East Meath - North Dublin Grid Upgrade Environmental Impact Assessment Report (EIAR): Volume 2

Chapter 9 – Noise and Vibration

EirGrid

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Contents

9. Noise and Vibration

9.1 Introduction

This Chapter presents the assessment of the potential impacts of the East Meath - North Dublin Grid Upgrade (hereafter referred to as the Proposed Development) as a result of noise and vibration arising from the Construction and Operational Phases, and the corresponding effects on noise and vibration sensitive receptors. This assessment is based on information presented in Chapter 4 (Proposed Development Description) in Volume 2 of this Environmental Impact Assessment Report (EIAR).

This assessment considers the potential for the construction and operational activities to give rise to noise and vibration impacts, including the following:

- Construction activity within the Planning Application Boundary (PAB), including open cut trenching, Joint Bays and Passing Bays, cable pulling and jointing, reinstatement, Horizontal Directional Drilling (HDD), construction access routes, Temporary Construction Compounds (TCCs) and upgrades to the existing Woodland and Belcamp Substations;
- Construction vehicle movements on public roads and construction access routes; and
- Operational aspects of the Proposed Development, including the operation of the Woodland and Belcamp Substations.

The likely potential impacts associated with the above activities on human receptors (i.e., dwellings, schools, medical facilities, nursing homes, vibration sensitive commercial premises and other noise and vibration sensitive locations) are considered within this Chapter.

The main sources of noise and vibration will be during the Construction Phase of the Proposed Development. The construction noise and vibration assessment has been undertaken based on the impacts of the construction activities that are proposed, based on experience of construction of these types of electricity and civil infrastructure developments.

9.2 Methodology

9.2.1 Study Area

The study area for the assessment of construction noise is 300 metres (m) from the proposed cable route or any other area within the PAB used for construction including the HDD Compounds, TCCs and works to the substations.

The study area for the construction vibration assessment is 100m from the proposed cable route or any other potential vibration source within the PAB, as vibration effects due to the proposed types of construction activities are not considered likely to occur beyond this distance.

The study area of 300m for construction noise and 100m for construction vibration is taken from the United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) Sustainability and Environmental Appraisal - LA 111 Noise and Vibration, Revision 2 (hereafter referred to as LA 111) (UKHA 2020).

The construction traffic noise study area is defined in LA 111 as 50m from the carriageway edge of any public roads where there is the potential for an increase in Basic Noise Level (BNL) of 1dB(A) or more (the decibel (dB) is a logarithmic unit used to measure sound levels and 'A' refers to A-weighted which is a weighting applied to reflect how sound is perceived by the human ear). BNL calculations are undertaken using traffic flow, speed and percentage of Heavy Goods Vehicles (HGVs) to calculate a reference noise emission for each

road link. The procedure for calculating a BNL is set out by The Calculation of Road Traffic Noise document (hereafter referred to as CRTN) (Department of Transport Welsh Office 1988).

The diversion route study area has been defined in accordance with LA 111 for where the Proposed Development requires full carriageway closures during the night (23:00hrs-07:00hrs) to enable construction works to take place. The diversion route study area has been defined to include a 25m width from the kerb line of the diversion route.

A study area for the operational noise and vibration assessment has not been defined as the approach has been to assess the impacts at the closest sensitive receptor in accordance with the relevant guidelines.

9.2.2 Relevant Guidelines, Policy and Legislation

The guidance documents used in this assessment are:

- British Standards Institution (BSI), British Standard (BS) 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise (hereafter referred to as BS 5228-1) (BSI 2014a). BS 5228-1 is used for all construction noise calculations and assessment;
- BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration (hereafter referred to as BS 5228-2) (BSI 2014b). An assessment of the likelihood of significant impacts as a result of ground-borne vibration has been carried out using the guidance contained within BS 5228-2;
- Environmental Protection Agency (EPA) Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (hereafter referred to as the NG4 Guidance Note for Noise) (EPA 2016);
- EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022) – used to determine environmental impact assessment (EIA) significance;
- BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (hereafter referred to as BS 4142) (BSI 2019);
- National Roads Authority (NRA) Guidelines for Treatment of Noise and Vibration in National Road Schemes (hereafter referred to as NRA Road Noise Guidelines) (NRA 2004);
- National Roads Authority (NRA) Good Practice Guidance for Treatment of Noise during the Planning of National Road Schemes (hereafter referred to as NRA Good Practice Road Noise Guidelines) (NRA 2014);
- United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) LA 111 Noise and Vibration (UKHA 2020); and
- EN 14388:2015 Road Traffic Noise Reducing Devices – Specifications (EN, 2015).

S.I. No. 549/2018 - European Communities (Environmental Noise) Regulations 2018 (as amended) transposes Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise (as amended) (commonly referred to the Environmental Noise Directive (END)) for the strategic control of environmental noise in Ireland. The relevant local authorities are required to prepare noise action plans based on strategic noise mapping to identify how noise will be managed and to deliver their obligations under the END.

Nuisance due to noise is dealt with by Number 7 of 1992 - Environmental Protection Agency Act, 1992 (as amended), and S.I. No. 179/1994 - Environmental Protection Agency Act, 1992 (Noise) Regulations, 1994 (as amended), and Number 27 of 2003 - Protection of the Environmental Act 2003 (as amended). The legislation requires the use of Best Available Techniques to control noise because of human activity "*which may be harmful to human health or the quality of the environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment.*"

Other policy documents relevant to the assessment include:

- Meath County Council (MCC) County Meath Noise Action Plan 2019 (MCC 2019); and
- Dublin Local Authorities including Dublin City Council (DCC), Fingal County Council (FCC), South Dublin County Council (SDCC) and Dún Laoghaire Rathdown County Council (DLRCC) Dublin Agglomeration Third Environmental Noise Action Plan December 2018 – July 2023 (hereafter referred to as the Dublin Agglomeration NAP 2018 – 2023) (DCC; FCC; SDCC; DLRCC 2018).

9.2.3 Data Collection and Collation

Baseline noise monitoring has not been carried out at noise sensitive receptors, as the application of the most stringent noise thresholds for construction and operational noise have ensured that a conservative and proportionate assessment has been achieved. This is a best practice approach used to capture all potential noise impacts. The baseline noise and vibration environment has been characterised through a desk-based study of publicly available published data sources, which are outlined in Section 9.3.

9.2.4 Appraisal Method for the Assessment of Impacts

9.2.4.1 Construction Noise

The potential construction noise impacts from the Proposed Development have been assessed according to BS 5228-1 (BSI 2014a).

A detailed plant list for each construction activity has been developed in conjunction with the project team, including the likely duration of the various activities (see Table 9.3).

Noise levels have been predicted for each noise sensitive receptor in the study area for each construction activity. Where activities vary over time, or move geographically, this has been taken into account by predicting a series of daily noise levels in order for the variation in noise levels to be characterised.

Baseline noise monitoring has not been carried out at noise sensitive receptors since the most stringent thresholds from BS 5228-1 have been used in the assessment. The most stringent BS 5228-1 thresholds are known as Category A and are set out in Table 9.1.

Table 9.1: Construction Noise Thresholds – Category A (BSI 2014a)

Assessment Category and Threshold Value Period	Threshold Value in Decibels (dB) $L_{Aeq,T}$
	Category A
Daytime (07:00hrs to 19:00hrs) and Saturdays (07:00hrs to 13:00hrs)	65
Evenings and weekends (19:00hrs to 23:00hrs weekdays, 13:00hrs to 23:00hrs Saturdays and 07:00hrs to 23:00hrs Sundays)	55
Night-time (23:00hrs to 07:00)	45
Note: dB $L_{Aeq,T}$ is the 'A' weighted equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period, T.	

Table 9.2 presents the magnitude of impact scale for construction noise based on guidance from LA 111 (UKHA 2020) which has been developed from assessment criteria set out in BS 5228-1. In accordance with LA 111, construction noise impacts shall constitute a significant impact where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- A period of 10 or more days or nights of working in any 15 consecutive days or nights; or
- A total number of days exceeding 40 in any six consecutive months.

Table 9.2 also presents the EPA Guidelines (EPA 2022) for the determination of significance based on the magnitude and duration of impact.

Table 9.2: Construction Noise Magnitude Scale and EPA Guidelines Determination of Significance

Magnitude of Impact	Construction Noise Level	Duration	EPA Guidelines Determination of Significance
Major	Above or equal to BS 5228-1 Category A threshold +5dB	> 10 days/nights over 15 consecutive days/nights; or > 40 days over six consecutive months	Significant
Moderate	Above or equal to BS 5228-1 Category A threshold and below BS 5228-1 Category A +5dB		Moderate to Significant
Minor/ Negligible	Below BS 5228-1 Category A threshold		Not Significant

The indicative construction programme is presented in Chapter 4 (Proposed Development Description) in Volume 2 of this EIAR. Construction is due to begin, subject to obtaining planning permission, in Quarter 3 (Q3) of 2026 and is due to finish in Quarter 4 (Q4) 2029.

Working hours during construction are typically expected to be:

- Weekdays 07:00hrs to 19:00hrs; and
- Weekends and bank holidays 08:00hrs to 14:00hrs.

There may be localised instances where construction work is required outside of normal working hours to facilitate traffic management, and this will only be undertaken with prior agreement with Meath and Fingal County Councils. For the purposes of the noise and vibration assessment, the construction activities have been divided into two categories:

- Those that remain in a fixed location, for example a HDD Compound or a Joint Bay; and
- Those where the activities move geographically, for example the advanced works or the excavation and ducting activities.

The construction activities will be phased, and full details of the phasing works are presented in Chapter 4 (Proposed Development Description) in Volume 2 of this EIAR. The basic elements of the Construction Phase are as follows:

- Phase 0: Site Establishment and Advanced Works;
- Phase 1: Installation of Passing Bays and Joint Bay structures;
- Phase 2: Excavation and installation of ducts; and
- Phase 3: Installation of cables.

Based on the programme information presented in Chapter 4 (Proposed Development Description) in Volume 2 of this EIAR, the following durations are set out in terms of assessing the construction noise impact from fixed work locations:

- The duration of the installation of each Joint Bay and each Passing Bay (Phase 1 of the works) will be approximately six days. Installation and reinstatement of the Joint Bays and Passing Bays is expected to start in Q4 2026 and last until Q3 2029;
- The duration of the construction of each TCC will be approximately 20 days, though they will be in operation for the full duration of the Construction Phase. Construction of the TCCs is likely to begin in Q3 2026;
- The duration of each HDD construction works will be approximately 54 days and will be undertaken during Phase 2 of the works. Construction works in relation to HDD works including the HDD compounds is likely to begin in Q3 2026 and be completed in Q3 2027;
- Construction of installation and jointing of cables (Phase 3 of the works) is likely to begin in Q4 2026 and last until Q3 2029; and

- Construction works at the substations is proposed to begin Q2 2027 and last until Q2 2029. The works at the Woodland Substation are expected to last approximately seven months, while the works at Belcamp Substation are expected to last approximately 17 months.

Based on the programme information presented in Chapter 4 (Proposed Development Description) in Volume 2 of the EIAR, the following rates of progress are anticipated for construction activities which will move geographically:

- Devegetation works are expected to progress at a rate of 200m per day. These activities are provisionally programmed for Q3 2026; and
- Excavation and installation of ducts (Phase 2 of the works) are expected to progress at a rate of 50m per day. These activities are likely to begin in Q3 2026 and be completed in Q4 2027.

Construction noise levels have been predicted using the CadnaA noise prediction software (DataKustik 2023). Two separate noise models have been constructed, one for the fixed works and another for the works which will move geographically.

For the fixed works model, noise sources have been positioned in the approximate centre of the works areas to represent the plant and equipment operating during each construction activity. The distances between the sensitive receptors and the construction areas have been calculated based upon supplied Ordnance Survey Ireland (OSI) Prime 2 data (OSI 2023). Construction area locations have been identified using the planning drawings for the Proposed Development, which are included as standalone drawings in the planning application pack. The sensitivity of the receptor has been identified using the OSI Prime 2 data. Contour data was obtained from the Earth Data website (NASA 2023) and all buildings have been assumed to be 6m high. Free field predictions have been made, which have been converted to facade levels (+3 dB) through post-processing of the results. Receiver points have been positioned 1.5m above ground to represent ground floor noise levels. First floor predictions have been made at 4m above ground. A ground absorption layer has been added to the model with acoustically hard areas (e.g. roads and water bodies) set to G=0; mixed areas set to G=0.5 and greenfield areas set to G=1.

For the moving works model, flat terrain between noise sources and receiver points has been assumed and no screening objects have been included within the noise model. Ground cover between noise sources and receivers has been assumed as acoustically hard with G=0. All noise sources are assumed to be operating at a height of 2m above ground level, and noise predictions at receiver points have been made at 1.5m (ground level) and 4m (first-floor level). The predicted noise levels from the noise model have been included within an analysis tool that calculates noise levels at each sensitive receptor, due to works at the closest of each construction activity. The tool assesses whether a receptor is likely to exceed the BS 5228-1 (BSI 2014a) Category A threshold noise levels (65dB on weekdays and Saturday mornings) for a period of 10 or more days in any 15 consecutive days, or a total number of days exceeding 40 in any six consecutive months.

A list of proposed construction activities and plant / equipment has been developed using the information in Chapter 4 (Proposed Development Description) in Volume 2 of the EIAR, along with additional information gathered from the project team and experience of similar projects. Table 9.3 presents a list of the proposed construction activities and plant items along with the percentage on-time and sound level taken from BS 5228-1.

Table 9.3: Proposed Construction Activities and Items of Plant

Activity	Item of Plant (BS 5228-1 Ref) (BSI 2014a)	% On-Time	Sound Power (L_w dB)
Phase 0 – Site Establishment and Advanced Works	Tracked Excavator (C.2.14)	40	107
	Circular Bench Saw (C.4.71)	20	113
Phase 1 – Passing Bays	Tracked Excavator (C.2.14)	50	107
	Dumper (C.4.3)	50	104
	Asphalt Paver (& tipper lorry) (C.5.31)	25	105
	Hydraulic vibratory compacter (C.2.42)	20	106
	Vibratory Roller (C.5.25)	20	103
Phase 1 – Joint Bays	Tracked Excavator (C.2.14)	50	107
	Dumper (C.4.3)	50	104
	Asphalt Paver (& tipper lorry) (C.5.31)	25	105
Phase 2 – Trenching and Ducting	Road Planer (C.5.7)	40	110
	Tracked Excavator (C.2.14)	50	107
	Dumper (C.4.3)	50	104
	Asphalt Paver (& tipper lorry) (C.5.31)	25	105
	Lorry (C.2.34)	50	108
	Hydraulic vibratory compacter (C.2.42)	50	106
	Vibratory Roller (C.5.25)	50	103
Phase 3 – Installation and jointing of cables	Wheeled Loader (C.4.13)	50	99
	Lorry (C.2.34)	30	108
	Telescopic Handler (C.4.54)	30	107
HDD	Tracked Drilling Rig (C.3.15)	100	110
	Directional Drill (Generator) (C.2.44)	100	105
	Wheeled Backhoe Loader (C.4.66)	30	97
	Tracked Excavator (C.2.14)	30	107
	Vibratory Roller (C.5.25)	30	103
Construction Access Route	Lorry (C.2.34)	50	108
	Dozer (C.2.11)	50	107
TCCs	Tracked Excavator (C.2.14)	40	107
	Diesel Generator (C.4.76)	100	89
	Telescopic Handler (C.4.54)	30	107
	Dozer (C.2.11)	40	107
	Vibratory Roller (C.5.25)	30	103
Substation Works	Tracked Excavator (C.2.14)	40	107
	Diesel Generator (C.4.76)	100	89
	Vibratory Roller (C.5.25)	25	103
	Telescopic Handler (C.4.54)	30	107

9.2.4.2 Construction Vibration

The potential vibration impacts from the Proposed Development have been assessed according to BS 5228-2 (BSI 2014b).

For the vibration calculations, ground compaction has been considered as a possibility everywhere within the PAB, and vibratory piling as a possibility at all HDD Compounds, which represents a precautionary approach as these have the potential to result in the greatest levels of vibration. Vibration levels experienced during construction will be influenced by factors including the number of surface layers, the thickness, density and

stiffness of surface layers, the depth of the water table, the topography of the site and the operating frequency of the plant.

Table 9.4 presents the magnitude of construction vibration impacts for human perception at residential receptors which have been reproduced from LA 111 (UKHA 2020) and BS 5228-2. In accordance with LA 111, construction vibration impacts shall constitute a significant impact where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- A period of 10 or more days of working in any 15 consecutive days; or
- A total number of days exceeding 40 in any six consecutive months.

Table 9.4 also presents the EPA Guidelines (EPA 2022) for the determination of significance based on the magnitude and duration of the impact.

Table 9.4: Construction Vibration Magnitude Scale and Determination of Significance for Human Perception at Residential Receptors

Magnitude of Impact	Construction Vibration Level	Duration	EPA Guidelines Determination of Significance
Major	Above or equal to 10.0mm/s PPV	> 10 days/nights over 15 consecutive days/nights; or > 40 days over six consecutive months	Significant
Moderate	Above or equal to 1.0mm/s PPV and below 10.0 mm/s PPV		Moderate to Significant
Minor	Above or equal to 0.3mm/s PPV and below 1.0mm/s PPV		Not Significant
Negligible	Below 0.3mm/s PPV		Not Significant
Note: mm/s = millimetres per second, PPV = Peak Particle Velocity			

BS 5228-2 states that vibration levels of 1.0 mm/s PPV can be tolerated if prior warning and explanation has been given to residents.

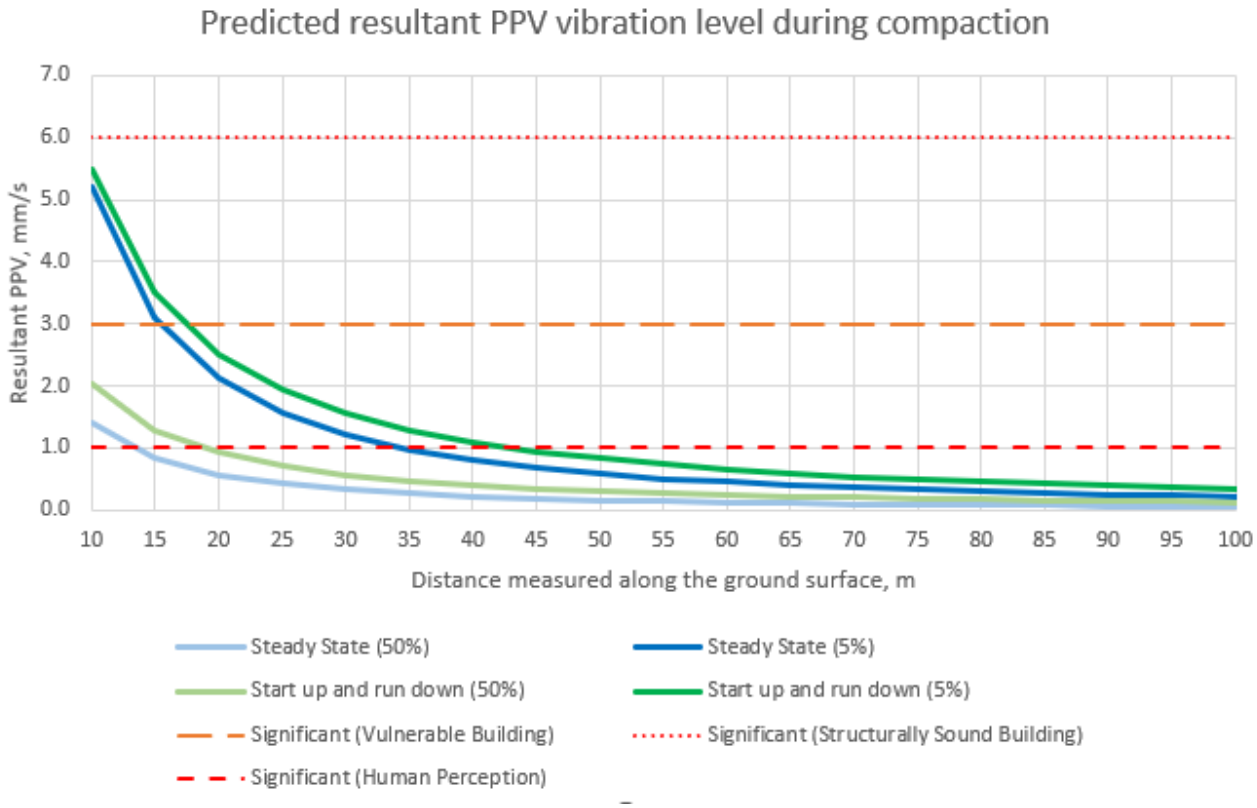
LA 111 recommends that the risk of structural damage due to construction vibration is also considered by reference to the criteria set out in BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration (hereafter referred to as BS 7385-2) (BSI 1993). Based upon this, BS 5228-2 and the professional experience of the assessment team, the criteria presented in Table 9.5 have been adopted.

Table 9.5: Construction Vibration Criteria to Prevent Cosmetic Damage to Buildings

Time Period	Potentially Vulnerable Building	Structurally Sound Building
All time periods	3.0mm/s PPV	6.0mm/s PPV

Vibration predictions during vibratory compaction have been made using the prediction formulae presented in Table E.1 of BS 5228-2. This Section presents the data inputs, assumptions and predictions. Predictions of vibration levels during compaction have been undertaken using technical data from a BOMAG BW211 Soil Compactor. This is a large single drum compactor with an operating weight of 13 tonnes, gross power of 98kW (kilowatts) and a compaction width of 2.1m.

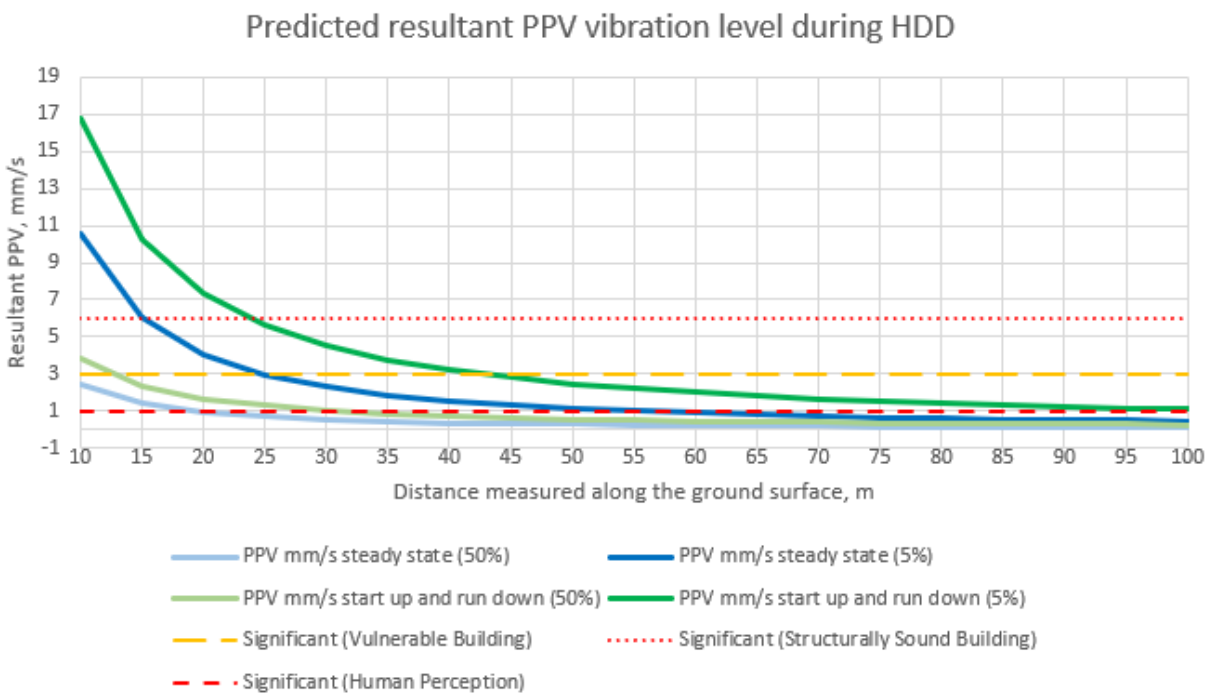
Graph 9.1 shows the resultant Peak Particle Velocity (PPV) vibration levels predicted for steady state and start up / run down (transient) compaction with 50% and 5% scaling factors, denoting the probability of the predicted value being exceeded.



Graph 9.1: Predicted Resultant PPV Vibration Level During Compaction

As Graph 9.1 shows, during steady state working, and at a distance of approximately 14m, there is a 50% probability of 1.0mm/s PPV being exceeded, with a 5% probability of 1.0mm/s PPV being exceeded at a distance of approximately 35m. During the transient start up and run down conditions, the distances at which 1.0mm/s PPV is predicted to be exceeded are approximately 20m (50% probability) and 45m (5% probability).

Graph 9.2 presents the resultant PPV vibration levels predicted for steady state and start up / run down (transient) during HDD works with 50% and 5% scaling factors, denoting the probability of the predicted value being exceeded. The only input parameter for the prediction method adopted (Table E.1 of BS 5228-2) was the distance measured along the ground surface. All other conditions are included in the constants and scaling factors within the empirical calculation.



Graph 9.2: Predicted Resultant PPV Vibration Level During HDD

During steady state working, and at a distance of approximately 18m, there is a 50% probability of 1.0 mm/s PPV being exceeded, with a 5% probability of 1.0mm/s PPV being exceeded at a distance of approximately 55m. During the transient start up and run down conditions, the distances at which 1.0 mm/s PPV is predicted to be exceeded are approximately 30m (50% probability) and 100m (5% probability).

9.2.4.3 Construction Traffic Noise and Vibration and Diversion Routes

Construction traffic noise predictions have been undertaken using the CRTN methodology (Department for Transport Welsh Office 1988) to predict the BNL at each road on the day with the largest number of construction vehicles to ensure the peak impacts are assessed. All construction traffic flow data are presented in Chapter 14 (Traffic and Transport) in Volume 2 of the EIAR.

The calculations included the following standard assumptions:

- Speed of 88km/hr (kilometres per hour) (in accordance with the CRTN for a single carriageway road, more than 9m wide);
- Impervious road surface; and
- No correction for road gradient.

An assessment of the proposed diversion routes has been undertaken using the methodology from LA 111 (UKHA 2020).

Table 9.6 presents the magnitude of impact for construction traffic noise and diversion routes based on guidance from LA 111 and the determination of significance based on the EPA Guidelines (EPA 2022). In accordance with LA 111, construction traffic noise and diversion impacts shall constitute a significant impact where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

- A period of 10 or more days of working in any 15 consecutive days; or
- A total number of days exceeding 40 in any six consecutive months.

Table 9.6: Magnitude of Impact and Determination of Significance for Construction Traffic Noise and Diversion Routes

Magnitude of Impact	Change in BNL Resulting from Construction Traffic Noise (dB)	Duration	EPA Guidelines Determination of Significance (EPA 2022)
Major	Greater than or equal to 5.0	> 10 days/nights over 15 consecutive days/nights; or > 40 days over six consecutive months	Significant
Moderate	Greater than or equal to 3.0 and less than 5.0		Moderate to Significant
Minor	Greater than or equal to 1.0 and less than 3.0		Not Significant
Negligible	Less than 1.0		Not Significant

9.2.4.4 Operational Noise and Vibration

Underground cables are not considered to be a noise source because soil covering the cables acts as an insulator preventing any significant noise emission above the ground. Therefore, operational noise impacts are not expected as a result of the underground cabling element of the Proposed Development. However, there is the potential for a permanent increase in environmental noise at local receptors close to upgraded / extended substations during the operation of the Proposed Development. At both Woodland and Belcamp Substations, compensation reactors will be installed as part of the Proposed Development, which have the potential to produce audible levels of noise. An assessment has been carried out using the NG4 Guidance Note for Noise (EPA 2016) to predict whether the reactors are likely to result in permanent noise impacts at receptors close to the substations. As a precautionary approach, the area around Woodland Substation has been considered as an area of 'low background noise' due to the rural location of the substation. Due to the proximity of road and air noise sources, Belcamp Substation has been considered as an 'all other areas' with corresponding noise limits shown in Table 9.7.

Table 9.7: Noise Limit Criteria (Reproduced from NG4 Guidance Note for Noise (EPA 2016))

Scenario	Daytime Noise Criterion, dB $L_{ar, T}$ (07:00 to 19:00 hrs)	Evening Noise Criterion, dB $L_{ar, T}$ (19:00 to 23:00 hrs)	Night-time Noise Criterion, dB $L_{ar, T}$ (23:00 to 07:00 hrs)
Areas of low background noise	45dB	40dB	35dB
All other areas	55dB	50dB	45dB

Where noise limits outlined in Table 9.7 are exceeded as a result of operational noise from the Proposed Development, the impact is considered Significant. However, where operational noise levels are equal to or below the limits outlined in Table 9.7, the impact is considered Not Significant.

Operational vibration impacts due to the Proposed Development are considered unlikely because the type of plant to be installed at the substations will not generate any vibration during operation. In addition, the underground cables are not likely to generate any vibration during the Operational Phase.

9.2.4.5 Sensitive Receptors

Receptors that are particularly sensitive to noise and / or vibration have been identified using guidance from the NRA Road Noise Guidelines (NRA 2004) and LA 111 (UKHA 2020). Examples of such receptors are dwellings, schools, hospitals, places of worship, heritage buildings, special habitats, amenity areas in common use and designated quiet areas. Counts of noise and vibration sensitive receptors within 300m of the Proposed Development have been made using guidance from the NRA Road Noise Guidelines.

Both the NRA Road Noise Guidelines and LA 111 note that receptors may have various sensitivities to noise, but do not specifically define a sensitivity scale. All sensitive receptors have been categorised as residential or 'other' sensitive receptors. Commercial and industrial receptors have not been assessed as they are generally considered less sensitive to noise and / or vibration.

9.2.4.6 Limitations of the Assessment

Baseline noise surveys have not been carried out for this assessment as the approach has been to use the most stringent noise limits from BS 5228-1, (BSI 2014a) known as Category A, to determine the magnitude of impact and the significance of impact.

9.3 Baseline Environment

9.3.1.1 Introduction

Baseline noise levels are likely to vary along the Proposed Development, with higher noise levels closer to transport infrastructure and during peak periods of transport activity. The main noise sources are likely to be from road traffic noise and airport noise. The proposed cable route will cross the M3, M2 and M1 Motorways, as well as regional roads including the R156, R157, R147, R121, R135, R122, R108 and R132 Regional Roads. Noise associated with Dublin Airport is also present in the baseline environment, particularly close to Belcamp Substation. Other noise sources in the baseline environment include rail noise, particularly where the Dublin to M3 Parkway railway line runs close to the M3 Motorway.

No baseline noise surveys have been undertaken for this assessment, as the approach for the assessment has been to use the most stringent noise limits from BS 5228-1, (BSI 2014a) known as Category A, to assess the construction and operational noise impacts from the Proposed Development.

9.3.1.2 Strategic Noise Maps

Round 4 strategic noise maps (EPA 2023) have been produced under the requirements of the END by the EPA for road, rail, airport and industrial noise. The road noise maps show the strategic noise mapping of all roads in the form of noise contours for the L_{den} (day, evening, night) period and the L_{night} (night) period for the Dublin, Limerick and Cork agglomerations, and the major roads outside of the agglomerations. Major roads were identified as those roads exceeding the flow threshold of three million passages per year. The rail noise maps show the strategic noise mapping of rail in the form of noise contours for the L_{den} (day, evening and night) and L_{night} (night) periods for the Dublin, Limerick and Cork agglomerations, and the major railway lines outside of the agglomerations. Major railway lines were identified as those railway lines exceeding the flow threshold of 30,000 train passages per year. The airport noise maps show the strategic noise mapping of airports, in the form of noise contours for the L_{den} (day, evening and night) and L_{night} (night) periods for Dublin, Limerick and Cork agglomerations airports and major airports outside the agglomerations. Major airports were identified as those airports exceeding the threshold of 50,000 aircraft movements per year. The industry noise maps show the strategic noise mapping for industrial areas in the form of noise contours for the L_{den} (day, evening and night) and L_{night} (night) periods for Dublin, Limerick and Cork agglomerations.

The strategic noise mapping shows road traffic noise levels are high at receptors in the following parts of the study area and are likely to be exposed to noise levels exceeding the BS 5228-1 (BSI 2014a) Category A thresholds:

- Where the proposed cable route will cross the M3 Motorway (e.g. in Paceland and Piercetown);
- Where the proposed cable route will follow the R121 Regional Road;
- Where the proposed cable route will cross the M2 Motorway;
- Where the proposed cable route will cross the R135 Regional Road;
- Where the proposed cable route will follow the R122 Regional Road;
- Where the proposed cable route will follow the R108 Regional Road;
- Where the proposed cable route will cross the R132 Regional Road; and
- Where the proposed cable route will cross the M1 Motorway.

The study area does not contain any strategic noise mapping for rail noise or industrial noise.

The strategic noise maps show that noise from Dublin Airport is likely to be audible throughout the study area with airport noise exceeding 60dB L_{den} close to Dublin Airport.

9.3.1.3 Woodland Substation

Woodland Substation is located in a rural area approximately 2km from the village of Batterstown in County Meath. The closest sensitive receptor (a dwelling) is located over 600m from the substation. The main noise sources in the baseline noise environment are likely to be from road traffic noise and transformer noise at the substation.

9.3.1.4 Belcamp Substation

Belcamp Substation is located approximately 1km east of Junction 3 of the M1 Motorway and approximately 200m north of the R139 Regional Road. The closest sensitive receptor is the Craobh Chiaráin GAA pitches which are located around 250m from the substation while the closest residential receptors are located in Cara Park approximately 300m from the substation. The main noise sources in the baseline noise environment are likely to be from road traffic noise and airport noise.

9.3.1.5 Temporary Construction Compounds

There are a total of seven proposed TCCs associated with the Proposed Development:

- Temporary Construction Compound 0 (TCC0) will be located at Chainage 0 within the existing Woodland Substation off the Redbog Road. The main noise source in the baseline noise environment is likely to be road traffic noise and noise from the existing Woodland substation. The closest sensitive receptor (a dwelling) is located over 600m from TCC0;
- Temporary Construction Compound 1 (TCC1) will be located at Chainage 3,550 just off the R156 Regional Road and the main noise source in the baseline noise environment of the proposed compound area is likely to be road traffic noise. The closest sensitive receptor is located approximately 75m from TCC1;
- Temporary Construction Compound 2 (TCC2) will be located at Chainage 10,600 just off the R156 Regional Road and the main noise source in the baseline noise environment of the proposed compound area is likely to be road traffic noise. The closest sensitive receptor is located approximately 65m from TCC2;
- Temporary Construction Compound 3 (TCC3) will be located at Chainage 21,600 in Hollystown where road traffic noise is likely to be the main noise source in the baseline noise environment of the proposed compound area. The closest sensitive receptor is located approximately 80m from TCC3;
- Temporary Construction Compound 4 (TCC4) will be located at Chainage 26,850 just off the R121 Regional Road. Road traffic noise is likely to be the main noise source in the baseline noise environment of the proposed compound area with occasional noise from agricultural activities. The closest sensitive receptor is located approximately 140m from TCC4;
- Temporary Construction Compound 5 (TCC5) will be located at Chainage 34,700 just off Stockhole Lane approximately 260m from the M1 Motorway. The baseline noise environment in the proposed compound area is likely to be dominated by road traffic noise and airport noise is also likely to be present. The closest sensitive receptor is located approximately 175m from TCC5; and
- Temporary Construction Compound 6 (TCC6) will be located at Chainage 37,500 just off Stockhole Lane adjacent to Belcamp Substation. The baseline noise environment in the

proposed compound area is likely to be dominated by road traffic noise and airport noise. The closest sensitive receptor is located approximately 460m from TCC6.

9.3.1.6 HDD Compounds

There will be three HDD crossings along the proposed cable route (with six HDD Compounds in total):

- HDD1 – M3 Motorway and adjacent Railway crossing (HDD1a and HDD1b Compounds). The baseline noise environment in the compound location is likely to be dominated by road traffic noise with rail noise also present. The closest sensitive receptor is located approximately 60m away;
- HDD2 – M2 Motorway crossing (HDD 2a and HDD 2b Compounds). The baseline noise environment in the compound location is likely dominated by road traffic noise with airport noise also present. The closest sensitive receptor is located approximately 40m away; and
- HDD3 – M1 Motorway crossing (HDD 3a and HDD 3b Compounds). The baseline noise environment in the compound location is likely to be dominated by road traffic noise and airport noise. The closest sensitive receptor is located approximately 280m away.

9.3.1.7 Joint Bays

Joint Bays are anticipated to be located every 750m along the proposed cable route and there will be 49 Joint Bays in total. The baseline noise environment in the Joint Bay locations is expected to be dominated by road traffic noise particularly in the in-road sections.

9.3.1.8 Passing Bays

Passing Bays are temporary traffic mitigation measures and will be located at 14 of the in-road Joint Bays. The baseline noise environment at the Passing Bay locations is likely to be dominated by road traffic noise.

9.3.1.9 Sensitive Receptor Counts

Table 9.8 shows the noise and vibration sensitive receptor counts within the 300m study area associated with the Proposed Development. Sensitive receptors have been identified using desktop information including OSI Prime 2 data (accessed September 2023) (OSI 2023) and Google Maps (accessed January 2024). There are a total of 763 receptors within 300m, made up mainly of dwellings but also other sensitive receptors including a school and three nursing homes.

Table 9.8: Sensitive Receptor Counts from the Proposed Development

Buffer Distance (m)	Number of Dwellings	Number of Other Sensitive Receptors	Total Number of Receptors
0 – 20	28	0	28
20 – 50	205	2	207
50 – 100	110	3	113
100 – 200	196	3	199
200 – 300	214	2	216
Total	**753**	**10**	**763**

9.3.1.10 Vibration Baseline

There are no significant sources of vibration within the PAB for the Proposed Development. Road traffic, in particular HGVs, may produce vibration, but the levels are likely to be negligible and not perceptible by humans at sensitive receptors.

9.4 Potential Impacts

9.4.1 'Do Nothing' Scenario

In the absence of the Proposed Development itself, the impact would be Neutral for noise and vibration. However, if the Proposed Development does not go ahead, noise levels are expected to increase through natural traffic growth and an increase in airport noise due to the expected expansion of Dublin Airport.

9.4.2 Construction Phase

9.4.2.1 Noise

Construction noise levels from the fixed works have been predicted at each receptor in the study area using CadnaA noise modelling software (DataKustik 2023). Table 9.9 presents a summary of the receptors which meet or exceed the 65dB threshold for each construction activity, the magnitude of impact, the corresponding duration of the works and the determination of significance. Some activities close to each other may run concurrently and, where this is the case, this has been taken into account. There are no receptors within 300m of Woodland Substation, and therefore, no noise predictions have been undertaken at this location.

Table 9.9: Summary of Receptors Exceeding 65dB Threshold for Weekdays and Saturday Mornings Without Mitigation for Fixed Construction Activities

No. of Receptors Meeting or Exceeding 65 dB Threshold	Construction Activity	Highest Predicted Noise Level (dB LAeq,T)	LA 111 Magnitude of Impact	Duration of Impact at Sensitive Receptor	LA 111 Determination of Significance	Significance of Impact
3	HDD2 (M2 Motorway crossing)	74	Major	54 days	Potentially significant as impact is Major, and duration of works will exceed 10 days in any 15-day period.	Adverse, Significant and Temporary in the absence of mitigation measures.
5	HDD1 (M3 Motorway crossing)	73	Major	54 days	Potentially significant as impact is Major, and duration of works will exceed 10 days in any 15-day period.	Adverse, Significant and Temporary in the absence of mitigation measures.
39	Phase 1 (Installation of Joint Bays and Passing Bays)	83	Major	6 days	Not Significant as duration will not exceed 10 days in any 15-day period.	Adverse, Not Significant and Temporary in the absence of mitigation measures.
28	Phase 3	81	Major	6 days	Not Significant as duration does will not exceed 10 days in any 15-day period.	Adverse, Not Significant and Temporary in the absence of mitigation measures.

Table 9.9 shows that noise levels will exceed the 65dB threshold at construction activities associated with HDD works across the M2 and the M3 Motorways. At both locations, the duration of the HDD works will exceed 10 days in any 15-day period. Therefore, the potential impact is assessed as Adverse, Significant and Temporary in the absence of mitigation measures. It is expected that certain activities within the HDD works will begin during daytime but may extend into the evening and night-time. For example, the pullback element of the HDD works is likely to take place during night-time hours but will only last around 24 to 48 hours. Therefore, the evening and night-time impacts are assessed as Adverse, Moderate and Temporary in the absence of mitigation measures. Image 9.1 and Image 9.2 show the location of the receptors expected to experience significant adverse impacts during construction works at HDD2 and HDD1, respectively.

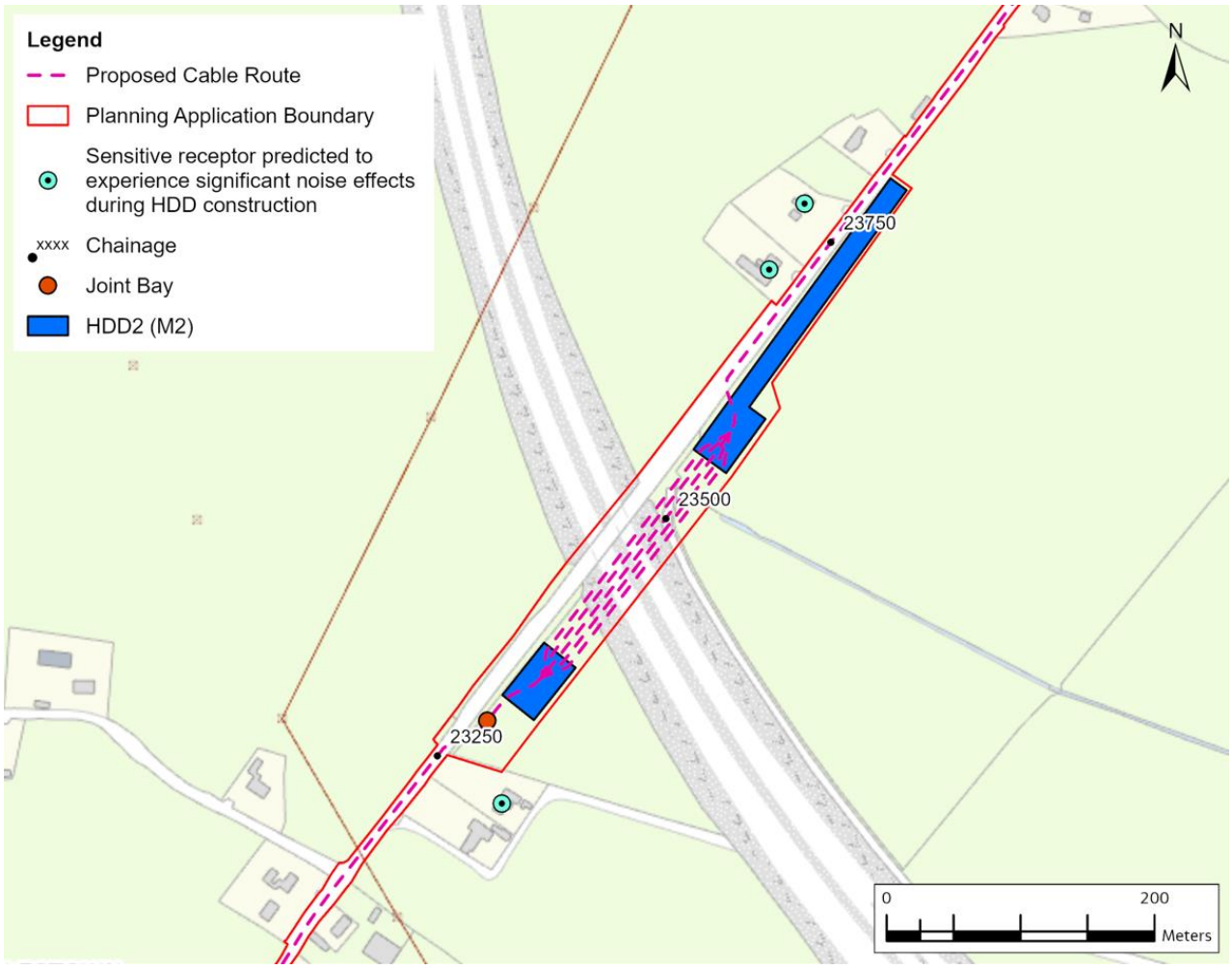


Image 9.1: Noise-Sensitive Receptors Predicted to Experience Adverse, Significant and Temporary Impacts during Construction Works at HDD2 Crossing

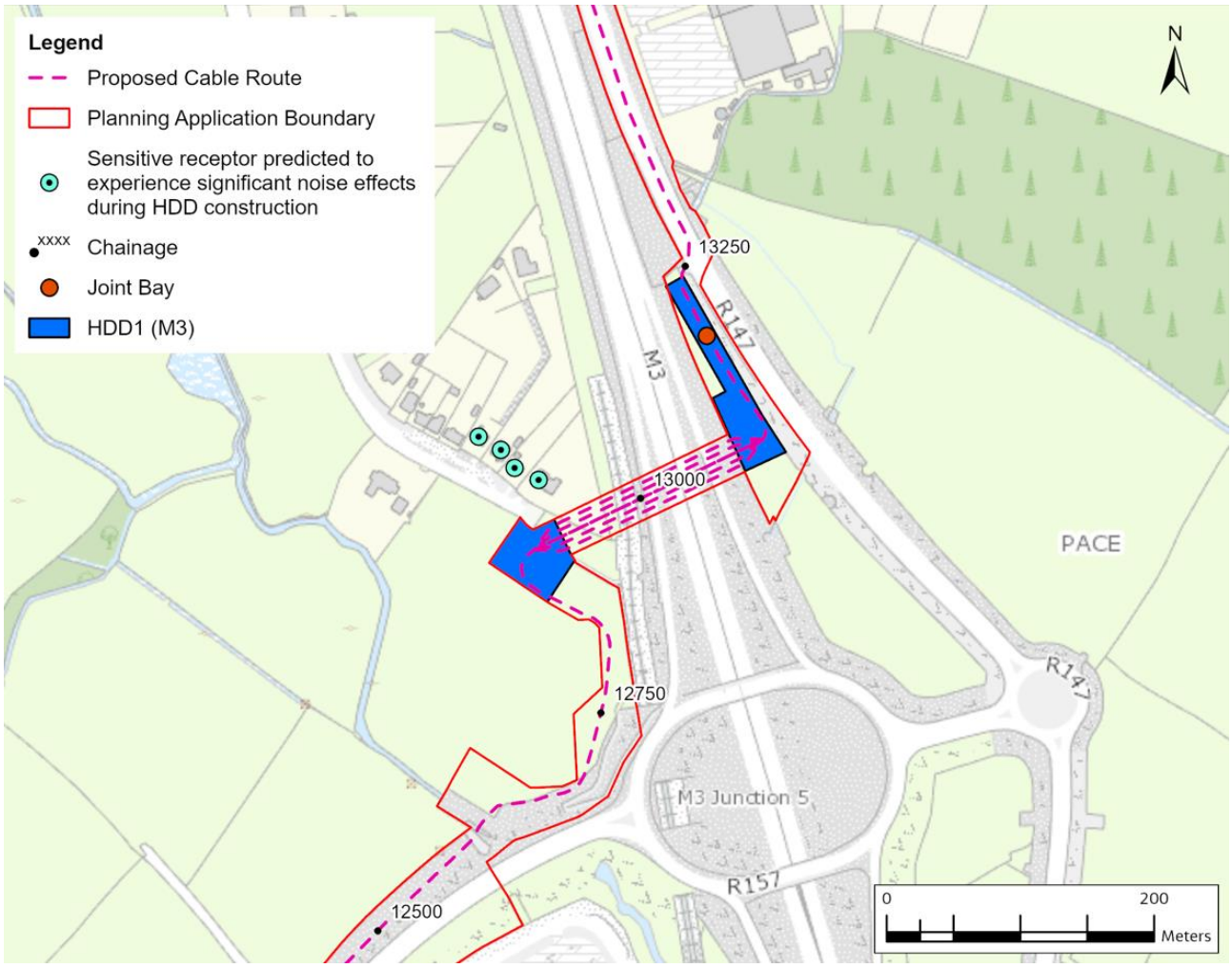


Image 9.2: Noise-Sensitive Receptors Predicted to Experience Adverse, Significant and Temporary Impacts during Construction Works at HDD1 Crossing

Construction activities associated with Phases 1 and 3 of the works will exceed the 65dB threshold but are not considered significant because the duration of the works at each Joint Bay and Passing Bay is not expected to exceed 10 days in any 15-day period. The potential impacts are assessed as Adverse, Not Significant and Temporary. Construction works at the TCCs and at the two substations are not predicted to exceed the 65dB threshold. Therefore, the potential impacts are assessed as Adverse, Not Significant and Temporary.

Construction noise levels for the works which progress at a daily rate have been calculated for Phase 0 (Devegetation Works), Phase 2 (Excavation and Installation of Cable Ducts) and works to the proposed access roads. The highest noise level predicted during Phase 0 was 72dB, while the highest noise level predicted during Phase 2 was 80dB. Both levels are above the weekday and Saturday morning threshold and will result in a major impact. However, as the works are proposed to progress at a rate of 200m a day for Phase 0 and 50m a day for Phase 2, the 10 days in any 15-day period criteria are not likely to be exceeded. Therefore, the potential impacts are assessed as Adverse, Not Significant and Temporary. Works to access roads are not expected to exceed the 65dB threshold, and therefore, the potential impact is assessed as Adverse, Not Significant and Temporary.

9.4.2.2 Vibration

During the Construction Phase of the Proposed Development, the main activities likely to result in perceptible vibration levels are vibratory compaction and HDD. Table 9.10 outlines the potential impacts from vibratory

compaction using the information presented in Graph 9.1. The results are based upon a 5% probability of the relevant thresholds being exceeded.

Table 9.10: Potential Impacts from Vibratory Compaction

Vibratory Compaction	Threshold (mm/s PPV)	Distance from Work Site (m)	Number of Receptors Potentially Affected	LA111 Magnitude and Significance	Determination of Significance
Human Perception at Residential Receptors					
Steady State	0.3	35-80	142	Minor - Not Significant	Neutral, Not Significant and Temporary
	1	6-35	168	Moderate - Not Significant as works will not exceed 10 days in any 15-day period	Adverse, Not Significant and Temporary
	10	<6	0	Major - Not Significant as works will not exceed 10 days in any 15-day period	Neutral, Not Significant and Temporary as no receptors affected
Transient (start up and run down)	0.3	45-115	158	Minor – Not Significant	Neutral, Not Significant and Temporary
	1	6-45	211	Moderate – Not Significant as works will not exceed 10 days in any 15-day period	Adverse, Not Significant and Temporary
	10	<6	0	Major – Not Significant as works will not exceed 10 days in any 15-day period	Neutral, Not Significant and Temporary as no receptors affected
Cosmetic Damage for Buildings					
Steady State	3	10-16	0	-	-
	6	<10	0	-	-
Transient (start up and run down)	3	10-18	0	-	-
	6	<10	0	-	-

Table 9.10 shows that vibratory compaction impacts relating to human perception at residential receptors are not considered to be significant. This is because, although moderate impacts are predicted in some instances, the receptors will experience the effects for less than 10 days. Therefore, the potential impacts is assessed as Adverse, Not Significant and Temporary. Minor impacts are assessed as Neutral and Not Significant and there are no major impacts. In terms of cosmetic damage, there are no buildings anticipated to experience cosmetic damage as a result of vibratory compaction.

Table 9.11 shows the potential impacts from vibratory piling at HDD works using the information presented in Graph 9.2. The results are based upon a 5% probability of the relevant thresholds being exceeded, which is in accordance with BS 5228-2 (BSI 2014b).

Table 9.11: Potential Impacts from HDD Works

HDD Works	Threshold (mm/s PPV)	Distance from Work Site (m)	Number of Receptors Potentially Affected	LA111 Magnitude and Significance	Determination of Significance
Human Perception at Residential Receptors					
Steady State	0.3	55-115	7	Minor - Not Significant	Neutral, Not Significant and Temporary
	1	11-55	1	Moderate – Potentially significant as works will take around 54 days to complete	Adverse, Moderate to Significant and Temporary
	10	<11	0	Major – No receptors affected therefore not significant	Neutral, Not Significant and Temporary
Transient (start up and run down)	0.3	105-255	16	Minor - Not Significant	Neutral, Not Significant and Temporary
	1	16-105	7	Moderate Potentially significant as works will take around 54 days to complete	Adverse, Moderate to Significant and Temporary
	10	<16	0	Major - No receptors affected therefore not significant	Neutral, Not Significant and Temporary
Cosmetic Damage for Buildings					
Steady State	3	15-25	0	-	-
	6	<15	0	-	-
Transient (start up and run down)	3	24-42	0	-	-
	6	<24	0	-	-

Table 9.11 shows that vibration impacts from HDD works at HDD1 (M3 Motorway) and HDD2 (M2 Motorway) related to human perception at residential receptors are assessed as Adverse, Moderate to Significant and Temporary, given that the works are proposed to take 54 days to complete, and therefore mitigation measures are required. Minor impacts are assessed as Neutral and Not Significant and there are no major impacts. HDD vibration impacts related to cosmetic damage to buildings are not likely to occur as a result of the construction works.

9.4.2.3 Construction Traffic and Proposed Diversions

The traffic data, BNLs and the expected construction traffic noise change are presented in Table 9.12. The calculations show that the highest traffic noise increase will be 1.7dB which is a minor magnitude of impact, and the potential impact is assessed as Not Significant according to LA 111 (UKHA 2020). Therefore, the potential impacts in relation to construction traffic on surrounding roads are assessed as Neutral and Not Significant.

Table 9.12: Construction Traffic Data

Road Link	Construction Phase 2026: Base			Construction Phase 2026: Base + Construction Traffic			Construction Traffic Noise Change (dB)
	AADT	% HGV	BNL	AADT	% HGV	BNL	
R125 Regional Road, between R154 and R156 Regional Roads	1482	11.9	64.4	1,643	15.5	65.4	1.0
R156 Regional Road, east of R125 Regional Road	3934	14.4	69.0	4,107	15.7	69.4	0.4
The Red Road, south of R154 Regional Road	223	11.2	56.1	315	8.6	57.2	1.1
R154 Regional Road, east of Batterstown	5816	11.0	70.2	5,856	11.0	70.2	0.0
R156 Regional Road, east of L2215 Local Road	4462	13.0	69.4	4,666	14.9	69.8	0.4
M3 Parkway	1942	6.3	64.7	1,942	6.3	64.7	0.0
R155 Regional Road, at Fairyhouse Racecourse	8549	9.2	71.6	8,549	9.2	71.6	0.0
L1007 Local Road, at Fidorfe Solar Farm	2378	8.7	66.0	2,378	8.7	66.0	0.0
Nuttstown Road, west of Belgree Court	1789	11.4	65.2	1,899	16.0	66.0	0.8
L1007 Local Road, at Forge Cross	3899	7.8	68.0	3,919	7.8	68.0	0.0
L1007 Local Road, south of Kilbride Lane	3635	8.6	67.8	3,706	10.3	68.2	0.4
Kilbride Lane, south of Sutton Farm Road	1031	11.0	62.7	1,102	16.7	63.8	1.1
R135 Regional Road, north of L2023 Local Road	5948	14.2	70.8	6,019	15.2	71.0	0.2
R130 Regional Road, south of R125 Regional Road	1388	15.9	64.7	1,388	15.9	64.7	0.0
R125 Regional Road, between R122 and R130 Regional Roads	6130	11.8	70.6	6,130	11.8	70.6	0.0
R122 Regional Road, south of Kilcoskan	1526	18.2	65.4	1,526	18.2	65.4	0.0
R121 Regional Road, west of R122 Regional Road	2458	12.2	66.7	2,656	15.6	67.5	0.8
R122 Regional Road, south of St. Margaret's Golf and Country Club	3013	9.1	67.1	3,121	11.9	67.6	0.5
Kilreesk Lane	2217	8.7	65.7	2,319	12.5	66.4	0.7
R122 Regional Road, north of Kilreesk Lane	1156	10.6	63.1	1,254	17.5	64.4	1.3
R122 Regional Road, west of L3132 Local Road	4462	13.0	69.4	4,560	14.8	69.7	0.3
R108 Regional Road, south of R125 Regional Road	5136	12.7	69.9	5,136	12.7	69.9	0.0
R125 Regional Road, east of Rowlestown	6596	10.6	70.7	6,596	10.6	70.7	0.0
R125 Regional Road, west of New Dairy Lane	7743	9.4	71.2	7,743	9.4	71.2	0.0
R132 Regional Road, north of R106 Regional Road	31278	10.4	77.4	31,278	10.4	77.4	0.0
R106 Regional Road, east of M1 Motorway	17717	5.2	74.1	17,717	5.2	74.1	0.0
R107 Regional Road, north of Feltrim Road	10278	6.4	71.9	10,278	6.4	71.9	0.0
R107 Regional Road, south of Feltrim Road	15769	6.6	73.8	15,769	6.6	73.8	0.0
Baskin Lane, west of Rahulk Lane	7736	7.9	71.0	7,791	8.5	71.1	0.1
Stockhole Lane, north of Baskin Lane	9294	7.0	71.6	9,465	7.7	71.8	0.2
Stockhole Lane, north of R139 Regional Road	9778	6.9	71.8	9,946	7.5	72.0	0.2
R139 Regional Road, east of Clonshaugh Road	39371	10.4	78.4	39,412	10.5	78.4	0.0

Road Link	Construction Phase 2026: Base			Construction Phase 2026: Base + Construction Traffic			Construction Traffic Noise Change (dB)
	AADT	% HGV	BNL	AADT	% HGV	BNL	
Hollywood, west of Chapelwood Drive	887	8.8	61.7	1,097	14.0	63.4	1.7
R135, south of Broughan Lane	6462	22.5	72.1	6,573	23.9	72.4	0.3
R122, north of R108	12439	16.3	74.3	12,550	17.1	74.4	0.1
R108, north of Harristown Road	8525	21.2	73.2	8,525	21.2	73.2	0.0
R132, north of Old Airport Road	24679	14.7	77.0	24,679	14.7	77.0	0.0
Drumree Road (N)	753	7.2	60.7	753	7.2	60.7	0.0
R154 Regional Road (NW)	9634	7.5	71.8	9,795	8.2	72.0	0.2
R154 Regional Road (SE)	5622	7.2	69.4	5,662	7.2	69.5	0.1
R125 Regional Road (NE)	6934	6.2	70.2	7,095	7.1	70.4	0.2
R154 Regional Road (NW)	8240	7.6	71.2	8,240	7.6	71.2	0.0
R125 Regional Road (SW)	2126	7.1	65.2	2,287	9.9	66.0	0.8
R154 Regional Road (SE)	9683	7.5	71.9	9,844	8.1	72.0	0.1
R156 Regional Road (NW)	3545	7.8	67.6	3,545	7.8	67.6	0.0
R125 Regional Road (SW)	982	7.5	61.9	982	7.5	61.9	0.0
R156 Regional Road (SE)	4093	7.0	68.0	4,254	8.6	68.5	0.5
R156 Regional Road (NE)	1523	5.4	63.5	1,684	9.5	64.6	1.1
R157 Regional Road (NE)	14337	6.7	73.4	14,619	7.3	73.6	0.2
R156 Regional Road (NW)	5463	7.1	69.3	5,721	8.9	69.8	0.5
R157 Regional Road (SW)	8872	5.4	71.1	8,872	5.4	71.1	0.0
L2228 Local Road (E)	5932	6.3	69.5	5,932	6.3	69.5	0.0
M3 Motorway On/Off Slip (N)	2414	5.2	65.4	2,724	10.4	66.8	1.4
R157 Regional Road (W)	15212	5.2	73.4	15,512	6.1	73.7	0.3
M3 Motorway On/Off Slip (S)	20578	7.5	75.1	20,888	8.1	75.3	0.2
R157 Regional Road (E)	18592	7.6	74.7	18,691	8.0	74.8	0.1
R147 Regional Road (N)	21469	6.6	75.2	21,579	7.1	75.3	0.1
R157 Regional Road (W)	18504	7.6	74.7	18,603	8.1	74.8	0.1
R147 Regional Road (S)	6850	8.2	70.5	6,949	9.5	70.8	0.3
R147 Regional Road (N)	19562	6.0	74.6	19,602	6.0	74.7	0.1
R147 Regional Road (S)	21435	6.6	75.2	21,534	7.1	75.3	0.1
L5026 Local Road Piercetown (E)	3213	10.2	67.5	3,312	12.9	68.0	0.5
R147 Regional Road (NW)	8910	5.7	71.2	8,910	5.7	71.2	0.0
R154 Regional Road (W)	5927	7.0	69.6	5,967	7.0	69.7	0.1
R147 Regional Road (SE)	18754	6.1	74.5	18,794	6.1	74.5	0.0
R155 Regional Road (NE)	7531	5.4	70.4	7,531	5.4	70.4	0.0
Woodland Road (NW)	5269	3.3	68.4	5,269	3.3	68.4	0.0
Somerville (SW)	1599	1.9	62.9	1,599	1.9	62.9	0.0
R155 Regional Road (S)	9020	2.6	70.6	9,020	2.6	70.6	0.0
R155 Regional Road (NE)	4590	2.0	67.5	4,590	2.0	67.5	0.0
R125 Regional Road (W)	8134	2.4	70.1	8,134	2.4	70.1	0.0
R155 Regional Road (S)	4559	2.0	67.5	4,559	2.0	67.5	0.0
R125 Regional Road (E)	10677	2.1	71.2	10,677	2.1	71.2	0.0
Skryne Road (NW)	5299	4.5	68.7	5,299	4.5	68.7	0.0
R125 Regional Road (W)	8900	2.2	70.5	8,900	2.2	70.5	0.0
R125 Regional Road (S)	13038	3.2	72.3	13,038	3.2	72.3	0.0
Glebe Lane (NE)	106	15.1	53.4	106	15.1	53.4	0.0
Main Street (NW)	13495	3.2	72.5	13,495	3.2	72.5	0.0
The Avenue (SW)	7787	2.7	70.0	7,787	2.7	70.0	0.0
Ratoath Childcare Access (SE)	353	1.1	56.2	353	1.1	56.2	0.0
R125 Regional Road (E)	17682	3.5	73.7	17,682	3.5	73.7	0.0
R125 Regional Road (W)	11686	3.2	71.9	11,686	3.2	71.9	0.0
Kilbride Road (E)	2703	2.3	65.3	2,703	2.3	65.3	0.0
Main Street (S)	9498	3.6	71.0	9,498	3.6	71.0	0.0
R135 Regional Road (N)	6627	9.4	70.5	6,627	9.4	70.5	0.0
R135 Regional Road (S)	7683	9.9	71.3	7,683	9.9	71.3	0.0
R130 Regional Road (NE)	3416	7.1	67.3	3,416	7.1	67.3	0.0
R135 Regional Road (N)	7632	9.9	71.2	7,632	9.9	71.2	0.0
R121 Regional Road (W)	3104	5.4	66.6	3,247	9.4	67.4	0.8
R135 Regional Road (S)	6359	12.5	70.8	6,569	14.2	71.2	0.4
R121 Regional Road (E)	2948	7.0	66.6	3,142	10.2	67.4	0.8
R121 Regional Road (N)	2835	5.6	66.2	3,092	7.6	66.9	0.7

Road Link	Construction Phase 2026: Base			Construction Phase 2026: Base + Construction Traffic			Construction Traffic Noise Change (dB)
	AADT	% HGV	BNL	AADT	% HGV	BNL	
Kilbride Road (W)	6496	3.1	69.3	6,687	5.9	70.0	0.7
R121 Regional Road (S)	3337	5.4	66.8	3,535	6.2	67.3	0.5
Kilbride Road (E)	5510	5.2	69.0	5,711	8.3	69.7	0.7
Kilbride Road (NW)	5895	4.8	69.2	6,244	7.6	70.0	0.8
Roundabout Link Road (W)	5971	7.1	69.7	5,971	7.1	69.7	0.0
Corduff Road (S)	13743	15.0	74.5	13,743	15.0	74.5	0.0
Roundabout Link Road (NE)	13514	16.3	74.6	13,863	17.3	74.8	0.2
N2 National Road On/Off Slip (NW)	6001	16.7	71.1	6,370	18.7	71.7	0.6
Roundabout Link Road (SW)	14884	17.3	75.2	15,233	18.1	75.4	0.2
N2 National Road On/Off Slip (SE)	11122	17.2	73.9	11,491	18.3	74.2	0.3
Roundabout Link Road (NE)	6454	17.7	71.6	6,664	19.2	71.9	0.3
R135 Regional Road (N)	6069	12.6	70.6	6,279	14.4	71.0	0.4
Roundabout Link Road (W)	6465	17.8	71.6	6,675	19.3	71.9	0.3
R135 Regional Road (S)	6387	17.0	71.5	6,387	17.0	71.5	0.0
R108 Regional Road (N)	14083	10.5	74.0	14,205	11.1	74.1	0.1
Kilreesk Road (W)	3448	6.9	67.3	3,559	9.8	67.9	0.6
L3132 Local Road (S)	12991	11.0	73.7	13,102	11.7	73.9	0.2
R108 Regional Road (E)	1098	7.5	62.4	1,098	7.5	62.4	0.0
R108 Regional Road (N)	11456	6.6	72.4	11,456	6.6	72.4	0.0
R108 Regional Road (SW)	14317	9.4	73.9	14,439	10.1	74.0	0.1
Naul Road (E)	11600	9.9	73.0	11,728	10.8	73.2	0.2
R132 Regional Road (NE)	23964	5.7	75.5	23,964	5.7	75.5	0.0
Naul Road (NW)	15676	10.1	74.4	15,804	10.8	74.5	0.1
N132 National Road (S)	29543	7.4	76.7	29,822	7.9	76.8	0.1
Stockhole Lane (SE)	10059	2.6	71.1	10,232	3.4	71.3	0.2
R836 Regional Road (N)	13245	2.9	72.3	13,245	2.9	72.3	0.0
R132 Regional Road (SW)	19080	5.1	74.4	19,080	5.1	74.4	0.0
R125 Regional Road (S)	18225	2.4	73.6	18,225	2.4	73.6	0.0
R132 Regional Road (E)	27509	4.0	75.7	27,509	4.0	75.7	0.0
R125 Regional Road (N)	7443	2.6	69.8	7,443	2.6	69.8	0.0
R125 Regional Road (W)	15121	3.0	72.9	15,121	3.0	72.9	0.0
Rathbeale Road (E)	11923	2.8	71.9	11,923	2.8	71.9	0.0
Balheary Road (N)	16841	3.4	73.5	16,841	3.4	73.5	0.0
Castlegrange Green (W)	985	3.1	61.1	985	3.1	61.1	0.0
R125 Regional Road (S)	8011	4.2	70.4	8,011	4.2	70.4	0.0
R125 Regional Road (E)	18680	4.5	74.2	18,680	4.5	74.2	0.0
R132 Regional Road (N)	36170	4.9	77.1	36,170	4.9	77.1	0.0
R125 Regional Road (W)	23593	4.7	75.2	23,593	4.7	75.2	0.0
R132 Regional Road (S)	32900	5.0	76.7	32,900	5.0	76.7	0.0
Local Road (E)	4178	1.8	67.1	4,178	1.8	67.1	0.0
R132 Regional Road (N)	32838	4.9	76.7	32,838	4.9	76.7	0.0
Seatown Road (W)	8914	1.4	70.3	8,914	1.4	70.3	0.0
R132 Regional Road (S)	31953	4.4	76.5	31,953	4.4	76.5	0.0
Seatown Road (E)	9985	7.5	72.0	9,985	7.5	72.0	0.0
R132 Regional Road (N)	31971	4.4	76.5	31,971	4.4	76.5	0.0
R106 Regional Road (W)	14992	3.4	73.0	14,992	3.4	73.0	0.0
R132 Regional Road (SW)	26880	3.9	75.6	26,880	3.9	75.6	0.0
Drynam Road (S)	4396	2.2	67.4	4,396	2.2	67.4	0.0
R106 Regional Road (E)	18798	3.9	74.1	18,798	3.9	74.1	0.0
Applegreen Access (N)	4215	1.9	67.1	4,215	1.9	67.1	0.0
R106 Regional Road (W)	18608	4.1	74.1	18,608	4.1	74.1	0.0
Mountgorry Way (S)	17173	4.2	73.7	17,173	4.2	73.7	0.0
R106 Regional Road (E)	18969	2.9	73.9	18,969	2.9	73.9	0.0
R106 Regional Road (N)	11556	3.5	71.9	11,556	3.5	71.9	0.0
R106 Regional Road (W)	13403	3.4	72.5	13,403	3.4	72.5	0.0
R107 Regional Road (S)	11620	3.0	71.8	11,620	3.0	71.8	0.0
Clonshaugh Road (N)	13265	6.5	73.1	13,429	7.0	73.2	0.1
R139 Regional Road (W)	54782	5.9	79.1	54,984	6.1	79.1	0.0
Unused Arm (S)	8	0.0	39.5	8	0.0	39.5	0.0

Road Link	Construction Phase 2026: Base			Construction Phase 2026: Base + Construction Traffic			Construction Traffic Noise Change (dB)
	AADT	% HGV	BNL	AADT	% HGV	BNL	
R139 Regional Road (E)	54702	5.1	78.9	54,743	5.2	79.0	0.1
R147(N)	5853	10.3	70.1	5,952	11.8	70.4	0.3
R147(S)	4855	5.8	68.6	4,855	5.8	68.6	0.0
Bracetown Business Park	3003	16.0	68.0	3,102	18.7	68.5	0.5
R135 (N)	6209	18.2	71.5	6,209	18.2	71.5	0.0
L3120 (W)	9082	20.2	73.4	9,082	20.2	73.4	0.0
R135 (S)	8083	25.5	73.4	8,194	26.5	73.6	0.2
L3120 (E)	10803	15.8	73.6	10,914	16.7	73.7	0.1
R122	12728	11.5	73.7	12,839	12.3	73.8	0.1
L3120	10433	15.3	73.4	10,544	16.2	73.5	0.1
R108 (S)	11391	10.1	73.0	11,391	10.1	73.0	0.0
R108 (E)	857	12.1	62.1	857	12.1	62.1	0.0
R108 (N)	11350	10.1	73.0	11,350	10.1	73.0	0.0
R122	8328	11.8	71.9	8,328	11.8	71.9	0.0
R108 (E)	6249	19.0	71.6	6,249	19.0	71.6	0.0
R108	7182	18.2	72.1	7,182	18.2	72.1	0.0
Harristown Road	4727	32.6	71.8	4,727	32.6	71.8	0.0
R108	15445	14.0	74.9	15,445	14.0	74.9	0.0
Old Airport Road	13458	11.7	74.0	13,458	11.7	74.0	0.0
R132	20011	8.9	75.2	20,011	8.9	75.2	0.0
Old Airport Road	13581	11.6	74.0	13,581	11.6	74.0	0.0
Swords Road	15769	13.2	74.9	15,769	13.2	74.9	0.0
Cemetery	921	1.1	60.4	921	1.1	60.4	0.0
R132 (N)	17759	8.0	74.6	17,759	8.0	74.6	0.0
Corballis Road S	11617	14.2	73.7	11,617	14.2	73.7	0.0
R132(S)	19995	8.9	75.2	19,995	8.9	75.2	0.0
Eastland's Road	8287	6.5	71.0	8,287	6.5	71.0	0.0
R132 (N)	25849	8.1	76.2	26,128	8.7	76.4	0.2
Airport Exit	18725	5.1	74.3	18,725	5.1	74.3	0.0
Airport Access	16757	4.5	73.7	16,757	4.5	73.7	0.0
R132 (S)	18600	7.9	74.8	18,600	7.9	74.8	0.0
M1 Link Road	44733	6.4	78.3	45,012	6.7	78.4	0.1

Table 9.13 shows the likely impact and significance of the 14 proposed diversion routes required to facilitate full road closures during construction of the Proposed Development. The locations of the proposed diversion routes are shown in the Construction Traffic Management Plan (Appendix B of the CEMP, which is included as a standalone document in the planning application pack), and in Figure 14.3 in Volume 4 of the EIAR.

Table 9.13: Proposed Diversion Routes and Determination of Noise Significance

Diversion Route	Noise Change dB	LA 111 Magnitude of Impact	Approximate Duration of Diversion Phase 1 / Phase 3 (days)	Approximate Duration of Diversion During Phase 2 (days)	LA 111 Significance of Impact	Determination of Significance
Route 1.2	6.0dB	Major	18 / 8	134	Significant during Phase 1 and Phase 2 only	Adverse, Significant and Temporary
Route 1.6	3.2dB	Moderate	n/a / 8	50	Significant during Phase 2 only	Adverse, Moderate to Significant and Temporary
Route 1.7	2.4dB	Minor	n/a / 10	19	Not Significant	Adverse, Not Significant and Temporary
Route 1.9	2.4dB	Minor	n/a / 10	11	Not Significant	Adverse, Not Significant and Temporary
Route 1.10	2.4dB	Minor	n/a / 10	42	Not Significant	Adverse, Not Significant and Temporary
Route 1.12	2.4dB	Minor	8 / 8	26	Not Significant	Adverse, Not Significant and Temporary
Route 1.14	6.8dB	Major	7 / 16	34	Significant Phase 2 and Phase 3 only	Adverse, Significant and Temporary
Route 1.16	6.8dB	Major	10 / 18	20	Significant during all three phases	Adverse, Significant and Temporary
Route 1.18	3.8dB	Moderate	n/a	20	Significant during Phase 2 only	Adverse, Moderate to Significant and Temporary
Route 1.20	3.8dB	Moderate	n/a / 10	36	Significant Phase 2 and Phase 3 only	Adverse, Moderate to Significant and Temporary
Route 1.21	4.9dB	Moderate	8 / 8	50	Significant during Phase 2 only	Adverse, Moderate to Significant and Temporary
Route 1.23	4.9dB	Moderate	8 / 8	24	Significant during Phase 2 only	Adverse, Moderate to Significant and Temporary
Route 1.24	5.6dB	Major	7 / 5	37	Significant during Phase 2 only	Adverse, Significant and Temporary
Route 1.25	4.7dB	Moderate	n/a	2	Not Significant	Adverse, Not Significant and Temporary

Table 9.13 shows that the LA 111 magnitude of impact at diversion routes 1.2, 1.14, 1.16 and 1.24 is Major and the duration thresholds are exceeded (UKHA 2020) . Therefore, potential significant adverse impacts are expected at sensitive receptors within 25m of these routes. The magnitude of impact for Routes 1.6, 1.18, 1.20, 1.21 and 1.23 is Moderate and the duration thresholds are exceeded therefore potential significant

impacts are expected at receptors within 25m of these routes. Significant impacts are not expected for Route 1.25 as this diversion is not expected to exceed the duration criteria of 10 days in any 15-day period even though the potential impact is Moderate. Significant impacts are not anticipated at Routes 1.7, 1.9, 1.10 and 1.12 as the magnitude of impact is Minor. It should be noted that individual diversion routes will be in place for a maximum of nine months so any noise impact will be Temporary.

Construction traffic is not anticipated to give rise to perceptible ground borne vibration at receptors within the PAB. For example, a HGV over an irregular road surface is likely to result in PPV levels below 0.3 mm/s, for which the potential impact is assessed as Neutral impact and Not Significant.

9.4.3 Operational Phase

Once constructed, the majority of the Proposed Development will result in no noise or vibration. However, a transformer and a compensation reactor will be installed as part of the works at Belcamp Substation. Noise data for the transformer and compensation reactor are shown in Table 9.14.

Table 9.14: Operational Noise Data

Noise Source	Frequency (Hertz (Hz))								
	31.5	63	125	250	500	1000	2000	4000	8000
Transformer	94	100	102	97	97	91	86	81	74
Compensation Reactor	85	91	93	88	88	82	77	72	65

There are residential receptors approximately 300m to the south of Belcamp Substation and Craobh Chiaráin GAA pitches approximately 250m to the east of the substation. A CadnaA noise model has been used to calculate the operational noise levels from the Proposed Development at the closest receptors (DataKustik 2023). Table 9.15 shows the results of the predicted operational noise level at the closest receptors along with night-time noise criterion taken from the NG4 Guidance Note for Noise (EPA 2016).

Table 9.15: Operational Noise Assessment at Belcamp Substation

Distance to Receptor	Noise Level Predicted at Closest Sensitive Receptor	Night-Time Noise Criterion (23:00hrs to 07:00hrs)
300m (Residential receptors in Cara Park)	42dB(A)	45dB(A)
250m (Craobh Chiaráin GAA pitches)	39dB(A)	45dB(A)
* Taken from NG4 Guidance Note for Noise Table 1 for 'All Other Areas' (EPA 2016)		

Table 9.15 shows that the predicted noise levels at the closest receptors will be below the 45dB night-time noise criterion, and therefore, no operational noise impacts are anticipated. The potential impact is assessed as Neutral and Not Significant.

Additional electrical equipment will be installed at Woodland Substation, including a shunt reactor and transformers. However, there are no sensitive receptors within 300m of Woodland Substation, and therefore, no adverse Operational Phase noise impacts are anticipated at Woodland Substation.

The equipment to be installed as part of the Proposed Development will not produce high levels of vibration and, as a result, vibration impacts during the Operational Phase are not likely.

In terms of the Environmental Noise Regulations 2018, future noise action plans by the relevant competent authorities are not likely to be affected as they deal with managing the operational impacts from road, rail, air and industry noise sources. The Proposed Development is not likely to result in any significant increase in operational noise which would require noise management by the relevant authorities in the future.

9.5 Mitigation and Monitoring Measures

9.5.1 Construction Phase

9.5.1.1 Construction Works

This assessment has shown that there is the potential for significant construction noise and vibration impacts at the nearest sensitive receptors associated with the HDD works at the M2 and the M3 Motorway crossings. Construction activities will comply with BS 5228-1 (BSI 2014a) and BS 5228-2 (BSI 2014b) and the following measures will be implemented during construction:

- The appointed contractor will comply with local authority controls on noise and vibration during construction;
- Noise barriers will be installed around the following HDD Compounds, and acoustic enclosures will be placed around the HDD plant:
    - HDD2 M2 Motorway (Chainage 23,550). Noise barriers will be placed on the perimeter of both launch and receiver HDD Compounds (HDD Compound 2a and 2b) to screen noise at the nearest sensitive receptors;
    - HDD1 M3 Motorway (Chainage 12,800). Noise barriers will be placed on the perimeter of both launch and receiver HDD Compounds (HDD 1a and 1b) to screen noise at the nearest sensitive receptors;
    - The noise barriers will be within the PAB. The requirement for the noise barriers will be confirmed pre-construction through confirmatory assessment following detailed design for the HDD (within the parameters assessed in this EIAR). The location of the noise barrier will be set out and agreed with the local planning authority in advance of the works designed to keep noise levels within the specified limits. If it can be demonstrated to the local authorities that the barriers are not required, in accordance with the limits in this assessment, then they will not be provided, subject to agreement with the local planning authority;
    - BS 5228-1 states that a noise barrier which blocks the line of sight between the source and the receptor would result in an approximate attenuation of 10dB. Therefore, the noise barriers will be designed to block the line of sight between the noise source and the affected receptors;
    - Noise barriers will comply with the standard BS EN 14388:2015 – Road traffic noise reducing devices. Specifications (BSI 2015);
    - Portable acoustic enclosures will be placed around the HDD plant in HDD2 and HDD1 including the drilling rig and the generator. Acoustic enclosures will surround the noise source in order to reduce noise levels at nearby receptors;
    - Local residents will be kept informed of any HDD works taking place outside normal working hours;
    - All valid complaints will be dealt with expeditiously and appropriate action will be taken;
    - The routing, depth, locations, and drilling types of the proposed HDD works will be carefully selected to avoid effects. Confirmatory structural surveys will be completed pre-construction at all structures that will be crossed or that are within 50m of the HDD locations. Monitoring by the appointed contractor of these locations will occur during the HDD works, and the surveys will be repeated post-construction. In the extremely unlikely event of repairs being required, these will be immediately undertaken in agreement with the structure owner; and
    - During the HDD works, constant monitoring by the specialist drilling team will be carried out. The volume of cuttings produced will also be monitored to ensure that no over cutting takes place and that hole cleaning is maintained. The nature of the cuttings will

also be monitored to understand the ground conditions as the drilling progresses. The CEMP (included as a standalone document in the planning application pack) will be updated pre-construction with further information of HDD monitoring, when the appointed contractor is appointed, and will be agreed with stakeholders including the local authorities, Transport Infrastructure Ireland, Waterways Ireland, and Irish Rail.

- The appointed contractor will develop and implement a Stakeholder Communications Plan which will facilitate community engagement prior to the commencement of construction;
- Only plant conforming with or better than relevant national or international standards (including BS 5228-1 and BS 5228-2), directives or recommendations on noise or vibration emissions will be selected and used. Construction plant will be maintained in good condition with regards to minimising noise and vibration emissions;
- Plant will be operated and maintained appropriately, with due regard for manufacturer recommendations. All vehicles, plant and equipment will be switched off when not in use;
- Where practicable, gates (to TCCs, HDD Compounds and construction areas) will not be located opposite noise sensitive receptors;
- Routes and programming for the transport of construction materials, spoil and personnel will be carefully selected to reduce the risk of increased noise and vibration impacts during construction;
- Vehicle and mechanical plant / equipment used for the purpose of the works will be fitted with effective exhaust silencers, to be maintained in good working order and operated in such a manner to minimise noise emissions;
- Construction plant and activities will be positioned appropriately to minimise noise at sensitive locations;
- Equipment that breaks concrete by pulverising or similar, rather than by percussion, will be used close to noise sensitive locations;
- Mufflers will be used on pneumatic tools;
- Works will be programmed to minimise the requirement for working outside normal working hours;
- Unnecessary revving of engines and idling will be avoided;
- Plant and vehicles will be started-up sequentially rather than all together;
- Drop height of materials will be minimised;
- Rubber linings will be used in, for example, chutes and dumpers to reduce impact noise;
- Any plant, such as generators, which are required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen;
- Low vibratory or non-vibratory plant will be used when working in close proximity to a vibration sensitive receptor;
- Vibratory equipment will be started-up or turned off as far away from sensitive receptors as possible; and
- All site access roads will be kept even to reduce vibration.

9.5.1.2 Diversion Routes

There is the potential for significant impacts in association with some diversion routes. As a result, the following mitigation measures have been identified and will be implemented:

- Road closures and diversion routes will be minimised; and
- Suitable advanced warning of road closures will be provided to residents within 25m of the affected diversion routes.

9.5.2 Operational Phase

The assessment has shown that during the Operational Phase, the potential impacts will be Neutral and Not Significant, and therefore, no mitigation measures are required.

9.6 Residual Impacts

9.6.1 Construction Phase

9.6.1.1 Noise

Table 9.16 outlines the construction activities that have the potential to experience significant noise impacts, without the application of appropriate mitigation measures, and the significance of impact with the application of appropriate mitigation, as outlined in Section 9.5.

Table 9.16: Construction Activities with Potential Significant Noise Impacts (Pre-Mitigation) and the Predicted Impacts (Post-Mitigation)

Construction Activity	Potential Significance of Impact (Pre-Mitigation)	Predicted Significance of Impact (Post-Mitigation)
HDD2 (M2 Motorway)	Adverse, Significant and Temporary in the absence of mitigation measures	Adverse, Not Significant and Temporary with mitigation measures in place
HDD1 (M3 Motorway)	Adverse, Significant and Temporary in the absence of mitigation measures	Adverse, Not Significant and Temporary with mitigation measures in place

Following the implementation of mitigation measures, there are no predicted significant residual noise impacts as a result of HDD works. Residual impacts in relation to all other construction noise activities are assessed as Adverse, Not Significant and Temporary.

9.6.1.2 Vibration

Table 9.17 outlines the potential vibration impacts associated with some of the HDD works in relation to human perception at residential receptors are assessed as Adverse, Moderate to Significant and Temporary in the absence of mitigation measures. With the implementation of the mitigation measures outlined in Section 9.5, including giving prior warning to affected residents, the predicted impacts are assessed as Adverse, Not Significant and Temporary.

Table 9.17: Construction Activities with Potential Significant Vibration Impacts (Pre-Mitigation) and the Predicted Impacts (Post-Mitigation)

Construction Activity	Potential Significance of Impact (Pre-Mitigation)	Predicted Significance of Impact (Post-Mitigation)
HDD2 (M2 Motorway)	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Not Significant and Temporary with mitigation measures in place
HDD1 (M3 Motorway)	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Not Significant and Temporary with mitigation measures in place

Following the implementation of mitigation measures, there are no predicted significant residual vibration impacts as a result of HDD works. Residual impacts in relation to all other construction vibration activities are assessed as Adverse, Not Significant and Temporary.

9.6.1.3 Construction Traffic and Proposed Diversions

Table 9.18 outlines the potential impacts for diversion routes predicted to experience significant adverse impacts, in the absence of mitigation. There are no appropriate measures to mitigate impacts resulting from diversion routes, so the impact will remain as Adverse, Significant and Temporary at the diversion routes shown in Table 9.18.

Table 9.18 Diversion Routes with Significant Effects Pre-Mitigation and the Impact Post-Mitigation

Construction Activity	Potential Significance of Impact (Pre-Mitigation)	Predicted Significance of Impact (Post-Mitigation)
Diversion Route 1.2	Adverse, Significant and Temporary in the absence of mitigation measures	Adverse, Significant and Temporary
Diversion Route 1.6	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Moderate to Significant and Temporary
Diversion Route 1.14	Adverse, Significant and Temporary in the absence of mitigation measures	Adverse, Significant and Temporary
Diversion Route 1.16	Adverse, Significant and Temporary in the absence of mitigation measures	Adverse, Significant and Temporary
Diversion Route 1.18	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Moderate to Significant and Temporary
Diversion Route 1.20	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Moderate to Significant and Temporary
Diversion Route 1.21	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Moderate to Significant and Temporary
Diversion Route 1.23	Adverse, Moderate to Significant and Temporary in the absence of mitigation measures	Adverse, Moderate to Significant and Temporary
Diversion Route 1.24	Adverse, Significant and Temporary in the absence of mitigation measures	Adverse, Significant and Temporary

9.6.2 Operational Phase

No significant noise or vibration impacts are considered likely during the Operational Phase. Therefore, the residual impact is assessed as Neutral and Not Significant.

9.7 Conclusion

A noise and vibration impact assessment has been carried out on the Proposed Development, in line with relevant guidelines, policies and standards. Potential significant adverse noise and vibration impacts have been identified, associated with HDD works at the M2 and the M3 Motorway crossings. However, the impacts will be temporary, and with the application of the mitigation measures outlined in Section 9.5, including the installation of temporary noise barriers and acoustic enclosures, it is considered that no significant residual adverse noise or vibration impacts will occur as a result of the HDD works. In addition, no noise impacts are anticipated as a result of construction traffic on surrounding roads. This is because the magnitude of impact is minor at all roads to be used during the Construction Phase.

Diversion routes to be used during road closures have the potential to result in Adverse, Significant and Temporary noise impacts. There are no suitable measures to mitigate these impacts at diversion routes, and as a result, the residual impact remains as Adverse, Significant and Temporary in relation to the diversion routes identified in Table 9.18. It should be noted that these impacts will be temporary and are expected to last less than one year.

The operational noise assessment concluded that no significant noise and / or vibration impacts will occur as a result of the Operational Phase of the Proposed Development.

9.8 References

BSI (1993). BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration

BSI (2014a). BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise

BSI (2014b). BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration

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EN, 2015. EN 14388:2015 Road Traffic Noise Reducing Devices – Specifications.

Directives and Legislation

Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise. Commission Directive 2020/367/EC amends Annex III of Directive 2002/49/EC as regards the establishment of assessment methods for harmful effects of environmental noise

Number 7 of 1992 - Environmental Protection Agency Act, 1992 (as amended)

Number 27 of 2003 - Protection of the Environment Act 2003 (as amended)

S.I. No. 179/1994 - Environmental Protection Agency Act, 1992 (Noise) Regulations, 1994

S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (as amended) by S.I. No. 663/2021 - European Communities (Environmental Noise) (Amendment) Regulations 2021.