Alexandra Basin Redevelopment 2

Bringing Dublin Port To 2040

Environmental Impact Assessment Report

# Chapter 12 Terrestrial Noise & Vibration

Volume 2



CALAFORT ÁTHA CLIATH
DUBLIN PORT

TETRA TECH

# 12 Terrestrial Noise and Vibration

## Chapter Contents

12 Terrestrial Noise and Vibration ..... 12-1
12.1 Introduction ..... 12-2
12.2 Assessment Methodology ..... 12-2
12.3 Baseline Environment ..... 12-19
12.4 Description of Likely Significant Effects ..... 12-20
12.5 Inter-relationships ..... 12-27
12.6 Mitigation and Monitoring ..... 12-28
12.7 Potential Cumulative Effects ..... 12-33
12.8 Residual Impacts ..... 12-33
12.9 Summary of Effects and Conclusions ..... 12-34
12.10 Limitations of Assessment ..... 12-36

## 12.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) comprises an appraisal of the existing terrestrial noise and vibration conditions within the Project study area and addresses the potential effects of the ABR2 Project on terrestrial noise and vibration. The assessment is based on the description of works as noted in **Chapter 5 Project Description**. Where potential adverse impacts are identified, the assessment identifies mitigation measures that will be implemented to prevent, reduce or offset potential adverse effects, or enhance potential beneficial effects where possible.

### 12.1.1 Scope of the Assessment

The primary purpose of this EIAR chapter is to provide an assessment of the likely effects of the ABR2 Project during the construction and operational phases.

## 12.2 Assessment Methodology

This section describes the methodology which has been used in the assessment of terrestrial noise and vibration, which may impact or be impacted by the ABR2 Project. The methodology and associated impact assessment had regard to the general guidance for the undertaking of an Environmental Impact Assessment (EIA), as presented in **Chapter 1 Introduction**.

### 12.2.1 Guidance and Legislation

This section includes a summary of Irish and international guidance documents that have been used as reference material for the purposes of completing the Noise and Vibration Assessment.

#### 12.2.1.1 Environmental Protection Agency (EPA) Office of Environmental Enforcement (OEE) - Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)

This document relates primarily to noise surveys and assessments for Environmental Protection Agency (EPA)-licensed facilities, but in the absence of any other directly applicable guidance documents, it provides useful reference material for the purposes of completing the noise assessment for the ABR2 Project.

The EPA published two earlier documents in relation to the survey, assessment and management of noise emissions from licensed facilities, namely the Environmental Noise Survey Guidance Document (commonly referred to as NG1) and Guidance Note for Noise in Relation to Scheduled Activities - 2nd Edition (commonly referred to as NG2). These two documents have been withdrawn with the publication of NG4.

NG4 provides detailed consideration of a range of noise-related issues, including basic background to noise issues, various noise assessment criteria and procedures, noise reduction measures, Best Available Techniques (BAT) and the detailed requirements for noise surveys. NG4 provides typical limit values for noise from licensed sites, namely:

- Daytime (07:00 - 19:00) - 55dB LAr,T;

- Evening (19:00 - 23:00) - 50dB LAr,T:
- Night-time (23:00 - 07:00) - 45dB LAeq,T.

In the description of the limits above, the $L_{Aeq,T}$ is the equivalent continuous sound level over the measurement period and $L_{Ar,T}$ is equal to the $L_{Aeq}$ but includes an additional penalty of 5dB(A) to account for any tonal or impulsive characteristics to the noise source.

While consideration is given to these threshold limits in the general context of the noise assessment for the ABR2 Project, the Project is located in the context of an urban/suburban environment where existing noise levels regularly exceed the typical noise limits set out in NG4 for EPA-licensed sites.

Other EPA guidelines, such as Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022) and Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements) (2003), have also been considered in the preparation of this EIAR Chapter.

#### 12.2.1.2 National Roads Authority (NRA) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004)

The purpose of this document is to provide guidance on the treatment of noise and vibration during the planning and design of national road schemes. The guidelines are not mandatory but are recommended to achieve appropriate consistency with respect to the treatment of noise and vibration during the various stages of road scheme planning and development. These guidelines are considered within the assessment as they provide guidance on construction noise and vibration.

**Construction Phase**

The National Roads Authority (NRA) Guidelines list maximum permissible noise levels typically deemed to be acceptable for the construction phase of road schemes (See **Table 12-1**). These values are indicative only, and more stringent limits may be applied where pre-existing noise levels are low.

**Table 12-1: Maximum Permissible Noise Levels at the Façade of Dwellings During Construction**

| Days & Times | LAeq (1 hr) dB | LpA(max)slow dB |
|---|---|---|
| **Monday to Friday 07:00 – 19:00hrs** | 70 | 80 |
| **Monday to Friday 19:00 – 22:00hrs** | 60* | 65* |
| **Saturday 08:00 – 16:30hrs** | 65 | 75 |
| **Sunday Bank Holidays 08:00 – 16:30hrs** | 60* | 65* |

*Construction activity at these times, other than that required in respect of emergency works, will normally require explicit permission of the relevant local authority.

**Operational Phase**

There are currently no Irish standards or limits governing the assessment of noise and/or vibration associated with either new or existing roads. Article 77 of the Roads Act (1993) deals with noise. It outlines the powers of the Minister to make regulations in respect of noise limits, measurement and mitigation. No specific guidance in respect of noise or noise limits is contained within the Roads Act.

The NRA Guidelines set out to establish desirable design goals for new national road schemes having regard to EU Directive 2002/49/EC. The guidelines stipulate that all future national road schemes should be designed to meet the following design goal:

Day-evening-night 60dB $L_{den}$ (free field residential facade criteria).

Mitigation measures are only deemed necessary when the following three conditions are satisfied at designated sensitive receptors:

- The combined expected maximum traffic noise level, i.e. the relevant noise level, from the proposed road scheme together with other traffic in the vicinity is greater than the design goal;
- The relevant noise level is at least 1dB more than the expected traffic noise level without the proposed road scheme in place; and
- The contribution to the increase in the relevant noise level from the proposed road scheme is at least 1dB.

#### 12.2.1.3 British Standard BS5228:2009+A1:2014 Noise and Vibration Control on Construction and open Sites

This British standard consists of two parts and covers the need for protection against noise and vibration of persons living and working in the vicinity of construction and open sites. The standard recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.

Part 1 of the standard provides a method of calculating noise from construction plant, including:

- Tables of source noise levels;
- Methods for summing up contributions from intermittently operating plant;
- A procedure for calculating noise propagation;
- A method for calculating noise screening effects; and
- A way of predicting noise from mobile plant, such as haul roads.

The standard also provides guidance on legislative background, community relations, training, nuisance, project supervision and control of noise and vibration.

The ABC method outlined in Section E3.2 has been used for the purposes of determining whether the predicted noise levels from the construction activities will result in any significant noise impact at the nearest noise-sensitive properties.

**Table 12-2** below outlines the applicable noise threshold limits that apply at the nearest noise-sensitive receptors. The determination of what category to apply is dependent on the existing baseline ambient (LAeq) noise level (rounded to the nearest 5dB) at the nearest noise-sensitive property. For daytime, if the ambient noise level is less than the Category A threshold limit, the Category A threshold limit (i.e. 65dB) applies. If the ambient noise level is the same as the Category A threshold limit, the Category B threshold limit (i.e. 70dB) applies. If the ambient noise level is more than the Category A threshold limit, the Category C threshold limit (i.e. 75dB) applies.

**Table 12-2: Noise Threshold Limits at Nearest Noise-Sensitive Receptors**

| | Threshold Limits [dB(A)] | | |
|---|---|---|---|
| | **Category A** | **Category B** | **Category C** |
| **Night-time (23:00 - 07:00)** | 45 | 50 | 55 |
| **Evening and Weekends (19:00 - 23:00 Weekdays, 13:00-23:00 Saturdays, 07:00-23:00 Sundays)** | 55 | 60 | 65 |
| **Weekday daytime (07:00-19:00) and Saturdays (07:00-13:00)** | 65 | 70 | 75 |

#### 12.2.1.4 Dublin City Council (DCC) – Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Prior to the commencement of work on a site within the Dublin City Council (DCC) area, DCC require a construction and demolition plan to be developed in accordance with this guide. The guide is a best practice guidance document aimed at ensuring that demolition and construction work does not have an adverse impact on those living and working near the demolition/construction activities. The guide presents a risk-based approach taking into account the locality, nature of the work and the expected duration of work.

The guide contains two risk assessment tables, whereby cells are ticked based on the categories that are most applicable to the ABR2 Project. A total risk assessment table is subsequently completed based on the sub-total numbers from the initial two risk assessment tables. Once the risk category has been determined from the total risk assessment, good practice measures are outlined within the guide for the particular project.

#### 12.2.1.5 World Health Organisation (WHO) - Guidelines for Community Noise

In 1999, the World Health Organisation (WHO) proposed guidelines for community noise. In this guidance, a LAeq threshold daytime noise limit of 55dB is suggested for outdoor living areas in order to protect the majority

of people from being seriously annoyed. A second daytime limit of 50dB is also given as a threshold limit for moderate annoyance.

The guidelines suggest that an internal LAeq not greater than 30dB for continuous noise is needed to prevent negative effects on sleep. This is equivalent to a façade level of 45dB LAeq, assuming open windows or a free-field level of about 42dB LAeq. If the noise is not continuous, then the internal level required to prevent negative effects on sleep is a LAmax,fast of 45dB. Therefore, for sleep disturbance, the continuous level as well as the number of noisy events should be considered.

While consideration is given to these threshold limits in the general context of the noise assessment for the ABR2 Project, the Project is located in the context of an urban/suburban environment where existing noise levels regularly exceed the typical noise limits set out in the WHO Guidelines.

#### 12.2.1.6 World Health Organisation (WHO) - Night Noise Guidelines for Europe

The Night Noise Guidelines for Europe was published in 2009 on the back of extensive research completed by a WHO working group. Considering the scientific evidence on the threshold of night noise exposure indicated by Lnight, outside as defined in the Environmental Noise Directive (2002/49/EC), an Lnight, outside of 40dB should be the target of the night noise guideline (NNG) to protect public, including the most vulnerable groups such as children, the chronically ill and the elderly. An interim target of 55dB is recommended where the NNG cannot be achieved. These guidelines are applicable to Member States of the European Region and may be considered as an extension to the previous WHO Guidelines for Community Noise (1999). The guidelines do not expand on the noise limits applicable to non-continuous noise and hence the guidance included in the 1999 guidelines is still applicable in relation to this.

In the context of the existing environment in the vicinity of the ABR2 Project, noise levels in the study area regularly exceed the 40dB night noise limit included in this document.

#### 12.2.1.7 World Health Organisation (WHO) - Methodological Guidance for Estimating the Burden of Disease from Environmental Noise

In 2012, the WHO published the Methodological Guidance for Estimating the Burden of Disease from Environmental Noise. This document outlines the principles of quantitative assessment of the burden of disease from environmental noise, describes the status in terms of the implementation of the European Noise Directive and reviews evidence on exposure-response relationships between noise and cardiovascular diseases.

#### 12.2.1.8 World Health Organisation (WHO) – Environmental Noise Guidelines for the European Region

In 2018, the WHO published the Environmental Noise Guidelines for the European Region. The main purpose of these guidelines is to provide recommendations for protecting human health from exposure to environmental noise from various sources. The guidelines set out to define recommended exposure levels for environmental noise in order to protect population health.

The guidelines are intended to be suitable for policymaking in the WHO European Region. They focus on the most used noise indicators Lden and/or Lnight, which are provided for exposure at the most exposed facade, outdoors. The guidelines provide specific recommendations for various noise sources, including road traffic noise.

For average noise exposure, the guidelines recommend reducing noise levels produced by road traffic below 53 dB Lden. The guidelines also recommend a night-time exposure value of 45 dB Lnight for road traffic noise, on the basis that 3% of the participants in studies were highly sleep-disturbed at a noise level of 45.4 dB Lnight.

#### 12.2.1.9 UK Department of Transport (Welsh Office) - Calculation of Road Traffic Noise (CRTN)

This Calculation of Road Traffic Noise (CRTN) guidance document outlines the procedures to be applied for calculating noise from road traffic. These procedures are necessary to enable entitlement under the Noise Insulation Regulations (NI) 1995 to be determined, but they also provide guidance appropriate to the calculation of traffic noise for more general applications, e.g. environmental appraisal of road schemes, highway design and land use planning.

The document consists of three different sections, covering a general method for predicting noise levels at a distance from a highway, additional procedures for more specific situations and a measurement method for situations where the prediction method is not suitable. The prediction method constitutes the preferred calculation technique, but in a small number of cases, traffic conditions may fall outside the scope of the prediction method, and it will then be necessary to resort to measurement. The prediction method has been used in this instance to determine the likely traffic noise increases as a result of the ABR2 Project.

#### 12.2.1.10 Environmental Noise Directive (END) 2002/49/EC

The Environmental Noise Directive (END) 2002/49/EC was transposed into Irish legislation in the form of the Environmental Noise Regulations, 2006. The legislation sets out the manner by which Strategic Noise Maps must be prepared in Ireland for large agglomerations, major roads, major railways and major airports. Strategic Noise Maps were prepared for the Dublin Agglomeration from 2012 onwards, and a Noise Action Plans (NAP) was published for consultation.

The proposed redevelopment will alter the noise environment in the vicinity of Dublin Port and, hence will alter the Strategic Noise Maps in this area. Under the requirements set out under END, the Strategic Noise Maps are required to be updated every five years. The changes brought about by the proposed redevelopment will be incorporated into the updated Strategic Noise Maps for the Dublin Agglomeration as part of this ongoing update process.

#### 12.2.1.11 Vibration

The NRA Guidelines for the Treatment of Noise & Vibration in National Road Schemes is one of the few Irish guidance documents that gives recommendations relating to vibration from construction phase activities in Ireland. The guidelines recommend that vibration is limited to the values set out in **Table 12-3** in order to ensure

that there is little or no risk of even cosmetic damage to buildings. These values and the values indicated in **Table 12-4** should be used as guidance for monitoring vibration levels from the construction phase of the ABR2 Project.

**Table 12-3: Recommended Vibration Level Thresholds for NRA Schemes**

| Allowable Vibration Velocity (Peak Particle Velocity) at the Closest Part of Any Sensitive Property to the Source of Vibration, at a Frequency of: | | |
|---|---|---|
| Less than 10Hz | 10 to 50 Hz | 50 to 100 Hz (and above) |
| 8mm/s | 12.5mm/s | 20mm/s |

Limits of transient vibration, above which cosmetic damage could occur, are also given numerically in **Table 12-4** (Ref: BS5228-2:2009+A1:2014). Minor damage is possible at vibration magnitudes which are greater than twice those given in **Table 12-4**, and major damage to a building structure can occur at values greater than four times the tabulated values (definitions of the damage categories are presented in BS7385-1:1990, 9.9).

**Table 12-4: Transient Vibration Guide Values for Cosmetic Damage (Ref BS5228-2:2009+A1:2014)**

| Type of Building | Peak Particle Velocity (PPV) (mm/s) in Frequency Range of Predominant Pulse | |
|---|---|---|
| | 4 Hz to 15 Hz | 15 Hz and above |
| Reinforced or framed structures.<br>Industrial and heavy commercial buildings. | 50 mm/s at 4 Hz and above | 50 mm/s at 4 Hz and above |
| Unreinforced or light-framed structures.<br>Residential or light commercial buildings. | 15 mm/s at 4 Hz, increasing to 20 mm/S at 15 Hz | 20 mm/s at 15 Hz, increasing to 50 mm/s at 40 Hz and above. |

British Standard BS 7385 (1993) Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground-borne vibration indicates that cosmetic damage should not occur to property if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz. These guidelines refer to relatively modern buildings, and therefore, these values should be reduced to 50% or less for more sensitive buildings.

The human body is an excellent detector of vibration, which can become perceptible at levels which are substantially lower than those required to cause building damage. The human body is most sensitive to vibration in the vertical direction (foot to head). The effect of vibration on humans is guided by British Standard 6472:1992. This standard does not give guidance on the limit of perceptibility, but it is generally accepted that vibration becomes perceptible at levels of approximately 0.15 to 0.3 mm/s.

BS 6472 defines base curves, in terms of rms acceleration, which are used to assess continuous vibration. Table 5 of the Standard states that in residential buildings, the base curve should be multiplied by 1.4 at night and by 2 to 4 during the daytime to provide magnitudes at which the probability of adverse comment is low.

In order to assess human exposure to vibration, ideally, measurements need to be undertaken at the point at which the vibration enters the body, i.e. measurements would need to be taken inside properties. However, various conversion factors have been established to convert vibration levels measured at a foundation to levels inside buildings, depending on the structure of the building.

Where vibration is intermittent or occurs as a series of events, the use of Vibration Dose Values (VDVs) is recommended in BS6472 for the assessment of subjective response to vibration. The VDVs at which it is considered there will be a low probability of adverse comment are drawn from BS6472 and presented in **Table 12-5**.

**Table 12-5: Threshold Values for the Evaluation of Disturbance due to Vibration**

| Place | Daytime 16 Hour VDV (ms-1.75) | Night-time 8 Hour VDV (ms-1.75) |
|---|---|---|
| Critical working Area | 0.11 | 0.09 |
| Residential | 0.22 – 0.43 | 0.13 |
| Office | 0.43 | 0.361 |
| Workshops | 0.87 | 0.73 |

*These VDV thresholds do not apply unless night-time work was a regular activity at these premises.*

### 12.2.2 Terrestrial Noise and Vibration Study Area

**Figure 12-1** illustrates the approximate study area for the assessment of terrestrial noise and vibration from the ABR2 Project. Particular emphasis has been placed on assessing the potential impact on noise or vibration-sensitive receptors within 500m of the ABR2 Project. The nearest sensitive receptors with the greatest potential for terrestrial noise and vibration impacts are properties located to the south of the existing Port lands along Pigeon House Road and Coastguard Cottages. Sensitive receptors to the west of the Port beyond East Wall Road (R131) and to the north of the Port in Clontarf are also considered. While the impact assessment focuses primarily on residential receptors, it also includes commercial receptors where there is potential for terrestrial noise and vibration impacts on these commercial activities.

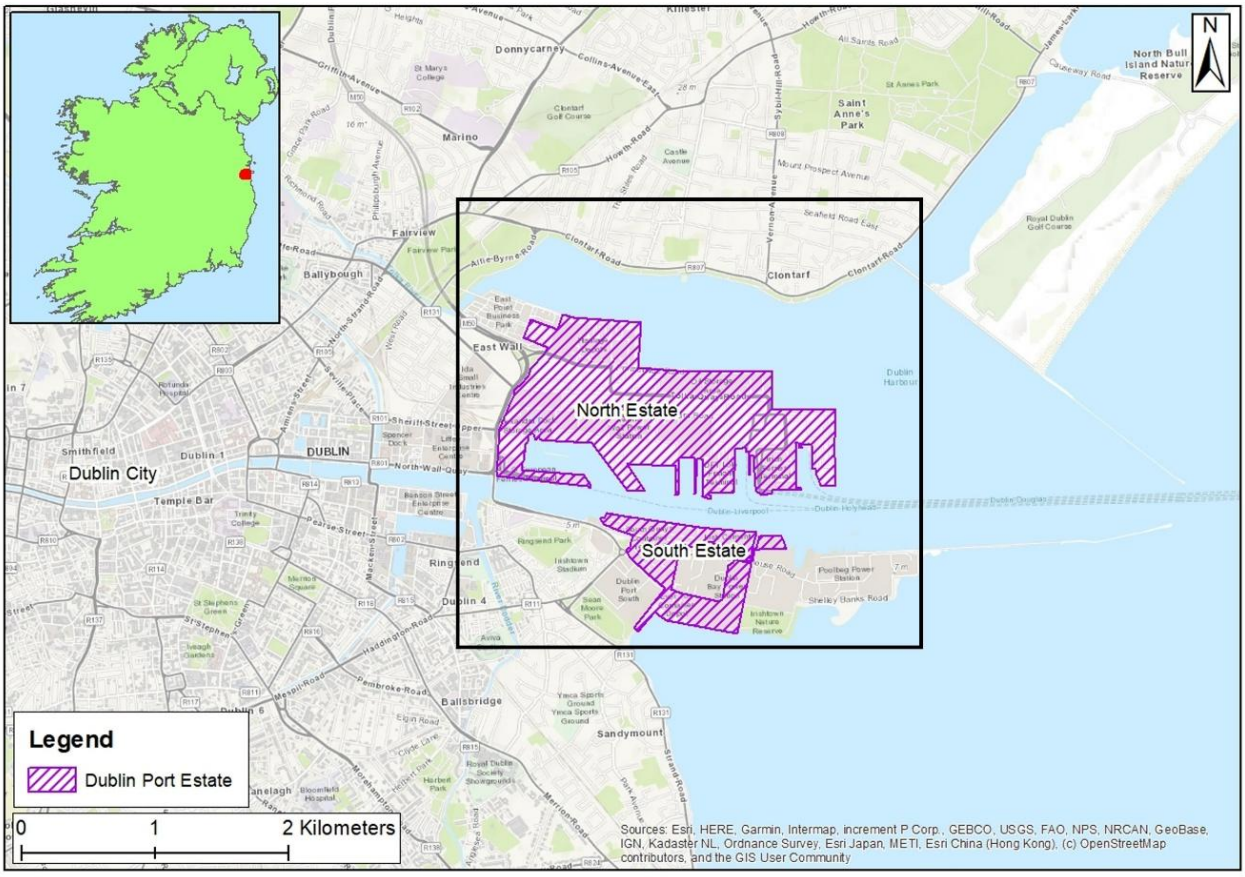



**Figure 12-1: Terrestrial Noise and Vibration Study Area**

## 12.2.3 Baseline

The baseline environment relevant to this EIAR Chapter was informed by a combination of desktop data sources and site-specific surveys.

### 12.2.3.1 Desktop Study

Tetra Tech (formerly RPS) has completed detailed impact assessments, including terrestrial noise and vibration assessments, for a number of large-scale projects in the Dublin Port area for over a decade, including the ABR Project, the MP2 Project and the 3FM Project. In the course of completing these assessments, a large dataset of source information has been gathered within the study area. This information includes the accumulation of extensive desktop datasets, site survey data and many years of recorded noise monitoring data at multiple locations within the vicinity of the Port area. All previously available information gathered for these various projects was available for the completion of the ABR2 Project assessment and will be supplemented with any relevant updated desktop and survey information.

### 12.2.3.2 Site-specific Surveys

A range of different site-specific surveys have been undertaken to inform the EIA to record the existing noise environment in the vicinity of the ABR2 Project. These surveys include shorter-term attended noise surveys at

specific sensitive locations and longer-term unattended locations where noise monitoring has been taking place for several years at different locations to the south, west and north of the Port. All details in relation to the noise surveys completed are contained in **Section 12.3** of this chapter.

### 12.2.4 Consultation

Following completion of the EIA Scoping Report, consultation was undertaken to obtain opinions regarding the ABR2 Project and its potential and scope for significant effects. DCC commented that the Scoping Report was generally comprehensive in nature, setting out both the information to be contained in the EIAR and the information assessment methodology.

DCC strongly advised that the EIAR, including the various assessments and studies, take account of the policies and objectives of the Dublin City Development Plan 2022 – 2028. It also advised that the “Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (May 2022)”” published by the EPA and Guidance on EIA Scoping, European Commission, 2017, be consulted to inform the preparation of the EIAR.

### 12.2.5 Assessment Criteria and Assessment of Significance

**General Significance Criteria**

**Table 12-6** contains the general significance criteria that can be used for determining the level of impact associated with a particular aspect of the ABR2 Project. Different aspects of noise from the ABR2 Project (e.g. construction, plant/equipment, traffic, etc.) are assessed using the different methodologies as described in the relevant guidance document. Where feasible, the significance criteria have been used in the various assessments included in this chapter, having regard to the sensitivity of receptors.

**Table 12-6: Criteria to Define the Sensitivity of Receptors**

| Sensitivity | Description | Examples of Receptor |
|---|---|---|
| High | Receptors where occupants or activities are particularly susceptible to noise | Residential<br>Quiet areas for outdoor recreation<br>Religious institutions (e.g. churches and cemeteries)<br>Schools during the daytime |
| Medium | Receptors are moderately sensitive to noise, which may cause some distraction or disturbance | Offices<br>Restaurants<br>Sports grounds where noise is not a normal part of the event (e.g. golf courses and tennis courts) |
| Low | Receptors where distraction or disturbance from noise will have minimal effect | Commercial buildings not occupied during operational hours<br>Factories and working environments with existing high noise levels<br>Sports grounds and facilities where noise levels are a normal part of activity |

The majority of receptors expected to be affected by noise and vibration impacts arising due to the ABR2 Project are the residents of dwellings in the vicinity of the existing Port. Residents are deemed to be highly sensitive. The significance of the effect is determined as a function of the sensitivity of the receptor and the magnitude of impact it is exposed to. This is set out in **Table 12-7**.

**Table 12-7: Matrix for Determining Significance of Effect for Receptors of High Sensitivity**

| Magnitude of Impact (Beneficial of Adverse) | Significance of Effect for Receptors of High Sensitivity |
|---|---|
| Major | Large or very large |
| Moderate | Moderate or large |
| Minor | Slight |
| Negligible | Slight |
| No impact | Neutral |

*Effects are considered to be significant when identified as likely to have a Moderate, Large or Very Large effect.*

### 12.2.6 Construction Noise

The NRA Guidelines for the Treatment of Noise & Vibration on National Road Schemes (2004), British Standard BS 5228:2009+A1:2014 Noise and Vibration Control on Construction and Open Sites are the standard noise

guidance documents for assessing construction phase noise impacts. **Section 12.2.1** contains a brief description of these guidance documents.

On account of the temporary nature of construction activities, higher noise threshold limits apply to construction phase activities as compared to permanent operational phase activities. The appropriate noise threshold limits for construction phase activities are outlined in **Table 12-1** and **Table 12-2**. These guidance documents do not apply significance criteria for noise impacts other than outlining permissible threshold limits for noise as outlined in these tables.

### 12.2.7 Traffic Noise

The NRA guidelines (2004) are the primary guidance used in Ireland for the purposes of assessing road traffic noise and determining conditions where mitigation measures are appropriate. A number of UK guidance documents that are used for the purposes of assessing road traffic noise are detailed below and are useful reference material for the consideration of the impact level associated with changes in road traffic noise.

As outlined in **Section 12.2.1**, the CRTN is the standard noise guidance document for predicting traffic noise levels from traffic flow information and other relevant road topographical information. While the CRTN provides a methodology for predicting traffic noise levels, it does not provide significance criteria for assessing changes in traffic noise levels.

The UK Design Manual for Roads and Bridges (DMRB) is a guidance document which was created for the purpose of assessing noise and vibration impacts from road projects. The classification of magnitude of noise impact tables included in LA111 are applicable to the assessment of road traffic changes associated with the ABR2 Project.

**Table 12-8** and **Table 12-9** present the magnitude of noise impacts for both short-term changes in traffic noise levels and long-term changes in traffic noise levels. The short-term criteria are used for the purposes of assessing the construction phase noise levels and the commencement of the operational phase in the year of opening, while the long-term criteria have been used for the purposes of assessing long-term operational phase traffic noise levels 10 years after the year of opening. An additional column has been included in **Table 12-8** and **Table 12-9** to link the magnitude level defined in the DMRB with the significance criteria outlined in **Table 12-7**.

**Table 12-8: Classification of Magnitude of Noise Impacts in the Short Term**

| Noise Change LA10,18hr | Magnitude of Impact | Equivalent Significance Criteria (See Table 12-7) |
|---|---|---|
| 0 | No Change | Neutral |
| 0.1 - 0.9 | Negligible | Neutral |
| 1.0 - 2.9 | Minor | Minor Adverse/Beneficial Effect |
| 3.0 - 4.9 | Moderate | Moderate Adverse/Beneficial Effect |
| 5.0 + | Major | Major Adverse/Beneficial Effect |

**Table 12-9: Classification of Magnitude of Noise Impacts in the Long Term**

| Noise Change LA10,18hr | Magnitude of Impact | Equivalent Significance Criteria (See Table 12-7) |
|---|---|---|
| 0 | No Change | Neutral |
| 0.1 - 2.9 | Negligible | Neutral |
| 3.0 - 4.9 | Minor | Minor Adverse/Beneficial Effect |
| 5.0 - 9.9 | Moderate | Moderate Adverse/Beneficial Effect |
| 10.0 + | Major | Major Adverse/Beneficial Effect |

### 12.2.8 Vibration

In terms of significance criteria, BS 5228:2009+A1:2014 provides guidance on the effects of vibration levels on residential receptors. Table B1 of Annex B provides an outline of vibration levels and associated effects; this is reproduced in **Table 12-10** below. An additional column has been added to the table to link these vibration levels to the equivalent significance criteria as outlined in **Table 12-7**.

**Table 12-10: Guidance on Effects of Vibration Levels on Sensitive Receptors**

| Vibration Level | Effect | Significance Criteria (See Table 12-7) |
|---|---|---|
| 0.14 - 0.3 mm/s | Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration. | Neutral |
| 0.3 - 1.0 mm/s | Vibration might be just perceptible in residential environments | Minor Adverse Effect |
| 1.0 - 10.0 mm/s | It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents. | Moderate Adverse Effect |
| >10 mm/s | Vibration is likely to be intolerable for any more than a very brief exposure to this level. | Major Adverse Effect |

### 12.2.9 Operational Plant/Equipment Noise

There are no mandatory noise limits set out in Irish legislation for operational phase plant/equipment noise. There are several Irish and international guidance documents that are listed in **Section 12.2.1**. These documents are used for the purpose of reference material. The EPA NG4 guidance document sets out the requirements for noise compliance on EPA-licensed sites, however, the ABR2 Project will not be an EPA-licensed site, and this document will not apply to it. The WHO guidelines and BS8233:2014 set out desirable internal/external noise levels at residential properties for good living conditions and are useful reference points for determining the potential for significant noise impacts at residential properties.

A key element of determining likely noise impacts from plant/equipment noise is the existing ambient (LAeq) and background noise levels (LA90) at the relevant property. **Section 12.3** provides summary details of various noise surveys completed in the vicinity of various noise-sensitive properties and **Appendix 12-1** provides detailed information on these surveys. The potential for noise impacts associated with plant/equipment noise has been determined in the context of reference noise guidance documents and the existing ambient/background noise levels recorded in the noise surveys.

### 12.2.10 Methodology for Noise Monitoring

A baseline noise survey was completed involving unattended and attended noise measurements to record the existing noise environment at the nearest noise-sensitive receptors to the ABR2 Project. **Figure 12-2** to **Figure 12-5** illustrate the locations of all baseline noise monitoring locations. These noise monitoring locations are listed below under the separate headings of unattended noise monitoring locations and attended noise monitoring locations.

**Unattended Noise Monitoring Locations (U-NMLs)**

The unattended noise monitoring locations are permanent noise monitoring locations set up in the vicinity of the Port to record existing noise levels in different directions from the Port area. These include:

- Marina (U-NML1, **Figure 12-2**) – the marina is located just north of Pigeon House Road / Coastguard Cottages;
- P&O Site (U-NML2, **Figure 12-3**) – this NML is located on the western end of the port site; and
- Clontarf (U-NML3, **Figure 12-4**) – this NML is located off Clontarf Road on the grounds of Scoil Ui Chonaill GAA Club.

**Attended Noise Monitoring Location (A-NML)**

The attended noise monitoring survey was completed over daytime, evening and night-time periods at the nearest portion of Pigeon House Road (i.e. Coastguard Cottages) that has the potential to be impacted by the ABR2 Project. This location is:

- Coastguard Cottages (A-NML1, **Figure 12-5**).

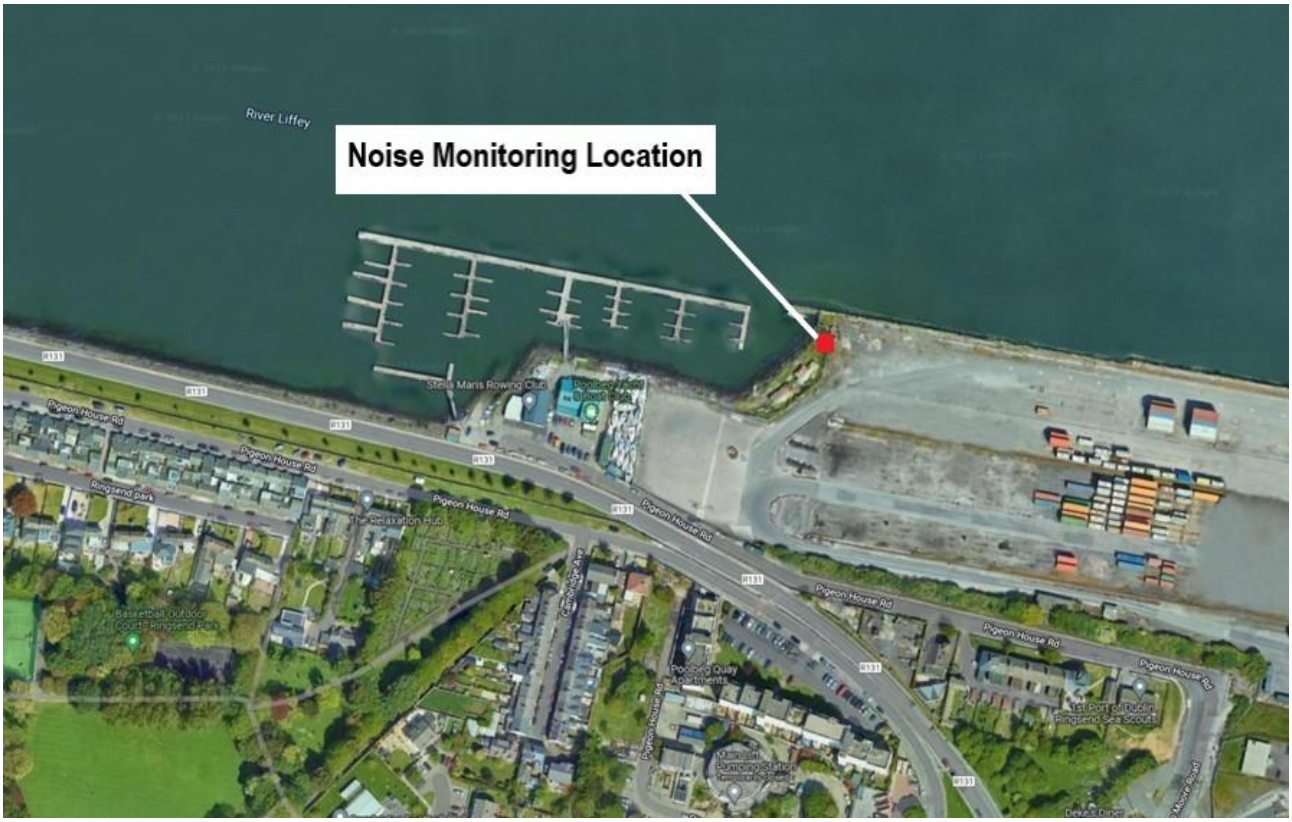



**Figure 12-2: Marina Noise Monitoring Location (U-NML1) [Copyright Google Maps]**

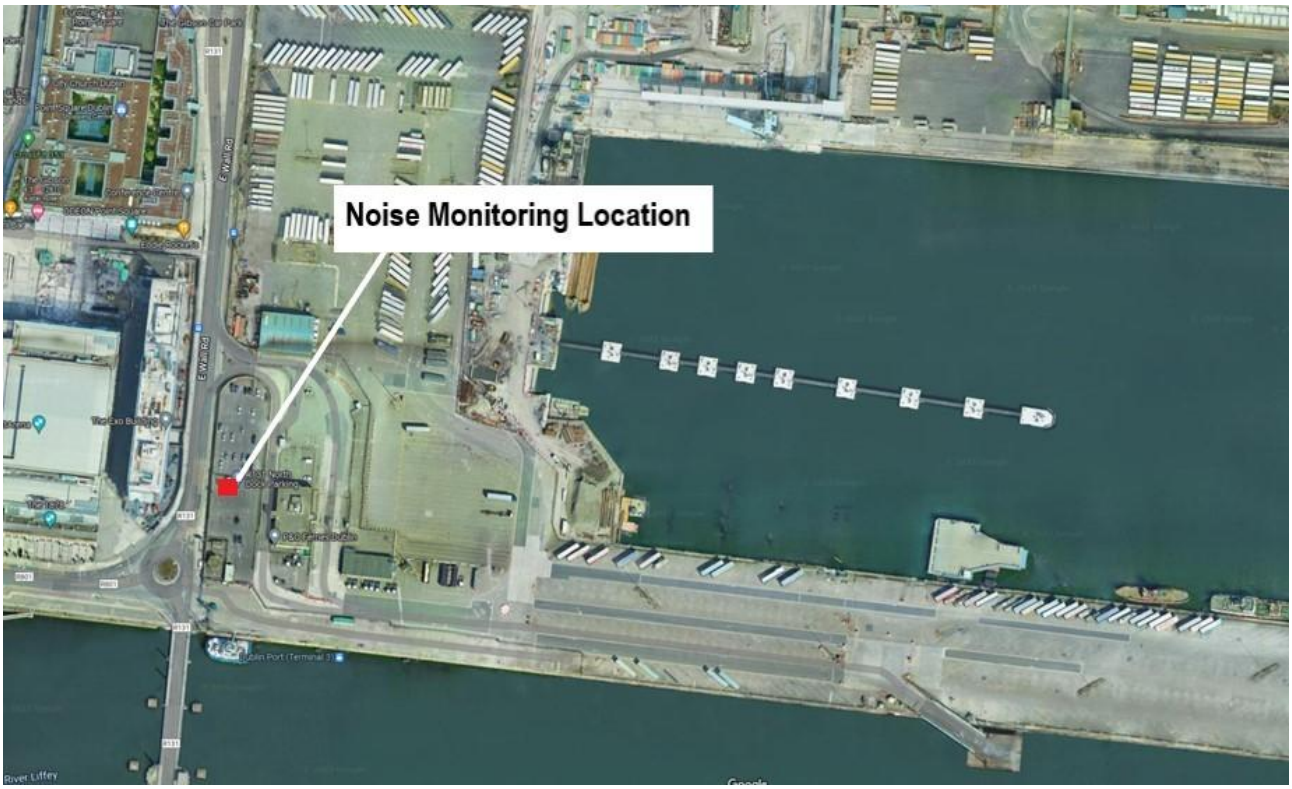



**Figure 12-3: P&O Noise Monitoring Location (U-NML2) [Copyright Google Maps]**




**Figure 12-4: Clontarf Noise Monitoring Location (U-NML3) [Copyright Google Maps]**




**Figure 12-5: Coast Guard Cottages Noise Monitoring Location (A-NML1) [Copyright Google Maps]**

The baseline noise monitoring survey was completed at various locations and dates in October 2025 using the following noise monitoring equipment:

- Norsonic Nor140 Sound Level Meter (BS EN IEC 61672-1:2003 Class 1) [Serial No: 1402995]
- Norsonic Sound Calibrator 1251 [Serial No: 33739]

The microphone was placed at a height of 1.2 - 1.5m above ground level. The sound level meter was accurately calibrated before and after use, with no drift observed. The weather conditions during the noise monitoring survey were in accordance with the requirements of BS7445: Description and Measurement of Environmental Noise.

The following parameters were recorded during each monitoring period:

- LAeq The continuous equivalent A-weighted sound pressure level. This is an “average” of the sound pressure level.
- LAmax This is the maximum A-weighed sound level measured during the sample period.
- LAmin This is the minimum A-weighted sound level measured during the sample period.
- LA10 This is the A-weighted sound level that is exceeded for noise for 10% of the sample period.
- LA90 This is the A-weighted sound level that is exceeded for 90% of the sample period.

### 12.2.11 Noise Model

The ABR2 Project was modelled using CadnaA noise modelling software. The CadnaA noise modelling software package uses the ISO9613 prediction methodology along with a range of topographical and ordnance data

collected on the surrounding area to build up a picture of the noise environment in the vicinity of sensitive receptors in the study area. The software was used to build a 3-dimensional model of all features which may affect the generation and propagation of noise in the vicinity of the ABR2 Project.

The CadnaA noise model was used for predicting cumulative noise levels at various stages of the construction phase and for predicting the cumulative noise levels from existing and proposed scenarios for the operational phase of the ABR2 Project. The noise model was calibrated using noise measurement data recorded and presented in **Section 12.3** and the model showed good alignment with measurement data from the existing baseline noise environment.

## 12.3 Baseline Environment

**Section 12-2** provides details on the baseline noise monitoring survey completed at various locations and on various dates. The detailed noise monitoring survey measurements are presented in **Appendix 12-1**.

Using the data included in **Appendix 12-1**, summary data on the ambient (LAeq) and background (LA90) noise levels at each noise monitoring location for different periods of the day have been included in **Table 12-11**. This summary data has been presented in the format of a range of recorded noise levels for the relevant time period in question. Where there were significant outlier data measurements within any dataset, these have been disregarded in the context of not presenting a distorted range of noise levels for that measurement period.

**Table 12-11: Summary of Noise Monitoring Surveys**

| Noise Monitoring Location | Range of Measured Noise Levels dB(A) | | |
|---|---|---|---|
| | **Daytime (07:00 – 19:00)** | **Evening (19:00 – 23:00)** | **Daytime (23:00 – 07:00)** |
| Marina (U-NML1) October 2025 | Ambient Noise Level (LAeq) | | |
| | 51-68 | 48-66 | 48-60 |
| | Background Noise Level (LA90) | | |
| | 47-58 | 44-54 | 42-53 |
| P&O (U-NML2) October 2025 | Ambient Noise Level (LAeq) | | |
| | 60-68 | 56-62 | 51-64 |
| | Background Noise Level (LA90) | | |
| | 54-61 | 47-58 | 44-59 |
| | Ambient Noise Level (LAeq) | | |

| Noise Monitoring Location | Range of Measured Noise Levels dB(A) | | |
|---|---|---|---|
| | **Daytime (07:00 – 19:00)** | **Evening (19:00 – 23:00)** | **Daytime (23:00 – 07:00)** |
| Clontarf (U-NML3) October 2025 | 52-68 | 49-61 | 41-64 |
| | Background Noise Level (LA90) | | |
| | 42-55 | 33-50 | 32-47 |
| Coastguard Cottages (A-NML1) October 2025 | Ambient Noise Level (LAeq) | | |
| | 58 – 61 | 55 – 60 | 47 – 52 |
| | Background Noise Level (LA90) | | |
| | 52 – 55 | 51 – 54 | 45 – 48 |

## 12.4 Description of Likely Significant Effects

### 12.4.1 Assessment of Construction Effects

#### 12.4.1.1 Construction Noise - General

A detailed noise model was created of the port and surrounding noise-sensitive receptors in order to predict the cumulative noise level associated with construction phase activities at the nearest noise-sensitive properties. In order to create the noise model, it was necessary to define the various plant and equipment used as part of the construction phase activities. **Table 12-12** includes a list of the most significant plant/equipment to be used during the construction phase for the ABR2 Project.

**Table 12-12: Plant and Equipment to be Used During Construction Phase (Ref:BS5228:2009+A1:2014)**

| Activity / Plant (Reference from Annes C & D, BS5228:2009+A1:2014) | Power Rating (kW) | Equipment Size, Weight (Mass), Capacity | Sound Power Level (dB) |
|---|---|---|---|
| Haulage: Road Lorry - Full (C6 - Ref 21) | 270 | 39t | 108 |
| Lifting: Wheeled Mobile Telescopic Crane (C4 - Ref 38) | 610 | 400t | 106 |
| Tracked excavator (C2 - Ref 3) | 102 | 22t | 106 |
| Wheeled loader (C2 - Ref 27) | 193 | - | 108 |
| Dozer (C2 - Ref 12) | 142 | 20t | 109 |
| Power: Diesel Generator (C4 - Ref 83) | 3 | 210kg | 93 |
| Distribution of Material: Tipper Lorry (C8 - Ref 20) | - | - | 107 |
| Pumping Water: Water pump (C2 - Ref 45) | 20 | 6 in | 93 |
| Dredging: Trailing Suction Hopper Dredge | | | 114 |
| Sediment Washing Plant | | | 108 |
| Stabilisation / Solidification Treatment Plant | | | 98 |
| Wastewater Treatment Processing | | | 90 |
| Barge to transport materials | | | 108 |

### 12.4.1.2 Construction Noise Impacts

**Section 5.6** of the Project Description provides a detailed summary of the proposed phasing of the ABR2 Project, which will take place over a period of approximately three years. **Section 5.6** provides details on the proposed site compound areas and working areas, including the working hours within these areas. On the basis of these details, a detailed noise modelling exercise has been completed using CadnaA noise modelling software (See **Section 12.2.1.11**) for the worst-case activities in each area for the daytime (i.e. 07:00 – 19:00), evening (i.e.19:00 – 23:00) and night-time (i.e. 23:00 – 07:00) periods. This was based on the worst-case

assumptions of the plant listed in **Table 12-12** being active in each of those working areas during the respective time period.

**Figure 12-6** illustrates the nearest noise-sensitive properties to the properties works to the north in Clontarf, to the south at Coastguard Cottages / Poolbeg Quay Apartments / Pigeon House Road and to the west at the 3Arena.

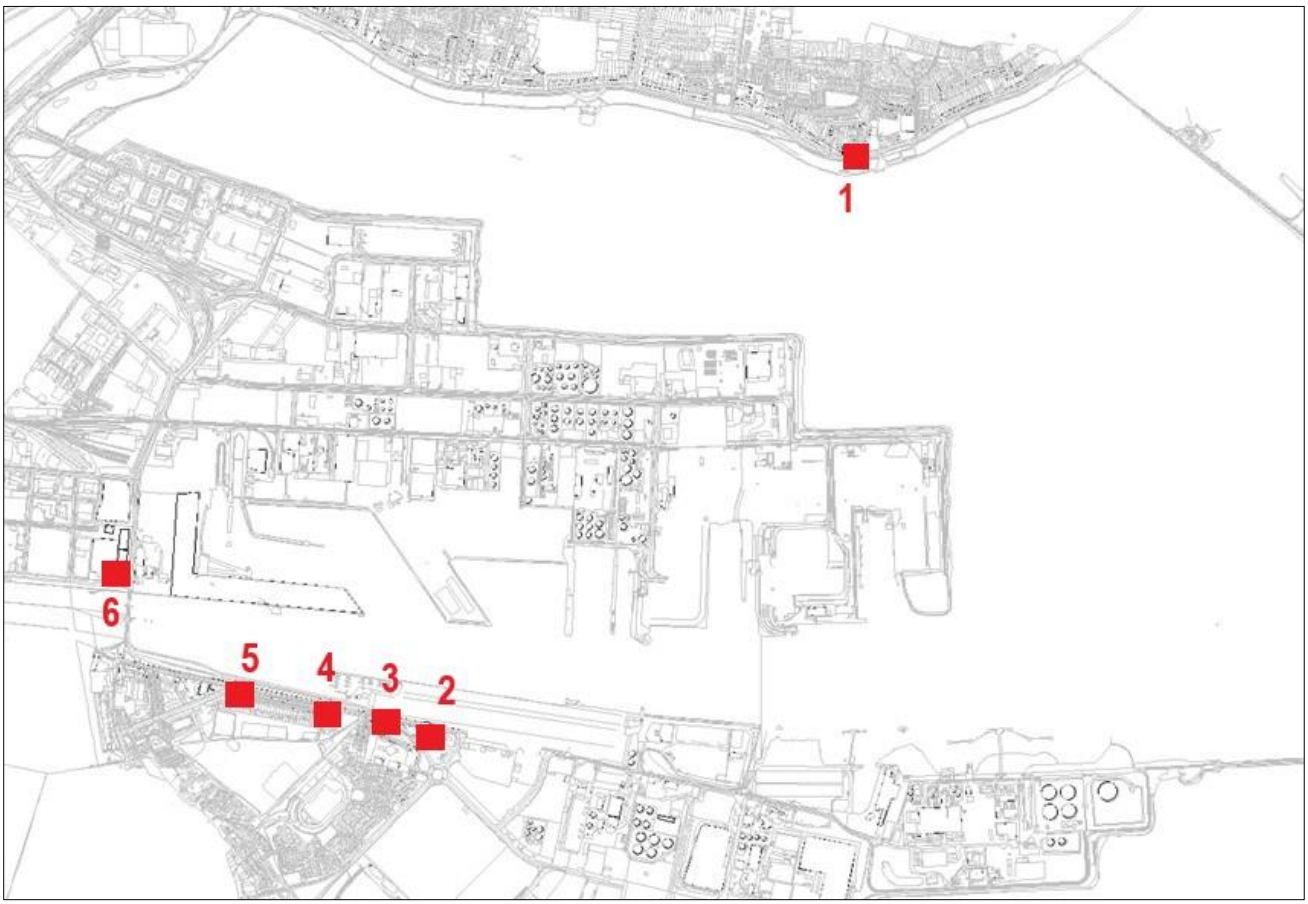



**Figure 12-6: Nearest Noise-Sensitive Properties**

**Tables 12-13 – 12-15** present the worst-case noise levels associated with the ABR2 Project works at the nearest noise-sensitive properties as presented in **Figure 12-6** for the daytime (07:00 – 19:00), evening (19:00 – 23:00) and night-time (32:00 – 07:00) periods. Each table contains the most onerous (Category A) noise threshold limit included in BS5228:2009+A1:2014 for each of these periods of the day for comparison with the worst-case predicted noise levels.

**Table 12-13: Worst-Case Predicted Noise Levels from ABR2 Project (Daytime 07:00 – 19:00)**

| Property (Property Reference in Figure 12-6) | Worst-Case Predicted Noise Level dB(A) | Category A BS5228 Noise Limit – Daytime (07:00 – 19:00) |
|---|---|---|
| Clontarf (1) | 47.9 | 65 |
| Coastguard Cottages (2) | 48.8 | 65 |
| Poolbeg Quay Apartments (3) | 53.7 | 65 |
| Pigeon House Road (4) | 51.1 | 65 |
| Pigeon House Road (5) | 49.3 | 65 |
| 3Arena | 43.1 | 65 |

**Table 12-14: Worst-Case Predicted Noise Levels from ABR2 Project (Evening 19:00 – 23:00)**

| Property (Property Reference in Figure 12-6) | Worst-Case Predicted Noise Level dB(A) | Category A BS5228 Noise Limit – Evening (19:00 – 23:00) |
|---|---|---|
| Clontarf (1) | 47.9 | 55 |
| Coastguard Cottages (2) | 46.1 | 55 |
| Poolbeg Quay Apartments (3) | 51.8 | 55 |
| Pigeon House Road (4) | 48.0 | 55 |
| Pigeon House Road (5) | 45.6 | 55 |
| 3Arena | 41.8 | 55 |

**Table 12-15: Worst-Case Predicted Noise Levels from ABR2 Project (Night-time 23:00 – 07:00)**

| Property (Property Reference in Figure 12-6) | Worst-Case Predicted Noise Level dB(A) | Category A BS5228 Noise Limit – Evening (23:00 – 07:00) |
|---|---|---|
| Clontarf (1) | 37.7 | 45 |
| Coastguard Cottages (2) | 40.4 | 45 |
| Poolbeg Quay Apartments (3) | 41.9 | 45 |
| Pigeon House Road (4) | 41.9 | 45 |
| Pigeon House Road (5) | 41.6 | 45 |
| 3Arena | 40.2 | 45 |

On the basis of the predicted noise levels included in **Table 12-13 – 12-15**, worst-case noise levels from the ABR2 Project will be below the most onerous Category A noise threshold limits included in BS5228:2009+A1:2014 for each of the day, evening and night-time periods.

#### 12.4.1.3 Construction Phase Traffic Noise Impacts

As part of the construction phase noise impact assessment, construction phase traffic flows over the construction period were assessed. It is estimated that there will be fewer than 160 HGV movements (combined arrivals and departures) in any one day associated with the ABR2 Project works.

The UK DMRB (LA111) states that it takes a 25% increase or a 20% decrease in traffic flows in order to get a 1dB(A) change in traffic noise levels. On the basis of traffic flow levels on the routes by which construction traffic will be travelling to the construction site and worst-case daily construction traffic levels presented above, traffic noise levels associated with the construction phase of the ABR2 Project will be substantially less than 1dB(A) at noise-sensitive receptors along these routes. It is generally accepted that it takes an approximate 3dB(A) increase in noise levels to be perceptible to the average person (Ref: NRA Guidelines for the Treatment of Noise and Vibration in National Road Scheme, 2004). Based on this reference, the traffic noise increases associated with the construction phase on the local road network will have a negligible noise impact at these properties.

#### 12.4.1.4 Construction Phase Vibration Impacts

On account of the significant distance between the ABR2 Project works and the nature of the works, there is no potential for any significant vibration impacts at the nearest sensitive properties.

### 12.4.1.5 Dublin City Council Construction and Demolition Plan

**Section 12.2.1.4** summarises the requirement to complete a construction and demolition plan prior to the commencement of work on a site as set out in the DCC Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition. This guide presents a risk-based approach to be completed taking into account the locality, nature of work and the expected duration of work.

This section contains the risk assessment for the ABR2 Project. **Table 12-16** details the Risk Assessment A for locality / site information, while **Table 12-17** presents the Risk Assessment B for work information. **Table 12-18** contains the Total Risk Assessment based on Risk Assessments A and B.

**Table 12-16: Dublin City Council Guide Risk Assessment A**

| | Low | Medium | High |
|---|---|---|---|
| Expected duration of work | | | |
| Less than 6 months | | | |
| 6 months to 12 months | | | |
| Over 12 months | | | x |
| Proximity of nearest sensitive receptors | | | |
| Between 25m and 50m | x | | |
| Less than 25m | | | |
| Hospital or school within 100m | | | |
| Between 25m and 50m | | | |
| Day time ambient noise levels | | | |
| High ambient noise levels (>65dB[A]) | | | |
| Medium ambient noise levels (55-65dB[A]) | | x | |
| Low ambient noise levels (<55dB[A]) | | | |
| Working Hours | | | |
| 7am – 6pm Mon-Fri; 8am-1pm Sat | | | |

| | Low | Medium | High |
|---|---|---|---|
| Some extended evening or weekend work | | | |
| Some night time working, including likelihood of concrete power floating at night | | | x |
| SUBTOTAL A | 1 | 1 | 2 |

**Table 12-17: Dublin City Council Guide Risk Assessment B**

| | Low | Medium | High |
|---|---|---|---|
| Location of works | | | |
| Majority within existing building | | | |
| Majority external | | | x |
| External Demolition | | | |
| Limited to two weeks | | | |
| Between 2 weeks and 3 months | | x | |
| Over 3 months | | | |
| Ground works | | | |
| Basement level planned | | | |
| Non percussive methods only | x | | |
| Percussive methods for less than 3 months | | | |
| Percussive methods for more than 3 months | | | |
| Piling | | | |
| Limited to 1 week | | | |
| Bored piling only | | | |

| | Low | Medium | High |
|---|---|---|---|
| Impact or vibratory piling | | | |
| Vibration generating activities | | | |
| Limited to less than 1 week | | | |
| Between 1 week and 1 month | | | |
| Greater than 1 month | | | |
| SUBTOTAL A | 1 | 1 | 1 |

**Table 12-18: Dublin City Council Guide Total Risk Assessment**

| | Low | Medium | High |
|---|---|---|---|
| Risk Assessment A | 1 | 1 | 2 |
| Risk Assessment B | 1 | 1 | 1 |
| Total | 2 | 2 | 3 |

The DCC guidelines state that the total risk assessment with the most ticks indicates the risk category that should be employed, albeit that **Table 12-18** indicates a marginal difference between all of the risk categories.

### 12.4.2 Assessment of Operational Effects

As the ABR2 Project consists only of the outstanding construction elements included in the ABR Project that were not completed before the planning timeframe by which they were required to be completed, there is no operational phase aspect to the ABR2 Project.

## 12.5 Inter-relationships

Effects on Terrestrial Noise and Vibration also have the potential to have secondary effects on other receptors, which are considered in relevant topic-specific chapters. These receptors and effects are:

- Effects on Human Health (Considered in **Chapter 19 Population and Human Health**)
  - Effect of ABR2 Project noise levels on the amenity of human receptors
- Effects on Ecological Receptors (Considered in **Chapter 7 Biodiversity, Flora and Fauna**)

- Effect of ABR2 Project noise levels on ecological receptors

## 12.6 Mitigation and Monitoring

### 12.6.1 Mitigation

#### 12.6.1.1 Construction Phase Noise

**Section 12.4.1** contains an assessment of the noise impact associated with the construction phase of the ABR2 Project at the nearest noise-sensitive properties. The assessment of the worst-case predicted construction noise levels using the ABC Method (BS5228:2009+A1:2014) indicates that the worst-case construction noise levels will be below the most onerous category A noise threshold limits included in BS5228:2009+A1:2014.

British Standard BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites: Part 1 - Noise outlines a range of measures that can be used to reduce the impact of construction phase noise on the nearest noise-sensitive receptors. Examples of some of the best practice measures included in BS5228:2009+A1:2014 are listed below:

- Ensuring that mechanical plant and equipment used for the purpose of the works are fitted with effective exhaust silencers and are maintained in good working order.
- Careful selection of quiet plant and machinery to undertake the required work where available.
- All major compressors should be ‘sound-reduced’ models fitted with properly lined and sealed acoustic covers, which should be kept closed whenever the machines are in use.
- Any ancillary pneumatic percussive tools should be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Machines in intermittent use should be shut down in the intervening periods between work.
- Ancillary plant such as generators, compressors and pumps should be placed behind existing physical barriers, and the direction of noise emissions from plant, including exhausts or engines, should be placed away from sensitive locations, in order to cause minimum noise disturbance.
- Handling of all materials should take place in a manner which minimises noise emissions; and
- Audible warning systems should be switched to the minimum setting required by the Health & Safety Authority.

A detailed Construction Environmental Management Plan (CEMP) will be prepared in advance of the construction and will detail all aspects of controlling noise emissions at the nearest noise-sensitive properties to the ABR2 Project. The CEMP will include various sub-plans which will address specific environmental disciplines, including a Noise Management Plan (NMP). The NMP will be an iterative document, which will be updated on an ongoing basis in consultation with DCC. The document will detail the requirements for compliance noise monitoring to be completed during each stage of the construction process. As detailed within the CEMP, a complaints procedure should continue to be operated by the Contractor throughout the construction phase, and all efforts should be made to address any noise issues at the nearest noise-sensitive properties.

### 12.6.1.2 DCC Air Quality and Noise Control Unit's Good Practice Guide for Construction and Demolition

**Section 12.4.1.5** includes the total risk assessment completed for the ABR2 Project based on the details included within this guide. As stated in **Section 12.4.1.5**, the ABR2 Project falls into the high-risk category in the total risk assessment, albeit marginally so. **Table 12-19 to Table 12-23** provide details of the good practice measures outlined in the guide for high-risk projects. These measures only include the noise-related elements included within the guide.

**Table 12-19: General Considerations**

| General Considerations | |
|---|---|
| All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise. | All sites |
| Good Quality site hoarding should be erected to maximise the reduction in noise levels. | Medium and high risk sites |
| The contact details of the contractor and site manager shall be displayed to the public, together with the permitted operating hours, including any special permissions given for out-of-hours work. | Medium and high risk sites |
| The site entrance shall be located to minimise disturbance to noise-sensitive receptors. | Medium and high risk sites |
| Internal haul routes shall be maintained and steep gradients shall be avoided. | Medium and high risk sites |
| Material and plant loading and unloading shall only take place during normal working hours unless the requirement for extended hours is for traffic management (i.e. road closure) or health and reasons (application must be made to DCC a minimum of 4 days prior to proposed works). | All sites |
| Use rubber linings in chutes, dumpers and hoppers to reduce impact noise. | Medium and high risk sites |
| Minimise opening and shutting of gates through good coordination of deliveries and vehicle movements. | Medium and high risk sites |

**Table 12-20: Mitigation for Plant**

| Plant | |
|---|---|
| Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC. | All sites |
| Fit all plant and equipment with appropriate mufflers or silencers of the type recommended by the manufacturer. | All sites |
| Use all plant and equipment only for the tasks for which it has been designed. | All Sites |

| Plant | |
|---|---|
| Shut down all plant and equipment in intermittent use in the intervening periods between work or throttle down to a minimum. | All sites |
| Power all plant by mains electricity where possible rather than generators. | Medium and high risk sites |
| Maximise screening from existing features or structures and employ the use of partial or full enclosures for plant. | Medium and high risk sites |
| Locate movable plant away from noise sensitive receptors. | All sites |

**Table 12-21: Mitigation for Vehicle Activity**

| Vehicle Activity | |
|---|---|
| Ensure all vehicle movements (on site) occur within normal working hours. (Other than where extension of work requiring such movements has been granted in cases of required road closures or for health and safety reasons). | All sites |
| Plan deliveries and vehicle movements so that vehicles are not waiting or queuing on the public roads. If unavoidable engines should be turned off. | Medium and high risk sites |
| Minimise the opening and closing of the site access through good coordination of deliveries and vehicle movements. | Medium and high risk sites |
| Plan the site layout to ensure that reversing is kept to a minimum. | Medium and high risk sites |
| Where reversing is required, use broadband reverse sirens or where it is safe to do so disengage all sirens and use banksmen. | Medium and high risk sites |
| Rubber/neoprene or similar non-metal lining material matting to line the inside of material transportation vehicles to avoid first drop high noise levels. | Medium and high risk sites |

**Table 12-22: Mitigation for Demolition**

| Demolition Phase | |
|---|---|
| Employ the use of acoustic screening; this can include planning the demolition sequence to utilise screening afforded by buildings to be demolished. | Medium and high risk sites |
| If working out of hours for Health and Safety reasons (following approval by DCC) limit demolition activities to low level noise activity unless absolutely unavoidable. | All sites |
| Use low impact demolition methods such as non-percussive plant where practicable. | Medium and high risk sites |

| Demolition Phase | |
|---|---|
| Use rotary drills and 'bursters' activated by hydraulic or electrical power or chemically based expansion compounds to facilitate fragmentation and excavation of hard material. | High risk sites |
| Avoid the transfer of noise and vibration from demolition activities to adjoining occupied buildings through cutting any vibration transmission path or by structural separation of buildings. | Medium and high risk sites |
| Consider the removal of larger sections by lifting them out and breaking them down either in an area away from sensitive receptors or off site. | High risk sites |

**Table 12-23: Monitoring**

| Monitoring | |
|---|---|
| Establish pre-existing levels of ambient noise by baseline monitoring or the use of the noise maps. | Medium and high risk sites |
| Carry out regular on-site observation monitoring and checks/audits to ensure that BPM is being used at all times. Such checks shall include;<br>• Hours of work<br>• Presence of mitigation measures<br>• Number and type of plant<br>• Construction methods<br>Site reviews must be recorded and made available for inspection. | High risk sites |
| Monitor noise and vibration continuously during demolition, piling, excavation and sub and superstructure works at agreed locations and report to DCC at agreed intervals and in an agreed format.<br>To comply with this, the following must take place.<br>The monitoring locations for existing sites, as agreed with officers of DCC, must remain in situ. If additional monitoring is required, this will be provided and the new locations will be agreed with DCC. For all new sites, the monitoring locations must be agreed with DCC.<br>The results of the monitoring must be forwarded to officers of the Air Quality Monitoring and Noise Control Unit every two weeks in the following format:<br>Provide the construction noise level as defined in British Standard 5228 and the peak particle velocity readings for the hours of operation of the site. This will include the construction noise level for any overtime period worked outside of normal working hours. Provide a report detailing and discussing the noise and vibration levels over the reporting period. If a breach is recorded the follow-up action that took place to prevent any further breaches must be included in the report.<br>This information must be provided in electronic format. If results are required owing to complaints, the results will be provided as soon as possible by the contractor to DCC. | High risk sites |

| Monitoring | |
|---|---|
| Appraise and review working methods, processes and procedures on a regular basis to ensure continuous development of BPM. | Medium and high risk sites |
| The 'ABC' Method detailed in Paragraph E.3.2 of BS 5228-1:2009 shall be used to determine acceptable noise levels for day, evening and nighttime work. | Medium and high risk sites |
| Vibration levels must be kept below 1.0 mm/sec (PPV) where possible. Where levels are expected to exceed this value, residents must be warned and an explanation given. | Medium and high risk sites |
| Contact details for the site manager and liaison officer should be displayed prominently on the site hoarding. | Medium and high risk sites |
| All staff should be briefed on the complaint procedure and the mitigation requirement and their responsibilities to register and escalate complaints received. | Medium and high risk sites |
| Send regular updates at appropriate intervals to all identified affected neighbours/businesses via a newsletter and post relevant information on the site hoarding. Also, make the information available via email/website, including weekly noise monitoring reports. | Medium and high risk sites |
| Arrange regular community liaison meetings at appropriate intervals, including prior to commencement of the ABR2 Project. | High risk sites |
| Meet regularly with neighbouring construction sites to ensure activities are coordinated to minimise any potential cumulative issues. | High risk sites |

### 12.6.2 Monitoring

Annex IV of Directive 2014/52/EU (Part 7) states that the information requirements under Article 5(1) of the Directive include "a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases."

Section 8.2 of the EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) provides specific commentary on the monitoring requirements under the Directive. This section highlights the role of monitoring in ensuring that the project in practice conforms to the predictions made during the EIA and in demonstrating that the proposal operates as intended.

The guidance also cautions against excessive reliance on monitoring on the basis that this may lead to operational changes that fall outside the scope of the project that was subject to scrutiny during the consent process. It is also states that monitoring post consent should not be used to allow the deferral of the gathering of information that is necessary for the assessment/consent.

The guidelines highlight the importance of ensuring that monitoring is described within the context of the operation of the project processes. On this basis, monitoring descriptions should refer to remedial actions to be taken, responsible parties and should be expressed as 'if-then' scenarios.

**Section 12.4** includes the noise impact assessment during the construction phase of the ABR2 Project. This assessment highlighted that predicted noise levels from the ABR2 Project will be below the most onerous Category A BS5228:2009+A1:2014 noise threshold limits at the nearest noise-sensitive properties. Mitigation measures are included in **Section 12.6** to ensure these noise threshold limits are not exceeded.

Any noise monitoring locations used for the ABR2 Project will be agreed in advance of the commencement of the construction phase in consultation with DCC. This noise monitoring locations will be detailed within the NMP as part of the CEMP. The NMP will remain an iterative live document throughout the construction process and noise monitoring location will remain under review throughout the process.

## 12.7 Potential Cumulative Effects

**Chapter 21 Cumulative Effects and Environmental Interactions** outlines the methodology used to complete the assessment of cumulative effects, which may arise from adjacent or nearby development, together with those predicted for the Project. The projects which have been considered within the assessment of cumulative effects are outlined in **Chapter 21 Cumulative Effects and Environmental Interactions**. In relation to noise and vibration, only projects within 1km of the nearest noise sensitive properties have been considered within the cumulative assessment as on account of distance attenuation, there is no potential for noise and vibration impacts beyond this distance.

The construction phase for the ABR2 Project will extend over a period of approximately 3 years. It is difficult to determine the likelihood of when construction works associated with the ABR2 Project may be likely to take place in tandem with the construction of other sites that are currently subject to pending/granted planning permission.

As detailed in **Section 12.4**, the ABR2 Project is not predicted to generate any significant construction phase noise impacts at the nearest noise-sensitive properties and predicted noise levels are below existing ambient (LAeq) noise levels and at or below existing background sound levels (LA90) at the nearest noise-sensitive properties. On the basis of this and following a review of pending/granted planning applications in the study, it is not predicted that there will be any significant cumulative noise impact from the ABR2 Project in tandem with any other projects at the nearest noise-sensitive properties.

## 12.8 Residual Impacts

**Section 12.4** contains a detailed noise impact assessment for the construction phase of the ABR2 Project. This assessment indicates that there will be no adverse noise impacts at the nearest noise-sensitive properties.

**Section 12.6** provides details on specific noise mitigation measures to be applied during the construction phase. These mitigation measures will ensure that all residual noise impacts associated with the ABR2 Project will be reduced to minor adverse or lower.

There will be no operational phase noise impact associated with the ABR2 Project and hence no operational phase residual impact.

## 12.9 Summary of Effects and Conclusions

A summary of the impact assessment is provided in **Table 12-**. On the basis of the assessment completed in this chapter, there will be no significant adverse noise impact associated with the ABR2 Project at the nearest noise-sensitive properties.

**Table 12-25: Summary of Effects relating to Terrestrial Noise and Vibration**

| Potential Effect and Receptor | Phase[1] | | Magnitude of Effects | Sensitivity of Receptor | Significance of Effect | Significant/Not Significant | Mitigation Measures | Residual Effects |
|---|---|---|---|---|---|---|---|---|
| | C | O | | | | | | |
| Construction Noise | ✓ | | C: Low | C: High | C: Minor | C: Not Significant | Adherance to British Standard BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites: Part 1 and mitigation measures established within the CEMP | Minor adverse or lower |
| Construction Traffic Noise | ✓ | | C: Low | C: High | C: Minor | C: Not Significant | Adherance to British Standard BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites: Part 1 and mitigation measures established within the CEMP | Minor adverse or lower |
| Construction Vibration | ✓ | | C: Negligible | C: High | C: Negligible | C: Not Significant | Adherance to British Standard BS5228:2009+A1:2014 – Noise and vibration control on construction and open sites: Part 1 and mitigation measures established within the CEMP | Minor adverse or lower |
| Operational Phase Noise | | | O: None | O: High | O: None | O: Not Significant | N/A | N/A |

[1] C: Construction Phase; O: Operational Phase

## 12.10 Limitations of Assessment

There were no significant limitations in terms of completing the assessment included in this chapter.