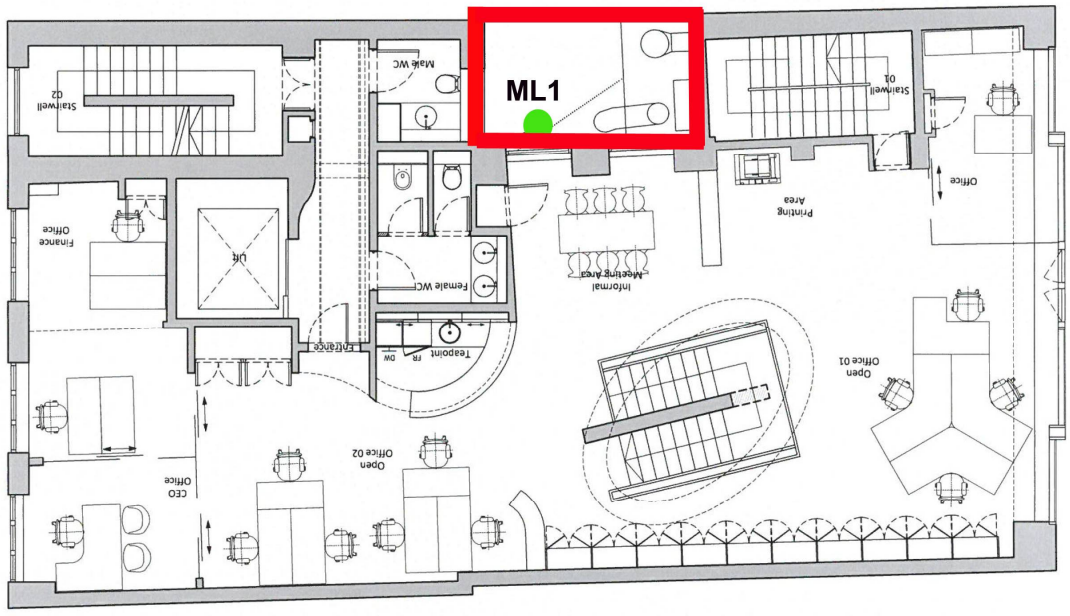
NOISE SURVEY LTD

Noise Assessment Report for Institute of Materials, Minerals and Mining

Report Ref:	206IMMM
Client:	The Institute of Materials, Minerals and Mining
Site Location:	The Institute of Materials, Minerals and Mining 297 Euston Road London NW1 3AD
Date of Issue:	05th May 2017
Date of Assessment:	Tuesday 11th – Wednesday 12th April 2017



Picture 1: Site layout plan with the red boundary indicating the external light well where the inlet and out let ducting is located together with the air conditioning unit and passive air vent. The green circle indicates the measurement location.

Executive Summary

In the context of the noise environment, the difference over background of 9 dB during the night and 7dB during the day is acceptable because it is largely due to characterized noise irregularity

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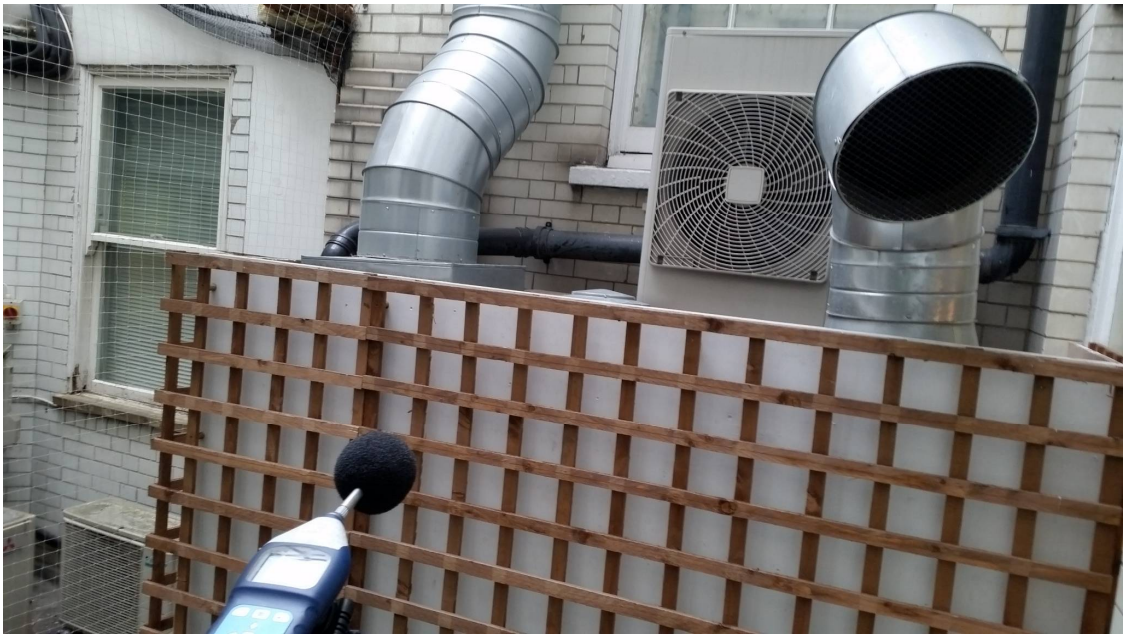
and tonality that is already an existing feature of the noise environment. For this reason the specific noise represents a low likelihood of adverse impact.

Uncertainty is assessed at ± 5 dB

Source under Assessment

The client has installed a commercial kitchen fume extractor together with an air conditioning unit and a passive vent for a gas boiler. When the fume extractor, air conditioning unit and vent are in operation, they generate noise that is spread into the light well where the ducting inlet is located. The out let for the fume extractor is at roof height above the light well and it is next to commercial offices. It is the noise from the extractor fan, air conditioning unit and passive ventilation that is assessed in this report.



Picture 2: The inlet for the fume extractor is to the right with the air conditioning unit in the middle. The fan extractor ducting is visible to the left however the extract outlet is at roof height and is not visible in the picture.

Picture 3: The extract ducting can be seen in the picture but the out let is at roof height. The picture also shows the construction of the light well.

Methodology

A single type 1 Casella CEL 490 sound level meter was used to measure noise at the nearest residential building. This was an apartment whose kitchen window forms part of the light well and it is on the same floor as the fan inlet and air conditioning unit as shown in picture 4 below. . All other floors are occupied as offices or used as commercial space.

The meter was successfully calibrated before and after the measurements. The meter was set to measure the LAeq and LAF90 both cumulatively and to log levels on an hourly and 15min basis.

The day time ambient noise level was measured first for 1 hour (from 09:55 – 10:55). This is noise that includes the extractor fan and air conditioning unit operating at maximum capacity together with the passive vent. The day time residual noise was measured from 11:10 – 18:00 on Tuesday the 11th of April.

The meter was left to log noise levels unattended. The office was closed until 05:30 on Wednesday the 12th of April. Staff were told not to begin using the oven extractor or air

conditioning unit till 06:30AM. The residual night noise was measured from 05:30 – 06:30 and the ambient noise was measured from 06:30 -07:00 of Wednesday the 12th of April.

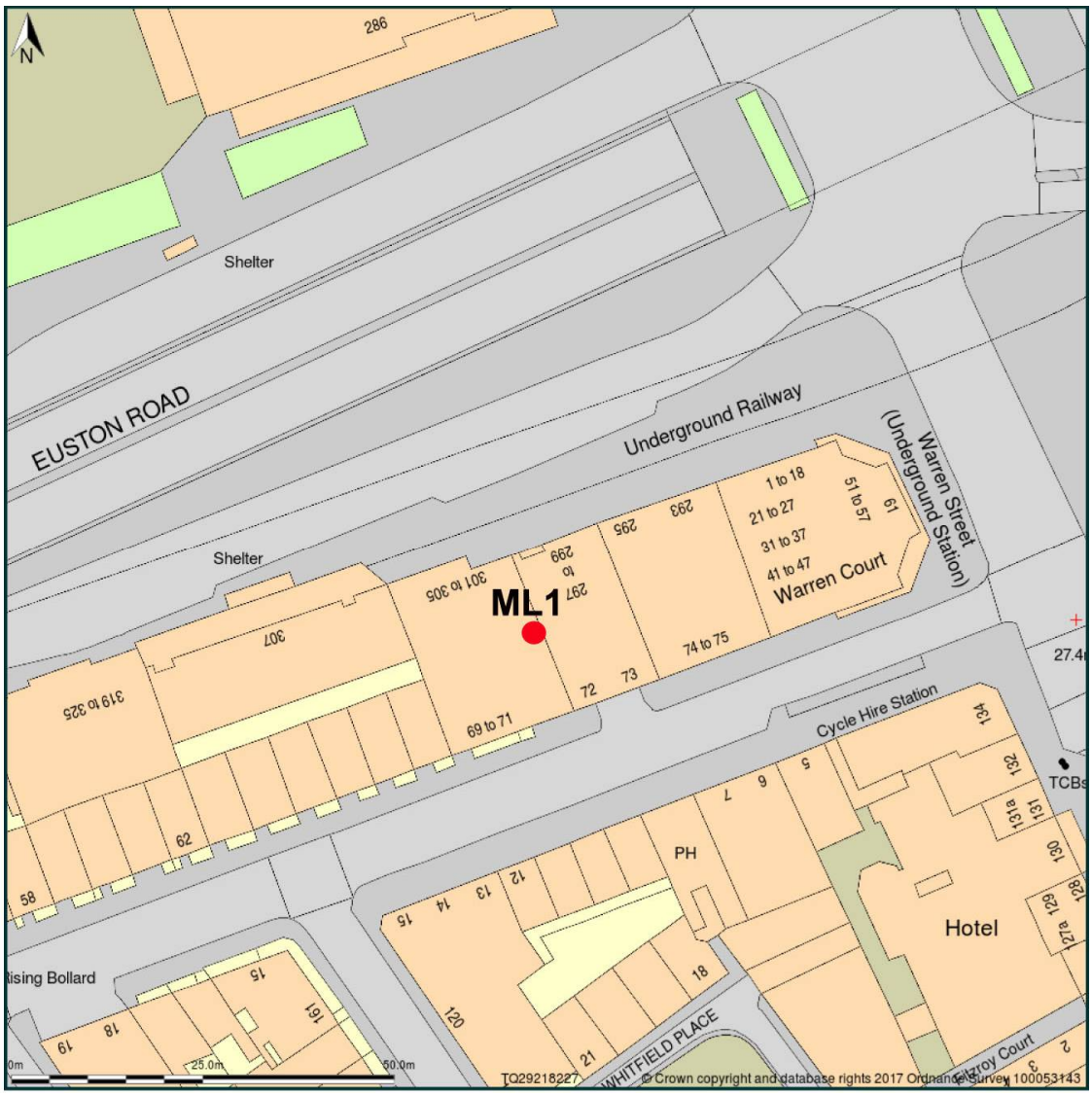
During measurement of the residual noise the extractor fan and air conditioning unit were switched off. The passive vent was left open for health and safety purposes, (it is noted that noise from the passive vent is negligible). The residual noise was measured.

Picture 4: The window furthest to the left is the kitchen window to the nearest residential dwelling. The picture shows the presence of existing 3rd party air conditioning units next to the noise sensitive dwelling whose noise is included in the residual noise. At least 5 3rd party air conditioning units can be seen in the picture.

Façade Correction

Façade measurements occur when the meter is in front of a large reflective surface at a distance of less than 3.5m away from the reflective surface. In this instance both the ambient and residual measurements would require a façade correction. However the net result would be the same so no correction has been applied to any measurement.

Site and Measurement Locations



Site plan: This is a site location plan purchased and cropped from the website https://www.buyaplan.co.uk on 5th May 2017 at 15:15. The full site plan is attached as part of this report in the Appendix. The red circle indicates the noise measurement locations and is marked with ML1.

Hours of Operation

The air conditioning unit and the extractor fan are in operation between 05:30AM – 18:00 PM.

The passive vent is in operation continuously 24 hours per day.

Receptor Sensitivity

The nearest residential dwellings is 3m from the specific noise which consists of the passive vent, fan inlet and air conditioning unit.

Date and Time of Measurements

Measurements were conducted on Tuesday 11th – Wednesday 12th of April 2017. The measurements started at 09:45 on Tuesday and continued to 10:00AM on Wednesday.

Mode of Operation.

During measurement of the ambient noise, the extractor fan and the air conditioning unit were running at maximum.

Noise Characteristics

Irregular: The specific noise collectively is irregular and a +6dB character correction has been applied

Impulsive: None detectable at the nearest dwelling.

Tonal: Barely detectable at the noise sensitive receptor however a +3dB character correction is applicable in the context of the noise environment.

A combined character correction of +6dB has been applied for tonality and irregularity from the specific noise.

Location	Ambient Noise (Specific noise on)	Residual Noise (Specific noise off)	Background Noise (Specific noise off $L_{AF}90$
ML1 (Day)	$L_{Aeq\ (1\ hour)}$ 58.1dB	$L_{Aeq\ (7\ hours)}$ 57dB	$L_{AF90\ (7\ hours)}$ 51dB

ML1 (Night)	LAeq (15min) 57.4dB	$L_{Aeq\ (1\ hour)}$ 54 dB	$L_{AF90\ (1\ hours)}$ 52dB

Table 1: Day and night time measurements at ML1.

Specific Noise Level

The day time combined noise from the extractor fan, air conditioning unit and passive vent also known as the specific noise, is obtained by subtracting the residual noise from the ambient noise. In this instance the specific noise is LAeq (1 hour day) 52dB.

The night time specific noise is LAeq (15min) 55dB.

BS4142:2014 Assessment Day Time Based on Actual Measurements at ML1.

Results		**Relevant Clause BS4142:2014**	**Commentary**
Measured ambient sound level	$L_{Aeq\ (60min)}$ 58.1dB	7.3.1	Specific noise obtained by onsite measurement
Residual Sound Level	$L_{Aeq\ (7\ hours)}$ 57dB	7.3.3	Obtained by onsite measurement
Background sound level	$L_{AF90\ (5\ hours\ 6min)}$ 51dB	8.3	Measured onsite
day time, reference time interval is 60 min.		7.2	
Specific sound level (ambient noise – residual noise)	52dB	7.3.3	Obtained by measurement and calculation
Acoustic feature correction	+6dB	9.2	
Rating Level (specific level plus correction for noise characteristics)	58dB	9.2	

Excess of rating over background level	58 – 51 = 7dB	11	
This indicates a likelihood of an adverse impact if isolated from the context of the noise environment.		11	
Uncertainty of the assessment	uncertainty is estimated at ± 5dB		

Table 2: BS4142 noise rating level calculation for day time specific noise.

BS4142:2014 Assessment Night Time

Results		**Relevant Clause BS4142:2014**	**Commentary**
Measured ambient sound level	$L_{Aeq\ (15min)}$ 57.4dB	7.3.1	Specific noise obtained by onsite measurement
Residual Sound Level	$L_{Aeq\ (1\ hours)}$ 54 dB	7.3.3	Obtained by onsite measurement
Background sound level	$L_{AF90\ (1\ hours)}$ 52dB	8.3	Measured onsite
night time, reference time interval is 15 min.		7.2	
Specific sound level	55dB	7.3.3	Obtained by measurement and calculation
Acoustic feature correction	+6dB	9.2	
Rating Level (specific level plus correction for noise characteristics)	61dB	9.2	
Excess of rating over background level	61 – 52 = 9dB	11	
This indicates a likelihood of an adverse impact if		11	

isolated from the context of the noise environment.			
Uncertainty of the assessment	uncertainty is estimated at ± 5dB		

Table 3: BS4142 night time noise rating level calculation.

Context of the Noise Environment

- The noise sensitive dwelling is located in central London which is characterized by a mixed use environment.
- There is an elevated residual noise level of 57dB in the day and 54dB in the night. The source of this residual noise is from 5 existing air conditioning units next to the noise sensitive dwelling combined with road traffic noise from the Euston Road.
- Irregular noise and tonality are an existing feature of the noise environment because of tonal and irregular noise from 3rd party air conditioning units adjacent to the dwelling and road traffic noise.
- The light well reflects sound from its walls that are higher than would be in an open space.
- The adverse impact is mainly due from the irregularity and tonality of the specific noise for which +6dB character correction was applied. Excluding the character correction the difference between the day time and background level is 1dB in the day and 3dB in the night.
- The difference between the specific noise and the residual noise is low.

In the context of the noise environment, the difference over background of 9 dB during the night and 7dB during the day is acceptable because it is largely due to characterized noise irregularity and tonality. The noise environment provides irregular and tonal noise from 5 existing 3rd party air conditioning units and passing vehicles on the main Euston road and other nearby road traffic noise.

Noise particularly from Euston road and a number of 3rd party air conditioning units is elevated, irregular, tonal and constant both night and day. It is the elevated irregularity and tonality of frequent road traffic noise and air conditioning units that in our opinion, in the context, represents a low likelihood of adverse impact.

Uncertainty

The noise levels were obtained by direct onsite measurements. The sound level meter was fitted with a wind shield and maintained on a tripod during the measurement period. Once readings were began, the sound level meter was free from human interference. This was done to minimize uncertainty in the readings. In addition, the data used was taken during suitable weather conditions. Each measurement was conducted for a duration sufficient to provide a representation of the background and residual noise levels.

Variations in the specific noise and background noise levels will be different depending on road traffic noise from Euston road and the intensity of 3rd party air conditioning units operating next to the noise sensitive dwelling.

It is likely that the noise levels will vary from day to day depending on the background levels. An uncertainty of ±5dB has been used because of the potential difference.

Laboratory calibration uncertainty of the sound level meter ± 1 dB

$$u = \sqrt{a^2 + b^2 + c^2 ... etc}$$

U = ± 5 dB

Conclusion

In the context of the noise environment, the difference over background of 9 dB during the night and 7dB during the day is acceptable because it is largely due to characterized noise irregularity and tonality that is already an existing feature of the noise environment. For this reason the specific noise represents a low likelihood of adverse impact.

Uncertainty is assessed at ± 5 dB

Signed:

Donald I Angir

Donald Angir AM IOA BA(Hons)

Noise Consultant

Noise Survey Ltd

05th May 2017

BIBLIOGRAPHY

British Standards Institution (2014) BS EN 4142:2014 **Methods for Rating and Assessing Industrial and Commercial Sound.** London. BSI

Watson R, Downey O, (2013) **The Little Red Book of Acoustics A Practical Guide 3rd Edition,** Blue Tree Acoustics.

APPENDIX A

Measuring Equipment

Casella Cel 490 type 1 sound level meter serial 240855 (ML1). Last calibrated by Casella December 2016 traceable to UKAS standards.

Cesva Acoustic Calibrator 94dB @ 1KHz serial No 9004470. Laboratory calibrated by Pennine Instruments Services Ltd on 29th June 2015.

Kane May Thermostat model KM330 serial: 723858 calibrated 19/05/2015 by Stroma Technology certificate: 723858-150519

Kaindl Electronic model: Windtronic 2 Anemometer.

Measuring Equipment & Calibration

On each occasion at the beginning and at the end of measurements the meter was calibrated with an acoustic calibrator before and after the measurements with negligible deviation (≤ 0.5dB).

Weather Conditions

	Wind	Cloud Cover (Subjective)	Temperature	Precipitation
Time of Measurement on Tuesday 11th April 2017 at 10:30AM	3m/s	90%	14°C	None
Time of Measurement on Tuesday 11th April 2017 at 12:00PM	2m/s	30%	16°C	None
Time of Measurement on Wednesday 12th April 2017 at 10:00AM	1m/s	80%	13°C	None

Table 4: Weather conditions on 11th and 12thth April 2017 during measurements. The sound level meters were calibrated successfully before and after the measurements with no significant deviations (≤0.5dB).

Measurement Data Institute of Materials Minerals and Mining

Period number	Flags (OBPZ)	Date	Time	LAFmx dB	LAeq dB	LAF10.0 dB	LAF90.0 dB
1	-----	11/04/2017	11:15:48	70.4	57.3	58	56.5
2	-----	11/04/2017	11:30:48	60.9	55.9	58	50.5
3	-----	11/04/2017	11:45:48	63.2	57.5	58	57
4	-----	11/04/2017	12:00:48	63.5	57.6	58.5	57
5	-----	11/04/2017	12:15:48	71.4	57.8	58	54
6	-----	11/04/2017	12:30:48	62.5	57.4	58	56.5
7	-----	11/04/2017	12:45:48	64.5	53.2	57	50.5
8	-----	11/04/2017	13:00:48	64.8	56	58	51.5
9	-----	11/04/2017	13:15:48	68.5	53.2	55.5	50
10	-----	11/04/2017	13:30:48	64.4	53.9	57.5	50.5

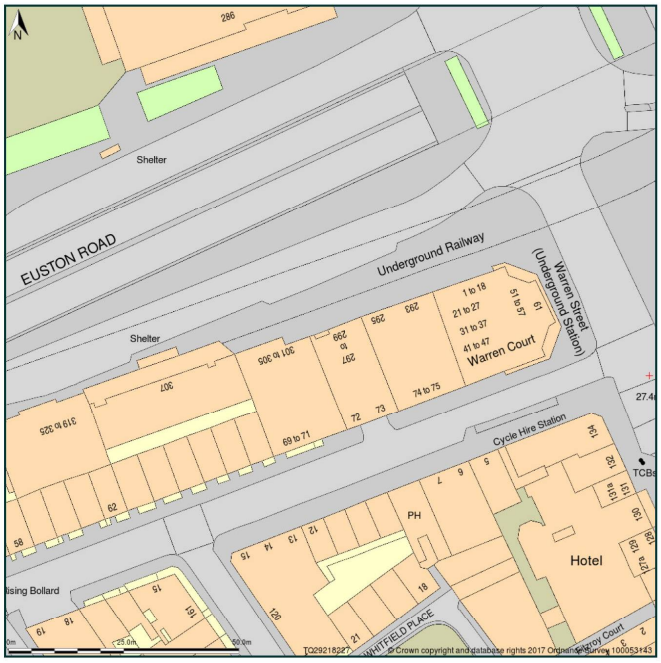
11	-----	11/04/2017	13:45:48	65.9	55.6	58	50.5
12	-----	11/04/2017	14:00:48	73.9	57.9	58.5	57
13	-----	11/04/2017	14:15:48	66.5	56.4	58	51.5
14	-----	11/04/2017	14:30:48	66.9	58	58.5	57
15	-----	11/04/2017	14:45:48	67	58.1	59	57
16	-----	11/04/2017	15:00:48	64.2	55.6	58	51.5
17	-----	11/04/2017	15:15:48	75.2	58	59	53.5
18	-----	11/04/2017	15:30:48	67.2	56.4	58	52
19	-----	11/04/2017	15:45:48	65.3	57.8	58.5	57
20	-----	11/04/2017	16:00:48	67.8	57.8	58	57
21	-----	11/04/2017	16:15:48	66.6	57	58.5	51.5
22	-----	11/04/2017	16:30:48	65.2	56.1	58	51
23	-----	11/04/2017	16:45:48	67.5	57	58	52
24	-----	11/04/2017	17:00:48	67.4	56.2	58	52
25	-----	11/04/2017	17:15:48	65.3	58.1	59	57
26	-----	11/04/2017	17:30:48	76.1	58.5	59	57
27	-----	11/04/2017	17:45:48	64.8	57.7	58.5	57
28	-----	11/04/2017	18:00:48	61.7	53.6	56.5	51
29	-----	11/04/2017	18:15:48	67.8	53.5	54.5	51
30	-----	11/04/2017	18:30:48	66.4	53.6	55	51
31	-----	11/04/2017	18:45:48	65.5	52.8	54	51
32	-----	11/04/2017	19:00:48	68.1	52.8	54	51
33	-----	11/04/2017	19:15:48	64	53.5	55.5	51
34	-----	11/04/2017	19:30:48	58.6	52.2	53.5	50.5
35	-----	11/04/2017	19:45:48	72.9	52.8	54	50
36	-----	11/04/2017	20:00:48	60.5	52.6	54	50.5
37	-----	11/04/2017	20:15:48	61.3	52.7	54	50.5
38	-----	11/04/2017	20:30:48	78.5	53.5	54.5	50.5
39	-----	11/04/2017	20:45:48	65.1	52.5	54	50.5
40	-----	11/04/2017	21:00:48	64.7	53.2	54.5	50.5
41	-----	11/04/2017	21:15:48	61.7	52.6	54	50
42	-----	11/04/2017	21:30:48	64.3	53.1	54.5	51
43	-----	11/04/2017	21:45:48	68.2	53	54	50.5

44	-----	11/04/2017	22:00:48	68.3	53.7	54.5	50
45	-----	11/04/2017	22:15:48	57.9	52.4	54	50.5
46	-----	11/04/2017	22:30:48	72.4	53.8	54.5	50
47	-----	11/04/2017	22:45:48	66.2	52.8	54.5	50.5
48	-----	11/04/2017	23:00:48	64.8	52.6	54	50
49	-----	11/04/2017	23:15:48	62	52	53.5	49.5
50	-----	11/04/2017	23:30:48	62.8	52.3	53.5	50
51	-----	11/04/2017	23:45:48	66	52.7	54	50
52	-----	12/04/2017	00:00:48	61.3	51.7	53	50
53	-----	12/04/2017	00:15:48	59.6	51	52.5	49
54	-----	12/04/2017	00:30:48	60.3	51.1	53	49
55	-----	12/04/2017	00:45:48	64.2	51.3	53.5	48.5
56	-----	12/04/2017	01:00:48	56.2	51	52.5	49
57	-----	12/04/2017	01:15:48	60.2	50.5	52	48.5
58	-----	12/04/2017	01:30:48	59.1	50.7	52.5	48.5
59	-----	12/04/2017	01:45:48	55.9	50.3	52	48.5
60	-----	12/04/2017	02:00:48	56	50.6	52.5	48.5
61	-----	12/04/2017	02:15:48	60.4	50.9	53	48.5
62	-----	12/04/2017	02:30:48	65.9	51.2	52.5	48.5
63	-----	12/04/2017	02:45:48	59.8	50.7	52	48.5
64	-----	12/04/2017	03:00:48	64.4	51.1	52.5	48.5
65	-----	12/04/2017	03:15:48	62.2	51.1	53	48.5
66	-----	12/04/2017	03:30:48	69.3	52.4	53	49
67	-----	12/04/2017	03:45:48	59.3	51.3	53	49
68	-----	12/04/2017	04:00:48	57	51.3	53	49
69	-----	12/04/2017	04:15:48	58.8	51.6	53.5	49.5
70	-----	12/04/2017	04:30:48	56.7	51.7	53.5	49.5
71	-----	12/04/2017	04:45:48	57.8	52	54	49.5
72	-----	12/04/2017	05:00:48	71.6	53.8	54.5	50.5
73	-----	12/04/2017	05:15:48	57.2	52.6	54.5	50.5
74	-----	12/04/2017	05:30:48	69.7	53.8	55	51.5
75	-----	12/04/2017	05:45:48	64.5	53.7	55	51.5
76	-----	12/04/2017	06:00:48	69.6	53.6	55	51.5

77	-----	12/04/2017	06:15:48	71.2	54.6	55.5	52
78	-----	12/04/2017	06:30:48	67.7	55.1	57	52.5
79	-----	12/04/2017	06:45:48	70.2	57.4	58	56
80	-----	12/04/2017	07:00:48	67.3	57.2	58.5	56
81	-----	12/04/2017	07:15:48	71.5	56.6	57	55.5
82	-----	12/04/2017	07:30:48	68.3	56.6	57.5	55.5
83	-----	12/04/2017	07:45:48	67.5	56.5	57	55.5
84	-----	12/04/2017	08:00:48	67.1	56.2	57	55
85	-----	12/04/2017	08:15:48	64.8	56.1	57	55
86	-----	12/04/2017	08:30:48	64.4	57.3	59.5	55.5
87	-----	12/04/2017	08:45:48	63.2	57.4	59.5	55.5
88	-----	12/04/2017	09:00:48	73.8	58.6	59.5	55.5
89	-----	12/04/2017	09:15:48	71.1	56.9	59.5	55
90	-----	12/04/2017	09:30:48	67.5	58.9	60	56

Table 5: Measurement data at ML1

297 Euston Road_ London_ NW1 3AD



Site Plan shows area bounded by: 529146.57, 182200.13 529287.99, 182341.55 (at a scale of 1:1250), OSGridRef: TQ29218227. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

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