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# Executive Summary

This Technical Note has been produced to provide details of the peak or maximum noise levels that would be anticipated during construction in the vicinity of Hintlesham Woods Site of Special Scientific Interest (SSSI) and the effects of this on breeding birds using the SSSI, including nightingale (*Luscinia megarhynchos*).

To avoid and reduce potential effects on breeding birds at Hintlesham Woods, National Grid (the Applicant) has committed to limit the activities that can take place within the bird breeding season to those that would require an electrical outage. These activities are:

- Installation of conductors / transposition works;
- Construction of pylon 4YL12A and removal of the existing pylon 4YL12; and
- Assembly and removal of temporary pylon RB12T.

The construction of the foundations of temporary pylon RB12T are the closest and potentially noisiest activity to be undertaken within the bird breeding season. The average noise levels predicted at the edge of Hintlesham Woods SSSI due to the construction of the foundations of temporary pylon RB12T were modelled as approximately 60 dBA at 200m from the source (see ES Chapter 7: Biodiversity [APP-075]). This is below the 70dB threshold level identified by Cutts *et al.*, (2009) where a behavioural response by birds to noise would be expected.

The calculation of maximum sound levels has been based on the methodology described in Annex F of BS 5228-1, which predicts average noise levels from construction activities, with corrections added to convert to maximum sound levels. This method modelled maximum sound levels of 80dBA at 200m from the source, in the absence of any best practice measures and the worst-case environment scenario. Records of nightingale are located along the north-east boundary of Hintlesham Woods SSSI approximately 360m from the proposed temporary pylon location. The maximum noise levels from the pylon construction (using a reasonable worst case percussive piling foundation construction technique) at this distance is 70dBA.

The Applicant has reviewed the available geotechnical ground investigation results in the location of temporary pylon RB12T and commit to using an alternative (lower noise) foundation construction method than percussive piling. Use of standard foundations would reduce the maximum noise level to approximately 58dBA at 200m and 53dB at 360m from source, respectively.

In summary, all proposed construction activities that would need to take place within the bird breeding season (assuming percussive piling would not be used for foundation construction at pylon RB12T), would generate maximum noise levels of below the 70dB threshold level identified by Cutts *et al.* (2009). Therefore, the project is not anticipated to disturb breeding birds, including nightingale, within the SSSI when taking into account maximum sound levels.

The following measure (EM-AB14) has been added to the Register of Environmental Actions and Commitments submitted at Deadline 3 (**Document 7.5.2 (B)**):

*'Percussive piling will not be used to construct the foundations of temporary pylon RB12T (607067, 243469), to reduce the maximum (peak) noise levels associated with this construction method to avoid subsequent disturbance on sensitive species at Hintlesham Woods SSSI.'*

# 1. Introduction

## 1.1 Purpose of the Technical Note

1.1.1 This Technical Note has been produced to provide details of the peak or maximum noise levels that would be anticipated during construction in the vicinity of Hintlesham Woods Site of Special Scientific Interest (SSSI) and the effects of this on breeding birds using the SSSI. Natural England noted in their relevant representation [RR-042], that the assessment of noise effects on breeding birds in the application for development consent presented average noise levels rather than maximum noise levels.

1.1.2 Natural England's Relevant Representation [RR-042] stated the following:

*'The noise assessment in ES Chapter 14: Noise and Vibration (application document 6.2.14) and the interpretation of this assessment in Document 6.3.7.1.2: ES Appendix 7.1 – Annex B Hintlesham Woods SSSI Assessment, should be revised to include peak values as well as average sound power values. This is because sudden, unpredictable loud noises are more likely to startle birds and cause an escape flight response. It would be expected that peak sound power levels would be provided to determine the impact from noise disturbance on breeding birds. The potential 'startle effect' can be assessed using maximum noise level (LAmax) and peak sound pressure (LApeak). The difference between LApeak and LAmax shows the 'rise time' of the noise signal, which is likely to be an important factor with respect to the potential for the noise to disturb birds.*

*Further assessment of the impacts of construction works on birds during the breeding season is required. Natural England is particularly concerned about the impact to the nightingale population, which Natural England has been notified by the RSPB has declined significantly. Paragraph 4.3.8 of Hintlesham Woods SSSI Assessment (document 6.3.7.1.2) suggests the woodland would buffer some of the construction noise. However, this is not the case for the nightingale, which the surveys reported in the Species Baseline Report (document 6.3.7.2) have identified are located on the edge of the woodland on the side where the works will occur.*

*Mitigation – Following the mitigation hierarchy, the first preference would be for all works to be completed outside the bird breeding season (March to August, inclusively). However, Natural England acknowledges there are constraints due to some works having to be undertaken during power outages during the summer months. We would therefore advise that the schedule of works during the bird breeding season is further considered to avoid all construction works between April and June, which is the peak breeding season for nightingale. Avoidance of July would also be recommended due to the potential for second broods'.*

1.1.3 The RSPB has noted in the Statement of Common Ground (SoCG) [REP1-028] that the noise assessment should be based on maximum noise levels, rather than average noise levels, as impulsive noise is likely to have the greatest impact and that mitigation should be proposed to avoid impacts as far as possible.

## 1.2 Baseline and Existing Information

### Breeding Bird Baseline

- 1.2.1 This Technical Note considers the noise effects on woodland breeding birds in general, which could be present anywhere within the woods. However, Natural England notes in its Relevant Representation [RR-042], that it is particularly concerned about the impact to the nightingale (*Luscinia megarhynchos*) population at Hintlesham Woods SSSI. Environmental Statement (ES) Figure 7.2.4 [APP-149] shows nightingale to be present along the north-east edge of the woods. This Figure is reproduced in Appendix A for ease of reference. Therefore, the assessment in the Technical Note in some places references the shortest distance to the woodland (for breeding birds in general) and also the distance to the nightingale habitat, where different.
- 1.2.2 Nightingale, migrate to the UK to breed between April and June. Migration back to African wintering grounds starts in July. Joys and Crick (2004) suggest that first egg clutches of nightingale occur between the 5 May and 6 June, most likely in mid-May. Incubation of eggs takes around 14 days while the fledging period is an additional 13 days (British Trust of Ornithology (BTO), 2023).

### Noise Assessment in the ES

- 1.2.3 To avoid and reduce effects on breeding birds at Hintlesham Woods, National Grid committed to limiting the activities that can take place within the bird breeding season to those that would require an electrical outage. Embedded measure EM-AB09 in the Register of Environmental Actions and Commitments (REAC) (**Document 7.5.2 (B)**), states that for the construction works in and around Hintlesham Woods (between pylons 4YL011 and 4YL017A) construction works would be undertaken outside of bird breeding season except for the following activities which need to take place within agreed electrical outages:
- Installation of conductors / transposition works;
  - Construction of pylon 4YL12A and removal of the existing pylon 4YL12; and
  - Assembly and removal of temporary pylon RB12T.
- 1.2.4 Information regarding construction noise levels was provided in ES Appendix 14.1: Construction Noise and Vibration Data [APP-136]. These values were provided as average noise levels, based on data provided 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).
- 1.2.5 The average noise levels predicted in the ES at the edge of Hintlesham Woods SSSI due to the construction of the foundations of temporary pylon RB12T (which is the closest noisy activity that would occur within the bird breeding season) were approximately 60 dBA. This is shown on ES Figure 7.1.8 [APP-149], which is reproduced in Appendix A for ease of reference. This noise level assumed percussive piling of the foundations as a reasonable worst-case. Average noise levels during conductor tensioning would be 55dBA. The calculations assumed hard ground as a reasonable worst-case.

- 1.2.6 The potential impact of average noise on breeding birds at Hintlesham Woods SSSI was presented in ES Appendix 7.1 Annex B: Hintlesham Woods SSSI Assessment [APP-111] and in ES Chapter 7: Biodiversity [APP-075], specifically paragraphs 7.6.20 to 7.6.28. This concluded in paragraph 7.6.28 that *'although works would unavoidably need to be scheduled during bird breeding season, the potentially disturbing construction activities would be at distance where disturbance to breeding birds would be limited. As a result, there would be an impact of small magnitude which would result in a minor adverse effect, which would be not significant'*.

### 1.3 Scope of the Assessment

- 1.3.1 This Technical Note describes the prediction of maximum (peak) sound levels at Hintlesham Woods SSSI associated with the works that need to take place within bird breeding season (i.e. those exceptions in EM-AB09). It focuses on the construction of temporary pylon RB12T, which lies approximately 200m to the north of Hintlesham Wood SSSI and is closer than pylons 4YL012 and 4YL012A.
- 1.3.2 The Technical Note also focuses on assembly activities rather than removal activities, as the maximum sound levels associated with pylon assembly activities (assuming percussive piling as assumed in the ES), are considered to be greater than those during pylon removal (comprising cutting of pylon legs and pulling to the ground with a tractor) where the threshold noise levels are very short term and at 53dB at 200m (Table 2.2 in ES Appendix 14.1: Construction Noise and Vibration Data [APP-137] which is significantly below the widely accepted 70dB threshold for bird disturbance (see Section 2.2 Disturbance Levels).
- 1.3.3 The Technical Note also considers the maximum noise levels associated with the installation of conductors and the transposition works.

## 2. Methodology

### 2.1 Noise Modelling

- 2.1.1 The calculation of maximum sound levels has been based on the methodology described in Annex F of BS 5228-1, which predicts average noise levels from construction activities, with corrections added to convert to maximum sound levels. There are no direct relationships between average and maximum sound levels from construction noise. As such, maximum sound levels have been predicted at the edge of Hintlesham Woods SSSI based on available information, empirical formulas, and professional judgement.
- 2.1.2 The predicted average sound levels considered in the application for development consent, considered the percentage 'on-time' of each plant item. Maximum sound levels would be the same irrespective of the percentage 'on-time'. As such, a 100% 'on-time' is assumed when considering maximum levels to remove the effect of averaging over the assessment period required for a 'standard' construction noise assessment.
- 2.1.3 With regards to percussive piling activities, the methodology set out in Section 8.5.2.5 of BS 5228-1 has been used to convert average sound levels from piling activities ( $L_{Aeq,T}$ ) into  $L_{A01,T}$  values, which is the sound level exceeded for only 1% of the time. This may be regarded as a 'typical' maximum. The  $L_{A01,T}$  value is dependent on the number of blows per minute, whereas the maximum value would be relative static. As such, the worst-case correction value of 11dB has been added to average value, which will therefore tend towards the maximum value. Actual maximum values would be expected to be slightly higher by between 2 and 5dB based on professional judgement.
- 2.1.4 For non-percussive activities, such as for standard foundation construction or non-percussive piling foundation construction and conductor pulling, noise levels would be expected to be relatively steady during works when the plant is operating. As noted above, assuming a 100% 'on-time' removes the effects of averaging over the assessment period and would therefore be considered a typical maximum. However, some natural variation in noise level would be expected which would lead to maximum noise levels slightly higher than the 100% 'on-time' level. Actual maximum values would be expected to be slightly higher by up to approximately 5dB based on professional judgement.
- 2.1.5 For the purposes of the initial assessment, it is assumed that the ground is acoustically hard, as a worst-case.
- 2.1.6 The assessment presented in this note focuses on pylon RB12T, as it is the closest pylon to the SSSI that relies on an outage for construction and therefore would need to be constructed during bird breeding season.

### 2.2 Disturbance Levels

- 2.2.1 As detailed in paragraph 7.6.23 of ES Chapter 7: Biodiversity [APP-075], although there is limited published guidance on disturbance thresholds for woodland birds, there is advice on 100m to 250m buffer considerations for a range of British raptor species such as red kite, buzzard and hobby (Goodship *et al.*, 2002) in Scottish forests. Goodship *et al.*, (2022), while not publishing the size of disturbance buffer zones required around nightingale nests, do provide indicative distances for nightjar *Caprimulgus europaeus* which are similarly ground nesting and summer migrant birds that breed in this region of the UK. The advised buffer zone for nightjar is 150m.

- 2.2.2 A study on the effects of construction noise for waterbirds identified 70dB and above as generating an impact on bird activity (Cutts *et al.*, 2009). Sound levels of 70dB  $L_{Amax}$  were considered to be above the level that would initiate a behavioural response by birds and below the level that initiates flight responses in most cases. Sound levels above 85dB would cause bird movement with them still remaining on site (see Table 2.1 below). In addition, commercial bird scarers are sold with effectiveness over 100dB (with possible reaches of 155dB) (Rutland County Council, n.d.) suggesting that sound levels lower than 100dB are unlikely to generate the desired response.
- 2.2.3 Wright *et al.*, (2010) specifically considered impulsive sources of noise such as piling and also identified 70dB as a level that could cause flight responses with return to original locations in the majority of species. Postlethwaite and Stephenson (2012) concluded that 70dB would be very precautionary, and a level 10dB higher would still be a precautionary level indicator of bird behavioural changes in relation to percussive piling noise. A historical report, (Owens, 1977), showed that the first gunshots at a nearby gun range caused birds to disperse from their site but they quickly returned and ignored subsequent firings that day. The 70dB level was used in ES Chapter 7: Biodiversity [APP-075] as a precautionary threshold level.
- 2.2.4 The links between visual and audible stimuli are evident throughout (Cutts *et al.*, 2009) and it is clear that noise by itself is not necessarily a cause for disturbance if not accompanied by a perceived visual threat. Blumstein *et al.*, (2005) identified that across 150 avian species, that larger species had greater alert distances than smaller species. As a smaller species, certainly smaller than that majority of water birds, it would be anticipated that nightingale would have a higher tolerance to such potential disturbance.

**Table 2.1 – Noise Impact Criteria – Construction Noise (from Cutts *et al.*, 2009)**

<b>Impact</b>	<b><math>L_{Amax}</math></b>
No impact	Below 50dBA
Behavioural changes (alarm calls, heads up, change in feeding/roosting activity)	Equal or less than 70dBA
Movement within area	Above 70dBA
Movement out of area but remaining on site	Above 85dBA
Movement off site	Not defined

- 2.2.5 There is likely to be some existing impulsive noise disturbance from ongoing agricultural activities around Hintlesham Woods SSSI. For example, commonly used farm machinery used for seeding, spraying, fertilising and harvesting arable land, such as to the north of Hintlesham Woods SSSI, are likely to generate noise around 80dB (sound level of tractor at 10m as detailed in BS 5228-1, Table C.4 ref: 74). Some of these agricultural activities are likely to take place during bird breeding season.
- 2.2.6 Deer cull activity has also been confirmed within Hintlesham Woods SSSI which, depending on deer species, can occur during the bird breeding season. Should this occur, impulsive noise disturbance from gunfire would be in the order of 115dB approximately 1m from source and exceeding 70dBA within approximately 200m.



## 2.3 Assumptions and Limitations

- 2.3.1 Sound levels are based on available plant data from BS 5228-1 or manufacturers data, as appropriate. The noise level calculation methodology is described in Section 2.1.
- 2.3.2 The published guidance around disturbance thresholds on birds is centred around waterbirds. However, this is deemed appropriate to use in relation to passerine species, as a precautionary approach, in the absence of specifics relating to woodland bird species.

## 2.4 Soft Ground Reduction

- 2.4.1 The type of ground over which the sound is travelling effects the propagation of sound. Acoustically 'soft' ground, (such as grassland, ploughed fields etc.) is more absorbent of sound energy than acoustically 'hard' surfaces (e.g. concrete, water, paved areas). Consequently, noise propagating over acoustically hard ground results in a higher noise level than over acoustically soft ground at the same distance. The rate in reduction of noise level depends on the frequency of the sound and the qualities of the ground it interacts with.
- 2.4.2 For the purposes of this assessment, it is assumed that the ground is acoustically hard as a worst-case, as this may be the case if the ground is wet or frozen. However, in practice the ground would typically be considered acoustically soft and frozen ground would be highly unlikely during the bird breeding season. As such, resultant noise levels would be expected to be lower by approximately 0dB at 25m, 3dB 100m, and 5dB at 300m, based on the sound propagation calculation methodology described in Annex F of BS 5228-1.

# 3. Noise Assessment presented in the ES

## 3.1 Pylon Construction (Percussive Piling)

### Design Assumptions

- 3.1.1 The following activities need to take place within the bird breeding season (March to August, inclusive) due to the agreed electrical outages:
- Installation of conductors / transposition works (see Section 3.2 below);
  - Construction of pylon 4YL12A and removal of the existing pylon 4YL12; and
  - Assembly and removal of temporary pylon RB12T.
- 3.1.2 The assumption in the ES in relation to the temporary pylon (RB12T) located at National Grid Reference (NGR) 607067, 243469 is that the foundations would be constructed using percussive piling. This is the closest pylon to the SSSI that relies on an outage for construction and therefore would need to be constructed during bird breeding season. This is located approximately 200m away from Hintlesham Woods SSSI at the closest point and 360m away from the north-eastern edge of Ramsey Wood, which is known to support nightingale. This pylon is shown on ES Figure 7.1.8 [APP-149], which is reproduced in Appendix A for ease of reference.
- 3.1.3 The assessment assumes percussive piling would be required to construct temporary pylon RB12T. This construction method is assumed to have a maximum noise level at a distance of 10m of 103dBA (based on an average noise level of 88 dBA at 11m based on data from Annex C of BS 5228-1, reference C3.8, plus a correction of 15dB to estimate the maximum sound level, as described in paragraph 2.1.3 above).

### Noise Assessment

- 3.1.4 Assuming a 100% 'on-time' (see paragraph 2.1.2), the average noise level from percussive piling would be 65 dBA at the edge of Hintlesham Woods SSSI, at a distance of 200m (see Table 3.1). The worst-case  $L_{A01,T}$  value would therefore be expected to be 76 dB  $L_{A01,T}$ . Maximum values would be expected to be slightly higher, estimated to be between 2 and 5 dB. Maximum sound levels would therefore be expected to be in the order of approximately 80 dB  $L_{Amax,T}$  at the edge of the woods. Noise levels would be lower at greater distances.

Table 3.1 – Modelled Noise (dB) for Percussive Piling

Distance from Noise source	Average dB at 200m from Source (as in ES)	100% 'on-time' average, $L_{Aeq,T}$	$L_{Amax,T}$ (Hard Ground)	$L_{Amax,T}$ (Soft Ground)
200m	60dB	65dB	80dB	76dB
360m	56dB	60dB	75dB	70dB

## 3.2 Installation of Conductors and Transposition Works

### Design Assumptions

- 3.2.1 Conductors would be installed in sections between angle/tension pylons where the overhead line changes direction. A pulling site would be established at one end of the section with the conductors running out from a tensioning site at the other end of the section. In order to install the conductors, pilot wires would be run along the length of the section between the pulling site and the tension site. At each intermediate pylon the pilot wire would go up through the running wheels located either at the end of the insulator set or under the pylon cross arm. The tensioning machine keeps the pilot wire and conductors off the ground and clear of any obstacles.
- 3.2.2 When the conductor is installed for the section, it would be fastened at its finished tension and height above ground by construction workers working from temporary platforms on the pylons. The conductor would be tensioned to provide the correct sag profile and the ends jointed onto the tension insulators.
- 3.2.3 The pulling machine sites are normally placed at a position approximately 1-2 times the pylon height, at a position in line with, and behind, the first and last pylons in the section being pulled. In the section close to Hintlesham Woods SSSI pulling and tensioning is proposed at pylons RB11 (NGR 607008, 243509) and RB16 (NGR 606275, 241894). Pylon RB11 is located approximately 260m from Hintlesham Woods SSSI to the north at the closest point and 360m away from the eastern edge of the SSSI which contains records of the presence of breeding nightingale. Pylon RB16 is located south-west of Hintlesham Woods SSSI, approximately 700m from the closest edge of the woods. Pylon RB11 and RB16 are shown on ES Figure 7.1.8 [APP-149], which is reproduced in Appendix A for ease of reference.

### Noise Assessment

- 3.2.4 There would be some variation in noise levels during the conductor tensioning processing. Assuming a 100% 'on-time' for all plant, this would result in a predicted maximum noise level of 55dBA at the nearest edge of Hintlesham Woods SSSI (see Table 3.2). However, it is anticipated that there would be some natural variation in noise level during these activities, resulting in slightly higher maximum values. It is assumed that this value would be in the order of 5dB. Maximum sound levels are likely to be in the order of 60dB  $L_{Amax,T}$  at the edge of Hintlesham woods SSSI. Sound levels would be lower at greater distances. Records of breeding nightingale are at additional distance (approximately 350m) and therefore would experience reduced exposure to the noise source.

Table 3.2 – Modelled Noise (dB) for Conductors and Transposition Works

Distance from Noise source	100% 'on-time' average, $L_{Aeq,T}$	$L_{Amax,T}$ (Hard Ground)	$L_{Amax,T}$ (Soft Ground)
260m (existing pylon RB11)	55dB	60dB	55dB
700m (proposed pylon RB16)	46dB	51dB	44dB

# 4. Impact Assessment

## 4.1 Pylon Construction (Percussive Piling)

- 4.1.1 The closest boundary edge of the Hintlesham Woods SSSI (supporting the breeding bird assemblage, including nightingale) to the pylon construction (noise source) is approximately 200m. The maximum noise levels from the pylon construction (percussive piling) at this distance is 80dB (Table 3.1). 80dB exceeds the 70dB disturbance threshold published by Cutts *et. al.* (2009) that could result in movement i.e. temporary displacement of birds (see Table 2.1).
- 4.1.2 The nightingale records are located along the north-east boundary of Hintlesham Woods SSSI approximately 360m from the proposed temporary pylon location. The maximum noise levels from the pylon construction (percussive piling) at this distance is 70dB (Table 3.1). This value is where the sound level is exceeded for only 1% of the time and so can be assumed to be a 'maximum' value, occurring rarely. This is at the 70dB disturbance threshold published by Cutts *et. al.* (2009) where behavioural changes by birds may be seen but no active movement away from their location.

## 4.2 Installation of Conductors and Transposition Works

- 4.2.1 For the installation of conductors and transposition works, noise would be generated in the bird breeding season at the pulling site to the north of Hintlesham Woods SSSI at the new permanent pylon RB10 which would be approximately 260m away from Hintlesham Woods at its closest point. At this distance the predicted maximum sound level would be 60dB. The pulling location for RB16 would be approximately 700m to the closest edge of the woods. At this distance the predicted maximum noise level would be 51dB.
- 4.2.2 For both pulling locations the maximum sound level is at least 10dB lower than the 70dB published by Cutts *et al.* (2009), as the noise level which can generate an impact on bird behaviour.

# 5. Discussion

## 5.1 Introduction

- 5.1.1 As set out in ES Appendix 7.1 Annex B: Hintlesham Woods SSSI Assessment [APP-111], the Applicant has sought to limit the works within bird breeding season around Hintlesham Woods SSSI through embedded measure EM-AB09 in the REAC (Document 7.5.2 (B)). However, there are still a limited number of activities that need to take place during an agreed electrical outage when electricity demand is at its lowest and therefore would need to take place during bird breeding season.
- 5.1.2 The impact assessment presented within this Technical Note has shown that the sound levels associated with the assumed percussive piling at RB12T would exceed the 70dB disturbance threshold published by Cutts *et. al.* (2009) where behavioural changes may be seen by birds but there would be no active movement away from their location, at the edge of the woodland.
- 5.1.3 Therefore, further assessment has been undertaken to look at alternative construction techniques that could be used instead of percussive piling (a worst case scenario assumed in the EIA) to construct the foundations at this pylon.

## 5.2 Alternative Construction Techniques

- 5.2.1 An alternative method using standard foundations (see paragraph 4.6.9 in ES Chapter 4: Project Description [APP-072]) could be used to construct the temporary pylon (RB12T). The maximum noise levels associated with this method are presented in Table 5.1. This shows that the noise levels would be considerably lower than the 70dB disturbance threshold published by Cutts *et. al.* (2009).

Table 5.1 – Modelled Noise (dB) for Standard Foundations

Distance from Noise source	100% 'on-time' average, $L_{Aeq,T}$	$L_{Amax,T}$ (Hard Ground)	$L_{Amax,T}$ (Soft Ground)
200m	53dB	58dB	54dB
360m	48dB	53dB	47dB

- 5.2.2 The Applicant has reviewed the ground investigation results in the location of temporary pylon RB12T. This shows that standard foundations or non-percussive piling (which is much quieter) would be suitable in the expected ground conditions rather than the worst case (percussive piling) foundation construction method assumed in the EIA. The Applicant can therefore commit to using an alternative (lower noise) method than percussive piling for foundation construction at this pylon. The following measure (EM-AB14) has been added to the REAC submitted at Deadline 3 (Document 7.5.2 (B)):

*'Percussive piling will not be used to construct the foundations of temporary pylon RB12T (607067, 243469), to reduce the maximum (peak) noise levels associated with this construction method to avoid subsequent disturbance on sensitive species at Hintlesham Woods SSSI.'*

- 5.2.3 With the above measure in place, the maximum sound levels at the SSSI (both closest point and at the locations with nightingales present) would be considerably lower than the 70dB disturbance threshold published by Cutts *et. al.* (2009) and would avoid disturbance.

## 6. Conclusion

- 6.1.1 This Technical Note provides information regarding maximum sound levels associated with the construction works near Hintlesham Woods that would occur during bird breeding season. Maximum sound levels from construction activities have been predicted at the edge of Hintlesham Woods and other locations, based on available information, empirical formulas, and professional judgement.
- 6.1.2 The assessment in ES Chapter 7: Biodiversity [APP-075] showed that the maximum noise levels for the construction of the foundations of the temporary pylon (RB12T) using a percussive piling (worst case assumed in the EIA) method are estimated to be between 70 and 80dB  $L_{Amax,T}$  at the edge of Hintlesham Woods SSSI. These exceed the 70dB disturbance threshold for birds (Cutts *et al.*, 2009), including nightingale. Noise levels (and therefore disturbance) would be lower at greater distances. Therefore, the Applicant has committed to using an alternative (lower noise) foundation construction method. The following measure (EM-AB14) has been added to the REAC submitted at Deadline 3 (**Document 7.5.2 (B)**):
- ‘Percussive piling will not be used to construct the foundations of temporary pylon RB12T (607067, 243469), to reduce the maximum (peak) noise levels associated with this construction method to avoid subsequent disturbance on sensitive species at Hintlesham Woods SSSI.’*
- 6.1.3 Noise levels associated with the conductor and transposition works are estimated to be less than 60dB at the edge of the SSSI and would not exceed the threshold. Therefore, no further assessment or mitigation is proposed.
- 6.1.4 In summary, all proposed construction activities that would need to take place within the bird breeding season (assuming percussive piling would not be used for foundation construction at pylon RB12T), would generate maximum noise levels of below the 70dB threshold level identified by Cutts *et al.* (2009) where a behavioural response by birds would be expected. Therefore, the project is not anticipated to disturb breeding birds within the SSSI when taking into account maximum sound levels.

# References

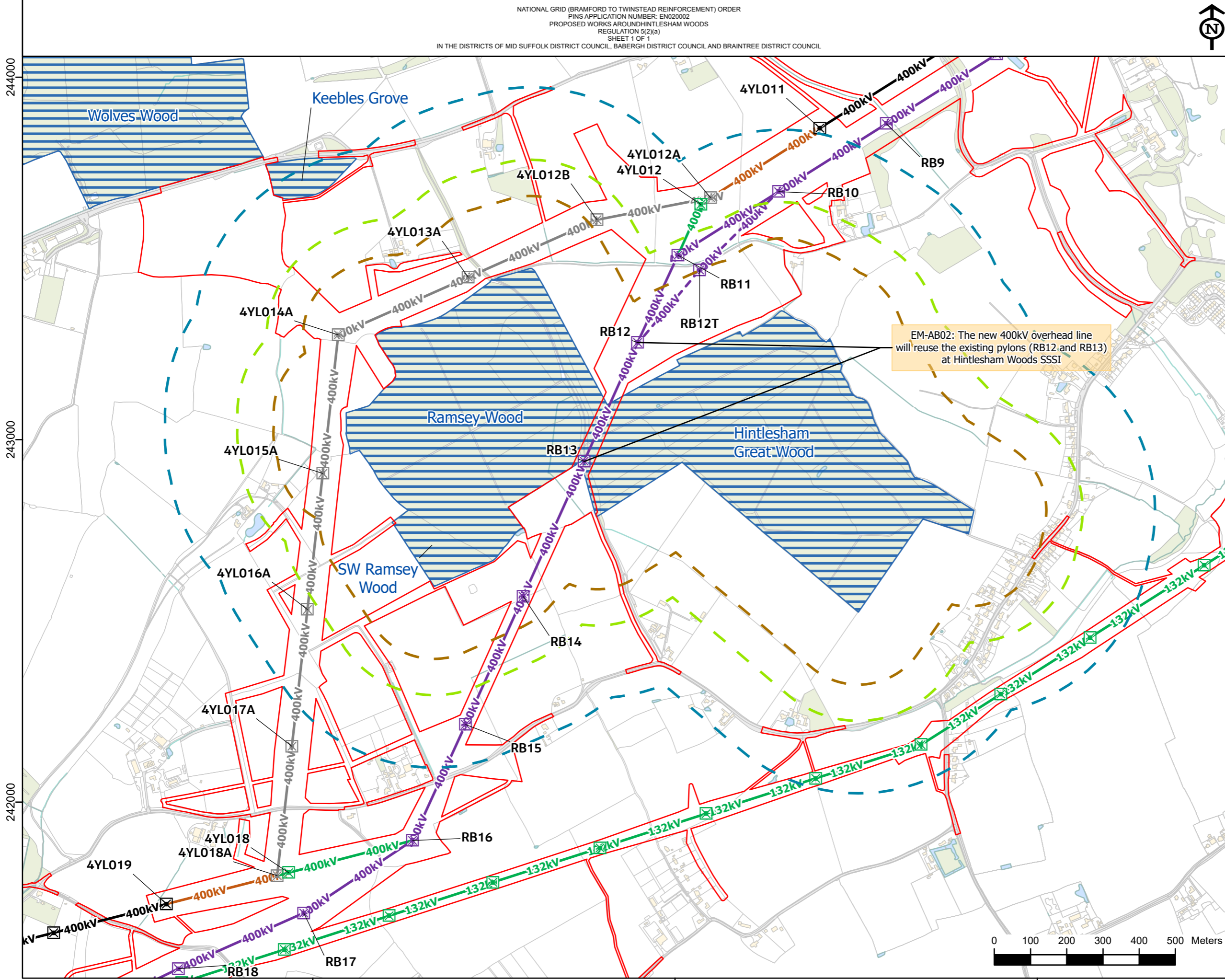
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# Appendix A: Figures



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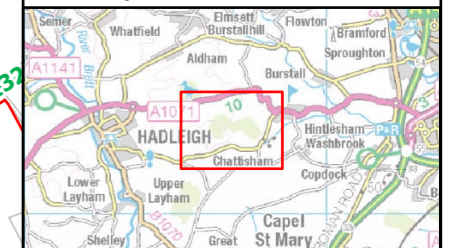


EM-AB02: The new 400kV overhead line will reuse the existing pylons (RB12 and RB13) at Hintlesham Woods SSSI

- Order Limits
- Sites of Special Scientific Interest (SSSI)
- 200m buffer around Hintlesham Woods
- 300m buffer around Hintlesham Woods
- 500m buffer around Hintlesham Woods
- Proposed overhead line
- Existing overhead line
- Proposed modification to overhead line
- Proposed realignment of existing overhead line
- Proposed removal of overhead line
- Temporary overhead line diversion
- Proposed pylon
- Existing pylon
- Proposed pylon realignment
- Proposed pylon removal

Unit	Unit name
001	WOLVES WOOD
002	KEEBLES GROVE
003	RAMSEY WOOD
004	SW RAMSEY WOOD
005	HINTLESHAM GREAT WOOD

Note - The buffers are based on the main construction activities in and around the woods. These exclude areas of planting, which would typically be undertaken outside of bird nesting season.



NG Investment No. ETX/01142				
A	04/2023	Rev A for DCO Application	PM	CW
ISSUE	DATE	REMARKS	DRWN	CHKD

PROJECT: **Bramford to Twinstead Reinforcement**

**nationalgrid**

TITLE: **Figure 7.1.8  
Proposed Works around  
Hintlesham Woods**

CIRCUIT / SITE :  
**Bramford – Pelham & Bramford  
– Braintree – Bulls Lodge**

ORIGINATOR DRAWING NO.  
AAA\_BTT\_HabitatsFR\_Fig7\_1\_8\_Rev0

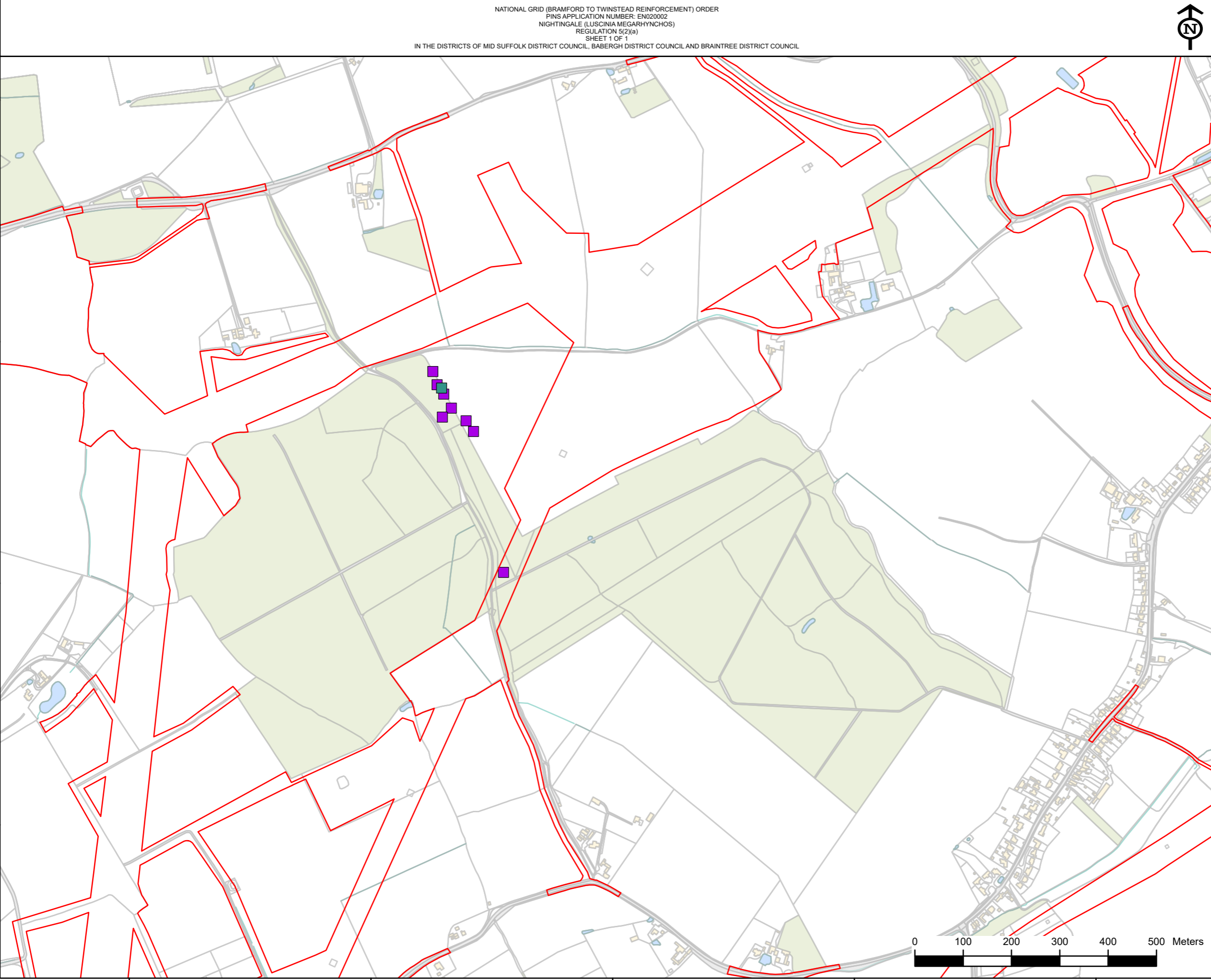
NG DRAWING No. BT-JAC-020631-500-0016	SHEET NO. 1	NO. OF SHEETS 1	ISSUE: A
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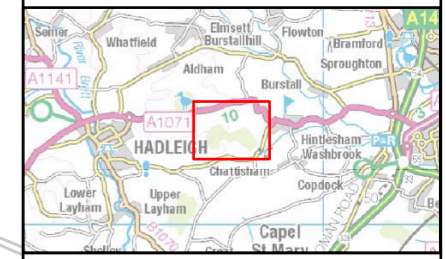


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244000  
243500  
243000  
242500



- Order Limits
- Adult - unidentified sex
- Adult male



NG Investment No. ETX/01142

A	02/2023	Rev A for DCO Application	PM	LG	CW
ISSUE	DATE	REMARKS	DRWN	CHKD	APPD

PROJECT: **Bramford to Twinstead Reinforcement**



TITLE:  
**7.2.4 Nightingale**  
*(Luscinia megarhynchos)*

CIRCUIT / SITE :  
**Bramford – Pelham & Bramford**  
 – Braintree – Bulls Lodge

ORIGINATOR DRAWING NO.  
 AAA\_BTT\_BreedingBirds\_Fig7\_2\_4\_Rev01

NG DRAWING No. BT-JAC-020631-500-0053	SHEET NO. <b>1</b>	NO. OF SHEETS <b>1</b>	ISSUE: <b>A</b>
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