# 12. Noise and Vibration

## Introduction

12.1 This chapter considers the potential effects of noise and vibration from the demolition, construction and subsequent operation of the Proposed Development upon sensitive uses adjacent the Application Site and proposes mitigation measures where necessary.

12.2 It also outlines the potential suitability of the site for residential development based on an assessment of existing noise levels affecting the site.

12.3 This chapter provides a description of the local and national standards and guidelines applicable to noise and vibration. It details the assessment methodology used to determine the noise and vibration effects, describes the baseline noise environment on and around the Application Site and assesses the Proposed Development's suitability for residential development as well as the predicted construction and operational effects on existing potentially sensitive uses around the site. The significance of noise and vibration effects is quantified and, where necessary, mitigation measures are proposed. The residual effects following mitigation are described.

## Legislation and Planning Policy Context

### *Legislation*

12.4 **The Control of Pollution Act**, 1974 (COPA). Section 60 of the Act provides powers to local authority officers to serve an abatement notice in respect of noise nuisance from construction works, whilst Section 61 provides a method by which a contractor can avoid such action by applying for consent to conduct construction activities in advance of their occurrence (a 'prior consent'). The prior consent is agreed between the local authority and the contractor and may contain a range of agreed working conditions designed to minimise or prevent the occurrence of noise nuisance from construction activities. The prior consent is usually applied for at a stage in a project when a detailed construction Method Statement is available.

### *National Guidance*

12.5 **British Standard (BS) 7445**: Parts 1 and 2 "Description and measurement of environmental noise" (BSI, 1991 and 2003). The Standard provides details of the instrumentation and measurement techniques to be used when assessing environmental noise, and defines the basic noise quantity as the continuous A-weighted sound pressure level ($L_{Aeq}$). Part 2 of BS 7445 replicates ISO standard 1996-2

12.6 **BS 5228: 2009** "Code of practice for noise and vibration control on construction and open sites" (BSI, 2009). This standard provides guidance on the causes of construction noise and vibration, presents several methods for predicting noise and vibration levels from construction sites affecting nearby sensitive receptors including limit values for cosmetic damage from vibration in buildings. The Standard includes source noise and vibration levels for typical items of plant equipment found on construction sites.

12.7 **BS 4142: 1997** "Method for rating industrial noise affecting mixed residential and industrial areas" (BSI, 1997). The Standard provides a method for determining noise levels from factories and other industrial premises, and the existing background noise level. It also prescribes a method for assessing whether the industrial noise is likely to give rise to complaints.

12.8 **Department of Transport "Calculation of road traffic noise"** [CRTN] (DoT, 1988). This document provides a method for assessing noise from road traffic, in the UK. The calculation methods provided include correction factors to take account of variables affecting the creation and propagation of road traffic noise including the percentage of heavy goods vehicles, different road surfacing, inclination, screening by barriers and relative height of source and receiver.

12.9 Highways Agency document **"Design Manual for Roads and Bridges"** (DMRB). Volume 11, Part 3, Section 7 (HA, 2008) provides guidance on the environmental assessment of noise effects from road schemes. For this development, minor junction changes and road upgrades at the main site access to Macclesfield are proposed i.e. road widening and a roundabout, but these are incidental to the main scheme and are limited in spatial extent. The effects arising from this Development are not caused by the road works and a DMRB assessment was, therefore, not conducted. DMRB does, however, contain useful advice and information relating to transport-related noise and vibration, which has relevance with regard to the construction and operational traffic impacts affecting sensitive receptors adjacent to the road networks.

12.10 The **Noise Insulation Regulations 1974** (SI 1975/1763) impose a duty on highway authorities to carry out or make a grant in respect of the cost of carrying out insulation works, if noise from a new or altered highway causes noise above a 'specified' level of 68 dB $L_{A10\ (18\text{-hour})}$, provided certain other conditions are met. The Regulations only apply to roads maintained at the public expense, i.e. public roads, and will not apply to roads privately maintained by Sainsbury's Supermarkets Ltd or any other private roads. In the context of this assessment, this will apply to the existing section of Macclesfield Road immediately adjacent to the supermarket access which is due to be upgraded to accommodate the junction; as it is intended that the main supermarket access road, the loop of employment use road immediately to the south of the supermarket returning past the petrol filling station as well as the residential access road off Abbey Green Road, will all be adopted by the SCC Highway Authority, these roads were included in the assessment of road noise impacts with regard to the Noise Insulation Regulations. The properties to which these requirements might apply will be the existing residential properties adjacent to Macclesfield Road close to the proposed junction upgrade works; proposed residential properties within the Development would not qualify under the Regulations. An "altered highway" in the Regulations is one of which the location, width or level has been changed and does not apply simply to resurfacing.

12.11 World Health Organisation (WHO) **"Guidelines for community noise"** (WHO, 1999). These guidelines present health-based noise limits intended to protect the population from exposure to excess noise. It presents guideline limit values at which the likelihood of particular effects, such as sleep disturbance or annoyance, may increase. The guideline values are 50 or 55 dB $L_{Aeq}$ during the day, related to annoyance, and 45 dB $L_{Aeq}$ or 60 dB $L_{Amax}$ at night, related to sleep disturbance.

### *National Planning Policy*

12.12 PPG 24 (Planning and noise). This document provides guidance to local authorities in England on the use of the planning system to minimise the adverse impact of noise, principally with regard to new development but also regarding noise from new noise-causing developments. It introduces the concept of Noise Exposure Categories (NEC) for determining the suitability of sites for residential development based on existing noise levels affecting the site, which are determined from a noise measurement survey.

### *Regional Planning Policy*

12.13 Chapter 8 of the West Midlands RSS, "Quality of the environment", contains several policies relating to noise.

12.14 Policy QE3 (Creating a high quality built environment for all) – specifically section B. iv, in relation to regeneration strategies for the region's cities, towns and villages states that:

> *"Particular attention should be given to: […] iv) assessing and minimising the impacts of noise and light pollution as a result of development."*

12.15 Policy QEC4P (Greenery, Urban Greenspace and Public Spaces) states that:

> *"Local authorities and others should also encourage patterns of development which maintain and improve air quality and minimise the impact of noise upon public space. Artificial lighting should be used sensitively to aid safety whilst minimising pollution."*

12.16 Policy QE6V (The conservation, enhancement and restoration of the Region's landscape), with regard to the landscape character, states that:

> *"Local authorities and other agencies, in their plans, policies and proposals should conserve, enhance and, where necessary, restore the quality, diversity and distinctiveness of landscape character throughout the Region's urban and rural areas by: […] v) considering other factors that contribute to landscape character including tranquillity and the minimisation of noise and light pollution"*

12.17 Within the Structure Plan, Policy D2 (The Design and Environmental Quality of Development) states that:

> *"Development should generally conserve and, where possible, improve the quality of life and the environment and should: […] (c) minimise pollution of land, water and air, waste generation, nuisance from noise, and pollution by artificial sources of light"*

### *Local Planning Policy*

#### Local Plan

12.18 The adopted Local Plan has not specific noise-related policies. However, Draft Policy SD1 (Achieving Sustainable Development) of the Core Strategy seeks to ensure the effects of pollution, including noise are avoided or mitigated.

12.19 Within the Local Plan, Policies E and D5 (Noise Attenuation Requirements) state that:

> *"New development likely to generate or be subject to an unacceptable level of noise will be required to provide adequate noise attenuation measures. Where attenuation measures cannot satisfactorily minimise the potential for noise nuisance, the proposed development will be refused."*

## Assessment Methodology and Significance Criteria

### *Assessment Methodology*

#### Demolition and Construction Noise and Vibration

12.20 A detailed construction programme and Method Statement will not be available until the principal construction contractor has been appointed following the granting of planning permission. Preliminary discussions were undertaken with the Environmental Health Department (EHD) of SMDC and it was agreed that, in the absence of a detailed construction programme or finalised development plans, a semi-qualitative impact assessment of general site activities should undertaken but with an element of quantitative assessment in the event that piling operations are anticipated. The Council Officers have stated that for the purposes of the planning application, they would be satisfied that the potential effects associated with construction activities would, for the most part, be most effectively controlled through an application by the principal contractor for a S.61 'prior consent' in accordance with the requirements of the Control of Pollution Act 1974.

12.21 Noise and vibration from potential piling activities were assessed quantitatively as these aspects have the potential for adverse effect at nearby sensitive receptors. In particular, percussive piling generates high levels of noise. The effect of piling noise and vibration were assessed using methods defined in BS 5228, which

allow for the prediction of noise and vibration levels from construction activities at a receptor, accounting for factors such as: source noise/vibration level; operating time of the equipment as a percentage of the assessment period (on-time); distance from source to receptor; acoustic screening provided by intervening topography, buildings or noise barriers; the type of intervening ground (hard/soft). Calculated receptor noise levels were presented as 'free-field' hourly noise levels outside potentially affected sensitive properties adjacent to the site.

12.22 The assessment of vibration encompasses both ground-borne and air-borne vibration; other than piling activities, ground-borne vibration may arise due to the movement of heavy vehicles where the interaction of the tyre and road surface or the jolting of vehicles over rough ground may create vibrations in the ground. More significant vibration may arise from percussive or vibro-piling operations. Air-borne vibration is more commonly associated with low frequency noise emitted by vehicle and plant equipment engines and exhausts. Both forms of vibration may manifest themselves as the rattling of loose fixtures or fittings whilst very low levels of ground-borne vibration may be perceptible to people within dwellings. Significant levels of air-borne vibration may be expected to give rise to annoyance for residents whilst perceptible ground-borne vibration may give rise to significant alarm and often leads to concern regarding building damage; however, levels of ground-borne vibration are often perceptible at levels significantly below those required for even minor cosmetic damage to buildings to occur.

12.23 The following assumptions were made in undertaking the assessment:

- It was assumed that normal construction activities would occur during daytime hours only; the precise details will be agreed and specified within the prior consent.
- Whilst detailed ground investigations have not taken place, discussions with Pam Brown Associates indicate that piling might be required for the main supermarket building and all the employment buildings.
- Assessment was undertaken of potential noise and vibration effects from both percussive (driven cast-in-situ) and continuous flight augered piling. Source noise levels of 122 dB $L_{WA}$ for percussive and 108 dB $L_{WA}$ for augered piling were assumed, taken from Table C.12, Annex C of BS5228. The percussive piling source noise level included the addition of a 5 dB 'penalty' to account for the potentially increased disturbance that such noise can cause for nearby residents.

- Piling noise effects were assessed quantitatively whilst piling vibration effects were assessed qualitatively, as the level of detail currently available does not allow more detailed calculation of vibration propagation.

- Receptor noise levels associated with piling operations were calculated at a select number of representative receptors close to the Site boundary, assuming the piling rig to be located at the closest point to each receptor, where piling may be required. The noise levels were calculated as hourly values with an on-time of 30%, as the piling process typically involves relatively short periods of piling followed by longer periods of preparation and set-up.

- The predicted piling noise levels were discussed in relation to a fixed noise limit of 70 dB $L_{Aeq,1h}$; this noise limit is derived from previous guidance (no longer in print), is discussed in the latest version of BS 5228 and is commonly accepted (by EHDs) as being an acceptable noise level for relatively temporary construction activities. Where the calculated receptor noise levels from piling exceeded this limit, mitigation was discussed.

- Data concerning potential numbers of construction-related vehicles were provided by the Denis Wilson Business Group, Haskoning UK Ltd; it was indicated that the majority of the construction-related traffic would travel along the A53 from Buxton or from the direction of the M6, but that none would travel along the A523 from the direction of Macclesfield or along the A520 St Edwards Street. The assessment conservatively assessed potential effects arising from 100% of the construction-related vehicles travelling along each section of the A53.

**Service Yard Operations Noise**

12.24 Plans of the proposed Sainsbury's supermarket show that the service yard is located on the north western side of the main building, with vehicle access running along the western side of the building. The service yard is enclosed by the store building and the adjacent employment buildings to the south and west and is enclosed by the supermarket to the east and north. To the north west the service yard will be enclosed by a low barrier beyond which is the Tessenderlo site and a small hill between the Site and Bridge End.

12.25 The following assumptions were made:

- Noise levels at receptors from service yard activities were to be predicted by computer noise modelling exercise using measured noise levels from deliveries.

- The EHO agreed in principle with a 45 dB $L_{Aeq,1h}$ assessment of night time delivery noise.

- The assessment would include maximum noise level ($L_{max}$) from night time deliveries; the assessment utilised an 'acceptable' $L_{Amax}$ value of 60 dB as being appropriate to distinguish the potential for perceived sleep disturbance to local residents caused by individual night time noise events, in accordance with the guidance contained in the WHOs "Guidelines for community noise" (WHO, 1999). The WHO has recently issued the "Night noise guidelines for Europe" (WHO, 2009) which complements, rather than supersedes, the 1999 document. However, the health-based dB $L_{night}$ noise levels recommended within the 2009 document, based on long-term time-averaging of noise over a year, are too low to be achievable within all but the quietest environments in the UK where existing noise levels already exceed the recommended levels. They are also based on the need to prevent long-term health effects caused by chronic sleep disturbance and do not accurately reflect the potential 'perception' of disturbance by residents, caused by a limited number of individual noise events during the night.

- Data regarding the proposed delivery schedule were provided by Sainsbury's Supermarkets Ltd and are presented in **Table 12.4**.

**Operational Traffic Noise and Vibration**

12.26 Data regarding the baseline and Proposed Development-generated traffic were obtained from the TA conducted by Denis Wilson Business Group, Haskoning UK Ltd. The tabulated data were assessed to establish those road links where a change in noise of 1 dB or more may occur, approximately equivalent to an increase in total traffic flows of 25% or a decrease of 20%; DMRB indicates that noise level changes of 1 dB may be perceptible upon the immediate opening of a road scheme although a change in noise levels of 3 dB may be the least perceptible change in long term noise levels from road traffic. In the context of the existing noise environment in Leek, a 3 dB change was taken to be the limit of 'significance' for road traffic noise changes, as detailed in **Table 12.1**.

12.27 However, following the guidance in DMRB, where the tabulated traffic data indicated that the development might give rise to a potentially significant 1 dB change in noise levels, assessment of the potential noise levels changes was undertaken using the Atkins RoadNoise computer software package. This implements the calculation methods given in CRTN to predict changes in noise level adjacent to a road. The model takes account of factors such as topography, ground type, screening by buildings and barriers, road speed, traffic composition, road surface and road gradient. Ordnance Survey topographic data was used for constructing the base terrain for the computer model.

12.28 In undertaking the modelling work, the following assumptions were made:

- All ground adjacent to the road and between the road and receptors was presumed to be hard, potentially noise-reflective ground, to provide a conservative assessment.
- Receptor locations at properties were set at ground and first-floor level but the assessment of effects was undertaken using the first floor level as this is often marginally higher than ground floor levels: this is the method recommended in DMRB for properties with one or more floors above ground level.
- Buildings were taken to be 7 metres in height unless otherwise specified.
- The existing and proposed road surfaces (where appropriate) were assumed to be standard hot-rolled asphalt and no reduction in noise levels from new road surfaces, such as from generic 'quiet surfaces', was assumed.

12.29 In addition to the above assessments, assessment was undertaken in accordance with the Noise Insulation Regulations, 1974. The Regulations specify that where a new or significantly altered road causes noise levels at a property of 68 dB $L_{A10, (18hour)}$ or more (the 'relevant noise level'), providing other conditions are met, that property may be eligible for the provision of noise insulation to mitigate the adverse effects of the noise increases. This applies only to those properties adjacent or close to the proposed junction / roundabout creation and road upgrade works on Macclesfield Road.

**Supermarket Service Plant Noise**

12.30 Noise from externally mounted service plant on the proposed supermarket may give rise to audible noise in the surrounding area; this is most likely to occur

during the night time as day time noise levels are such that such noise is unlikely to be heard. At this stage in the Proposed Development, details of the proposed plant, its source noise levels and location are unknown. Therefore, qualitative discussion of potential noise effects was undertaken. The discussion included reference to the criteria presented in BS 4142 concerning likelihood of complaint about noise according to quantitative differences between the 'rating' noise level of the plant equipment in question and existing background noise levels at the receptor position.

**Suitability of Site for Residential Development**

12.31 Measured noise levels from the survey were used to assess suitability of site for residential development, focussing on outward-facing residences on Macclesfield Road, in accordance with the guidance contained in PPG24. PPG24 defines a site's suitability for residential development by referencing the measured noise levels to stated noise exposure categories (NEC), using the 16-hour daytime (07:00 – 23:00) and 8-hour night time (23:00 – 07:00) dB $L_{Aeq}$ noise levels. These noise indices were derived in the following manner: the three 1-hour noise measurements obtained adjacent to Macclesfield Road were converted to the dB $L_{A10\ (18\ hour)}$ noise level using the methodology provided by CRTN (shortened measurement procedure). This noise level was then converted to a 16-hour $L_{Aeq}$ using the correction of -2 dB suggested in Annex 1 of PPG24.

12.32 Assessment of suitability with regard to night time noise is more problematic due to the intermittent nature of traffic on Macclesfield Road which means that time-averaged noise levels are not always the most suitable parameter when sleep disturbance. In terms of site suitability, the measured dB $L_{Aeq}$ and $L_{Amax}$ noise levels from the traffic were examined, in relation to the specified night time NEC values and the 82 dB $L_{Amax}$ noise level specified in PPG 24; PPG 24 recommends that where a night time noise level of 82 dB $L_{Amax}$ is regularly exceeded, the site should be considered to be in NEC C regardless of the measured $L_{Aeq}$ noise level.

12.33 The assessment additionally considered the cumulative daytime (07:00 – 23:00) noise effects on the proposed residential properties arising from both existing and Development-generated traffic on Macclesfield Road and the adjacent supermarket access road.

12.34 With regard to suitability for development of the proposed residential properties off Abbey Green road, set further back from Macclesfield Road, the EHD was satisfied that a more qualitative assessment of the suitability of the site be undertaken; this is partly because the separation distance to Macclesfield Road

means that noise levels will be significantly reduced and because the potential traffic flows on the new residential access road off Abbey Green Road are too low to permit noise prediction.

12.35 However, noise from the supermarket car park, potentially affecting the rear of the proposed adjacent residential properties, was quantitatively predicted but not noise from the service yard at the rear of the proposed retail units as the operations of these units are entirely unknown at this time; qualitative discussion of potential effects from these units was undertaken.

## Significance Criteria

12.36 There are no statutory or guideline significance criteria that can be assigned to relative changes in noise level. Significance of effects will be site specific, affected by factors such as the nature of existing and predicted noise, sensitivity of receptors and time of day.

12.37 The glossary in PPG 24 states:

> *"A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to a halving or doubling of the loudness of a sound".*

12.38 With reference to the assessment of a specific noise source against the measured background noise, BS 4142 states that:

> *"A difference of around +10 dB or more indicates that complaints are likely. A difference of around +5 dB is of marginal significance. If the rating level [service plant noise] is more than 10 dB below the measured background noise level, then this is a positive indication that complaints are unlikely."*

12.39 Additionally, DMRB states that:

> *"A change of 1 dB(A) in the short-term (e.g. when the project is opened) is the smallest that is considered perceptible. In the long-term, a 3 dB(A) change is considered perceptible, and such an increase should be mitigated if possible."*

12.40 While the guidance contained within BS 4142 refers to a different form of assessment, using the $L_{A90}$ background noise level, and DMRB refers to noise level changes from free-flowing traffic, based on an assessment of the 18-hour $10^{th}$ percentile noise level (dB $L_{A10\ (18\ hour)}$), the general principles behind these

statements were utilised in order to provide an understanding of the potential significance of noise level differences and to derive conservative noise effects significance criteria. The standard significance criteria applied to environmental impacts assessments are described in Chapter 2; the relative equivalence of these definitions to quantitative changes in noise level are presented in **Table 12.1**.

**Table 12.1: Significance criteria associated with quantitative noise level change**

| Change (dB) | Significance Criteria | Definition |
|---|---|---|
| ≥ +10.0 | Substantial Adverse | The development (either on its own or with other proposals) could have a substantial adverse effect on the character and integrity of the site and/or the surrounding area. |
| +5.0 to 9.9 | Moderate Adverse | The development (either on its own or with other proposals) could have a moderate adverse effect on the character and integrity of the site and/or the surrounding area. |
| +3.0 to 4.9 | Minor Adverse | The development (either on its own or with other proposals) could have a minor adverse effect on the character and integrity of the site and/or the surrounding area. |
| 0.0 to +2.9 | Negligible | No observable effect. |
| 0.0 to -2.9 | Negligible | No observable effect. |
| -3.0 to 4.9 | Minor Beneficial | The development (either on its own or with other proposals) could have a minor beneficial effect on the character and integrity of the site and/or the surrounding area. |
| -5.0 to 9.9 | Moderate Beneficial | The development (either on its own or with other proposals) could have a moderate beneficial effect on the character and integrity of the site and/or the surrounding area. |
| ≥ -10.0 | Substantial Beneficial | The development (either on its own or with other proposals) could have a substantial beneficial effect on the character and integrity of the site and/or the surrounding area. |

12.41 It should be noted that where the noise from a specific noise source, for example service yard delivery, is lower than the existing noise level or threshold noise level used for assessment, this does not imply a beneficial effect. In order to result in a beneficial effect, the development would need to reduce existing noise levels at a receptor. For this reason, unless explicitly stated, it should be assumed that a negative numerical noise effect, for example -5 dB, implies that no effect will occur.

### *Consultation*

12.42 Consultation was undertaken with the EHD of SMDC and SCC)Highways Officer, on the 16 September 2009. Also present were members of Sainsbury's highways/traffic team from the Denis Wilson Business Group, Haskoning UK Ltd.

12.43 In this meeting the following issues, with regard to noise, were discussed:

- Noise from the use of the proposed PFS was discussed; Denis Wilson explained that the intended hours of operation would be the same as the store, namely 08:00-22:00.
- With regard to construction noise, the Council Officers confirmed that they would prefer to control construction noise and vibration through a S.61 prior consent (Control of Pollution Act 1974) rather than trying to specify noise limits at this early stage in the Development.
- The Council Officers sought clarification on the effect of piling noise. Royal Haskoning confirmed that this would be suitably assessed in the Environmental Statement (ES).
- It was agreed that it is likely that construction materials such as stone, cement etc will predominantly come from the south and east of Leek, rather than from the Macclesfield direction.
- Night time noise was raised as an issue with background (dB $L_{A90}$) noise levels in the vicinity of the development potentially dropping below 20 dB(A). The Council Officers were uncertain if Tessenderlo operated at night (they are currently not restricted) and they requested that Royal Haskoning undertake noise measurements on Kiln Lane due to its elevated location overlooking the site and from where previous noise complaints have been received. Royal Haskoning agreed that this location, amongst others, would be included in the survey.
- With regard to 24 hour deliveries to the supermarket, Royal Haskoning pointed out that an external night time noise level of 45 dB $L_{Aeq,1h}$ would normally be an acceptable noise limit at which WHO Guidelines indicate increased likelihood of sleep disturbance; trying to get delivery noise levels to below this level would be unrealistic. The Council Officers were reserved on this point; they were satisfied with this level, in principal, but were more concerned about impact noise, noise from trolleys being moved within trucks, reversing alarms, etc. Royal Haskoning confirmed that this would be suitably addressed in the ES.

- It was agreed that the noise measurement survey would incorporate short term sample measurements of 15 minutes during the day and 5 minutes at night. Royal Haskoning also stated that they intended to undertake a shortened CRTN (Calculation of road traffic noise) measurement of three 1-hour periods during the day alongside Macclesfield Road close to the proposed site entrance to supplement and support the modeled traffic noise data with regard to noise currently affecting the site.

- The Council Officers were satisfied that detailed PPG24 assessment would be undertaken for properties close to Macclesfield Road with a more qualitative assessment with regard to properties set back from the road to the north, adjacent to Abbey Green Road.

- Scheme opening year would be 2012 (the subsequent traffic predictions have been given with a baseline year of 2013; the difference is negligible).

## Baseline Conditions

12.44 The existing noise situation was established through a noise measurement survey, providing quantitative data on the existing situation, supplemented by qualitative observation of the character of the local noise.

12.45 The measurement locations are presented in **Figure 12.1** at the end of this Chapter. They were:

i) at the junction of Grace Street and Macclesfield Road, approximately 5 metres from the nearside carriageway edge;

ii) on Kiln Lane overlooking the development site, close to the entrance to the residential property called Bryn Hellig;

iii) on Abbey Green Road close to the junction with Park Road, to the east of the Application Site; and

iv) Adjacent to 41 to 53 Abbey Green Road to the north east of the Application Site.

### *Daytime Noise*

12.46 The daytime noise environment in the vicinity of measurement location 1, on Kiln Lane, is generally dominated by road traffic noise. However, other contributions were noted from the Tessenderlo works, a nearby garage to the north and

effectively below the measurement location (close to Macclesfield Road) and with contributions from local domestic noise and occasional bird song.

12.47 At measurement location 2 adjacent to Macclesfield Road, the existing noise is dominated by road traffic noise, with continuously flowing traffic including numerous commercial and heavy goods vehicles.

12.48 At measurement location 3, at the junction of Abbey Green Road and Park Road, no single noise source dominated, with noise from distant road traffic, occasional vehicles passing, an electric wood saw from DS Pine Mill and occasional noises from the nearby commercial units providing a variety of noise contributions.

12.49 Further north on Abbey Green Road, in the vicinity of measurement location 4, bird song dominated the noise environment, with intermittent noise contributions from passing vehicles. An intermittent contribution was also present from the nearby commercial area, including banging, shouting and reversing alarms, and a continuous source of fan noise from the direction of the Churnett Works was also audible.

### *Night Time Noise*

12.50 During the night, at location 1 on Kiln Lane, the noise environment was dominated by plant noise from the Tessenderlo works, primarily from cooling tower fans but also from occasional impact noises seemingly associated with the movements and loading/unloading of heavy goods vehicles within the Tessenderlo site. Occasional light and heavy vehicles on Macclesfield road also made a contribution with occasional significant noise from commercial vehicles passing over surface irregularities in the road.

12.51 At location 2, traffic on Macclesfield Road was intermittent, with periods of no traffic movements for several minutes interspersed with periods of multiple vehicle passes. Even during the night, significant numbers of commercial and heavy goods vehicles travelled on the road, some being extremely noisy as they encountered pot-holes and other irregularities in the road. Additionally, plant equipment noise from Tessenderlo was clearly audible and made a significant contribution to the background noise level when vehicles were not passing.

12.52 At location 3, noise from the plant equipment at Tessenderlo was audible as a constant noise source. Intermittent passing vehicles on Macclesfield Road were also clearly audible.

12.53 At location 4, adjacent to 41 to 53 Abbey Green Road, there was a clear line of site to the Tessenderlo works; the noise from the cooling tower fans was clearly audible and dominated the noise environment although vehicle noise from Macclesfield Road was occasionally audible.

12.54 **Table 12.2** presents a summary of the measured noise levels obtained during the baseline survey. The full measurement data and observations are presented in **Table 12.10** at **Appendix 12.2**. Note that the data also include a derivation of the dB $L_{A10\ (18\ hour)}$ (between the hours of 06:00 and midnight) noise level using the shortened measurement procedure in CRTN; this data was used in the assessment of suitability of the Application Site for residential development, in accordance with the guidance in PPG 24.

**Table 12.2: Summary of measured baseline noise levels**

| Location | | Measured Noise (dBA) | | | | |
|---|---|---|---|---|---|---|
| | | $L_{min}$ | $L_{90}$ | $L_{eq}$ | $L_{10}$ | $L_{max}$ |
| 1 | Day | 44.9 | 48.3 | 52.7 | 54.6 | 70.7 |
| | Night | 42.2 | 44.2 | 45.8 | 47.4 | 57.1 |
| 2 | Day | 39.6 | 52.4 | 69.9 | 74.1 | 88.9 |
| | *Derived $L_{A10\ (18\ hour)}$* | | | | *73.1* | - |
| | Night | 32.9 | 34.5 | 55.1 | 44.7 | 79.4 |
| 3 | Day | 38.9 | 41.6 | 54.2 | 51.7 | 76.5 |
| | Night | 32.8 | 34.2 | 32.5 | 37.0 | 41.3 |
| 4 | Day | 35.9 | 39.4 | 52.9 | 53.2 | 75.5 |
| | Night | 30.4 | 32.4 | 34.4 | 34.7 | 52.6 |

## Potential Effects

12.55 The potentially affected receptors with regard to demolition and construction noise are those properties on Abbey Green Road, adjacent to or overlooking the Proposed Development site, properties on Macclesfield Road close to the site access and other residential properties along which construction-related traffic may move, and properties overlooking the Proposed Development site from the elevated ground to the south.

### *Demolition and Construction Noise*

12.56 On-site noise from demolition, site preparation works and construction, other than piling, mostly arises as the result of the operation diesel engines and exhausts with contributions from the impact of metal vehicle body parts with materials,

surfaces or other vehicles / body parts. Noise levels from such activities would generally be expected to be in the range of 50 to 80 dB $L_{Aeq}$, depending on the activity and proximity of the operations to the receptors; the higher end noise levels would only be expected to be associated with significantly noisy works or noisy activities occurring particularly close to receptors. Acceptable construction noise limits are often set in the region of 65 to 70 dB $L_{Aeq}$, but may vary depending on site specific conditions (note that conversational speech at 1 metre may be in the region of 60 to 65 dB(A)). In addition, it is probable that the Site would be developed in a phased manner, most likely as market conditions dictate. This would result in relatively limited areas being developed at any one time.

12.57 The only potentially sensitive receptors that might be significantly adversely affected by general construction noise are the properties at the Macclesfield Road end of Thomas Street and Grace Street and the residential properties on Abbey Green Road which are adjacent to or overlook the Application Site, close to the junction with Park Road, where specific mitigation may be required. All other potentially sensitive properties are set further back from the Application Site and would not be expected to be significantly adversely affected by general on-site construction noise. On the whole, the noise from general construction of such activities was qualitatively predicted to have a negligible or minor adverse effect, requiring no specific mitigation measures. Few activities would give rise to noise levels that might cause moderate to major adverse noise effects, these tending to relate to operations requiring the use of pneumatic equipment to break up or chip away at concrete etc. and for which mitigation might be required.

12.58 In general, it was not possible to quantitatively assess the construction noise effects in any detail and, as discussed at paragraph 12.56, the Council's EHO stated a preference for control of noise through the application by the principal contractor for a S.61 prior consent in accordance with the requirements of the Control of Pollution Act 1974. This will be undertaken at a time when a more detailed construction Method Statement is available and will enable robust noise and vibration control measures to be specified. Notwithstanding this caveat, generic mitigation measures will be applied and these are discussed in more detail later in this chapter.

12.59 Piling may be required for the supermarket and for the employment buildings although detailed ground investigations have not yet been conducted. Additional potentially affected receptors considered with regard to piling noise were residential properties close to the Dyers Arms and existing PFS on Macclesfield Road, and residential properties at Bridge End, although the latter benefit from

partial screening by the intervening terrain, namely the toe of the hill to the west of the Application Site.

12.60 **Table 12.3** presents the results of the indicative predictive assessment of piling noise levels at the nearest potentially noise sensitive premises

**Table 12.3: Predicted piling noise levels at nearest receptors**

| Receptor location | Piling-receptor separation distance (m) | Percussive piling noise (dB $L_{Aeq}$) | Augered piling noise (dB $L_{Aeq}$) |
|---|---|---|---|
| 41 – 53 Abbey Gn Rd | 185 | 69 | 55 |
| Abbey Gn Rd / Park Road | 75 | 76 | 62 |
| Thomas St / Macc Rd | 100 | 74 | 60 |
| Macc Rd next to PFS | 125 | 72 | 58 |
| Bridge End* | 150 | 65 | 51 |
| 12.61 * 5 dB attenuation added to allow for partial screening by intervening terrain | | | |

12.62 The assessment of piling noise predicted that noise levels in exceedence of the 70 dB $L_{Aeq}$ threshold, by up to 6 dB, would occur for properties on Abbey Green Road near to the junction with Park Road and along Macclesfield Road including the properties immediately adjacent to the Dyers Arms/PFS opposite Tessenderlo. This would equate to a potential moderate effect and mitigation will be required. Properties on Abbey Green Road to the north of the Site and those on Bridge Road would not be significantly affected by piling noise.

### *Demolition and Construction Vibration*

12.63 It is not possible at this stage in the scheme to quantitatively predict what vibration effects might arise from the demolition and construction activities on the Application Site. The distance between most of the Site and potentially sensitive receptors suggests that airborne vibration will not be a cause of adverse effect at any receptor. Perceptible ground borne effects are only likely to be associated with piling operations, affecting properties closest to the site. Humans are extremely sensitive to vibration down to levels as low as 0.3 mm/s ppv (peak particle velocity) in general residential settings; it is possible therefore, for low levels of unexpected or unusual vibration to cause distress or alarm in residents, usually centred on concern over structural damage to their properties. The levels

of human vibration detection, however, are significantly lower than those that might be expected to cause minor cosmetic damage, as outlined in BS 5228.

12.64 There is, therefore, no likelihood that any activities associated with the construction and demolition activities on this Site will cause any damage whatsoever, cosmetic or otherwise, to any adjacent properties. There remains the likelihood that perceptible vibration may occur in properties particularly close to the piling activities, perhaps within 100 metres, where significant vibration from traffic does not already occur; properties immediately adjacent to Macclesfield Road, for example, may already be subject to significant perceptible levels of traffic-induced vibration and are unlikely to be adversely affected by on-site piling vibration. It is possible, however, that ground-borne vibration from piling may be perceptible at properties on Abbey Green Road near the junction with Park Road and, exceptionally, possibly at Bridge End with the result that a minor to moderate adverse effect may occur.

12.65 The level of detail required to undertake quantitative ground-borne vibration will not available until a much later stage in the scheme at which time more precise requirements and methodology for piling would be indentified. Therefore, detailed assessment and control of potential effects will best be achieved through the S61 prior consent process.

### *Service Yard Operation Noise*

12.66 The assessment encompasses potential effects from both the service yards for the supermarket as well as those associated with the employment and retail uses on site. At this time, it is not known what end-uses the employment and non-food retail uses will have and what daily deliveries might visit the units. It is not possible, therefore to undertake detailed quantitative noise assessment for these aspects.

12.67 However, it is clear that the proximity of the retail units to proposed residential units would preclude overnight deliveries due to the potential for major adverse noise effects. Daytime deliveries, in the context of the existing noise situation, are unlikely to be give rise to more than a minor adverse effect and mitigation will be required.

12.68 With regard to the employment units, day time delivery noise is unlikely to be a cause for concern due to the nature of the existing noise situation. With regard to night time noise from employment use deliveries, indicative predictive assessment was undertaken based upon an examination of an hourly-averaged

time period as well as the potential single maximum event noise level that might occur. The hourly-averaged assessment assumed the arrival and departure of three delivery vehicles to the loading area of the employment units in a typical hour.

12.69 The assessment conservatively assumed the cumulative effect associated with the arrival, unloading and departure of a delivery vehicle to the foodstore within the same hour. Assessment was against an acceptable night time noise level of 45 dB $L_{Aeq, 1h}$, as discussed at paragraph 12.25. The results of this assessment are presented in **Table 12.5**.

12.70 The supermarket service yard will be located on the western corner of the supermarket, screened from Macclesfield Road by the employment units. The nearest residential properties will be those at Bridge End, to the west of the Site and those at the junction of Macclesfield Road and Grace Street; both sets of properties will be screened from the service yard, by intervening topography in the case of Bridge End and by the employment units in the case of Grace Street.

12.71 41 to 53 Abbey Green Road will be approximately 310 metres from the closest part of the service yard with the main supermarket building screening line of sight.

12.72 Properties on Kiln Lane overlooking the Site, for which screening by the employment buildings will not apply, will be between approximately 310 and 360 metres from the closest part of the service yard. Bryn Hellig (Kiln Lane) will be approximately 380 metres from the service yard but is in an elevated position overlooking the Site.

12.73 No receptors have a direct line of sight of the service yard.

12.74 Day time deliveries to the service yard will not generate significant adverse effects particularly in the context of the existing noise situation. However, night time delivery noise may be audible, with properties on Kiln Lane as sensitive receptors.

12.75 The proposed delivery schedule is presented in **Table 12.4**, based on a typical schedule for a Sainsbury's store of this size.

**Table 12.4: Proposed daily delivery schedule**

| Number of Deliveries | Type of Product Delivered | Time Period of Delivery | Typical Type of Vehicle |
|---|---|---|---|
| 1 | Frozen | Daytime | Articulated HGV |
| 1 | Produce | Overnight | Articulated HGV |
| 2 | Fresh | Overnight | Articulated HGV |
| 3 | Grocery | 2 Day / 1 Night | Articulated HGV |
| 2 | Bread | Early Morning | 13.5 T Rigid (8m) |
| 2 | Newspaper | Early Morning | 18T Rigid (10m) |
| 1 | Milk | Early Morning | 26 T Rigid (11.5m) |
| **12** | | | |

12.76 Assessment of service yard operations was undertaken using the SoundPLAN noise modelling software, with receptor locations allocated to the closest properties adjacent to the site.

12.77 The assessment of supermarket delivery activities assumed the arrival of one heavy goods vehicle, manoeuvring within the service yard, unloading and departure of the vehicle. The activity noise was assessed over an assumed typical hour with regard to both the time-averaged noise levels ($L_{Aeq}$) and the maximum ($L_{Amax}$) noise level occurring during that hour. The hourly-averaged calculations additionally assumed the movements of a limited number of staff vehicles entering and leaving the foodstore car park during the same assessment time period. The results of the assessment are summarised in **Tables 12.5** and **12.6**, with more detailed tabulated results, showing the relative contributions of the various noise sources, presented in **Tables 12.11** and **12.12** at **Appendix 12.2.**

**Table 12.5: Hourly averaged night time delivery noise effects – foodstore and employment units**

| Receptor | Total hourly-averaged noise level (dB $L_{Aeq, 1h}$) | Noise limit (dB $L_{Aeq, 1h}$) | Impact (dB) |
|---|---|---|---|
| 17 Abbey Green Rd | 29.2 | 45 | -14.1 |
| 22 Abbey Green Rd | 32.5 | | -11.5 |
| 40 Abbey Green Rd | 31.2 | | -12.0 |
| Bryn Hellig | 34.4 | | 34.4 |
| Kiln Lane | 33.9 | | -11.0 |
| 101 Macclesfield Rd | 37.1 | | -7.8 |
| 1 Grace St | 35.1 | | -9.9 |
| 1 Thomas St | 36.7 | | -8.3 |
| 2 Thomas St | 43.1 | | -1.9 |
| Proposed residential on access road | 54.8 | | 9.8 |
| Proposed residential facing car park | 31.9 | | -5.0 |
| Proposed residential at rear of retail units | 43.3 | | -1.6 |

**Table 12.6: maximum delivery activity noise effects**

| **Receptor** | **Maximum predicted delivery noise** (dB $L_{Amax}$) | **Noise limit*** (dB $L_{Amax}$) | **Effect** (dB) |
|---|---|---|---|
| 17 Abbey Green Rd | 46.0 | 60.0 | -14.0 |
| 22 Abbey Green Rd | 47.5 | | -12.5 |
| 40 Abbey Green Rd | 46.3 | | -13.7 |
| Bryn Hellig | 52.1 | | -7.9 |
| Kiln Lane | 46.1 | | -13.9 |
| 101 Macclesfield Rd | 57.5 | | -2.5 |
| 1 Grace St | 47.3 | | -12.7 |
| 1 Thomas St | 50.7 | | -9.3 |
| 2 Thomas St | 61.6 | | 1.6 |
| Proposed residential on access road | 73.9 | | 13.9 |
| Proposed residential facing car park | 49.4 | | -10.6 |
| Proposed residential at rear of retail units | 61.1 | | 1.1 |

* WHO, 1999

12.78 The assessment indicated that the proposed new apartments on the site access road might experience major adverse effects from night time deliveries. **Table 12.11** at **Appendix 12** demonstrate that the majority of the noise effect arises from the movement of HGVs on the Site access road and operations in the service yard itself have no effect on any receptors. Mitigation will be required with regard to the prevention of sleep disturbance for the apartment residents facing the access road.

12.79 The assessment also indicates that there will be a negligible (adverse) noise effect, associated with maximum night time delivery noise, for the residents at the end of Thomas Street and at the rear of the proposed residential properties off Abbey Green Road facing the proposed supermarket car park. The maximum night time delivery noise is unlikely to occur many times during the night and, for properties on Thomas Street, maximum noise levels in excess of this already occur, as demonstrated by the measurement data in **Table 12.2**. In view of these factors, mitigation against night time delivery noise is not judged necessary for any of the other properties around the Application Site

### *Operational Traffic Noise*

12.80 The development traffic data against which a noise impact screening exercise was conducted are presented in **Table 12.13** at **Appendix 12**. **Table 12.7** presents the results of the initial screening assessment, showing of percentage changes in total traffic flows associated with the Proposed Development. The numbers in the first column are the road link references used in the TA.

**Table 12.7: Relative traffic flow changes in scheme opening year**

| **Link** | | **Baseline** | | **Baseline + Development** | | **% Increase** |
|---|---|---|---|---|---|---|
| | | **AAWT** | **%HGV** | **AAWT** | **%HGV** | |
| 1a | A523 Macclesfield Rd (west off site access) | 10725 | 2.7 | 11103 | 1.8 | 4 |
| 1b | A523 Macclesfield Rd (between site access & Belle Vue Rd) | 10574 | 2.8 | 18411 | 2.0 | 74 |
| 2 | Site Access (off A523 Macclesfield Road) | - | - | 7813 | 1.2 | - |
| 1c | A523 Macclesfield Rd (between Belle Vue Rd & Abbey Green Rd) | 9935 | 2.4 | 15764 | 2.0 | 59 |
| 3 | Belle Vue Road | 2614 | 2.8 | 3894 | 1.8 | 49 |
| 4a | Abbey Green Road (between A523 Macc Rd and site access) | 959 | 0.0 | 1178 | 0.6 | 23 |
| 5 | Residential access (off | - | - | 454 | 1.4 | - |

| Link | | Baseline | | Baseline + Development | | % Increase |
|---|---|---|---|---|---|---|
| | | AAWT | %HGV | AAWT | %HGV | |
| | Abbey Green Road) | | | | | |
| 4b | Abbey Green Road (north of site access) | 612 | 0.0 | 689 | 0.0 | 13 |
| 1d | A523 Mill St (between Abbey Green Rd & Church St) | 9908 | 3.6 | 15974 | 2.7 | 61 |
| 6 | Church St | 5730 | 0.8 | 6719 | 0.7 | 17 |
| 1e | A523 Church St (between Church St and St Edwards St) | 13140 | 2.6 | 18383 | 2.3 | 40 |
| 1f | A523 Stockwell St (between Ball Haye St & St Edwards St) | 10137 | 3.1 | 12713 | 2.4 | 25 |
| 7a | St Edwards St (between Broad St and A523 Church St) | 8952 | 2.2 | 11186 | 2.5 | 25 |
| 9a | Broad St | 10670 | 2.6 | 11699 | 2.7 | 10 |
| 9b | Brook St | 11037 | 2.1 | 11087 | 2.0 | 0 |
| 7b | Compton | 12691 | 2.0 | 13845 | 1.2 | 9 |
| 10a | Ball Haye St (N) | 7369 | 3.7 | 7740 | 2.7 | 5 |
| 1g | Buxton Road | 10321 | 2.3 | 11920 | 2.0 | 15 |
| 10b | Ball Haye St (S) | 4747 | 1.7 | 5298 | 1.5 | 12 |

12.81 The assessment predicted that changes in traffic flows greater than 25% would occur on seven of the road-links on the local highway network.

12.82 For these seven road links, further assessment was conducted in accordance with the guidance in CRTN and the results are presented in **Table 12.8.**

**Table 12.8: Quantitative noise change for identified road links**

| Link | | Baseline (dB $L_{A10,18h}$) | Baseline + Development (dB $L_{A10,18h}$) | Impact (dB) |
|---|---|---|---|---|
| 1b | A523 Macclesfield Rd (between site access & Belle Vue Rd) | 67.4 | 69.6 | 2.1 |
| 1c | A523 Macclesfield Rd (between Belle Vue Rd & Abbey Green Rd) | 67.0 | 68.9 | 1.9 |
| 3 | Belle Vue Road | 61.3 | 62.7 | 1.4 |
| 1d | A523 Mill St (between Abbey Green Rd & Church St) | 67.4 | 69.2 | 1.8 |
| 1e | A523 Church St (between Church St and St Edwards St) | 68.3 | 69.6 | 1.4 |
| 1f | A523 Stockwell St (between Ball Haye St & St Edwards St) | 67.3 | 68.1 | 0.7 |
| 7a | St Edwards St (between Broad St and A523 Church St) | 66.5 | 67.6 | 1.1 |

12.83 Based on the significance criteria presented in **Table 12.1**, these changes represent a negligible change in long-term traffic noise levels and mitigation measures will not be necessary.

12.84 Assessment of eligibility for sound insulation in accordance with the Noise Insulation Regulations 1974, found that no properties would be eligible. Properties immediately adjacent to the supermarket access road and upgraded section of Macclesfield Road were actually predicted to experience a negligible (<0.5 dB) decrease in traffic noise due to the slight increase in distance between the existing properties and the new road.

### *Operational Traffic Vibration*

12.85 The noise assessment found that a negligible change in traffic noise levels would arise as a result of the additional development traffic on the road network. DMRB identifies that the percentage of people “bothered” by vibration is lower than for noise, at all exposure noise levels. With this in mind and in the context of the

existing high use of the road network, including the movement of a significant number of goods vehicles, there was judged to be no significant vibration effect associated with the movement of additional development-generated traffic on the local highway network.

### *Supermarket Service Plant Noise*

12.86 Insufficient data are available at this time regarding the location and noise that might arise from externally mounted plant equipment on the supermarket. However, the separation distance between the supermarket and the nearest potentially noise sensitive premises, alongside the existing noise from air cooling plant on Tessenderlo, suggests that the supermarket plant equipment will not be audible at any adjacent property. However, in order to minimise the likelihood of disturbance in the event that the surrounding noise situation changes, generic mitigation of service plant equipment noise will be recommended.

### *Suitability of Site for Residential Development*

12.87 The data presented in **Table 12.2** indicates that the 18 hour 10$^{th}$ percentile noise level, at a distance of 5 metres from Macclesfield Road, was 73.1 dB $L_{A10\ (18\ hour)}$. This value was derived from the three 1-hour measurements undertaken at the junction of Grace Street and Macclesfield Road. PPG24 indicates that the dB $L_{Aeq,\ 16h}$, which is the daytime noise parameter against which suitability for residential development would be assessed, can be derived by subtracting 2 dB from the 18-hour 10$^{th}$ percentile value, resulting in a value of 71.1 dB $L_{Aeq,\ 16h}$. The data also show that night time maximum noise levels of approximately 79 to 80 dB occur; it is likely, from our observation of noise from commercial traffic passing over pot holes in the road that noise levels of 82 dB $L_{Amax}$ also occur. It was conservatively predicted, therefore, that the proposed residential development area within the Site boundary and facing onto Macclesfield Road, lies within NEC C both day and night, with the daytime value being very close to the boundary with NEC D. This, in turn, indicates that when a detailed design for the apartments comes forward, appropriate mitigation against road traffic noise will be required; this is discussed in paragraph 12.106.

12.88 The data in **Table 12.2** indicate that for areas along Abbey Green Road, set back from Macclesfield Road, noise levels fall to approximately 54 dB $L_{Aeq}$ during the day time and 32 dB $L_{Aeq}$ at night. These data are very brief sample measurements only so there will undoubtedly be some variation around these values, but they clearly indicate that these areas are in, or below the lower

boundary of, NEC A. These areas of the Application Site are, therefore, suitable for residential development.

## Mitigation Measures

### *Demolition and Construction*

12.89 The assessment identified that, whilst detailed quantitative assessment was not possible at this early stage of the development, general construction operations were predicted to have no more than a minor adverse effect on surrounding noise or vibration sensitive receptors. Particularly noisy activities, however, might give rise to occasional major adverse effects. The most appropriate mitigation measures will be the application of Best Practice construction methods, use of the S61 prior consent process at a stage of the development when detailed construction Method Statements are available and community engagement; our experience has shown that this last measure is often the least used and yet one of the simplest and most effective mitigation measures available to construction contractors. Timely engagement of the community can provide a perceived sense of involvement and control over the construction activities, particularly if provided with a means for raising issues of concern during the construction process.

12.90 It was identified that percussive piling, if required, might give rise to adverse noise and groundborne vibration effects for properties on Abbey Green Road close to the junction with Park Road and, potentially perceptible vibration for properties at Bridge End.

12.91 The most appropriate mitigation measures would be the use of quieter/alternative piling methods and, if necessary, the use of temporary noise barriers around areas of particularly noisy operations. Effective community engagement can be particularly useful with regard to minimising the perception of adverse effects from piling operations with significant reductions in the likelihood of complaints about noise or vibration. The use of pre-condition surveys in properties particularly close to areas of piling can, additionally, prevent subsequent claims for damage to properties.

12.92 These control measures will, however, be specified in more detail through the subsequent S61 prior consent process.

### *Operational Development*

#### Service Yard Operations

12.93 It was identified in the assessment that the proximity of new housing to the proposed retail units, precluded night time deliveries to these units. Day time noise associated with deliveries to these units was predicted to give rise to a minor adverse effect. Mitigation in this instance would best be provided through the construction of a solid wall or fence to the perimeter of the service yard; such a barrier would be expected to provide approximately 10 dB of sound attenuation. The barrier may need to be at least 3 metres tall to screen the noise from heavy goods vehicles.

12.94 The assessment predicted that night time delivery noise would adversely affect the proposed residential apartments facing the supermarket access road; modern double-glazing provided for residential developments in accordance with energy efficiency requirements of the Building Regulations 2000 would provide at least 30 dB of sound attenuation, which would entirely mitigate this effect. However, should residents wish to open windows, the attenuation performance of the windows would be significantly reduced. It may, therefore, be necessary for the proposed residential apartments facing the access road to be supplied with mechanically assisted ventilation to provide sufficient air exchange in rooms without the need to open windows. However, as the proposed apartments are at an Outline Application stage, further detailed design will be necessary at a later stage should the residential scheme be brought forward for completion.

#### Operational Traffic Noise

12.95 The assessment found that a negligible noise effect would arise from the operational development-generated traffic and mitigation will not be required.

#### Supermarket Service Plant Noise

12.96 The assessment predicted that, in the context of the existing noise environment, adverse effect from the operation of this equipment was unlikely. However, to ensure no adverse disturbance should the surrounding noise environment change in the future, the design of the supermarket will need to carefully consider the location of the plant equipment to ensure that it is located where the supermarket itself or other buildings provide a barrier between the plant equipment and the nearest residential receptors. It may also be necessary to screen the plant

equipment with acoustic louvres specified according to the noise emissions of the plant. These details will be addressed during the more detailed design stage of the Development.

#### Suitability of Site for Residential Development

12.97 The assessment indicated that the apartments facing the site access road and Macclesfield Road would most likely lie within NEC C, approaching the boundary with NEC D during the day. The mitigation recommended at paragraph 12.96, in relation to the provision of mechanically assisted ventilation for residential properties facing the store access road, will also need to be considered for rooms or apartments on the façade facing Macclesfield Road. However, it has already been identified that this is a matter that will need to be addressed in more detail at such time as a detailed scheme design for the residential development is put forward.

## Residual Effects

12.98 **Table 12.9** summarises the significance of the residual effects.

### *Demolition and Construction*

12.99 With the use of current Best Practice construction methods, the application for a Section 61 prior consent to minimise the potential for disturbance from construction activities, communication with local residents with regard to any particularly noisy activities and the use of quieter piling methods where applicable, it is predicted that the demolition and construction activities will have a negligible effect for residential properties surrounding the Application Site.

### *Operational Development*

#### Service Yard Operations

12.100 The construction of a solid noise barrier around the rear boundary of the retail units service yard would be expected to reduce day time noise such that a negligible effect would arise. Restriction of night time deliveries would ensure that no adverse night time effect was caused.

12.101 The provision of suitable double glazing and mechanically assisted ventilation for rooms or properties in the proposed apartments facing the access road would

ensure that no night time noise effect was caused. This however, is a matter to be dealt with in more detail in any subsequent detailed design of the residential apartments.

**Supermarket Service Plant Noise**

12.102 Generic mitigation in the form of appropriate siting of the service plant equipment and the use of acoustic louvres, if judged to be necessary, will ensure that no adverse effect arises from the operation of this equipment.

**Suitability of Site for Residential Development**

12.103 The assessment indicated that provision of double glazing and mechanically assisted ventilation for rooms or apartments facing Macclesfield Road, would ensure that no adverse noise effect was caused for future residents. However, as discussed previously, this is a matter most appropriately addressed when the detailed design for the residential units is submitted.

## Conclusions

12.104 The assessment reviewed the potential noise and vibration effects associated with the demolition, construction and operation of the Proposed Development.

12.105 The assessment predicted that potential adverse effects might arise from particularly noisy construction activities and piling; mitigation is proposed such that no more than a minor adverse effect would occur. The mitigation measures included the use of Best Practice construction methods, the application by the principal contractor for a S61 prior consent and community engagement.

12.106 Assessment of operational effects predicted that potential adverse effects might arise as a result of the operation of the service yards for the various units within the Proposed Development, including from noise associated with delivery vehicles moving on the supermarket access road. Appropriate mitigation is suggested such that no adverse effect would occur; this includes the suggestion that good quality double-glazing and mechanically assisted ventilation might need to be provided to the proposed residential units on the Application Site. However, it was also identified that such measures would need to be considered at a later date should a detailed design for the residential units be put forward.

12.107 It was also suggested that generic mitigation be applied to the supermarket's externally mounted service plant, such that no effect would arise should the

ambient noise environment change. At present the plant would be unlikely to be audible beyond the Site boundary due to daytime urban noise and night time plant noise from the Tessenderlo site. With this mitigation in place, there would be no adverse noise effect from the operation of the plant equipment.

## Summary Table

**Table 12.9 – Summary of the Potential and Residual Effects**

| Issue | Potential Effect | Mitigation Measure(s) | Residual Effect |
|---|---|---|---|
| **Demolition and Construction** | | | |
| General construction noise and vibration | Negligible to minor adverse | S61 'prior consent', Best Practice construction methods, community engagement, pre-condition surveys | None |
| Noisy construction activities | Moderate to major adverse | | None or minor adverse |
| Piling noise | Moderate adverse | | None or minor adverse |
| Piling vibration | Minor to moderate adverse | | None |
| **Completed Development** | | | |
| Supermarket night time deliveries - access road noise | Major adverse for proposed apartments facing access road, negligible for properties on Thomas Street | Mitigation designed in to building i.e. glazing and mechanical ventilation – to be addressed as part of detailed design for residential | None |
| Retail units night time deliveries | Major adverse for proposed residential off Abbey Green Road | Restrict delivery hours | None |
| Retail units daytime deliveries | Minor adverse | Noise barrier | None or negligible |
| Service plant | None but potential for adverse effect at night should surrounding noise change | Careful siting and use of acoustic louvres, if appropriate | None |
| Suitability of site for residential development | Façades of proposed residential in NEC C/D | Mitigation designed in to building i.e. glazing and mechanical ventilation – to be addressed as part of detailed design for residential | None, suitable for residential development with appropriate mitigation |

# Figures

**Figure 12.1: Noise measurement locations**