Plant Noise Impact Assessment

Client:	Cotton Thompson Cole
Project:	Gaucho Restaurant 64 Heath Street London NW3 1DN
Our Reference:	BS 33777/NIA
Date of Report:	16 February 2015
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1.0 Introduction

Noise Solutions Ltd has been commissioned by Cotton Thompson Cole to undertake a plant noise impact assessment for external AC units at the Gaucho restaurant, 64 Heath Street, Hampstead.

Noise levels for the plant installations have been predicted at the nearest noise sensitive receptors to the site and assessed against the requirements of Camden Council's Development Policy 28 – *Noise and Vibration*.

2.0 Site Layout and Nearest Residential Properties

The external plant is located at the rear of the property at roof level surrounded by a parapet. There are five external AC units, understood to operate only during opening hours.

Appendix A contains noise level details of the proposed plant units.

The area surrounding the site is predominantly residential in nature. The nearest noise sensitive receptors to the proposed plant area are the flats (R1) located approximately 10m to the north from the plant area. There is screening between the plant and these properties due to the surrounding parapet roof.

There are further residential flats to the east at a distance of around 25m, with full line of sight of the equipment.

Appendix B contains a plan showing the site and surrounding area.

3.0 Existing Noise Climate

An environmental noise survey was undertaken to establish prevailing noise levels at a location representative of the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate (in the absence of all existing plant associated with the site). The results of the noise survey have been summarised in Table 1, below. The full set of measurement results and details of the survey methodology can be found in Appendix C.

Table 1 Summary of noise survey results

Measurement period	**Range of noise levels over measurement period (dB)**			
	$L_{Aeq(5mins)}$	$L_{Amax(5mins)}$	$L_{A10(5mins)}$	$L_{A90(5mins)}$
Evening (07.00 - 23.00 hours)	50-75	56-103	51-73	47-63
Night-time (23.00 – 07.00 hours)	39-68	45-96	41-71	33-57

4.0 Noise Assessment Criteria

Camden Council's Development Policy 28 – *Noise and Vibration* Table E states that noise from plant and machinery should not exceed a level 5dB below the prevailing background noise level during operational hours. However it is also stated that where plant is anticipated to exhibit tonal or

impulsive characteristics, noise from plant should not exceed a level 10dB below the prevailing background noise level.

The proposed equipment is understood to be inverter driven and will therefore ramp up and down to cope with demands on the systems rather than switching on and off. The AC equipment is not expected to exhibit any tonal or impulsive characteristics providing the systems are well maintained.

The corresponding noise emission limits, applicable at the nearest affected noise sensitive property, are shown in the following table:

Table 2 Plant noise emission limits

Time	**Noise Rating Level, dB(A)**
Daytime (07.00 – 23.00)	42
Night-time (23.00 – 07.00)	28

5.0 Noise Impact Assessment

Plant noise levels have been predicted at the facades of the nearest most affected residential receptors (R1 and R2). Predictions have been based upon the manufacturer's noise data provided in Appendix A.

Noise levels have been predicted taking into account directivity of sound propagation and the distance between the source and receiver. It should be noted that noise predictions have been based upon there being no line of sight between the proposed plant and the nearest receptors (R1), although the flats at R2 are expected to have full line of sight.

The AC units are expected to run during opening hours only and, as such, have been assessed during the daytime period.

Noise level predictions during the daytime period have been based upon all five AC units operating simultaneously at full capacity. The units will not operate during the more sensitive night-time period.

Table 3, below, summarises the results of the predicted noise calculations. The full set of calculations can be found in Appendix D.

Table 3 Summary of predicted noise levels at receptors

Receptor	**Predicted noise level at receptor (dBA)**	**Criterion (dBA)**	**Difference (dB)**
R1	35	42	-7
R2	32	42	-10

The noise level predictions demonstrate that cumulative plant noise emissions will comply comfortably with the local authority noise criteria during the

daytime period at the nearest noise sensitive receptors. Additional mitigation measures will not be required.

6.0 Conclusion

Noise Solutions Ltd has been commissioned by Cotton Thompson Cole to undertake a plant noise impact assessment for external AC units at the Gaucho restaurant, 64 Heath Street, Hampstead.

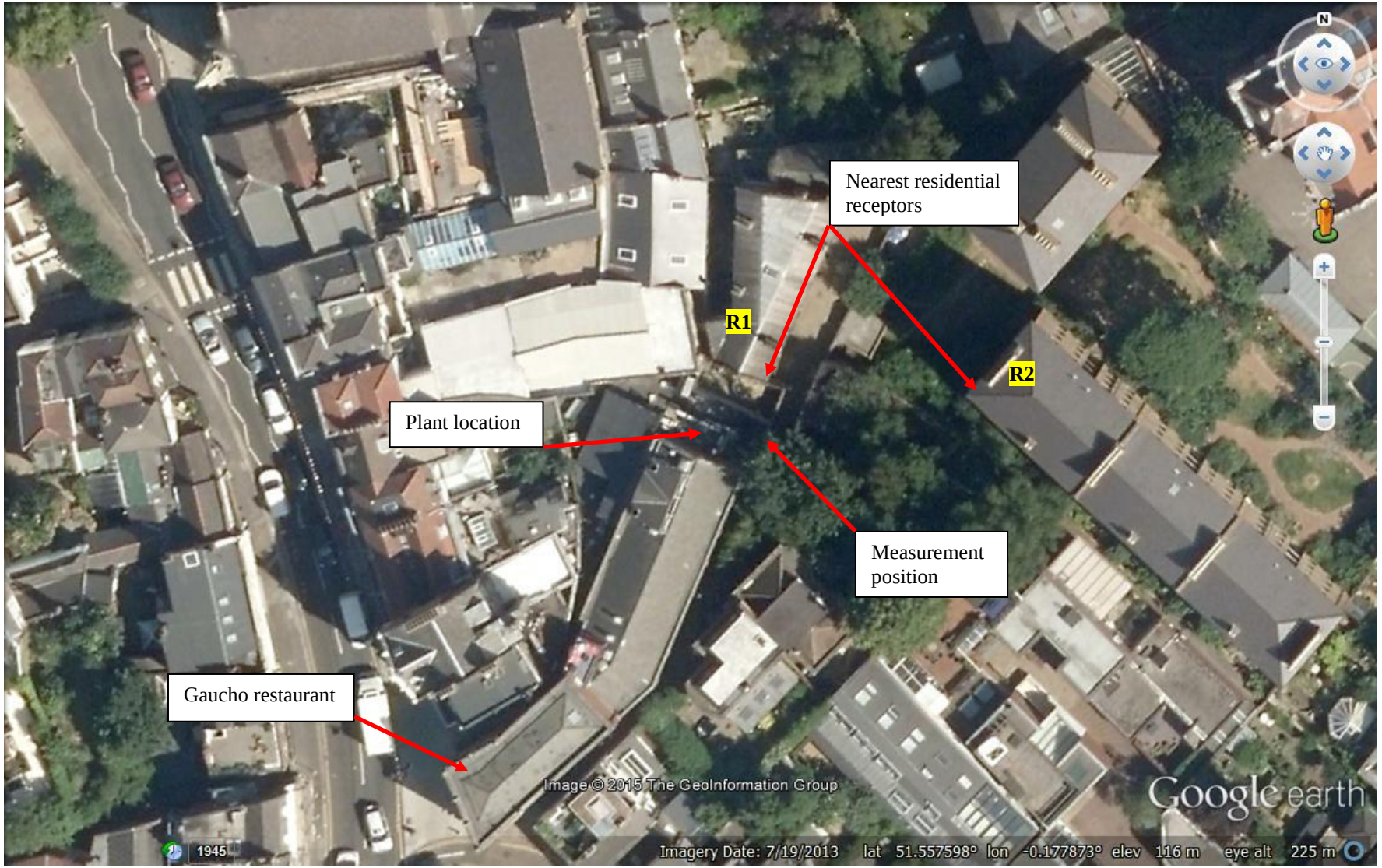
A noise survey was undertaken to determine the existing background noise level at the noise sensitive receptors nearest to the site. Cumulative noise levels for the proposed plant have been predicted at the nearest noise sensitive receptors to the site and assessed using the local authority emissions criteria.

The noise level predictions demonstrate that cumulative plant noise emissions comply with the London Borough of Camden's noise criteria at the nearest receptors.

APPENDIX A
Details of proposed plant

Plant	Noise level, dB(A)	Reference distance
AC unit (5no.) Daikin RZQ125DV1	53	1

APPENDIX B
Site Plan



APPENDIX C
Details of environmental noise survey

C.1. Measurement period

Measurements of the existing background noise level were taken between 10.45 hours on Friday 30th January and 16.00 hours on Sunday 1st February 2015. The sound level meter was programmed to record the A-weighted L_{eq}, L_{90}, L_{10} and L_{max} noise indices for consecutive five-minute sample periods for the duration of the noise survey. Sample periods were sufficiently short to allow an assessment of background noise levels in the absence of existing nearby plant.

C.2. Measurement position

The measurement position was located on the rear terrace area, screened from the existing AC unit. In accordance with BS 7445-2:2003 *'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were taken under free-field conditions with the microphone positioned at a height of approximately 1.5m above roof level.

C.3. Noise measurement equipment

Details of the equipment used during the course of the noise survey have been provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.1 dB) in the calibration level was noted.

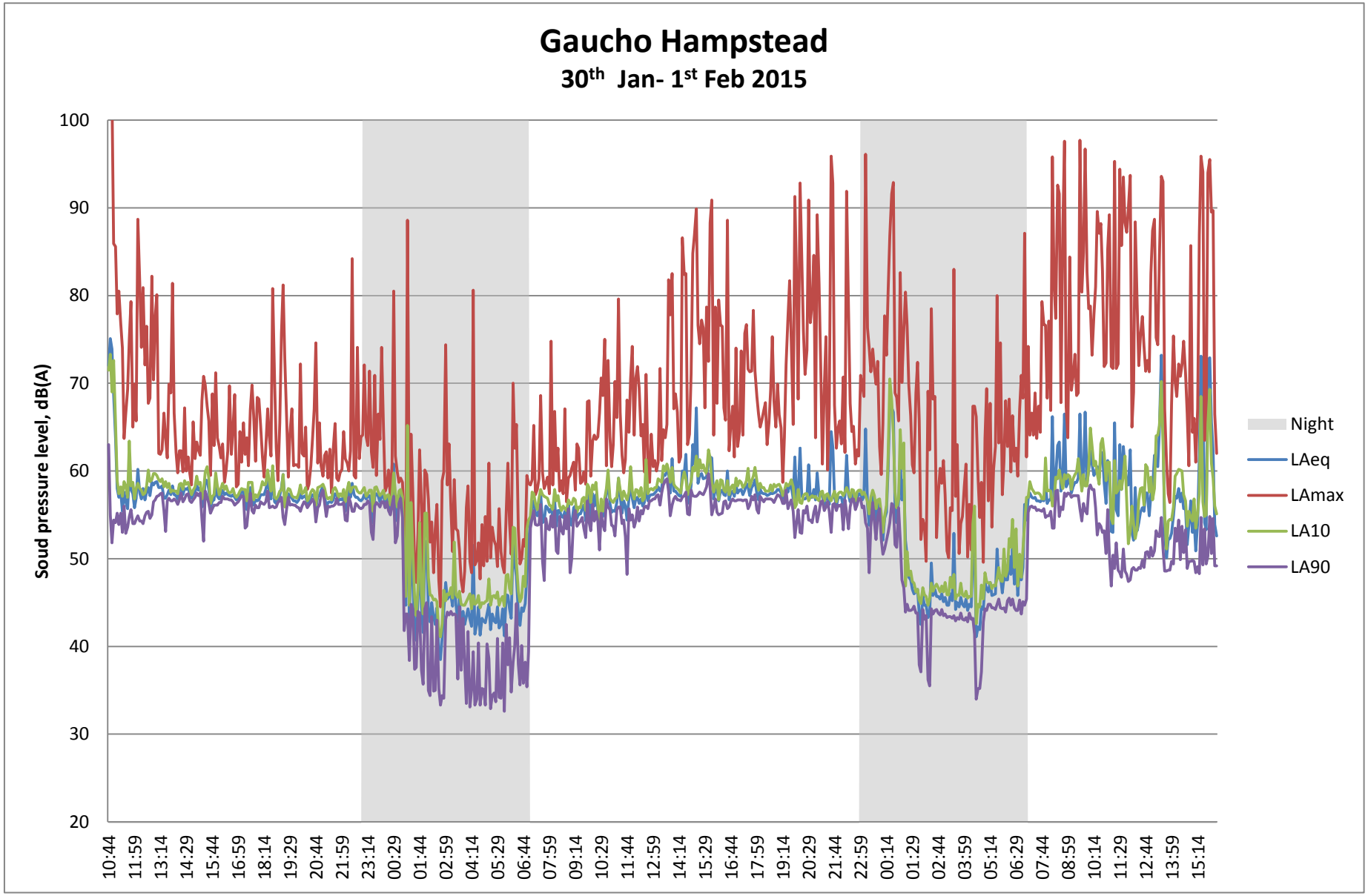
Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Rion NL-31 / 00593605	27/01/2014	14412
Condenser microphone	Rion UC-53A / 316131		
Preamplifier	Rion NH-21 / 30365		
Calibrator	Rion NC-74 /35094453	27/01/2014	14411

C.4. Results

The results of the noise survey are considered to be representative of typical prevailing noise levels at the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.

The noise climate at the measurement position was dominated by local and distant road traffic noise and aircraft flyovers to a lesser extent. The results of the noise survey have been provided overleaf.

APPENDIX C (continued)
Measured noise data (dBA)



APPENDIX D
Predicted noise levels

Receptor 1 Properties to north

Plant	Plant noise level		Distance		Directivity	Minimum screening	Resultant at receptor (dBA)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	
AC 1 Daikin RZQ125DV1	53	1	10	-20.0	0	-5	28.0
AC 2 Daikin RZQ125DV1	53	1	10	-20.0	0	-5	28.0
AC 3 Daikin RZQ125DV1	53	1	10	-20.0	0	-5	28.0
AC 4 Daikin RZQ125DV1	53	1	10	-20.0	0	-5	28.0
AC 5 Daikin RZQ125DV1	53	1	10	-20.0	0	-5	28.0

Cumulative daytime plant noise level=35dB(A)

Receptor 2 Flats to east

Plant	Plant noise level		Distance		Directivity	Minimum screening	Resultant at receptor (dBA)
	Noise level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	
AC 1 Daikin RZQ125DV1	53	1	24	-27.6	0	0	25.4
AC 2 Daikin RZQ125DV1	53	1	24	-27.6	0	0	25.4
AC 3 Daikin RZQ125DV1	53	1	24	-27.6	0	0	25.4
AC 4 Daikin RZQ125DV1	53	1	24	-27.6	0	0	25.4
AC 5 Daikin RZQ125DV1	53	1	24	-27.6	0	0	25.4

Cumulative daytime plant noise level=32dB(A)