

13. Noise and Vibration

Introduction

1. This chapter of the ES assesses the likely significant effects of the Proposed Development as described in Chapter 2 - Site Context and The Proposed Development in terms of noise and vibration. This chapter is supported by Appendices 13.1 to 13.3.
2. The Chapter describes the methods used to assess the baseline conditions currently existing at the Site and its surroundings. The following effects have been assessed having reference to national and local policy and relevant guidance documents.
 - Construction Phase – Noise and Vibration;
 - Operational Phase – Noise effect from road traffic on the Proposed residential properties; and
 - Operational Phase – Noise effect changes in road traffic and proposed local centre and leisure uses on existing noise sensitive properties
3. The noise and vibration assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised below.

Planning Policy and Legislation

Noise Policy Statement for England, 2010¹

4. The Noise Policy Statement for England (NPSE) sets out the long term aims of Government noise policy to “promote good health and good quality of life through the effective management of noise within the context of Government policy on sustainable development” The main aims of the NPSE are:
 - Avoid significant Adverse impacts on health and quality of life
 - Mitigate and minimise Adverse impacts on health and quality of life
 - Where possible contribute to the improvements of health and quality of life through the effective management of noise
5. The NPSE Explanatory Note provides the concept of adverse effects and the relevant definition for various degrees of significance of these effects as detailed in Table 13.1 below.

Table 13.1 Terms of Effect from the Noise Policy for England

Level of Effect	Description
NOEL No Observed Effect Level	This is the level below which no effect can be detected. In simple terms, below this level there is no detectable effect on health and quality of life due to noise.

LOAEL Lowest Observed Adverse Effect Level	This is the level above which significant 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.

National Planning Policy Framework, 2019²

6. Incorporating the aims of the NPSE, the National Planning Policy Framework (NPPF), 2019, sets out the Government's planning policies in order to achieve sustainable development, including minimising the impacts of noise.
7. In respect of noise, Paragraph 180 of the NPPF states the following:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation”.*

8. Updated guidance to the NPPF, the Planning Practice Guidance(PPG): Noise, has been issued relating to noise, although it does not assign acceptable construction noise levels or acceptable operational noise levels in the context of maintaining existing residential or commercial amenity. The PPG does however outline the qualitative effects of noise exposure and subsequent extent of mitigation.

Planning Practice Guidance – Noise³

9. The online Planning Practice Guidance for noise provides guidance on the consideration of noise in planning and cross-refers to both the NPPF and the NPSE. It also provides guidance for the assessment of noise and sets out the concept of “Observed Effect Levels”, which are used in the World Health Organisation (WHO) Guidelines (discussed below), and the considerations in mitigation of noise and protection of tranquil areas. The PPG does not contain specific technical guidance, this being set out in the documents it refers to (i.e. the NPSE, NPPF and WHO Guidelines), which are referred to and applied in the assessment that follow.

Professional Practice Guidance (ProPG) on Planning and Noise – New Residential Development⁴

10. Whilst not government policy the ProPG on Planning and Noise jointly produced by the Chartered Institute of Environmental Health (CIEH), Institute of Acoustic (IOA) and Association of Noise Consultants (ANC) provides detailed guidance on the assessment of noise on new residential developments.
11. The ProPG recommends a 2 stage approach; an initial assessment which identifies the risk of noise on the proposed planning application. The advice contained within ProPG is based on the policy objectives contained within the NPPF and the objective noise guidelines within BS 8233:2014.

Local Planning Policy

12. In relation to local policy regard is had to Policy LP52 of Kirklees Local Plan Strategy and Policies (February 2019)⁵ which in relation to noise sensitive development states the following.

“...where environmentally sensitive development would be subject to significant levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable impact on the environment.”

Legislative Framework

13. The applicable legislative framework is summarised as follows:
 - Part III of the Environmental Protection Act 1990⁶ which requires local authorities to Serve abatement notices where the noise is emitted from any premises, or vehicles, machinery and equipment in the street, that constitutes a statutory nuisance;
 - Part III of the Control of Pollution Act 1974⁷, which gives local authorities the power to control noise from construction sites either by prior consent (section 61) or by service of a notice (section 60); and
 - Additional statutory powers to control noise exist outside the planning system. The granting of planning permission does not remove the need to comply with these controls.

Assessment Methodology

14. A scoping opinion has been sought from the Kirklees Council. Comments have been received, dated 30 October 2020, in relation to noise and vibration including the following comments:

- *The impact of noise from outdoor sports activities within the development, on both existing and future residential uses, needs to be included in the list of potential noise impacts.*
- *Please note that, both in terms of noise and air quality, there is the potential for highways mitigation measures (such as traffic signals, if required) to alter traffic flows resulting in queuing traffic. That in itself could affect properties in close proximity, especially those closest to the proposed/existing junctions and signals. This should be considered in the ES.*
- *Otherwise the general proposals and methodology regarding noise and vibration issues are considered to be satisfactory.*

15. The potential noise and vibration sources identified for assessment are as follows:

- a qualitative assessment for noise and vibration arising from works and activities associated with the construction phase;
- the impact of road traffic noise on the proposed residential properties; and
- noise arising as a result of an increase in traffic flow on the local road network, local centre and from the proposed leisure uses

16. Vibration from the Development, beyond the construction phase is not considered to be significant due to the uses proposed.

Assumptions and Limitations

17. All noise predictions are, necessarily, limited by the extent of knowledge at any particular point in time. At this stage in the design process no detailed masterplan is available. A site allocations plan has been provided however this does not provide sufficient detail to enable a full assessment to be carried out.

18. As a result, the impact of noise from existing sources is limited to an initial site assessment in accordance with the advice in the Professional Practice Guidance on Planning and Noise. Construction noise calculations to the level required, for example, by the Control of Pollution Act 1974 cannot be undertaken at this stage because of the level of detail of contractor's plant needed is not available at the planning stage.

19. Similarly, road traffic impacts are based on data provided in Chapter 6 and is limited by the same limitations as set out in that assessment. Computer modelling is based on a series of assumptions, albeit these are derived from expert knowledge and calibrated software, along with actual 'source' measurements carried out at similar sites. The assumptions used in the assessment are set out in detail as each aspect is assessed in the text that follows.

Significance Criteria

Receptor Sensitivity

20. Sensitivity of receptors is assessed with reference to the description in Table 13.2 below:

Table 13.2 Receptor Sensitivity

Value/Sensitivity	Description
High	Receptors such as world heritage sites, scheduled monuments and habitats supporting nationally or internationally important wildlife communities. Highly vibration sensitive structures or uses such as certain laboratories medical facilities or industrial processes.
Moderate	Receptors such as dwellings, hospitals, schools and other places of quiet recreation. Habitats supporting nationally and internationally important wildlife communities
Low	Receptors with low sensitivity to noise and vibration such as offices, other workplaces and play areas
Very Low	Receptors of very low sensitivity such as industrial or commercial buildings, transient or mobile receptors

Effect Magnitude

21. The numerical values determining the impact magnitude depend on the activity being assessed and its likely duration. Table 13.3 contains criteria for considering the magnitude of noise and vibration effects. These criteria apply across all aspects of the Proposed Development including the construction and operational phases. Actual values for the assessment of magnitude vary, dependent on the source of noise, as recommended in the various different noise assessment standards and sources of guidance

Table 13.3 Magnitude

Magnitude	Criteria
High	Large scale, permanent/irreversible or medium/long term changes, to key characteristics or features of the particular environmental aspect's character or distinctiveness
Moderate	Medium-scale, permanent/irreversible or medium term changes to key characteristics of the particular environmental aspect's character or distinctiveness
Low	Noticeable but small-scale change, over a partial area, to key characteristics of features of the particular environmental aspect's character or distinctiveness
Negligible	Noticeable but very small change, or barely discernible changes for any length of time, over a small area, to key characteristics of features of the particular environmental aspect's character or distinctiveness

Effect Significance

22. The significance of noise and vibration on a receptor or community is dependent on the magnitude of the effect, the sensitivity of the receptors and on other factors such as the existing acoustic environment. Using the magnitude and sensitivity set out in the proceeding paragraphs the following matrix, Table 13.4 has been applied in assessing the significance of noise effects.

Table 13.4 Noise Significance Matrix

Magnitude	Sensitivity of receptor		
	High	Moderate	Low
Major	Major	Major-Moderate	Moderate-Minor
Moderate	Major-Moderate	Moderate - Minor	Minor
Minor	Moderate-Minor	Minor	Minor – Negligible
Negligible	Negligible	Negligible	Negligible

23. Following the classification of an effect as detailed in Table 13.4, a clear statement will be made as to whether the effect is significant or not significant. As a general rule, major and moderate effects are considered to be significant and moderate/minor and negligible effects are considered to be not significant. However professional judgement will also be applied where appropriate.
24. According to the guiding principles within the Noise Policy Statement for England, there are three relevant conditions which could occur:
- Levels could be below the Lowest Observable Effect Level (LOAEL)
 - Levels could be above the LOAEL but below the Significant Observable Adverse Effect Level (SOAEL)
 - Levels could be above the SOAEL
25. Using the above significance matrix and generic definitions the actual values to be used to define the LOAEL and SOAEL for the specific sources and circumstances have been determined.

Construction Noise

26. To assess the likely significant effects of demolition and construction noise 'The ABC' provided in BS5228-1+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1⁸ Noise has been used. This assessment method is based on the existing ambient noise level (rounded to the nearest 5dB). The existing ambient noise level is then compared to the total noise level, including construction. If the total noise level exceeds the appropriate category value then a significant effect is deemed to occur. The threshold levels are shown in Table 13.5 below.

Table 13.5 Threshold of significance effect at dwellings

Period	Threshold Value dB		
	Category A ^a	Category B ^b	Category C ^c
Mon – Fri (0700 – 1900 hrs) Saturday (0700 – 1300 hrs)	65	70	75
Evenings Monday to Friday (1900 – 2300 hrs)	55	60	65

Saturday (1300 – 2300 hrs) Sunday and Bank Holidays (0700 – 2300 hrs)			
Night time (2300 – 0700 hrs)	45	50	55

^aCategory A: Threshold Values to use when ambient noise levels (when rounded to nearest 5dB) are less than those values

^bCategory B: Threshold Values to use when ambient noise levels (rounded to nearest 5dB) are less than Category A values

^cCategory C: Threshold Values to use when ambient noise levels (rounded to nearest 5dB) are higher than Category A values

27. A significant effect (SOAEL) will occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level or if the existing ambient noise level exceeds the threshold value, the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

Vibration

28. Vibration effects on human receptors will be assessed using the values derived from BS 6475:2008⁹ Guide to Human Exposure to Vibration in Buildings and BS 7385:1993¹⁰ Part 2 Guide to Damage Levels from Ground-borne Vibration. These documents contain relevant guidance for both damage to buildings and disturbance to humans from vibration.
29. Using the values within these standards the LOAEL and SOAEL for construction vibration are shown in Table 13.6 below:

Table 13.6 SOAEL and LOAEL for construction vibration

Sensitivity of receptor	Period	LOAEL	SOAEL	Parameter
Residential	Day (0700 – 2300 hours)	0.2	0.8	VDV $ms^{-1.75}$
	Night (2300 – 0700 hours)	0.1	0.4	

Road Traffic Noise

30. Changes in road traffic noise both during the construction and operational phase will be assessed against the criteria set in the Calculation of Road Traffic Noise (CRTN) 1988¹¹ which provides a method of calculating the change in noise level as a result of a development by comparing the traffic flows along strategic routes with and without the development.
31. Changes in noise level of less than 3 dBA are not perceptible under normal circumstances and changes of 10 dBA are equivalent to a doubling of loudness. Based on the Institute of Environmental Management & Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment¹² the following table is used to encompass the effect of changes in noise level.

Table 13.7 – Response to Changes in Noise Level

Change in noise level L_{AeqT} dB	Response	Effect
<3	Imperceptible	None
3 - 5	Perceptible	Slight
6 - 10	Up to a doubling	Significant
11 - 15	More than doubling	Substantial
>15	-	Severe

32. Using the above LOAEL and SOAEL values for road traffic noise would be defined as set out in Table 13.8 below.

Table 13.8 LOAEL and SOAEL values for road traffic noise

Sensitivity of receptor	LOAEL	SOAEL
Medium	+3 dB	+6 dB
High	+1 dB	+3 dB

Existing noise affecting proposed residential development

33. The current nationally recommended noise levels for dwellings are given in BS 8233: 2014¹³ Guidance on Sound Insulation and Noise Reduction for Buildings which for new dwellings recommends the following internal noise levels.

Table 13.9 BS 8233:2014-Indoor Ambient Noise Levels for Dwellings

Activity	Location	0700 – 2300 hours	2300 – 0700 hours
Resting	Living Room	35 dB $L_{Aeq16hour}$	—
Dining	Dining	40 dB $L_{Aeq16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq16hour}$	30 dB $L_{Aeq8hour}$

34. There is no longer a L_{Amax} standard for bedrooms in BS 8233. However, footnote 4 to the above table states that 'Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax} depending on the character and number of events per night. Sporadic noise events could require separate values.' In this case, it is proposed that the previous BS8233 internal standard (also referenced in World Health Organisation Guidelines for Community Noise¹⁴) is applied. This is 45 dB L_{Amax} , inside bedrooms.
35. For outdoor areas (i.e. gardens), BS 8233:2014 recommends that *'it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB*

$L_{Aeq,T}$. However, the document recognises that these guideline values are not achievable in all circumstances and in higher noise areas, a compromise might be warranted. In such circumstances, development should be designed to achieve the lowest practicable levels in these external amenity spaces.

36. These guideline values are based on the WHO Guidelines for Community Health which was released in a final form in 2000. The World Health Organisation guidance is referenced in the NPSE.
37. The WHO guideline values are appropriate to what are termed “critical health effects”. This means that the limits are at the lowest noise level that would result in any psychological, physiological or sociological effect. They are, as defined by NPSE, set at the Lowest Observed Adverse Effect Level (LOAEL). Based on the effect of the change in noise level as shown in table 13.7 above changes in noise level of between 6-10 dB will cause a significant effect. Therefore, the SOAEL for noise affecting is determined from the guidance values in BS 8233:2014 plus 6dB

Noise from Local Centre

38. The main effects from the proposed district centre will be from servicing of the units and also from any mechanical services plant that will be installed. At this stage specific detail on the proposed district centre is not known.
39. The appropriate method for the assessment of commercial sound is set out in BS 4142:2014 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas¹⁵. It can be applied to set a limit for operational noise from the site and to set limits for mechanical services noise from the commercial premises.
40. These limits have been set by comparing the ‘rating level’ of noise from the development to the typical background sound levels at the receptors. The rating level is notated as L_{Ar} and background sound as BR in the table below.

Table 13.10 LOAEL and SOAEL for mechanical services plant

Period	Sensitivity of Receptor	LOAEL	SOAEL	Parameter
Day (0700 – 2300hrs)	Medium	BG	BG +10*	L_{Aeq1hr}
	High	BG	BG + 5*	L_{Aeq1hr}
Night (2300 – 0700hrs)	Medium	BG	BG + 10*	$L_{Aeq15min}$
	High	BG	BG +5*	$L_{Aeq15min}$

Noise from proposed leisure uses

41. The proposed masterplan included relocation of the existing driving range/golf course and new Multi-use Games Area (MUGA). At this stage the exact location of the uses is not known and therefore it will not be possible to carry out a detailed assessment. However, regard will be had to the absolute levels and guidelines values in the Sport England Guidance on Artificial Grass Pitches (AGP) – Acoustics (2015)¹⁶.
42. This guidance sets out noise criteria based on WHO Guidelines for Community Noise but with a shorter time period to reflect the actual use of the facilities and the change in noise level.

Baseline Conditions

43. The noise climate of the area generally is as would be expected for this location, and is dominated by road traffic noise during the day and at night from the M62 which runs along the northern boundary of the site.
44. A site survey was carried out to determine existing noise levels at the site. Measurements were taken between 22nd and 23rd September 2020 at four locations as shown in Figure 13.1 below and described in Table 13.11 below.

Table 13.11 Description of monitoring locations

Location	Site Description
NM 1	Microphone located close to A641. The microphone was located on a tri-pod approx. 1.4 metres above ground level in free-field conditions. Measurements recorded over three hour period in accordance with the shortened measurements procedure in the Calculation of Road Traffic Noise (CRTN)
NM 2	Measurements on northern boundary with direct line of sight of M62. Microphone located on a tri-pod 1.4 metres above ground level in free-field conditions. Measurements recorded over three hour period in accordance with the shortened measurements procedure in the Calculation of Road Traffic Noise (CRTN)
NM 3	Measurements recorded close to entrance to Bradley Park Golf Course close to Bradley Road. The microphone was located on a tri-pod approx. 1.4 metres above ground level in free-field conditions. Measurements recorded over three hour period in accordance with the shortened measurements procedure in the Calculation of Road Traffic Noise (CRTN)
NM 4	24-hour unattended measurements carried out on northern boundary of the site on approx. 12m from M62. Microphone fixed to post 1.4 metres above ground level in free-field conditions.

Figure 13.1: Noise monitoring locations



45. The measurement locations were chosen to determine existing noise levels from the main roads bordering the site to input into the acoustic model along with the traffic data provided. Weather conditions during the survey were determined from site observations and were warm, dry with light south westerly breeze. Weather conditions were suitable for taking noise measurements. All equipment was calibrated before and after the survey with no drift in accuracy.

Existing noise sources

46. At locations NM1 and NM3 measurements were taken over taken specifically over a three hour period to allow the calculation of daytime noise levels in accordance with the shortened measurement procedure within the Calculation of Road Traffic Noise (CRTN). At NM4 continuous measurements were recorded between 16:15 hrs on 22 September until 13:30 hrs on 23rd September 2020. Full details of the baseline noise surveys are presented in Appendix 13.1 and summarised in Table 13.12 below.

Table 13.12 Summary of noise survey results

Location	Day time (0700 – 2300 hrs)		Night time (2300 – 0700 hrs)		
	L _{Aeq16hr}	L _{A90}	L _{Aeq8hr}	L _{A90}	L _{Amax}
NM1	73 dB	65 dB	--	--	88 dB
NM2	78 dB	77 dB	--	--	84 dB
NM3	72 dB	57 dB	--	--	87 dB
NM4	82 dB	69 dB	77 dB	60 dB	88 dB

Vibration

47. Measurements of existing vibration levels were not undertaken at the Site, as it is considered that being subject to almost exclusively road traffic noise and not in the vicinity of significant sources of vibration, existing levels would be very low and will not cause impact on the proposed development.

Noise Modelling

48. SoundPLAN computer modelling has been undertaken based on predicted future traffic levels 2033. The models employ the calculation methodology set out in the Calculation of Road Traffic Noise (CRTN). In accordance with design and assessment standards for residential development as set out in BS 8233:2014 and the ProPG Guidance on Planning and Residential Development the daytime (L_{Aeq16hr}) and night time periods (L_{Aeq8hr} and L_{Amax}) have been determined.

Assessment of Impact

Construction Phase

49. The most notable sources of noise during construction would be during periods of earthworks and remediation, construction of site infrastructure and the construction of substructures. In addition to on-site sources, increased noise may be caused by HGV movements travelling to and from the development site during construction. The level of noise will be dependent on the location of the construction activities on a daily basis and the equipment being used, with noise levels being attenuated as the distance between the source and receptor increases and the percentage on-time of the plant.
50. As discussed in Limitations and Assumptions, it is not possible at this stage to undertake a full construction noise assessment, beyond adopting a reasonable limit for construction noise and exercising professional judgement and experience as to the likely noise levels and effects.
51. The nearest noise sensitive properties are the existing residential properties which border Bradley Road to the south of the development and those on the western boundary of the site. These properties are considered to be of moderate significance.
52. Based on the allocations plan development will take place close to the boundary of these properties and during these periods there is likely to be a temporary moderate-major adverse impact which will reduce as work moves away from the boundary of the site.

Construction Traffic

53. In addition to the construction plant operating on the Site, there would be some movement of materials to and from the site by road. Construction traffic will be routed via the strategic road network. Vehicle flows of this size would represent a very small percentage of the daily flow on the surrounding roads. It is therefore considered that this effect of construction traffic would be small in comparison of the existing road traffic movements and would equate to negligible effect.

Construction Vibration

54. Ground borne (structural damage, including damage to any utilities) and airborne (nuisance, such as window rattling and floor movement) vibration during the construction phase is often a cause for concern, particularly in relation to piling operations. Owing to the complex relationship between the forces of the vibrating source, the intervening geology, distance and construction of the receiving structure, it is impossible to predict the degree of vibration, which may occur during the construction phase to a degree of accuracy.
55. The levels of vibration that are required to be generated before structural damage occurs are high and taking into account the distance to the nearest receptors, unlikely to be reached in the construction of the Development where receptors are relatively remote from the source of vibration (in comparison to construction and demolition of high rise buildings

in city centres with receivers directly adjacent to the development site). However, without mitigation there is a potential a temporary moderate-major adverse impact from vibration.

Operational Phase

Suitability of the site for Residential Development

56. As described in Chapter 2. in accordance with the site allocations the proposed development includes residential properties, including the areas as shown on the Areas Plan identified as 'R' for which a separate detailed application for circa. 275 residential properties and area 'A' for which planning permission for the residential development on land off Tithe House Way (105 dwellings approved 04/09/2020 under application ref: 2018/93965).
57. A detailed noise assessment of the impact of noise has been carried out to accompany the planning application for residential development (R) has been carried out. A copy of this report is attached to Appendix 13.2 and concludes that subject to mitigation measures that can be incorporated into the design of the scheme that the impact on the proposed residential development (R) is negligible.
58. A site allocations plan has been provided however this does not provide sufficient detail to enable a full assessment to be carried out.
59. Using SoundPLAN computer modelling software as described in paragraph 12.36 above an initial site assessment in accordance with the advice in the Professional Practice Guidance on Planning and Noise has been carried out. The initial site noise risk assessment does not include the impact of any mitigation measures that have been incorporated into the design of the project but is intended to give an indication as to the extent of the acoustic issues that will be faced.
60. The noise models are based on all noise sources, including on future road traffic levels on the M62 and local roads for the year 2033. The results are shown in Appendix 13.3. Based on the predicted noise levels the initial noise assessment indicates a medium/low risk for the residential development across the site. Without mitigation measures of any kind, the effects on future occupiers of the development could, in theory, be exposed to levels above the guideline thresholds, which, depending on the development area could be described as moderate-major or minor adverse effect.

Noise from Road Traffic on the Existing Network

61. In assessing the change in noise level as a result of traffic generated by the Development, reference has been made to the traffic data supplied by the Transport Consultants.
62. The increase in road traffic noise can be made by comparing the base traffic flows without development and the base + full development by means of the following formula in the CRTN:

(Change in noise level = 10 log (future traffic flow/base traffic flow))

63. Based on traffic data provided by Optima Highways the change in noise level, daytime (0700-2300 hrs) and night time (2300 – 0700 hrs) has been calculated, the results are shown in Table 13.13 below.

Table 13.13: Change in Noise Level

Road Sector (2-way)	Daytime (0700 – 2300)			Night Time (2300 – 0700)		
	2019 Baseline	2034 Future	Change in level dB	2019 Baseline	2034 Future	Change in level dB
M62	112845	127860	+0.5	7581	8589	+0.5
Bradford Rd	17135	20311	+0.7	1006	1186	+0.7
Bradley Road	16919	21019	+0.9	1096	1377	+0.9

64. The change in noise level will be less than 1dB, therefore the impact of increased road traffic on the existing network on existing noise sensitive properties will be negligible.

Noise from Local Centre

65. The Proposed Development includes a new local centre which is identified to be located on the southern part of the site with access directly off Bradley Road. However, based on experience of similar sites the main impacts will be noise from mechanical services plant and noise from delivery activity. As there is no detailed masterplan it is not possible to carry out a detailed assessment at this stage, however taking into account the close proximity of the existing residential properties it is considered, without mitigation noise from local centre has the potential to cause a moderate/major effect on existing residential properties.

Noise from Leisure activities

66. In pre-application discussions comments have been received regarding the potential impact of the Multi-use Games Areas (MUGA) that may be provided as part of the development of the site.
67. However, based on the Sport England Guide on Artificial Grass Pitches (AGP) – Acoustics (2015) if When a site is in an open location, noise levels of 50 dB L_{Aeq1hr} can be achieved at a distance of 40m from any noise sensitive receptors. 50 dB L_{Aeq1hr} is considered to be the lowest observed adverse effect level (LOAEL) and therefore if sited more than 40m from existing or proposed residential properties the impact can be considered negligible. The effect of noise from use of the MUGA will depend on the final layout and it is not possible to carry out a detailed assessment at this stage, however depending on the location there is the potential for an adverse effect of various significance.

Environmental Mitigation Measures / Residual Impact Assessment

Construction Phase

Construction Noise

68. Noise and vibration from the construction phase will be carried out in accordance with the best practice as shown in BS 5228. This will be implemented through a construction environmental management plan (CEMP). The CEMP would include the following measures to control the demolition and construction noise and vibration effects.

- Ensuring all plant is fitted with correct and working exhaust mufflers and noise suppression kits;
- changing where possible methods and processes to keep noise levels low;
- positioning plant as far away from residential property as physically possible;
- limiting the hours worked on noisy operations;
- adhering to restricted working hours, normally between 0800 to 1800 weekdays and 0800 – 1300 hours on Saturdays, with no working on Sunday or Bank Holidays;
- undertake noise and vibration monitoring on-site, where necessary;
- liaising with the occupants of adjacent properties affected by noise, informing them of nature of works, proposed hours of work and anticipated duration prior to commencement of activities. Details of neighbour liaison manager who would be responsible for dealing with any complaints should they arise;
- using screens around any static plant located adjacent to sensitive receptors;
- establishing noise and vibration action levels above which consideration would be given to use of alternative techniques and/or means of reducing noise; and
- implementation of specific on-site measures such as, using modern well maintained plant, utilising off-site prefabrication, using non-vibratory or percussion piling techniques and switching off plant and equipment when not in use.

69. The implementation of the CEMP can be secured through a suitable worded planning condition. It is concluded that following implementation of the CEMP when construction work is taking place close to existing noise sensitive properties there will be as temporary minor-moderate effect from construction noise

Construction Traffic

70. Construction traffic has been assessed as having a negligible effect.

Construction Vibration

71. The measures included within the CEMP will also be effective for vibration and the residual effect will be a temporary minor-moderate adverse as a worst case when construction work is taking place close to existing noise sensitive properties.

Operational Phase

Suitability of the Site for Residential Development

72. Generally, there is a hierarchy of noise control that should be considered in all cases to mitigate the noise. These are as follows:
1. Maximise the spatial separation of noise source(s) and receptor(s);
 2. Using existing topography and existing structures to screen the proposed development site from significant sources of noise;
 3. Incorporating noise barriers as part of the scheme to screen the proposed site from significant sources of noise;
 4. Using the layout of the scheme to reduce noise propagation across the site;
 5. Using the orientation of buildings to reduce the noise exposure of noise sensitive rooms;
 6. Using the building envelope to mitigate noise to acceptable levels
73. As shown on the proposed allocations plan, the area closest to the M62 is not proposed for residential development, maximising the distance between the proposed residential properties and the main source of noise in the area. Further mitigation measures can be implemented through the detailed design of each phase of the development, including the use of building envelope to achieve noise levels in accordance with the criteria specified in BS 8233:2014.
74. Taking into account the mitigation measures available the residual effect of noise on the proposed residential properties can be considered to be negligible.

Noise from Road Traffic on the Existing Network

75. The effect of increased noise from road traffic has been assessed as negligible and no mitigation measures are proposed.

Noise from Local Centre

76. The effects of noise from the local centre can be reduced through the introduction of mitigation measures such as enclosures around delivery yards and the limiting delivery and trading hours. These measures will be determined when the detailed design of the local centre is known.
77. In relation to noise from any mechanical services it is a typical requirement that noise from any plant should not exceed the existing background noise level at any noise sensitive receptors. This can be imposed by way of a planning condition.
78. Following mitigation the residual effect of noise from the local centre will be negligible.

Noise from Leisure Activities

79. The effect of noise from use of the MUGA will depend on the final layout however if sited closer than 40m from any noise sensitive property it may be necessary to include mitigation measures to reduce noise. This would include the use of screening around the MUGA's and restricting the hours of use of the facilities. Following mitigation, the residual effect of noise from the proposed leisure activities will be negligible.

Cumulative Effects

80. Noise effects are generally localised and individual developments, with the exception of traffic increases, only have a cumulative effect if they are in close proximity and affecting the same receptors.

Construction Phase

Construction Noise and Vibration

81. With regard to construction noise it is not possible to predict with a level of accuracy the cumulative effect as this would depend on the phasing of the construction plan for each site. Unless construction on other sites is taking place simultaneously and in similar close proximity to receptors, noise from separate construction areas is unlikely to result in any cumulative effects.

Construction Traffic

82. The effects of other developments on traffic conditions in the area have been accounted for in the calculations of noise increases within the chapter, based on information provided by the transport consultants.

Summary and Conclusions

83. Without any mitigation measures in place, the likely effects of the Proposed Development would be short term moderate-major during the construction phase and moderate-major adverse effect on the residential element of the scheme and from the potentially noise generating activities i.e. the local centre and leisure uses introduced as a result of the development.
84. Mitigation measures for the construction phase (noise and vibrations) will be implemented through a Construction Environmental Management Plan (CEMP) which will revolve around a set of good practice procedures in line with guidance contained within BS 5233 and Local Authority requirements.
85. Mitigation measures through the use of good acoustic design principles and where necessary, the use of the building envelope will achieve suitable internal and external living conditions for future residents.

86. The effects of noise from the Local Centre and proposed leisure uses (MUGA's) will be mitigated through a combination of operational restrictions to avoid noise sensitive periods and physical measures such as maximising distance separation and screening.

87. The residual effects of construction phase of the Proposed Development have been assessed as short-term minor to moderate adverse. The residual effects of the operational phase of the Proposed Development on both existing and future receptors, have been assessed as negligible in all cases.

88. Table 13.14 contains a summary of the likely significance effects.

Table 13.4 Summary Table of Significance – Noise and Vibration

Potential Effect	Nature of Effect	Significance	Mitigation Measures	Residual Effects
Construction Phase				
Construction Noise	Temporary	Moderate-Major Adverse	Management measures through use of CEMP	Minor-Moderate
Construction Traffic	Temporary	Negligible	None	Negligible
Construction Vibration	Temporary	Moderate-Major Adverse	Management measures through use of CEMP	Minor-moderate
Operational Phase – Completed Development				
Suitability of site for residential	Permanent	Moderate-Major Adverse	Good acoustic design measures and use of building envelope	Negligible
Road Traffic noise	Permanent	Negligible	None	Negligible
Local Centre	Permanent	Moderate-Major Adverse	Trading/delivery hours controls, screening around service yards, engineered noise control of plant noise	Negligible
Leisure Use (MUGA)	Permanent	Moderate-Major Adverse	Location of MUGA, localised screening, restriction on hours of use	Negligible
Cumulative Effects				
Construction	Temporary	Major-moderate Adverse	Management measures through use of CEMP	Minor-Moderate
Road Traffic Noise	Permanent	Negligible	None	Negligible

References

1. DEFRA (March 2010) Noise Policy Statement for England
2. DCLG (February 2019) National Planning Policy Framework
3. DCLG National Planning Practice Guidance
4. IOA, ANC, CIEH (May 2017) – Professional Practice Guidance -Planning and Noise
5. Kirklees Council Local Planning Statement (February 2019)
6. Office for Public Information (1990) Environmental Protection Act
7. HMSO (1974) Control of Pollution Act
8. BSI (2014) BS 5228-1+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1
9. BSI (2008) BS 6475:2008 Guide to Human Exposure to Vibration in Buildings
10. BS 7385:1993 Part 2 Guide to Damage Levels from Ground-borne Vibration
11. Department of Transport (1988) Calculation of Road Traffic Noise
12. Institute of Environmental Management & Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment
13. BSI (2014) BS 8233:2014 Guidance on sound insulation and noise reduction for buildings
14. BSI (2019) BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound
15. Sport England (2015) Artificial Grass Pitches (AGP) Acoustics-Planning