

“The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.”

- 11.9 In support of this, paragraph 123 states that planning decisions should aim to:
- *“avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
 - *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
 - *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
 - *identify and protect areas of tranquility which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason”.*
- 11.10 Pollution, including noise, is defined as anything that might lead to an adverse impact on human health, the natural environment or general amenity.
- 11.11 Annex 3 of the NPPF states that the document replaces Planning Policy Guidance 24 ‘Planning and Noise’ (PPG24)³ but falls short of providing any specific technical guidance.
- 11.12 Web based guidance on the NPPF has been issued with regard to noise⁴ although it does not explicitly state acceptable construction noise levels or indeed acceptable operational noise levels in the context of maintaining existing residential or commercial amenity. The National Planning Practice Guidance does outline the qualitative effects of noise exposure and what action should be taken and states that:
- “Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.”*

Noise Policy Statement for England, 2012

- 11.13 The Noise Policy Statement for England (NPSE)⁵ sets out the long term vision of Government noise policy as follows:
- ‘Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.’*
- 11.14 The policy aims, through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development, to:
- Avoid significant adverse impacts on health and quality of life;
 - Mitigate and minimise adverse impacts on health and quality of life; and
 - Where possible, contribute to the improvement of health and quality of life.
- 11.15 The NPSE sets out three terms with regard to noise effects:
- No Observed Effect Level (NOEL);
 - Lowest Observed Adverse Effect Level (LOAEL); and
 - Significant Observed Adverse Effect Level (SOAEL).

- 11.16 The above terms are not defined in-terms of absolute levels within the NPSE which acknowledges that these will change with regard to noise source and receiver types.

Local Planning Policy

Reading Borough Local Development Framework, Adopted Core Strategy, Adopted 2008 (Updated 2015)

- 11.17 Part of the Reading Borough Council (RBC) Core Strategy's⁶ environmental objective is to minimise noise pollution. Policy CS34: Pollution and Water Resource, states the following:
- *"Development will only be permitted where it would not be damaging to the environment though noise;*
 - *Proposal for development that are sensitive to the effects of noise will only be permitted in areas where they will not be subject to high levels of such pollution, unless adequate mitigation measures are provided to minimise the impact of such pollution."*

Reading Borough Local Development Framework, Sites and Detailed Policies Document, Adopted 2012 (Updated 2015)

- 11.18 Design Management Policy 4 'Safeguarding Amenity' in the Sites and Detailed Policies Document⁷ states that "Development will not cause a significant detrimental impact to the living environment of existing or new residential properties in terms of noise and disturbance". This policy aims to ensure that existing and additional residential properties provide acceptable living environment.

Reading Borough Local Development Framework, Reading Central Area Action Plan, 2009

- 11.19 Policy RC9 – Living in the Centre of the Reading Central Area Action Plan (RCAAP)⁸, states that proposals for residential developments will be assessed against certain criteria. The criteria pertaining to noise are as follows:
- Proposals for new residential development within the central area will be required to demonstrate how the issue of potential noise disturbance from neighbouring land uses and other sources have been considered and if necessary, mitigated. New residential development should not be located next to existing town centre uses where those uses would give rise to unacceptable levels of noise and disturbance to the occupiers of the new scheme, unless this can be mitigated.
- 11.20 Within the document it also states that "In the rare event of a conflict developing between uses, certain uses will have priority, as the centre is the only suitable location. Major retail and town centre leisure development, including evening economy uses, will take first precedence, followed by, to a more limited extent, offices. In contrast, housing uses, including supporting social and community facilities, can be located in many places across the Borough".
- 11.21 The document also specifies that tall buildings that include residential will need to take account of noise issues in the same way as all additional residential development under Policy RC9.

Station Hill South Planning and Urban Design Brief, 2007

- 11.22 The Station Hill South Planning and Urban Design Brief⁹, provides a number of specific development and design principles for Station Hill South. Principle 7 responds to the aim of achieving a mixed-use development and encouraging day and night-time activities. However, with regards to noise pollution, residential developments will be expected to mitigate, where

possible, against any disturbance arising from this town centre location in accordance with the now revoked PPG24.

[Station Area Framework, 2010 \(web page¹⁰\)](#)

- 11.23 There are several references to noise within the Station Area Framework document as follows.
- Chapter 6 Density, Mass, Height outlines that development of 'Tall Buildings' should not result in negative noise impacts on existing residential properties;
 - Chapter 10 Sustainability advocates the use of living walls in building design to enhance acoustic performance;
 - Chapter 11 Transport indicates that parking design should aim to minimise undesirable external environmental effects, including noise.

[Reading Borough Local Development Framework – Revised Sustainable Design and Construction Supplementary Planning Document, Adopted 2011](#)

- 11.24 The RBC Revised Sustainable Design and Construction Supplementary Planning Document¹¹ aims with regard to noise is *"to minimise damage to the environment through noise pollution"*. To this end, the Development will need to incorporate measures to minimise noise pollution. With regards to residential development, it specifies that noise mitigation needs to be carefully designed, in particular where it is located near to a busy road, railway line or other noise generating infrastructure. The document also lists generic noise mitigation measures such as sound insulation, bunds and noise barriers.

[Reading Borough Council Planning and Noise \(web page¹²\)](#)

- 11.25 RBC states its position with regard to planning and noise issues on its web pages as follows:
- The design and proposed noise mitigation will be assessed against BS 8233:1999¹³ Sound Insulation and noise reduction for buildings - Code of practice. For recommended internal noise levels and for all new build residential developments it is expected that the internal noise levels should comply with the 'good' standard as defined in Table 5 of BS 8233:1999;
 - Commercial / industrial developments should demonstrate that any noise from new plant should be at least 10dB below the existing background level as measured at the nearest noise sensitive receptor.
- 11.26 Explanation of the British Standards quoted by RBC is presented in the following Guidance Section.

Guidance

[IEMA Guidelines for Environmental Noise Assessment, 2014](#)

- 11.27 The IEMA Guidelines for Environmental Noise Assessment¹⁴ address the key principles of assessing noise effects and are applicable to all development proposals where noise effects may occur.
- 11.28 The guidance provides advice with regards to the collection of baseline noise data, prediction of noise levels and how noise should be assessed. The guidance recognises that the effect associated with a particular noise source will be dependent on a number of factors including but not limited to the sensitivity of the receptor, frequency and duration of the noise source and time of day. However, it stops short of providing specific assessment criteria which developments

should achieve but instead suggests that the methodology adopted should be selected on a site by site basis with reference to relevant national and local standards.

British Standard 8233 – Guidance on Sound Insulation and Noise Reduction for Buildings, 2014

- 11.29 BS 8233¹⁵ provides guidelines for the control of noise in and around buildings. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

World Health Organisation, Guidelines for Community Noise, 2000

- 11.30 The World Health Organisation (WHO) document¹⁶ provides guidance of a similar nature to BS 8233:1999, although it places more emphasis on the potential health effects associated with noise. Specifically, the document recommends internal and external noise levels that would provide an acoustic environment that is conducive to uninterrupted speech and sleep. Daytime noise limits aim to prevent the majority of the population being moderately or seriously annoyed by noise. Night-time noise limits are intended to ensure a good night's sleep.

British Standard 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 Noise, 2009+A1:2014 and Part 2 Vibration, 2009

- 11.31 BS 5228¹⁷ part one and part two¹⁸ provides guidance on the assessment of noise and vibration effects during the development of a site, including procedures for estimating noise levels from construction activities and vibration attributable to vibratory rolling and piling activities.
- 11.32 The guidance does not define acceptable limits. However, it does provide potential methods for assessing the significance of noise and vibration effects, which should be defined on a site-specific basis. BS 5228 also provides guidance on minimising potential effects through the use of mitigation and the adoption of BPM.

British Standard 4142 - Methods for Rating and Assessing Industrial and Commercial Sound, 2014

- 11.33 BS 4142¹⁹ provides a method for the rating and assessment of sound of an industrial and/or commercial nature. The assessment method allows the likely effects of sound on people to be determined. The significance of the sound depends upon the margin by which the 'rating level' ($L_{A,r,Tf}$) exceeds the background level (L_{A90}). Typically the greater this difference the greater the magnitude of the effect.
- 11.34 The 'rating level' is equal to the specific sound level if there are no acoustic features present (tonal/impulsive/intermittent). Depending on the acoustic feature and acoustic correction of +2 to +9dB may be applied to obtain the rating noise level. Where a sound has more than one acoustic feature then the appropriate acoustic corrections are summed.

Calculation of Road Traffic Noise (CRTN): 1988

- 11.35 The guidance provided within CRTN²⁰ provides a method for the calculation of road traffic noise levels, taking into account factors such as distance between the road and receptor, road configuration, ground cover, screening, angle of view, reflection from façades and traffic flow, speed and composition. The noise parameter calculated is the $L_{A10-18 \text{ hour}}$ and is based on the 18 hour Annual Average Weekday Traffic (18hr-AAWT).

Legislation & Policy Overview

- 11.36 Both national and local planning policy contains provisions to safeguard the amenity of existing and future noise sensitive receptors (NSRs) from potential adverse noise effects associated with new development. These policy provisions are complemented by the noise assessment mechanisms and standards contained within the suite of relevant BS Guidelines. Together, these documents should ensure that appropriate safeguards are in place to protect NSRs during both the construction and operation of proposed developments.

Assessment Methodology and Significance Criteria

Assessment Methodology

- 11.37 The assessment of potential noise and vibration effects was based on the following:
- Identifying potentially sensitive existing and future noise receptors on the Site and within the surrounding area;
 - Establishing baseline noise conditions currently existing at the Site and nearby receptor locations through an attended noise survey and vibration monitoring;
 - Assessing the suitability of the Site for the Development in terms of the prevailing baseline noise conditions;
 - Assessing likely noise and vibration levels generated during the construction works associated with the Development;
 - Establishing design aims for plant and services to be located on, or within, the proposed new buildings at the Site;
 - Assessing likely noise levels from the completed Development with reference to current guidance as detailed above;
 - Formulating proposals for mitigation, where appropriate; and
 - Assessing the significance of any residual effects.

Establishing the Baseline Conditions

Existing and Future Noise Sensitive Receptors

- 11.38 The nearest NSRs and future NSRs to the Site boundary were identified following a Site visit and study of an OS map of the Site and surrounds. NSRB and J to M have been incorporated since the 2013 ES either because of change of use in the surrounding buildings to residential uses or to represent future conditions on Site. The identified NSRs are included in Table 11.1 and shown on Figure 11.1.

Table 11.1: Noise Sensitive Receptors

NSR Reference (Figure 11.1)	Description of NSR	Distance from Site Boundary (approximate in metres)
A	Three Guineas Public House, Grade II listed building, Station Hill.	30m North
B	Bridewell House/Samuel House, Junction of Greyfriars Road/Friar Street	60m West
C	The Gateway Public House, Greyfriars Road, with residential use at first floor level	15m West
D	Terrace housing on Stanshawe Road. Oblique view of Site and intervening buildings between Site and NSRs.	35m West
E	Terrace housing on Vachel Road. Oblique view of Site and intervening buildings between Site and NSRs.	65m South-West
F	Novotel and Ibis Hotels, Friar Street. Intervening buildings between hotels and Site.	70m East
G	Malthouse Public House, 53 Greyfriars Road, residential 1 st and 2 nd floor levels.	15 m West
H	39 Friar Street, Grade II listed building.	10m East
I	Projection East and West, Merchants Place	35m South East
J	Residential, 5-21 Tudor Road	60m West
K	Future NSR Plot E	Within Site Boundary
L	Garrard House, multi-storey residential development.	15m South
M	Future NSR Plot F	Within Site Boundary

- 11.39 The area adjacent to the Site predominantly comprises retail use and commercial offices. The only residential properties directly adjacent to the Site are The Gateway Public House (residential first floor level) on Greyfriars Road approximately 15 metres west from the Site boundary, The Malthouse Public House (residential first and second floor level) also on Greyfriars Road at the junction with Tudor Road approximately 15 metres west from the Site boundary, and Projection East and West at Merchants Place approximately 35 metres south-west from the Site boundary. Residential housing is also located on Stanshawe Road and Vachel Road which is off Greyfriars Road. The nearest property to the Site boundary on Stanshawe Road is approximately 45 metres but the line of sight from the terrace houses to the Site is obstructed by intervening buildings which will act to reduce noise levels from the Site. The closest residential housing on Vachel Road is approximately 65 metres to the south east of the Site boundary. As with the properties on Stanshawe Road the line of sight from the properties is obscured by intervening buildings.

- 11.40 Future NSRs are proposed within the Development in Building Plots E and F (i.e. residential units) at first floor level and upwards above retail use at ground floor level (refer to Parameter Plans 6 and 7, Ground floor Uses Drawing No. 698_PP_07_006 & 698_E_PP_07_006 and Upper Floor Uses Drawing No. 698_PP_07_007 & 698_E_PP_07_007 respectively).
- 11.41 The future NSR of Garrard House at 30 Garrard Street, which consists of conversion from office to residential use, is approximately 15 metres south of the SH3 Site boundary.

Baseline Noise Survey

- 11.42 A baseline noise survey was undertaken at the Site over a typical weekday period from Tuesday 13th December until Thursday 15th December 2011. The 2011 baseline noise survey is still considered applicable to the assessment of the proposed Development. This is because the main source affecting the Site is road traffic noise; the traffic volume would need to have doubled to result in a noise increase of 3dB(A), which is generally accepted as being just perceptible. This is unlikely to have occurred therefore the 2011 baseline data is still applicable. Further to this, given demolition works are currently on going it would not be possible to repeat the baseline survey without contribution from this source.
- 11.43 The noise monitoring locations are illustrated on Figure 11.1 and described in Table 11.2. Monitoring was undertaken at locations representative of the Site boundaries.

Table 11.2: Noise Monitoring Locations

Monitoring Location (Figure 11.1)	Description	Observations and Predominant Noise Sources
LT1	Long term unattended facade monitoring location at 2 nd floor level facing onto Friar Street (Southern Site Boundary)	Noise climate dominated by road traffic movements along Friar Street and adjoining road network.
LT2	Long term unattended facade monitoring location at 2 nd floor level facing onto Station Hill and Reading Railway Station. (Northern Site Boundary)	Noise climate dominated by road traffic from the adjoining road network and Reading Railway Station. During the noise survey Station Hill was closed due to construction works. Intermittent construction noise was discernible during the daytime period. The noise measured at this location is therefore indicative at best without the contribution of road traffic noise along Station Hill.
LT3	Long term unattended facade monitoring location at 3 rd floor level facing onto Greyfriars Road. (Western Site Boundary)	Noise climate dominated by road traffic along both Greyfriars Road and adjoining road network.
LT4	Long term unattended free-field monitoring location at roof top location, 6 th floor level, facing onto Garrard Street.	Noise climate dominated by road traffic along both Garrard Street and adjoining road network.

- 11.44 Full details of the baseline noise survey are presented in Appendix 11.2.

Vibration

- 11.45 There are no sources of on-site vibration and the Site survey did not reveal any perceptible incidents of vibration at any part of the Site. Consequently, a zero baseline level has been assumed for the purposes of this assessment.

Construction Noise Assessment Methodology

- 11.46 To assess the potential effects of construction noise on existing NSRs, 'The ABC Method' provided in BS 5228-1:2014 was used. It should be noted that the 2014 ABC Method is slightly different to that of the replaced 2009 version in that assessment is now based on the 'Site Noise Level' and not the 'Total Noise Level' (Site Noise Level combined with prevailing ambient level). Indicative construction noise levels were calculated on the basis of the outline construction information provided within Chapter 6: Development Programme Demolition and Construction. Calculations were carried out in accordance with the methodology prescribed within BS 5228-1:2014 for each of the major stages of construction, accounting for the typical types of plant and activities expected within the identified major stages of work.
- 11.47 Information on construction traffic generation was provided by Peter Brett Associates, the transport consultant for the project.
- 11.48 Full details of the predictions and assumptions of the construction noise assessment are contained within Appendix 11.3.

Construction Vibration Assessment Methodology

- 11.49 There are two aspects of vibration effects which need consideration:
- The effects on people or equipment within buildings; and
 - The effects on buildings (or other structures) themselves.
- 11.50 There are currently no British Standards that provide a methodology for predicting levels of vibration from construction activities other than BS5228-2:2009, which relates to percussive or vibratory rolling and piling only. At this stage, specific details on construction activities relating to the Development that may give rise to vibration are not known, although it is anticipated that rotary bored piling may be required down to depths of 30 to 50 metres. In this respect a qualitative assessment has been conducted based on distances at which vibration perceptibility, annoyance and cosmetic damage to buildings may occur which are described later within this Chapter.

Completed Development

Assessment of Residential Amenity

- 11.51 In relation to the suitability of the Site for the residential uses proposed for Telecom House / Plot E and Plot F, due to a lack of a baseline level against which to draw comparisons (the future occupants would have no previous experience of the conditions that prevail at the Site), it is not appropriate to assess potential effects in terms of noise and vibration change. Therefore, the suitability of the Site for the residential Development was undertaken by comparison against absolute levels, as set out within BS8233:2014 and WHO.
- 11.52 The criteria relevant to the Site are presented as Tables 11.3 and 11.4.

Table 11.3: BS 8233:2014 Assessment Criteria For Residential Spaces

Activity	Location	Daytime $L_{Aeq, 16 \text{ hour}}$ (07:00 to 23:00)	Night-Time $L_{Aeq, 8 \text{ hour}}$ (23:00 to 07:00)
Resting	Living room	35dB	Not applicable
Dining	Dining room / area	40dB	Not applicable
Sleeping (daytime resting)	Bedroom	35dB	30dB

- 11.53 When considering external amenity spaces such as gardens balconies and terraces, the guidance provided in BS 8233 states:

“For traditional external areas that are used for amenity space, such as gardens or patios it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited”.

Table 11.4: WHO Recommended Noise Levels

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time Base (hours)	$L_{Amax,fast}$ (dB)
Outdoor living area	Serious annoyance, daytime and evening.	55	16	-
	Moderate annoyance, daytime and evening.	50	16	-
Dwelling, indoors Inside bedrooms	Speech intelligibility and moderate annoyance, daytime and evening.	35	16	
	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

- 11.54 With regard to assessment of external areas of Public Realm and Private Spaces within the Development, comparison against the WHO guideline value of 55dB $L_{Aeq,16h}$, below which serious community annoyance is unlikely to arise, has been made.

Fixed Plant & Building Services

- 11.55 At this stage specific detail on fixed mechanical plant and building services noise related to the Development is not known. Guidance provided in BS 4142:2014 has therefore been used to derive provisional noise limits to safeguard against complaints from residents of nearby dwellings, having regard to RBC's Local Plan requirements.
- 11.56 The procedure for assessing the likelihood of complaints, as set out in BS 4142:2014, is to compare the measured or predicted noise level from the source in question (i.e. the 'specific noise level' immediately outside the noise sensitive building) with the background noise level. Where

the noise contains a 'distinguishable discrete continuous note' (e.g. whine, hiss, screech, hum) or if there are distinct impulses in the noise (e.g. bang, clicks, clatters or thumps), or if the noise is irregular enough to attract attention, then a correction of +2 to +9 dB is added to the specific noise level to obtain the 'rating level'. Where a sound has more than one acoustic feature then the appropriate acoustic corrections are summed

- 11.57 The significance of the noise difference between the rating level and background set out in BS4142:2014 are provided as Table 11.5. These have been used to derive appropriate limiting criteria for fixed mechanical plant.

Table 11.5: Significance of Noise Difference Between Rating Level and Background (BS4142)

Noise Difference (Rating Level – Background)	Significance ^[1]
+≥ 10 dB	Indication of significant adverse impact
+5 dB	Indication of adverse impact
≤0	Indication of low impact

Note: [1] Adverse impacts include but are not limited to annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

Servicing and Delivery

- 11.58 In the absence of guidelines for assessing the effects of service and delivery noise, a qualitative assessment was undertaken based on a review of the potential service yard locations and layout.

Proposed Uses

- 11.59 The potential noise effects resulting from proposed future uses, such as breakout noise, are typically assessed quantitatively by determining the change in the prevailing ambient noise level within the vicinity of adjacent NSRs. However, as the Development is in outline, in the case of retail uses the specific details of future tenants is not known. As such, a qualitative assessment has been conducted.

Assessment of Car Parking Noise

- 11.60 There are currently no guidelines in the United Kingdom for the assessment of noise from car park activity. The interaction of potential noise sources such as engines operating at low speeds, closing of car doors and other unquantifiable noise (e.g. people talking) is, by its nature, poorly defined.
- 11.61 Therefore, a qualitative assessment was undertaken, based on the number and location of car parking spaces proposed within the Development, the distances between the noise sources and NSRs and a review of the environmental conditions between the two.

Operational Road Traffic Noise

- 11.62 Road traffic noise levels are typically measured and predicted in units of L_{A10} (18 hour) dB as set out in the Department of Transport's 'Calculation of Road Traffic Noise, 1988' (CRTN). The L_{A10} is the A-weighted sound level in decibels exceeded for 10% of the measurement period, which in this case is the 18-hour period between 06:00 and 24:00 hours. This noise index has been shown to correlate well with people's subjective annoyance due to road traffic noise. The potential effects of changes in road traffic noise were evaluated by consideration of the estimated changes in L_{A10}