

Appendix 2.2

Baseline noise survey details

Introduction

An environmental noise survey has been undertaken to determine the noise climate within and around the periphery of the proposed development in Princes Dock, Liverpool. Measurements have been made to enable the assessment of noise from existing sources affecting the proposed development and proposed new sources forming part of the development affecting existing land uses.

Methodology

Attended noise measurements were taken during the following periods:

- Day time between 14:00 and 17:00 on Tuesday the 19th of January 2016, and between 11:25 and 15:00 on Thursday the 10th of March 2016
- Evening between 19:00 and 23:00 on Wednesday the 9th of March 2016
- Night time between 23:00 and 04:00 on Tuesday the 19th of January 2016

All measurements were taken by Thomas Mays and Achim Klein of Arup. The measurement locations are shown in Figure B1. The measurement locations were chosen to provide an indication of the typical background noise levels at times of the day, evening and night at the nearest noise sensitive receptor to the proposed development and to determine the existing noise climate at the proposed residential facades.



Figure B1: Site plan and measurement locations. Imagery ©2016 Google, map data ©2016 Google

For measurements during the day time, sets of 15 minute measurements were taken at each measurement location; during the evening and night time, sets of 5 or 10 minute measurements were taken, dependent on the measurement location.

L_{Aeq} , L_{A10} , L_{A90} , and L_{Amax} values were all stored. Octave band spectra were also recorded at all locations. All broadband measurements were A-weighted and used a fast time constant (0.125s). The equipment used is detailed in Table B1.

Equipment	Manufacturer	Type	Serial number
Precision grade noise logging sound level meter (Kit B)	RION	NA-28	30921859
½" diameter pre-polarised condenser microphone (Kit B)	RION	UC-59	04158
Type 1 sound pressure level calibrator (Kit B)	RION	NC-74	34235940
Preamplifier (Kit B)	RION	NH-23	11914
Precision grade noise logging sound level meter (Kit C)	RION	NA-28	30921840
½" diameter pre-polarised condenser microphone (Kit C)	RION	UC-59	04139
Type 1 sound pressure level calibrator (Kit C)	RION	NC-74	34336010
Preamplifier (Kit C)	RION	NH-23	11895

Table B1: Noise survey equipment

The microphones were located at approximately 1.5m above the ground. The sound level meters and microphones are Type 1, conforming to BS EN 61672-1: 2003. The calibration of sound level meters and microphones were checked before and after use, to confirm that there was no significant drift in meter response at the calibrator frequency and level. This verification indicated that there was less than 0.5dB variation between checks. The meters are annually calibrated and this calibration is traceable to international standards.

During the measurements the weather was calm and dry. All measurements were undertaken under acoustically free-field conditions, except where otherwise stated.

Results

B3.1 Measurement Location 1

19 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
14:19	15:00	52.0	56.3	58.3	68.3	
14:56	15:00	52.9	58.0	61.6	69.3	
15:32	15:00	52.8	58.3	61.8	71.1	Small boat noise
16:10	15:00	53.4	60.0	64.0	77.1	
16:47	15:00	53.6	60.1	64.1	74.6	

Table B2: Measured daytime noise levels at Measurement Location 1

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
21:18	10:00	47.9	51.5	52.4	68.3	
22:19	10:00	49.0	58.5	60.0	76.8	

Table B3: Measured evening noise levels at Measurement Location 1

20 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
02:29	05:00	43.9	46.7	48.8	61.6	
02:34	05:00	44.8	48.0	50.2	61.4	
03:40	05:00	41.8	44.7	46.8	61.5	
03:46	05:00	41.8	45.1	47.0	52.3	

Table B4: Measured night time noise levels at Measurement Location 1

Measurement Location 2

19 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
14:00	15:00	50.9	58.1	59.9	77.1	
14:36	15:00	51.8	61.2	65.5	75.6	
15:14	15:00	51.7	60.9	65.4	74.0	
15:50	15:00	51.9	62.4	66.9	77.1	
16:28	15:00	53.5	63.7	68.4	75.5	

Table B5: Measured daytime noise levels at Measurement Location 2

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
21:31	10:00	47.2	53.8	52.8	71.0	
22:31	10:00	49.4	54.9	54.9	74.1	Large ferry passed

Table B6: Measured evening noise levels at Measurement Location 2

20 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
02:42	05:00	42.1	45.7	49.3	54.3	
02:48	05:00	42.4	45.0	47.2	55.4	
03:27	05:00	41.3	44.2	45.7	55.8	
03:33	05:00	41.5	43.8	46.4	53.1	

Table B7: Measured night time noise levels at Measurement Location 2

Measurement Location 3

10 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
11:43	15:00	60.3	75.2	79.3	92.0	
12:35	15:00	61.2	74.8	78.8	90.5	

Table B8: Measured daytime noise levels at Measurement Location 3, façade measurement

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
19:21	15:00	58.5	74.8	79.2	92.1	
20:12	15:00	56.0	73.8	78.1	92.0	

Table B9: Measured evening noise levels at Measurement Location 3, façade measurement

19 th -20 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
23:33	05:00	50.8	66.5	65.8	68.4	
23:39	05:00	51.9	67.0	69.0	83.8	
23:45	05:00	51.6	68.4	70.0	86.6	Very loud car pass-by
00:30	05:00	50.7	67.0	70.1	84.8	
00:35	05:00	49.5	60.3	62.6	79.8	
00:41	05:00	49.8	63.7	63.3	83.0	
01:34	05:00	48.9	53.5	57.3	61.8	
01:39	05:00	48.9	62.3	63.8	82.6	
01:45	05:00	49.0	65.6	63.3	89.6	Very loud car pass-by

Table B10: Measured night time noise levels at Measurement Location 3, façade measurement

Measurement Location 4

10 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
11:25	15:00	55.7	59.3	61.5	68.4	Some building site noise (shovelling, talking)
14:34	07:24	55.2	60.1	62.5	75.6	Some building site noise, Canada goose noise. Measurement stopped early due to car alarm

Table B11: Measured daytime noise levels at Measurement Location 4

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
19:39	15:00	54.3	58.6	61.1	64.0	
19:55	15:00	54.8	58.2	60.6	67.7	

Table B12: Measured evening noise levels at Measurement Location 4

19 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
23:08	05:00	46.6	54.4	57.8	68.7	
23:13	05:00	47.0	55.4	58.1	71.8	
23:19	05:00	46.3	53.9	58.2	64.5	
00:52	05:00	44.7	49.2	51.5	64.7	
00:58	05:00	45.6	55.6	59.6	70.7	
01:04	05:00	45.2	52.1	55.7	65.8	
01:11	05:00	45.4	51.6	54.4	64.4	
01:17	05:00	44.4	53.4	54.9	68.8	
01:23	05:00	44.7	49.0	52.1	63.5	

Table B13: Measured night time noise levels at Measurement Location 4

Measurement Location 5

19 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
14:03	15:00	56.0	63.1	67.1	74.0	
15:00	15:00	57.5	63.7	67.3	77.0	
15:50	15:00	58.2	64.1	67.3	71.9	
16:08	15:00	58.9	63.9	67.0	73.1	

Table B14: Measured day time noise levels at Measurement Location 5, façade measurement

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
21:45	10:00	54.5	60.6	64.0	77.5	
22:46	10:00	53.6	59.7	63.8	68.6	

Table B15: Measured evening noise levels at Measurement Location 5, façade measurements

20 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
02:58	05:00	51.7	57.8	61.6	71.2	
03:05	05:00	51.3	52.5	53.8	61.0	
03:12	05:00	51.2	53.3	55.8	62.2	
03:17	05:00	51.2	53.1	54.8	61.7	

Table B16: Measured night time noise levels at Measurement Location 5, façade measurements

Measurement Location 6

10 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90} , T	dBL _{Aeq} , T	dBL _{A10} , T	dBL _{Amax,F}	Notes
12:16	15:00	60.6	71.1	75.4	83.9	Some roller shutter noise
13:10	15:00	62.4	71.5	75.6	80.8	

Table B17: Measured daytime noise levels at Measurement Location 6

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90} , T	dBL _{Aeq} , T	dBL _{A10} , T	dBL _{Amax,F}	Notes
20:49	10:00	55.1	67.7	72.1	78.6	
21:59	10:00	59.0	70.5	74.3	79.8	

Table B18: Measured evening noise levels at Measurement Location 6

20 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90} , T	dBL _{Aeq} , T	dBL _{A10} , T	dBL _{Amax} , F	Notes
02:11	05:00	52.0	59.0	59.5	76.9	
02:19	05:00	52.0	63.3	67.8	76.6	
03:56	05:00	52.1	61.5	64.4	76.2	
04:00	05:00	52.1	54.9	56.4	66.0	

Table B19: Measured night time noise levels at Measurement Location 6

Measurement Location 7

19 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
14:32	15:00	52.3	55.0	57.1	63.9	
15:25	15:00	51.8	55.4	58.2	63.5	
16:35	15:00	53.5	56.7	58.7	61.9	

Table B20: Measured day time noise levels at Measurement Location 7

Measurement Location 8

10 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
12:00	15:00	65.0	76.1	80.5	88.3	
12:52	15:00	65.8	76.9	81.6	88.3	
13:51	15:00	66.0	77.1	81.9	89.4	

Table B21: Measured day time noise levels at Measurement Location 8

9 th March 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
19:03	15:00	63.5	76.7	81.3	92.0	
20:30	15:00	58.5	75.2	80.1	89.5	

Table B22: Measured evening noise levels at Measurement Location 8

19 th -20 th January 2016						
Start time (hh:mm)	Elapsed time (mm:ss)	dBL _{A90,T}	dBL _{Aeq,T}	dBL _{A10,T}	dBL _{Amax,F}	Notes
23:52	05:00	54.3	71.4	74.5	86.0	
23:58	05:00	56.4	68.7	72.9	83.7	
00:04	05:00	52.5	71.7	73.6	86.4	
00:11	05:00	52.7	70.8	74.4	84.7	
00:16	05:00	53.4	72.6	76.0	89.4	
00:22	05:00	52.5	71.0	72.1	89.6	
01:53	05:00	52.7	67.2	67.6	87.3	
01:58	05:00	52.2	62.3	62.1	81.2	
02:04	05:00	52.5	68.1	70.0	85.5	

Table B23: Measured night time noise levels at Measurement Location 8