

3rd November 2010

Lynne Smith
Kimberly Clark
By email

Dear Lynne,

Coleshill Mill Vacuum Pump Attenuators – Post Installation Noise monitoring Results

Further to the noise survey carried out in the vicinity of the Kimberly Clark site in Flint in June 2010, acoustic attenuation in the form of attenuators have been installed on the vacuum pumps at the Coleshill Mill.

Installation options and specifications for these attenuators were provided by WSP Acoustics in a letter dated 7th July 2010. On the basis of the recommendations within this letter, Kimberley Clark then opted to install separate attenuators on each of the two vacuum pump duct runs, the specifications of which are understood to have been as close as possible to those detailed in the letter report.

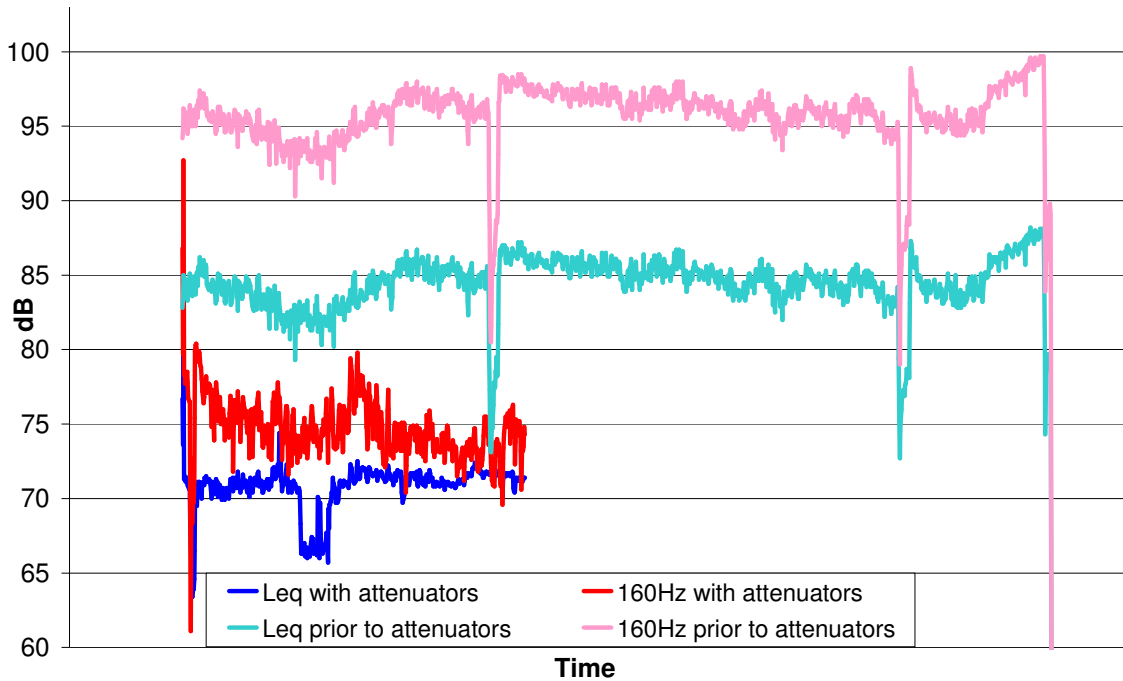
Subsequent to the installation of the attenuators WSP Acoustics has undertaken a further noise survey at the site, with the objective of determining the reduction in noise level that has been achieved at the duct termination point on the roof of the Coleshill Mill.

Due to the directional nature of the noise emanating from the duct terminations, to avoid an unfair comparison of before and after noise levels it was ensured that the microphone location for the second noise survey was the same distance away, and in the same direction away from the duct terminations, as it was during the first survey.

The survey was undertaken over a period of approximately 54 hours, starting at 15:30 on Wednesday 6th October and ending at 21:30.

Following analysis of the frequency distribution measured during the initial survey it was identified that the noise content within the 160Hz centre frequency band was the most prominent. The before and after L_{eq} noise levels measured at the duct termination in terms of both A weighted and 160Hz values, are all shown in **Figure 1** below.

Figure 1: Noise Survey Results for 'before' and 'after' attenuator installation



From the results it is immediately apparent that a reduction in noise levels has been achieved by the installation of the attenuators. Due to factors such as weather conditions and operational conditions it is somewhat difficult to determine the exact extent to which noise level has been reduced, however the overall values for the respective measurement durations (albeit the latest survey was shorter) are given in the table below:

Scenario	Overall L_{eq}	
	A weighted	160Hz Centre Frequency Band
Before	84.7	96.1
After	71.1	75.6
Difference	-13.6	-20.5
Expected difference	N/A	-12 to -14

The actual measured difference in the noise level of the 160Hz centre frequency band, somewhat surpasses the 12-14dB reduction in performance that was specified. There could be several reasons for this including perhaps the attenuator performing better than was stated or extra performance being gained from the number of bends added to the duct work.

Figure 3 of the original report highlighted that during periods when the occupant of 19 Northop Road reported 'the noise' ('the noise' being that which has been the subject of several complaints) as being present ('on'), there was a noticeable difference in the measured L_{Aeq} and measured 160Hz noise levels at

the property. This difference was generally never more than 10dB. Therefore, with all other things being equal, and assuming that the vacuum pump discharge was the source of this noise, the reduction of around 20dB which has now been achieved should mean that even when 'on', noise in the frequency band centred around 160Hz should be less than the L_{Aeq} , and should therefore be much less noticeable and less likely to give rise to complaints.

Another point to note from Figure 1 is that the two traces (160Hz and A weighted) for the 'before' situation follow each other very closely. Conversely the two 'after' traces do not. This indicates that noise in the 160Hz centre frequency band is no longer as prominent, and that due to the overall drop in noise levels other noises are likely to be contributing to the measured A weighed noise levels.

We trust that the above is clear, however if you have any queries or further questions, please do not hesitate to contact us.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Nick Adamson'.

Nick Adamson
Acoustic Consultant
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