

The noise and vibration ES chapter reports on the noise and vibration effects associated with the demolition and construction stage and operational stage of the proposed development.

### Existing Conditions

A desk study of ordnance survey maps and satellite imagery was undertaken to identify the nearest noise sensitive receptors to the site. A baseline noise survey was also undertaken to establish the current background noise environment at the nearby noise sensitive receptors during day and night periods.

The existing baseline noise climate is characterised by road traffic noise, harbour and docks activity and noise associated with people shopping and visiting the harbour public realm.

The following receptors sensitive to construction noise were identified:

- Residential Receptors to the South of the Dock known as Maritime Studios, Pendennis Rise;
- Residential Apartments at Challenger Quay;
- Residential properties along Church Street; and
- Residential properties along Trefusis Road, Flushing.

The following receptors sensitive to construction and operational traffic were identified:

- Residential receptors along Melvill Road A39;
- Residential receptors along Bar Road (West of Tinnars Walk);
- Residential receptors along Tinnars Walk;
- Residential receptors along Avenue Road; and
- Residential receptors along Bar Road (East of Tinnars Walk).

### Demolition and Construction

Demolition and construction works will produce varied noise levels as the type of activity and distance to receptor changes throughout the development. Effects would be direct, temporary, reversible and short-term.

During the demolition and construction stage the following impacts and effects have been assessed:

- Changes in daytime noise levels during demolition and construction which would result in not-significant adverse effects, ranging from negligible to negligible to minor in scale;

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- Changes in evening noise levels during demolition and construction which would result in not-significant adverse effects ranging from negligible to negligible to minor in scale for most receptors. One minor to moderate adverse, **potentially significant** effect was assessed for residential receptors at Challenger Quay;
- Changes in night-time noise levels during demolition and construction which would result in not-significant adverse effects ranging from negligible to minor in scale for most receptors. One minor to moderate adverse, **potentially significant**, effect was assessed for residential receptors at Challenger Quay; and
- Changes in road traffic noise levels during demolition and construction which would result in not-significant adverse effects ranging from negligible to minor in scale for some receptors. Moderate adverse, **potentially significant**, effects were assessed for residential receptors along Tinnars Walk and Bar Road (East of Tinnars Walk).

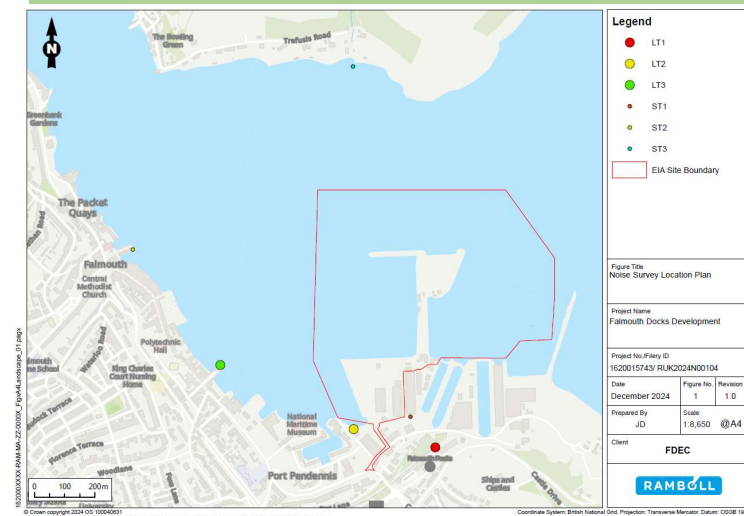
### Operation

The operational stage of the proposed development could lead to increases in road traffic noise on nearby sensitive receptors. In addition to existing maritime/industrial operations at Falmouth Docks, activities associated with floating offshore wind (FLOW), such as crane operations to dismantle or lower wind turbines, would occur infrequently.

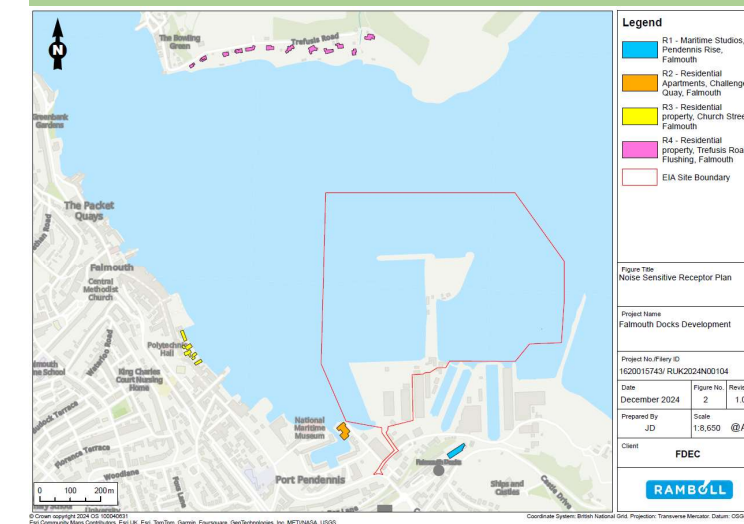
During the operational stage the following impacts and effects have been assessed:

- Changes in road traffic noise levels during operation of the proposed development which would result in not significant negligible to minor adverse effects; and
- Operational activity noise from FLOW operations which would result in not significant negligible to minor adverse effects.

## 14. Noise and Vibration



### Noise Survey Locations



### Location of Noise Sensitive Receptors

14 Noise and Vibration

14.1 Introduction

- 14.1.1 This chapter reports on the likely noise and vibration effects associated with the demolition and construction stage and operational stage of the proposed development.
- 14.1.2 This chapter is supported by the following technical appendices in ES Volume 2:
- Technical Appendix 14.1 – Baseline Noise Survey;
  - Technical Appendix 14.2 - Demolition and Construction Noise supporting information;
  - Technical Appendix 14.3 - Operational Assessment supporting information;
  - Technical Appendix 14.4 – Legislation and Guidance
- 14.1.3 The assessment has been informed by the following legislation, policies and published guidance:
- National Legislation and Policy:
    - NPPF (2024)<sup>1</sup> in particular the following sections:
      - ‘Chapter 15 – Conserving and enhancing the natural environment’;
      - Noise Policy Statement for England (2010)<sup>2</sup>;
      - The Control of Pollution Act (1974)<sup>3</sup>;
    - Local Policy:
      - Cornwall Local Plan Strategic Policies 2010 - 2030<sup>4</sup>
      - Policy 13 Development Standard
      - Policy 16 Health and Wellbeing
    - National guidance and industry standards:
      - PPG: Noise<sup>5</sup>;
      - British Standard (BS) 4142:2014 +A1 2019<sup>6</sup> - Methods for rating and assessing industrial and commercial sound;
      - BS 5228:2009+A1:2014<sup>7</sup> - Code of practice for noise and vibration control on construction and open sites;
      - BS 7385-2:1993<sup>8</sup> - Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from ground borne vibration;
      - BS 7445-1:2003<sup>9</sup> - Description and measurement of environmental noise – Guide to quantities and procedures;
      - BS 8233:2014<sup>10</sup> - Guidance on sound insulation and noise reduction for buildings;
      - BS 6472-1:2008<sup>11</sup> - Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting;

- ISO 9613 Part 2:1996<sup>12</sup> - Acoustics: Attenuation of sound during propagation outdoors: Part 2: General method of calculation;
- Calculation of Road Traffic Noise (CRTN) (1988)<sup>13</sup>;
- The Design Manual for Roads and Bridges (DMRB) LA 111 (2020)<sup>14</sup>;
- Institute of Environmental Management and Assessment Guidelines for Environmental Noise Impact Assessment (‘IEMA Guidelines’) (2014)<sup>15</sup>; and
- World Health Organisation (WHO): Guidelines for Community Noise (1999)<sup>16</sup>.

14.2 Consultation

14.2.1 Table 14.1 summarises the key EIA Scoping Opinion responses with respect to the noise and vibration assessment.

| Table 14.1: Summary of consultation                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consultee /Date of Consultation                                                                                                  | Summary of Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Summary of Action Taken and Where in this Chapter Comments are Addressed                                                                                                                                                                                                                                                   |
| Ramboll to Cornwall Council 5 <sup>th</sup> September 2023                                                                       | Ramboll issued a technical memo to Cornwall council (ref RUK2023N00104-RAM-ME-00006.pdf) stating the proposed survey methodology to BS7445 ( Parts 1 & 2) and setting out the survey locations near to potential receptors.<br><br>The memo also sets out the assessment methodology in line with the scoping report.                                                                                                                                                                                                                                                                                               | The methodology proposed in the memo was utilised for completion of the noise survey and assessments presented the noise and vibration chapter.                                                                                                                                                                            |
| Falmouth Harbour Scoping Response, reference: FHC/A&P/ Redevelopment Falmouth Docks/23/MC, dated 11 <sup>th</sup> September 2023 | Falmouth Harbour operate a marina, anchorage and moorings near to the potential works site. Visitors and residents come to Falmouth for holidays and to relax. We are concerned about the additional noise these works may produce over potentially quite an extended period, as works are likely to be staged. We regularly receive noise complaints that come to us in the first instance so are aware of noise impacting local residents and visitors. We feel it would be wise for further investigation and investment in noise abatement as a mitigation to be considered wider than the proposed 250m zone.” | Noise impacts associated with both the construction and operational stage have been undertaken and reported on in this ES chapter. The study area is 700 m from the site boundary for the construction assessment and 1.1 km from the site boundary for operational impacts. Mitigation is considered within this chapter. |

<sup>1</sup> Department for Levelling Up, Housing and Communities, 2024. National Planning Policy Framework. London. HMSO.

<sup>2</sup> Department of Environment, Food and Rural Affairs, 2010. Noise Policy Statement for England.

<sup>3</sup> Secretary of State, 1974. Control of Pollution Act, HMSO.

<sup>4</sup> Cornwall Council , Adopted November 2016, Available at : <https://www.cornwall.gov.uk/media/ozhj5k0z/adopted-local-plan-strategic-policies-2016.pdf>

<sup>5</sup> Planning Practice Guidance; <https://www.gov.uk/government/collections/planning-practice-guidance>. Accessed on 8 September 2022.

<sup>6</sup> British Standards Institution, 2014. British Standard 4142:2014+ A1:2019: Method for Rating and Assessing Industrial and Commercial Sound. BSI.

<sup>7</sup> British Standards Institution, 2014. BS 5228:2009+A1:2014: Code of practice for noise and vibration control on construction and open sites. BSI.

<sup>8</sup> British Standards Institution, 1993. British Standard 7385-2:1993: Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Groundborne Vibration. BSI.

<sup>9</sup> British Standards Institution, 2003. BS 7445 Part 1:2003: Description and measurement of environmental noise – Guide to quantities and procedures. BSI.

<sup>10</sup> British Standards Institution, 2014. BS 8233:2014+ A1:2019: Guidance on sound insulation and noise reduction for buildings. BSI.

<sup>11</sup> British Standards Institution, 2008. BS 6472:2008: Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting. BSI.

<sup>12</sup> International Organization for Standardization, 1996. ISO 9613 Part 2:1996: Attenuation of sound during propagation outdoors: General method of calculation. ISO.

<sup>13</sup> Department of Transport and the Welsh Office, 1988. Calculation of Road Traffic Noise. DoT & Welsh Office.

<sup>14</sup> Highways England (now National Highways), May 2020. Design Manual for Roads and Bridges, LA111: Noise and Vibration (Version 2). HE.

<sup>15</sup> Institute of Environmental Management and Assessment (IEMA), 2014. Guidelines for Environmental Noise Impact Assessment.

<sup>16</sup> World Health Organisation. 1999. Guidelines for Community Noise. Geneva. WHO.

### 14.3 Assessment Scope

14.3.1 The assessment scope is in accordance with relevant legislation, policy and guidance and the methodology set out in the EIA Scoping 'Falmouth Docks Development Environmental Impact Assessment Scoping Report' dated 01/08/2023 and summarised in this section.

#### Technical Scope

14.3.2 The technical scope of the assessment has considered the following potential effects:

##### Potential Demolition and Construction Effects

- Effects due to the demolition and construction noise; and
- Effects due to changes in road traffic noise levels during construction.

##### Potential Operational Effects

- Effects due to changes in road traffic noise levels during operation; and
- Effects due to activity noise from new noise sources at Falmouth Docks.

14.3.3 Note that due to no fixed plant being proposed as part of the proposed development, 'effects due to noise from new fixed plant installations' has been scoped out of the EIA and is not reported on further in this chapter.

#### Spatial Scope

14.3.4 The study area for the demolition and construction noise assessment covers an area that extends approximately 700 m from the site boundary. The study area incorporates existing sensitive receptors located in Falmouth and properties across the Penryn River Bay to the north of the proposed development. However, guidance from BS 5228:2009+A1:2014 states that calculations beyond 300 m should be treated with caution due to the increasing importance of meteorological effects.

14.3.5 The study area for the operational road traffic noise assessment covers an area of up to 1.1 km from the site boundary and has been assessed for all road links provided by the Applicant's transport consultant. This operational study area has been selected as Melvill Road extends for up to 1.1 km from the proposed development red line boundary.

#### Temporal Scope and Assessment Scenarios

14.3.6 The assessment has considered impacts during the demolition and construction stage which would be temporary and short term (up to 5 years) between the expected construction period.

14.3.7 The demolition and construction noise assessments have considered the following scenarios, which consider a number of reasonable worst-case scenarios with multiple construction activities being undertaken in parallel:

##### Daytime Weekday Construction Activities

- Scenario 1: Dredging Northern and Queens Wharf (single dredging operation), enabling & strengthening on Queens Wharf, loading of dredged arisings on Duchy Wharf, demolition of terrestrial buildings, breaking & Demolition of Western Wharf.
- Scenario 2: Piling on Western Wharf, dredging near FLOW Deck and Duchy Wharf, enabling / strengthening of Duchy Wharf, loading of dredged arisings on Duchy Wharf.
- Scenario 3: Concrete works (Deck construction) on Western Wharf, Piling Works on Queens and Northern Wharf, loading dredged arising on Duchy Wharf (including concrete batching).
- Scenarios 4: Concrete works (Deck construction) on Northern Wharf, concrete works (Deck construction) on Western Wharf, Piling on FLOW Deck area, loading on dredged arisings and concrete batching on Duchy Wharf.

##### Evening & Night-time Construction activities

- Scenario 5: Dredging Queens Wharf (single dredging operation), revetment removal (digging not breaking), Loading dredged arisings on Duchy Wharf.

- Scenario 6: Dredging on Western Wharf, loading dredged arisings on Duchy Wharf, revetment digging and removal on near FLOW Deck and Duchy Wharf areas.
- Scenario 7: Dredging Flow and duchy area, loading dredged arisings on Duchy Wharf including concrete batching plant, concrete works on Duchy for crane pads.

14.3.8 The operational development stage assessments would be expected to be permanent and long-term in nature (i.e. more than 10 years).

14.3.9 The following scenarios have been assessed for the operational stage:

- Scenario A: Existing Baseline (2023);
- Scenario B: Future Baseline (2026); and
- Scenario C: Future Baseline (2027) with the proposed development.

14.3.10 The assessment has been undertaken considering the existing baseline noise levels measured in 2023 and the future baseline road traffic flow data provided by the transport consultant for 2027.

14.3.11 No cumulative schemes have been considered within the traffic flow data that has been used to inform these assessments, however the traffic data does include appropriate growth factors (refer to ES Chapter 13 Transport and Accessibility for further details).

### 14.4 Baseline Characterisation Method

#### Desk Study

14.4.1 A desk-based study of mapping and satellite imagery was completed to identify potential noise and vibration sensitive receptors near to the proposed development.

14.4.2 The nearest human vibration sensitive receptors are expected to be approximately 250 m from the site. Ground-borne demolition and construction vibration would not be perceptible at this distance and therefore, demolition and construction vibration was scoped out of the assessment.

14.4.3 No desk-based study was carried out to characterise the existing baseline noise climate around the proposed site which was determined via a field study.

14.4.4 For the purposes of traffic assessments, traffic data has been obtained from survey and assessments by the project traffic consultant as detailed in ES Chapter 13 Transport and Accessibility.

#### Field Study

14.4.5 The existing noise environment has been characterised by a baseline noise survey that was completed between 7 and 18 September 2023 and undertaken in accordance with BS 7445-1:2003. The survey was completed at measurement locations to quantify the prevailing ambient and background noise levels within the study area.

14.4.6 The baseline unattended, long term noise survey and the attended survey locations determined the noise levels and characterisation of the existing noise at the nearby noise sensitive receptors. Figure 14.1 shows the survey locations.

14.4.7 Survey location LT1 was located to be representative of R1 (residential sensitive receptors to the south of the Dock known as Maritime Studios, Pendennis Rise Falmouth).

14.4.8 Survey Location LT2 was located to be representative of the sensitive receptor R2 (Residential apartments Challenger Quay, Falmouth). This location was also deemed to be representative of other residential properties near/ on Bar Road that are not screened from noise propagating from the wider Falmouth Docks site and other sources on Falmouth waterfront such as the upper floors of Trelawney House Care home.

14.4.9 Survey Location LT3 and additional measurements at ST2 was located to be representative of R3 (Residential properties along Church Street Falmouth).

14.4.10 Additional attended measurements at ST3 characterised daytime noise levels at Receptor R4 (Residential properties along Trefusis Road, Flushing, Falmouth).

14.4.11A baseline vibration survey was not conducted as no significant sources were identified and the distances to receptors were large.

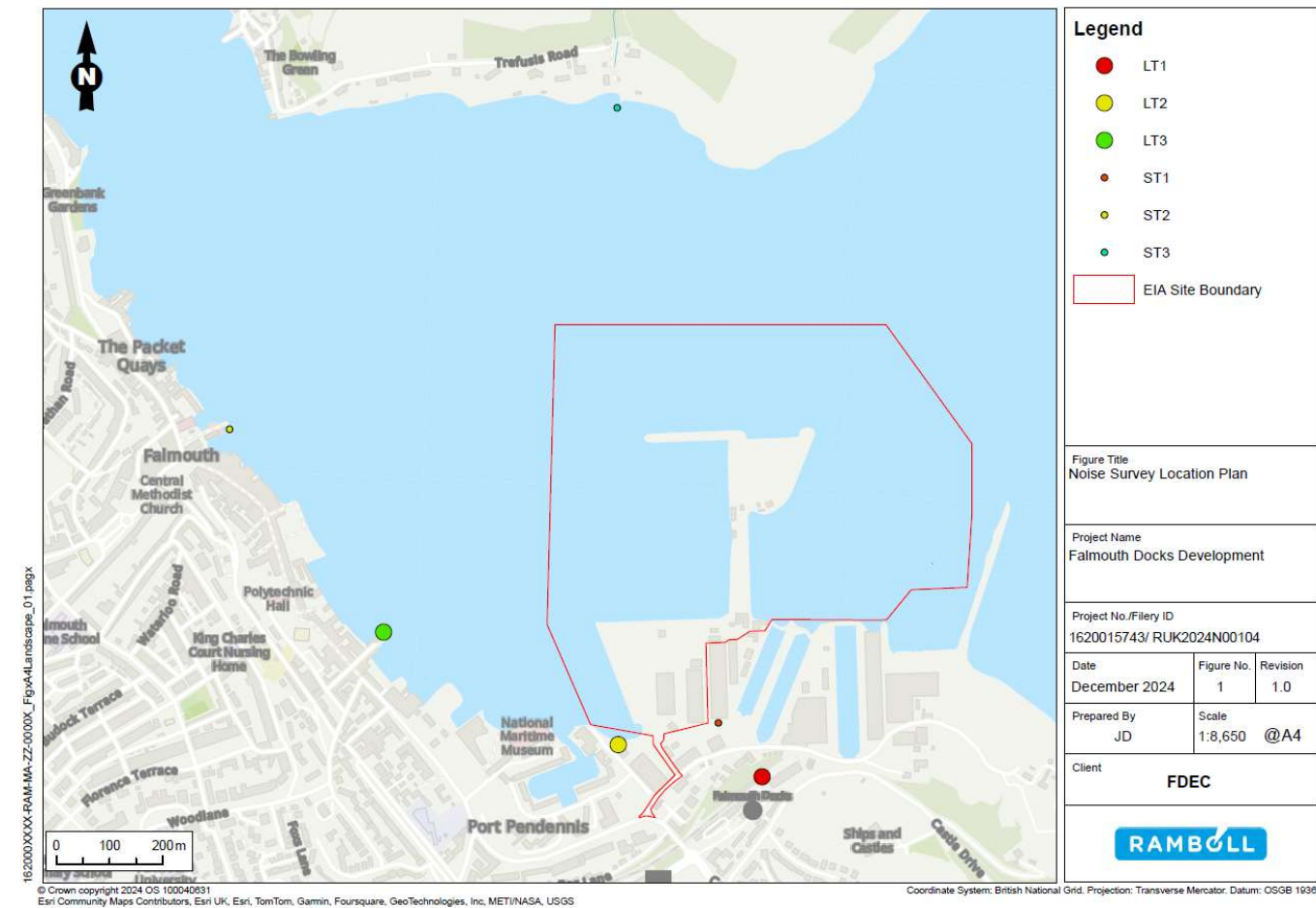


Figure 14-1: Noise Survey Locations

Modelling

14.4.12Modelling of the demolition and construction works and operational stage was undertaken as described in Section 14.5.

14.5 Assessment Method

Methodology

- 14.5.1 A noise prediction model of the Falmouth Docks Development and surrounding study area was developed using CadnaA® version 2024; a proprietary noise modelling software widely used for predicting noise from a variety of sources. The software implements the standard noise prediction methodology detailed in BS5228:2009+A1:2014 for demolition and construction noise and ISO 9613 Part 2:1996 for operational assessments. The model has been used to assess the likely effects of noise sources within the study area.
- 14.5.2 Existing topography for the proposed development site and surrounding area was obtained from open-source LIDAR<sup>17</sup> data. As no major level changes are anticipated in the wider development plan, this data is deemed to be suitable for the demolition and construction assessments and operational assessments.
- 14.5.3 The noise model has been used to predict noise impact during the demolition and construction and operational development stage.

14.5.4 Demolition and construction noise impacts have been predicted based on the use of plant and methodologies as described in Chapter 5: Demolition and Construction. Demolition and construction noise emissions and activities have been assigned to specific areas of the site based on the proposed demolition and construction noise phasing as detailed in Chapter 5: Demolition and Construction and ES Volume 2: Technical Appendix 14.2.

Demolition and Construction Stage

Demolition and Construction Plant Noise

- 14.5.5 To determine the likely effect of noise levels during the demolition and construction stage, noise level predictions have been completed to BS 5228:2009+A1:2014, taking full account of Best Practicable Means (BPM) to be adopted.
- 14.5.6 Demolition and construction plant noise thresholds were set to the 'ABC method' in Annex E of BS 5228:2009+A1:2014, for residential receptors. Additional details of the demolition and construction calculations and assumptions are given in ES Volume 2: Technical Appendix 14.2.
- 14.5.7 Typical plant equipment and percentage on-times have been used to predict the expected noise levels for each scenario during demolition and construction. This has been carried out in accordance with BS 5228:2009+A1:2014, which accounts for the following variables:
- Sound power levels for each item of equipment;
  - Distance attenuation between source and receiver;
  - Percentage operating time of the noise source;
  - Any relevant barrier attenuation effects;
  - Ground absorption; and
  - Façade corrections.

Demolition and Construction Road Traffic Noise

- 14.5.8 Demolition and construction traffic noise levels have been assessed against 2023 baseline traffic flows as presented in Chapter 13: Transport and Accessibility. Assessments have been conducted in-line with the short-term impact criteria as detailed in LA111. Details of calculations, assumptions and limitations are given in Technical Appendix 14.2. The basic noise level (BNL) at a nominal façade position 10 m from the kerb of each link has been calculated following the methodology provided in CRTN.
- 14.5.9 The BNL and any associated change along the road links identified, is deemed to be representative of noise sensitive receptors along the road link. Therefore, for simplicity, the assessment has been carried out for each road link instead of every NSR along that link. As a worst-case scenario, each road link has been assumed to have a high receptor sensitivity unless it is confirmed that the specific road link does not have such a receptor. If moderate and major effects are found on a specific road link, NSRs along these links have been reviewed to confirm sensitive receptor types.
- 14.5.10The change in road traffic noise level road link has then been determined for the following scenarios:
- Comparison 1: Scenario 2 versus Scenario 1 (Do Minimum, i.e. the change in baseline road traffic noise levels 2026); and
  - Comparison 2: Scenario 3 versus Scenario 2 2026 (Do Something, i.e. the effect of the proposed construction on the development).

Operational Stage

Road Traffic Noise

14.5.11Potential effects arising due to the change in road traffic noise that is expected to occur with the proposed development have been assessed in line with the methodologies in CRTN and DMRB LA111.

<sup>17</sup> Department for Environment Food & Rural affairs survey data, [www.environment.data.gov.uk/survey](http://www.environment.data.gov.uk/survey)

14.5.12 The BNL at a nominal position 10 m from the kerb of each link has been calculated following the methodology provided in CRTN.

14.5.13 The BNL and any associated change along a road link is representative of NSRs along that link. Therefore, for simplicity, the assessment has been carried out for each road link instead of every NSR along that link. As a worst-case scenario, each road link has been assumed to have a high receptor sensitivity.

14.5.14 The change in road traffic noise level road link has then been determined for the following scenarios:

- Comparison 1: Scenario 2 versus Scenario 1 (Do Minimum, i.e. the change in baseline road traffic noise levels 2027); and
- Comparison 2: Scenario 3 versus Scenario 2 2027 (Do Something, i.e. the effect of the proposed development when compared to the future baseline).

14.5.15 The results have been assessed using the short-term changes in traffic noise levels magnitude of impact criteria in accordance with Table 3.45a of LA111 Noise & Vibration Revision 2 (May 2020).

14.5.16 The road traffic noise assessment includes effects due to changes in road traffic noise caused by the arrival of cruise ships, e.g. buses for passengers to Falmouth and the wider Cornwall area, and HGV movements on the road network due to cargo ship movements.

14.5.17 Details of calculations, assumptions and limitations are given in Technical Appendix 14.3.

#### Operational activity noise from FLOW operations

14.5.18 Equipment selections for the proposed FLOW operations have been assumed based on the descriptions given in Chapter 4: Proposed Development Description. The assumed equipment selections relevant sound power information has been obtained from BS 5228:2009+A1:2014. The full list of the proposed equipment is given in Technical Appendix 14.3.

14.5.19 Noise levels at the nearby receptors have been predicted using CadnaA® version 2024; a proprietary noise modelling software widely used for predicting noise from a variety of sources. The software implements the standard noise prediction methodology detailed in ISO 9613 Part 2:1996.

14.5.20 Since the existing operational noise from the site and the wider Falmouth Docks site is an intrinsic part of the existing ambient noise, the additional FLOW activity noise has been assessed against the existing ambient noise, to determine the potential dB change in ambient noise levels. Magnitude is assessed based on the amount of change in dB, cause by the additional activities, see Table 14.8.

#### Cumulative Stage

14.5.21 No cumulative schemes have been identified in Chapter 2: EIA Process and Methodology. Therefore, no cumulative noise assessments have been undertaken.

### 14.6 Assessment Criteria

14.6.1 The criteria used to assess the significance of an effect are set out in the following sub-sections. Consideration has been given to the sensitivity of the NSR and the magnitude of impact to determine the scale of the effect. Consideration has been given to the likelihood of the effect, the duration of the effect, the reversibility of the effect, the geographical extent of the effect and professional judgement applied to establish if the scale of effect would be significant.

#### Receptor Sensitivity/Value Criteria

14.6.2 The sensitivity of noise sensitive receptors has been classified as low, medium or high, in accordance with the criteria set out in Table 14.2. The receptors assessed throughout this noise and vibration chapter are deemed to have high sensitivity.

| Table 14.2: Receptor sensitivity criteria |                                             |
|-------------------------------------------|---------------------------------------------|
| Sensitivity                               | Noise Sensitive Receptor Criteria           |
| Low                                       | Industrial, commercial and retail premises. |

| Table 14.2: Receptor sensitivity criteria |                                                                                        |
|-------------------------------------------|----------------------------------------------------------------------------------------|
| Sensitivity                               | Noise Sensitive Receptor Criteria                                                      |
| Medium                                    | Places of worship, community facilities and offices.                                   |
| High                                      | Residential Properties including care homes, educational buildings, hospitals, hotels. |

#### Impact Magnitude Criteria

14.6.3 The magnitude of impact has been classified as low, medium or high, in accordance with the criteria set out in Table 14.3 – Table 14.9.

14.6.4 The effect levels are based on PPG and are defined as:

- No Observed Adverse Effect Level (NOAEL);
- Lowest Observed Adverse Effect Level (LOAEL): noise that can be heard and can cause small changes to behaviour and/or attitudes; and
- Significant Observed Adverse Effect Level (SOAEL): noise that can cause a change in behaviour and/or attitude.

#### Demolition and Construction Stage

##### Demolition and Construction Plant Noise

14.6.5 To assess the likely effects of noise from demolition and construction, predictions have been made using BS 5228-1:2009+A1:2014, considering the Best Practical Means, in full, as detailed in the ES Chapter 5: Demolition and Construction Description. Demolition and construction noise thresholds have been set for the nearest NSRs closest to the site boundary. The thresholds for daytime, evening and night-time construction are set using the 'ABC Method' for residential receptors detailed in Annex E of BS 5228-1:2009+A1:2014 which is based on the baseline noise survey measurements presented in Technical Appendix 14.1 at each receptor location. Above this threshold noise level, there is potential for significant effects to occur. The magnitude of impact is adjusted for each category and SOAEL is set at equal to the threshold value. Exceedance of the typical baselines ambient noise level at the receptor location indicates a LOAEL.

14.6.6 The demolition and construction stage noise threshold criteria for residential noise sensitive receptors are detailed in Table 14.3 – Table 14.5 for daytime, evening and night-time thresholds, respectively.

| Table 14.3: Demolition and construction noise criteria for residential receptors – daytime |                                                                       |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Magnitude of Impact                                                                        | Daytime Demolition and Construction Noise Level dB L <sub>Aeq,T</sub> |
|                                                                                            | Category A                                                            |
| High                                                                                       | ≥70                                                                   |
| Medium                                                                                     | 65-69                                                                 |
| SOAEL                                                                                      | 65                                                                    |
| Low                                                                                        | 55-64                                                                 |
| LOAEL                                                                                      | 55 (R1 to R4)                                                         |
| Negligible                                                                                 | <55dB                                                                 |

| Table 14.4: Demolition and construction noise criteria for residential receptors – evening |                                                                       |            |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------|
| Magnitude of Impact                                                                        | Daytime Demolition and Construction Noise Level dB L <sub>Aeq,T</sub> |            |
|                                                                                            | Category A                                                            | Category B |
| High                                                                                       | ≥60                                                                   | ≥65        |
| Medium                                                                                     | 55-59                                                                 | 60-64      |

| <b>Table 14.4: Demolition and construction noise criteria for residential receptors – evening</b> |                                                                             |                   |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------|
| <b>Magnitude of Impact</b>                                                                        | <b>Daytime Demolition and Construction Noise Level dB L<sub>Aeq,T</sub></b> |                   |
|                                                                                                   | <b>Category A</b>                                                           | <b>Category B</b> |
| SOAEL                                                                                             | 55                                                                          | 60                |
| Low                                                                                               | 50-54                                                                       | 55-59             |
| LOAEL                                                                                             | 50 (R1,R2 & R4)                                                             | 55 (R3)           |
| Negligible                                                                                        | <50                                                                         | <55               |

| <b>Table 14.5: Demolition and construction noise criteria for residential receptors – night-time</b> |                                                                             |                   |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------|
| <b>Magnitude of Impact</b>                                                                           | <b>Daytime Demolition and Construction Noise Level dB L<sub>Aeq,T</sub></b> |                   |
|                                                                                                      | <b>Category A</b>                                                           | <b>Category C</b> |
| High                                                                                                 | ≥50                                                                         | ≥60               |
| Medium                                                                                               | 45-49                                                                       | 55-59             |
| SOAEL                                                                                                | 45                                                                          | 55                |
| Low                                                                                                  | 40-44                                                                       | 50-54             |
| LOAEL                                                                                                | 40 (R4)                                                                     | 50 (R1 to R3 )    |
| Negligible                                                                                           | <40 dB                                                                      | <50               |

#### Demolition and Construction Road Traffic Noise Criteria

14.6.7 The change in road traffic noise level for each road has been determined. The magnitude of impact criteria is based the on short-term changes in traffic noise levels in LA111 and is shown in Table 14.6.

| <b>Table 14.6: Short-term demolition and construction traffic noise magnitude of impact criteria</b> |                     |                                                         |
|------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------|
| <b>Magnitude of Impact</b>                                                                           | <b>Effect Level</b> | <b>Change in Basic Traffic Noise Level LA10,18hr dB</b> |
| High                                                                                                 | SOAEL               | ≥5.0                                                    |
| Medium                                                                                               | SOAEL               | 3 to 4.9                                                |
| Low                                                                                                  | LOAEL               | 1 to 2.9                                                |
| Negligible                                                                                           | NOAEL               | <1.0                                                    |

#### Operational Development Criteria

##### Road Traffic Noise Criteria

14.6.8 The magnitude of impact criteria is based the on short-term changes in traffic noise levels in LA111 and is shown in Table 14.7. The short-term magnitude of change criteria have been used for the assessment, as the traffic data considers the traffic flows in the year of the operational development, with and without the proposed development.

| <b>Table 14.7: Short-term operational traffic noise magnitude of impact criteria</b> |                     |                                                                    |
|--------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------|
| <b>Magnitude of Impact</b>                                                           | <b>Effect Level</b> | <b>Change in Basic Traffic Noise Level L<sub>A10,18hr</sub> dB</b> |
| High                                                                                 | SOAEL               | ≥5.0                                                               |
| Medium                                                                               | SOAEL               | 3 to 4.9                                                           |
| Low                                                                                  | LOAEL               | 1 to 2.9                                                           |
| Negligible                                                                           | NOAEL               | <1.0                                                               |

##### Operational activity noise from FLOW operations

14.6.9 The following criteria have been developed for the assessment in dB change in the operational noise coming from the site (Table 14.8).

| <b>Table 14.8: Operational noise from FLOW operations</b>                                  |                     |                            |
|--------------------------------------------------------------------------------------------|---------------------|----------------------------|
| <b>Description</b>                                                                         | <b>Effect Level</b> | <b>Magnitude of Impact</b> |
| > 5 dB change in noise level between total level and pre-existing ambient noise level      | SOAEL               | High                       |
| 3 to 4.9 dB change in noise level between total level and pre-existing ambient noise level | LOAEL               | Medium                     |
| 1 to 2.9 dB change in noise level between total level and pre-existing ambient noise level | NOAEL               | Low                        |
| < 1 dB change in noise level between total level and pre-existing ambient noise level      | NOEL                | Negligible                 |

#### Scale of Effect Criteria

14.6.10 Impacts have been assessed on the basis of the value/sensitivity of receptors against the magnitude of impact to determine the scale of effect as presented in Table 14.9.

| <b>Table 14.9: Scale of effect criteria</b> |                                     |               |             |
|---------------------------------------------|-------------------------------------|---------------|-------------|
| <b>Sensitivity of Receptor</b>              | <b>Magnitude of Change (impact)</b> |               |             |
|                                             | <b>Low</b>                          | <b>Medium</b> | <b>High</b> |
| Low                                         | Negligible                          | Minor         | Minor       |
| Medium                                      | Minor                               | Moderate      | Moderate    |
| High                                        | Minor                               | Moderate      | Major       |

14.6.11 Based on professional judgement, moderate and major effects are considered significant in EIA terms.

14.6.12 In determining the significance of reported effects, consideration has been given to the type of effect i.e. direct, indirect or secondary, the geographical extent of the effect and the duration of the effect i.e. temporary which is considered to be either short-term (up to 5 years) or medium-term (5-10 years); or permanent which is considered long-term (10 years or more).

14.6.13 Duration of effects has been described as short, medium or long-term, in accordance with the criteria set out in Table 14.10.

| <b>Table 14.10: Duration of effects criteria</b> |                 |
|--------------------------------------------------|-----------------|
| <b>Duration</b>                                  | <b>Criteria</b> |
| Short                                            | Up to 5 years   |
| Medium                                           | 5 to 10 years   |
| Long-Term                                        | >10 years       |

#### Nature of Effect Criteria

14.6.14 The nature of the effect is in accordance with Chapter 2 and has been described as either adverse, neutral or beneficial.

- Beneficial – An advantageous effect to an NSR,
- Neutral – An effect that on balance, is neither beneficial nor adverse to a NSR or is equally adverse and beneficial; or
- Adverse – A detrimental effect to an NSR.

Assumptions and Limitations

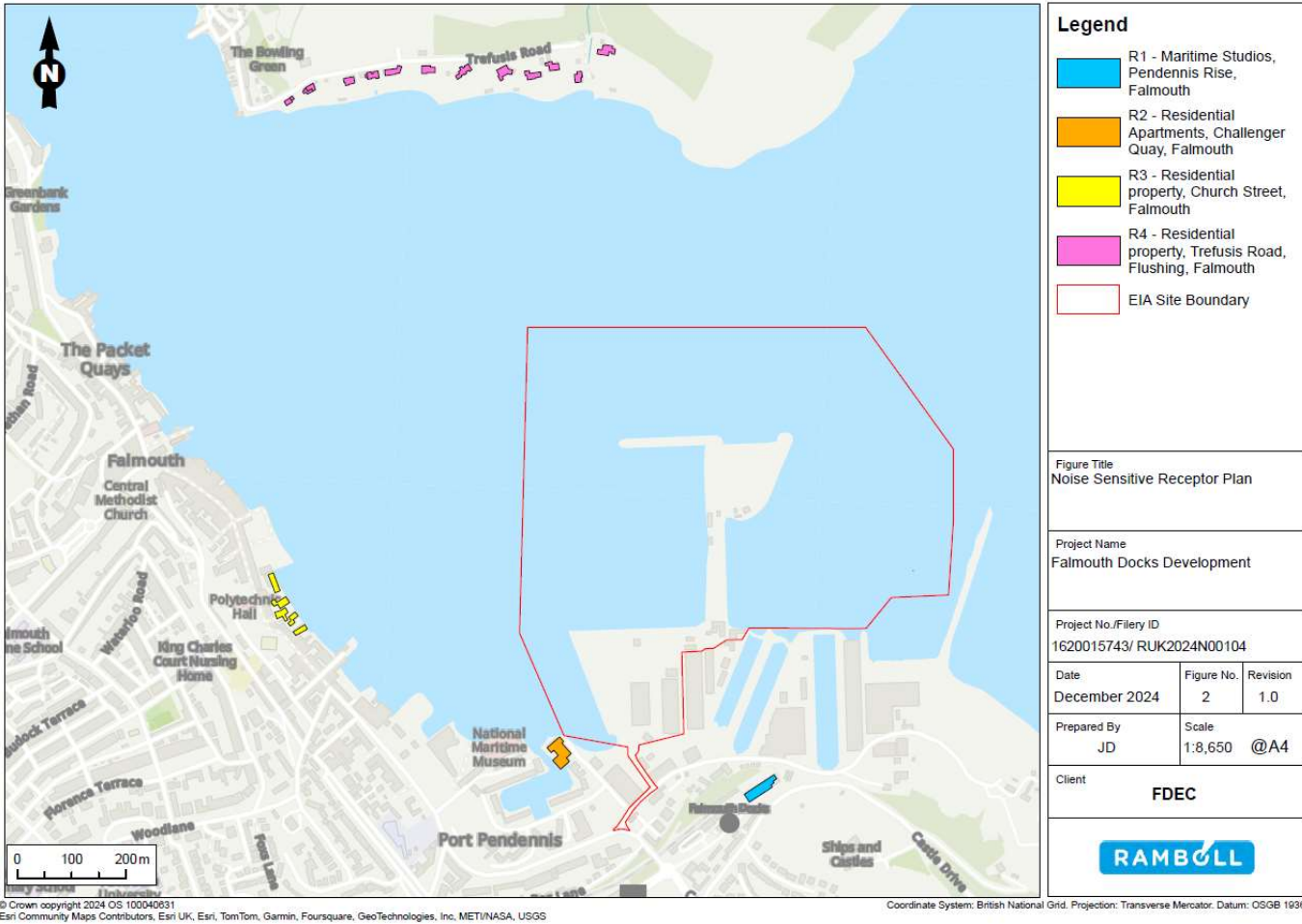
- 14.6.15 All reasonable measures have been carried out to reduce uncertainty in the baseline noise survey data and the calculations carried out and presented in this chapter and associated technical appendices.
- 14.6.16 Uncertainty in baseline noise levels has been minimised by completing unattended measurements over daytime, evening, weekend and night-time periods.
- 14.6.17 Attended measurements were completed (where possible) to support the unattended measurements and supplemented with observations of the type of sound source audible at each location.
- 14.6.18 The 3D noise model uses the calculation methods of BS 5228:2009+A1:2014 which provides noise level predictions accounting for a downwind condition between source and receiver (i.e. reasonable worst case sound propagation assumptions). The 3D noise model and calculated results are all rounded to the nearest A weighted decibel.
- 14.6.19 The noise prediction model accounts for topography and existing building massing. The ground profile for the site and study area receptors has been determined from Open-Source LIDAR<sup>18</sup> data for the study area. The proposed site topography for the surrounding area is not expected to change.
- 14.6.20 Building massing height have been estimated for the nearest buildings to the proposed development based on a review of photos and Google Earth imagery. For residential properties further away from the development, the heights have been fixed at 8m above the surrounding topography.
- 14.6.21 The demolition and construction noise assessments have allowed for a - 5 dB reduction in noise levels for the implementation of Best Practicable Means (BPM) incorporating the measures introduced in the Outline Construction Environmental Management Plan (CEMP).
- 14.6.22 The demolition and construction noise assessments have allowed for a + 3dB addition to the noise levels at residential receptors to represent façade levels.
- 14.6.23 Construction noise and vibration assessment are based on the project programme and assume one continuous dredging operation as a worst-case scenario.
- 14.6.24 It is assumed that the ambient baseline noise level at receptor R4 is 40 dB LAeq,8hr based on the daytime measurements conducted at this location and change in noise level between daytime and night at other locations within the study area.
- 14.6.25 Construction equipment selections and 'on times' have been assumed based on the information provided in Chapter 5: Demolition and Construction.
- 14.6.26 It is assumed that piling, compaction, breaking and demolition would not occur in the evening, weekends and night-time. Calculations assume only one piling rig would be active at a time.
- 14.6.27 The road traffic noise changes assessments has relied on data provided by the project transport consultants for baseline, construction and operational traffic flows.
- 14.6.28 Exact equipment used on the proposed FLOW device maintenance operations are unknown at this time. Assumptions have been made for typical plant and tools that would be used in the operational stage and are presented in Technical Appendix 14.3. An assumed height of 10 m of typical FLOW noise sources has been used in the assessment. If the sources are lower, the resultant noise at receptors may be lower.
- 14.6.29 It is assumed that FLOW operations considered in the operational assessment, such as crane operations to dismantle wind turbines would only occur during the daytime.
- 14.6.30 Since cranes and shipyard operational noise from the site is an intrinsic part of the existing environmental noise at sensitive receptors. Changes to operational noise and to equipment and processes as part of the FLOW activities, are not considered to be suitable for assessment against the

- background noise in accordance with BS 4142:2014+A1:2019. This is because it would place an unreasonable restriction on the site.
- 14.6.31 Examples of plant considered suitable for assessment in accordance with BS 4142:2014+A1:2019 would be fixed plant such as chillers, heat pumps, air handling units, pumps, transformers and fixed generators. These are not proposed as part of the proposed development and therefore this assessment is not applicable and has been scoped out of the assessment.
- 14.6.32 As per the scoping for this development. Noise contribution from cruise ships and vessels visiting the site have not been considered as they are intermittent, temporary and the activity type is an intrinsic part of the existing environmental noise and character in Falmouth. Berthing for ship repair vessels, are also not considered in this assessment as these sources are existing and understood to not change with the proposed development.

14.7 Baseline Conditions

Existing Baseline

- 14.7.1 The existing baseline noise climate is characterised by road traffic noise, harbour and docks activity and noise associated with people shopping and visiting Falmouth Harbour. Further information on the existing baseline and noise survey conducted in 2023 can be found in the Technical Appendix 14.1. Refer to Figure 14.1 for survey locations.
- 14.7.2 Tables 14.11 to 14.14 present summaries of each unattended survey location LT1, LT2, LT3 and attended measurements at ST3. The locations of noise sensitive receptors are shown in Figure 14.2.



<sup>18</sup> Department for Environment Food & Rural affairs survey data , [www.environment.data.gov.uk/survey](http://www.environment.data.gov.uk/survey)

**Table 14.11 : Survey 1 results of baseline noise at LT1**

| Date and Time Period (T) | Ambient noise level Range / dB $L_{Aeq,T}$ | Modal background noise levels / dB $L_{A90,1hr}$ Day / 15min Night | Lowest background noise levels / dB $L_{A90,1hr}$ Day/ 15min Night | Maximum noise levels / dB $L_{AFmax,5min}$ 10th Highest |
|--------------------------|--------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------|
| Daytime (07:00-23:00)    | 51 to 60*                                  | 48                                                                 | 44                                                                 | n/a                                                     |
| Evening (19:00-23:00)    | 48 to 52                                   |                                                                    |                                                                    |                                                         |
| Night-time (23:00-07:00) | 47 to 53                                   | 46                                                                 | 44                                                                 | 74 to 88                                                |

\*This excludes data from Friday 8 September 2023 (71 dB  $L_{Aeq,T}$ ) which was influenced by hedge cutting and maintenance occurring nearby. Thursday 7 September 2023 is also excluded as data was not captured over the whole daytime period.

**Table 14.12 Survey 1 results of baseline noise at LT2**

| Date and Time Period (T) | Ambient noise level Range / dB $L_{Aeq,T}$ | Modal background noise levels / dB $L_{A90,15min}$ | Lowest background noise levels / dB $L_{A90,15min}$ | Maximum noise levels / dB $L_{AFmax,15min}$ |
|--------------------------|--------------------------------------------|----------------------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Daytime (07:00-23:00)    | 48 to 62*                                  | 48                                                 | 36                                                  | n/a                                         |
| Evening (19:00-23:00)    | 44 to 51                                   |                                                    |                                                     |                                             |
| Night-time (23:00-07:00) | 42 to 50                                   | 48                                                 | 35                                                  | 66 to 88                                    |

\* Thursday 7 September 2023 is excluded as data was not captured over the whole daytime period.

**Table 14.13: Survey 1 results of baseline noise at LT3**

| Date and Time Period (T) | Ambient noise level Range / dB $L_{Aeq,T}$ | Modal background noise levels / dB $L_{A90,15min}$ | Lowest background noise levels / dB $L_{A90,15min}$ | Maximum noise levels / dB $L_{AFmax,15min}$ |
|--------------------------|--------------------------------------------|----------------------------------------------------|-----------------------------------------------------|---------------------------------------------|
| Daytime (07:00-23:00)    | 56 to 61                                   | 49                                                 | 39                                                  | n/a                                         |
| Evening (19:00-23:00)    | 49 to 61                                   |                                                    |                                                     |                                             |
| Night-time (23:00-07:00) | 45 to 54                                   | 39                                                 | 31                                                  | 81 to 100                                   |

\* Thursday 7 September 2023 is excluded as data was not captured over the whole daytime period.

14.7.3 For the purposes of establishing baseline conditions at each sensitive receptor:

- LT1 was positioned to be representative of R1;
- LT2 was positioned to be representative of R2;
- LT3 was positioned to be representative of R3; and
- Additional short-term measurements were undertaken at ST3 to establish existing conditions at R4. Analysis of the background noise levels has determined the following representative noise levels for each receptor location.

**Table 14.14 Summary of representative background noise per receiver location  $L_{Aeq, 10hr}$  dB**

| Receptor | Period                   | Existing representative background noise level |
|----------|--------------------------|------------------------------------------------|
| R1 (LT1) | Daytime (07:00-23:00)    | 48 dB $L_{A90,1hr}$                            |
|          | Night-time (23:00-07:00) | 46 dB $L_{A90,15min}$                          |
| R2 (LT2) | Daytime (07:00-23:00)    | 48 dB $L_{A90,1hr}$                            |
|          | Night-time (23:00-07:00) | 48 dB $L_{A90,15min}$                          |
| R3       | Daytime (07:00-23:00)    | 49 dB $L_{A90,1hr}$                            |

**Table 14.14 Summary of representative background noise per receiver location  $L_{Aeq, 10hr}$  dB**

| Receptor | Period                   | Existing representative background noise level |
|----------|--------------------------|------------------------------------------------|
| (LT3)    | Night-time (23:00-07:00) | 39 dB $L_{A90,15min}$                          |
| R4 (ST3) | Daytime (07:00 – 23:00)  | 46 dB $L_{A90,1hr}$                            |

14.7.4 Occasional noisy events occur when ships or ferries depart the harbour. On occasions, when large ship depart the harbour, a loud horn can be heard on audio recordings for each survey location LT1, LT2 and LT3.

14.7.5 Additional attended measurements were undertaken at ST1 , ST2 and can be found in Technical Appendix 14.1.

#### Future Baseline

14.7.6 The future baseline noise climate would be largely dictated by any changes in the noise contribution from the site, wider Falmouth Port site and changes in local area road traffic noise. However, the future baseline is not expected to be materially different from the 2023 existing baseline in character.

#### Sensitive Receptors

14.7.7 The receptors identified as sensitive to the proposed development, and which have been 'scoped-in' to the assessment are summarised in Table 14.15; refer to Figure 14.2 for R1 to R4 receptor locations.

**Table 14.15: Summary of sensitive receptors**

| Receptor                                                                                                | Sensitivity |
|---------------------------------------------------------------------------------------------------------|-------------|
| Construction Noise Assessment Receptors                                                                 |             |
| R1 – Residential Receptors to the South of the Dock known as Maritime Studios, Pendennis Rise Falmouth. | High        |
| R2 – Residential Apartments, Challenger Quay, Falmouth, TR11 3YL                                        | High        |
| R3 – Residential properties along Church Street Falmouth                                                | High        |
| R4 – Residential properties along Trefusis Road, Flushing, Falmouth                                     | High        |
| Construction Traffic and Operational Road Traffic Assessment Receptors                                  |             |
| A - Residential receptors along Melvill Road A39, Falmouth                                              | High        |
| B - Residential receptors along Bar Road (West of Tinnars Walk) , Falmouth                              | High        |
| C - Residential receptors along Tinnars Walk, Falmouth                                                  | High        |
| D - Residential receptors along Avenue Road, Falmouth                                                   | High        |
| E - Residential receptors along Bar Road (East of Tinnars Walk), Falmouth                               | High        |

14.7.8 Other potential receptors were initially considered as part of the construction noise assessments. However, it was found that the following receptors are appropriate based on;

- Receptor R1 (Residential Receptors to the South of the Dock known as Maritime Studios, Pendennis Rise Falmouth) represent the worst-case scenario for receptors on Pendennis Rise, Falmouth due to its prominent location to the south of the site.
- Receptor R2 (Residential Apartments, Challenge Quay, Falmouth, TR11 3YL) represent the worst-case scenario for receptors around Bar Road and Falmouth waterfront. It is considered worst case based on its proximity to the site and lack of screening.
- Receptor R3 (Residential properties along Church Street Falmouth) represent the worst-case scenario for receptors to the west of the site due to the façade facing across the Harbour and with little screening in between.

- Receptor R4 (Residential properties along Trefusis Road, Flushing, Falmouth) being the worst-case scenario receptor to the north of the site across the open water to Flushing.

14.7.9 For the purposes of setting the sensitivity of receptors along each road link. The adjacent sensitive receptors are assumed to be residential with high sensitivity as this represents the worst-case scenario for the assessment.

## 14.8 Assessment of Effects

### Demolition and Construction Effects

#### Demolition and Construction Noise

14.8.1 The results of the daytime demolition and construction noise assessment have concluded the following noise levels presented in Table 14.16 to 14.18. Noise levels are predicted at the façades of the noise sensitive receptors during each development scenario considered. Results include reduction of up to 5dB as a result of the proposed embedded mitigation as detailed in Chapter 5: Demolition and Construction, Best Practical Means BPM and details given in the proposed Outline CEMP.

| Table 14.16 Daytime demolition and construction noise levels $L_{Aeq, 12hr}$ dB and magnitude of change |                                                           |                 |                 |                 |                 |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Receptor                                                                                                | BS5228 Threshold dB Receptor Threshold $L_{Aeq, 12hr}$ dB | Scenario 1      | Scenario 2      | Scenario 3      | Scenario 4      |
| R1                                                                                                      | 65 – A                                                    | 60 (Low)        | 57 (Low)        | 52 (Negligible) | 55 (Low)        |
| R2                                                                                                      | 65 – A                                                    | 61 (Low)        | 62 (Low)        | 51 (Negligible) | 57 (Low)        |
| R3                                                                                                      | 65 – A                                                    | 52 (Negligible) | 54 (Negligible) | 47 (Negligible) | 52 (Negligible) |
| R4                                                                                                      | 65 – A                                                    | 52 (Negligible) | 51 (Negligible) | 51 (Negligible) | 50 (Negligible) |

14.8.2 The results of the evening demolition and construction noise assessment have concluded the following noise levels presented in Table 14.17.

| Table 14.17 Evening demolition and construction noise levels $L_{Aeq, 4hr}$ dB and magnitude of change |                                                          |                 |                 |                 |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------|-----------------|-----------------|
| Receptor                                                                                               | BS5228 Threshold dB Receptor Threshold $L_{Aeq, 4hr}$ dB | Scenario 1      | Scenario 2      | Scenario 3      |
| R1                                                                                                     | 55 – A                                                   | 50 (Low )       | 49 (Negligible) | 50 (Low)        |
| R2                                                                                                     | 55 – A                                                   | 52 (Low)        | 51 (Low)        | 55 (Medium)     |
| R3                                                                                                     | 60 – B                                                   | 44 (Negligible) | 43 (Negligible) | 48 (Negligible) |
| R4                                                                                                     | 55 – A                                                   | 41 (Negligible) | 43 (Negligible) | 44 (Negligible) |

14.8.3 The results of the night-time demolition and construction noise assessment have concluded the following noise levels presented in Table 14.18.

| Table 14.18 Night-time demolition and construction noise levels $L_{Aeq, 8hr}$ dB and magnitude of change |                                                          |                 |                 |                 |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------|-----------------|-----------------|
| Receptor                                                                                                  | BS5228 Threshold dB Receptor Threshold $L_{Aeq, 8hr}$ dB | Scenario 1      | Scenario 2      | Scenario 3      |
| R1                                                                                                        | 55 – C                                                   | 50 (Low)        | 49 (Negligible) | 50 (Low)        |
| R2                                                                                                        | 55 – C                                                   | 52 (Low)        | 51 (Low)        | 55 (Medium)     |
| R3                                                                                                        | 55 – C                                                   | 44 (Negligible) | 43 (Negligible) | 48 (Negligible) |
| R4                                                                                                        | 45 – A                                                   | 41 (Low)        | 43 (Low)        | 44 (Low)        |

### Demolition and Construction Noise Scale of Effects

14.8.4 Table 14.19 presents the daytime scale of the effects from demolition and construction noise.

| Table 14.19 Daytime demolition and construction noise effects |            |            |            |            |
|---------------------------------------------------------------|------------|------------|------------|------------|
| Receptor                                                      | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
| R1                                                            | Minor      | Minor      | Negligible | Minor      |
| R2                                                            | Minor      | Minor      | Negligible | Minor      |
| R3                                                            | Negligible | Negligible | Negligible | Negligible |
| R4                                                            | Negligible | Negligible | Negligible | Negligible |

14.8.5 Daytime demolition and construction noise levels are predicted to give rise to a **negligible to low** magnitude of change for R1 and R2. Therefore, demolition and construction noise effects on local residents would be temporary and **Negligible to Minor Adverse**. The effects would be temporary and short-term and therefore **not significant**.

14.8.6 Daytime demolition and construction noise levels are predicted to give rise to a **Negligible** magnitude of change for R3 & R4. Therefore, demolition and construction noise effects on local residents would be temporary and **Negligible Adverse**. The effects would be temporary and short-term and therefore **not significant**.

14.8.7 Table 14.20 presents the scale of the effect from demolition and construction noise during the evening.

| Table 14.20 Evening demolition and construction noise effects |            |            |                 |
|---------------------------------------------------------------|------------|------------|-----------------|
| Receptor                                                      | Scenario 5 | Scenario 6 | Scenario 7      |
| R1                                                            | Minor      | Negligible | Minor           |
| R2                                                            | Minor      | Minor      | <b>Moderate</b> |
| R3                                                            | Negligible | Negligible | Negligible      |
| R4                                                            | Negligible | Negligible | Negligible      |

14.8.8 Evening demolition and construction noise levels are predicted to give rise to a **low to medium** magnitude of change for R2. Therefore, demolition and construction noise effects on local residents would be temporary and **Minor to Moderate Adverse**. The effects would be temporary, short-term and **not significant to potentially significant**. The activities that lead to potentially significant effects are dredging activities in the nearby Duchy Wharf which also contains the proposed loading and storage site for dredged material, which potentially further increases noise from this area.

14.8.9 Evening demolition and construction noise levels are predicted to give rise to a **negligible to low** magnitude of change for R1. Therefore, demolition and construction noise effects on local residents would be temporary and **Negligible to Minor Adverse**. The effects would be temporary, short-term and therefore **not significant**.

14.8.10 Evening demolition and construction noise levels are predicted to give rise to a **negligible** magnitude of change for R3 & R4. Therefore, demolition and construction noise effects on local residents would be temporary and **Negligible Adverse**. The effects would be short-term and therefore **not significant**.

14.8.11 The following Table 14.21 presents the scale of the effect from demolition and construction noise during the night-time.

| Table 14.21 Night-time demolition and construction noise effects |            |            |                 |
|------------------------------------------------------------------|------------|------------|-----------------|
| Receptor                                                         | Scenario 5 | Scenario 6 | Scenario 7      |
| R1                                                               | Negligible | Negligible | Minor           |
| R2                                                               | Minor      | Minor      | <b>Moderate</b> |
| R3                                                               | Negligible | Negligible | Negligible      |
| R4                                                               | Minor      | Minor      | Minor           |

14.8.12 Night-time demolition and construction noise levels are predicted to give rise to a **low to medium** magnitude of change for R2. Therefore, demolition and construction noise effects on local residents would be temporary and **Minor to Moderate Adverse**. The effects would be temporary, short-term and **not significant to potentially significant**. The activities that lead to potentially significant effects are dredging activities in the nearby Duchy Wharf as described in scenario 7 which also contains the proposed loading and storage site for dredged material which potentially further increases noise from this area.

14.8.13 Night-time demolition and construction noise levels are predicted to give rise to a **low** magnitude of change for R4. Therefore, demolition and construction noise effects on local residents would be temporary and **Minor Adverse**. The effects would be short-term and therefore **not significant**.

14.8.14 Night-time demolition and construction noise levels are predicted to give rise to a **negligible to low** magnitude of change for R1. Therefore, demolition and construction noise effects on local residents would be temporary and **Negligible to Minor Adverse**. The effects would be temporary, short-term and therefore **not significant**.

14.8.15 Night-time demolition and construction noise levels are predicted to give rise to a **negligible** magnitude of change for R3. Therefore, demolition and construction noise effects on local residents would be temporary and **Negligible Adverse**. The effects would be temporary, short-term and therefore **not significant**.

#### Demolition and Construction Road Traffic Noise

14.8.16 This section summarises the effects of demolition and construction road traffic noise on the nearby sensitive receptors. Level changes have been calculated in accordance with Calculation of Road Traffic Noise CRTN and effects are detailed in Table 14.22.

14.8.17 Demolition and construction road traffic noise levels and the effects would be direct, temporary and short-term. Although the traffic data presented is for one year, the resulting predicted effects are representative of other years where construction will take place e.g. 2027.

14.8.18 Unless otherwise stated, the calculated (BNL and noise level change on a road link is representation of all sensitive receptors along the road link. Each road link is considered to contain residential receptors and therefore high receptor sensitivity. Additional supporting information for the construction road traffic noise assessment can be found in Technical Appendix 14.2.

**Table 14.22 Summary of predicted changes in road traffic noise during demolition and construction**

| Ref. | Road Link Name                 | Road Traffic Noise Level at Façade, dB LA10,18hr     |                                                 | Change in Road Traffic Noise Level, dB LA10,18hr | Magnitude of Impact | Effect          |
|------|--------------------------------|------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|---------------------|-----------------|
|      |                                | 2026 without Development Do-Minimum Future Year DMFY | 2026 Construction Do-Something Future Year DSFY |                                                  |                     |                 |
| A    | Melvill Road                   | 67.6                                                 | 68.7                                            | 1.1                                              | Low                 | Minor           |
| B    | Bar Road, West of Tinnars Walk | 62.1                                                 | 62.1                                            | 0.0                                              | Negligible          | Negligible      |
| C    | Tinnars Walk                   | 61.7                                                 | 64.9                                            | 3.2                                              | Medium              | <b>Moderate</b> |
| D    | Avenue Road                    | 64.4                                                 | 64.4                                            | 0.0                                              | Negligible          | Negligible      |
| E    | Bar Road, East of Tinnars Walk | 62.7                                                 | 66.2                                            | 3.5                                              | Medium              | <b>Moderate</b> |

14.8.19 Demolition and construction road traffic noise levels changes are predicted to give rise to a **Medium** magnitude of change along road links Tinnars Walk and Bar Road (East of Tinnars Walk). Therefore,

demolition and construction road traffic noise effects on local residents would be temporary and **Moderate Adverse**. The effects would be temporary, short-term and **potentially significant**. However, the effects in this location are influenced by the quantity of HGVs used in the worst-case scenario of removing dredged material by road. This assumes no dewatering takes place which would otherwise reduce the total volume to be removed by road. The effects would short-term and temporary.

14.8.20 Demolition and construction road traffic noise level changes are predicted to give rise to a **low** magnitude of change along Melville Road. Therefore, demolition and construction road traffic noise effects on local residents would be temporary and **Minor Adverse**. The effects would be temporary, short-term and **not significant**.

14.8.21 Demolition and construction road traffic noise level changes are predicted to give rise to a **negligible** magnitude of change along Bar Road (West of Tinnars Walk) and Avenue Road. Therefore, demolition and construction road traffic noise effects on local residents would be **Negligible Adverse** and **not significant**.

#### Operational Effects

##### Operational Road Traffic Noise

14.8.22 This section summarises the effects of the operational development in terms of road traffic noise on the nearby sensitive receptors. Level changes have been calculated in accordance with Calculation of Road Traffic Noise CRTN and effects are detailed in Table 14.23. Operational road traffic noise levels and the effects would be direct, permanent and long-term. The presented assessment looks at the changes in road traffic noise as a worst-case assessment using the short-term criteria as opposed to using the long-term criteria. For example, a low impact would be deemed to be negligible in the long-term methodology.

14.8.23 Unless otherwise stated, the calculated BNL and noise level change on a road link is representation of all sensitive receptors along the road link. Each road link is considered to contain residential receptors and therefore high receptor sensitivity. Additional supporting information for the construction road traffic noise assessment can be found in Technical Appendix 14.2.

**Table 14.23 Summary of predicted changes in road traffic noise during operation**

| Ref. | Road Link Name                 | Road Traffic Noise Level at Façade, dB LA10,18hr     |                                                | Change in Road Traffic Noise Level, dB LA10,18hr | Magnitude of Impact | Effect     |
|------|--------------------------------|------------------------------------------------------|------------------------------------------------|--------------------------------------------------|---------------------|------------|
|      |                                | 2027 without Development Do-Minimum Future Year DMFY | 2027 Development Do-Something Future Year DSFY |                                                  |                     |            |
| A    | Melvill Road, Falmouth         | 67.6                                                 | 67.7                                           | 0.1                                              | Negligible          | Negligible |
| B    | Bar Road, West of Tinnars Walk | 62.2                                                 | 62.3                                           | 0.1                                              | Negligible          | Negligible |
| C    | Tinnars Walk                   | 61.7                                                 | 62.3                                           | 0.5                                              | Negligible          | Negligible |
| D    | Avenue Road                    | 64.4                                                 | 64.4                                           | 0.0                                              | Negligible          | Negligible |
| E    | Bar Road, East of Tinnars Walk | 62.7                                                 | 64.4                                           | 1.7                                              | Low                 | Minor      |

14.8.24 Operational changes in road traffic noise levels are predicted to give rise to a **low** magnitude of change along Bar Road, East of Tinnars Walk. Therefore the operational road traffic noise effects on local residents would be permanent, long-term and **Minor Adverse**. The effects would be long-term and **not significant**.

14.8.25 Operational changes in road traffic noise levels are predicted to give rise to a negligible magnitude of change along all other assessed road links. Therefore the operational road traffic effects on local residents would be **Negligible Adverse** and **not significant**.

#### Operational activity noise from FLOW operations

14.8.26 The results of the operational assessment on FLOW operations have concluded the following noise levels presented in Table 14.24. Noise levels are predicted near to the façades of the receptors free-field.

| Table 14.24 Daytime FLOW Operational Noise Levels & dB change $L_{Aeq, 1hr}$ dB |                                 |                                                                   |                                                          |
|---------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------|----------------------------------------------------------|
| Receptor                                                                        | Lowest Daytime Existing Ambient | Flow Operational Noise level at the Receptor ( $L_{Aeq, 1hr}$ dB) | Predicted dB Change in ambient noise level and magnitude |
| R1                                                                              | 51                              | 43                                                                | 52 (+1) (Low)                                            |
| R2                                                                              | 52                              | 48                                                                | 54 (+2) (Low)                                            |
| R3                                                                              | 58                              | 43                                                                | 43 (0) (Negligible)                                      |
| R4                                                                              | 52                              | 39                                                                | 39 (0) (Negligible)                                      |

14.8.27 It is important to note that the activities such as crane operations to dismantle or lower wind turbines as part of FLOW, would occur infrequently and similar activities in character currently occur within the site.

14.8.28 FLOW activity noise is predicted to give rise to a low magnitude of change for R1 and R2. Therefore, FLOW activities noise effects on local residents would be permanent and **Minor Adverse**. The effects would be intermittent and therefore not significant.

14.8.29 FLOW activity noise is predicted to give rise to a negligible magnitude of change for R3 and R4. Therefore, FLOW activity noise effects on local residents would be permanent and **Negligible Adverse**. The effects would be intermittent and therefore **not significant**.

### 14.9 Additional Mitigation

#### Demolition and Construction Noise

14.9.1 Due to the temporary nature of impacts, and embedded construction best practice, no additional mitigation is deemed to be required.

#### Demolition and Construction Road Traffic Noise

14.9.2 Due to the temporary nature of impacts, and embedded construction best practice, no additional mitigation is deemed to be required.

#### Operational Road Traffic Noise

14.9.3 No additional mitigation is deemed to be required.

#### Operational activity noise from FLOW operations

14.9.4 No additional mitigation is deemed to be required.

### 14.10 Enhancement Measures

#### Demolition and Construction Noise

14.10.1 No enhancement measures are proposed or required in respect of demolition and construction noise.

#### Demolition and Construction Road Traffic Noise

14.10.2 No enhancement measures are proposed or required in respect of demolition and construction road traffic noise.

#### Operational Road Traffic Noise

14.10.3 No enhancement measures are proposed or required in respect of road traffic noise.

#### Operational activity noise from FLOW operations

14.10.4 No enhancement measures are proposed or required in respect of FLOW operations.

### 14.11 Demolition and Construction Residual Effects

#### Demolition and Construction Noise

14.11.1 As no additional mitigation would be required, the residual operational effects remain as reported in the assessment of effects section.

#### Demolition and Construction Road Traffic Noise

14.11.2 As no additional mitigation would be required, the residual operational effects remain as reported in the assessment of effects section.

### 14.12 Operational Residual Effects

#### Operational Road Traffic Noise

14.12.1 As no additional mitigation would be required, the residual operational effects remain as reported in the assessment of effects section.

#### Operational activity noise from FLOW operations

14.12.2 As no additional mitigation would be required, the residual operational effects remain as reported in the assessment of effects section.

### 14.13 Summary of Significant Effects

14.13.1 Table 14.25 provides a tabulated summary of the outcomes of the Noise and Vibration assessment of the proposed development. It reports on the likely effects with respect to Noise and Vibration associated with the demolition and construction and completed phases of the proposed development.

| Table 14.25: Summary of (Noise & Vibration) Effects                                                 |                                                |                                                                       |                       |                                                                       |                            |                      |                          |                                    |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------|----------------------------|----------------------|--------------------------|------------------------------------|
| Receptor                                                                                            | Description of Effect                          | Pre-Additional Mitigation Effect: Scale/ Nature/ Significance*        | Additional Mitigation | Post-Additional Mitigation Effect: Scale/ Nature/ Significance*       | Details of Residual Effect |                      |                          |                                    |
|                                                                                                     |                                                |                                                                       |                       |                                                                       | Direct/ Indirect           | Permanent/ Temporary | Reversible/ Irreversible | Short-term/ Medium-term/ Long-term |
| Demolition and Construction                                                                         |                                                |                                                                       |                       |                                                                       |                            |                      |                          |                                    |
| R1 and R2 Residential                                                                               | Daytime Demolition and Construction Noise      | Negligible to Minor/ Adverse/ Not Significant                         | Not required          | Negligible to Minor/ Adverse/ Not Significant                         | Direct                     | Temporary            | Reversible               | Short-term                         |
| R3 and R4 Residential                                                                               | Daytime Demolition and Construction Noise      | Negligible /Adverse/ Not Significant                                  | Not required          | Negligible /Adverse/ Not Significant                                  | Direct                     | Temporary            | Reversible               | Short-term                         |
| R2 Residential                                                                                      | Evening Demolition and Construction Noise      | Minor to Moderate/Adverse/ Not significant to Potentially Significant | Not required          | Minor to Moderate/Adverse/ Not significant to Potentially Significant | Direct                     | Temporary            | Reversible               | Short-term                         |
| R1 Residential                                                                                      | Evening Demolition and Construction Noise      | Negligible to Minor/Adverse/Not Significant                           | Not required          | Negligible to Minor/Adverse/Not Significant                           | Direct                     | Temporary            | Reversible               | Short-term                         |
| R3 and R4 Residential                                                                               | Evening Demolition and Construction Noise      | Negligible/Adverse/ Not Significant                                   | Not required          | Negligible/Adverse/ Not Significant                                   | Direct                     | Temporary            | Reversible               | Short-term                         |
| R2 Residential                                                                                      | Night-time Demolition and Construction Noise   | Minor to Moderate/Adverse/ not significant to Potentially Significant | Not required          | Minor to Moderate/Adverse/ not significant to Potentially Significant | Direct                     | Temporary            | Reversible               | Short-term                         |
| R4 Residential                                                                                      | Night-time Demolition and Construction Noise   | Minor/Adverse/Not Significant                                         | Not required          | Minor/Adverse/Not Significant                                         | Direct                     | Temporary            | Reversible               | Short-term                         |
| R1 Residential                                                                                      | Night-time Demolition and Construction Noise   | Negligible to Minor/Adverse/Not Significant                           | Not required          | Negligible to Minor/Adverse/Not Significant                           | Direct                     | Temporary            | Reversible               | Short-term                         |
| R3 Residential                                                                                      | Night-time Demolition and Construction Noise   | Negligible/Adverse/Not Significant                                    | Not required          | Negligible/Adverse/Not Significant                                    | Direct                     | Temporary            | Reversible               | Short-term                         |
| Residential Receptors along C - Tinners Walk<br>E - Bar Road (East of Tinners Walk)                 | Demolition and Construction Road traffic noise | Moderate/Adverse/Potentially Significant                              | Not required          | Moderate/Adverse/Potentially Significant                              | Direct                     | Temporary            | Reversible               | Short-term                         |
| Residential Receptors along A - Melvill Road                                                        | Demolition and Construction Road traffic noise | Minor/Adverse/Not Significant                                         | Not required          | Minor/Adverse/Not Significant                                         | Direct                     | Temporary            | Reversible               | Short-term                         |
| Residential Receptors along B - Bar Road<br>D - Avenue Road                                         | Demolition and Construction Road traffic noise | Negligible/Adverse/Not Significant                                    | Not required          | Negligible/Adverse/Not Significant                                    | Direct                     | Temporary            | Reversible               | Short-term                         |
| Operational Development                                                                             |                                                |                                                                       |                       |                                                                       |                            |                      |                          |                                    |
| Residential Receptors along E - Bar Road (East of Tinners Walk)                                     | Operational development road traffic noise     | Minor/Adverse/Not Significant                                         | Not required          | Minor/Adverse/Not Significant                                         | Direct                     | Permanent            | Irreversible             | Long-term                          |
| Residential Receptors along A - Melvill Road<br>B - Bar Road<br>C - Tinners Walk<br>D - Avenue Road | Operational development road traffic noise     | Negligible/Adverse/Not Significant                                    | Not required          | Negligible/Adverse/Not Significant                                    | Direct                     | Permanent            | Irreversible             | Long-term                          |

| Table 14.25: Summary of (Noise & Vibration) Effects |                                                 |                                    |              |                                    |        |           |              |            |
|-----------------------------------------------------|-------------------------------------------------|------------------------------------|--------------|------------------------------------|--------|-----------|--------------|------------|
| Residential                                         |                                                 |                                    |              |                                    |        |           |              |            |
| R1 and R2                                           | Operational activity noise from FLOW operations | Minor/Adverse/Not Significant      | Not required | Minor/Adverse/Not Significant      | Direct | Permanent | Irreversible | Short-term |
| R3 and R4                                           | Operational activity noise from FLOW operations | Negligible/Adverse/Not Significant | Not required | Negligible/Adverse/Not Significant | Direct | Permanent | Irreversible | Short-term |
| Notes - n/a                                         |                                                 |                                    |              |                                    |        |           |              |            |

14.14 Cumulative Effects

Intra-Project Effects

14.14.1As explained in Chapter 2: EIA Process and Methodology, intra-project cumulative effects are discussed in Chapter 20: Intra-Cumulative Effects.

Inter-Project Effects

14.14.2No development projects have been identified as likely to have inter-project cumulative effect.