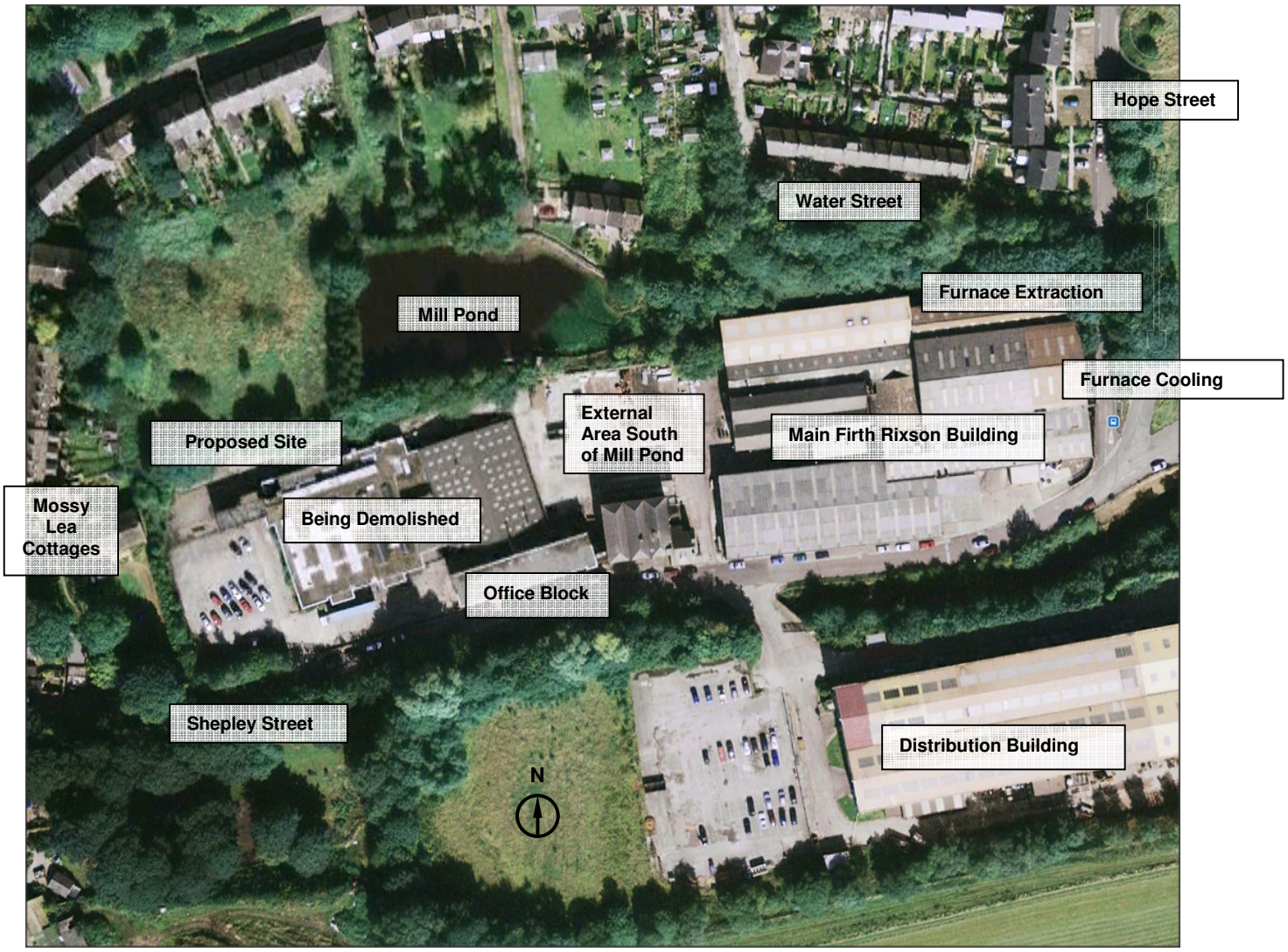
8.7 A sound insulation scheme, relating to appropriate glazing and the provision of appropriate ventilation to allow windows to be kept closed in the habitable rooms on the southern boundary, during both the day and night-time periods. The required acoustic performances are presented in section 7.

8.8 The external daytime noise level in the rear garden due to industrial noise would be below AEC's suggested noise level limit of 50dBL_{Aeq}. All the gardens on the proposed site will be screened from road traffic on Shepley Street.

8.9 As the above indicates, appropriate planning conditions can be set to adequately control internal noise levels in the proposed properties.

FIGURE 1 – Proposed Site Plan Showing Monitoring Locations

FIGURE 2 – Existing Site Plan



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APPENDIX A – Acoustic Terminology in Brief

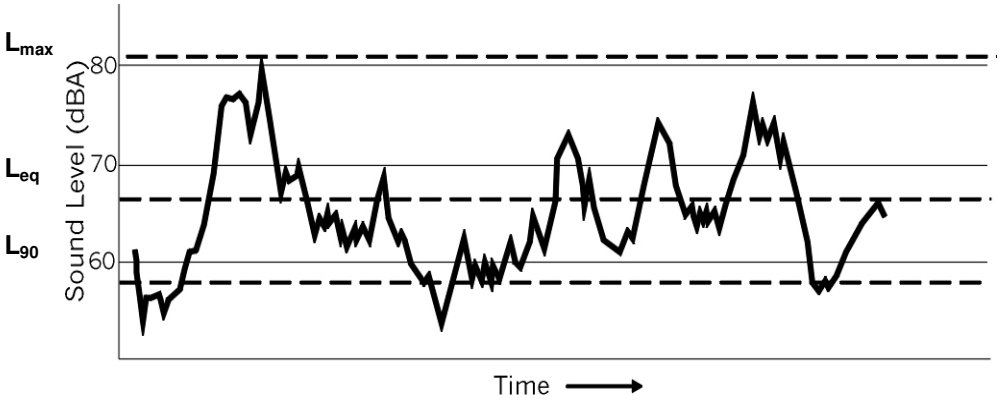
Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz *(Hz)*, that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discreet frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA,* normally used to assess the effect of noise on people. The dBA weighting emphasises or reduces the importance of certain frequencies within the audible range.

Noise Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the noise.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of noise can be described by several different levels. The most common of these are described below.



Example of Sound Level Varying With Time

$L_{Aeq,T}$	The equivalent continuous (A-weighted) sound level may be considered as the "average" sound level over a given time, T. It is used for assessing noise from various sources including transportation, industrial and construction sources and can be considered as the "ambient" noise level.
L_{A90}	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value used to describe the "background" noise.
L_{Amax}	The maximum (A-weighted) sound level during a measurement period.
Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
R_w	Single number rating used to describe the airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz, when ***measured in a laboratory***.
$D_{n,e,w}$	Weighted element-normalised level difference. Single number rating used to describe the performance of a ventilation unit.

APPENDIX B – Measurement Procedure

Dates & Times of Survey	Tuesday 13 March 2012, 1330 to 1730h Tuesday 20 March 2012, 2300 to 0100h
Personnel Present	*Tuesday 13*: Paul Knowles (AEC) *Tuesday 20*: Ben Tomlin (AEC
Equipment Used	*Tuesday 13*: B&K 2260 Real Time Analyser (AEC Kit 1) *Tuesday 20*: B&K 2250 Real Time Analyser (AEC Kit 3)
Weather Conditions	*Tuesday 13*: 12°C, overcast and calm. *Tuesday 20*: 8°C, overcast and calm.
Measurement Procedure	Ambient and background noise levels were measured at three locations, identified as A to C on Figure 1 and described below.

A – On the edge proposed site in the disused Firth Rixson Metals car park, 5m from the open carriageway.

B – On the eastern boundary of the site, to the north of the mill pond, 60m from the edge of Hope Street.

C – In the middle of the grassy area, 20m from the eastern boundary.

Locations A and C were selected to measure road traffic, general ambient and background noise levels, which were measured in terms of L_{Aeq}, L_{A10}, L_{90} and L_{Amax} (fast response) typically over 5 to 15 minute periods.

All the measurements were taken at a height of 1.5m above ground unless stated and all were free field measurements.

The sound level analysers, which conform to BS EN 61672-12003 *'Electro acoustics – sound level meters - Part1Specifications'* for Class 1 Type Z meters, were in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration.

Measured Data	A summary of the results are presented in Tables B1 and B2.

TABLE B1 – Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}	
A	1353-1408	56.4	58.0	50.3	75.8	Road Traffic on Shepley Street, including HGV and Bus pass bys. During periods of no traffic the noise climate comprises of the river and plant noise from the office block.
	1452-1507	54.0	55.1	50.3	74.1	
	1552-1607	55.1	56.4	50.7	73.5	
B	1414-1429	44.9	47.2	38.8	62.6	Noise from the industrial unit to the south east, distant traffic noise and the occasional distant plane.
	1513-1528	44.0	47.0	39.0	60.0	
	1638-1653	46.3	48.9	40.2	63.9	
D	1431-1446	43.5	45.6	39.7	66.5	Noise from the industrial unit to the east, distant traffic noise and the occasional distant plane.
	1530-1545	45.2	47.9	40.7	57.7	
	1655-1710	46.3	49.1	41.5	59.8	

TABLE B2 – Night-Time Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}	
A	2351-2356	48.2	48.8	47.5	57.7	Noise climate dominated by the river, with a contribution from distant plant.
	2356-0001	48.3	48.6	47.9	58.4	
	0001-0006	48.1	48.4	47.6	58.6	
	0057-0102	48.3	48.8	47.6	59.4	
B	2307-2312	45.1	49.4	37.2	58.0	Noise levels dominated by ducks on Mill Pond
	2312-2317	39.4	42.0	36.2	53.1	Distant plant and the river dominated, with aircraft adding to the noise climate.
	2319-2324	41.4	44.1	36.7	57.8	Distant plant and the river dominated. Maximum due to occasional bang from industrial units.
	0017-0022	42.5	45.7	34.7	60.0	Noise levels due to aircraft, distant plant, and a distant train.
	0022-0027	37.2	38.9	33.7	58.6	Distant plant and the river dominated. Maximum due to occasional bang from industrial units.
	0027-0032	35.7	36.4	34.0	49.4	Distant plant and the river dominated. Maximum due to occasional bang from industrial units.
C	2327-2332	46.5	50.8	36.0	63.8	Noise levels due to aircraft, and distant plant.
	2332-2337	46.7	50.8	36.5	65.1	Noise levels due to aircraft, and distant plant.
	2338-2343	38.0	38.5	35.6	55.3	Noise levels dominated by distant plant only.
	0035-0040	38.9	40.1	35.0	56.4	Distant plant and the river dominated. Maximum due to occasional bang from industrial units.
	0041-0046	37.9	40.3	35.0	55.1	Distant plant and the river dominated. Maximum due to occasional bang from industrial units.
	0047-0052	37.4	37.4	34.8	59.2	Distant plant and the river dominated. Maximum due to occasional bang from industrial units.

APPENDIX C – PPG 24 Guidance

PPG 24 NOISE EXPOSURE CATEGORIES FOR DWELLINGS

NEC	
A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as a desirable level.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example, because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

RECOMMENDED NOISE EXPOSURE CATEGORIES FOR NEW DWELLINGS NEAR EXISTING NOISE SOURCES

NOISE LEVELS[0] CORRESPONDING TO THE NOISE EXPOSURE CATEGORIES FOR NEW DWELLINGS, $L_{Aeq,T}$ dB				
	NOISE EXPOSURE CATEGORY			
NOISE SOURCE	A	B	C	D
Road traffic				
0700 – 2300h	<55	55-63	63-72	>72
2300 – 0700[1]h	<45	45-57	57-66	>66
Rail traffic				
0700 – 2300h	<55	55-66	66-74	>74
2300 – 0700[1]h	<45	45-59	59-66	>66
Air traffic[2]				
0700 – 2300h	<57	57-66	66-72	>72
2300 – 0700[1]h	<48	48-57	57-66	>66
Mixed sources[3]				
0700 – 2300h	<55	55-63	63-72	>72
2300 – 0700[1]	<45	45-57	57-66	>66

Notes

[o] **Noise levels**: the noise level(s) ($L_{Aeq,T}$) used when deciding the NEC of a site should be representative of typical conditions

[1] **Night-time noise levels** (23.0-07.00): sites where individual noise events regularly exceed 82dBL_{Amax}(S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8h}$(except where the $L_{Aeq,8h}$ already puts the site in NEC D).

[2] **Aircraft noise:** daytime values accord with the contour values adopted by the Department of Transport which relate to levels measured 1.2m above open ground. For the same amount of noise energy, contour values can be up to 2dB(A) higher than those of other sources because of ground reflection effects.

[3] **Mixed sources:** this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant.