Appendix 15.2 Construction Noise Assessments

CONSTRUCTION NOISE

Introduction

The modelling reported in this section is intended to predict the noise levels arising from construction activities and the effects on the existing noise climate of the area. The models assess construction noise at different phases and include noise from various types of construction plant items (using sound pressure levels from British Standards 5228-1:2009 + A1 2014 Code of practice for noise and vibration control on construction and open sites). The modelled scenarios are the following:

- Earthworks;
- Paving;
- Piling; and
- General construction.

These construction scenarios have been modelled in each of the preliminary assessment locations and the results can be found in Table 15.2.1.

Table 15.2.1: Summary of construction scenarios for each assessment location, ('x' indicates scenario assessment has been conducted at this point in the drafting of the PEIR (July 2020).

ID	Location	Construction Scenario			
		Earthworks	Paving	Piling	General Construction
1	North-West NSRs, near Gate 2 construction (Kent)	x	x	x	x
2	North NSRs, near staff hotel construction (Kent)	-	-	-	x
3	London Resort access road construction (Kent)	x	x	-	x
4	South east NSRs, near access roads construction (Kent)	x	x	-	x
5	Tilbury Docks parking lot construction (Essex)	-	x	-	x

Earthworks

The following plant equipment and quantities have been assumed for the site Earthworks based on plant item noise data in British Standards 5228-1:2009 + A1 2014 Code of practice for noise and vibration control on construction and open sites.

Table 15.2.2: Assumed plant noise levels during site earthworks.

BS5228 Table & Ref no.	Equipment	Octave band sound pressure levels at 10 m (dB), Hz							
		63	125	250	500	1k	2k	4k	8k
C.5 #14	Bulldozer	77	86	75	75	82	80	73	67
C.5 #16	Articulated dump truck	88	90	80	79	76	71	65	61
C.5 #18	Tracked excavator	76	79	75	75	76	73	70	65

Paving

The following plant items have been assumed for paving works.

Table 15.2.3: Assumed plant noise levels during site paving.

BS5228 Table & Ref no.	Equipment	Octave band sound pressure levels at 10 m (dB), Hz							
		63	125	250	500	1k	2k	4k	8k
C.5 #32	Asphalt Paver (+ tipper lorry)	87	84	81	80	79	76	74	67
C.5 #24	Vibratory Roller	89	82	76	77	72	74	81	61

Piling

The following plant items have been assumed for different piling work types.

Table 15.2.4: Assumed plant noise levels during site piling.

BS5228 Table & Ref no.	Equipment	Octave band sound pressure levels at 10 m (dB), Hz							
		63	125	250	500	1k	2k	4k	8k
C.3 #1	Hydraulic hammer rig	82	82	82	89	83	78	75	70
C.3 #8	Vibratory piling rig	83	82	79	82	84	82	77	67
C.3 #14	Large rotary bored piling rig	84	92	81	80	78	76	68	61

General Construction

The following plant items have been assumed for general construction works.

Table 15.2.5: Assumed plant noise levels during site piling.

BS5228 Table & Ref no.	Equipment	Octave band sound pressure levels at 10 m (dB), Hz							
		63	125	250	500	1k	2k	4k	8k
C.3 #1	Concrete mixer truck	82	82	82	89	83	78	75	70
C.3 #8	Truck mounted concrete pump + boom arm	83	82	79	82	84	82	77	67
C.3 #14	Diesel generator	84	92	81	80	78	76	68	61
C.3 #27	Vibro-displacement and compaction of stone	91	84	79	77	74	69	70	59

Assessment criteria

The criteria for the significance of effect due to construction noise upon noise sensitive receptors are derived from Annex E of BS 5228-1. These criteria are based on the total construction noise level, which is the combination of the pre-existing ambient noise level plus construction noise. The threshold of significant effect on dwellings criteria is included in Table 15.2.6 below.

Table 15.2.6: Threshold of significant effect on dwellings.

Evaluation period	Assessment category ($L_{Aeq,T}$ dB)		
	A	B	C
Night-time (23:00-07:00)	45	50	55
Evening and Weekends*	55	60	65
Daytime (07:00-19:00)	65	70	75

**19:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays.*
Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A.
Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A.

The Category (A, B or C) is to be determined separately for each time period and the lowest noise category is then used throughout the 24-hour cycle, e.g. a site which is Category A by day and Category B or C in the evening and night will be treated as Category A for day, evening and night.

Table 15.2.7: Magnitude of impact from construction noise.

Magnitude of impact	Total construction noise level
Negligible	0 to 3 dB > Assessment Category
Small	3 to 5 dB > Assessment Category
Medium	5 to 10 dB > Assessment Category
Large	+10 dB > Assessment Category

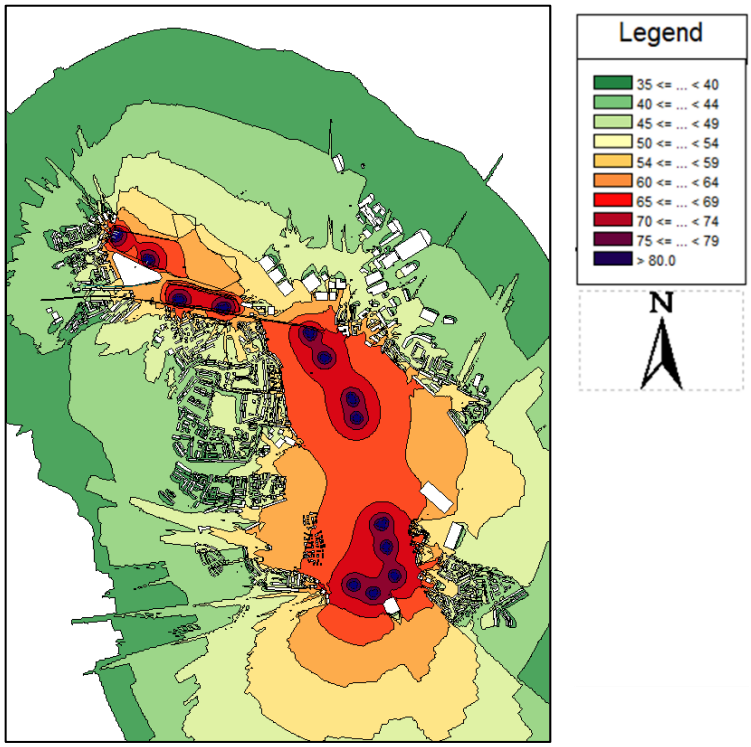
At this stage (July 2020), the magnitude of impact and significance of effect due to construction noise has not been determined. The present models exclude any other noise sources that are not caused as a result of construction works (i.e. road traffic noise or railway noise) in order to see that the models are accurately calibrated before calculating the noise impact on sensitive receptors.

Kent Project Site assessment

Earthworks

The following figure displays noise levels as a result of earthworks at the Kent Project Site, using the data provided in Table 15.2.2.

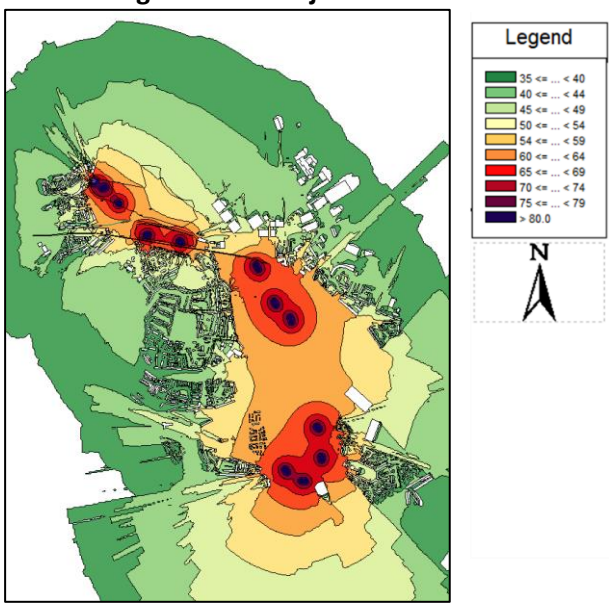
Figure 15.2.1: Calculated daytime levels LAeq,18hr dB(A) as a result of earthworks for the area surrounding the Kent Project Site.



Paving

The following figure displays noise levels as a result of paving works at the Kent Project Site, using the data provided in Table 15.2.3.

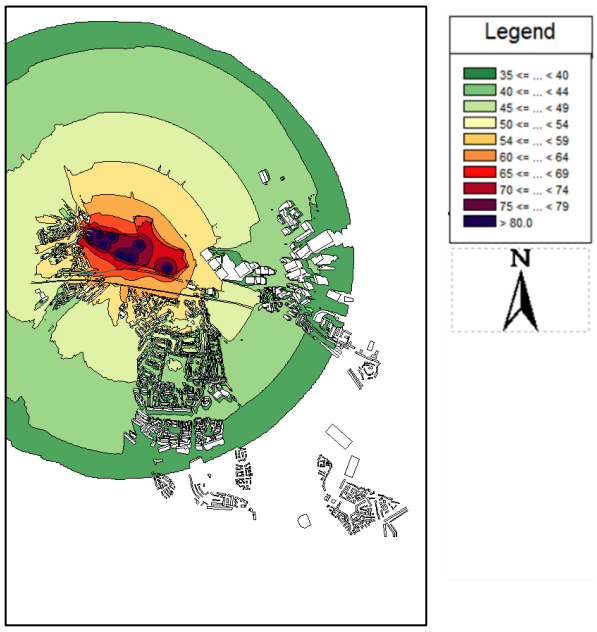
Figure 15.2.2: Calculated daytime levels LAeq,18hr dB(A) as a result of paving works for the area surrounding the Kent Project Site.



Piling

The following figure displays noise levels as a result of piling works at the Kent Project Site, using the data provided in Table 15.2.4.

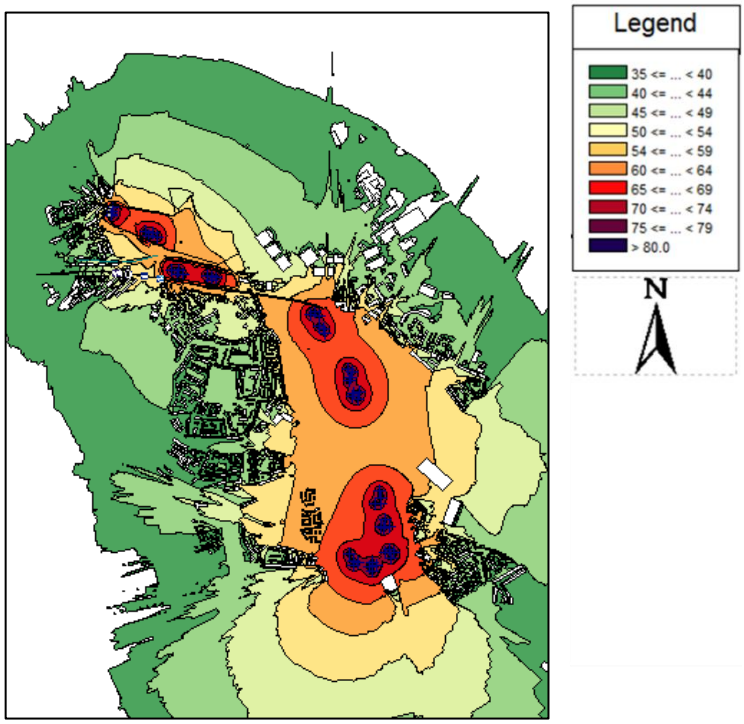
Figure 15.2.3 Calculated daytime levels LAeq,18hr dB(A) as a result of piling works for the area surrounding the Kent Project Site.



General Construction

The following figure displays noise levels as a result of paving works at the Kent Project Site, using the data provided in Table 15.2.5.

Figure 15.2.4 Calculated daytime levels LAeq,18hr dB(A) as a result of general construction works for the area surrounding the Kent Project Site.

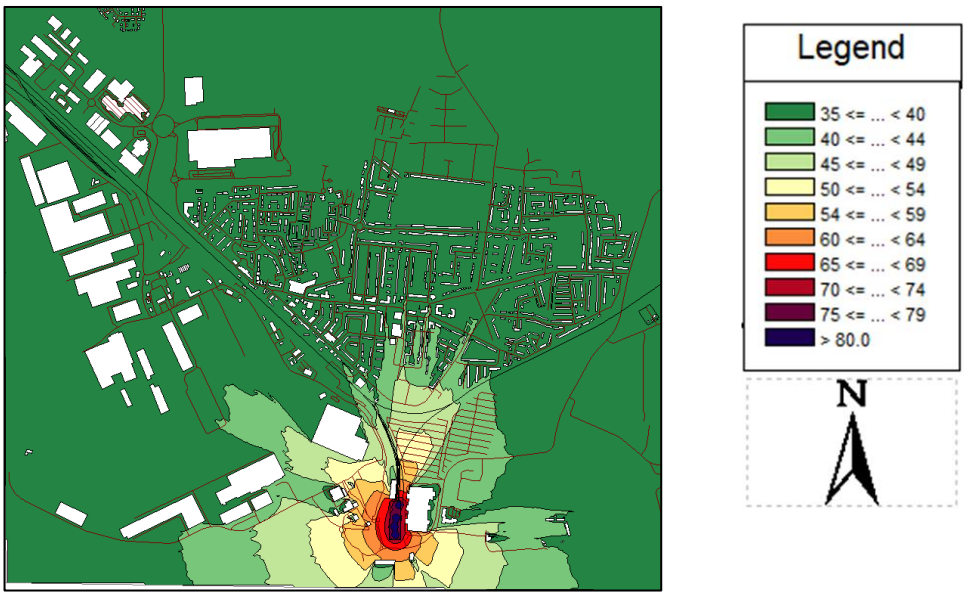


Essex Project Site assessment

Paving

The following figure displays noise levels as a result of paving works at the Essex Project Site, using the data provided in Table 15.2.3.

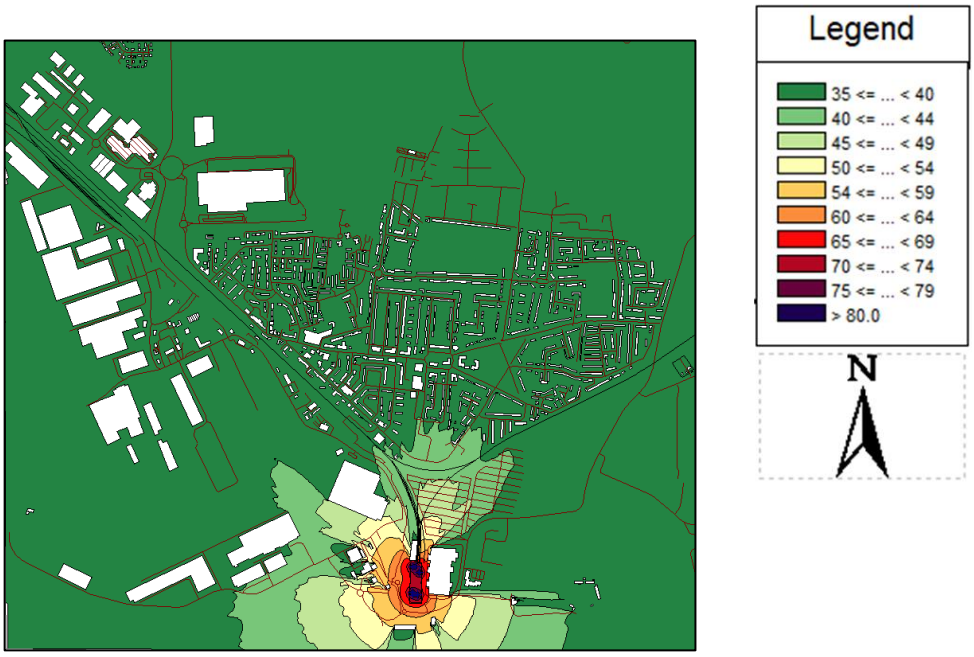
Figure 15.2.5 Calculated daytime levels LAeq,18hr dB(A) as a result of paving works for the Essex Project Site.



General construction

The following figure displays noise levels as a result of general construction works at the Essex Project Site, using the data provided in Table 15.2.5.

Figure 15.2.6 Calculated daytime levels LAeq,18hr dB(A) as a result of general construction works for the Essex Project Site.



Future work

Modelling will be carried out to combine both the construction noise sources as well as the pre-construction existing noise climate. By adding the construction noise sources to the existing noise climate in both the Kent and Essex project sites, it is possible to determine the magnitude of noise impact from the various construction activities. The magnitude of noise impact will be calculated at the different NSRs in both Kent and Essex for the ES.