



MAMHILAD

ENVIRONMENTAL STATEMENT

CHAPTER 11

NOISE



Consultation Draft

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11 Noise and Vibration

11.1 Introduction

- 11.1.1 The Acoustics Team at the Brighton office of RPS Planning and Development (RPS) has been appointed to carry out a noise assessment to accompany the planning application for the proposed mixed use development consisting of residential, employment, a school and community/leisure facilities at Mamhilad, Pontypool and as described in detail in Chapter 2. The site is currently a mixture of greenfield, brownfield and existing commercial buildings and parking, and lies within the administrative area of Torfaen County Borough Council (TCBC).
- 11.1.2 This chapter provides an assessment of the likely noise and vibration effects of the proposed development on existing noise and vibration sensitive receptors (NVSRs). The assessment is based on the Concept Masterplan ref 23286/9700 (see Figure 2.1).
- 11.1.3 This chapter describes the assessment methodology; the baseline conditions at the site and surroundings; the likely environmental noise and vibration effects; and the mitigation measures required to avoid any significant adverse effects and to reduce and minimise any other adverse effects.
- 11.1.4 Noise and vibration effects arising from construction activities associated with the proposed development will be minimal; on this basis, a qualitative assessment has been provided. There are no significant sources of vibration associated with the operation of the proposed development; on this basis, significant operational vibration effects are unlikely and this aspect has been scoped out of the assessment. Noise effects arising from operational plant associated with the proposed development will be controlled by design and condition; on this basis, a qualitative assessment has been provided.
- 11.1.5 The assessment has been undertaken based upon appropriate information on the proposed development provided by the client and its project team. RPS is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. The assessment has been undertaken with integrity, objectivity and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally and lawfully in accordance with the Code of Ethics of the ANC.
- 11.1.6 The technical content of this assessment has been provided by RPS personnel, all of whom are corporate (MIOA) or non-corporate, associate members (AMIOA) of the IOA (the UK's professional body for those working in acoustics, noise and vibration). This chapter has been peer reviewed within the RPS team to ensure that it is technically robust and meets the requirements of our Quality Management System.

11.2 Assessment Methodology

Terminology

- 11.2.1 The study area for the noise and vibration assessment covers the site, the noise sensitive receptors immediately surrounding the site, and the road links for which traffic data has been provided.
- 11.2.2 The assessment considers sources of noise both from construction of the development, and the subsequent operation, with regard to building services and plant etc. Noise changes arising from changes in traffic flows on the surrounding network are also assessed.
- 11.2.3 The methodology for determining the scale or magnitude of an impact is set out below in Table 11.1 to Table 11.3.

Table 11.1 Methodology for Assessing Magnitude – Noise

Magnitude of Impact	Criteria for Assessing Impact
Major	Total loss of or major / substantial alteration to key elements / features of the baseline (pre-development) conditions such that the post development character / composition / attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements / features of the baseline conditions such that post development character / composition / attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss / alteration will be discernible / detectable but not material. The underlying character / composition / attributes of the baseline condition will be similar to the pre-development circumstances / situation.
Negligible	Very little change from baseline conditions. Changes barely distinguishable, approximating to a 'no change' situation.

11.2.4 The magnitude of any adverse noise impact will be determined based on the criteria above, in the context of the activity generating the adverse effect.

Table 11.2: Methodology for Determining Sensitivity

Sensitivity	Example of Receptor
High	The receptor / resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor / resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor / resource is tolerant of change without detriment to its character, or is of low local importance.

11.2.5 Residential properties are considered to be of moderate sensitivity, based on the criteria above. The sensitivity of other NSRs will be determined on a case-by-case basis.

Table 11.3: Effect Significance Matrix

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major	Major - Moderate	Moderate - Minor
Moderate	Moderate	Moderate - Minor	Minor
Minor	Moderate - Minor	Minor	Minor - Negligible
Negligible	Negligible	Negligible	Negligible

11.2.6 The criteria in Table 11.3 will be used to determine the overall effect of any impact. With regards to EIA, adverse impacts of minor or negligible magnitude are not considered significant, provided that they have been reduced as far as is reasonably practicable.

11.2.7 Limitations of the assessment are discussed towards the end of this section.

Construction Noise and Vibration

11.2.8 Noise effects will be assessed with reference to BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 1: Noise'. The Standard provides guidance, information and procedures on the control of noise from construction sites and promotes a 'Best Practicable Means' (BPM) approach to control noise.

11.2.9 Adverse effects due to construction noise associated with this type of development tend to be relatively limited and, in this case, the existing levels of environmental noise at the nearest NVSRs are high due to road and rail transport. Construction noise will therefore be addressed qualitatively on the basis of professional judgement and experience of similar schemes. The potential effects will be determined based on the semantic scale provided in Table 11.1 above.

11.2.10 Vibration effects will be assessed with reference to BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration'. The Standard provides guidance,

information and procedures on the control of noise from construction sites and promotes a BPM approach to control vibration.

- 11.2.11 Vibration from construction activities, particularly piling and vibratory compaction, may impact on adjacent buildings and occupants; however, given the minimum distances to the nearest extant buildings, it is considered most unlikely that adverse effects would occur. Furthermore, it is considered unlikely that percussive piling methods, which have the greatest potential to cause adverse effects, would be used in the construction of the proposed development. Construction vibration will therefore be addressed qualitatively on the basis of professional judgement and experience of similar schemes. The potential effect will be determined based on the semantic scale provided in Table 11.1 above.

Construction Traffic

- 11.2.12 For off-site construction traffic, which will mostly relate to changes in road traffic on the public highway, the change in noise level will be deemed significant if the change exceeds 6 dB(A). Construction traffic will be addressed qualitatively on the basis of professional judgement and experience of similar schemes. The potential effect will be determined based on the semantic scale provided in Table 11.4 below.

Table 11.4: Assessment Criteria – Construction Traffic

Criteria	Description
High	Change in road traffic sound emission $L_{A10,T}$ of more than 20 dB and depending on the context.
Medium	Change in road traffic sound emission $L_{A10,T}$ of 10 to 20 dB and depending on the context.
Low	Change in road traffic sound emission $L_{A10,T}$ of 6 to 10 dB and depending on the context.
Negligible	Change in road traffic sound emission $L_{A10,T}$ of less than 6 dB and depending on the context.

Operational Traffic Noise

- 11.2.13 The DMRB Volume 11, Section 3, Part 7 provides guidance for the classification of magnitude of impact of traffic noise from changes on the road network
- 11.2.14 A change in road traffic noise of 1 dB in the short-term (e.g. when a scheme is opened) is the smallest that is considered perceptible. In the long term, a 3 dB change is considered perceptible. The magnitude of impact is, therefore, considered to be different in the short-term and the long term. The classification of magnitude of impacts used for traffic noise is given in Table 11.5 (short-term) and Table 11.6 (long term). In summary, following the opening of a scheme, people are more sensitive to the immediate change in noise, but over time their sensitivity decreases. These impacts relate to changes in noise due to the permanent operation of the proposed development (not construction traffic).

Table 11.5: Classification of Magnitude of Noise Impacts in the Short-term

Noise Change $L_{A10,18h}$	Magnitude of Impact
0 dB	No change
0.1 – 0.9 dB	Negligible
1.0 – 2.9 dB	Minor
3.0 – 4.9 dB	Moderate
5.0+ dB	Major

Table 11.6: Classification of Magnitude of Noise Impacts in the Long Term

Noise Change $L_{A10,18h}$	Magnitude of Impact
0 dB	No change
0.1– 2.9 dB	Negligible
3.0 – 4.9 dB	Minor
5.0 – 9.9 dB	Moderate
10+ dB	Major

Operational Plant and Deliveries

- 11.2.15 Potential adverse effects due to mechanical plant and deliveries associated with the proposed development will be controlled via condition, and target design criteria will be determined which will state the maximum acceptable noise levels due to plant and deliveries in accordance with BS 4142:2014 'Methods for rating and assessing industrial and commercial sound' and local policy. The potential effect will be determined based on the semantic scale provided in Table 11.7 below.

Table 11.7: Assessment Criteria – Plant and Deliveries

Criteria	Description
High	Difference between Rating Level and Background Level of more than +10 dB and depending on the context.
Medium	Difference between Rating Level and Background Level of +5 to +10 dB and depending on the context.
Low	Difference between Rating Level and Background Level of 0 dB to +5 dB and depending on the context.
Negligible	Difference between Rating Level and Background Level of less than 0 dB and depending on the context.

11.3 Legislative and Policy Context

National and Local Planning Policy

- 11.3.1 National planning guidance on noise is contained within Technical Advice Note (Wales) 11 (TAN 11) (Welsh Government, 1997). This note provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.
- 11.3.2 Tan 11 has been updated by Welsh Government in memo CL-01-15 Updates to Tan 11 Noise - Noise Action Plan (2013-18) Commitments (CL-01-15). Whilst the considerations to be given to noise remain unchanged, supporting legislation and underpinning British Standards have been revised and amended.
- 11.3.3 Planning Policy Wales (Welsh Government, 2016) provides the following introduction to national planning policy with regards to noise (and by implication vibration):

“Noise can affect people’s health and well-being and have a direct impact on wildlife and local amenity. Noise levels provide an indicator of local environmental quality. The objective of a policy for noise is to minimise emissions and reduce ambient noise levels to an acceptable standard. Noise Action Plans, drawn up by the Welsh Ministers in relation to Wales under the Environmental Noise Directive, and the Wales Regulations, aim to prevent and reduce environmental noise where necessary and preserve environmental noise quality where it is good. They are a planning consideration in the use and development of land.”

A noise action plan for Wales 2013–2018

- 11.3.4 A noise action plan for Wales 2013-2018 (Welsh Assembly Government, December 2013) indicates 171 noise action planning priority areas (NAPPA) for road traffic noise in Wales. Two of these NAPPAs lie on the A4042, to the north and south of the Bryntovey roundabout; the southern-most adjacent to the development site. These are areas where Welsh Government has prioritised in planning their acoustic mitigation works (such as Welsh Government’s ongoing commitment to restore road surfaces using quieter structures).
- 11.3.5 The Welsh Government strategy with regards to NAPPAs does not include restrictions to noise-sensitive or noise-generating activities in their vicinity (see section 4.11 of the Noise Action Plan). However, it is considered good practice for the developer to avoid increasing noise in NAPPAs as far as is reasonably practicable.

Consultation

- 11.3.6 An Environmental Impact Assessment (EIA) Scoping Report was provided to TCBC in March 2016.

- 11.3.7 A Scoping Opinion was received in July 2014 from TCBC in response to the Scoping Report which includes comments with regards to noise. It states that:

Noise & Vibration

An update to the previous noise/vibration assessment dated September 2006 will be required. This will require updated baseline noise surveys at the nearest sensitive receptors. Any assessment must be undertaken within the framework of the latest guidance on the assessment of noise and its propagation and should include an assessment of air quality impacts during the demolition and construction phases of the development. The following standards and criteria should be used and referenced:

- 1 *Technical Advice Noise 11 (TAN 11)*
- 2 *The World Health Organisation Guidelines for community noise*
- 3 *BS4142*
- 4 *BS5228*
- 5 *BS8233*
- 6 *The Design Manual for Roads and Bridges (Noise screening assessment)*

- 11.3.8 It is considered that this assessment addresses the above requirements.

Standards and Guidelines

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

- 11.3.9 British Standard (BS) 8233 'Guidance on sound insulation and noise reduction for buildings' [ref] draws on the results of research and experience to provide information on the design of buildings to provide internal acoustic environments appropriate to their functions. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics in non-critical situations.
- 11.3.10 BS 8233:2014 defines a range of indoor ambient noise levels for spaces when they are unoccupied. A summary of the levels recommended in BS 8233:2014 Table 4 for rooms used for resting and sleeping is provided in Table 11.9 below. The levels are for sources without a specific acoustic character. The noise levels defined within BS 8233:2014 are based on guidance published by the World Health Organisation (WHO), discussed below.

Table 11.8: BS 8233:2014 Indoor Ambient Noise Levels in Unoccupied Spaces

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Resting	Living room	35 dB LAeq,16h	-
Dining	Dining room / area	40 dB LAeq,16h	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16h	30 dB LAeq,8h

- 11.3.11 In relation to external noise levels, the second paragraph of 7.7.3.2 from BS 8233:2014 states that:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq,T with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. ..."

British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound'

- 11.3.12 The foreword to BS 4142:2014 provides the following introduction for the assessment of human response to sound:

"Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood."

- 11.3.13 BS 4142:2014 primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development) at residential NSRs. The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
- 11.3.14 The specific sound levels should be determined separately in terms of the $L_{Aeq,T}$ index over a period of $T = 1$ -hour during the daytime and $T = 15$ -minutes during the night-time. For the purposes of the Standard, daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours.
- 11.3.15 BS 4142:2014 states that measurement locations should be outdoors, where the microphone is at least 3.5 m from any reflecting surfaces other than the ground and, unless there is a specific reason to use an alternative height, at a height of between 1.2 m and 1.5 m above ground level. However, where it is necessary to make measurements above ground floor level, the measurement position, height and distance from reflecting surfaces should be reported, and ideally measurements should be made at a position 1 m from the façade of the relevant floor if it is not practical to make the measurements at least 3.5 m from the façade.
- 11.3.16 The commentary to paragraph 9.2 of BS 4142:2014 suggests the following subjective methods for the determination of the rating penalty for tonal, impulsive and/or intermittent specific sounds:
- Tonality*
- For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a rating penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.*
- Impulsivity*
- A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible.*
- Other sound characteristics*
- Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.*
- Intermittency*
- When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. ... If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."*
- 11.3.17 BS 4142:2014 requires that the background sound levels adopted for the assessment be representative for the period being assessed. The Standard recommends that the background sound level should be derived from continuous measurements of normally not less than 15-minute intervals, which can be contiguous or disaggregated. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound level between the shoulder night periods. The accompanying note to paragraph 8.1.4 states that
- "A representative level ought to account for the range of background sounds levels and ought not automatically to be assumed to be either the minimum or modal value."*
- 11.3.18 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level of the specific sound. In the context of the Standard, adverse impacts

include, but are not limited to, annoyance and sleep disturbance. Typically, the greater this difference, the greater is the magnitude of the impact:

- 11.3.19 A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- 11.3.20 A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- 11.3.21 The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- 11.3.22 The significance of the effect of the noise in question should be determined on the basis of the initial estimate of impact significance from the BS 4142:2014 assessment. It is necessary to consider all pertinent factors, including:
- the absolute level of the sound;
 - the character and level of the residual sound compared to the character and level of the specific sound;
 - the context in which the sound occurs; and
 - the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:
- facade insulation treatment;
 - ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
 - acoustic screening.

Guidelines for Community Noise

- 11.3.23 The World Health Organisation (WHO) published guidance on the desirable levels of environmental noise in 2000. In this document, Guidelines for Community Noise (GCN), the authors consider that sleep disturbance criteria should be taken as an internal noise level of 30 dB $L_{Aeq,8hr}$ or an external level of 45 dB $L_{Aeq,8hr}$, measured at 1 m from the façade. It is also suggested that internal L_{Amax} levels of 45 dB and external L_{Amax} levels of 60 dB, should not be exceeded.
- 11.3.24 For daytime levels, it is considered that:
- “To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB L_{Aeq} on balconies, terraces, and outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB L_{Aeq} . Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.”*
- 11.3.25 However, a review of health effects based noise assessment methods undertaken for the DETR by Porter et al in 1998, just before the issue of GCN, it is noted that:
- “Perhaps the main weakness of both WHO-inspired documents is that they fail to consider the practicality of actually being able to achieve any of the stated guideline values.”*
- 11.3.26 The report goes on to state that:
- “around 56% of the population in England and Wales are exposed to daytime noise levels exceeding 55 dB L_{Aeq} and that around 65% are exposed to night-time noise levels exceeding 45 dB L_{Aeq} (as measured outside the house in each case). The value of 45 dB L_{Aeq} night-time outdoors is equivalent to the 1995 WHO*

guideline value of 30 dB L_{Aeq} night-time indoors allowing 15 dB attenuation from outdoors to indoors for a partially open window (for free air ventilation to the bedroom). The percentages exposed above the WHO guideline values could not be significantly reduced without drastic action to virtually eliminate road traffic noise and other forms of transportation noise (including public transport) from the vicinity of houses. The social and economic consequences of such action would be likely to be far greater than any environmental advantages of reducing the proportion of the population annoyed by noise. In addition, there is no evidence that anything other than a small minority of the population exposed at such noise levels find them to be particularly onerous in the context of their daily lives.'

- 11.3.27 Based on the most recent national survey of noise exposure carried out in England and Wales in 2000/2001, the percentage of the population exposed to day and night-time noise levels exceeding the WHO guidelines are 54% and 67%, respectively. The studies indicate that:

"the percentage of the UK population exposed to daytime levels of 55 dB $L_{Aeq,16hr}$ or greater, have decreased since 1990, whilst the percentage of the UK population exposed to night-time levels of 45 dB $L_{Aeq,8hr}$ or greater, have increased since 1990, although this change is not considered statistically significant".

- 11.3.28 Therefore, the levels suggested in Guidelines for Community Noise may be considered more aspirational than immediately attainable.

11.4 Baseline Conditions

Establishing Baseline Conditions

- 11.4.1 Unattended baseline sound level surveys were carried out between 14:40 on 1st September and 18:25 on 7th September 2016 in order to establish the baseline sound levels in the area predominantly from road noise.
- 11.4.2 The unattended long term measurements were made using a Rion NL-52 sound level meter (SLM), a Type 1 SLM with one of the best performing environmental windshields. BS 7445 2:1991 recommends that sound level meters used for the acquisition of data pertinent to land use be preferably Type 1. Data were logged of the A-weighted sound pressure level in 100 ms periods as the A-weighting is used for environmental sound assessment and 100 ms periods enable the data to be post-processed into any suitable time period.
- 11.4.3 LT_1 was positioned on the disused carpark approximately 45 m off the A4042 Usk Road carriageway edge. The microphone was installed at a height of 1.5 m above local ground level and in a freefield location (e.g. at least 3.5 m away from any reflecting surfaces, excluding the ground). At the time of set-up and collection of the survey the main noise sources were road traffic on the A4042.
- 11.4.4 The baseline sound level survey locations are presented in Figure 11.1: Baseline Survey Location.
- 11.4.5 All instrumentation was field calibrated prior to and following the measurements using a Rion NC 74 calibrator and no significant drift was observed between the start and end of the survey. All equipment had been calibrated within the previous two years at the time of the measurements. Calibration certificates are available on request.
- 11.4.6 Weather conditions during the survey period were determined from a portable meteorological station installed near to the noise survey location. During the survey wind speeds were low (ranging between 0.0 and 6 m/s) while daily rainfall accumulation ranged between 0 and 5 mm. Weather conditions appear to have had no effect of the sound measurement data and, therefore, no data have been excluded from the dataset due to wind or rainfall.
- 11.4.7 The L_{Aeq} , L_{AFmax} , L_{A90} and L_{A10} indices have been derived from the 15 minute data for each full period (i.e. 16 hours during the daytime and 8 hours during the night-time).
- 11.4.8 A summary of the baseline survey results is presented in Table 11.10 below for the surveys in location LT1. A chart showing time histories and baseline survey results are provided in Appendix 11.1.

Table 11.9: Baseline Sound Level Survey Results for LT1

Start	Duration (hrs)	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
01/09/2016 14:45	8	62	69 - 76	64	54
01/09/2016 23:00	8	54	64 - 74	56	33
02/09/2016 07:00	16	61	67 - 84	64	55
02/09/2016 23:00	8	52	60 - 75	54	31
03/09/2016 07:00	16	62	68 - 78	65	55
03/09/2016 23:00	8	52	65 - 72	55	36
04/09/2016 07:00	16	59	63 - 82	62	50
04/09/2016 23:00	8	53	62 - 78	54	37
05/09/2016 07:00	16	62	68 - 76	64	54
05/09/2016 23:00	8	54	58 - 78	54	32
06/09/2016 07:00	16	61	67 - 83	63	54
06/09/2016 23:00	8	53	61 - 73	55	32
07/09/2016 07:00	11.5	61	67 - 83	63	55
Average	Daytime	61	63 - 84	64	54
	Night-time	45	58 - 78	47	29

Assessment of Potential Effects

- 11.4.9 The proposed layout includes residential use, employment, community, school and community/leisure facilities. Parking and servicing are also proposed and there is an existing sub-station on the site.
- 11.4.10 Construction of the scheme will involve demolition of some existing buildings and erection of the proposed development. Both the construction/demolition works and associated vehicle movements on the surrounding road network have potential to result in adverse effects within the surrounding area.
- 11.4.11 The area surrounding the site is primarily agricultural in use, with isolated industry/commercial/residential properties.
- 11.4.12 Four isolated properties lie to the south or west of the development area: Ty-poeth Farm, Llanvihangel Pontymoel; Court Farm; and Wern Farm. The nearest two of these are approximately 200m from the application site boundary. Across the A4042 near Pen-y-Lan lie approximately six properties, approximately 40m from the application site boundary. A lane north of the site has approximately three properties, situated between 5m and 40m from the application site boundary.
- 11.4.13 A vacant public house, the Waine-Y-Clare is situated across the A4042 to the south of Bryntovey roundabout.
- 11.4.14 The Monmouthshire and Brecon Canal is an important recreation facility in the local area, and has the potential to have houseboats in residential use, albeit this usage is only likely to be on a temporary basis if so. It lies 160m from the application site boundary at its closest. A sports ground is identified across the A4042, although it is not currently in use.

Representative Sound Levels in the Context of the Locality

- 11.4.15 The main sound source affecting the site was observed to be road traffic, in particular on the A4042 road which runs along the east boundary of the proposed development site. It was for this reason that the survey was carried out at the location along the east side of the site.
- 11.4.16 Based on the baseline measurements, it is considered that the following sound level metrics appropriately describe the current noise environment.
- 11.4.17 At ground floor level, the average L_{Aeq,16h} for LT1 was 61 dB during the day and 53 dB L_{Aeq,8hr} during the night. With regards to rating and assessing the effects of industrial and commercial sound (following BS 4142:2014) at existing and proposed residence, it is considered that levels of 54 dB L_{A90,16hr} daytime / 34 dB L_{A90,8hr} night-time are representative of existing residences' "background" sound environment (with a minimum level of 25 dB L_{A90,15min}). It is considered that these levels are representative of the baseline sound conditions for the existing NSRs nearest the A4042.

11.4.18 For properties away from the A4042, a quieter prevailing noise environment would be expected. From calculation and RPS's inspection of the area, a level of 55 dB $L_{Aeq,16h}$ during the day and 48 dB $L_{Aeq,8hr}$ during the night is considered representative. With regards to rating and assessing the effects of industrial and commercial sound (following BS 4142:2014) at existing and proposed residence, it is considered that levels of 48 dB $L_{A90,16hr}$ daytime / 30 dB $L_{A90,8hr}$ night-time are representative of existing residences' "background" sound environment.

Construction

11.4.19 Temporary noise and vibration impacts are expected to arise during demolition and construction works. The impacts will depend on the contractors working methods, plant utilisation etc. The works are likely to include excavation and piling for new-build elements as well as general demolition and construction works using a variety of plant and equipment.

Construction Noise

11.4.20 Construction traffic will also generate temporary noise impacts. As the proposed development is bounded by busy roads, however, it is anticipated that there is no likelihood of adverse significant effects due to construction traffic.

11.4.21 With suitable mitigation implemented during construction, along with working methods and plant utilisation designed to minimise the noise impacts, it is considered that the magnitude of impact due to construction works can be minimised. Where construction works are limited to the daytime, for NSRs within 40m of extended noisy works (typically, for example, those lasting more than 10 days in 14 days; or 40 days in six months) may experience a moderate adverse impact. Beyond this, NSRs within 100m of extended noisy works may experience a minor adverse impact.

11.4.22 With regards to the proposed development, this would likely result in the existing residential properties immediately to the north of the development experiencing a moderate adverse impact during construction. Residences across the A4042, around Pen-Y Lan would experience a minor adverse impact. It is considered that the nearby residential dwellings are of moderate sensitivity.

11.4.23 This minor impact magnitude would result in a moderate or minor adverse effect on the nearby residential dwellings identified, and a negligible effect beyond.

11.4.24 Provided standard control measures are implemented (though a Contractor's Construction Noise Management Plan or similar), it is considered that the magnitude of impact due to noise arising from construction traffic will be negligible. This is because the residential dwellings are already in close proximity to major roads and therefore the construction traffic will cause little change from baseline conditions. A minor or negligible impact magnitude would result in minor or negligible effects at nearby residential dwellings from construction traffic noise.

Construction Vibration

11.4.25 Construction vibration would rarely be perceptible beyond the perimeter of the site, and would be of minor or negligible magnitude.

11.4.26 Results of the above are summarised in Table 11.11 below.

Table 11.10: Construction Noise & Vibration Effects

Receptors	Sensitivity	Construction Noise	Construction Vibration	Significance
Residential Receptors – Lane north of site	Medium	Moderate	Minor	Moderate Adverse
Residential Receptors – A4042 around Pen-Y Lan	Medium	Minor	Negligible	Minor - Negligible

Operational Noise & Vibration

Mechanical Plant

- 11.4.27 As the proposed development includes employment use and a school, it is likely that HVAC plant will be included within the development and, therefore, noise emissions from mechanical plant must be considered. An existing sub-station area is identified within the application site boundary and this will also have potential to impact surrounding NSRs, although there is no indication that complaint has arisen previously.
- 11.4.28 Noise emissions from new plant will be reduced as far as is reasonably practicable, by means of appropriate plant selection, installation and containment. The plant will be selected, installed, operated and maintained such as to minimise any distinct characteristics of its noise emissions, such as tonal or impulsive content. Any plant in the basement/sub-basement of proposed NSRs shall be controlled such that the sound emissions through either the structure of the building, vents or openings are below a level where a significant adverse effect might occur.
- 11.4.29 In order to ensure that plant noise does not result in any significant adverse effects, either at existing surrounding NSRs or on residents of the new building, it will be necessary to demonstrate that the plant achieves the appropriate standard. Noise effects will be determined using the methodology and guidance in BS 4142:2014.
- 11.4.30 From the proposed layout of the scheme, the areas identified for school or employment use are significantly closer to areas of proposed housing than they are to any existing NSRs. The design and specification of plant to achieve a satisfactory level at proposed housing, therefore, will adequately ensure that no significant adverse effect from plant noise at existing NSRs. As such, the effect of proposed plant can be of no more than minor adverse significance, and in all likelihood will be negligible at existing NSRs.
- 11.4.31 The existing substation is situated 120m from the vacant public house across the A4042. In ensuring that substation noise is satisfactory at the nearest proposed houses (approximately 60m to the southwest), noise levels at the public house will also be ensured to be negligible. There is no indication that the development of the site will significantly increase the nature or magnitude of the substation emissions.
- 11.4.32 The representative background sound level across the site, considered representative of the surrounding residences, was determined to be 27 dB $L_{A90,0hr}$ during the night. Depending on the context and connotation of the sound, a rating level of +5 dB above the representative background sound level might mark the lowest observed adverse effect level; equivalent to a +5 dB rating difference under BS 4142:2014 (an indication of adverse impact, but not significant adverse impact). To ensure that the lowest observed adverse effect level is not exceeded, it is recommended that the rating level from all proposed plant does not exceed the representative background sound level, i.e. the cumulative rating level of the plant shall be designed not to exceed 32 dB $L_{Ar,T}$ at the nearest NSR (existing or proposed). Where possible, plant noise shall be reduced as far as is reasonably practicable.
- 11.4.33 With these measures, an impact of no more than minor magnitude would result. For residential receptors, this would be an adverse effect of minor significance.
- 11.4.34 Where residential properties are proposed within the development, in proximity to proposed plant areas, it is considered that, in protecting these proposed residential areas, all surrounding existing NSRs will also be adequately protected from significant adverse effect.
- 11.4.35 For the above requirement criteria, the rating level $L_{Ar,T}$ may be taken to be equal to the $L_{Aeq,T}$ arising from the plant, provided that no significant tonal or impulsive characteristic are distinct at the receptor. Where tonal or impulsive content is present, a rating correction, as specified in BS 4142:2014 shall be applied and the required $L_{Aeq,T}$ contribution from the plant may need to be between 3 dB and 15 dB lower than the specified rating level.
- 11.4.36 Where plant is proposed within a structure containing a NSR, noise transmitted from plant through the structure of the building shall also be controlled, to achieve appropriate levels as specified in BS 8233:2014. To ensure that plant noise does not significantly contribute to the internal noise environment of the proposed development, it is recommended that any structure-borne noise is limited to 10 dB below the thresholds given in BS 8233:2014 for appropriate internal ambient noise levels for dwellings. Given that plant will

operate both day and night-time and bedrooms are situated structurally near to plant areas, structure-borne noise within these rooms should not exceed 20 dB $L_{Aeq,8hr}$.

- 11.4.37 With particular reference to noise generated by lifts, BS 8233:2014 recommends a maximum noise level of 25 dB $L_{Amax,F}$ for bedrooms; 30 dB $L_{Amax,F}$ for living rooms and 35 dB $L_{Amax,F}$ for other areas.
- 11.4.38 The maximum recommended noise levels within the living accommodation due to lift operation should not exceed the values given in the previous paragraph. These values should be regarded as upper guideline values and every effort should be made in the design of the lift systems and components to minimize noise and vibration at source such that lower levels result in practice. The lift motor and associated equipment should be installed on suitable anti-vibration mountings to prevent the transmission of excessive vibration and/or structure-borne noise to any parts of the living accommodation.
- 11.4.39 Plant associated with emergency events, such as emergency smoke extractors, need not comply with this requirement, provided they are not regularly in used.
- 11.4.40 Provided that the above criteria are met and appropriate control measures for plant noise are implemented, it is considered that nearby existing residential dwellings will experience a negligible impact magnitude due to plant noise or vibration and therefore the significance of the effect due to the noise or vibration will also be negligible.

Sports/Public Open Space usages

- 11.4.41 Public open spaces, including sports pitches, areas of retaining planting, LAPs, LEAPs, NEAPs, MUGAs and allotments may emit noise from their users. The nature of the noise will depend on the use, but the separation between any existing NSRs and formal recreation areas is such that negligible adverse impact would result from their use. This is a negligible effect.
- 11.4.42 The effects of site-generated noise (from any operational consideration) on the recreational use of the Monmouthshire and Brecon Canal would also be negligible.

Traffic Generation

- 11.4.43 The noise change due to traffic generation from the site has been assessed based on the difference in traffic flow between the following scenarios:
- 2017 flow with the proposed development and 2017 flow without the development (opening year);
 - 2032 flow with the proposed development and 2017 flow without the development (opening year to future year); and
 - 2032 flow with the proposed development and 2032 flow without the development (future year).
- 11.4.44 Traffic data, links and assessment are provided in Appendix 11.2.
- 11.4.45 Maximum traffic generation occurs on the links immediately accessing the site. Noise on these links, however, is generally of far less significance than that arising from the existing main roads around the perimeter of the site.
- 11.4.46 In the short term, the maximum noise change due to traffic generation is +1.2 dB on Old Abergavenny Road, between the site access and the roundabout with the A4042. On the A4042, a maximum noise increase of 0.7 dB is predicted, with an increase of 0.7 dB around the length of A4042 identified as a NAPPAs within the Noise Action Plan for Wales.
- 11.4.47 Under the criteria set out in Table 11.5, this would be a minor change on Old Abergavenny Road, and a negligible change on the A4042. Due to part of the A4042 being identified as a NAPPAs, it is considered appropriate to escalate the impact on the A4042 from negligible to minor, despite the smallness of the noise increase. The effects of these minor adverse impacts on residential NSRs would be minor.
- 11.4.48 Over a longer term, considering the change from 2017 to 2032, a maximum change of 1.8 dB is predicted on Old Abergavenny Road; and 1.4 dB on the A4042. These changes would be negligible using the criteria in Table 11.6, but with part of the A4042 being identified as a NAPPAs, it is considered appropriate to escalate

the impact on the A4042 from negligible to minor, despite the smallness of the noise increase. The effects of these minor adverse impacts on residential NSRs would be minor.

11.4.49 Results of the above are summarised in Table 11.12 below.

Table 11.11: Summary of Operation Noise & Vibration Effects

Receptors	Sensitivity	Operation Noise	Operation Vibration	Operation Traffic	Significance
Residential Receptors	Medium	Negligible	Negligible	Minor	Minor Adverse

11.5 Mitigation Proposals

Mitigation Measures

11.5.1 No mitigation measures beyond those incorporated into the design above are required. Notwithstanding this, noise emissions will be minimised as far as is reasonably practicable.

11.5.2 The committed mitigation measures that have been incorporated by design include:

- Design of plant room enclosures sufficient to mitigate noise and vibration emissions from any plant installed within.
- Appropriate selection of plant to minimise noise and vibration emissions as far as is reasonably practicable;
- Appropriate glazing to ensure that internal noise levels within the proposed residences achieve a satisfactory standard;
- During construction, suitable mitigation will be implemented, including selection of working methods and plant utilisation designed to minimise the noise impacts; and
- Implementation of a Contractor's Construction Noise Management Plan or similar.

11.5.3 These measures have been included in the assessment of predicted significant effects.

11.5.4 For properties on the lane to the north of site, additional control measures will be required to ensure that a significant adverse effect does not occur during construction. In addition to the measures identified above, these measures may include phasing of construction works in this area, additional temporary barriers, or compensation packages, depending on the magnitude and duration of the works.

Assessment Limitations

11.5.5 In all assessments, it is good practice to consider uncertainty which can arise from a number of different aspects. There are degrees of uncertainty associated with: instrumentation used for surveying; measurement technique and the variables influencing the measurement results such as transmission path and weather conditions; source terms used for modelling; calculation uncertainty; assessment uncertainty; and the subjective response of residents to noise sources.

11.5.6 Uncertainty due to instrumentation has been significantly reduced with the introduction of more modern instrumentation and is reduced further by undertaking field calibration checks on sound level meters before and after each measurement period and that all instrumentation is within accepted calibration intervals. Uncertainty due to measurement technique has been minimised by ensuring all personnel are appropriately qualified, trained and have sufficient experience to undertake the required measurements and observations. All data and records relating to the baseline surveys are reviewed to confirm that there is evidence that the correct procedures were followed and that the data acquired is valid and appropriate for the assessment.

11.5.7 Every effort has been made to reduce the uncertainty of the baseline noise measurements; however the dataset is limited by its duration as the baseline data was acquired during one morning, as such there is no

data on how the baseline sound environment varies from day to day. However, based on professional judgement including substantial experience of acquiring and analysing baseline data for numerous sites in various locations, and a desk based review of the site and surrounding area in conjunction with discussions with the consultant who undertook the site visit, it is considered that the baseline data acquired during the survey is representative of a typical morning as it is not anticipated that the variance of the baseline levels would be such that the background sound level would regularly and significantly fall below the measured baseline levels, which are considered to be low and typical of the area.

- 11.5.8 Calculation uncertainty and assessment uncertainty have been reduced by peer review of all baseline data, model input data, model results and assessment calculations, and by using the appropriate level of precision at each stage of the assessment calculations.
- 11.5.9 With regard to subjective response, the noise standards and guidance adopted for the assessment will have been based upon the subjective response of the majority of the population or will be based upon the most likely response of the majority of the population. This is considered to be the best that can be achieved in a population of varying subjective response which will vary dependent upon a wide range of factors.
- 11.5.10 All areas and potential consequences of uncertainty have been minimised at every stage of the assessment process. On the basis of the above, and in the context of subjective response, the effects of uncertainty on the assessment are considered minimal.

11.6 Residual Effects

- 11.6.1 With the committed design and mitigation, and with additional measures as appropriate to ensure that properties on the lane to the north of the site are adequately protected, no significant residual effects (ie no effects above minor adverse) would occur during construction or operation.

11.7 Assessment of Cumulative Effects

- 11.7.1 No cumulative effects are considered likely to occur. The magnitudes of effects associated with this development are sufficiently minor or negligible such that the cumulative effect with other schemes would not be significant.
- 11.7.2 The noise change resulting from expected changes in future traffic growth (as set out in Chapter 4 – Transportation and Access) has specifically been assessed and shown to be of negligible significance.

11.8 Summary

- 11.8.1 The Acoustics Team at the Brighton office of RPS Planning and Development (RPS) has been appointed to carry out a noise assessment for inclusion within an EIA for a proposed mixed use development at Mamhilad, Pontypool. This assessment has been undertaken to determine the effects of the development on the surrounding environment and to determine any mitigation measures that may be required to ensure suitable internal and external noise environments are achieved.
- 11.8.2 The summary of effects is provided in Table 11.13.

Table 11.12: Summary of Effects

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*	Residual Effect (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Is Residual Effect 'Significant'? (Y/N)
Construction						
Construction Noise on residential receptors	Temporary	Moderate to Minor Adverse	Appropriate construction best-practice. For properties on "Lane to north of site", additional control may be required.	L	Minor Adverse	N
Construction Noise on non-residential receptors	Temporary	Minor – Negligible Adverse	Appropriate construction best-practice	L	Minor – Negligible Adverse	N
Construction Vibration	Temporary	Negligible	Appropriate construction best-practice	L	Negligible	N
Operation						
Operational plant noise on residential receptors	Permanent	Minor Adverse	Appropriate design plant selection, installation & maintenance	L	Minor Adverse	N
Operational plant noise on non-residential receptors	Permanent	Minor Adverse	Appropriate design plant selection, installation & maintenance	L	Minor – Negligible Adverse	N
Operational traffic noise on residential receptors	Permanent	Minor Adverse	-	L	Minor Adverse	N
Operational traffic noise on non-residential receptors	Permanent	Minor Adverse	-	L	Minor – Negligible Adverse	N
Operational vibration on residential receptors	Permanent	Negligible	Appropriate design plant selection, installation & maintenance	L	Negligible	N
Operational vibration on non-residential receptors	Permanent	Negligible	Appropriate design plant selection, installation & maintenance	L	Negligible	N

11.8.3 It is considered that, with appropriate mitigation, plant utilisation and working methods, and provided that standard control measures are implemented (through a Contractor's Construction Noise Management Plan or similar), noise generation due to construction works will result in minor adverse effects. Traffic generation due to construction works will result in a negligible effect.

11.8.4 Mechanical and electrical plant on the development shall be selected, installed, operated and maintained such as to minimise any distinct characteristics of its noise emissions, such as tonal or impulsive content. Plant shall be designed such as to ensure that the resulting cumulative rating level at the nearest NSRs does not exceed 41 dB $L_{A,T,r}$ as determined following BS 4142:2014.

- 11.8.5 Mechanical and electrical plant within all plant areas of the development shall be selected, installed, operated and maintained such as to minimise any distinct characteristics of its noise emissions, such as tonal or impulsive content. Plant within this area shall be designed such as to ensure that the resulting cumulative rating level at the nearest NSRs does not exceed 42 dB $L_{A_{r,T}}$ as determined following BS 4142:2014.
- 11.8.6 Provided that plant meets the criteria set out above, it is considered that the significance of effect due to plant noise on existing nearby receptors will be negligible.

Consultation Draft

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Figure 1: Baseline Survey Location

Project Number	JAE8608	Project Title	Mamhilad Urban Village		
Client:		Rev :	0	Drawn By:	JA
		Date:	09/11/16	Checked By:	SCS
File location:	O:\Jobs_8001-9000\8608e\Rev2		 6-7 Lovers Walk Brighton East Sussex BN1 6AH T 01273 546800 F 01273 546801 E rpsbn@rpsgroup.com W rpsgroup.com		
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