14. Noise and Vibration

Introduction

14.1 This Chapter reports the outcome of the assessment of likely significant environmental effects arising from the Proposed Development in relation to noise and vibration during the construction stage.

14.2 The Chapter describes the technical consultation that has been undertaken during the EIA, the scope of the assessment and assessment methodology, and a summary of the baseline information that has informed the assessment.

14.3 In line with **Chapter 2: Approach to EIA**, the assessment reports on the likely significant environmental effects, the further mitigation measures required to prevent, reduce or offset any significant adverse effects, or further enhance beneficial effects. The conclusions are provided both in terms of the residual effects and whether these are considered significant. The assessment of effects takes into consideration both primary and tertiary mitigation (see **Chapter 2: Approach to EIA** for further details) and is informed by the EIA Scoping process (**Appendix 2.1 – 2.2**) and iterative scoping process where applicable.

14.4 This Chapter, and its associated **Figures 14.1** and **Appendices 14.1 – 14.6**, is intended to be read as part of the wider ES with particular reference to the introductory Chapters of this ES (**Chapters 1 – 5**).

14.5 In addition, this Chapter should be read in conjunction with **Chapter 15: Assessment of Cumulative Effects**.

Summary of Consultation

14.6 **Table 14.1** provides an overview of the consultation that has been undertaken to inform the Proposed Development and EIA, including the consideration of likely significant effects and the methodology for assessment.

Table 14.1: Summary of Consultation

Body / Organisation	Contact	Date and Form of Consultation	Summary
MCC	Environmental Health Officer	Email 11 December 2025	Email outlining proposed methodology for assessing construction noise and vibration. Response received on 19 December 2025 confirming that proposals are acceptable.

Scope of the Assessment

14.7 An EIA Scoping Report was submitted to Manchester City Council (MCC) on 30th September 2025, as presented as **Appendix 2.1**. The EIA Scoping Opinion was received on 18th November 2025 (**Appendix 2.2**). This section provides an update on the scope of the assessment presented within this Chapter following submission of the EIA Scoping Report.

Effects Not Considered to be Significant

14.8 The following effects were not considered significant as part of the EIA Scoping Report and are not considered further in this Chapter:

- Impact of existing noise on future users of the Proposed Development;
- Impact of noise generated by the Proposed Development on existing and proposed sensitive receptors; and
- Impact of vibration on existing and proposed sensitive receptors.

14.9 Potential effects from operational noise are covered in the noise impact assessment supporting the planning application for the development. This is provided in **Appendix 14.1**.

14.10 Construction and demolition noise and vibration was also considered to be not significant as part of the EIA Scoping Report (**Appendix 2.1**). Following the EIA Scoping process, MCC requested that noise and vibration during the construction stage be scoped into the EIA (**Appendix 2.2**).

Effects Considered in the EIA

14.11 The following effects (**Table 14.2**) are reported within this Chapter:

Table 14.2: Effects Considered in the EIA

Effect Considered	Receptors	Applicable Development Stage
Nuisance and disturbance as a result of demolition and construction traffic	Existing sensitive human receptors listed in **Table 14.3**	Construction
Nuisance and disturbance as a result of demolition and construction noise (excluding traffic)	Existing sensitive human receptors listed in **Table 14.3**	Construction
Nuisance and disturbance as a result of demolition and construction vibration	Existing sensitive human receptors listed in **Table 14.3** Existing structures listed in **Table 14**.3	Construction

Assessment Methodology

Legislative Framework, Policy and Guidance

14.12 The following legislation and policy has informed the assessment of effects within this Chapter, and is detailed further in **Appendix 14.3**:

- The Control of Pollution Act 1974 (CoPA)[1];
- Environmental Protection Act 1990 (EPA)[2];
- Noise Policy Statement for England (NPSE)[3]; and
- Planning Practice Guidance – Noise (PPG-N)[4].

14.13 The following guidance has informed the assessment of effects within this Chapter and is detailed further in **Appendix 14.3**:

- BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise' (BS 5228-1)[5];
- BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration' (BS 5228-2)[6];
- Design Manual for Roads and Bridges (DMRB), LA111 'Noise and Vibration', Revision 2, May 2020[7];
- Department of Transport Calculation of Road Traffic Noise 1988 (CRTN)[8]; and
- Institute of Sustainability and Environmental Professionals (ISEP, formerly known as the Institute of Environmental Management & Assessment) 'Guidelines for Environmental Noise Impact Assessment'[9].

Defining the Study Area

14.14 DMRB provides guidance on defining the study area for the construction and operational phase of highways projects. This guidance is adopted for this project to identify potential noise and vibration sensitive receptors (NVSRs).

14.15 Regarding the assessment of construction noise and vibration (excluding traffic), DMRB notes that:

- *"A study area of 300m from the closest construction activity is normally sufficient to encompass noise sensitive receptors", and that*
- *"A study area of 100m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive receptors."*

14.16 With a caveat that "variations in the study area can be defined for individual projects".

14.17 For construction traffic, DMRB states that:

> *"A construction traffic study area shall be defined to include a 50 m width from the kerb line of public roads with the potential for an increase in baseline noise level (BNL)*

of 1 dB(A) or more as a result of the addition of construction traffic to existing traffic levels."

14.18 The study areas are shown in **Figure 14.1**. The noise and vibration sensitive receptors considered in the assessment are shown in **Figure 14.2**.

14.19 From the study areas defined above, the closest receptors or groups of receptors in each direction from the Site have been identified in **Table 14.3**, along with the approximate minimum distance between the receptor and the Site boundary for Phase A and Phase B. The assessment focusses on these receptors; noise effects will be lower at receptors further from the Site.

14.20 We understand that Faraday Tower to the south of the Site is unoccupied prior to demolition. Charles Street car park to the north of the Site is also proposed to be demolished. These buildings are not considered for noise effects but are considered for vibration effects in structures.

Table 14.3: Noise and vibration sensitive receptors

Receptor(s)	Receptor ID	Direction from site	Approximate distance from the Phase A Site boundary, in m	Approximate distance from the Phase B Site boundary, in m
Echoes Day Nursery	NVSR1	West	50	N/A
Weston Halls Student Accommodation	NVSR2	West	0	N/A
Ibis Hotel	NVSR3	West	80	0
Princess Street residential buildings	NVSR4	West	125	45
Granby Row residential buildings	NVSR5	North	65	65
Pariser Building and James Lighthill Building (University of Manchester)	NVSR6	East	16	50
John Garside Building and George Begg Building (University of Manchester)	NVSR7	South	35	9

Receptor(s)	Receptor ID	Direction from site	Approximate distance from the Phase A Site boundary, in m	Approximate distance from the Phase B Site boundary, in m
Weston and Pendulum Phase A	NVSR8	East	N/A	6
Faraday Tower	NVSR9	South	16	30
Charles Street car park	NVSR10	North	18	18

Background Studies to Inform the ES / Establishing the Baseline

14.21 **Table 14.4** summarises all surveys undertaken to inform the assessment presented within this Chapter.

Table 14.4: Baseline Surveys and Noise Modelling

Survey	Overview	Date of Completion
Baseline Noise Surveys and noise modelling as detailed in the noise impact assessment supporting the planning application (**Appendix 14.1**)	Measurements of the existing sound environment were carried out to quantify the existing sound environment at the nearest receptors	October 2025

Assessment Process

Construction noise impact (excluding traffic)

14.22 The methodology to assess construction noise impacts (excluding potential noise impacts form construction traffic) is defined in BS 5228-1.

14.23 Potential noise impacts are dependent on construction methodology. At this stage, detailed information regarding the type of equipment, phasing and duration of the works is not available. This assessment is based on assumptions regarding the likely demolition and construction methodologies and activity durations. These assumptions have been developed considering an outline CEMP prepared by the contractor, along with Apex's experience of similar developments. The final assumptions have been reviewed by the contractor and are presented in **Appendix 14.4**.

14.24 The proposed site working hours are:

- Monday to Friday: 07:30 to 18:00 hours
- Saturday: 07:30 to 13:00 hours

14.25 Potential noise effects are only considered within the proposed working hours.

14.26 Annex C of BS 5228-1 contains a database of typical noise emission levels from a range of demolition and construction activities and equipment. The quantitative prediction methods detailed in Annex F of the standard has been used to assess construction noise at the identified NVSRs.

14.27 The methodology takes into account:

1) the sound power outputs of construction processes and plant;

2) the periods of operation of construction processes and plant;

3) the distances from sound sources to receptor;

4) the presence of screening by barriers;

5) the reflection of sound; and

6) attenuation of sound over soft ground.

14.28 The distance correction methodology in Annex F applies for receptor positions at least 25m from the construction activity. For receptors 10m or less from the activity, the LAeq,T activity level at 10m is used without correcting for distance, on the assumption that activities very close to the Site boundary will only occur for short durations. For receivers less than 25m from the activity there will be greater uncertainty associated with the calculated noise levels.

Construction traffic noise impact

14.29 The methodology for assessing potential impacts of construction traffic is taken from DMRB LA111. The change in Basic Noise Level (BNL) due to the addition of construction traffic to existing traffic flows is calculated for public roads that are to be used as construction traffic routes, in accordance with the methodology outlined in CRTN. This method considers:

- The change in traffic flow due to construction traffic;
- Vehicle speed; and
- The percentage of heavy duty vehicles (HDVs).

14.30 The CRTN methodology is only suitable for roads with traffic flows over 1,000 vehicles per 18-hour day and is applied for Sackville Street and Princess Street.

14.31 Charles Street does not meet the CRTN method minimum traffic flow criterion. For this road, the Noise Advisory Council (NAC) 'A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level Leq'[10] method has been used.

14.32 Details of the construction traffic assessment are provided in **Appendix 14.5**.

Construction vibration impact

14.33 The new structures will require piled foundations to support the buildings. The impact of vibration on people depends on the piling method utilised, ground conditions, receptor

distance and receptor sensitivity. Continuous flight auger injected piling and vibratory sheet piling are proposed.

14.34 BS 5228-2 states that: "*The levels of vibration associated with continuous flight auger injected piling and pressed-in piling are minimal, as the processes do not involve rapid acceleration or deceleration of tools in contact with the ground but rely to a large extent on steady motions. Continuous vibrations at a low level could be expected from the prime movers*."

14.35 Effects from auger piling are considered likely to be negligible.

14.36 Vibration levels from vibratory piling are estimated according to the empirical prediction formula in Annex E of BS 5228-2. The prediction equation for a nominal hammer energy of $1.2 \leq W \leq 10.7$ kJ is:

$$v_{res} = \frac{k_v}{x^{\delta}}$$

14.37 Where:

- v_{res} is the resultant PPV vibration level in mm/s;
- x is the distance measured along the ground surface in metres (between 1 and 100 m);
- k_v is a scaling factor relating to the probability of the PPV vibration level being exceeded and is taken as $k_v = 126$ for this assessment, relating to a 33 % probability of the resulting vibration level being exceeded; and
- δ is a parameter representing the operating condition, and is taken as 1.3 for this assessment to represent 'all operations'.

14.38 Distances for the vibration assessment are taken from the closest point of the Phase A and Phase B building footprints to each sensitive receptor.

14.39 During Phase A, parts of the Weston Halls building will still be occupied, so vibration generated by demolition activities may be transmitted through the building structure. Regarding this situation, BS 5228-2 states:

"*Those seeking to determine suitable vibration limits for construction operations should be aware of the particular noise problem that can occur when such operations take place in existing buildings that are either occupied or contiguous with occupied buildings. Vibration introduced directly into the structure by equipment such as breakers, hammers and drills might attenuate only slowly as it is transmitted through the structure and might therefore produce unacceptable levels of noise in rooms remote from the source. In particularly sensitive situations it might be necessary to use alternative techniques and equipment."*

14.40 Vibration transmission paths through building structures are complex, and it is not possible to quantify the likely vibration and reradiated noise impacts from the Phase A demolition on residents of Weston Halls. Best practicable means should be used to minimise vibration generation. Mitigation is discussed further below.

Reporting of the Environmental Effect and Significance Criteria

14.41 The assessment of likely significant environmental effects as a result of the Proposed Development has taken into account the construction stage. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value/importance), magnitude of change (or impact), the level of effect and significance.

Determining Sensitivity of Receptor

14.42 The sensitivity of affected receptors has been considered on a scale of **high**, **medium**, **low** or **negligible.** The sensitivity of receptors to noise and vibration impacts on people has been defined based on **Table 14.5**.

14.43 With respect to noise and vibration impacts on people, NVSRs 1-8 identified in **Table 14.3** are classified as having high sensitivity, and NVSRs 9 and 10 have negligible sensitivity. Assessments of noise and vibration impacts on people are not carried out for NVSRs 9 and 10.

14.44 Regarding vibration impacts on structures, NVSRs 1-8 are considered to have high sensitivity. NVSRs 9 and 10 are considered to have low sensitivity, since these buildings are proposed to be demolished.

Table 14.5: Receptor sensitivity criteria – noise and vibration impacts on people

Sensitivity/ Value of Receptor	Description	Examples of Receptor Use
High	Receptors where people or operations are particularly susceptible to noise and vibration.	Auditoria/studios; Specialist medical/teaching centres, or laboratories with highly sensitive equipment. Residential; Quiet outdoor areas used for recreation; Conference facilities; Schools/educational facilities in the daytime; Hospitals/residential care homes; Libraries; places of worship.
Medium	Receptors moderately sensitive to noise and vibration or where it may cause some distraction or disturbance	Offices; Restaurants; and Sports grounds when spectator or other noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).
Low	Receptors where distraction or disturbance of people from noise and vibration is minimal	Factories and working environments with existing high noise levels; and Sports grounds when spectator or other noise is a normal part of the event.
Negligible	Buildings or locations that are typically unoccupied	Unoccupied buildings

Determining the Magnitude of Change

14.45 The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of **large**, **medium**, **small** or **negligible**.

Construction noise (excluding traffic)

14.46 For construction noise, the magnitude of change has been determined based upon the margin by which predicted construction noise levels will comply or exceed the receptor construction noise assessment criteria as determined following the ABC assessment method detailed within BS 5228-1.

14.47 **Table 14.6** details the resulting impact magnitude and effect level criteria that have been applied, considering guidance from Table 3.16 of DRMB. Details of the ABC method are provided in **Appendix 14.4**.

Table 14.6: Construction noise (excluding traffic) magnitude of change criteria

Magnitude of change	Construction Noise
Large	Above or equal to the threshold level + 5 dB
Medium	Above or equal to the threshold level and below the threshold level + 5 dB
Small	Above or equal to the baseline level and below the threshold level
Negligible	Below the baseline level

Construction traffic noise

14.48 For construction traffic, the magnitude of change is determined using **Table 14.7**, which considers guidance from Table 3.17 of DMRB. The increase in BNL is calculated by subtracting the BNL calculated for the traffic flows for during the construction period with no development from the BNL calculated for the same period including construction traffic.

14.49 This table applies regardless of the method used to calculate the BNL for roads used for construction traffic.

Table 14.7: Construction traffic noise magnitude of change criteria

Magnitude of change	Increase in BNL of closest public road used for construction traffic, dB
Large	Greater than or equal to 5.0
Medium	Greater or equal to 3.0 and less than 5.0
Small	Greater or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

Construction vibration – effect on people

14.50 Since environmental vibration is not typically perceptible within sensitive sites, any perceptible construction vibration can be considered as a change. The magnitude of change is defined in **Table 14.8** based on guidance from DMRB and BS 5228-2.

Table 14.8: Construction vibration effects on people magnitude of change criteria

Magnitude of change	Vibration level	Guidance of effect of vibration levels from BS 5228-2
Large	Above or equal to 10mm/s PPV	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Medium	Above or equal to 1.0mm/s PPV and below 10mm/s PPV	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
Small	Above or equal to 0.3mm/s PPV and below 1.0mm/s PPV	Vibration might be just perceptible in residential environments.
Negligible	Below 0.3mm/s PPV	Vibration might be just perceptible in the most sensitive situations for most vibration frequences associated with construction. At lower frequencies, people are less sensitive to vibration.

Construction vibration – effect on structures

14.51 Construction activities that produce vibration may impact adjacent structures. The criteria used in this assessment relate to the potential for cosmetic damage, not structural damage. The principal concern is generally transient vibration due to piling.

14.52 **Table 14.9** identifies transient vibration levels above which cosmetic damage to buildings may occur, and associated impact magnitudes, based on guidance in BS 5228-2 for "Unreinforced or light framed structures" and "Residential or light commercial buildings". The principal vibration source during the construction stage is likely to be vibratory piling, which is a continuous vibration source. The BS 5228 guide values have therefore been reduced by 50%. For transient vibration sources the values could be doubled.

Table 14.9: Construction vibration effects on structures magnitude of change criteria

Peak component particle velocity in frequency range of predominant pulse		Description based on BS 5228	Magnitude of change
4 Hz to 15 Hz	15 Hz and above		
> 30 mm/s at 4 Hz increasing to 40 mm/s at 15 Hz	> 40 mm/s at 15 Hz increasing to 100 mm/s at 40 Hz +	Major damage possible	Large
> 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	> 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz +	Minor damage possible	Medium
> 7.5 mm/s at 4 Hz increasing to 10 mm/s at 15 Hz	> 10 mm/s at 15 Hz increasing to 25 mm/s at 40 Hz +	Guide values for cosmetic damage	Small
< 7.5 mm/s at 4 Hz increasing to 10 mm/s at 15 Hz	< 10 mm/s at 15 Hz increasing to 25 mm/s at 40 Hz +	Below the cosmetic damage guide value	Negligible

NOTE 1: Values referred to are at the base of the building.

NOTE 2: For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

14.53 Annex F of BS 5228-2 states that for vibratory piling "*As a guide, whole building response for buildings up to four storeys in height, as opposed to building element response, generally occurs at frequencies between 5 Hz and 15 Hz. Buildings element response, e.g. slabs, can occur at frequencies between 5 Hz and 40 Hz. For buildings more than four storeys in height, the whole building response frequency is likely to be less than 5 Hz to 12 Hz*.". Therefore, the guideline vibration values for 4 to 15 Hz are compared with the predicted vibration levels.

Determining the Level of Effect

14.54 The level of effect for construction noise has been informed by the magnitude of change due to the Proposed Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and **Table 14.10** has been a tool which has assisted with this process.

14.55 Whilst **Table 14.10** provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is '*beneficial*' or '*adverse*'.

Table 14.10: Matrix to Support Determining the Level of Effect

Magnitude of Change	Sensitivity (or value / importance)			
	High	Medium	Low	Negligible
Large	Major	Moderate to Major	Minor to Moderate	Negligible
Medium	Moderate to Major	Moderate	Minor	Negligible
Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

14.56 The following terms have been used to define the level of the effects identified and these can be 'beneficial' or 'adverse':

- **Major effect**: where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- **Moderate effect**: where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- **Minor effect**: where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and
- **Negligible**: where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

14.57 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

Determining Significance

14.58 For each effect, a statement has been made as to whether the level of effect is '**Significant**' or '**Not Significant**'. This determination has been based on professional judgement and/or relevant guidance/legislation where applicable.

14.59 Significance has only been concluded for residual effects (i.e. following the identification of secondary mitigation).

Baseline Conditions

14.60 Baseline noise levels have been measured around the Site, and noise levels across the Site and at the nearest receptors have been modelled as described in the noise assessment prepared to accompany the planning application for the Proposed Development, as shown in **Appendix 14.1**. These are summarised for each relevant receptor in **Table 14.11.**

Table 14.11: Summary of baseline noise levels

Receptor	Receptor ID	Baseline noise level
Echoes Day Nursery	NVSR1	60
Weston Halls Student Accommodation	NVSR2	57
Ibis Hotel	NVSR3	60
Princess Street residential buildings	NVSR4	68
Granby Row residential buildings	NVSR5	59
Pariser Building and James Lighthill Building (University of Manchester)	NVSR6	66
John Garside Building and George Begg Building (University of Manchester)	NVSR7	59
Weston and Pendulum Phase A	NVSR8	< 55 at upper floors

14.61 Baseline conditions for the construction traffic noise assessment are based on traffic data provided by the transport consultant SLR. A summary of the baseline annual average weekday traffic (AAWT) flows and percentage heavy duty vehicles (HDVs) is provided in **Table 14.12**.

14.62 When assessing construction vibration, it has been assumed that no environmental vibration is currently perceptible.

Future Baseline

14.63 SLR have advised that "*traffic in Manchester City Centre is not growing and in fact has been falling over time, therefore the Baseline flows are equivalent to future years*".

14.64 Ambient noise levels around the Site are likely to stay the same or experience a slight decrease in future.

Primary and Tertiary Mitigation

Construction Stage

14.65 The following tertiary mitigation which has been evaluated as part of the construction stage assessment is outlined below.

14.66 Since the proposed construction methodologies and durations have not been finalised, it is not possible at this stage to determine the specific mitigation measures that will be required to reduce construction noise and vibration impacts to a minor effect level. A planning condition will require preparation of a CEMP for the Proposed Development. A full construction noise and vibration assessment in accordance with BS 5228 will be undertaken as part of the process of preparing the CEMP once a contractor has been appointed and construction details are further developed. Therefore MCC's environmental health department will have the opportunity to review the final proposed scheme of mitigation prior to work starting on Site.

14.67 The following section provides an overview of best practice measures to control noise and vibration emissions from construction sites, and details some specific measures that may be adopted if required following preparation of the detailed CEMP.

Construction Environmental Management Plan ('CEMP')

14.68 A Construction Environmental Management Plan (CEMP) will be prepared for the Proposed Development.

14.69 It is assumed that the measures set out within the CEMP prepared for each phase of the development will be adopted during the construction process and that preparation of the CEMP will be secured by an appropriately worded planning condition (and updated where and if necessary to suit each phase of development).

14.70 The preferred approach for controlling construction noise is to reduce levels at source where possible, but with due regard to practicality. In CoPA and the EPA this is referred to as the use of 'best practicable means' ('BPM') to control emissions.

14.71 As outlined in BS5228-1, sometimes a greater noise level may be acceptable if the overall construction time (and therefore the duration of disruption) is reduced.

14.72 Where major effects are predicted for specific construction activities, communication with those potentially affected will be critical to maintaining good relations with neighbours and minimising complaints. As advised in BS 5228-1, notification and communication with the local community throughout the construction period also serves to publicise the works schedule, giving warning to residents regarding periods when higher levels of noise may occur during specific operations, and providing them with lines of communication where complaints can be addressed. Dissemination of such information is likely to encourage the community to be tolerant of short-term disturbance considering the potential long-term benefits of the Proposed Development.

14.73 The CEMP may make provision for an enhanced period of noise and vibration monitoring at the beginning of demolition works for Phase A of the Weston Halls building and vibratory sheet piling to determine methods of work that do not risk causing building damage to the parts of Weston Halls retained during Phase A and to the Ibis Hotel during Phase B construction. Noise and vibration monitoring results would be scrutinised more closely during this period, with investigations carried out and further mitigation applied if required, should vibration levels approach the maximum permissible limits.

14.74 If carried out, this period of enhanced monitoring could also be used to determine construction and demolition methodologies to minimise noise and vibration impacts on people at the nearest receptors to the Site.

14.75 Vibration monitoring could be undertaken to further lower the risk of damage to structures and building condition surveys could be carried out before and after the where major vibration effects on structures are currently predicted, both to provide reassurance to the building owner and protection to the contractor in the event of cosmetic damage being subsequently discovered.

14.76 It is not currently known whether the university buildings to the south and east of the Site contain vibration sensitive equipment. The contractor should contact the university before the CEMP is finalised to determine whether vibration sensitive equipment is present that would necessitate lower construction vibration limits and/or enhanced communications during vibration generating works.

14.77 Other suitable mitigation measures to reduce noise impacts could include the following:

- Position noise-generating equipment or activities as far away from sensitive receptors as practicable (e.g. a central position within the Site);
- Ensure all processes are in place to minimise noise before works begin, which should ensure that BPM are being achieved throughout the construction programme;
- Use hoarding around the work site perimeter where practicable to screen noise from low-level sources;
- Use localised acoustic barriers around the most significant noise generating activities;
- Limit the duration and/or simultaneous operation of noisy plant;
- Select plant or construction techniques with the lowest practicable noise generation;
- Use equipment with effective silencers/insulation, such as attenuated generator sets;
- Wherever practicable, use hydraulic techniques for breaking rather than percussive techniques;
- Select piling techniques to minimise noise levels generated;
- Use prefabricated materials or constructions where practical;
- Properly maintain all plant and equipment used for the works;
- Switch noise generating equipment off when not in use;
- Operate equipment to prevent excessive noise and vibration generation;
- Select plant certified to meet relevant current legislation as defined by the BS 5228 standards and to comply with regulatory/legislative noise emission requirements;

- Ensure that all Contractors are familiar with current legislation and the guidance in BS 5228 Parts 1 and 2, which should form a prerequisite of their appointment;

- Conduct loading and unloading of vehicles, dismantling of site equipment such as scaffolding and moving equipment or materials around the site away from sensitive receptors where practical and in a manner to minimise noise generation;

- Carefully consider construction traffic haul routes to minimise speed, reversing movements and to minimise the number of construction vehicles during peak traffic flows on local roads;

- Carry out in-situ noise monitoring during construction to verify that impacts are within suitable limits;

- Use SMART or broadband noise reversing alarms; and

- Noise complaints should be reported to the contractor and immediately investigated.

14.78 Other mitigation measures to reduce construction vibration impacts could include:

- Where an unexpected obstruction to piling is encountered, halt piling at that position until the obstruction can be dealt with, rather than attempting prolonged works;

- Where reasonably practicable, replace plant and/or methods of work causing significant levels of vibration at sensitive premises with other less intrusive plant and/or methods of working;

- To minimize any potential adverse impacts as a result of vibration from stationary plant, relocate equipment immediately adjacent to sensitive receptors or isolate it using resilient mountings;

- Assess the characteristics of vibration emissions from each item of plant, and their collective effect during the plant selection process. Where practicable, select plant which will have the least impact in terms of vibration; and

- Implement a scheme of vibration monitoring, including vibration alerts during works that have the potential to result in damage to existing structures. The scope of this monitoring would be agreed between the contractor and the relevant stakeholders.

14.79 Any work outside the stated hours will be subject to prior agreement of, and/or reasonable notice to, MCC, as appropriate.

14.80 Method statements regarding construction management, traffic management, and overall site management will be prepared in accordance with best practice and relevant British Standards to help minimise impacts of construction works. One of the key aims of such method statements is to minimise disruption to local residents during the construction stage.

14.81 The CEMP will be prepared considering the above potential mitigation measures to ensure that BPM are adopted with regards to each phase of the Proposed Development.

14.82 In addition to the general mitigation measures outlined above, the contractor responsible for the construction works could make an application to MCC for consent to work under Section 61 of the Control of Pollution Act (1974). A Section 61 consent to work application would allow MCC to review the contractor's proposals in advance and would also require that BPM are employed to control and minimise noise and vibration effects.

Assessment of Effects, Secondary Mitigation and Residual Effects

Construction Stage

Nuisance and disturbance as a result of demolition and construction traffic

14.83 Details of the construction traffic noise assessment are provided in **Appendix 14.5** and the assessment result are shown in **Table 14.12**. The magnitude of change to the basic noise level for each public road which will form part of the construction traffic route for the Site is predicted to be less than 1.0 dB, which is a negligible magnitude of change.

Table 14.12: Matrix to Support Determining the Level of Effect

Road	Baseline		Peak construction			
	Total traffic flow AAWT	%HDV	Peak daily construction traffic flows (HDV)	Total traffic flow AAWT	%HDV	Noise level change, dB
Sackville Street	1879	1.6	50 (34)	1929	3.3	0.8
Charles Street	873	6.4	50 (34)	923	9.8	0.2
Princess Street	6723	3.0	50 (34)	6773	3.5	0.7

14.84 NVSRs 1-4 and 6-8 are located within the study area for construction traffic noise, within 50m of the proposed construction traffic routes. The sensitivity of these receptors is considered to be high. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be negligible.

Secondary Mitigation or Enhancement

14.85 No secondary mitigation or enhancement is required.

Residual Effect

14.86 In the absence of secondary mitigation, the residual effects for all receptors is the same as that reported in the pre-mitigation scenario.

Significance

14.87 This effect is considered to be **Not Significant**.

Nuisance and disturbance as a result of demolition and construction noise (excluding traffic)

14.88 Details of the construction noise assessment (excluding traffic) are provided in **Appendix 14.4**. The magnitude of change and magnitude of effect for each phase of construction before the inclusion of any of the potential mitigation measures that may be adopted within the CEMP for the development is presented in **Table 14.13**.

14.89 The magnitude of change presented below is based on calculated noise levels for a worst case scenario with all construction activities occurring at the Site boundary of the relevant construction stage, which is unlikely to occur in practice or would only occur for a short period of time.

Table 14.13: Construction noise (excluding traffic) magnitude of change

Receptor	Magnitude of change					
	Phase A			Phase B		
	Site Preparation	Substructure Works	Superstructure Works and General Construction	Site Preparation	Substructure Works	Superstructure Works and General Construction
NVSR1	Negligible	Negligible	Negligible		N/A	
NVSR2	Large	Large	Large		N/A	
NVSR3	Negligible	Negligible	Negligible	Large	Negligible	Negligible
NVSR4	Negligible	Negligible	Negligible	Medium	Negligible	Negligible
NVSR5	Large	Large	Medium	Large	Large	Large
NVSR6	Large	Large	Large	Negligible	Large	Large
NVSR7	Large	Large	Large	Large	Large	Large
NVSR8		N/A		Large	Large	Large

14.90 It is noted that some calculated construction noise levels exceed the trigger values for noise insulation and rehousing defined in Section E.4 of BS 5228-1; however, these requirements only occur if the activity occurs "f*or a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months",* which is considered unlikely.

14.91 The potential impact will be reassessed as part of the preparation of the CEMP for the development. It is considered that by implementing BPM and following development of the CEMP, the magnitude of change can be reduced to no greater than small at any identified NVSR.

14.92 The sensitivity of NVSRs 1-8 is considered to be high. The magnitude of change is considered to be no more than small. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be no more than minor.

Secondary Mitigation or Enhancement

14.93 No secondary mitigation or enhancement is required.

Residual Effect

14.94 In the absence of secondary mitigation, the residual effects for all receptors is that same as that reported in the pre-mitigation scenario.

Significance

14.95 This effect is considered to be **Not Significant**.

Nuisance and disturbance as a result of demolition and construction vibration

People

14.96 Details of the construction vibration assessment are provided in **Appendix 14.6**. The magnitude of change and magnitude of effect for each phase of construction before the inclusion of any of the potential mitigation measures that may be adopted within the CEMP for the development is presented in **Table 14.14.**

Table 14.14: Construction vibration (people) magnitude of change and effect

Receptor	Magnitude of change	
	Phase A	Phase B
NVSR1	Small	N/A
NVSR2	Large	N/A
NVSR3	Small	Large
NVSR4	Negligible	Small
NVSR5	Small	Small
NVSR6	Medium	Small
NVSR7	Medium	Small
NVSR8	N/A	Medium

14.97 The potential impact will be reassessed as part of the preparation of the CEMP for the development. It is considered that by implementing BPM and following development of the CEMP, the magnitude of change can be reduced to no greater than small at any identified NVSR.

14.98 The sensitivity of NVSRs 1-8 is considered to be high. The magnitude of change is considered to be at most small. Therefore, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be no more than minor.

Structures

14.99 Details of the construction vibration assessment are provided in **Appendix 14.6**. The magnitude of change and magnitude of effect for each phase of construction before the

inclusion of any of the potential mitigation measures that may be adopted within the CEMP for the development is presented in **Table 14.15**.

Table 14.15: Construction vibration (structures) magnitude of change and effect

Receptor	Magnitude of change		Level of effect	
	Phase A	Phase B	Phase A	Phase B
NVSR1	Negligible	N/A	Negligible	N/A
NVSR2	Medium	N/A	Major	N/A
NVSR3	Negligible	Medium	Negligible	Major
NVSR4	Negligible	Negligible	Negligible	Negligible
NVSR5	Negligible	Negligible	Negligible	Negligible
NVSR6	Negligible	Negligible	Negligible	Negligible
NVSR7	Negligible	Negligible	Negligible	Negligible
NVSR8	N/A	Negligible	N/A	Negligible
NVSR9	Negligible	Negligible	Negligible	Negligible
NVSR10	Negligible	Negligible	Negligible	Negligible

14.100 The potential impact will be reassessed as part of the preparation of the CEMP for the development. It is considered that by implementing BPM and following development of the CEMP, the magnitude of change can be reduced to no greater than small at any identified NVSR.

14.101 The sensitivity of NVSRs 2 and 3 is considered to be high. The magnitude of change is considered to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.

14.102 The sensitivity of NVSRs 1 and 4-10 is considered to be high. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

Secondary Mitigation or Enhancement

14.103 No secondary mitigation or enhancement is required.

Residual Effect

14.104 In the absence of secondary mitigation, the residual effects for all receptors is that same as that reported in the pre-mitigation scenario.

Significance

14.105 This effect is considered to be **Not Significant**.

Limitations and Assumptions

14.106 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- At this early stage of development, the proposed construction techniques, durations, phasing and activity locations have not been determined. This results in uncertainty associated with the assessment inputs, and therefore the predicted noise and vibration levels.

- Vibration levels informing the final assessment of effects cannot be quantitatively determined as they will depend on the final demolition and piling methodologies which will be finalised following preparation of the CEMP.

- During Phase A of the development, parts of Weston Halls will be demolished while other parts of the building are still occupied. Vibration generated within the building structure is likely to lead to perceptible vibration and reradiated noise effects in other parts of the building, but it is not possible to predict the magnitude of the vibration due to the complexity of the vibration transmission paths through the building and the variability of the vibration input into the structure.

- Some noise sensitive receptors are directly adjacent to the Site boundary, therefore construction activities may occur very close to the windows of noise-sensitive buildings. The prediction methods in BS 5228-1 only apply at greater distance from the source. There is greater uncertainty associated with predicted noise levels at receptors very close to the Site boundary.

Summary

14.107 **Table 14.16** provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

14.108 The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter and summarised within Environmental Management Plan included within **Volume 3: Environmental Management Plan**.

Table 14.16: Summary of Residual and Significant Effects

Effect	Receptor	Residual Effect	Is the Effect Significant?
Construction Stage			
Nuisance and disturbance as a result of demolition and construction traffic	NVSRs 1-4 and 6-8	Negligible adverse	NO
Nuisance and disturbance as a result of demolition and construction noise (excluding traffic)	NVSRs 1-8	Minor adverse	NO
Nuisance and disturbance as a result of demolition and construction vibration	NVSRs 1-10	Negligible – minor adverse	NO

References

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[4] Ministry of Housing, Communities and Local Government (6 March 2014, last updated 22 July 2019). Guidance Noise. Available at: https://www.gov.uk/guidance/noise--2 [Date accessed: 18/12/25].
[5] British Standards Institute (2014). British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.
[6] British Standards Institute (2014). British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.
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[9] Institute of Environmental Management and Assessment (November 2014). Guidelines for Environmental Noise Impact Assessment Version 1.2.
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