

Holly Lane, Landywood. Design Note dated 15/06/2023.

Introduction.

A meeting between John Jowitt of PJ Planning, Adrian McCordick of Hoare Lea Acoustics, and Helen Benbow and Philip Edge of South Staffordshire Council was held on the afternoon of Thursday 15th June 2023.

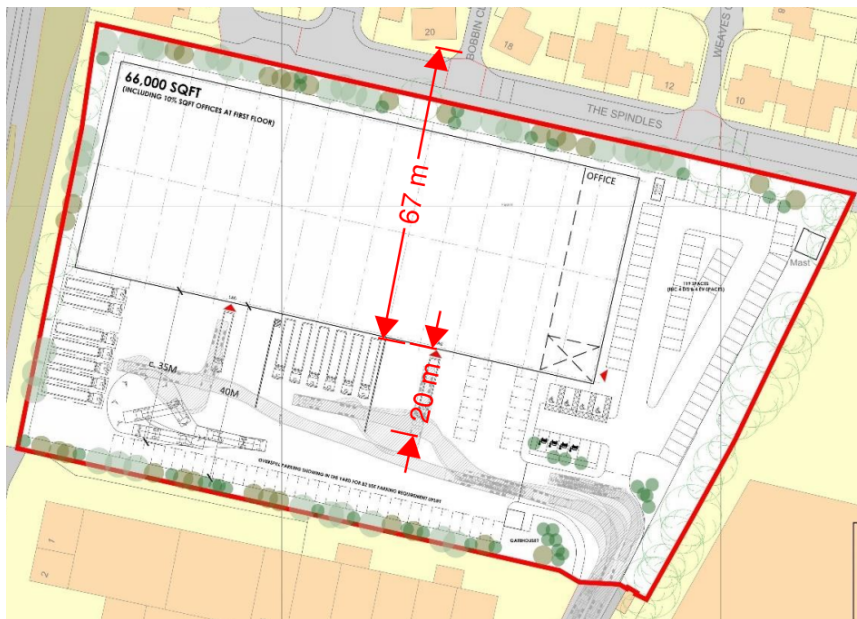
Two areas of concern were raised by the council as detailed below:

- Noise from the service yard to the third floor windows on dwellings at The Spindles to the north.
- Noise from vehicles manoeuvring along the access road on dwellings at The Spindles to the north.

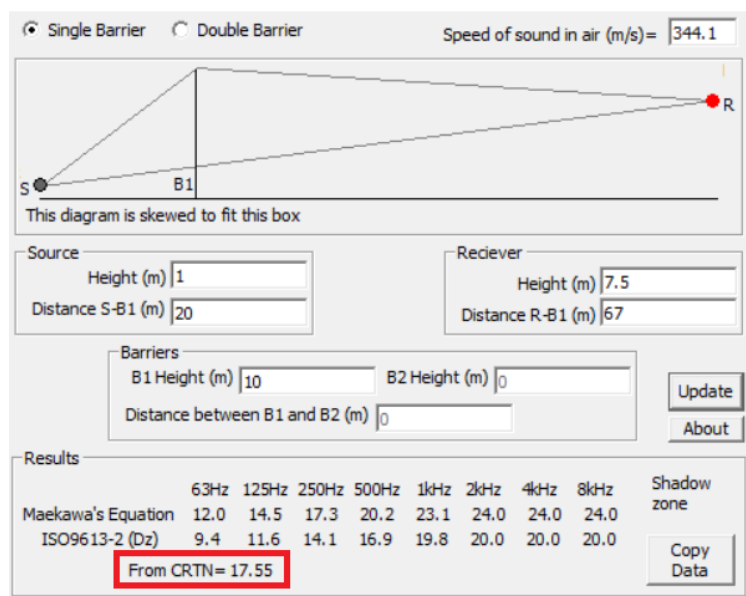
Additional information on both of these items is provided below.

Noise from the Service Yard on dwellings to the north.

Section 7.3 of the submitted noise report states, '*The service yard will be screened from the dwellings to the north by the building and the path difference over the building is in excess of 1m which would provide a screening effect of 15dB for these dwellings.*'



The calculation to determine the level of barrier absorption provided by the building itself in accordance with the principles of the Calculation of Road Traffic Noise (CRTN: 1995) can be summarised in the sketch below.



Single Barrier Double Barrier Speed of sound in air (m/s) = 344.1

This diagram is skewed to fit this box

Source
Height (m) 1
Distance S-B1 (m) 20

Receiver
Height (m) 7.5
Distance R-B1 (m) 67

Barriers
B1 Height (m) 10 B2 Height (m) 0
Distance between B1 and B2 (m) 0

Update
About

Results

	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Shadow zone
Maekawa's Equation	12.0	14.5	17.3	20.2	23.1	24.0	24.0	24.0	
ISO9613-2 (Dz)	9.4	11.6	14.1	16.9	19.8	20.0	20.0	20.0	
From CRTN = 17.55									

Copy Data

For the purposes of assessment, the noise source height (vehicle engines and reversing alarms), 'S' has been taken to be a height of 1 metre above the ground.

The receiver height, 'R', is the centre of the second-floor windows of the dwellings on the far side of The Spindles at a height of 7.5 metres above the ground.

The height of the building, 'B1' is 10 metres.

The typical distance from the noise source 'S' to the barrier 'B1' is 20 metres.

The distance from the barrier, 'B1' to the receiver 'R' is 67 metres.

The calculated level of barrier reduction provided by the building is 17.5dB.

On the basis of the above, a noise impact assessment conducted in accordance with the principles of BS4142 has been conducted as detailed in Appendix 1 attached to this note.

In summary, with the benefit of barrier screening as provided by the unit as detailed above, the noise impact from vehicle movements and reversing alarms would be 'low' at all times of the day and night.

The assessment indicates that external loading/unloading activities would be a 'low' level of noise impact during day, increasing to a level of 'adverse impact' at the dwellings during the night. As a result, as per the recommendations of the report, it is recommended that this activity should occur only within the workshop building with the door closed during night time periods.

Noise from HGVs on the access road on dwellings to the north.

HGVs will access the site from Holly Lane in the south. Due to the open view of the eastern carpark located to the east of the site, it is considered that nos. 4, 6, 8 and 10 The Spindles will have a direct line of sight to vehicles traveling along this section of road. Once vehicles turn west into the site, they will be screened from view by the unit itself.

The assessment as provided in Appendix 2 attached to this note indicates that, for the lowest background sound levels over a weekend, without additional mitigation measures in place, HGV movement on the access road would achieve a BS 4142 condition of 'low impact' during the daytime, increasing to a level of 'adverse impact' during the night time.

As such, consideration should be made for localised screening in this area in order to reduce noise levels down to a level of 'low impact'.

It is acknowledged that the effectiveness of any such barrier would reduce as vehicles move further to the south. However, as vehicles drive away from the site, the level of distance attenuation will increase.

A method for assessing the level of vehicle noise on the access road would be to split the length of the access road down into a series of smaller segments and assess each segment separately. If 9 segments are taken into consideration, then each segment of the 120m access road will be 15 metres in length, which, on the basis of a vehicle travelling 15 mph, will take 2 seconds to traverse.

A full assessment of the each of the segments above for the more onerous night time period is detailed below with 'A' to 'I' representing each of the segments from 94 metres to 214 metres.

Barrier attenuation has been included on the basis of a 2 metre high fence running along the car park edge of the access road.

Calculation step	A	B	C	D	E	F	G	H	I
HGV movement – $L_{Aeq,T}$ at 10m	68	68	68	68	68	68	68	68	68
On-time correction (2 sec)(2 HGVs)	-23.5	-23.5	-23.5	-23.5	-23.5	-23.5	-23.5	-23.5	-23.5
Distance attenuation (as above)	-19.5	-20.7	-21.9	-22.9	-23.8	-24.6	-25.3	-26.0	-26.6
Barrier attenuation	-10.5	-5.0	-3.5	-2.8	-2.3	-2.0	-1.8	-1.6	-1.5
Specific noise level of HGV mov ^t - L_{Aeq}	14.5	18.7	19.1	18.8	18.4	18.0	17.4	16.9	16.4
Total noise level of HGV mov ^t - L_{Aeq}	27.3								
Noise character correction	3								
Rating Level at residential facade	30.3								
Lowest background level L_{A90}	28								
Difference	+2.3								
BS4142 Assessment	Marginally above 'low impact'								

The calculations above demonstrate that with a 2 metre high fence, the level of noise impact from vehicles travelling along the entire length of the access road will reduce to a level marginally above 'low impact'.

As similar assessment with a range of barrier heights is summarised below.

Barrier Height	Noise Level at Nearest Dwellings, dB	Level Difference, dB	BS4142 Assessment
2.0m	27.3	+2.3	Marginally above 'low impact'
2.5m	26.5	+1.5	Marginally above 'low impact'
3.0m	25.6	+0.6	Marginally above 'low impact'

Notwithstanding the above, it is noted that absolute noise levels from HGVs at the nearest dwellings on The Spindles, without consideration for an additional barrier, are already particularly low when compared with the existing noise climate, and are based upon external noise levels. After allowance for a sound reduction of 15dB for an open window, internal noise levels would be below a level of $L_{Aeq,T}$ 16dB, a level 14dB (25 times) below the BS8233 criteria for night time sleeping. It is considered probable that this level of vehicle noise would not be noticeable over that of noise break-in from general traffic along The Spindles and Gorsey Lane given that late night ambient noise levels are of a similar level and significantly higher for the remainder of the day.

Appendix 1.

HGV movement within the Service Yard.

The nominal centre point of the service yard will be approximately 87m from the nearest residential receptor on The Spindles.

Noise impact from HGV movement will comprise arrival and departure of the vehicle. The vehicle movement will be at low speed and, typically, of the order of 5-10mph. The active length of the service yard is approximately 80m. Given the low speed of movement, the vehicle will operate at low revs at all times. Once parked, the engine is switched off and there is then no noise attributable to the vehicle until it leaves the site.

The assessment is based on the following assumptions:

- The distance between the centre of the service yard and the nearest dwelling is 87m
- eight HGV arrivals and departures occur within any one-hour period during the day
- two HGV arrivals and departures occur within any 15minute period at night
- The duration of vehicle movements is approximately 18sec for each vehicle drive through (80m traverse at 10mph) whilst reversing time is 11 sec (25m reverse at 5mph). Total on-time is 376sec/hr daytime and 58sec/15min at night

Archive measurements have been made of HGV movement at a similar facility and these have been used as a reference source level for this assessment.

The BS4142 impact assessment for vehicle arrival and departure within a single assessment period is set out in the following table:

Calculation step	day – dB	night – dB
HGV movement – $L_{Aeq,T}$ at 10m	68	68
On-time correction	-9.8	-11.9
Distance attenuation – 87m	-23.5	-23.5
Barrier attenuation	-17.5	-16.6
Specific noise level of HGV mov ^t - L_{Aeq}	21.9 (1hr)	19.8 (15min)
Character correction	+3	+3
Rating Level at residential facade	24.9	22.8
Lowest background level L_{A90}	35	28
Difference	-10.1	-5.2
BS4142 Assessment	'Low impact'	'Low impact'

The assessment above indicates that, for the lowest background sound levels over a weekend, HGV movement on the service yard would achieve a BS 4142 condition of 'low impact' for all periods of both day and night time.

It is noted that the night time assessment is based upon two HGV movements in any 15minute period and where there is no HGV activity, there will be no noise impact from this source.

Reversing alarms within the service yard.

There are two types of HGV reversing alarm in common use - tonal (beeper) and white noise. In practice, the white noise device produces a broadband noise output that is less noticeable at distance from the source.

Manufacturer's data indicates that, for tonal alarms, the most common rating level is SWL 96-98dB.

The nearest residential façades to the north are at a distance of approximately 87m from the centre of the service yard where vehicles will reverse into the dock levellers.

For calculation, it is assumed that there will be eight arrivals per hour during the day and two arrivals per 15 mins during the night and the alarm will operate for 11 seconds as the vehicle reverses into the dock.

The assessment for the loudest alarms and impact at the nearest dwellings is as follows:

Parameter	day - dB	night - dB
SWL	98	98
L_{Amax} at 1m	87	87
Distance – 87m	-38.8	-38.8
On time correction	-25.1(1hr)	-19.1(15min)
No of movements	+9	+3
Barrier screening	-17.5	-17.5
Level at dwelling – L_{Aeq}	14.6 (1hr)	14.6 (15min)
Character correction	+5	+5
Rating Level - L_{Aeq}	19.6	16.9
Lowest background – L_{A90}	35	28
Difference	-15.4	-8.4
BS 4142 assessment	'Low impact'	'Low impact'

The assessment indicates that a condition of 'low impact' would be achieved at all times of the day and night time.

External loading activity within the service yard.

The service yard has 2no level access doors where vehicles can be loaded/off-loaded by means of diesel fork lift truck. Noise will be generated by the FLT (engine noise and reversing alarms) and by movement of goods. The southern level access doors are approximately 62m from the nearest dwellings on The Spindles.

Archive measurement data for FLT activity is available for a pallet park at a large industrial site. The measurement data is for 5-minute samples at a nominal distance of 10m from the centre of activity. Activities comprised 2no large diesel fork lift trucks moving steel pallets on the yard area and loading steel pallets onto a HGV trailer. The trucks were fitted with tonal (beeper) reversing alarms which operated throughout and the highest noise levels were generated when pallets were occasionally scraped along the yard during the movement/loading process. The derived mean level over several sample measurements was $L_{Aeq,5min}$ 62.7dB and maximum levels were in the range L_{Amax} 69-80dB.

On the basis of 'worst case' assessment, it is assumed that loading/unloading operations are continuous for a one hour period during the daytime and for any 15minute period at night. The following calculation is for the level access door at the western end of the service yard which is nearest to the dwellings at an approximate mean distance of 120m.

Calculation step	day - dB	night - dB
Source level – $L_{Aeq,T}$ 10m	62.7	62.7
Distance correction – 62m	-15.8	-15.8
Barrier screening	-17.5	-17.5
Level at dwelling - L_{Aeq}	29.4	29.4
Noise character correction	+5	+5
Rating Level at residential façade - L_{Aeq}	34.4	34.4
Lowest background level L_{A90}	35	28

Difference	-0.6	+6.4
BS4142 Assessment	'Low impact'	'Adverse impact'

The assessment indicates that external loading/unloading activities would be a 'low' level of noise impact during day, but an adverse noise impact at the dwellings during the night. As a result, it is recommended that this activity should occur only within the workshop building with the door closed during night time periods.

Appendix 2.

HGV movements along the access drive.

The nominal centre point of the access drive from Holly Lane in the south, is approximately 145 m from the nearest residential receptor on The Spindles to the north (nos. 4, 6 8 and 10) with a closest point of 94 metres.

Noise impact from HGV movement will comprise arrival and departure of the vehicle. The vehicle movement will be at low speed and, typically, of the order of 15mph. The active length of the access road is approximately 120m. Given the relatively low speed of movement, the vehicle will operate at low revs at all times.

The assessment is based on the following assumptions:

- The distance between the centre of the access road and the nearest dwelling is 145m
- eight HGV arrivals and departures occur within any one-hour period during the day
- two HGV arrivals and departures occur within any 15minute period at night
- The duration of vehicle movements is approximately 18 sec for each vehicle drive through (120m traverse at 15mph). Total on-time is 144 sec/hr daytime and 36 sec/15min at night

Archive measurements have been made of HGV movement at a similar facility and these have been used as a reference source level for this assessment.

The BS4142 impact assessment for vehicle arrival and departure within a single assessment period is set out in the following table:

Calculation step	day – dB	night – dB
HGV movement – $L_{Aeq,T}$ at 10m	68	68
On-time correction	-14.0	-14.0
Distance attenuation – 145m	-23.2	-23.2
Barrier attenuation	0	0
Specific noise level of HGV mov^t - L_{Aeq}	30.8 (1hr)	30.8 (15min)
Character correction	+3	+3
Rating Level at residential facade	33.8	33.8
Lowest background level L_{A90}	35	28
Difference	-1.2	+5.8
BS4142 Assessment	'low impact'	'adverse impact'

The assessment above indicates that, for the lowest background sound levels over a weekend, HGV movement on the service yard would achieve a BS 4142 condition of 'low impact' during the daytime, increasing to a level of 'adverse impact' during the night time.

Highest levels of noise will be when vehicles travel west into the service yard and as such, consideration should be made for localised screening in this area in order to reduce noise levels down to a level of 'low impact'.

Notwithstanding the above, it is noted that absolute noise levels from HGVs at the nearest dwellings on The Spindles is reasonably low and are based upon external noise levels. After allowance for a sound reduction of 15dB for an open window, internal noise levels would be below a level of $L_{Aeq,T}$ 16dB, a level 14dB (25 times) below the BS8233 criteria for night time sleeping. It is considered probable that this level of vehicle noise would not be noticeable over that of general traffic along The Spindles and Gorsey Lane.

It is noted that the night time assessment is based upon two HGV movements in any 15minute period and where there is no HGV activity, there will be no noise impact from this source.