PROPOSED FACTORY EXTENSION AT HAYWOOD AND PADGETT

THE BAKERY, SHAWFIELD ROAD, CARLTON

BARNSLEY, SOUTH YORKSHIRE, S71 3HS

NOISE IMPACT ASSESSMENT

On behalf of:

Haywood And Padgett

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1.0 INTRODUCTION

1.1 Dynamic Response was commissioned by 'David Cooper' from 'Haywood And Padgett' to assess the noise impact from processes and external equipment in relation to a factory extension at 'Haywood And Padgett', The Bakery, Shawfield Road, Carlton, Barnsley, S71 3HS, which will be in close proximity to a number of existing residential dwellings. We understand that this assessment was requested in connection with a planning application proposal which is being prepared by 'S.Lang' from 'Building Design Services, 15 Hunters Avenue, Barnsley, S70 6PL'.

1.2 From a discussion with 'D.Cooper' from 'Haywood And Padgett', we understand that the site operates 24 hours a day. We further understand that proposals are generally to comprise the bridging of two existing buildings on site to form one larger building with an additional small extension adjacent to the existing East and South building facades.

1.3 In relation to noise generating activities within the proposed extension areas, we understand that the following processes/equipment will be in the relevant areas.

- Existing warehouse space furthest East and new build extension directly East – To be converted into a new bakery/oven line similar to existing baking/oven lines in the main complex.
- New build extension adjacent to the existing Southern building façade – To be used as storage only with gas powered forklift trucks operating.
- New build extension/bridged section between the existing two buildings – To be used as storage only with gas powered forklift trucks operating.
- 2 No. external flour storage silos – To be installed adjacent to the existing Southern building façade.

1.4 We have not been made aware of any exhaust, extraction or ventilation systems in relation to the proposed development therefore this has not been included in this assessment.

1.5 The nearest likely to be affected existing residential dwellings are believed to be directly East of the site boundary at an approximate distance of 38m being that of properties at 'Fylde Close', and South East of the site boundary at an approximate distance of 130m being that of properties at 'Preston Way'.

1.6 From a conversation with the Local Authority involved, We understand that any noise break-out due to activities on the site should be assessed against British Standard 4142: 1997, 'Method for Rating

industrial noise affecting mixed residential and industrial areas', and achieve a combined target rating level of no more than +5 dB above the existing background $L_{A90,}$.

1.7 The assessment has included:

- An inspection of the site and surroundings;
- Carrying out a background noise survey at positions deemed representative of the nearest residential dwelling(s);
- Assessing the noise impact by reference to the relevant British Standards in accordance with BS 4142 : 1997;
- Providing recommendations for any additional noise mitigation measures, if possible/necessary.

1.8 Noise levels referred to in this report have been rounded to the nearest whole decibel (dB), with exception to any calculations where deemed applicable, as fractions of decibels are imperceptible.

2.0 BACKGROUND NOISE LEVEL SURVEY

2.1 Measurements of the existing background noise climate were carried out adjacent to the nearest existing residential dwellings at 'Fylde Close' and 'Preston Way' during the daytime on Friday 28th October 2011 between 12:00 – 13:00 and 13:10 – 14:10 hours, and during the night-time on Friday 28th/Saturday 29th October 2011 between 02:50 – 03:50 and 04:00 – 05:00 hours.

2.2 The background noise levels were measured over 4 no. 15 minute periods and included octave band level analysis. The noise measurements were recorded using a Norsonic NOR-140 Type 1 Sound Level Meter (Serial No. 1403571) at a height of approximately 1.2m above ground level. The calibration level of the meter was checked before and after the surveys with a Norsonic Type 1251 sound calibrator (Serial No. 31829) with no variation in level observed.

2.3 The weather conditions for the survey were dry, warm and with a light breeze for the daytime measurements, and dry, cool and with a light breeze for the night-time measurements.

2.4 It was noted that during these measurements of the background noise, the dominant noise source was mainly from industrial activities believed to be from 'Carlton Industrial Estate', although there was transport noise audible from nearby transportation links.

2.5 The results of the background noise survey are detailed in Appendix II and are summarised in Table 1.

Table 1: Existing Ambient Noise Levels

Time (Hours)	Noise Levels, dB			Measurement Location
	L_{Aeq}	L_{A90}	L_{Amax}	
12:00 – 13:00	49	46	58	At Nearest Residential Dwelling 'Fylde Close' At Approximately 38m From 'Haywood & Padgett Boundary'
04:00 – 05:00	43	41	60	
13:10 – 14:10	41	39	51	At Nearest Residential Dwelling 'Preston Way' At Approximately 130m From 'Haywood & Padgett Boundary'
02:50 – 03:50	39	38	54	

2.6 Therefore, the lowest existing background noise levels were 41 dB L_{A90} at 'Fylde Close' and 38 dB L_{A90} at 'Preston Way'.

3.0 INDUSTRIAL/FIXED PLANT NOISE LEVELS

3.1 Although the exact equipment which will be installed within the proposed extension is not known at this stage, it is proposed to be a bakery/oven line virtually identical to the existing bakery/oven line already in use within the factory. Therefore, by measuring the existing noise levels generated by processes within the existing bakery, it should be representative of the likely noise generated in the proposed extension areas. Similarly, as we understand that the remaining other building extensions are to be used as storage only, by surveying the existing forklift trucks whilst operating internally, this should produce noise levels representative of the proposed usage for these storage areas. This means that we were able to take short-term measurements of noise within each internal manufacturing/processing zone and/or area to represent the noise levels for use within this assessment.

3.2 With regard to external plant, we further understand that the only external plant to be installed externally is that of 2 no. additional flour storage silos with an external pump mounted at ground level, again which are to be identical to existing silos. Therefore, we were able to survey the noise produced by them.

3.3 The proposed bakery/oven line and external flour silos can be seen in images 1 to 4 below, continued overleaf.



IMG-1



IMG-2



IMG-3



IMG-4

3.4 In order to represent a worst case scenario, the highest noise level recorded from the bakery/oven line has been used in this assessment. In addition, during the site visit, the only audible noise from the flour silos was due to an external pump at ground level rather than noise from the silos themselves.

3.5 The results of our noise survey for the proposed equipment which will be used on site can be seen in Table 2 below.

Table 2: Typical Noise Levels – Frequency Spectra

Noise Within Or Item	**Sound Pressure Level (dB_{Leq}) @ Octave Band Centre Frequency (Hz)**								**dB(A)**	**dB L_{Amax}**
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**		
Bakery/Oven Line Dough Mixing – Maximum Level Recorded	66	72	74	77	76	78	76	70	**83**	**94**
Forklift Trucks Managing Storage	83	71	64	65	63	70	57	51	**73**	**83**
External Flour Pump At Approximately 1m Distance	66	63	74	81	81	77	78	78	**86**	**89**

3.6 The noise levels as seen in Table 2, have been used as the basis for our noise impact assessment, as outlined in Section 4.0.

4.0 ASSESSMENT & RECOMMENDATIONS

4.1 We understand that the Local Authority requires any assessment at the site to be in accordance with the requirements of British Standard 4142 'Method for rating industrial noise affecting mixed residential and industrial areas', 1997.

4.2 BS 4142 requires the noise from the equipment (in L_{Aeq}) to be compared with the background noise level (L_{A90}) in the absence of any machine noise. A correction to obtain the 'Specific Noise Level' is sometimes necessary along with a 5 dB 'acoustic feature' penalty, which is added for any machinery that gives rise to sudden peaks of noise or discrete tones to obtain the 'Rating Level'.

4.3 British Standard 4142 states that if the rated noise level exceeds the L_{A90} background noise level by 10 dB or more, then complaints would be likely. An excess of 5 dB over the background noise level is viewed as being 'of marginal significance'. A noise rating level of 10 dB below the background noise is a positive indication that complaints will be unlikely.

4.4 In order to represent a worst case scenario, it has been considered that any part of the factory extension could be operational 24 hours a day and therefore should be assessed against the lower existing background levels that of 41 and 38 dB L_{A90} respectively.

4.5 We understand that all newly constructed and existing external walls and floors will generally comprise an approximate 0.7mm steel skin, 100mm rigid insulation with a minimum 33 Kg/m^3 density, and another 0.7mm steel skin.

4.6 The acoustic performance of the building elements above have been calculated using a software package called 'Insul' which is usually accurate to within +/- 3 dB.

4.7 Using the proposed building constructions from Section 4.5, assuming that all fire doors/doors are kept closed during activities/processes and that there is no glazing or holes/gaps present, and ignoring workmanship defects, we have calculated the resultant noise level, as seen in Table 3 overleaf. The external plant equipment has also been included in Table 3.

Table 3: Predicted Resultant Noise Levels From Noise Break-out

Noise From	@ Fylde Close Building Facades	@ Preston Way Building Facades
New Bakery/Oven Line	34 dB @ 55m	27 dB @ 165m
Extension Formed By Bridge Between Existing Buildings – Used As Storage Only	21 dB @ 140m	19 dB @ 165m
Extension Formed By New Build Adjacent To Southern Building Façade – Used As Storage Only	21 dB @ 110m	16 dB @ 165m
External Silo Pump	45 dB @ 110m	41 dB @ 170m

4.8 The results of the calculations show that the external 'Pump' unit will still require further mitigation advice as, if the acoustic feature correction of +5 were to be added, the resultant noise levels would be considerably above the existing background L_{A90} level. In order to reduce the noise output from the 'External Pump', we would recommend that an acoustic fence/barrier be constructed around the unit leaving a 0.5m air space between the fence/barrier and the 'Pump' unit. Such an acoustic fence/barrier should be around the entire perimeter and extend 3.5m above ground level. Based on these details, we have calculated that the acoustic fence/barrier should provide an additional 13 dB of screening, thus the resultant noise levels being 32dB @ 110m, and 28 dB @ 170m. If wood is considered for constructing the barrier, we would recommend that it should be a minimum 30mm thickness and have a minimum mass/unit area of 28Kg/m^2. It is important to make sure that there are no holes or gaps in the fence as this would reduce the predicted acoustic performance.

4.9 The combined noise level at both residential facades based on the calculated noise levels can be seen in Table 4 overleaf.

Table 4: Final Predicted Resultant Noise Levels

Noise From	@ Fylde Close Building Facades	@ Preston Way Building Facades
New Bakery/Oven Line	34 dB @ 55m	27 dB @ 165m
Extension Formed By Bridge Between Existing Buildings – Used As Storage Only	21 dB @ 140m	19 dB @ 165m
Extension Formed By New Build Adacent To Southern Building Façade – Used As Storage Only	21 dB @ 110m	16 dB @ 165m
External Silo Pump	32 dB @ 110m	28 dB @ 170m
Combined	36 dB(A)	31 dB(A)

4.10 If the 5 dB 'acoustic feature' correction is now added to the resultant levels to allow for any start-up noise, tonal noise or discrete peaks of noise, then the resultant noise levels become as seen in Table 5.

Table 5: Assessment to British Standard 4142 : 1997

Location	Specific Noise Level $L_{Aeq(1\ hour)}$	Acoustic Feature Correction	Rating Level	Background Noise Level $L_{A90(1\ hour)}$	Excess Of Rating Level Over Background Noise Level
'Fylde Close' At Most Noise Sensitive Time	36 dB	+5	41 dB	41 dB	0
'Preston Way' At Most Noise Sensitive Time	31 dB	+5	36 dB	38 dB	-2

4.11 Therefore, the Local Authority requirement of a maximum +5 dB above the existing background L_{A90} should be achievable based on the sound insulation specifications.

4.12 Although the calculations above demonstrate that noise breakout due to the individual building facades should be acceptable in relation to the existing background L_{A90} levels, it will be necessary to address the

entrance/exit areas of the factory affected by noise generating processes. Our calculations above are based on any access door be it fire/access or roller shutter door as seen in proposed drawing number S/3/3 dated August 2011, having a minimum sound insulation reduction as seen in Table 6.

Table 6: Required Access Door Sound Reduction Index (SRI) – Frequency Spectra

Sound Reduction Index (SRI) dB @ Octave Band Centre Frequency (Hz)								
63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	
9	12	13	14	16	18	24	26	**dB**

4.13 In addition, all doors separating internal areas should have automatic door closers fitted to reduce noise transference into other areas potentially leading to noise break-out. It should be noted that all separating doors should also have the appropriate door seals fitted, and any seals should be in good working order/condition.

5.0 SUMMARY AND CONCLUSIONS

5.1 Dynamic Response has carried out a noise impact assessment on behalf of 'D.Cooper' at Haywood And Padgett, The Bakery, Shawfield Road, Carlton, Barnsley, S71 3HS, in connection with a planning application.

5.2 This has involved carrying out a background noise survey at the nearest likely to be affected existing residential properties, the measurement of noise generating noise sources, the prediction of the resultant noise levels which could be likely to affect existing nearby residents, and an assessment of the noise impact in accordance with British Standard 4142: 1997, 'Method for Rating industrial noise affecting mixed residential and industrial areas', in conjunction with the Local Authority's requirements.

5.3 Based on the noise levels within this report which were recorded during the survey, the noise impact assessment demonstrates that provided the noise mitigation scheme in the report is implemented, the noise generated from noise break-out and proposed external plant equipment at 'Haywood And Padgett' should be able to meet the Local Authority criteria of no more than +5 dB above the existing background L_{A90}, in accordance with BS 4142 : 1997. However, as the exact equipment to be installed is not known at this juncture, we would recommend that the manufacturer noise data details be checked against those used in this report to ensure the noise levels will not be higher than those used as a basis for this assessment.

5.4 Attention to detail is vital with any works to soundproof a building and care must be taken to seal any holes or gaps in the construction with the appropriate acoustic mastic or similar. Failure to do this may result in the predicted noise reduction not being achieved.

APPENDIX I – NOISE UNITS AND INDICES

dB

The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. When measuring sound (or noise) levels, it usually ranges from 0 dB (the threshold of hearing) to 140 dB (the threshold of pain).

dB(A)

Are decibels measured using a sound level meter using a frequency rating which relates sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) generally agree with peoples assessment of loudness.

Hz

Is a unit of frequency which is equal to one cycle per second. The frequency is related to the pitch of a sound.

L_{Aeq}

This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period.

L_{Amax}

This is the maximum A-weighted noise level that was recorded during the monitoring period.

L_{A10}

Is the A-weighted noise level exceeded for 10% of the measurement duration (T).

L_{A90}

Is the A-weighted noise level exceeded for 90% of the measurement duration (T) and is generally used to define the background noise level.

SEL

This is the ‘sound exposure level’ of a single event (such as a passing train) and is the L_{Aeq} value of the whole event normalised to a 1 second period level of a sound.

APPENDIX II – RESULTS OF NOISE SURVEYS

Dates: Friday 28th/Saturday 29th October 2011

Equipment: NOR-140 Type 1 Sound Level Meter (Serial No. 1403571)

Weather: Dry, Warm and with a light breeze (Daytime)
Dry, Cool and with a light breeze (Night-time)

Measurement Location(s): At Representative Residential Dwelling Position, See Below

Table A1: Background Noise Levels

Location	Time	L_{Aeq}	L_{A90}	L_{Amax}	Comments
At Nearest Residential Dwelling 'Fylde Close' At Building Façade. Access Made Available Due To Adjacent Public Footpath @38m From Site Boundary	12:00 – 12:15	48.5	45.8	57.8	Dominant Noise From Nearby Industrial/Commercial Premises And Activities Occurring. Some Transport Noise Audible Although At A Reduced Rate During The Night-time Periods. N.B. Some Rustling Leaves Due To Overhead Trees
	12:15 – 12:30	48.7	44.8	56.7	
	12:30 – 12:45	49.0	46.6	56.8	
	12:45 – 13:00	49.2	47.4	55.3	
	04:00 – 04:15	41.8	40.5	60.2	
	04:15 – 04:30	42.4	40.6	50.0	
	04:30 – 04:45	43.4	41.8	55.2	
	04:45 – 05:00	43.0	41.7	54.2	

Location	Time	L_{Aeq}	L_{A90}	L_{Amax}	Comments
At Nearest Residential Dwelling 'Preston Way' At Building Boundary. @130m From Site Boundary	13:10 – 13:25	41.2	39.8	47.3	Dominant Noise From Nearby Industrial/Commercial Premises And Activities Occurring. Some Transport Noise Audible Although At A Reduced Rate During The Night-time Periods.
	13:25 – 13:40	40.6	38.7	50.7	
	13:40 – 13:55	41.7	39.8	50.8	
	13:55 – 14:10	41.3	38.6	51.0	
	02:50 – 03:05	39.2	37.8	50.6	
	03:05 – 03:20	39.0	37.7	48.8	
	03:20 – 03:35	39.6	37.8	48.5	
	03:35 – 03:50	38.9	37.6	53.9	