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Client: JB Architectural Design Ltd
C/O 212-218 London Road
Waterlooville
Hampshire
PO7 7AJ

SITE ADDRESS

Proposed 12 X Bedroom HMO, 8 X Flats & Commercial Use
212-218 London Road
Waterlooville
Hampshire
PO7 7AJ

Date: 26th January 2026

TECHNICAL NOTE TN0064 – 212-218 London Road, Waterlooville

Project: Technical Note assessing delivery Noise to the rear elevation of the scheme

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The purpose of this technical note is to assess the impact (in addition to the detailed NIA prepared) of the delivery noise and associated noise with the petrol filling station to the North of the site.

A planning application is to be made for the erection of 8 x purpose-built dwelling – flats and a 12-x bedroom HMO over 4 floors. The road traffic associated with London Road is the dominant noise source apparent at the site and this can be clearly illustrated in the measured levels.

There will not be any windows on the Northern façade of the building, with all noise sensitive windows either on the front or rear elevation. This technical note will refer to the rear windows, and particularly the noise associated with the petrol filling station located 20m (centre) to the North. The distance of 200m will be used for the calculations, and it is also worth noting that the majority of the noise sensitive windows will be further away than this due to the location of the filling station.

The filling station is open between 0600-2200hrs every day so the only time period whereby it will be open during noise sensitive hours is between 0600-0700hrs, so this is the period used for calculations and possible impact.

Application History:

A noise impact assessment was undertaken between 20th to 23rd November 2025 (Job No: 0064 – Vine Acoustics Ltd) following a pre application response from the local authority. The purpose of this assessment was to determine the impact of road traffic using London Road and the noise associated with the petrol filling station located to the West & North respectfully of the proposed residential scheme.

This assessment monitored the noise in question and provided some mitigation measures for the dwellings.

After submission of this report and subsequent correspondence with the local authority, further detail was requested by the local authority environmental health department – designed to specifically assess the noise associated with the petrol filling station (PFS) located to the North, including fuel pumps, vehicle movement & deliveries.

The noise levels produced from the PFS were measured for a 24hour period during the initial assessment and robust & comprehensive mitigation measures were included within the report – including upgraded glazing to all windows, MVHR with summer bypass fitted to all dwellings facing London Road and possible acoustic trickle vents for windows on the rear elevation.

Detailed calculations have been performed for a typical delivery to a PFS, along with unloading fuel/goods and also direct measurements have been taken at a PFS to offer direct measurements associated with the noise source.

Further to this, historical data has been used for a similar scheme. All of this will be considered during this document, but time corrections will also apply to the noise levels due to the noise sources being operational for a short period of time.

Furthermore, no mitigation measures are possible at the noise source, so the absolute level of sound reduction required to meet both the LA90 values, and the criteria set out in BS8233: 2014 will be included.

Background Noise Levels:

The PFS operates between 0600-2200hrs so the LA90 15min values between 0500-0600hrs on Sunday have been used for this assessment. Therefore, it is anticipated that the noise levels during the majority of the week will actually be higher than those shown below but these have been used as a worst-case scenario.

Time Period	LAeq	LA90
0500-0515	56dBA	41dBA
0515-0530	56dBA	45dBA
0530-0545	56dBA	45dBA
0545-0600	58dBA	48dBA

To account for reflection, a further -3dB acoustic feature correction will be applied so the lowest level during this period was 38dBA.

Please note the increase in levels between 0500hrs to 0600hrs – the LA90 values increase by +7dB, further indication that the site is exposed to high noise levels not associated with the PFS but rather the road networks and the road network is the dominant noise source apparent at the site.

Delivery Calculations – SEL Values:

The Sound Exposure Level (SEL) metric represents all the acoustic energy (a.k.a. sound pressure) of an individual noise event as if that event had occurred within a one-second time period.

Residential Dwellings	Arrival	Reversing	Leaving	
SEL at 10m dB(A)	79	86	79	
No of events	1	1	1	
Distance, m	20	20	20	
Distance correction	-6	-6	-6	
Orientation reduction	0	0	0	
Reference period	1 hour	1 hour	1 hour	
Correction for reference period	-36	-36	-36	
Barrier correction	0	0	0	Total
Total Noise at dwelling	37	44	37	45dB

Table 2 - Delivery Vehicle Unloading – For residential dwelling.

Unloading Noise at 10m, dB LAeq	58
Distance, m	20
Distance correction	-6
Orientation reduction	0
Barrier Correction	0
Time correction, 20mins per hour	-5
Unloading sound level at dwelling	47

Tables 3&4 - Combined delivery arrival, unloading & leaving

Noise Source	1	2	Total
Residential Dwellings	45	47	49dB

1 – Delivery Vehicle Movements

2 – Unloading

Location	Combined Level	Ambient Noise Level	Difference	Req Reduction
Delivery Area	49dBA	53dBA – LAeq 15min value @ 5am 38dBA – LA90 15min value @ 5am	-4dB 11dB	N/A 11dB

The calculation used for this equation is:

$$LAeq(T) = SEL + 10 \log N - 10 \log T$$

where LAeq (T) = Equivalent continuous sound pressure level over time period T

SEL = 'Single Event Level', i.e., the 1 second LAeq which has the same total A-weighted energy as the entire event

N = Number of events in time period T

T = Time period in seconds

It must be reiterated that the mitigation measures can only be applied to the receptor location. The above calculations indicate a sound reduction value of 11dB required to satisfy the above levels at the façade.

Additional acoustic feature corrections can be applied for intermittency (+3dB) and clearly perceptible for impulsivity (+6dB) – then an additional +9dB can be applied to the rating levels, which indicates an overall sound reduction of 20dB being applied to the levels associated with a delivery – using the SEL methodology.

It is unlikely that the noise levels will be tonal at the receptor due to the other noise sources in operation.

For some perspective, the rating levels could be compared to the LAeq values, as shown below. Such a method could be adopted to show the dominant noise source being road traffic and the actual impact of the PFS would be negligible at the residential façade (no windows directly facing the PFS at all).

Combined Servicing Noise Level – Existing Dwellings		49dBA
Background LAeq 15min (0500hrs)		56dBA
Combined BGN & specific		56.79dBA
Increase over BGN		+0.79dB

Change in Sound Level

Change in sound level dB	Change in Power		Change in apparent loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half/ Twice as loud
20	1/100	100	Much Quieter / Louder

The above table is taken from 'Engineering Noise Control' by Mr. D. A Bies & C. H Hansen

Historic Data – LAeq,T & LAmax Values:

The table below illustrates the overall impact of the scheme, using measured data from another site. The time correction equation used to correct the levels in accordance with the reference period is (the actual delivery times of the tanker is unknown but it is assumed it will not be before 0700hrs:

- 10log (duration of event/duration of reference period) in seconds

Event Noise Level (at 10m)						Overall
Arrival		Unloading		Departure		
Duration (mins)	LAeq,T (dB)	Duration (mins)	LAeq,T (dB)	Duration (mins)	LAeq,T (dB)	LAmax (dB)
3	69	20	66	1	72	79

Activity	Resultant Noise Level
Arrival	
Baseline Level	LAeq3min = 69
Distance Attenuation to 20m = $20\log \frac{10}{20} = -6$	LAeq3min = 63
Screening Loss	None – although some may apply
Convert to 1hour = $10\log \frac{180}{3600} = -13$	LAeq 1hour = 50

Activity	Resultant Noise Level
Unloading	
Baseline Level	LAeq20min = 66
Distance Attenuation to 20m = $20\log \frac{10}{20} = -6$	LAeq20min = 60
Screening Loss	None – although some may apply
Convert to 1hour = $10\log \frac{1200}{3600} = -5$	LAeq 1hour = 55

Activity	Resultant Noise Level
Departure	
Baseline Level	$L_{Aeq1min} = 72$
Distance Attenuation to 20m = $20\log_{10}/_{20} = -6$	$L_{Aeq1min} = 66$
Screening Loss	None – although some may apply
Convert to 1hour = $10\log_{60}/_{3600} = -18$	$L_{Aeq1hour} = 48$

Overall Delivery Process	
50 + 55 + 48	$L_{Aeq,T} = 57\text{dBA}$
Acoustic Feature Corrections	+3 Intermittency +6 Impulsivity
Total Rating Level	66dBA
$L_{A90\ 15min}$ 0500hrs	38dBA
Difference	28dB
Sound Reduction Required	-28dBA

Activity	Resultant Noise Level
L_{Amax}	
Baseline Level	$L_{Amax} = 79$
Distance Attenuation to 20m = $20\log_{10}/_{20} = -6$	$L_{Amax} = 73$
Recommended Level at window	45dBA
Difference	28dBA
Required level of sound reduction	-28dB

Vehicle Movements in PFS:

Assuming a receptor distance of 20m from the centre of the PFS. The table below is the source noise for vehicle movements taken on a similar sized site in fair and dry weather. Due to the proximity of the car park and vehicle movements (and car doors closing etc.) a point source equation has been used to establish the noise levels at 20m.

L_{Aeq} level at 2m	Distance propagation (2m to 20m)	Level at 20m	Level of Sound Reduction
65dBA	-20dBA	45dBA	-7dB
L_{Amax} level at 2m			
72dBA	-20dBA	52dBA	-7dB

The L_{Aeq} level above is compared to the $L_{A90\ 15min}$ at 0500hrs, with the L_{Amax} value being compared to the recommended internal level inside the bedroom for L_{Amax} noise.

Further to the above historic data from other PFS, the levels below were measured at a distance of 2m at a filling station of a similar size in Portchester, these have been calculated at a distance of 20m in the absence of any time corrections, again to assume the worst-case scenario.

L_{Aeq} level at 2m	Distance propagation (2m to 20m)	Level at 20m	Level of Sound Reduction
68dBA	-20dBA	48dBA	-10dB
L_{Amax} level at 2m			
79dBA	-20dBA	59dBA	-14dB

Again, the overall level of reduction can be seen in the tables above, if we apply the acoustic feature corrections (+9dB) it gives a total value of 19dB required to meet the L_{Aeq} to L_{A90} sound reduction and 23dB for the L_{Amax} levels.

The L_{Amax} values of a car door closing also need to be considered. The L_{Amax} level for a car door closing is shown below, this has been measured at a distance of 1m and therefore the same calculations can be applied to establish the noise level at 20m (residential façade).

Car Doors L_{Amax} noise

L_{Amax} level at 1m	Distance propagation (1m to 10m)	Level at 20m
74-78dBA	-20dBA	48-52dBA

The calculated level of the car doors closing at 20m is shown as being between 48-52dBA. The noise associated with the closing of car doors should not have an adverse impact on the residential dwellings located to the South.

Wickes superstore is located approximately 45m to the Northeast of the scheme, with the delivery area being approximately 55-60m away and this is screened by 2 x large buildings. It is anticipated that the noise associated with the Wickes store will be negligible at the façade (based on the detailed calculations and rating levels of the noise associated with the PFS which is only 20m with limited to no screening). Noise will decay by possibly up to -30dB assuming a source distance of 2m and receptor distance of between 55-60m and this does not include further reductions to be applied for time corrections and screening.

Residential Amenity Space:

The client will accept a proposal for a 2m high acoustic barrier (such as Jackson's reflective barrier) that has lab calculations suggesting an improvement of 28dB for the ground floor amenity spaces located to the South of the building. Whilst it is accepted that this level of performance is subjective to numerous factors and site specific it is anticipated that such a barrier will offer a high level of sound reduction and therefore achieve a reasonable standard of noise within the ground floor amenity spaces.

The other amenity spaces are located in completely screened locations and therefore will be exposed to much lower noise levels and it is expected that the limits listed in BS8233: 2014 can be achieved in these locations. The areas at 1st floor level are located towards the South of the building, so they are away from the petrol filling station and completely screened from the road noise by the building. They will also have some sort of boundary treatment to ensure privacy when in use which will further reduce the noise impact.

The areas at 3rd floor level will be located in a recessed area, again completely screened from the road traffic, so again it is anticipated that due to the building fabric specification in these locations, a reasonable level of enjoyment can be achieved in these locations.

Building Specifications:

Ventilation

The dwellings facing London Road will be ventilated with an MVHR system with summer bypass. These will ensure the dwellings can be ventilated when the windows are closed.

Make	Model	Type
Vent-Axia	Sentinel Kinetic Plus	Whole House Ventilation
Zehnder	ComfoAir Q350 ST	Whole House Ventilation with Summer Bypass

The MVHR system will have to be located in a location that will not impact on the noise sensitive bedrooms. It could be located in the hallway, cupboards or loft space. It will need regular maintenance so an access panel will be required.

The rear dwellings will be screened from the noise sources and the detailed calculations in both the NIA and this document ascertain a level of 30dB to be installed at the rear, (the lazing can be increased to 32dB) to further illustrate a good acoustic design the client is prepared to fit all noise sensitive rooms on this façade with acoustic trickle vents, some possible products are shown below:

Product	Sound Reduction - open	Sound reduction - closed
RW Simon Acoustic EHA trickle vent	36dB	38dB
RW Simon EHAS trickle vent	38dB	41dB
RW Simon Acoustic FV trickle vent	32dB	40dB
RW Simon Acoustic SL trickle vent	33dB	39dB

Façade Detail

The proposed façade is believed to be something like: - Aggregate block cavity wall, minimum 100mm blocks (minimum density 1350kg/m³), minimum 75mm cavity between leaves, finished with 13mm plaster. This system should achieve a sound reduction of between 50-52dB DnT,w + Ctr 'Code of Practice BS8233: 2014, Page 60 – Table E.1B – Airborne sound insulation of walls and partitions. Also, a cavity wall system comprising of 7N concrete blocks (two separate frames), have a sound reduction of approximately 53dB (predicted weighted sound reduction index values of Celcon Blockwork – from H&H Celcon). The 3rd floor extension will also be constructed in such a way that the minimum levels of sound reduction are achieved.

Windows

The windows for the front elevation will offer a minimum sound reduction of 37dB and the rear will be 30dB (clients will install glazing offering an overall reduction of 32dB). These, in conjunction with the other comprehensive measures, should ensure a suitable internal criterion.

Possible Units	Thickness	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Overall reduction
SG Solaglass 10-12-8.4	30.4mm	28	30	39	44	49	56	42-5 = 37dB
SG Solaglass 10-12-10.4	32.4mm	28	30	39	43	48	58	42-5 = 37dB
SG Solaglass 8-12-10	30mm	23	28	37	37	34	39	36-4=32dB
SG Solaglass 4-6-8.4	18.4mm	27	26	29	39	44	46	36-4 = 32dB

There are many other suitable products, and the client will have to show compliance with the windows before installation, the manufacturer will have the acoustic data for the windows.

Post Installation Acoustic Assessment – Condition:

The client will also accept a post development assessment (pre occupation condition) to measure the internal noise levels within the bedroom at the rear of the development over a 24hr period to ensure compliance with the recommended values for day time and night time. The room to be used can be agreed prior to commencement and the levels submitted to the local authority upon completion of the survey.

The conclusions of this technical note are aligned with those in the NIA – and the level of sound reduction and comprehensive mitigation measures should ensure a reasonable standard of living for the future residents of the scheme.