

APPENDIX 7.1 ASSESSMENT METHODOLOGY

This section sets out the methodology used in the determination of both the baseline conditions and the assessment of likely significant effects, using the relevant guidance documents set out in the main texts.

A desk study was undertaken to collate available site plans to identify nearby receptors and building uses. This information was used to identify the appropriate locations for baseline monitoring.

Effects Not Considered within the Scope

The vibration caused by the railway line to the north-east of the site has been scoped out. The railway line is located more than 100 m away from the boundary of the Site and River Medlock separates the railway line and the Site, which greatly reduces the vibration. On the basis of this, the vibration from the railway line has not been considered further in the assessment.

Operational traffic has not been considered as the development does not include car parking spaces for residents and potential changes in traffic is expected to be negligible as a result of the Proposed Development.

Operation vibration has not been considered as part of the assessment as there will be no vibration-generating activities from the operation of the development that could be perceivable at the nearby receptors.

Impact Assessment Methodology

The overall approach to the assessment comprises:

- Confirmation and review of the existing noise levels (and sources) at the Proposed Development site;
- Identification and assessment of noise and vibration impacts arising from construction processes that may affect existing / future noise sensitive receptors;
- Identification and assessment of noise impacts to future residents within the Proposed Development from existing transport related noise sources;
- Identification and assessment of noise impacts to existing and future receptors from building services plant associated with the Proposed Development; and
- Formulation of mitigation measures, where appropriate, to ensure any adverse effects of noise and vibration are minimised.

The assessment is split into construction phase and operational phase assessments to allow for separate consideration of construction and operational noise and vibration impacts on sensitive receptors.

This methodology has been discussed with the Local Environmental Health Department at Manchester City Council and the comments from the Environmental Protection Team has been adopted in this assessment.

Construction Phase – Site Noise

Table E.1 of BS5228-1 (reproduced as Table 1, below) provides a methodology for determining the potential significance of noise effects due to construction activities, based on the periods of construction (daytime, evening and night-time) and the baseline ambient noise levels at the receptors.

The baseline ambient noise levels are rounded to the nearest 5dB and then allocated into a threshold category (i.e. A to C). The predicted construction noise levels are then assessed against the corresponding noise threshold value. If the noise threshold value is exceeded, a potential adverse impact may be considered to occur.

The standard then states that the assessor needs to consider other project specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if the effect is ‘Significant’ (in EIA Terms).

Table 1: Threshold of Potential Major Construction Noise Impact at Dwellings			
Assessment category and threshold value period	Threshold value in dB L_{Aeq,T}		
	Category A	Category B	Category C
Night-time (23:00-07:00)	45	50	55
Evenings and weekends (19:00-23:00 weekdays, 13:00-23:00 Saturdays, and 07:00-23:00 Sundays)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 to 13:00)	65	70	75

The nearest noise sensitive receptors exposed to construction noise are:

- Existing residential apartments to the east of the Proposed Development (Stay Deansgate);
- Existing residential apartments to the south of the Proposed Development (North Towers); and
- Future residential apartments to the north of the Proposed Development.

At this stage, before the appointment of a contractor, no specific details on the construction activities, programme or number and type of construction plant are currently available.

Therefore, detailed construction noise predictions at specific receptors have not been completed. Instead, a qualitative approach has been adopted, focussing on the likely noisy construction activities and based upon BS 5228-1 and best practice mitigation measures. The assessment, therefore, focuses on the impact at existing residential properties and properties likely to be completed before the Proposed Development.

Construction Phase – Off-Site Construction Traffic

During construction, the Proposed Development will generate additional off-site traffic which will include the movement of materials and equipment via HGVs and the movement of the workforce associated with the construction. The DMRB states that a change of 1 dB $L_{A10,18hr}$ in the short term is the smallest change considered perceptible and that a change in traffic noise levels of 1 dB, $L_{A10,18hr}$ is equivalent to a 25% increase in traffic flow. Therefore, if the change in traffic flows due to construction traffic is less than 25% the change will be Not Significant.

Construction Phase – Vibration

BS5228-2 (BSI,2014) gives guidance on vibration levels that can be used to assess the likely impacts of construction activities. Annex E of the standards provides formulae for the prediction of Peak Particle Velocity (PPV) vibration levels for various types of vibratory compaction, percussive and vibratory piling. Different scaling factors are provided in BS 5228 for vibration predictions which correlate to the percentage probability of the predicted values being exceeded, with 5% being the most onerous, and generates the highest PPV values.

At this stage, the main potential source of vibration is the piling works to build the foundation. To give an indication of possible vibration impacts due to the use of piling rigs to build up the foundation an estimate of vibration levels has been completed. This has been based on predictions of vibratory piling, using the empirical relationships provided in BS 5228-2.

Vibration on Human Receptors

Annex B of BS 5228 includes criteria for the assessment of vibration effects and includes a table (reproduced as Table 7.4 in the main text of the chapter) that shows the guidance on the magnitude of an impact (a.k.a. magnitude of change) of vibration levels.

Vibration on Building

BS 7385-2 'Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration provides guidance on vibration levels likely to result in

cosmetic damage and is referenced in BS 5228-2. The guidance is reproduced and shown in Table 7.5 in the main text of the chapter.

The threshold of human perception of vibration in terms of PPV is much lower than the PPV limit that could cause cosmetic damage. Occupants cannot bear any more vibration before it causes damage to the building structure.

Operational Phase – Road Traffic Noise and Vibration

No car park has been proposed with the Proposed Development. Therefore, there will be no changes of traffic caused noise and vibration by the Proposed Development.

Operational Phase - Building Services

At this stage, no details of any building services plant are available, such as that which may be required at the shared use area of the Proposed Development.

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature in terms of the potential adverse impact on sound sensitive receptors. According to BS 4142:

- “A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.”
- “A difference of around + 5dB is likely to be an indication of an adverse impact, depending on the context”.
- “Where the rating level does not exceed the background sound level, this is an indication of the specific source having a low impact, depending on the context. “

Manchester City Council requests that *“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location”.*

Noise impact on the Proposed Building

Professional Practice Guidance on Planning & Noise: New Residential Development (ProPG) is a guidance document on the management of noise within the planning system in England for new build housing developments. The document draws together guideline limits for internal noise levels from external transport sources from other sources of guidance, including BS 8233, and the World Health Organisation (WHO) Guidelines for Community Noise.

This guidance is consistent with the Manchester's Local Development Framework and Guidance Document Public Protection Information for Developers:

- Bedrooms (night time – 23:00 – 07:00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times)
- • Living Rooms (daytime – 07:00 – 23:00) 35 dB L_{Aeq}
- • Gardens and terraces (daytime) 55 dB L_{Aeq}

The proposed criteria are presented in Table 7.7 in the main text of the chapter. The daytime period is defined as the 16 hours between 07:00 to 23:00 hours and the night-time period is defined as the 8 hours between 23:00 to 07:00 hours.