

Marling Cross

Construction Compound Noise Assessment

Highways England

Project number: 60549458_1

May 2019

Quality information

Prepared by	Checked by	Verified by	Approved by
Nathan Green Acoustic Consultant and Alex Young, Senior Acoustics Consultant			Paul Shields Head of Acoustics

Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	26.04.19	Minor Amendments	26.04.19	Alf Maneylaws	Associate

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Andy Meloy
AECOM (on behalf of Highways England)
Aldgate Tower
2 Leman Street
London
E1 8FA

Prepared by:

Nathan Green MSc, MIOA
Acoustic Consultant
T: +44-(0)113-204-5062
E: nathan.green@aecom.com

Alex Young, MSc MIOA
Senior Acoustics Consultant
D +44-(0) 115 907 7349
M +44 (0) 7789 669 485
alex.young@aecom.com

AECOM Infrastructure & Environment UK Limited

5th Floor, 2 City Walk
Leeds LS11 9AR
United Kingdom

T: +44 (0)113 391 6800
aecom.com

AECOM Infrastructure & Environment UK Limited

12 Regan Way, Chetwynd Business Park,
Chilwell, Notts.
NG9 6RZ, UK

T +44-01159077000
aecom.com

© 2019 AECOM Infrastructure & Environment UK Limited. All Rights Reserved.

This document has been prepared by AECOM Infrastructure & Environment UK Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Introduction	5
2.	Site Description.....	6
3.	Assessment Methodology.....	7
4.	Baseline Monitoring.....	8
5.	Noise Impact Assessment.....	9
6.	Conclusions.....	11
	Appendix A Noise Monitoring Location.....	12
	Appendix B Noise Survey Results	13
	Appendix C Site Plan	16

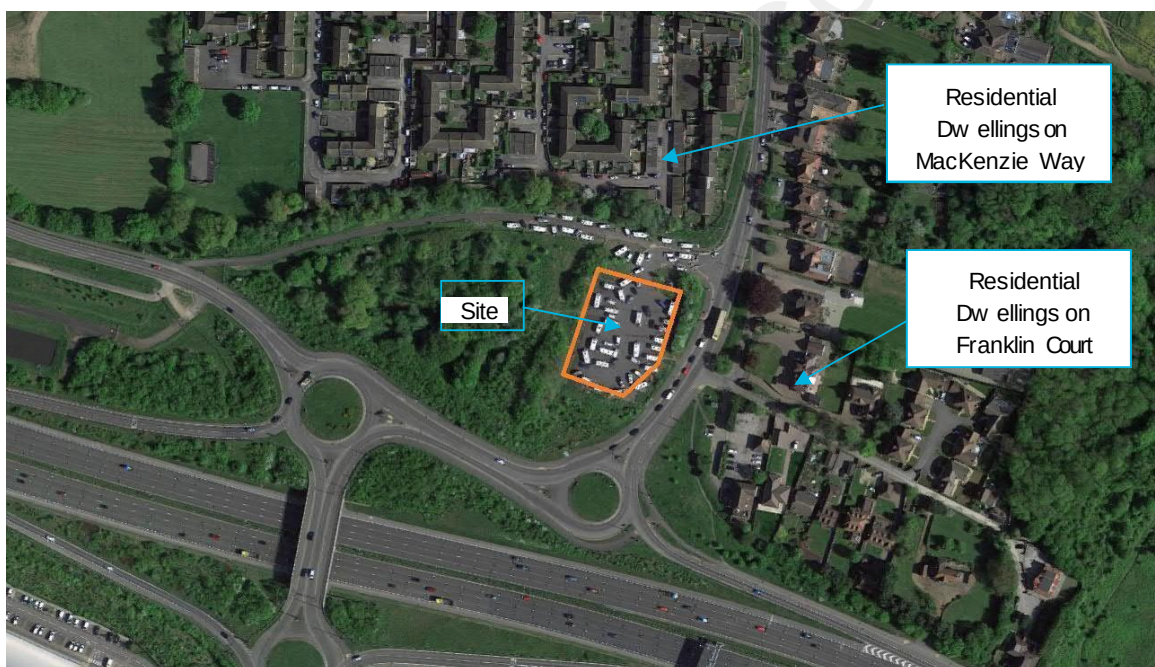
1. Introduction

- 1.1 AECOM forms part of Perfect Circle Joint Venture Limited who has been appointed by Highways England to perform ground investigation works for the Lower Thames Crossing project.
- 1.2 The wider Lower Thames Crossing project involves the construction of new highways, including cuttings, embankments, underpasses, overpasses, interchange enhancements and new technology; major tunnel construction, including ground treatment, logistic yards and power supplies; structures including bridge construction and demolition, site clearance, diversions and associated works.
- 1.3 The project will require several temporary satellite construction compounds to provide laydown areas for equipment used during the works, as well as to provide welfare and office facilities for drilling and supervising staff.
- 1.4 Marling Cross, Gravesham is a proposed location for one of these satellite compounds, which will operate for approximately two years.
- 1.5 This report contains an assessment of the potential noise impact of the Marling Cross construction compound on existing noise sensitive receptor positions in the area.
- 1.6 There are no activities associated with the construction compound that will give rise to high vibration and therefore vibration is scoped out of this assessment.
- 1.7 Furthermore, no significant establishment works are proposed for the compound due to existing hardstanding at the site (i.e. no construction of hardstanding is required, therefore establishment only comprises the delivery of portable cabins). Therefore, assessment of noise from the construction stage of the compound is also scoped out of this assessment.

2. Site Description

- 2.1 The Marling Cross site is located on the edge of Gravesend approximately 4km to the south east of the town centre. The site currently comprises an area of hardstanding which has previously been used as a lorry park.
- 2.2 There are residential dwellings to the north and east of the site. The nearest residential dwellings are to the north of the site on MacKenzie Way, approximately 35 metres from the site boundary. There are also residential dwellings to the east of the site on Franklin Court, approximately 55 metres from the site boundary.
- 2.3 An annotated aerial photo of site showing its location and the location of the nearest noise sensitive receptor is presented in Figure 1 below.

Figure 1 Annotated Aerial Photo



Imagery ©2019 Google, Map data ©2019 Google

3. Assessment Methodology

- 3.1 The impact of noise from the construction compound has been assessed in accordance with the 'ABC method' defined in BS 5228-1:2009¹. This method derives assessment criteria based on the existing noise environment at a given receptor position.
- 3.2 Table 1 details the 'Threshold Values' used in the 'ABC Method'. A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level. The most appropriate threshold values to use for a given assessment depends on the prevailing noise levels at the receptor position.

Table 1 BS5228 Threshold Values

Assessment category and threshold value period	Threshold Value dB $L_{Aeq,T}$ – free-field		
	Category A (a)	Category B (b)	Category C (c)
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (d)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1: A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.			
(a) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.			
(b) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values.			
(c) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values.			
(d) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.			

- 3.3 The noise survey for the site (discussed further below) indicates that the site in question falls into Category A for the daytime, Category B for the evening and Category C for the night time.

¹ BS 5228: 2009+A1: 2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites'

4. Baseline Monitoring

- 4.1 To quantify existing noise levels at the site, a measurement survey was conducted at the site between the 1st and 2nd of April 2019. Details of the survey are given in Appendix B. The results of the survey are summarised in Table 2.

Table 2 Measured Sound Levels

Time Period	ML1
Daytime $L_{Aeq,12hr}$ dB (07:00-19:00) ¹	63
Evening $L_{Aeq,4hr}$ dB (19:00-23:00)	61
Night Time $L_{Aeq,8hr}$ dB (23:00-07:00)	62

¹ Extrapolated from a shorter survey period.

- 4.2 The noise survey results show that the site falls into Category A for the daytime, Category B for the evening and Category C for the night time.

5. Noise Impact Assessment

- 5.1 There are two significant noise sources associated with the operation of the compound:
- Vehicles entering and exiting the site to load/unload equipment; and
 - Two generators located in the south eastern section of the site.
- 5.2 Noise from vehicles and the loading/unloading of equipment will be intermittent, whereas the generators are expected to operate constantly during the daytime and intermittently during the evening and night time.

Vehicle Movements and Equipment Unloading

- 5.3 Noise from vehicles accessing the compound and the loading and unloading of equipment has the potential to impact on existing noise sensitive receptors in the area.
- 5.4 However, the site is understood to have previously operated as a lorry park. Changing its use to a construction compound with vehicle deliveries is unlikely to alter the soundscape at the site.
- 5.5 However to minimise noise a set of management protocols have been developed.
- 5.6 The recommended noise management protocols are listed below :
- Good community relations should be established and maintained throughout the operation of the compound.
 - The loading and unloading of materials should take place as far away from residential properties as practical, ideally in locations which are acoustically screened from nearby noise sensitive receptors;
 - Materials should be handled with care and placed rather than dropped where possible. Drop heights of materials from lorries and other plant should be kept to a minimum;
 - Site operations and vehicle routes should be organised to minimise the need for reversing movements, and to take advantage of any natural acoustic screening present in the surrounding topography;
 - Reversing alarms should be disabled and a Banksman used to guide the vehicle during reversing.
 - No employees, subcontractors and persons employed on the site should cause unnecessary noise from their activities e.g. excessive 'revving' of vehicle engines, music from radios, shouting and general behaviour etc. All staff inductions at the site should include information on minimising noise and reminding them to be considerate of the nearby residents;
 - Measures should be put in place to ensure that employees know that minimisation of noise will be important at the site,

Generator Noise

- 5.7 Two generators are proposed to be located in the south eastern section of the site. It is understood that both generators will operate during the daytime, however only one generator will operate intermittently during the evening and night time. For robustness, this assessment assumes that the generator that operates during the evening and night time could potentially operate for prolonged periods.
- 5.8 The location of these generators is shown in a site plan given in Appendix C. The nearest receptor positions to the location of these generators are on Franklin Road to the east and MacKenzie Way to the north. Both receptor positions are approximately 80 metres from the generator.
- 5.9 The specific details of the generators are still to be confirmed, however it is understood that a 'silenced' generator similar to the John F Hunt 100kVA model will be specified². This unit generates a noise level of 66 dB $L_{Aeq,T}$ at seven metres. Therefore, a noise level of 66 dB $L_{Aeq,T}$ at seven metres has been assumed for this assessment.

² Details available at <https://www.johnfhuntpower.co.uk/product/100-kva-silenced-generators/>

- 5.10 Sound levels from the generator have been calculated at the location of the noise sensitive receptors. The results of these calculations are presented in Table 6 below.

Table 6: Proposed Operational Plant Data

Period	Calculated Level at the Nearby Noise Sensitive Receptor (dB L _{Aeq,8hr})	BS5228 Night Time Noise Threshold Value (dB L _{Aeq,8hr})	Exceedance Predicted? (Y/N)
Daytime	58	65	N
Evening	55	60	N
Night Time	55	55	N

- 5.11 It can be seen from the above that noise from the generator complies with the BS5228 threshold value for the night time period. It therefore follows that noise from the generator also complies with the threshold values for the day and evening periods.

6. Conclusions

- 6.1 This report details the construction and operational noise assessments for the proposed construction compound at Marling Cross, Gravesend, for the Lower Thames Crossing project.
- 6.2 There are no activities associated with the construction or operation of the compound that will give rise to high vibration levels and therefore vibration is scoped out of this assessment.
- 6.3 A measurement survey was conducted at the site between the 1st and 2nd of April 2019 to quantify existing sound levels in the area.
- 6.4 The measured noise levels have been used to determine assessment criteria in accordance with the 'ABC Method' defined in BS5228.
- 6.5 No significant establishment works are required. Therefore, no significant noise levels are expected during the construction of the compound.
- 6.6 Noise from vehicles accessing the compound for the loading and unloading of equipment has the potential to impact on existing noise sensitive receptors in the area. To address this, a set of management protocols have been developed to minimise the impact of this noise source as far as is practicable.
- 6.7 Noise from two generators proposed for installation at the site were assessed and comply with the assessment criteria.

Appendix A Noise Monitoring Location

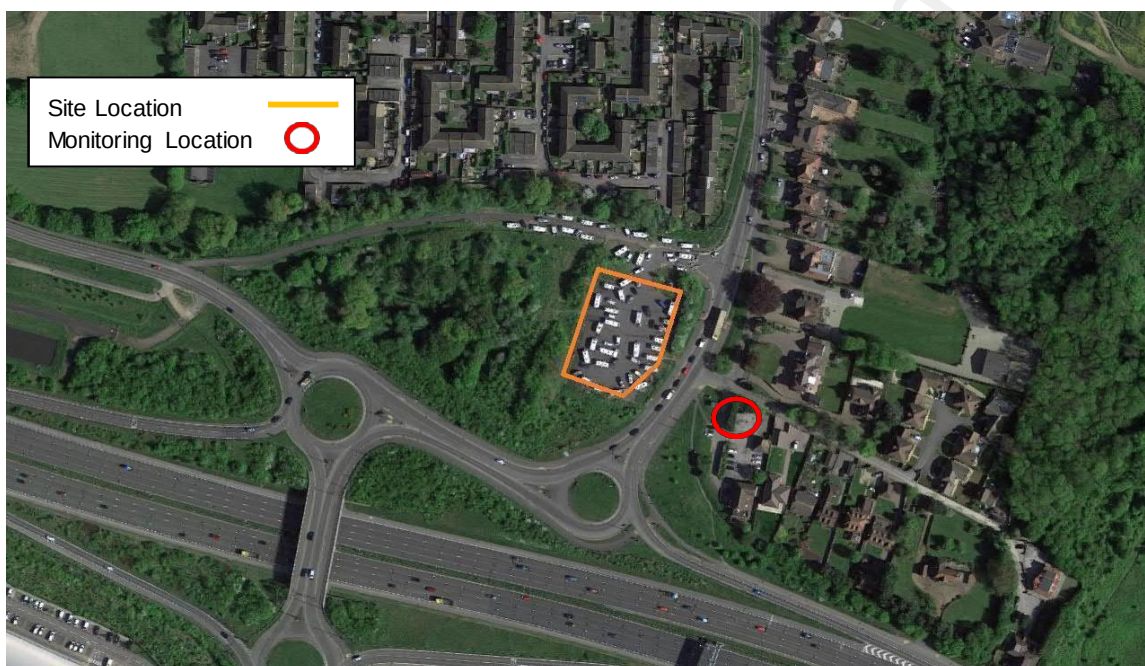


Appendix B Noise Survey Results

Description of Noise Monitoring Location

Location ID	Date	Details	Existing Noise Sources
LT1	Monday 1 st April to Tuesday 2 nd April 2019	Northwest corner of Nell's Café car park	Road traffic

Aerial Photograph of the Noise Monitoring Location



Imagery ©2019 Google, Map data ©2019 Google

Survey Instrumentation

Instrument	Manufacture	Model	Serial Number
LT1 Class 1 Sound Level Meter	Rion	NL-52	0420764
Calibrator 1	Rion	NC-74	50541127

The microphone was positioned approximately 1.5m above ground level in free-field conditions. Field calibration checks of the sound level meters before and after the surveys exhibited no significant drift (no greater than 0.2dB). Weather conditions at the beginning and end of the survey were noted to be dry with low wind speeds. The observed meteorological conditions are considered suitable survey conditions.

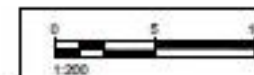
Measured Noise Levels

Date	Start Time	$L_{Aeq, 15min}$
Monday 1 st April 2019	14:15:00	62.2
	14:30:00	62.5
	14:45:00	62.7
	15:00:00	62.6
	15:15:00	62.9
	15:30:00	63.0
	15:45:00	65.1
	16:00:00	63.1
	16:15:00	64.8
	16:30:00	63.3
	16:45:00	62.6
	17:00:00	64.7
	17:15:00	63.0
	17:30:00	64.5
	17:45:00	63.6
	18:00:00	63.4
	18:15:00	63.3
	18:30:00	63.4
	18:45:00	63.3
	19:00:00	62.6
	19:15:00	62.9
	19:30:00	62.1
	19:45:00	62.9
	20:00:00	61.9
	20:15:00	61.4
	20:30:00	61.6
	20:45:00	61.1
	21:00:00	61.1
	21:15:00	60.9
	21:30:00	61.3
	21:45:00	60.5
	22:00:00	60.3
	22:15:00	62.9
	22:30:00	58.7
	22:45:00	58.9
	23:00:00	57.4
	23:15:00	57.9
	23:30:00	55.7

Tuesday 2 nd April 2019	23:45:00	56.5
	00:00:00	55.3
	00:15:00	55.2
	00:30:00	54.1
	00:45:00	54.3
	01:00:00	53.5
	01:15:00	55.5
	01:30:00	56.3
	01:45:00	55.8
	02:00:00	55.1
	02:15:00	57.6
	02:30:00	58.6
	02:45:00	56.7
	03:00:00	55.1
	03:15:00	55.7
	03:30:00	56.4
	03:45:00	57.2
	04:00:00	57.8
	04:15:00	59.7
	04:30:00	62.8
	04:45:00	64.2
	05:00:00	65.8
	05:15:00	66.7
	05:30:00	67.4
	05:45:00	67.0
	06:00:00	67.4
	06:15:00	66.5
	06:30:00	65.3
	06:45:00	65.3
	07:00:00	65.5
	07:15:00	57.4

Appendix C Site Plan

Gravesham Borough Council



PROJECT
LOWER THAMES CROSSING

CLIENT
LOWER THAMES CROSSING
5th Floor Beaufort House
15 Botolph Street
London EC3A 7DT

CONSULTANT
AECOM
Aldgate Tower
2 Leman Street
London, E1 8FA
www.aecom.com

NOTES

- Satellite Compound: 2530m²
- Porta-cabins: Total Area 246m²
(450m² including second storey on some units)
- Car Parking: Area 750m²
- Lay down Area: 520m²
- Anticipated up to 50 staff
- Unless otherwise stated, portable cabins are single-storey

KEY

- | | |
|---|--|
|  | EXISTING LAYOUT |
|  | OFFICE AND WELFARE SITE |
|  | CAR PARK |
|  | SEGREGATED PPE-FREE PEDESTRIAN WALKWAY |
|  | UNITS (VARIOUS) |
|  | GATES |
|  | PARKING BAYS |
|  | FENCING |
|  | SECTION LINE. REFER TO SITE ELEVATIONS FOR DETAILS |
|  | PROPOSED SITE BOUNDARY |
|  | EXISTING VEGETATION AND TREES |
|  | PROPOSED DECIDUOUS VEGETATION AS VISUAL SCREENING |
|  | PROPOSED WALL MOUNTED LED LUMINAIRE AT 5M/3M HEIGHT (RESPECTIVELY) |
|  | PROPOSED 3M TALL LIGHTING COLUMN WITH LED LANTERNS |

SPREADSHEET COMMENTS (DO NOT REMOVE, ADD COMMENTS TO THE SPREADSHEET TO REFLECT CHANGES TO THE BIDDING DOCUMENTS. YOUR COMMENTS WILL BE RECORDED.)	LN	ROW	DATE	BY
LAYOUT REARRANGED FOLLOWING SUBCONTRACTOR INPUT	LN	ROW	DATE	BY
INITIAL ISSUE	LN	ROW	DATE	BY
REVISION DETAILS	LN	ROW	DATE	BY

PROJECT MANAGEMENT INITIALS

DESIGNED: ALP CHECKED: AM APPROVED: AZ

PROJECT NUMBER

60549458

SHEET TITLE

SITE PLAN - MARLING CROSS
COMPOUND - PACKAGE A

SHEET NUMBER

60549458-SKT-P-MARLING_CROSS-SITE_PLAN

Gravesham Borough Council