The Great Grid Upgrade

Grimsby to Walpole

Preliminary Environmental Information Report

Volume 3 Part B Section Specific Assessments

Section 7 New Walpole B Substation

Chapter 10 Noise and Vibration

Appendices

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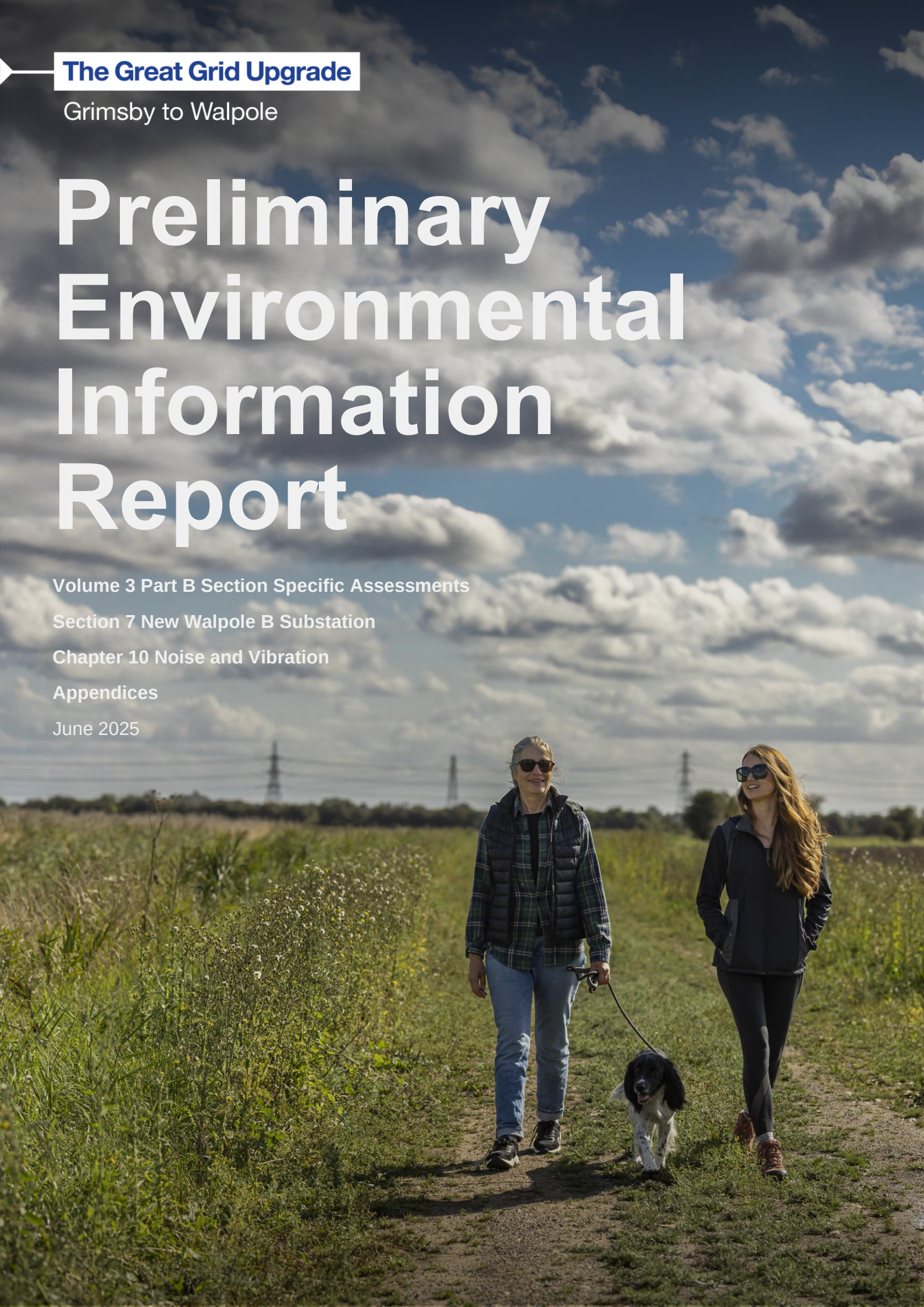

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10A. Construction Noise and Vibration Data

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10A. Construction Noise and Vibration Data

10A.1 Introduction

10A.1.1 This appendix presents information and data used within the assessment of Noise and Vibration effects from construction activities at noise vibration sensitive receptors (NSR) in the New Walpole B Substation Section (Section 7) as part of the Grimsby to Walpole Project (the Project). This appendix includes:

i. construction noise data; and

ii. construction vibration data.

10A.2 Construction Noise

10A.2.1 The construction noise assessment has been undertaken with reference to the methods and empirical data outlined in British Standard (BS) 5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise (BS 5228-1) (Ref 1).

Construction Plant Data

10A.2.2 Indicative construction plant and data associated with each proposed construction activity is presented in **Table 10A.1**. The table provides the average expected sound power level in A-weighted decibels (dBA) for each activity. For the purposes of the assessment, attenuation from mitigation measures is not included such that noise 'hot spots' can be identified, and specific mitigation measures can be identified.

Table 10A.1 Construction activity plant and noise data

Activity	Plant Item	Number of Plant Items	BS 5228-1 Ref	Per cent on time	A-weighted Sound Pressure Level at 10m, dBA	Average Activity Sound Pressure Level at 10m, dBA
General Works						
Site preparation	Tracked excavator	2	C2.7	70	70	79
	Dozer	3	C2.1	70	75	
Top soil strip	Tracked excavator	2	C2.7	70	70	79
	Dozer	3	C2.1	70	75	
Temporary access route	Wheeled backhoe loader	1	C2.8	70	68	79
	Dumper	2	C4.4	70	76	
	Vibratory roller	1	C2.40	70	73	
Temporary Construction Compounds						
Site preparation	Tracked excavator	2	C2.7	70	70	79
	Dozer	3	C2.1	70	75	
Road construction	Dumper	3	C4.4	70	76	82
	Road Roller	1	C5.19	70	80	
Compound buildings	Telehandler	2	C4.55	50	70	70
	Generator	2	C3.33	100	57	
Compound operation	Lorry	1	C2.34	25	80	76
	Telehandler	2	C4.55	50	70	
	Generator	2	C3.33	100	57	

Overhead Line Construction						
Pylon construction	Tracked excavator	1	C2.7	70	70	83
	Steel tube piling rig	1	C3.8	25	88	
	Concrete pump	1	C3.26	50	75	
Pylon Assembly	Telehandler	1	C4.55	50	70	67
Pylon installation	Crane lifting pylon	1	C4.46	10	67	57
Cable tensioning	Winder	1	Suppliers' data	60	77	78
	Rear Winder	1	Suppliers' data	60	77	
Substation Construction						
Site preparation	Tracked excavator	2	C2.7	70	70	79
	Dozer	3	C2.1	70	75	
Substation assembly	Telehandler	2	C4.55	50	70	82
	Generator	2	C3.33	100	57	
	Vibratory piling rig	1	C3.8	25	88	

10A.3 Construction Vibration

10A.3.1 The construction vibration assessment has been undertaken with reference to the methods and empirical data outlined in BS 5228-2:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 2: Vibration (BS 5228-2) (Ref 2).

10A.3.2 The main significant sources of vibration during construction activities are expected to be ground compaction, and percussive or vibratory piling. These processes may be required during the following activities:

i. Ground compaction with vibratory roller:
   - setup of site compounds;
   - site preparation;
   - temporary access route construction; and
   - cable laying.

ii. Piling:
   - pylon foundations; and
   - substation construction.

Prediction of Construction Vibration

10A.3.3 Peak particle velocity (PPV) vibration levels in mm/s generated by ground compaction and piling activities can be predicted using the guidance and empirical formulae in Table E1 of BS 5228-2. The formulae are shown below.

Vibratory roller calculation formula

$$v_{res} = k_s\sqrt{n_d}\left[\frac{A}{x+L_d}\right]^{1.5}$$ (Equation 1)

Where:

i. Vres = Resultant PPV, in millimetres per second (mm/s).

ii. ks = Scaling factor (and probability of predicted value being exceeded).

iii. nd = Number of vibrating drums.

iv. A = Maximum amplitude of drum vibration, in millimetres (mm).

v. x = Distance measured along the ground surface, in metres (m).

vi. Ld = vibrating roller drum width, in metres (m).

Percussive piling calculation formula

$$v_{res} \leq k_p \left[\frac{\sqrt{W}}{r^{1.3}}\right] \quad \text{(Equation 2)}$$

Where:

i. Vres = Resultant PPV, in millimetres per second (mm/s).

ii. Kp = Scaling factor (depending on soil conditions).

iii. W = Nominal hammer energy, in joules (J).

iv. r = Slope distance from the pile toe, in metres (m).

Assumptions

10A.3.4 The following conservative assumptions have been made to predict vibration levels to assess a reasonable worst-case:

i. Vibratory Roller assumptions:

- scaling factor of 75, representative of average conditions; and
- vibratory roller data based on worst case Bomag BW 213, 1 drum of 2.13 m width and maximum amplitude of 1.1 mm.

ii. Percussive piling assumptions:

- typical value of nominal hammer energy of 25 kJ; and
- scaling factor of 1.5 representative of typical soil conditions.

Vibration prediction results

10A.3.5 Equations 1 and 2 have been used to predict the minimum distances within which the vibration threshold values, in terms of the significant observed adverse effect level (SOAEL) on human receptors, and potential cosmetic building damage, may be exceeded (1.0mm/s, and 12.5mm/s PPV respectively). The calculated distances in **Table 10A.2** are used in the preliminary assessment to identify areas where NSR are potentially affected by construction vibration.

Table 10A.2 Indicative construction vibration threshold distances

Activity	Distance Within Which SOAEL May Be Exceeded (m)	Distance Within Which Cosmetic Building May Occur (m)
Ground compaction	18	<2
Percussive piling	70	<10

References

Ref 1 BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, British Standard Institution, 2014.

Ref 2 BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration, British Standard Institution, 2014.

10B. Initial Construction Traffic Noise Assessment

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10B. Initial Construction Traffic Noise Assessment

10B.1 Introduction

10B.1.1 This appendix presents the initial assessment of construction traffic noise affecting Noise and Vibration sensitive receptors (NSR) in the New Walpole B Substation Section (Section 7) as part of the Grimsby to Walpole Project (the Project).

10B.2 Assessment Methodology

10B.2.1 The assessment of construction traffic noise has been conducted following the guidance detailed in Design Manual for Roads and Bridges LA 111 (DMRB LA 111) (Ref 1). This provides guidance for the assessment and Noise and Vibration impacts from road projects; however, the guidance is widely used in the assessment of construction Noise and Vibration impacts from other types of project, particularly with regards to construction traffic noise in lieu of other guidance.

Data Sources

10B.2.2 The assessment is based on traffic data and assumptions that has been produced by National Grid Electricity Transmission plc (National Grid) to support the transport assessment, including the proposed numbers of heavy goods vehicles (HGV).

Study Area

10B.2.3 Noise from construction traffic on the existing local road network has been assessed based on the proposed construction traffic routes. The Study Area is defined following the guidance detailed in DMRB LA 111 which states that the construction traffic Study Areas shall be defined to include a 50 m width from the kerb line of public roads with the potential for an increase in basic noise level (BNL) of 1dB(A) or more because of the additional construction traffic to existing traffic levels.

Assessment Criteria

10B.2.4 Noise from construction traffic on the public highway has been calculated in accordance with the Calculation of Road Traffic Noise (CRTN) (Ref 2) and assessed against the criteria detailed in DMRB LA 111. The BNL from public roads used as construction traffic routes has been calculated in accordance with CRTN for the Do-minimum and Do-something scenarios in the construction period. The calculated BNL values were compared to determine the magnitude of the impact.

10B.2.5 The BNL is a standardised metric for determining the noise level from a road and is defined as the noise level exceeded for 10 per cent of the time at a reference of 10 m away from the nearside carriageway edge obtained from traffic flow, speed, and is calculated in line with the methodology described in CRTN.

10B.2.6 Calculations are based on the Annual Average Weekday Traffic over the 18-hour period between 06:00 and 00:00 (AAWT,18 h). The standard CRTN BNL calculation is applicable where the AAWT,18 h traffic flows are greater than 4000 vehicles per 18-hour day. Where flows are between 1000 and 4000 vehicles per day, a 'low flow' correction can be applied which is a function of the distance from the carriageway. For the purposes of the initial assessment, a typical worst-case distance of 10 m has been assumed (the correction reduces with increased distance, with no correction applied beyond 30 m).

10B.2.7 Where there are potential changes in the BNL on roads greater than or equal to 1dB(A) a subsequent assessment of the impacts has been conducted on NSR within 50 m of routes where there are potential significant effects. NSR include dwellings, healthcare facilities, education facilities or other buildings where noise can cause disturbance to people using the buildings.

10B.2.8 Construction traffic noise effects are significant where there are medium or large magnitude impacts for a duration of ten or more days in any 15 consecutive days or for a total number of days exceeding 40 in any six consecutive months. A detailed program of works is not currently available. However, for the purpose of this initial assessment it is assumed that the above temporal thresholds may be exceeded, as a worst-case.

10B.2.9 There are also potential significant effects were there is a small magnitude impact at NSR located within Noise Important Areas (NIA), which are more sensitive to increases in noise. NIAs are determined via strategic noise maps and highlight the residential areas experiencing the highest 1 per cent of noise levels from road and rail sources in England.

10B.3 Assessment

10B.3.1 The results of the construction traffic noise assessment are provided in **Table 10B.1**. It is assumed that there is no change in average speed between the do-minimum and do something scenarios. The results are colour coded as follows:

i. Green – Negligible magnitude impact (neutral)

ii. Yellow – Small magnitude impact (no NIA) (negative)

iii. Orange – medium magnitude impact, or small magnitude with NIA (negative)

iv. Red – Large magnitude impact (negative)

10B.3.2 Construction traffic noise impacts have been assessed on 8 construction traffic road links in Section 7 where data is available. The assessment indicates that construction traffic would lead to the following impacts:

i. no change in noise level on four road links;

ii. a negligible increase in noise level on three road links; and

iii. a small magnitude increase on one road link (which doesn't include NIAs).

10B.3.3 No medium or large magnitude construction traffic noise impacts are expected in Section 7. Additionally, there are no small magnitude impacts in locations which include NIAs (where a small magnitude impact may be considered significant). Therefore, there are no likely significant effects from construction traffic noise in Section 7.

Table 10B.1 Construction traffic noise assessment

Access Route Name/ID	Road Name	Baseline Data		Baseline Data Plus Construction Traffic		BNL, dB $L_{A10,18h}$		Change, dB	Outcome magnitude and effect.
		Total Daily Vehicles	Per cent HGV	Total Daily Vehicles	Per cent HGV	Baseline	Baseline Plus Construction Traffic		
LK14	Lynn Road	2537	10.5	2762	17.8	64.7	66.3	1.6	Small magnitude. Not significant
CR13-7	A47	18553	8.6	18736	9.7	75.6	75.8	0.2	Negligible magnitude. Not significant
CR28-2	A17	49933	7.3	50050	7.3	78.9	79	0.1	Negligible magnitude. Not significant
W51	A17	20855	10.8	20917	10.8	75.7	75.8	0.1	Negligible magnitude. Not significant
CR28-1	A17	19735	11.4	19804	11.4	75.6	75.6	0.0	No change. Not significant
CR29-1	A47	18158	10.3	18226	10.3	75.1	75.1	0.0	No change. Not significant
CR29-2	A47	22407	7.4	22475	7.4	75.5	75.5	0.0	No change. Not significant
LK15	West Drove North	44	6.8	437	52.3	very low flow	very low flow	0.0	No change. Not significant

References

Ref 1 Highways England et al. (2020). Design Manual for Roads and Bridges LA 111 Noise and vibration.

Ref 2 Department of Transport. (1988). Calculation of Road Traffic Noise.

10C. Initial Operational Substation Noise Assessment

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10C. Initial Operational Substation Noise Assessment

10C.1 Introduction

10C.1.1 This appendix presents the initial assessment of operational substation noise from the proposed New Walpole B Substation on noise sensitive receptors (NSR) in the New Walpole B Substation Section (Section 7) as part of the Grimsby to Walpole Project (the Project).

10C.2 Assessment Methodology

Assessment Methodology Introduction

10C.2.1 The assessment of operational noise has been conducted in accordance with British Standard (BS) 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound (BS 4142) (Ref 1).

BS 4142 Methodology

10C.2.2 BS 4142 is used to assess the potential significance of effects by comparing the 'rating sound level' of an industrial source against the typically representative ‘background sound level’ at the location of nearby NSR. Certain acoustic features can increase the potential for a sound to attract attention, and therefore increase its relative significance from that expected from a simple comparison between the specific sound level and the background sound level. BS 4142 identifies noise that contains audible tonality, impulsivity and/or intermittency for example and recommends that a correction be added to the specific sound level. The specific sound level along with any applicable correction is referred to as the 'rating level'. It should be noted that the penalties can be additive (i.e., if they have a combination of tonal, impulsive, and intermittent acoustic characters).

10C.2.3 Where tonality is audible at a receptor a penalty of between 0 and 6 dB may be applied. Subjectively, a 2 dB penalty may be applied where a tone is just perceptible, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible.

10C.2.4 The greater the difference between the rating level and the background sound level; the greater the likelihood of complaints/adverse impacts. The assessment criteria given by BS 4142 are as follows:

i. a difference of +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context; and

ii. a difference of +5 dB could be an indication of an adverse impact, depending on the context.

10C.2.5 The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact (in BS 4142 terminology), depending on the context.

10C.2.6 The assessment should also consider the context of the sound. Where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be considered, including:

i. The absolute level of the sound.

ii. The character and level of the residual sound compared to the character and level of the specific sound.

iii. The sensitivity of the receptor, including whether dwellings already incorporate design measures that secure good internal and/or outdoor conditions, such as: façade insulation treatment, ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation and acoustic screening.

10C.2.7 With regards to the absolute level of the sound, BS 4142 (Ref 1) states that where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background, particularly at night. Guidance in this matter is provided by the Association of Noise Consultants (ANC) BS 4142:2014+A1:2019 Technical Note, 2020 (ANC BS 4142 guidance) (Ref 2); and BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233) (Ref 3).

10C.2.8 The sound rating level has been compared to the representative background sound level to determine the magnitude of impact. More specifically, the magnitude of impact of operational noise is determined against the criteria detailed in **Table 10C.1**.

Table 10C.1 Magnitude of impact from operational substation noise

Magnitude	Comparison of sound rating level and representative background sound level
Large	Rating level > 10dB above the background sound level
Medium	Rating level between 5 and 9 dB above background sound level
Small	Rating level between 0 and 4 dB above background sound level
Negligible	Rating level below background sound level

10C.2.9 Although the above criteria has been used to assess the magnitude of impact, it is standard practice to aim for a sound rating level not to exceed the background sound level, such that the impact is ‘low’ (as defined in BS 4142), or negligible in terms of the impact magnitude definition defined in **Table 10C.1**.

10C.2.10 Consideration has also be taken of context, as defined in BS 4142, for the final determination of significance; in particular, absolute sound levels.

10C.2.11 When considering context, BS 4142 references BS 8233 (Ref 3) as providing context where background and sound rating levels are low. BS 8233 provides recommended noise levels for a variety of situations and locations, including in habitable spaces such as living rooms and bedrooms, and external amenity areas. Guidance has also been sought from the ANC BS 4142 guidance (Ref 2), as appropriate.

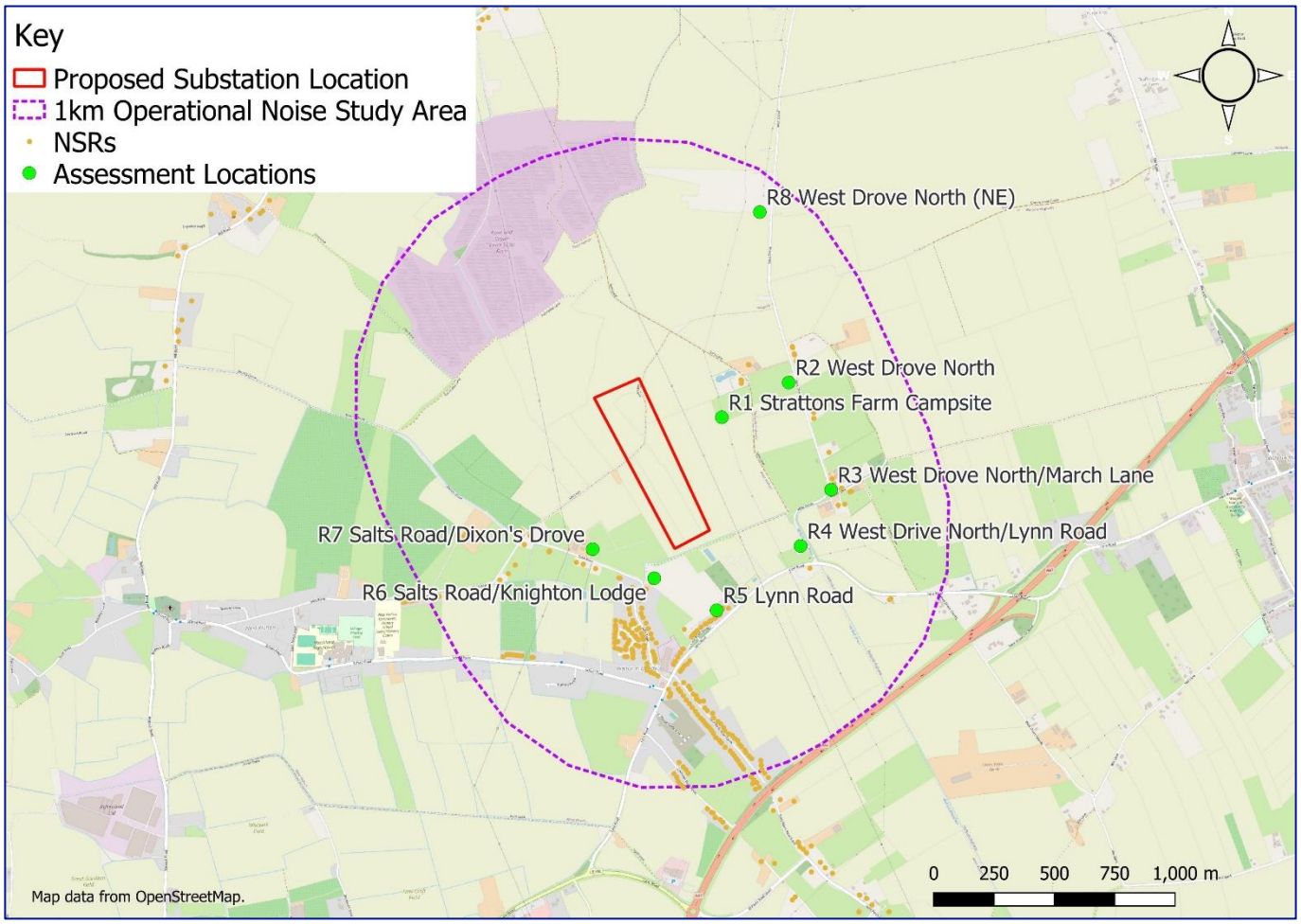
10C.3 Baseline Data

Baseline Data Introduction

10C.3.1 This section details the baseline information used within the preliminary operation noise assessment. This section provides a summary of the baseline data for use in the operational noise assessment.

10C.3.2 The proposed New Walpole B Substation location, Study Area, NSR locations, and assessment locations, are shown in **Image 10C-1**.

Image 10C-1 Proposed New Walpole B Substation noise survey and assessment locations



10C.3.3 Section 7 is predominantly rural, passing through agricultural land. The main sources of environmental noise are likely to be relatively distant road traffic on the A47 and A1101, as well as traffic on local roads. In terms of industrial sources, the main source of noise is likely to be agricultural activity.

10C.3.4 There are no NIAs close to the Draft Order Limits in this Section.

10C.3.5 With regards to NSRs in Section 7, the emerging preferred corridor passes by several villages. These include:

i. Walton Highway, approximately 100 m to the south of the Section 7 draft Order Limits the Ingleborough;

ii. West Walton, approximately 1 km to the southwest of the Section 7 draft Order Limits; and

iii. Ingleborough, approximately 1 km to the west of the Section 7 draft Order Limits Walton Highway.

10C.3.6 There are also isolated dwellings, farmhouses, and settlements within the Section 7 baseline Study Area.

10C.4 Study Area

10C.4.1 The proposed Study Area for operational noise effects from substations, based on guidance from International Organisation for Standardisation (ISO) 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors (ISO 9613-2) (Ref 4), would include NSR within 1 km of the proposed New Walpole B Substation, with a particular focus on the nearest NSR.

10C.5 Measured Noise Levels

10C.5.1 At this stage, baseline noise level surveys have not been undertaken in the vicinity of the proposed New Walpole B Substation due to ongoing coordination with the nearby proposed National Grid Ventures Eastern Green Link (EGL) project. Baseline surveys will be undertaken prior to the Environmental Statement (ES) stage and the assessment updated accordingly.

10C.5.2 However, given the rural nature of the site, ambient and background sound levels are expected to be relatively low, with typical background sound levels of around or less than 30 dB L_{A90} expected during night-time periods. The initial assessment at this stage therefore considers absolute noise levels and noise rating levels, with reference to the guidance from BS 4142 (Ref 1) and the ANC BS 4142 guidance (Ref 2) for situations where the existing background sound level is low.

10C.6 Operational Noise Assessment

Indicative Plant Data

10C.6.1 **Table 10C.2** presents indicative operational sound levels from the proposed New Walpole B Substation plant.

Table 10C.2 Indicative proposed New Walpole B Substation Plant Sound Data

Plant Item	Number of	Sound Power Level per Unit dBA	Assumed Mitigation	Resultant Sound Power Level per Unit dBA
Super Grid Transformer (SGT)	5	95	20 dB (Standard enclosure)	75
Shunt Reactor (SR)	2	94	20 dB (Standard enclosure)	74

10C.6.2 The proposed SGTs and SRs will encompass a cooling system. Under normal operating conditions, the cooling systems of the SGTs and SRs will rarely operate. Cooling systems may operate during emergency conditions and during times of unusually high demand. Such conditions usually occur only during exceptional events (i.e. extreme weather combined with faults elsewhere on the system) requiring an SGT and SRs to carry a higher-than-normal load. These conditions would usually persist for a short duration and as such cooler operation can typically be regarded as an exceptional event. As such, noise from the cooling systems of the proposed SGTs and SRs are not included in this assessment.

Operational Sound Propagation Modelling

10C.6.3 Specific sound levels due to the proposed New Walpole B Substation plant have been predicted via computer noise modelling using SoundPlan software (version 9.0) at 8 locations representative of nearby NSR. The model calculates noise levels in accordance with the methodology described in ISO 9613-2 (Ref 4). The resultant predicted operational noise levels at nearby NSR are presented in **Table 10C.3**.

Table 10C.3 Resultant specific sound levels at NSR

NSR location	Resultant specific sound level, dB LAeq
R1 Strattons Farm Campsite	21
R2 West Drove North	16
R3 West Drove North/March Lane	15
R4 West Drive North/Lynn Road	16
R5 Lynn Road	18
R6 Salts Road/Knighton Lodge	22
R7 Salts Road/Dixon's Drove	21
R8 West Drove North (NE)	11

10C.6.4 The results indicate that the highest predicted specific noise level is at R6 (Salts Road/Knighton Lodge The specific sound level is predicted to be 22 dB $L_{Aeq,T}$.

10C.6.5 Based on this specific noise level, a sound rating level of 28 dB $L_{Aeq,T}$ is assumed at the worst-case NSR, assuming a worst-case 6 dB acoustic character penalty for tonality.

BS 4142 Assessment

10C.6.6 In the absence of background sound level data, an assessment in accordance with BS 4142 (Ref 1) is not possible at this stage. However, an indicative assessment based on the principles of BS 4142 can be undertaken based on the results of the noise propagation modelling and assuming that background sound levels are expected to be low.

10C.6.7 The 2019 version of BS 4142 does not define 'low' in the context of background sound levels, nor rating levels. However, ANC guidance (Ref 2) suggests that the values of stated in the 1997 version would not be unreasonable; namely: low background sound levels as being less than about 30 dB L_{A90}, and low rating levels as being less than about 35 dB $L_{Ar,Tr}$.

10C.6.8 The context of absolute noise levels therefore indicates that both the background sound levels and noise rating levels are low. Therefore, in this instance the absolute levels might be as, or more, relevant that the margin by which the rating level exceeds the background sound level.

10C.6.9 BS 4142 references BS 8233 (Ref 3) as providing context where background and sound rating levels are low. BS 8233 provides recommended noise levels for a variety of situations and locations, including in habitable spaces such as living rooms and bedrooms, and external amenity areas. Guidance has also been sought from the ANC BS 4142 guidance (Ref 2), as appropriate.

10C.6.10 Further guidance of absolute noise levels is provided by:

i. World Health Organization (WHO) Guidelines for Community Noise (GfCN) (Ref 5);

ii. WHO Night Noise Guidelines (NNG) (Ref 6);

10C.6.11 The WHO GfCN and BS 8233 provide recommended guideline values for internal and external amenity spaces, including bedrooms, living rooms, and gardens. The guideline values are for 'anonymous' noise sources, such as road traffic. The assessment therefore considers the noise rating level, including the worst-case assumed penalty for acoustic character to account for the non-anonymous nature of the noise source. The guidance values for desirable conditions are:

i. bedrooms at night internally: 30 dB $L_{Aeq,8h}$;

ii. living rooms and bedrooms during the day internally: 35 dB $L_{Aeq,16h}$; and

iii. external amenity spaces (gardens): 50 dB $L_{Aeq,16h}$.

10C.6.12 With regard to external amenity spaces, the highest predicted noise rating level from the proposed New Walpole B Substation of 28 dB L_{Aeq} externally is significantly below the guidance values for desirable external conditions.

10C.6.13 With regards to internal noise levels, consideration must be given to reduction in noise level through a partially open window, which may be required for ventilation. WHO GfCN and BS 8233 indicate that the reduction in sound level through a partially open window is 15 dB (attenuation through closed windows would be expected to be in the region of 25 dB). Assuming a 15 dB reduction, the corresponding external noise levels for desirable conditions are:

i. outside bedrooms at night: 45 dB $L_{Aeq,8h}$; and

ii. living rooms and bedrooms during the day: 50 dB $L_{Aeq,16h}$.

10C.6.14 It is noted that the guideline values for reasonable conditions in external amenity areas is the same as the guideline value outside of habitable spaces during daytime periods (i.e. 50 dB $L_{Aeq,16}$).

10C.6.15 The predicted noise rating level from the proposed New Walpole B Substation of 28 dB L_{Aeq} externally would result in an internal sound level in the region of 15 dB L_{Aeq}. This is significantly below the guidance values for desirable conditions.

10C.6.16 The WHO NNG indicates that the lowest observed adverse effect level (LOAEL) is 40 dB $L_{night,outside}$. The predicted noise rating level from the proposed New Walpole B Substation of 28 dB L_{Aeq} externally is significantly below the LOAEL indicated by the WHO NNG.

10C.6.17 With closed windows, internal noise levels would be even lower.

10C.6.18 Based on the above findings, the noise rating level from the proposed new Walpole B Substation is expected to be below the LOAEL at all nearby NSR and the magnitude of impact is therefore likely to be negligible.

10C.7 Conclusions

10C.7.1 The initial operational noise assessment indicates that the noise rating level from the proposed New Walpole B Substation is expected to be below the LOAEL at all nearby NSR and the magnitude of impact is therefore likely to be negligible.

10C.7.2 As such, where appropriate mitigation measures are incorporated into the design, operational noise from the proposed New Walpole B Substation would therefore likely be not significant.

References

Ref 1 BS 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound, British Standard Institution, 2019.

Ref 2 BS 4142:2014+A1:2019 Technical Note Version 1.0. Association of Noise Consultants, 2020.

Ref 3 BS 8233:2014 Guidance on sound insulation and noise reduction for buildings, British Standard Institution, 2014.

Ref 4 ISO 9613-2:2024 Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors. International Organisation for Standardization. 2024.

Ref 5 World Health Organisation. Guidelines for Community Noise. Geneva. 1999.

Ref 6 World Health Organisation. Night noise guidelines for Europe. Geneva. 2009.

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