Technical Note - DC/23/1843 Additional Acoustic Information Following Comments from Horsham District Council

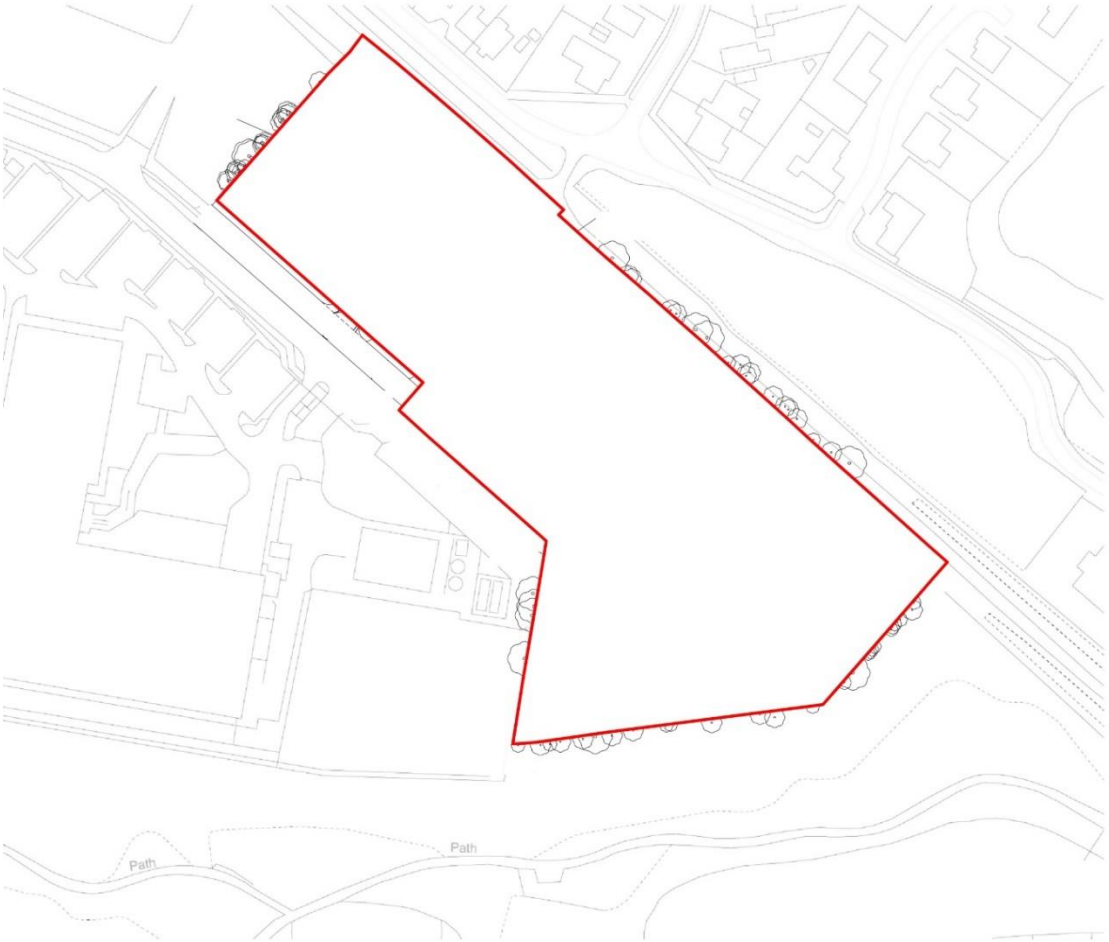
Date: 18th April 2024

Author: Matthew Hyden, Director, BEng, CEng, FIOA;
Reviewed by: Sasha Villa, Director, BSc, MIOA;
Approved by: Gabor Antony, Associate Director, MSc, MIAQM, MIEnvSc.

The Site and Proposed Development

This Technical Note has been prepared on behalf of Chancerygate Horsham Limited and relates to a planning application (DC/23/1843) for the redevelopment of the Former Sony Site, Southwater Business Park, Horsham (the 'Site', see **Figure 1**) located at the Southwater Business Park, Sony DADC UK Limited, Worthing Road, Southwater, RH13 9YT. The proposal is for the demolition of existing warehouse buildings and erection of new single-storey buildings to provide employment units for a flexible range of employment uses (Use Classes E(g)(iii), B2 and/or B8) with ancillary offices, together with associated access road, hard and soft landscaping, cycle parking, car parking, EV charging, service yard, loading bays, site infrastructure and associated works.

Figure 1 - Site Location



Introduction

Following submission of the planning application for the site, a number of comments were received from Horsham District Council (HDC) Environmental Health and Licensing Department in relation to the noise impact assessment. A technical note was produced (ref. 554969.0000.0002 dated 25th January 2024) in response to these comments.

Additional comments were then received from HDC (ref. DC/23/1843). This stated that a number of the original comments had been resolved, but also requested further information.

This technical note has been produced to address these further comments and, where necessary, provide the additional information requested.

The following paragraphs reproduce the comments received and provide the relevant additional information.

Responses to Comments

Comment 1 - N/A

Comment 2

> *We note that further assessment of the on-site activities has been included in 'Response 4' with the impact from mobile plant assessed. This information is welcomed, however in previous comments we mentioned mobile plant as an example of what had not been included previously, not for this to be the only noise source to be subject to additional assessment.*

Response 2

The previous assessments have shown that HGV movements and the use of mobile plant at the site are unlikely to result in adverse noise impacts. This is considered a reasonable assumption of the likely night-time activities at the site.

However, in response to the most recent comments additional noise from unloading has also been included in the noise model. This has been used to carry out an updated assessment of noise impact during the night-time period. Any impacts will be reduced during daytime periods due to higher background sound levels, so assessing the night-time only is considered to represent a worst-case assessment.

Unloading noise has been added to the predictions and is represented in the noise model as follows:

- Source sound power level based on measurements of unloading noise of 60 dB $L_{Aeq,T}$ at 10 metres.
- 25% on time over a 15 minute assessment period.
- Unloading occurring in one location.

As the assessment already includes a 3 dB character correction for 'intermittent' sound, no additional correction is considered to be necessary.

All other aspects of the noise model remain the same as described in the original noise impact assessment and the previous technical note. Therefore, the noise model now includes:

- HGV movements and alarms (2 no.)
- Mobile plant and alarms (2 no.)
- Unloading noise

Assuming all these activities occur within the same 15-minute night-time period, this is likely to represent a worst-case scenario and is considered unlikely to occur in reality.

The results of the updated noise modelling are shown in **Table 1**.

Table 1 - Updated Noise Modelling Results

Residential Receptor	Predicted Rating Level, dB $L_{Ar,15min}$ - Previous Assessment (tech note ref. 554969.0000.0002)	Predicted Rating Level, dB $L_{Ar,15min}$ - Updated Assessment (now including unloading noise)
NSR1 - Bakers Close	35	35
NSR2 - Andrews Lane	27	30
NSR3 - Station Road	<20	<20
NSR4 - Cripplegate Lane	33	35

It can be seen from the table above that the addition of unloading noise results in a slight increase in rating level noise at NSR2 and NSR4. However, all rating levels are at or below 35 dB $L_{Ar,T}$ and are therefore considered to be 'low' (ref. ANC BS 4142:2014+A1:2019 Technical Note and BS 4142:1997)

Furthermore, assuming 13 dB noise attenuation for an open window (ref. IoA / ANC Acoustics, Ventilation and Overheating Guide), it is likely that internal (i.e. inside bedrooms) rating levels would be 22 dB or less, and internal specific sound levels would be 19 dB or less. At these low absolute levels it is unlikely that adverse impacts would occur.

The prediction model now includes 2 HGVs with reversing alarms, 2 forklift trucks with reversing alarms and unloading activities, over a 15-minute night-time assessment period. This is considered to represent relatively intensive work for a night-time period and can be considered a worst case.

Comments 3 - 6

3. We note that the following is stated on page 7 of 'Response 4':

'HGV traffic currently using the Southwater Business Park access road was measured by the project transport consultant in June 2023. It was found that over a week (7 day) measurement period, there were a total of 16 night-time (23:00 to 07:00 hrs) HGV movements on the access road, with no movements occurring at weekends. It can be seen (from Table 3) that the proposed development is likely to result in a negligible increase in overall traffic levels (of 4 cars / LGVs). However, no additional HGV movements are expected at night. The traffic measurements show that in the absence of either the previous site operation or the proposed development there is HGV traffic already using this route (approximately 3 per week night on average), and therefore this is not out of character for the area.'

In response to above - in our view the key comment here is no additional HGV movements are 'expected'. The comments in the technical note are based on a particular pattern of activity that may or may not be representative of actual HGV movements to the site. It is important to note at this stage that it is our understanding that there can be no planning control on the number of vehicles that can access the business park during the night-time hours, if the frequency of servicing were to increase from that predicted or 'expected' then the impacts would also increase. In our view the distribution of noise events associated with HGV movements to and from the site is also important, experience of other sites with extended hours has shown that activity does not occur at regular intervals but tends to intensify in early morning as drivers seek to avoid congestion or commence long distance journeys and at night when vehicles arrive from distant locations.

4. We also note the other comments on page 7:

'It should also be noted that the nearest residential receptor to the Southwater Business Park access road is shown in Figure 3 below. This dwelling is 20 metres from the carriageway edge (and the closest façade of this dwelling is a gable end with no windows). The other buildings close to the access road are either outhouses or commercial in nature (a training centre) and therefore not considered sensitive at night.'

We accept that the building closes to the access road are either outhouses or commercial buildings. The closest residential property is approximately 18m from the carriageway, which in our view is not an insignificant distance, with 1st floor bedroom windows having line of sight to the access road to the business

park. The comment that there are no windows on the gable-end of this building does not, in our view, rule out the possibility of the rear bedrooms of this dwelling being impacted by night-time HGV movements. This section of the technical note also fails to discuss the fact that there are residential properties on Worthing Road in very close proximity to the junction between the access road to the proposed development and Worthing Road. We note the comment Other noise sensitive receptors are either much further away from the access road or closer to Worthing Road where they will already be subject to regular traffic noise during the night-time. Unfortunately we do not agree with this comment - in our view very little traffic is present during night-time hours in this part of our District. Regular HGV movements during the night-time are therefore likely to have a significant impact on residential amenity.

5. All of the above-mentioned residential properties have the potential to be impacted by night-time LGV and HGV movements to the business park.

6. We note the comments on page 8:

'The BS 4142 assessment methodology used for 'on site' commercial / industrial activities does not include the use of LAmax noise levels.
And
In some cases, when assessing the impact of changes in traffic at night-time (particularly when the traffic flow is low and includes HGVs) it may be appropriate to consider LAmax noise levels. However, in this case any changes in traffic using the Southwater Business Park are very small and there are no additional HGVs expected.'

We accept that the BS 4142 assessment methodology does not include the use of LAmax noise levels however, as details above, the comments in the technical note are based on a particular pattern of activity that may or may not be representative of actual HGV movements to the site. We are of the view that there is the potential for HGV movement to increase significantly from what they are currently, we therefore consider it entirely appropriate to consider LA max levels are part of the overall assessment.

Response 3

In summary, the key focus of the above comments is understood to be the potential for adverse impacts as a result of noise from HGVs using Southwater Business Park road (and, to a lesser extent, Worthing Road) to access the proposed site during the night-time. In particular, the comments request that an assessment of maximum noise levels is undertaken.

It is important to note that Worthing Road and the part of Southwater Business Park road that passes the nearest noise sensitive receptors (NSRs) are both adopted highways. The normal method of assessing the noise impact of vehicle using roads on existing dwellings, is to examine 'noise change'. The Design Manual for Roads and Bridges (DMRB) provides guidance on this, including noise criteria to assess the magnitude of impact.

The DMRB short term and long-term impact criteria for changes in road traffic noise level are reproduced in **Table 2** below:

Table 2 - DMRB Noise Impact Criteria

Magnitude of Impact	Short term noise change (dB $L_{A10,18hr}$ or L_{night})	Long term noise change (dB $L_{A10,18hr}$ or L_{night})
Major*	Greater than or equal to 5.0	Greater than or equal to 10.0
Moderate*	3.0 to 4.9	5.0 to 9.9
Minor	1.0 to 2.9	3.0 to 4.9
Negligible	Less than 1.0	Less than 3.0

Guidance on maximum noise levels in residential development to achieve good conditions is included in the 'ProPG - Planning & Noise - New Residential Development' (based on guidance from the World Health Organisation). The ProPG states that:

'Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).'

It is important to note that the ProPG document is intended to be used to assess noise impacts in new residential dwellings, in Section 1.3 the ProPG states:

'The scope of this ProPG is restricted to the consideration of new residential development'

The ProPG is therefore not intended to be used to assess impacts on existing dwellings. The impact of changes in traffic noise on existing dwellings are normally assessed based on a change in traffic noise basis (in line with the DMRB as described above).

It is also important to note that the 45 dB L_{AFmax} criterion of the ProPG is generally agreed to be the 'lowest observed adverse effect level' (LOAEL). Therefore, exceeding these values means adverse effects may occur, but it does not necessarily mean that significant adverse effects will occur.

Notwithstanding the above, in response to the recent comments and acknowledging that Southwater Business Park road currently has a low level of traffic using it, an assessment of L_{AFmax} noise levels at dwellings situated closest to Southwater Business Park road has been undertaken and is described below.

Noise impacts on Worthing Road will be assessed using the standard 'noise change' methodology.

Assessment of HGV Traffic Noise Levels

Existing night-time traffic data for the South Water Business Park road and Worthing Road has been provided by the project transport consultant. This data, in terms of annual average weekday traffic (AAWT) collected using traffic surveys is summarised in the table below.

It is important to note that the proposed site was not occupied / operational during the surveys, and therefore the data below does not include any vehicle movements from the site itself (previously occupied by Sony).

Table 3 - Existing Night-time Traffic Data 2023

Measured Night-time AAWT Traffic (23:00 to 07:00 hrs)					
Southwater Business Park road		Worthing Road, north of junction with Southwater Business Park road		Worthing Road, south of junction with Southwater Business Park road	
Car / LGV	HGV	Car / LGV	HGV	Car / LGV	HGV
8	4	306	35	212	31

Figure 2 below shows the site in relation to Southwater Business Park road / Worthing Road and the nearest noise sensitive receptors (NSRs).

Figure 2 - Site Context



It can be seen from the traffic data in **Table 3** above that there is already a significant amount of traffic using Worthing Road during the night-time period.

Therefore, NSRs located close to this road will already be subject to a significant number of maximum noise events during the night-time as existing vehicles (cars, LGVs and HGVs) pass on Worthing Road. In this type of scenario it is therefore considered that the most appropriate method of assessing potential impacts is to examine the change on traffic noise levels based on guidance in the Design Manual for Roads and Bridges (DMRB).

There are currently only a limited number of vehicles using Southwater Business Park road. Therefore, any new HGVs using this road as a result of the proposed development are more likely to result in a change in the noise environment (i.e. an increase the number of individual night-time noise events) and therefore have more potential to result in adverse impacts. As such, for HGVs using Southwater Business Park road, an assessment of individual noise events (using the L_{AFmax} parameter) has been carried out.

Worthing Road - Assessment of Noise Change

Based on the traffic data in **Table 3**, night-time road traffic noise levels from Worthing Road (with and without HGVs from the proposed development) have been predicted and the potential impact assessed.

As shown in **Table 3** above, the volume of traffic using Worthing Road is below the level where the Calculation of Road Traffic Noise (CRTN) methodology is reliable in predicting traffic noise levels. Therefore, the method outlined in Noise Advisory Council 'A Guide to measurement and Prediction of the Equivalent Continuous Sound Level' document (NAC Guide) has been used to predict noise change. This methodology is similar to CRTN, and allows a basic noise level (L_{Aeq} at 10 metres from the road) to be predicted based on a number of variables including traffic numbers, number of heavy vehicles, speed etc.

The prediction has assumed the following:

- It has been assumed that the development will generate 8 new two-way HGV movements (8 in and 8 out). This is one two-way movement an hour during the night-time.
- It has been assumed that all new HGV traffic will travel to / from the south on Worthing Road (as per the Delivery and Servicing Plan).
- For the purposes of the comparative calculation, vehicle speeds have been assumed as 50 kph and HGV noise source level has been based on NAC Guide '2 axle vehicles > 3000 kg' noise data.

Based on the above calculation it is predicted that the additional 8 two-way HGV movements on Worthing Road will result in a change in traffic noise levels of 0.9 dB $L_{Aeq,8hr}$ over the night-time period.

When assessed against the DMRB impact criteria (reproduced in Table 3) this suggests that noise impacts as a result of additional HGV movements will be negligible in the short term and long term.

Southwater Business Park Road - Assessment of Maximum Noise Levels

The closest NSR to Southwater Business Park road is a residential property, located to the north of the road. The most sensitive part of this dwelling is judged to be the east facing window closest to the road (there are no windows on the gable end and east facing windows are partially screened from Southwater Business Park road and already subject to traffic noise from Worthing Road). This window is approximately 20 metres from the nearside carriageway edge of Southwater Business Park road.

A simple noise modelling exercise has been undertaken to predict L_{AFmax} noise levels at the most sensitive window of the nearest noise sensitive property. This noise model is based on the following input data and assumptions:

- Maximum noise event of a passing HGV represented by a point source[1], at the closest point on the nearside carriage way of the Southwater Business Park road.
- Noise source height of 1 metres above ground
- Sound power level (SWL) of source based on recent measurements of HGVs on an access road at a similar site, of 74 dB L_{AFmax} at 15 metres.
- All ground assumed to be hard
- Noise levels predicted to ground and first floor and highest predicted value used in assessment.

Based on the results of the modelling, noise levels have been predicted at:

- the most exposed façade of the nearest residential NSR;
- inside the NSR with windows closed; and
- inside the NSR with windows open.

To predict internal noise levels it has been assumed that a standard residential façade (standard thermal double glazing / trickle ventilators and masonry façade) will provide at least 25 dB traffic noise reduction from external to internal. It has also been assumed that a partly open window will provide approximately 13 dB of noise attenuation (ref. guidance in the Association of Noise Consultants and Institute of Acoustics 'Acoustics, Ventilation and Overheating Guide' document).

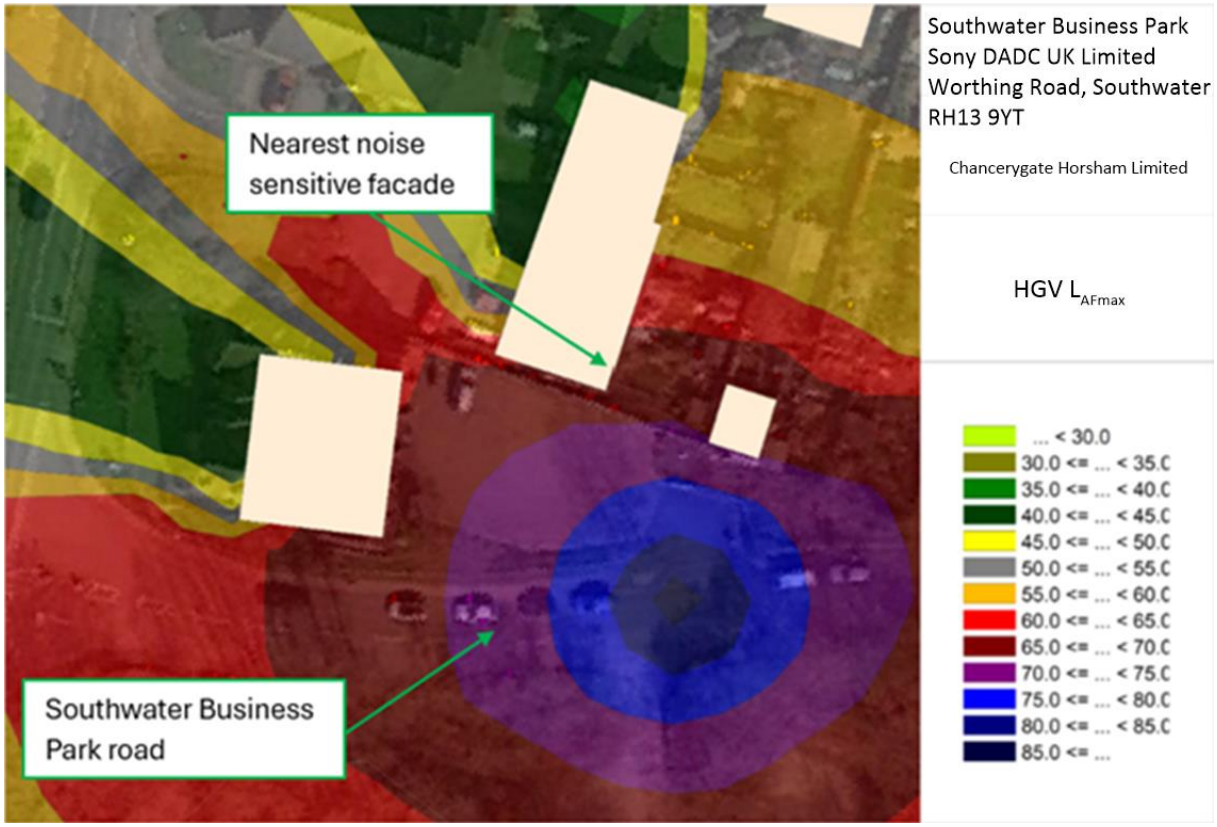
The results of the modelling are presented in **Table 4** below and graphically illustrated in **Figure 3** below.

[1] For L_{AFmax} noise events (0.125 Second time constant) for a relatively slow-moving vehicle, point source distance attenuation is considered appropriate, as opposed to line source distance attenuation that is used for 'normal' traffic noise in terms of 'average' noise in terms of L_{Aeq} or L_{A10}.

Table 4 - L_{AFmax} Noise Modelling Results

Prediction Location	Predicted noise level in dB L_{AFmax}
At nearest noise sensitive façade (free field)	66 dB L_{AFmax}
Inside dwelling windows closed	43 dB L_{AFmax}
Inside dwelling windows partly open	52 dB L_{AFmax}

Figure 3 - HGV L_{AFmax} Noise Map



Maximum noise levels incident on the nearest window of the nearest noise sensitive receptor have been predicted to be 66 dB L_{AFmax}.

It can be seen from **Table 4** above that with windows closed, maximum noise levels from passing HGVs are likely to be below 45 dB L_{AFmax} and therefore comply with the 'good conditions' criteria of the ProPG. At these levels it is unlikely that residents would be subject to adverse impacts at these noise levels, irrespective of how many HGVs used the road.

When windows are open (i.e. to provide relief from overheating), noise levels inside dwellings have been predicted to be approximately 52 dB L_{AFmax}. This is more than the 45 dB L_{AFmax} criteria of the ProPG. However, it is important to note that PRoPG criteria are based on long term noise levels (e.g. year long averages) and that the internal levels predicted above will only occur when windows are open. Therefore, the level of impact will depend partly on the internal noise levels, but also on how often windows need to be opened i.e. to avoid overheating.

It is not possible to estimate how often the residents of the nearest dwelling are likely to need to open their windows. However, one relevant piece of legislation is the Building Regulations Approved Document O 'Overheating'. One of the requirements of Approved Document O is that that '*account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence*'. In relation to this, Approved Document O states that:

'windows are likely to be closed during sleeping hours if noise within bedrooms exceeds… 55 dB L_{AFmax} more than 10 times a night'

Therefore, a new dwelling in this location would be able to rely on open windows, and still meet the noise related requirements of the Building Regulations Part O. This suggests that noise events at these levels would not stop a resident for reasonably enjoying their home, even if more than 10 events occurred.

It is important to note, that this analysis is based on the closest façade of the nearest noise sensitive receptor and therefore other more distant receptors will be subject to lower levels of sound.

It is also important to note, that the dwellings close to Southwater Business Park road are currently only subject to a relatively low number of HGV movements (4 per night on Southwater Business Park road based on recent traffic data). However, this does not include any vehicle movements from the site itself that could, in theory, under the use of the site by Sony, generate unlimited night-time HGV movements.

Summary of HGV Noise Assessment

In summary, the predictions / assessments above have shown that:

- For dwellings close to Worthing Road:
  - noise impacts as a result of an increase in HGV movements are likely to negligible (when assessed against the impact criteria of the DMRB).
- For the dwellings close to Southwater Business Park Road:
  - when windows are closed adverse impacts are unlikely at the nearest noise sensitive receptor.
  - when windows are open it is likely that people can 'reasonably enjoy their home' and therefore significant adverse impacts are unlikely.

Notwithstanding the above, although not considered absolutely necessary (especially as the extant planning permission for the site does not impose limits on HGV movements), it may be appropriate to include some form of limit on the number of HGVs that can access the site at night.

The development can support a total of no more than 8 (equivalent to one per hour) two-way HGV movements per night (e.g. 8 in and 8 out per night) is proposed. This will limit the number of movements that can occur during the night-time period and align with the assumptions used in the assessment of noise impacts on Worthing Road .

This will provide protection for residents (more than the existing planning permission for the Site) against intense use of the Site, but is also unlikely to overly constrain the proposed development, considering the above impact assessment shows that HGV movements are unlikely to result in significant noise impacts.

Additional Information

Based on anticipated operation of the proposed units, it is considered that the smaller units that form part of the Proposed Development (units 1 to 6) are unlikely to require night-time HGV movements and any HGV movements are likely to be associated with the larger Unit 7. This would result in the following requirements for night-time HGV movements.

Table 5 - Example HGV Requirements

Unit	Night-time HGV Movements
1 to 6	No HGVs from 23:00hrs to 07:00hrs
7	Up to 8 two-way HGV movements between 23:00 and 07:00hrs