

Chapter 9: Noise and Vibration

NOISE AND VIBRATION	
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SUPPORTING APPENDIX	ES Volume 3, Appendix: Noise and Vibration Annex 1: Acoustic Terminology Annex 2: Environmental Noise Survey Report Annex 3: Noise Modelling Assumptions
KEY CONSIDERATIONS	<p>The following key acoustic aspects have been considered in the assessment:</p> <ul style="list-style-type: none">Noise and vibration from construction activities at the Proposed Development;Noise from construction traffic from the Proposed Development. (The assessment of noise from construction traffic was initially scoped out but has been included in this ES chapter to avoid any doubt in the potential noise effects);Noise from building services plant noise from the completed Proposed Development and from completed nearby schemes; andNoise from operational road traffic from the completed Proposed Development and from Completed nearby schemes.
CONSULTATION	<p>A request for an EIA Scoping Opinion was prepared and submitted to the London Borough of Camden (LBC) on 4 August 2023. A copy of this Request is provided in ES Volume 3, Appendix: EIA Methodology – Annex 1 and sets out the proposed scope and methodology for the noise and vibration assessment and this ES chapter.</p> <p>A draft EIA Scoping Opinion was issued by LBC on 4 October 2023 and is provided in ES Volume 3, Appendix: EIA Methodology – Annex 3. A summary of the key points and how they have been addressed in this ES chapter are summarised below.</p> <ul style="list-style-type: none">Further clarity on environmental noise survey positions;Assessment of operational road traffic noise undertaken for relevant scenarios for noise;Inclusion of additional requested surrounding receptors;<ul style="list-style-type: none">130 Tottenham Ct Road, retail outlets and Radisson Hotel50 Triton Square, commercial office buildingFurther clarity on assessment methodology; andConsideration for HGV (and other construction traffic) ingress and egress points has been considered in the predictive noise modelling.

ASSESSMENT METHODOLOGY

Defining the Baseline

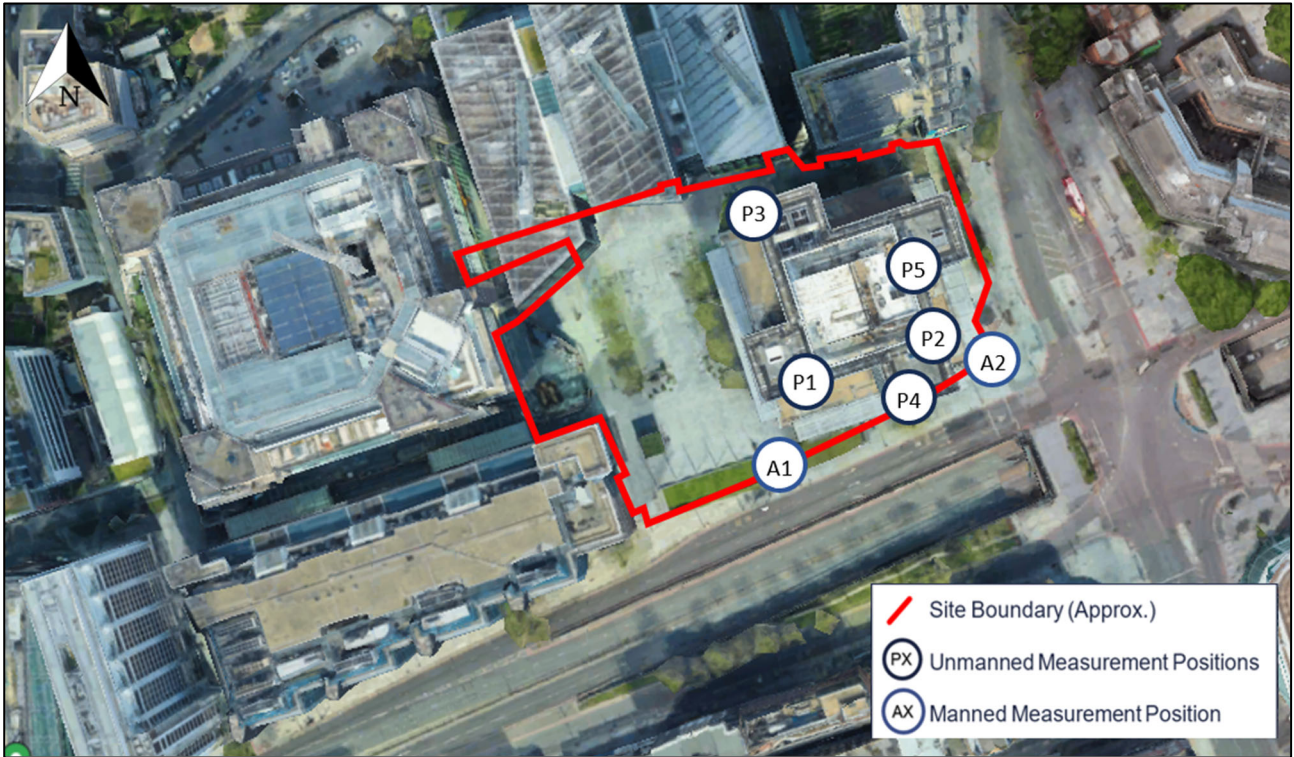
Current Baseline Conditions

- 9.1
- A baseline environmental noise and survey was undertaken in November 2022 to establish the existing noise climate around the site. The full environmental noise survey report is presented in **ES Volume 3, Appendix: Noise and Vibration – Annex 2**. The site location and measurement positions are shown in Figure 9.1.
- 9.2
- A baseline unattended noise survey was undertaken at the site from approximately 11:00 hours on 8 November 2022 for a period of 5-8 days. Further attended noise monitoring was undertaken from approximately 13:00 hours to 15:00 hours on 8 November 2022.
- 9.3
- The noise monitoring locations were as described in Table 9.1.

Table 9.1 Attended and Unattended Noise Monitoring Locations

Position No.	Type	Description
P1	Unattended	The sound level meter was placed on the podium roof. The microphone was attached to a pole fixed along the podium roof edge overlooking Euston Road (A501), approximately 15m from roadside and 8m above ground level.
P2	Unattended	The sound level meter was placed on the podium roof. The microphone was attached to a pole fixed along the podium roof edge overlooking the road junction, approximately 14m from Euston Road, 16m from Hampstead Road and 8m above ground level.
P3	Unattended	The sound level meter was placed on the podium roof. The microphone was attached to a pole fixed along the podium roof edge overlooking Regent's Plaza and Brock Street (pedestrians only/no motor vehicles), approximately 63m from Euston Road, 70m from Hampstead Road and 8m above ground level.
P4	Unattended	The sound level meter was placed on the tower roof. The microphone was attached to a pole fixed along the tower roof edge overlooking nearby road network, approximately 120m above ground level and 1.5m above the roof.
P5	Unattended	The sound level meter was placed on Level 11 East Staircase. The microphone was attached to a pole extruding a window overlooking nearby road network, approximately 40m above ground level and 1m from façade.
A1	Attended	The sound level meter was hand-held. The microphone was positioned approximately 1.5m above ground level and 3m from Euston Road (A501).
A2	Attended	The sound level meter was hand-held. The microphone was positioned approximately 1.5m above ground level and 6m from Hampstead Road.

Figure 9.1 Noise Monitoring Locations



- 9.4
- The results of the baseline noise survey have been used to inform the assessments in this ES chapter. During the deconstruction and construction works, noise and vibration impacts have been assessed upon nearby sensitive receptors, and once the Proposed Development is complete and operational.

Evolution of the Baseline and Future Baseline

- 9.5** The EIA Regulations¹ require that the likely evolution of baseline is considered in the event that the Proposed Development were not to come forward. In other words, the likely effect on the existing baseline conditions if the cumulative schemes and any relevant site designations, as listed in **ES Volume 1, Chapter 2: EIA Methodology**, were to come forward in the absence of the Proposed Development.
- 9.6** With regards to operational road traffic noise, there is the potential for cumulative schemes in the area to affect the flows on the local road network. Where appropriate, and particularly in relation to road traffic noise effects, future baseline scenarios have been applied accounting for traffic generated by other surrounding development schemes (otherwise known as cumulative schemes). This is to provide a robust assessment of road traffic noise effects that takes account of road traffic from other cumulative schemes in the area and not just background traffic growth or road traffic from the Proposed Development itself.
- 9.7** A list of cumulative schemes and approximate distances from the Proposed Development site is presented below.

Table 9.2 List of Cumulative Schemes

Site Name	App Ref(s)	Approximate Distance from Proposed Development
Land to the North of the British, Library, 96 Euston Road London NW1 2DB	2022/1041/P	900m
Central Somers Town, Covering Land at Polygon Road Open Space, Edith Neville Primary School 174 Ossulston Street and Purchase Street Open Space, London, NW1 1EE (Brill Place)	2015/2704/P 2019/5882/P 2020/4631/P 2022/2855/P	900m
Eastman Dental Hospital Site and Buildings (including the former Royal Free Hospital the Eastman Dental Clinic and the Levy Wing) WC1X 8LD	2018/5715/P	1,500m
Royal National Throat, Nose and Ear Hospital Site 330 Grays Inn Road (and fronting Swinton Street and Wicklow Street) London WC1X 8DA	2020/5593/P	470m
247 Tottenham Court Road, London, W1T 7HH; 3 Bayley Street, London, WC1B 3HA; 1 Morwell Street, London, WC1B 3AR; 2-3 Morwell Street, London, WC1B 3AR; and 4 Morwell Street, London, W1T 7QT	2020/3583/P	900m
Network Building (95-100 Tottenham Court Road) 76-80 Whitfield Street and 88 Whitfield Street London W1T 4TP	2020/5624/P 2020/5624/P 2020/5631/P	350m
Belgrove St, London WC1H 8AA	2020/3881/P	1,100m

Impact Assessment Methodology

- 9.8** The study area for the assessment is defined by the location of surrounding receptors and the end use of the Proposed Development. Receptors are outlined within the '*Receptors and Receptor Sensitivity*' section of this ES chapter.
- 9.9** This section presents the methodology used to assess each type of noise and vibration impact, in terms of the application of relevant standards and guidance, along with the types of data and analysis carried out.
- 9.10** The assessment considers the following types of noise and vibration:
- Noise and vibration from construction activities at the Proposed Development;
 - Noise from construction traffic from the Proposed Development;
 - Noise from building services plant noise from the completed Proposed Development and from completed nearby schemes; and
 - Noise from operational road traffic from the completed Proposed Development and from Completed nearby schemes.

Deconstruction and Construction

- 9.11** During the deconstruction and construction works, there is the potential for noise and vibration associated with deconstruction, earthworks, installation of necessary services and building construction to result in significant adverse effects; these impacts have therefore been assessed within this ES chapter.
- 9.12** As per **ES Volume 1, Chapter 5: Deconstruction and Construction**, works are proposed to be undertaken during normal working hours for construction unless otherwise agreed with LBC. These hours are typically weekdays 08:00-18:00 hours and Saturdays 08:00-13:00 hours, with no works being undertaken on Sundays.
- 9.13** Noise emissions from deconstruction and construction works at the surrounding noise sensitive receptors has been predicted using a 3D noise model based on the methodology outlined in BS 5228-1:2009² and relevant guidance presented in the Guide for Contractors Working in Camden³ and Camden's Minimum Requirements⁴.
- 9.14** The assumptions for plant noise levels considered in predictions are presented in **ES Volume 3, Appendix: Noise and Vibration – Annex 3**.

Deconstruction and Construction Noise

- 9.15** The deconstruction and construction programme is anticipated to be undertaken over the course of approximately 65 months, or 5 years and 5 months. The noise and vibration assessment has been undertaken in line with details of the proposed deconstruction and construction works, as set out in **ES Volume 1, Chapter 5: Deconstruction and Construction**.
- 9.16** The key deconstruction and construction stages that are to be considered for noise and vibration include:
- Deconstruction: deconstruction of the existing concrete frame structure;
 - Earthworks: decommissioning and relocation of existing services and utilities within the basement level of the site;
 - Substructure Construction: installation of new piles;
 - Concrete superstructure construction; and
 - Installation of Envelope and Cladding; installation of unitised cladding panels to the outer face of the superstructure.
- 9.17** Annex E of BS 5228-1 - Noise and Vibration Control on Construction and Open Sites includes the 'ABC method' for setting potential thresholds of significant effects at residential receptors. The ABC method has been used

¹ The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (As amended in 2018 and 2020)

² British Standards Institute, 2009, 'Noise and Vibration Control on Construction and Open Sites. Part 1, 2 & 4. Code of Practice. BS 5228'

³ Culture and Environment Directorate London Borough of Camden, 2008, 'Guide for Contractors Working In Camden'

⁴ Culture and Environment Directorate London Borough of Camden, (publish date unknown), 'Camden's Minimum Requirements'

in the assessment within this ES chapter to assess the potential for likely significant noise effects from the deconstruction and construction works.

9.18 This method defines category 'threshold values' which are determined by the proposed hours of operation and existing ambient noise levels (rounded to the nearest 5 dB). A significant effect is deemed to have occurred when the total noise level (including construction noise) exceeds the appropriate category threshold value. The scale and nature of the effect and whether the effects are significant or not are defined in the 'Methodology for Defining Effects' section of this ES chapter.

9.19 Table 9.3 presents the threshold of significant effects of the BS 5228 ABC method.

Table 9.3 Threshold of Potential Significant Effects at Residential Receptors

Assessment Category and Threshold Value Period	Threshold value (dB) $L_{Aeq,T}$		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Daytime (08:00 – 18:00) and Saturdays (08:00 – 13:00)	65	70	75
NOTE 1: A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level. NOTE 2: If the ambient noise level exceeds the threshold values given in the table (i.e., the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity. NOTE 3: Applied to residential receptors only.			
A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values. C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category B values.			

9.20 For non-residential receptors, no specific criteria are given by the London Borough of Camden (LBC); suitable criteria have therefore been adopted from Environmental Advisory Leaflet (ADL) 72, 1976 'Noise Control on Building Sites'⁵ which provides some guidance on setting appropriate construction noise limits depending on the site setting and independent of baseline noise conditions. These limits are:

- 70 dB(A) in rural, suburban and urban areas away from main road traffic and industrial noise; and
- 75 dB(A) in urban areas near main roads and heavy industrial areas.

9.21 Given the location of the site and surrounding area in relation to an urban area and nearby main roads, the 75 dB(A) limit is to be considered for non-residential receptors surrounding the Proposed Development.

Deconstruction and Construction Vibration

9.22 BS 5228 Part 2 provides guidance on human response to vibration and cosmetic damage associated with vibration. The simplified methods and historical vibration data contained within BS 5228 Part 2 have been used to predict potential annoyance alongside evaluation of cosmetic damage associated with vibration.

9.23 Table 9.4 presents the effects of vibration levels for human perception.

Table 9.4 Human Perception of Vibration Levels

Vibration Level	Effect
0.14 mm/s	Vibration might be perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaints but can be tolerated if prior warning and explanation has been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

⁵ DEPARTMENT OF THE ENVIRONMENT, 1976, *Noise control on building sites. Advisory Leaflet 72, 3rd Edition*. London: HMSO.

⁶ Department of Transport/Welsh Office, 1988, 'The Calculation of Road Traffic Noise'

⁷ Highways Agency, 2020, 'Design Manual for Roads and Bridges LA 1117'

9.24 BS 7358-2 also provides guidance on building vibration response limits for cosmetic damage.

Table 9.5 Guidance on Building Vibration Response Limits

Type of Building	Peak component particle velocity in frequency range of predominant pulse	
	4Hz to 15Hz	15Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4Hz and above	50mm/s at 4Hz and above
Unreinforced or light framed structures Residential or light commercial buildings	15mm/s at 4Hz increasing to 20 mm/s at 15Hz	20mm/s at 15Hz increasing to 50mm/s at 40Hz and above
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		

9.25 The values above in Table 9.5 refer to transient vibration events such as impact piling. BS 7358-2 notes that for continuous sources (such as vibratory compaction) these limits should be reduced by up to 50%.

Construction Traffic Noise

9.26 Changes in traffic noise as a result of the traffic associated with deconstruction and construction works, have been predicted using the Calculation of Road Traffic Noise (CRTN)⁶ methodology and assessed based on the approach for noise impacts set out in Design Manual for Roads and Bridges LA 1117⁷.

9.27 Traffic flow data has been provided by the Applicant's Transport Consultant (Velocity Transport Planning) and include the following scenarios for assessment in this ES chapter: Peak construction Average Annual Daily Traffic (AADT) (18hr) with cumulative schemes.

9.28 The traffic data has been used to calculate the dB L_{10} at 10m from the nearside road edge during construction works of the Proposed Development on surrounding local roads. This permitted a direct comparison of existing (baseline) road traffic noise with the expected road traffic noise during construction works to establish the likely effect.

Completed Development

Building Services Plant Noise

9.29 Noise emissions from building services plant has the potential to increase the background noise climate and impact nearby noise sensitive receptors.

9.30 As is standard at the planning stage, precise details of proposed building services plant associated with the Proposed Development are not yet known. Building services plant equipment will therefore be selected, located and attenuated such that the plant noise emission criteria agreed with LBC are satisfied. Such criteria will be agreed through appropriately worded planning conditions.

9.31 LBC's The 'Camden Local Plan'⁸ stipulates that their typical noise policy is for building services plant noise to not exceed a Rating Level of 10 dB below the existing background sound level, as defined in BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound'⁹

9.32 The Proposed Development may also include emergency back-up generators. These would only operate in the event of an emergency to provide backup power. LBC's Local Plan states that emergency equipment such as generators, which are only to be used for short periods of time, are required to meet the noise criteria of no more than 10 dB above the background level ($L_{A90\ 15min}$). The exact receptor location is not specified but it is assumed that this limit applies at 1m from the nearest noise sensitive receptors.

9.33 Maintenance and testing schedules of emergency plant equipment will need to be developed to avoid potential noise impacts during these periods.

⁸ London Borough of Camden, 2017, 'Camden Local Plan'

⁹ British Standards Institute, 2014, 'Method for Rating and Assessing Industrial and Commercial Sound BS 4142'

Complete and Operational Road Traffic Noise

- 9.34 An assessment has been undertaken of the change in road traffic noise which result from changes in road traffic flow on the local road network when the Proposed Development is operational. Road traffic noise has been predicted using the methods outlined in Calculation of Road Traffic Noise (CRTN)¹⁰.
- 9.35 Traffic flow data has been provided by the Applicant’s Transport Consultant (Velocity Transport Planning) and include the following scenarios for assessment in this ES chapter:
- 2023 Baseline AADT (18hr); and
 - 2028 Future baseline AADT (18hr) with cumulative schemes and the Proposed Development.
- 9.36 The traffic data has been used to calculate the dB L₁₀ at 10m from the nearside road edge for the scenarios above on surrounding local roads. This permitted a direct comparison of existing/future (baseline) road traffic noise with the expected road traffic noise during operation of the Proposed Development to establish the likely effect.

Site Suitability Assessment

- 9.37 The Proposed Development is to comprise laboratory enabled, office and flexible commercial floorspace and does not include any residential occupation, therefore, a site suitability assessment is not deemed to be required.

Assumptions and Limitations

- 9.38 To assess the effects of the Proposed Development, it was necessary to determine the baseline conditions. It is assumed that the baseline noise measurements, which were undertaken at the site in November 2022, are representative of the typical (long term) noise environment of the site.
- 9.39 It is assumed that contractors will comply with all legislation relevant to the control of noise and vibration from construction work that include:
- The Control of Pollution Act 1974 (COPA) with particular reference to part III¹¹;
 - The Environmental Protection Act 1990¹²; and
 - The Control of Noise at Work Regulations 2005¹³.
- 9.40 The predictions of deconstruction and construction noise and vibration have been based upon the following assumptions:
- Noise emissions from deconstruction and construction plant and activities will be compliant with the historical noise data presented in Annex C of BS 5228-1;
 - Levels of vibration from deconstruction and construction plant and activities will be compliant with the historical vibration data presented in Annex C of BS 5228-2¹⁴;
 - 2.4m high solid hoarding will be implemented at the boundary of the site;
 - Stationary plant and hand-held tools will be adequately screened when used for prolonged periods;
 - Mobile plant will manoeuvre around the site equally during deconstruction and construction; and
 - Locations and routes of fixed and mobile plant items have been selected based on reasonable assumptions for the site layout and likely access and egress points.
- 9.41 The exact selected equipment and deconstruction and construction methodology will be dependent on the appointed contractor. Reasonable worst-case assumptions have therefore been made for predictions with regards to operations, activities, locations, mobile plant routes and the associated plant and equipment that will be used. As such, the predicted deconstruction and construction noise and vibration levels represent an upper estimate or worst-case scenario in terms of emissions from the site during works.

¹⁰ Department of Transport/Welsh Office, 1988, ‘The Calculation of Road Traffic Noise’
¹¹ The Law Library, 1974, The Control of Pollution Act 1974
¹² The Environmental Protection Act 1990

Methodology for Defining Effects

Receptors and Receptor Sensitivity

- 9.42 Existing noise and vibration sensitive receptors that have the potential to be affected by the Proposed Development (during the deconstruction and construction works and once complete and operational) have been identified based on programme information, professional judgement, on-site surveys and observations. The sensitivity of the identified noise and vibration sensitive receptors have been defined based on the use and occupancy type of the receptor.
- 9.43 Table 9.6 summarises the sensitivity of various receptors, including use types relevant to the Proposed Development, and other uses for context, which is based on a mixture of professional experience and industry standards.

Table 9.6 Receptor Sensitivity

Sensitivity	Description	Examples of Receptor Usage
High	Receptors where noise will significantly affect the function of the receptor	Residential / Hotels Auditoria/studios; Specialist teaching centres; and Libraries.
Medium	Receptors where people or operations are particularly susceptible to noise	Quiet outdoor areas used for recreation; Conference facilities; Schools in daytime; and Hospitals/residential care homes
Low	Receptors of low sensitivity to noise, where it may cause some distraction or disturbance	Offices; Restaurants; and Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g., tennis, golf).
Very Low	Receptors where distraction or disturbance from noise is minimal	Residences and other buildings not occupied during working hours; Factories and working environments with existing high noise levels; and Sports grounds when spectator or noise is a normal part of the event.

Magnitude of Impact

Deconstruction and Construction Noise

- 9.44 The significance criteria for deconstruction and construction noise relate to the level of exceedance above the thresholds presented in Table 9.3. These are defined using category A and category C of the ‘ABC’ method of BS 56228-1 respectively and determined by comparison to the following effect levels:
- **NOEL** – No Observed Effect Level
This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.
 - **LOAEL** – Lowest Observable Adverse Effect Level
This is the level above which adverse effects on health and quality of life can be detected.
 - **SOAEL** – Significant Observed Adverse Effect Level
This is the level above which significant adverse effects on health and quality of life occur.
- 9.45 The exceedance impact criteria are presented in Table 9.7.

¹³ Health and Safety Executive, 2005, The Control of Noise at Work Regulations
¹⁴ British Standards Institute, 2009, ‘Noise and Vibration Control on Construction and Open Sites. Part 2. Code of Practice. BS 5228’

Table 9.7 Construction Noise Impact Criteria for Residential Receptors

Construction Noise Level	Effect Level	Magnitude of Impact
Assessment criterion is exceeded by 0 to 3 dBA;	NOAEL	Very Low
Assessment criterion is exceeded by 3 to 5 dBA;	LOAEL	Low
Assessment criterion is exceeded by 5 to 10 dBA; and	SOAEL	Medium
Assessment criterion is exceeded by over 10 dBA		High

Deconstruction and Construction Vibration

- 9.46** Based on BS 5228-2 (see Table 9.4), the table below presents the impact criteria for vibration effects on people and equipment within nearby sensitive receptors during deconstruction and construction.

Table 9.8 Vibration Effect Impact Criteria

Vibration Level (PPV)	Effect Level	Magnitude of Impact
< 0.3 mm/s	NOAEL	Very Low
0.3 mm/s – 0.9 mm/s	LOAEL	Low
1.0 mm/s to 9.9 mm/s	SOAEL	Medium
> 10.0 mm/s		High

Deconstruction and Construction Traffic Noise

- 9.47** The road traffic effects (of the deconstruction and construction of the Proposed Development on nearby noise sensitive receptors) can be categorised as noise associated with changes in road traffic movements around the site on local roads.
- 9.48** Impact criteria for assessing the deconstruction and construction road traffic effects, are presented in Table 9.9. The criteria are based on the approach for noise impacts set out in Design Manual for Roads and Bridges LA 1117.

Table 9.9 Construction Traffic Noise Impact Criteria

Increase in Basic Noise Level of Closest Public Road Used for Construction Traffic (dB)	Magnitude of Impact
<1.0	Very Low
1.0 – 2.9	Low
3.0 – 4.9	Medium
≥5.0	High

Operational Building Services Plant Noise

- 9.49** Noise emissions from building services plant associated with the completed and operational Proposed Development would need to be controlled to ensure that it would not have an effect on nearby noise sensitive receptors relative to the existing background sound level and also achieve LBC requirements for atmospheric plant noise emissions. Criteria for the assessment are set in accordance with the Institute of Acoustics (IOA) / Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Noise Impact Assessment'¹⁵.

Table 9.10 Operational Building Services Plant Noise Effect Scale Criteria

Increase in Noise Level (dBA)	Description	Magnitude of Impact
<1.0 dB	Noise increase is unlikely to be discernible	Very Low

¹⁵ Institute of Environmental Management and Assessment (IEMA) and Institute of Acoustics (IOA) Guidelines for Noise Impact Assessment, 2014

Increase in Noise Level (dBA)	Description	Magnitude of Impact
0.1 to 0.9 dB	A slight increase in noise levels may be perceived in affected buildings and outdoor recreational areas	Low
1.0 to 2.9 dB	Increase in noise levels is likely to be noticeable in affected buildings and outdoor recreational areas	Medium
>5.0 dB	Increase in noise levels is likely to be clearly perceptible and could have a significant effect on the continued use of a building	High

Completed and Operational Road Traffic Noise

- 9.50** The significance criteria for long term changes in road traffic noise (i.e., general flow) for the completed and operation development are determined using the criteria outlined in CRTN and the IOA / IEMA 'Guidelines for Noise Impact Assessment'.

Table 9.11 Operational Traffic Change Effect Scale Criteria

Change in Noise Level on Surrounding Roads	Subjective Response	Magnitude of Impact
<1.0 dB	Just perceptible change in loudness	Very Low
1.0 to 2.9 dB	Perceptible change in loudness	Low
3 to 4.9 dB	Up to a doubling or halving of loudness	Medium
>5.0 dB	Increase in noise levels is likely to be clearly perceptible	High

Defining the Effect

Scale and Nature of Effect

- 9.51** Table 9.12 determines the scale of effects based on the sensitivity of the receptor and the magnitude of the impact, as per the IOA / IEMA 'Guidelines for Noise Impact Assessment'.

Table 9.12 Scale of Effects

Sensitivity of Receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

- 9.52** Noise and vibration effects are typically classified as either Adverse (for Minor to Major impact) or Negligible. An Adverse effect refers to anything that can alter behaviour, attitudes, or the overall character of a location. A Negligible effect is used when there is no noticeable impact on the receptors. Beneficial noise effects are unlikely.

Geographic Extent of Effect

- 9.53** The effects under assessment in this ES chapter are local effects at a spatial level, such that they affect the immediate neighbouring receptors to the site. The effects on broader, more distant receptors (i.e., further from the site in relation to the receptors considered in this ES chapter) are deemed insignificant due to the reduction of noise and vibration with increasing distance and screening from intervening buildings from the site.

Effect Duration

9.54 Effects resulting from deconstruction and construction works are considered "temporary" for the purposes of the assessment in this ES chapter. These effects can be categorised as either "short term" (1 – 6 months) or "medium-term" (duration over 6 months) depending on the duration of the specific deconstruction and construction activities. Effects linked to the operational Proposed Development are classified as "permanent" or "long-term" effects.

Categorising Likely Significant Effects

9.55 Table 9.13 provides a contextual understanding of the magnitude of effects experienced by receptors and their probable acceptance to those effects. Guidance has been drawn from IEMA Guidelines for Environmental Noise Impact Assessment and the Planning Practice Guidance (PPG)¹⁶. It also establishes a correlation between the scale of effect and the ratings for LOAEL (Lowest Observed Adverse Effect Level), SOAEL (Significant Observed Adverse Effect Level) and NOAEL (No Observed Adverse Effect Level). The NOAEL (No Observed Adverse Effect Level) is equivalent to a Negligible effect rating.

Table 9.13 Classification of Noise Effects

Effect Scale	Description	Exceeds LOAEL	Exceeds SOAEL	Acceptable for Receptors?
Negligible	No discernible effect on the receptor	No	No	Yes
Minor	Non-intrusive, can be heard but does not cause any change in behaviour or attitude. Can slightly affect the character of an area but not such that there is a perceived change in the quality of life.	No	No	Yes
Moderate	Intrusive, noise can be heard and causes small changes in behaviour and/or attitude. Potential for non-awakening sleep disturbance. Affects the character of an area such that there is a perceived change in the quality of life.	Yes	No	No
Major	Disruptive, causes a material change in behaviour and/or attitude. Potential for sleep disturbance. Quality of life diminished due to change in character of the area.	Yes	Yes	No

9.56 A significant effect is an effect that is classified as being Moderate or Major in scale. Effects that are Minor or Negligible in scale are not considered to be significant effects.

BASELINE CONDITIONS

9.57 During the periods noise measurements were being taken on-site, the dominant noise sources were noted to be continuous road traffic on Euston Road (A501) and Hampstead Road. This included regular buses and heavy goods vehicles (HGVs). Regular acceleration of road vehicles was noted as they accelerated from the traffic lights on Euston Road (A501) and Hampstead Road. Passing conversing pedestrians was also noted during the attended measurements at street level.

9.58 The typical daytime $L_{Aeq}(16\text{-hour})$, night-time $L_{Aeq}(8\text{-hour})$, lowest daytime $L_{A90,T}$ and lowest night-time $L_{A90,T}$ noise levels measured during the unattended survey are presented in Table 9.14 below.

Table 9.14 Baseline Noise Survey Results (Unattended)

Position	Measured Noise Level (dB re 2×10^{-5} Pa)			
	Daytime (07:00 – 23:00) Hours, $L_{Aeq,16hr}$	Lowest Daytime (07:00 – 23:00) Hours, $L_{A90,T}$	Night-Time (23:00 – 07:00) Hours, $L_{Aeq,8hr}$	Lowest Night-Time (23:00 – 07:00) Hours, $L_{A90,T}$
P1	68	59	67	53
P2	66	53	63	47
P3	62	51	57	47
P4	60	52	57	51
P5	70	58	67	55

¹⁶ Department of Communities and Local Government (2014) Planning Practice Guidance

9.59 The A-weighted (dBA) L_{90} , L_{eq} and L_{max} sound levels from the attended survey locations are presented in Table 9.15.

Table 9.15 A-Weighted (dBA) L_{90} , L_{eq} and L_{max} Sound Levels (Attended)

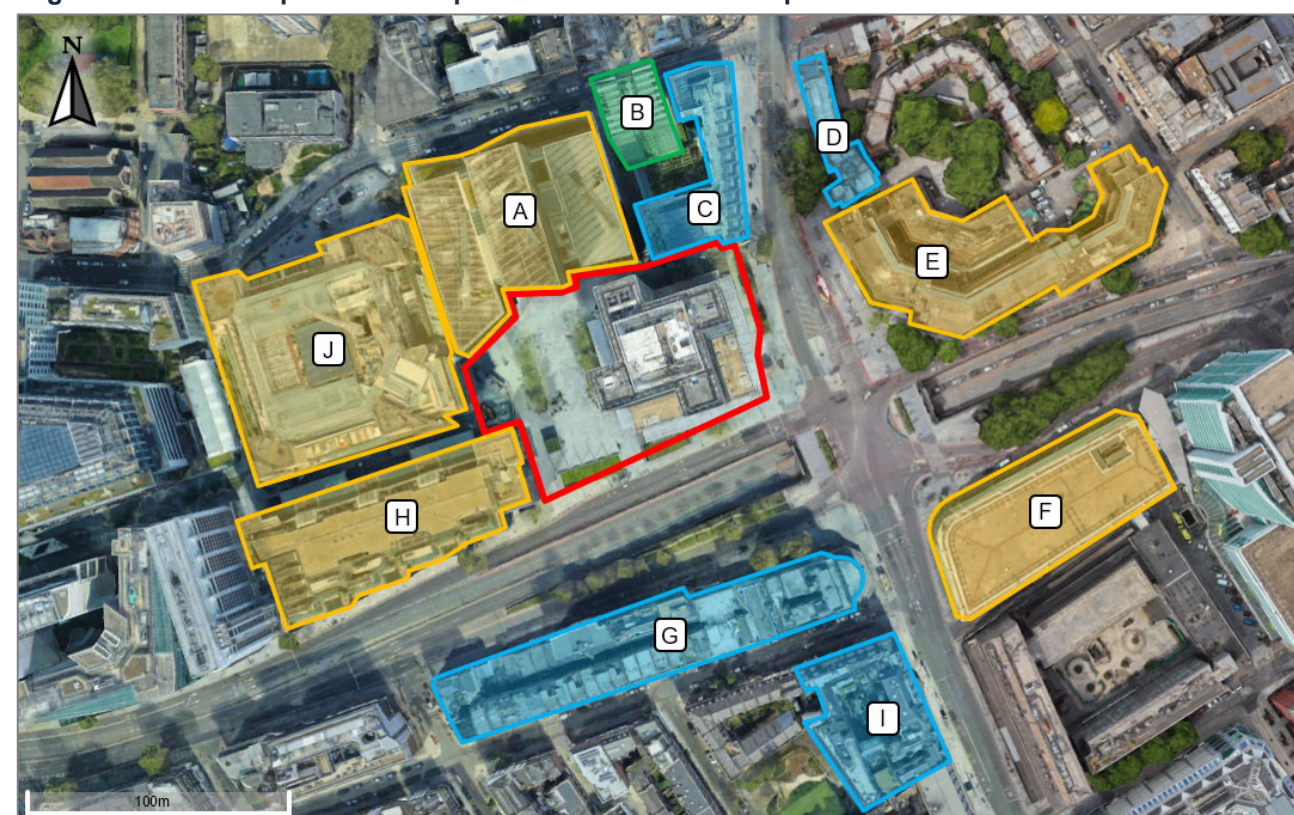
Position	Time	Sound Levels dBA		
		L_{90}	L_{eq}	L_{max}
A1	13:00 to 13:15 hours	63	69	81
A2	14:45 to 14:55 hours	66	71	85

RECEPTORS AND RECEPTOR SENSITIVITY

Existing

9.60 The existing noise and vibration sensitive receptors which could be affected by noise and vibration impacts associated with the Proposed Development are indicated in Figure 9.2, the description of these receptors are noted in Table 9.15.

Figure 9.2 Proposed Development and Sensitive Receptor Locations



9.61 Table 9.16 describes the identified nearby noise and vibration receptors.

Table 9.16 Existing Receptors

Ref	Type	Description	Sensitivity
A	Existing Commercial	10 Brock Street, commercial office building	Low
B	Existing Residential	The Triton Building, 26-storey residential tower	High
C	Existing Mixed-use	Commercial units with residential properties above on Hampstead Road	High
D	Existing Mixed-use	44 – 66 Hamstead Road, commercial and residential properties	High
E	Existing Commercial	250 Euston Road, university, and commercial office building	Low

Ref	Type	Description	Sensitivity
F	Existing Commercial	The Podium, 235 Euston Road, University College Hospital	Medium
G	Existing Mixed-use	Commercial and residential properties on Euston Road	High
H	Existing Commercial	1 Triton Square, commercial office building	Medium
I	Existing Mixed-use	130 Tottenham Ct Road, retail outlets and Radisson Hotel	High
J	Existing Commercial	50 Triton Square, commercial office building	Low

9.62 The sensitivity of The Podium, 235 Euston Road, University College Hospital is assumed to be medium as is often typical for Hospital uses and due to its location on a busy and noisy road intersection. In the event that this receptor is adversely affected by noise and vibration associated with the Proposed Development, mitigation would be through formation of a working group between the relevant University College London personnel and the contractor to ensure impacts are controlled and monitored.

9.63 Table 9.17 below indicates the applicable baseline measurement locations selected for receptors.

Table 9.17 Receptor Measurement Locations

Ref	Type	Description	Applicable Measurement Location
A	Existing Commercial	10 Brock Street, commercial office building	P3
B	Existing Residential	The Triton Building, 26-storey residential tower	P3
C	Existing Mixed-use	Commercial units with residential properties above on Hampstead Road	P3
D	Existing Mixed-use	44 – 66 Hamstead Road, commercial and residential properties	A2
E	Existing Commercial	250 Euston Road, university, and commercial office building	A2
F	Existing Commercial	The Podium, 235 Euston Road, University College Hospital	A2
G	Existing Mixed-use	Commercial and residential properties on Euston Road	A1
H	Existing Commercial	1 Triton Square, commercial office building	P1
I	Existing Mixed-use	130 Tottenham Ct Road, retail outlets and Radisson Hotel	A1
J	Existing Commercial	50 Triton Square, commercial office building	P3

Introduced

9.64 There are no residential receptors being introduced as part of the Proposed Development, as it will consist of predominantly offices and laboratory uses.

EMBEDDED MITIGATION

Deconstruction and Construction

9.65 Predictions of deconstruction and construction noise emissions includes consideration for the following measures that constitute the principles of 'Best Practicable Means (BPM)' as defined in the Control of Pollution Act 1974:

- 2.4m high hoarding around the perimeter of the site;
- Local screening of handheld tools; and
- Enclosures for fixed plant equipment such as generators and pumps.

POTENTIAL EFFECTS

Deconstruction and Construction

Deconstruction and Construction Noise Effects

9.66 Table 9.18 sets out the threshold of potential effect and significance criteria for deconstruction and construction noise. For residential receptors, the ABC criteria as stated in Table 9.3 is used. For non-residential receptors, the threshold has been identified as per the criteria set out in paragraph 9.20. The site and surrounding receptors are considered to be within an urban area with main roads.

Table 9.18 Receptors and Threshold of Potential Significance

Ref	Description	Type	ABC	Threshold of Potential Significance
A	10 Brock Street, commercial office building	Existing Commercial	-	75
B	The Triton Building, 26-storey residential tower	Existing Residential	A	65
C	Commercial units with residential properties above on Hampstead Road	Existing Mixed-use (inc. Residential)	A	65
D	44 – 66 Hamstead Road, commercial and residential properties	Existing Mixed-use (inc. Residential)	C	75
E	250 Euston Road, university, and commercial office building	Existing Commercial	-	75
F	The Podium, 235 Euston Road, University College Hospital	Existing Commercial	-	75
G	Commercial and residential properties on Euston Road	Existing Mixed-use (inc. Residential)	C	75
H	1 Triton Square, commercial office building	Existing Commercial	-	75
I	130 Tottenham Ct Road, retail outlets and Radisson Hotel	Existing Mixed-use (inc. Hotel)	C	75
J	50 Triton Square, commercial office building	Existing Commercial	-	75

9.67 Plant noise levels considered in predictions are presented in in **ES Volume 3, Appendix: Noise and Vibration - Annex 3**.

9.68 The modelled noise levels from deconstruction and construction works are pre-mitigation and align with the assumptions and limitations described in Paragraph 9.40.

9.69 The predicted noise levels at noise sensitive receptors are the dB L_{Aeq,10hr} noise levels at 1m from the worst-affected noise sensitive windows of the identified receptors. Buildings, ground and roads have been modelled as reflective.

9.70 Predictions have considered 'timeslices' for the deconstruction and construction works with reference to the proposed deconstruction and construction programme set out in **ES Volume 1, Chapter 5: Deconstruction and Construction works**.

9.71 The 'timeslice' approach considers each key noisy construction phase and accounts for the potential for simultaneous works and activities that are likely to take place during each phase.

Table 9.19 Assessment Timeslices

Timeslice	Description of Works During Timeslice	Duration
1	Deconstruction: deconstruction of the existing concrete frame structure	24 Months
	Earthworks: decommissioning and relocation of existing services and utilities within the basement level of the site and piling	14 Months
2	Substructure Construction: installation of concrete superstructure	27 Months
3	Installation of Envelope and Cladding; installation of unitised cladding panels to the outer face of the superstructure	31 Months

9.72 Table 9.20 below sets out the predicted noise levels during the assessment timeslices.

Table 9.20 Predicted Deconstruction and Construction Noise Levels

Ref	Description	Noise Levels During Timeslice 1 (dB LAeq,10hr)	Noise Levels During Timeslice 2 (dB LAeq,10hr)	Noise Levels During Timeslice 3 (dB LAeq,10hr)
A	10 Brock Street	79	78	75
B	The Triton Building, 26-storey residential tower	71	67	49
C	Residential properties above on Hampstead Road	68	62	53
D	44 – 66 Hamstead Road	70	62	51
E	250 Euston Road	74	67	54
F	The Podium, 235 Euston Road	71	68	58
G	Residential properties on Euston Road	75	72	67
H	1 Triton Square	84	86	83
I	130 Tottenham Ct Road	71	69	66
J	50 Triton Square	77	78	75

9.73 Figure 9.3, Figure 9.4 and Figure 9.5 below show the modelled sound propagation for each timeslice.

Figure 9.3 Timeslice 1 – dB LAeq,10hr Noise Levels

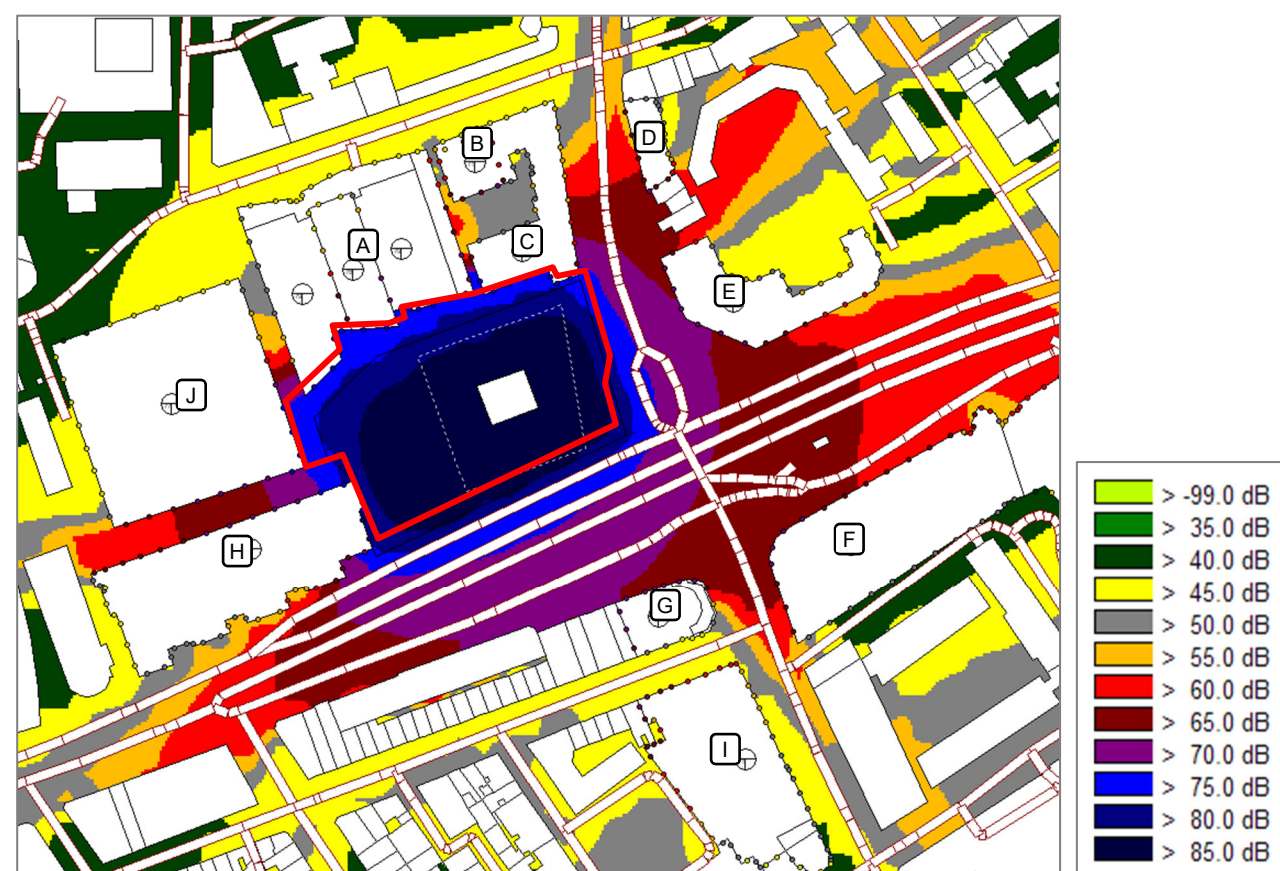


Figure 9.4 Timeslice 2 – dB LAeq,10hr Noise Levels

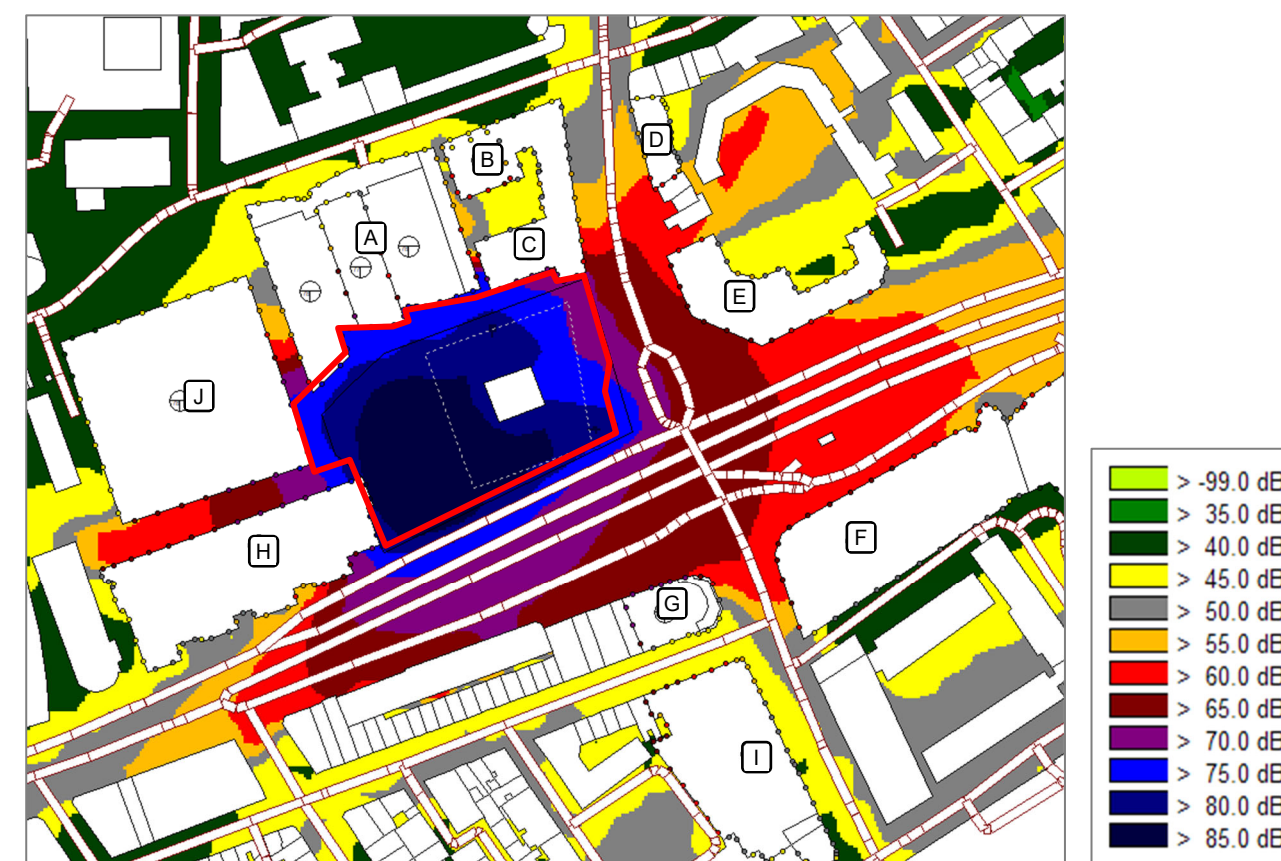
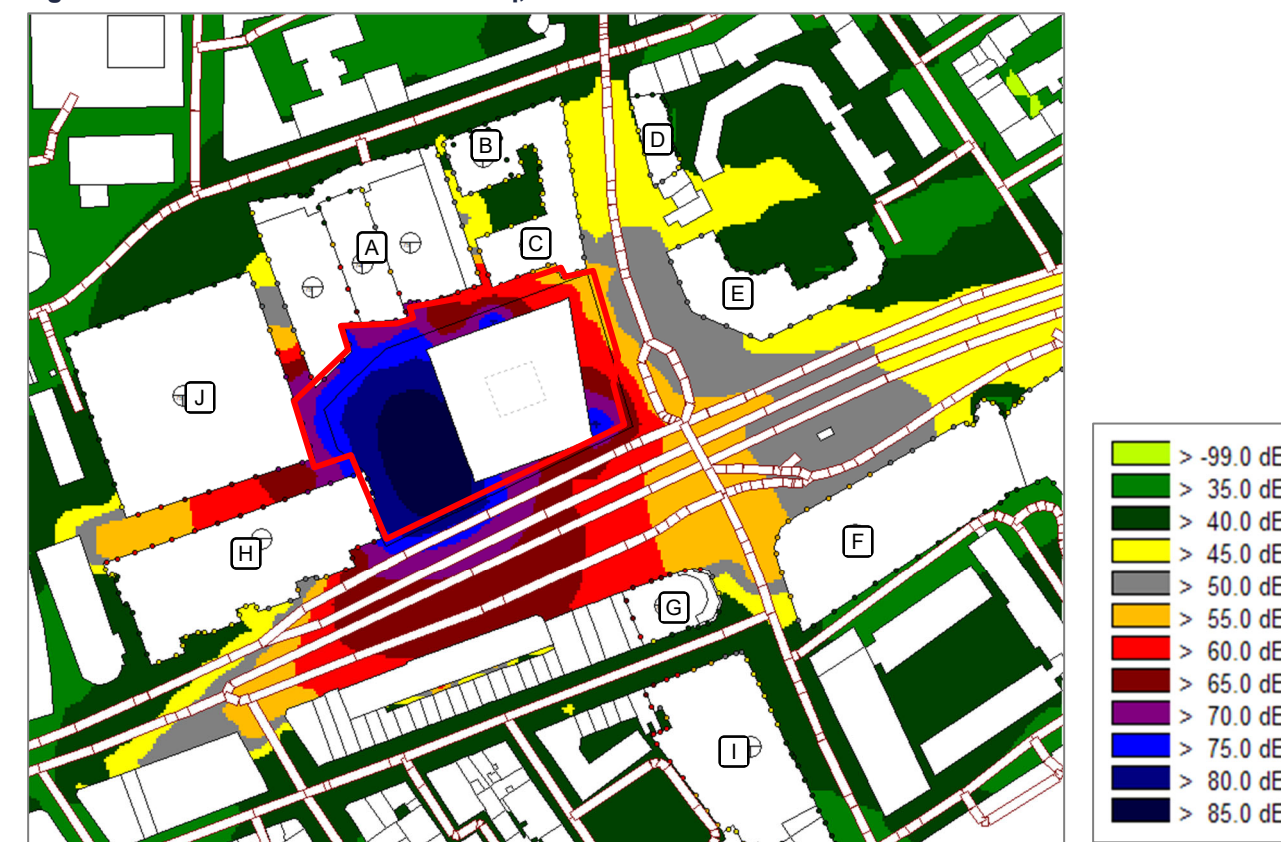


Figure 9.5 Timeslice 3 – dB LAeq,10hr Noise Levels



9.74 Table 9.21 below show presents a summary of the likely effects for at each noise sensitive receptor.

Table 9.21 Deconstruction & Construction Noise Effects

Ref	Description	Sensitivity	Timeslice 1	Timeslice 2	Timeslice 3
A	10 Brock Street	Low	Negligible	Negligible	Negligible
B	The Triton Building, 26-storey residential tower	High	Moderate Adverse	Minor Adverse	Negligible
C	Residential properties above on Hampstead Road	High	Minor Adverse	Negligible	Negligible
D	44 – 66 Hamstead Road	High	Negligible	Negligible	Negligible
E	250 Euston Road	Low	Negligible	Negligible	Negligible
F	The Podium, 235 Euston Road	Medium	Negligible	Negligible	Negligible
G	Residential properties on Euston Road	High	Negligible	Negligible	Negligible
H	1 Triton Square	Medium	Minor Adverse	Moderate Adverse	Minor Adverse
I	130 Tottenham Ct Road	High	Negligible	Negligible	Negligible
J	50 Triton Square	Low	Negligible	Negligible	Negligible

9.75 Noise Levels during Timeslice 1 (enabling works, deconstruction and piling/basement box construction) indicated that the likely effects will be Moderate Adverse (**significant**) at The Triton Building 26-storey residential tower (Receptor B) and Minor Adverse (not significant) at residential properties on Hampstead Road (Receptor C) and 1 Triton Square (Receptor H) respectively. Negligible (not significant) effects are indicated at all other noise sensitive receptors.

9.76 Noise Levels during Timeslice 2 (substructure construction) indicated that the likely effects will be Minor Adverse (not significant) at The Triton Building 26-storey residential tower (Receptor B) and Moderate Adverse (**significant**) at 1 Triton Square (Receptor H). Negligible (not significant) effects are indicated at all other noise sensitive receptors.

9.77 Noise Levels during Timeslice 3 (installation of envelope and cladding) indicated that the likely effects will be Minor Adverse (not significant) at 1 Triton Square (Receptor H). Negligible (not significant) effects are indicated at all other noise sensitive receptors.

9.78 It should be noted that the assessment of deconstruction and construction noise effects is based on a worst-case representation of assumptions for the activities over the course of a working day for each timeslice with noise sources operating simultaneously. In practice, these noise sources will likely operate for shorter periods.

9.79 To mitigate deconstruction and construction noise emissions, the principles of 'Best Practicable Means (BPM)', as defined in the Control of Pollution Act, 1974 should be used to reduce noise emissions throughout the works to a reasonable and practicable level. These measures are described in the 'Mitigation Measures, Monitoring and Residual Effects' section of this ES chapter.

Deconstruction and Construction Road Traffic Noise Effects

9.80 Baseline and future traffic flow data (AADT 18hr) on nearby public roads during peak construction has been provided by the Applicant's Transport Consultant (Velocity Transport Planning).

9.81 Table 9.22 below presents the predicted change in traffic noise on nearby worst-affected public roads as a result of the traffic associated with construction works using the CRTN methodology.

Table 9.22 Construction Traffic Noise Levels on Nearby Public Roads

Road	Traffic Noise Baseline (2023) (dB L _{10,18hr} at 10m)	Traffic Noise During Peak Construction (dB L _{10,18hr} at 10m)	Change in Noise Level (dB)	Magnitude of Impact
Hampstead Road	70.2	70.2	0.1	Negligible
Euston Road (underpass)	71.4	71.4	0.0	Negligible
Euston Road off-slip (EB)	67.4	67.4	0.0	Negligible

Road	Traffic Noise Baseline (2023) (dB L _{10,18hr} at 10m)	Traffic Noise During Peak Construction (dB L _{10,18hr} at 10m)	Change in Noise Level (dB)	Magnitude of Impact
Euston Road on-slip (WB)	66.5	66.5	0.0	Negligible
Euston Road on-slip (EB)	66.4	66.4	0.0	Negligible
Euston Road off-slip (WB - two-way)	67.7	67.7	0.0	Negligible
Tottenham Court Road	66.3	66.3	0.0	Negligible
Drummond Street	61.6	61.8	0.2	Negligible
Longford Street	62.3	62.5	0.2	Negligible

9.82 Comparison of calculated baseline road traffic noise during peak construction indicates that changes in road traffic flows as a result of the Proposed Development will result in a Negligible (not significant) effect on road traffic noise on surrounding public roads.

Deconstruction and Construction Vibration Effects

9.83 BS 5228 indicates that construction activities (particularly piling) usually only generate significant vibration effects when they are located within 20m from sensitive locations. It is not possible to accurately predict the potential impact as it depends on the type of piling, ground conditions, and receptor distance.

9.84 High vibration sensitive receptors within 20m of the site boundary (and therefore potential piling locations) are residential properties on Hampstead Road (Receptor C).

9.85 Table 9.23 presents historical example vibration levels for different phases of an augered piling activity at 10m, as sourced from BS 5228.

Table 9.23 Example Piling Vibration Levels

BS 5228 Ref.	Soil	Piling Activity / Mode	Distance (m)	Peak Particle Velocity (mm/s)
103	Fill Clay	Augering	10	0.38
103	Fill Clay	Dolly casing	10	1.1
103	Fill Clay	Auger hitting base of hole	10	0.96
103	Fill Clay	Spinning off	10	0.57
100	Fill / gravel / London clay	Driving Casing	7	3.2
100	Fill / gravel / London clay	With 3 t dolly	7	1.0

9.86 The approximate distance from the nearest potential piling locations to the boundary with residential properties on Hampstead Road (Receptor C) is approximately 12-15m and therefore vibration levels at this distance are likely to be less than set out in Table 9.23 above (levels of vibration typically reduce with increased distance from the vibration source). However, given this assessment is based on historical example data and receptors are located within 20m of the nearest piling locations, there is the potential that vibration within residential properties on Hampstead Road (Receptor C) could potentially exceed 1mm/s PPV (the level at which complaints are likely to be made by residents). However, it is noted that such vibration levels can be tolerated if prior warning and explanation has been given to residents.

9.87 Effects from vibration during piling at the closest locations to residential properties on Hampstead Road (Receptor C) has the potential to occasionally approach Moderate Adverse (**significant**) but is anticipated to likely be Minor Adverse (not significant) and short term with prior warnings. For construction of piles greater than 20m from residential properties on Hampstead Road (Receptor C), effects from construction vibration are anticipated to be Negligible (not significant).

9.88 All other surrounding vibration receptors are greater than 20m from any potential piling locations or low sensitivity. As such, effects from construction vibration at all surrounding receptors, other than residential properties on Hampstead Road (Receptor C), are anticipated to be Negligible (not significant).

9.89 Predicted cosmetic damage to nearby buildings (receptors) is anticipated to be Negligible (not significant).

Completed Development

Building Services Noise

- 9.90** The Proposed Development will incorporate numerous items of fixed plant (at roof level and within internal plant rooms) which would have the potential to generate noise, especially when operating at night when background noise levels are at their lowest.
- 9.91** Building services plant equipment will be selected, located, and attenuated such that the plant noise emission criteria agreed with LBC are satisfied. Such criteria will be agreed through appropriately worded planning conditions.
- 9.92** LBC's 'The 'Camden Local Plan' stipulates that their typical noise policy is for building services plant noise to not exceed a Rating Level of 10 dB below the existing background sound level, as defined in BS 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound'.
- 9.93** Table 9.24 presents the Rating Level limits for the identified residential noise sensitive receptors that have been established from the baseline noise monitoring data.

Table 9.24 Residential Building Services Noise Rating Level Limits

Ref	Receptor	BS 4142 Rating Level Limit (dBA)		
		Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	24 hours
B	The Triton Building, 26-storey residential tower	41	37	37
C	Residential properties on Hampstead Road	41	37	37
D	44 – 66 Hamstead Road	43	37	37
G	Residential properties on Euston Road	42	41	41

- 9.94** Table 9.25 presents the noise emissions limits for emergency plant equipment.

Table 9.25 Emergency Building Services Plant Noise Level Limits

Ref	Receptor	Emergency Plant Noise Limit at 1m from Receptor		
		Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)	24 hours
B	The Triton Building, 26-storey residential tower	61	57	57
C	Residential properties on Hampstead Road	61	57	57
D	44 – 66 Hamstead Road	63	57	57
G	Residential properties on Euston Road	62	61	61

- 9.95** It is likely that the following best practice noise control techniques would be implemented as part of the inherent detailed design of the development to meet the plant noise limits presented above:
- Enclosing noisy plant within the building envelope;
 - Selecting suitably quiet 'low noise' plant;
 - Positioning air intake/discharge louvres away from noise sensitive receptors;
 - Orientating air intake/discharge louvres away from noise sensitive receptors;
 - Attenuation of air intake/discharge louvres with duct-mounted attenuators and/or acoustic louvres;
 - Sound insulating plant housings/enclosures/rooms; and
 - Anti-vibration mounts to control structure-borne noise and vibration.
- 9.96** Through incorporation of the design measures described above, noise generated by fixed plant would have a Negligible (not significant) effect for all noise sensitive receptors.

Operational Road Traffic Noise Effects

- 9.97** Baseline and future operational traffic flow data (AADT 18hr) on nearby public roads has been provided by Velocity Transport Planning. Traffic flow data is inclusive of consideration for cumulative schemes.
- 9.98** Table 9.26 presents the predicted change in traffic noise on nearby public roads as a result of the traffic associated with the operational Proposed Development using the CRTN methodology.

Table 9.26 Operational Traffic Noise Levels on Nearby Public Roads

Road	Traffic Noise Baseline (2023) (dB L _{10,18hr} @ 10m)	Traffic Noise During Operation (Future Baseline 2028) (dB L _{10,18hr} @ 10m)	Change in Noise Level (dB)	Significance
Hampstead Road	70.0	70.0	0.0	Negligible
Euston Road (underpass)	71.4	71.4	0.1	Negligible
Euston Road off-slip (EB)	67.4	67.4	0.0	Negligible
Euston Road on-slip (WB)	66.5	66.5	0.0	Negligible
Euston Road on-slip (EB)	66.4	66.4	0.0	Negligible
Euston Road off-slip (WB - two-way)	67.7	67.8	0.0	Negligible
Tottenham Court Road	66.3	66.4	0.1	Negligible
Drummond Street	61.6	61.8	0.2	Negligible
Longford Street	62.3	62.5	0.2	Negligible

- 9.99** Comparison of calculated baseline road traffic noise with the predicted road traffic noise during the operation of the Proposed Development (including cumulative schemes) indicates that changes in road traffic flows will result in a Negligible (not significant) effect at all surrounding public roads.

MITIGATION, MONITORING AND RESIDUAL EFFECTS

Deconstruction and Construction Mitigation

Mitigation of Deconstruction and Construction Noise

- 9.100** To minimise potential Moderate Adverse (Significant) effects, a Construction Management Plan (CMP) detailing measures to mitigate potential noise and vibration effects on nearby noise sensitive premises will be defined and agreed with LBC.
- 9.101** In accordance with modern working practices, the principles of 'Best Practicable Means (BPM)', as defined in the Control of Pollution Act, 1974 should be used to reduce noise emissions throughout the construction works to a reasonable and practicable level.
- 9.102** These BPMs, which are contained in the CMP, include:
- Careful selection of construction methods and plant to be used;
 - Strategic placement of plant items as far from receptors as practicable possible and use of temporary acoustic barriers where appropriate and other noise containment measures such as screens and sheeting to minimise noise breakout and reduce noise levels at the potentially affected receptors.
 - Switching off of plant and vehicle engines when not in use;
 - Restriction of drop heights onto lorries;
 - Regular maintenance and servicing of vehicles, equipment and plant;
 - Vehicles and mechanical plant should be fitted with effective exhaust silencers;
 - Pneumatic percussive tools should be fitted with appropriate mufflers or silencers;
 - Appropriate handling and storage of materials; and

- Enforcement of restricted working hours for excessively noisy activities.

9.103 If a temporary source of noise from works within the site exceeds the relevant limits and cannot reasonably be prevented and the works being undertaken are crucial to progressing the Proposed Development, then separate liaison with LBC and the appropriate neighbours would take place.

9.104 In addition to the above, reasonable steps would be taken to keep the local community informed of proposed construction operations. The site management team will co-ordinate the dissemination of information (for example, by means of a regular newsletter) and to schedule those operations at times that would minimise the potential for disturbance. The site management team will provide a contact telephone number on the site boundary so that any concerns with construction activities can be communicated directly to a senior manager who will be able to address any concerns and control activities accordingly. This person will be responsible for logging complaints and actions.

9.105 The primary method for securing the measures which control of noise and vibration is a Section 61 consent under the Control of Pollution Act 1974 (CoPA). This consent will be sought from LBC.

9.106 A Section 61 consent under the CoPA will likely contain appropriate noise and vibration limits for construction activities at the nearby sensitive properties. These limits are recommended to be monitored (for both noise and vibration) and reported. The reports and monitoring will highlight when it is likely that the construction limits will be exceeded, so that construction activities can be effectively altered.

9.107 The potential for Moderate Adverse (significant) effects at The Triton Building 26-storey residential tower (Receptor B) have been predicted for works during Timeslice 1. To assess the effects of mitigation, it is a reasonable assumption that implementation of the principles of 'Best Practicable Means (BPM)' described in paragraph 9.102 could reduce construction related noise emissions by up to approximately 5 dB. However, given this assumption, noise and vibration monitoring is recommended to confirm that the BPM are effective and permit the adjustment of works on-site to reduce noise levels, if required.

9.108 When considering this assumed approximate 5 dB reduction in noise levels during each Timeslice, the potential effects are reduced as follows:

Timeslice 1

- Negligible (not significant) at all surrounding noise sensitive receptors.

Timeslice 2

- Minor Adverse (not significant) at 1 Triton Square (Receptor H).
- Negligible (not significant) at all other surrounding noise sensitive receptors.

Timeslice 3

- Negligible (not significant) at all surrounding noise sensitive receptors

Mitigation of Construction Road Traffic

9.109 The following principles of 'Best Practicable Means (BPM)' should be adopted for minimising noise associated with construction road vehicles:

- Time slots should be adopted for deliveries to ensure that convoys of vehicles do not arrive simultaneously and avoid potential engine idling on-site; and
- Implementation of an appropriate traffic management strategy. This strategy should include controls to prevent temporary parking of construction vehicles in the vicinity of Noise Sensitive Receptors.

Mitigation of Construction Vibration

9.110 The assessment of construction vibration indicated the potential for short term Moderate Adverse (**significant**) effects at residential properties on Hampstead Road (Receptor C) during construction of the closest piles.

9.111 Vibration limits should be set in compliance with BS 5228-2 to minimise the likelihood of Moderate Adverse (significant) effects and cosmetic building damage. Prior warning and explanations should be given to the occupiers of residential properties on Hampstead Road (Receptor C) prior to piling activities.

9.112 Agreed vibration limits should be controlled through the implementation of the CMP as set out above, along with continuous long term vibration monitoring at appropriate agreed locations to identify periods of potential exceedance and alter works, if required.

9.113 Provided the above measures are implemented during deconstruction and construction works, the likely residual vibration effects are anticipated to be Negligible (not significant) at all surrounding vibration receptors with the exception of residential properties on Hampstead Road (Receptor C) where the residual vibration effect from construction activities has the potential to be Minor Adverse (not significant) during the short term.

Completed Development Mitigation

9.114 The assessment of effects from the completed operational development do not indicate any significant effects at nearby sensitive receptors for both noise from building services plant and operational road traffic noise. As such, no additional mitigation is required to mitigate potential significant adverse effects associated with the Proposed Development.

Residual Effects

9.115 All of the residual effects resulting from the Proposed Development, are presented in Table 9.27, identifying whether the effect is significant or not.

Table 9.27 Residual Effects

Receptor	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D I	P T	St Mt Lt
Deconstruction and Construction							
10 Brock Street (Receptor A)	Timeslice 1 (enabling works, deconstruction and piling/basement box construction)	Negligible	Not Significant	L	D	T	Mt
The Triton Building, 26-storey residential tower (Receptor B)		Negligible	Not Significant	L	D	T	Mt
Residential properties above on Hampstead Road (Receptor C)		Negligible	Not Significant	L	D	T	Mt
44 – 66 Hamstead Road (Receptor D)		Negligible	Not Significant	L	D	T	Mt
250 Euston Road (Receptor E)		Negligible	Not Significant	L	D	T	Mt
The Podium, 235 Euston Road (Receptor F)		Negligible	Not Significant	L	D	T	Mt
Residential properties on Euston Road (Receptor G)		Negligible	Not Significant	L	D	T	Mt
1 Triton Square (Receptor H)		Negligible	Not Significant	L	D	T	Mt
130 Tottenham Ct Road (Receptor I)		Negligible	Not Significant	L	D	T	Mt
50 Triton Square (Receptor J)		Negligible	Not Significant	L	D	T	Mt
10 Brock Street (Receptor A)	Timeslice 2 (substructure construction)	Negligible	Not Significant	L	D	T	Mt

Receptor	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D I	P T	St Mt Lt
The Triton Building, 26-storey residential tower (Receptor B)		Negligible	Not Significant	L	D	T	Mt
Residential properties above on Hampstead Road (Receptor C)		Negligible	Not Significant	L	D	T	Mt
44 – 66 Hamstead Road (Receptor D)		Negligible	Not Significant	L	D	T	Mt
250 Euston Road (Receptor E)		Negligible	Not Significant	L	D	T	Mt
The Podium, 235 Euston Road (Receptor F)		Negligible	Not Significant	L	D	T	Mt
Residential properties on Euston Road (Receptor G)		Negligible	Not Significant	L	D	T	Mt
1 Triton Square (Receptor H)		Minor Adverse	Not Significant	L	D	T	Mt
130 Tottenham Ct Road (Receptor I)		Negligible	Not Significant	L	D	T	Mt
50 Triton Square (Receptor J)		Negligible	Not Significant	L	D	T	Mt
10 Brock Street (Receptor A)		Negligible	Not Significant	L	D	T	Mt
The Triton Building, 26-storey residential tower (Receptor B)	Timeslice 3 (installation of envelope and cladding)	Negligible	Not Significant	L	D	T	Mt
Residential properties above on Hampstead Road (Receptor C)		Negligible	Not Significant	L	D	T	Mt
44 – 66 Hamstead Road (Receptor D)		Negligible	Not Significant	L	D	T	Mt
250 Euston Road (Receptor E)		Negligible	Not Significant	L	D	T	Mt
The Podium, 235 Euston Road (Receptor F)		Negligible	Not Significant	L	D	T	Mt
Residential properties on Euston Road (Receptor G)		Negligible	Not Significant	L	D	T	Mt
1 Triton Square (Receptor H)		Negligible	Not Significant	L	D	T	Mt
130 Tottenham Ct Road (Receptor I)		Negligible	Not Significant	L	D	T	Mt
50 Triton Square (Receptor J)		Negligible	Not Significant	L	D	T	Mt
10 Brock Street (Receptor A)		Negligible	Not Significant	L	D	T	Mt

Receptor	Description of the Residual Effect	Scale and Nature	Significant / Not Significant	Geo	D I	P T	St Mt Lt
The Triton Building, 26-storey residential tower (Receptor B)	Vibration from deconstruction and construction	Negligible	Not Significant	L	D	T	Mt
Residential properties above on Hampstead Road (Receptor C)		Minor Adverse	Not Significant	L	D	T	St
44 – 66 Hamstead Road (Receptor D)		Negligible	Not Significant	L	D	T	Mt
250 Euston Road (Receptor E)		Negligible	Not Significant	L	D	T	Mt
The Podium, 235 Euston Road (Receptor F)		Negligible	Not Significant	L	D	T	Mt
Residential properties on Euston Road (Receptor G)		Negligible	Not Significant	L	D	T	Mt
1 Triton Square (Receptor H)		Negligible	Not Significant	L	D	T	Mt
10 Brock Street (Receptor A)		Negligible	Not Significant	L	D	T	Mt
The Triton Building, 26-storey residential tower (Receptor B)		Negligible	Not Significant	L	D	T	Mt
All Receptors A - J	Deconstruction and construction road traffic noise	Negligible	Not Significant	L	D	T	Mt
Completed Development							
All Receptors A - J	Building services noise	Negligible	Not significant	L	D	P	Lt
All Receptors A - J	Operational Road Traffic Noise Effects	Negligible	Not significant	L	D	P	Lt
Notes: Residual Effect Scale = Negligible / Minor / Moderate / Major Nature = Beneficial or Adverse Geo (Geographic Extent) = Local (L), Borough (B), Regional (R), National (N) D = Direct / I = Indirect P = Permanent / T = Temporary St = Short Term / Mt = Medium Term / Lt = Long Term N/A = not applicable / not assessed							

ASSESSMENT OF THE FUTURE ENVIRONMENT

Evolution of the Baseline Scenario

9.116 Without the Proposed Development it is likely that environmental noise levels (baseline) will remain broadly the same in the medium to long term. Road traffic noise is the dominant environmental noise source influencing the ambient noise climate around the site. A rise in road traffic movements on roads surrounding the site through natural growth (from the addition of new residences and businesses in the surrounding area) may occur in the long term but the resultant change in traffic noise levels is likely to be minimal.

Cumulative Effects Assessment

9.117 Schemes with a potential to result in cumulative effects have been identified in **ES Volume 1, Chapter 2: EIA Methodology** and listed with approximate distances from the site location in Table 9.2

- 9.118** All nearby major developments are required by the LBC to have accompanying noise impact reports and Construction Management Plans that incorporate and detail the general mitigation measures which will reduce these effects as far as possible to ensure compliance with the Control of Pollution Act and that compliance will be monitored by LBC.

Deconstruction and Construction

- 9.119** For schemes outside the scoping distance in this assessment (located beyond the noise sensitive receptors considered in this ES chapter that surround the site), the potential for cumulative impacts from deconstruction and construction noise is minimal, as the noise and vibration from the deconstruction, construction and operation of these schemes would contribute very little to the noise climate in the area of the receptors due to the intervening distance and screening from existing surrounding buildings. As shown in Table 9.2, the closest cumulative scheme approximately is 350m from the Proposed Development site with numerous building screening the site over the intervening distance. The effect of cumulative schemes on noise and vibration from deconstruction and construction is likely to be Negligible (not significant).
- 9.120** Due to the nature of the Proposed Development (in particular, its location within an urban context and surrounded by a comprehensive road network) construction traffic noise effects with surrounding schemes are determined to be Negligible (not significant).

Completed Development

- 9.121** The effect of cumulative schemes has been considered in the assessment of operational road traffic noise. The cumulative schemes listed in Table 9.2 have been considered. The assessment of cumulative effects for operational road traffic noise is determined to be Negligible (not significant).
- 9.122** No new or additional effects are predicted as a result of building services noise from the Proposed Development. LBC require that Rating Levels from building services plant are 10 dB below the existing background noise level when assessed in accordance with BS 4142. This should ensure that any potential increase in ambient noise levels when considering cumulative schemes is minimal and Negligible (not significant).

LIKELY SIGNIFICANT EFFECTS

- 9.123** No likely significant effects (after mitigation) have been identified in the deconstruction and construction noise assessments presented in this ES chapter.
- 9.124** There is potential for short term Minor Adverse (**not significant**) vibration effects during piling works.
- 9.125** Best Practicable Means (BPM) described in this ES chapter should be incorporated into a site-specific CMP (and are included in the CMP submitted with the application) to reduce any likelihood of potential Moderate Adverse (Significant) effects. Noise and vibration monitoring is recommended to confirm that the BPM are effective to reduce the likelihood of significant adverse effects.
- 9.126** No significant effects are likely as a result of construction road traffic movements.
- 9.127** No significant effects are likely as a result of the completed development from either buildings services noise or road traffic.