

**Proposed Residential Development  
Land off Cowbridge Road / St Athan Road  
St Athan**

**Environmental Noise Survey  
4365/ENS1**

24<sup>th</sup> November 2016

For: **Edenstone Homes**  
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## 1.0 Introduction

A residential development is proposed on land off Cowbridge Road / St Athan Road, St Athan.

Cowbridge / St Athan road lies on the western boundary of the proposed site. The site lies beneath the north/west flight path (Runway 12) of Cardiff International Airport, which is 4.5km away.

RAF St Athan is located to the south west of the site. We understand that military jet movements are not common, with only training planes and helicopters observed operating from the far south-western part, well away from the proposed development site.

Existing dwellings lie to the south-east of the site, and on the opposite side of the road.

This report has been commissioned to assess existing ambient and background noise levels impinging on the site from road and commercial air traffic. Survey results have been used for comparison with current planning guidance.

Appendix A explains acoustic terminology used in this report.

Appendix B contains graphs, tables and diagrams referenced in this report.

## 2.0 Planning Guidance

No planning conditions have been issued by the Local Planning Authority relating to noise. Reference is therefore made to TAN11:

### 2.1 Technical Advice Note (Wales) 11

Noise bands defining categories A-D of TAN 11 are set in terms of  $L_{Aeq,16hr}$  daytime, and  $L_{Aeq,8hr}$  night time levels for rail traffic noise, free field 1.2 - 1.5m above ground level as follows;

Table 1. Recommended noise exposure categories for new dwellings near existing noise sources (ref Table 2 of TAN 11 (Wales) October 1997)					
Noise Source	Time	Noise Exposure Categories			
		A	B	C	D
Road Traffic	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66
Rail Traffic	07:00-23:00	<55	55-66	66-74	>74
	23:00-07:00	<45	45-59	59-66	>66
Air Traffic	07:00-23:00	<57	57-66	66-72	>72
	23:00-07:00	<48	48-57	57-66	>66
Mixed Sources	07:00-23:00	<55	55-63	63-72	>72
	23:00-07:00	<45	45-57	57-66	>66

Note: In addition, sites where individual noise events regularly exceed  $82dB L_{Amax(slow)}$ , several times in any night time hour should be treated as being in NEC C, unless the  $L_{Aeq,8hr}$  already puts the site in NEC D.

#### 2.1.1 Civil Aviation Noise

TAN11 states:

*For major aerodromes, Noise and Number Index (NNI) contours have been produced for many years to aid development control. In September 1990 the Department of Transport adopted a new index and noise exposure contours are now expressed in terms of  $L_{eqdB}(A)$  over the period 0700-2300. This index is equivalent to  $L_{Aeq,T}$  used for other types of noise.*

*And Using forecast contours, it should be possible to determine approximately which areas are likely to fall within the different noise exposure categories.*

Published 2007 aircraft noise contours for Cardiff International Airport is given in Figure 4365/NC1. The proposed development site has been marked for reference, and is outside the extremities of the contours.

TAN11 goes on to advise:

*Beyond the extremities of the published contours, noise will still be audible near the arrival and departure routes. The former are generally predetermined by the orientation of the runway and safety considerations; however, departure routes can usually be designed to avoid, as far as possible, noise in built-up areas. The use of these routes may change over time because of changes in aircraft mix and operations. The departure routes often comprise a wide corridor of tracks. Local*

*planning authorities should consult National Air Traffic Services where appropriate. Where noise contours expressed in  $L_{eq}dB(A)$  are not available, local planning authorities should approach the aerodrome management to secure early compilation of contours.*

## **2.1.2 Military Aerodromes**

TAN11 advises:

*When determining such applications local planning authorities should take account of the differences between civil and military operations. Military jet aircraft can generate very high noise levels particularly during take off, and occasionally the effectiveness of noise abatement flight procedures normally adopted may be limited by operational requirements. Changes in aircraft type and number of movements may also occur over a short period, resulting in unpredictable changes in noise levels. However, military flying is usually concentrated into weekday working hours when the public sensitivity to noise is at its lowest.*

We understand that military jet movements are not common, with only training planes and helicopters observed operating from the far south-western part, well away from the proposed development site.

## **2.2 Road Noise**

The following typical planning conditions have been issued by a neighbouring Local Planning Authority relating to road noise, based on guidance from TAN 11 quoted above.

Noise levels in the planning conditions quoted below relate to the boundary between NEC B / C in TAN 11 – i.e. additional acoustic insulation and mechanical ventilation is proposed for NEC C facades.

*Prior to commencement of development a scheme shall be submitted to and approved in writing by the Local Planning Authority to provide that all habitable rooms exposed to external road noise in excess of 63dBA  $L_{eq}$  16 hour (free field) during the day (07.00 to 23.00 hours) or 57dBA  $L_{eq}$  8 hour (free field) at night (23.00 to 07.00 hours) shall be subject to sound insulation measures to ensure that all such rooms achieve an internal noise level of 40dBA  $L_{eq}$  16 hour during the day and 35dBA  $L_{eq}$  8 hour at night. The submitted scheme shall ensure that habitable rooms subject to sound insulation measures shall be able to be effectively ventilated without opening windows. No dwelling shall be occupied until the approved sound insulation and ventilation measures have been installed to that property in accordance with the approved details. The approved measures shall be retained thereafter in perpetuity.*

*No habitable room shall be occupied until the approved sound insulation and ventilation measures have been installed in that room.*

*Gardens shall be designed to provide an area which is at least 50% of the garden area for sitting out where the maximum day time noise level does not exceed 55dBA  $L_{eq}$  16 hour [free field].*

### 3.0 Survey Procedure

Two continuous monitoring positions were established on site to monitor road traffic noise levels and to record noise levels from plane flyovers.

Site Plan 4365/SP1 shows measurement positions used during our surveys.

#### Site Plan 4365/SP1 – Site Plan Showing Measurement Positions



### 3.1 Continuous Monitoring

Continuous monitoring was carried out from 1300hrs on 10<sup>th</sup> November 2016 for 24-hours at Positions A and B.

Data including  $L_{Amax}$ ,  $L_{Aeq}$ ,  $L_{A10}$  and  $L_{A90}$  were logged at 5-minute intervals over the monitoring period.

Site Plan 4365/SP1 shows the continuous monitoring positions used, namely:

- |            |   |
|------------|---|
| Position A | On the western site boundary (south), 6m from the road, 1.5m above site ground level. |
| Position B | On the western site boundary (north), 6m from the road, 1.5m above site ground level. |

### 3.2 Personnel and Equipment

Personnel Present: Paul McGrath of Hunter Acoustics

Date of Survey: 10<sup>th</sup> & 11<sup>th</sup> November 2016

The following equipment was used during our survey;

**Table 4365/T1 – Equipment List**

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.	Calibration Due
NTi	Type 1 - Sound Level Meter	XL2-TA	A2A-10021-E0	19-Aug-15	-	19-Aug-17
NTi	Preamplifier	MA220	5435	19-Aug-15	-	19-Aug-17
NTi	Microphone	Capsule	8547	19-Aug-15	-	19-Aug-17
PCB	Microphone 1/2" Prepolarized FF	377B02	LW135480	11-May-15	23928	11-May-17
Rion	Type 1 - Sound Level Meter	NL-32	1103396	03-Mar-15	1503124	03-Mar-17
Rion	Preamplifier	NH-21	34335	03-Mar-15	1503124	03-Mar-17
Rion	Microphone	UC-53A	317921	03-Mar-15	1503124	03-Mar-17
Rion	Calibrator (94.00dB @ 984Hz)	NC-73	10355197	26-Feb-16	1602107	26-Feb-17

Measurement systems were calibrated before and after the survey, no variation occurred.

### 3.3 Weather Conditions

Weather conditions are shown in weather history graph 4365/WH1 in Appendix B. In summary, the weather conditions during the monitoring period were dry with wind calm to a gentle breeze.

## 4.0 Survey Results

### 4.1 Continuous Monitoring

Time History Graphs 4365/TH1 & TH2 shows  $L_{Amax}$ ,  $L_{Aeq}$  and  $L_{A90}$  sound pressure levels measured at Position A & B over the 24-hour period.

The following  $L_{Aeq,16hr}$  daytime and  $L_{Aeq,8hr}$  night-time noise levels have been measured;

Position A	dB	Position B	dB
Daytime 0700-2300	$L_{Aeq,16hr} = 60.4$	Daytime 0700-2300	$L_{Aeq,16hr} = 59.6$
Night-time 2300-0700	$L_{Aeq,8hr} = 53.5$	Night-time 2300-0700	$L_{Aeq,8hr} = 53.1$

There were 2no events recorded during the night that exceeded 82dB  $L_{Amax}$  at Position A. These have been identified as an aircraft descending at 0043hrs, and an aircraft ascending at 0550hrs. No other aircraft activity was recorded between 2300hrs and 0700hrs.

Overall 13no civil aircraft movements (4no descents, 9no ascents) were observed during the monitoring period, referring to the sound recordings, which correspond to Cardiff International Airport's flight schedule. Typical levels equate to 66dB $L_{Aeq}$  and 78dB $L_{Amax}$  at Position B. The total duration of flights over the site equated to 8.5min during the day and 3.5mins during the night – this equates to:

Civil Aircraft: 0700-2300hrs: 46dB $L_{Aeq,16hr}$       0700-2300hrs: 45dB $L_{Aeq,8hr}$

Noise levels from civil aircraft movements to and from Cardiff International Airport are not therefore indicated to be significant. Road traffic noise is the controlling noise source.

Road traffic and aircraft flyover octave band spectra recorded at Position B are shown in Graphs 4365/G1&G2 in Appendix B.

## 5.0 Noise Map

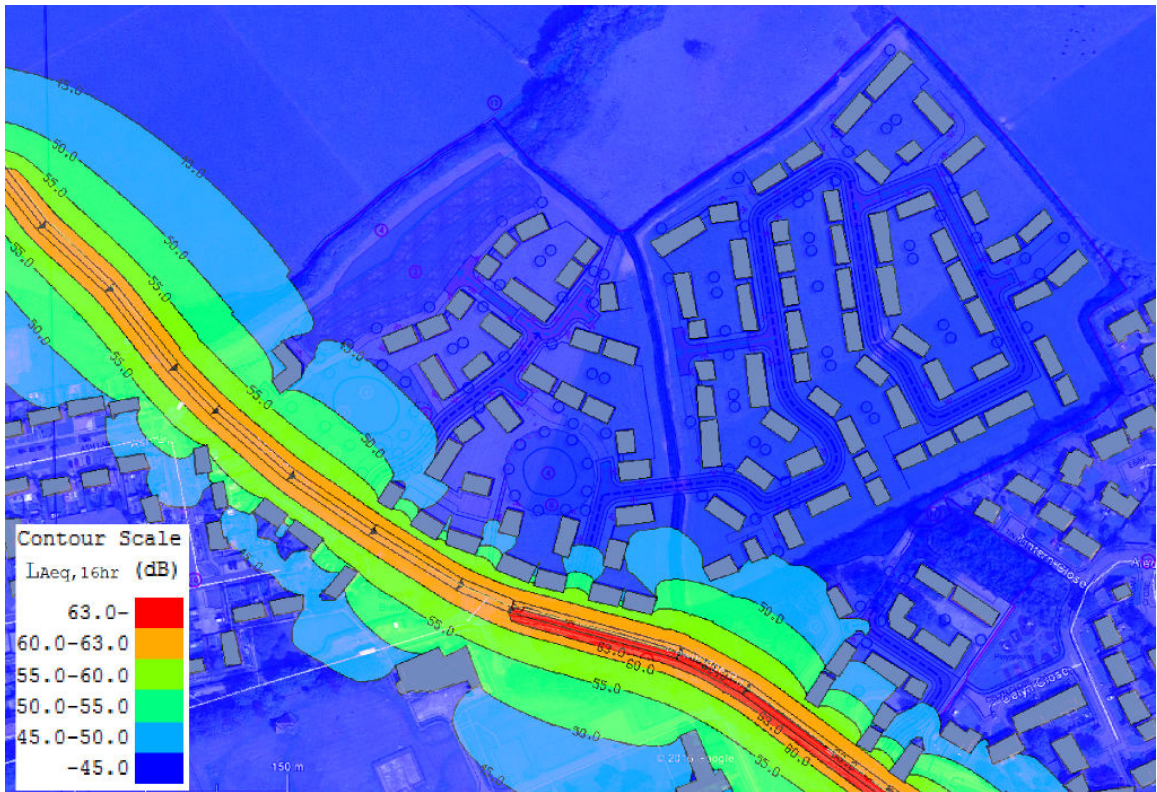
Site noise surveys have been carried out confirming road noise levels impinging on the site. Results from the noise surveys have been used to calibrate a noise map model. Noise maps have been plotted using Noise Map Five (5.1.6) software, which in turn uses methodology from Department of Transport's Calculation of Road Traffic Noise (CRTN). Noise map models include for distance losses and screening from existing/proposed buildings.

Noise maps 4365/NM1 in Appendix B show predicted daytime noise levels respectively at 1.5m above local ground level on the undeveloped site.

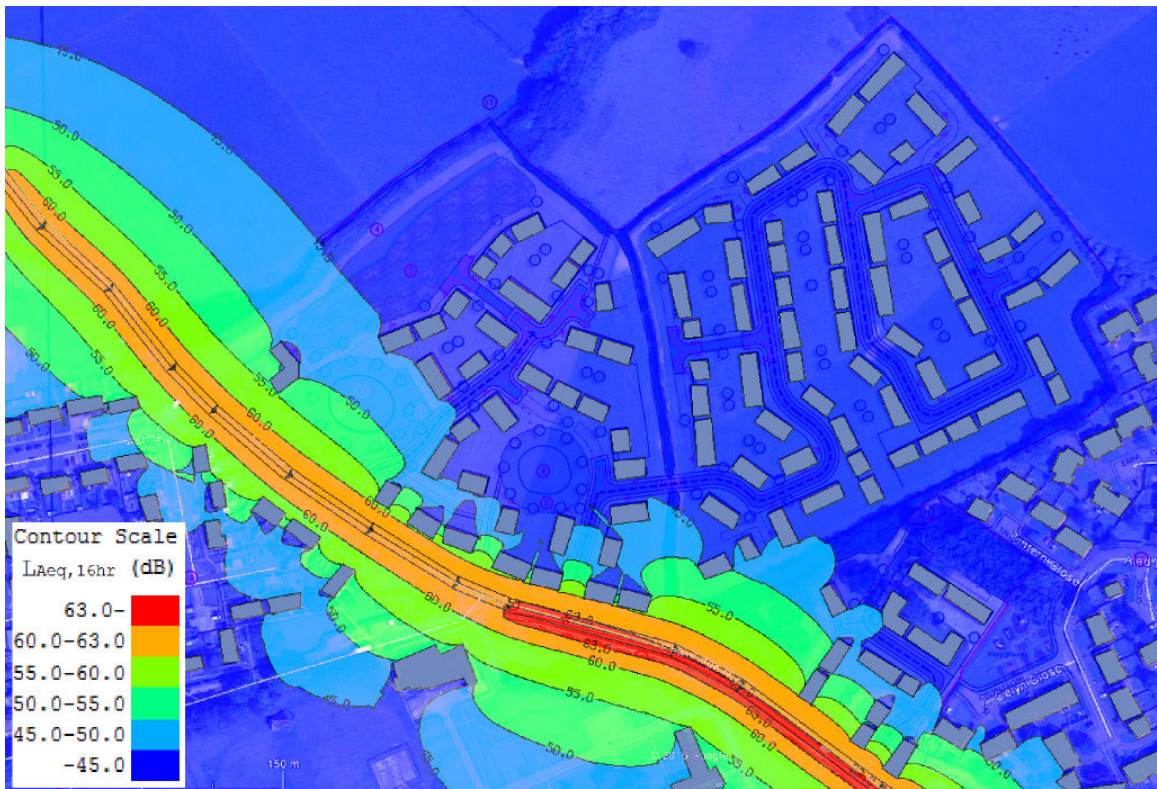
Noise map 4365/NM2 & NM3 below show predicted daytime noise levels at ground floor and first floor level across the developed site. Proposed site layout (Hammond Yates drawing 1617 100 Rev B dated 22.11.16) has been used in our assessment.



**Noise Map 4365/NM2 –  $L_{eq,16hr}$  Daytime (0700-2300hrs); Developed Site – Ground Floor (1.5m)**



**Noise Map 4365/NM2 –  $L_{eq,16hr}$  Daytime (0700-2300hrs); Developed Site – First Floor (4.5m)**



## 5.1 Discussion

Road traffic noise controls the ambient noise climate. Aircraft noise is not indicated to be significant. Noise levels across the site are indicated to fall under NECs A & B by day and night and therefore fall beneath trigger levels quoted in the typical planning conditions. Additional sound insulation measures would therefore not be necessary. Standard thermal double glazing and trickle ventilation sufficient.

Garden noise levels are indicated to be within the design aim.

## 6.0 Conclusion

An environmental noise survey has been carried out to assess existing ambient noise levels impinging on the proposed development site on land off Cowbridge Road / St Athan Road, St Athan from local road traffic and civil aircraft noise approaching/leaving Cardiff International Airport. Road traffic noise controls the ambient noise climate, with aircraft noise indicated to be occasional but not significant.

Noise maps have been plotted across the proposed development site. Noise levels are indicated to fall within NECs A & B of TAN 11 and below trigger levels quoted in the typical planning condition. No additional sound insulation measures are indicated to be required. Standard thermal double glazing and trickle ventilation sufficient.

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## Appendix A - Acoustic Terminology

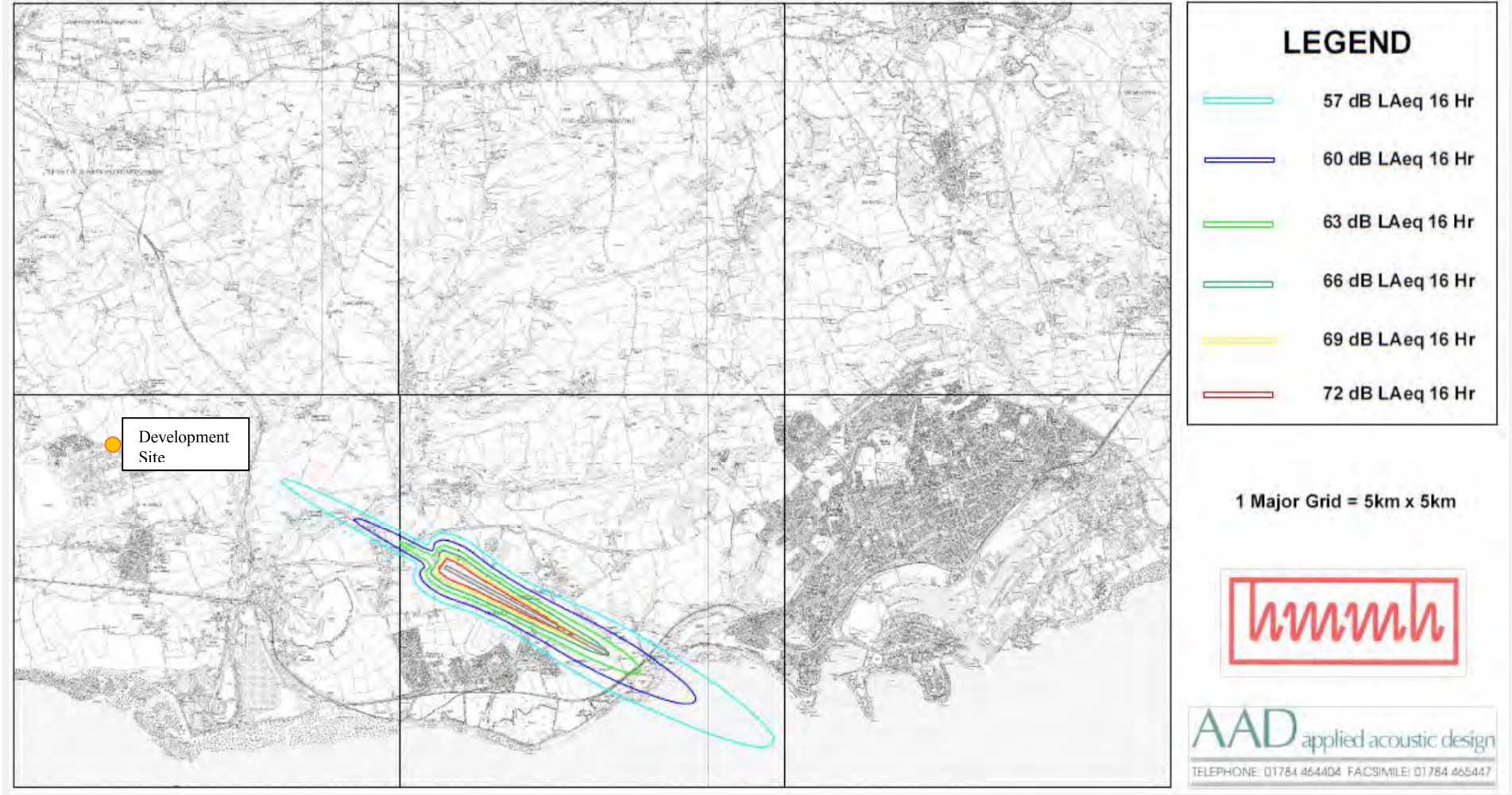
Human response to noise depends on a number of factors including; loudness, frequency content, and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

The following units have been used in this report:

- dB(A):** The sound pressure level weighted to correspond with the frequency response of the human ear, and therefore a person's subjective response to frequency content.
- L<sub>eq</sub>:** The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
- L<sub>90</sub>:** The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1-hour measurement. It is often used to define the background noise level.
- L<sub>10</sub>:** The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1-hour measurement
- SEL:** 'Sound Exposure Level', The dB(A) level which, if it lasted 1 second, would produce the same sound energy as the event in question (e.g. a train pass-by).

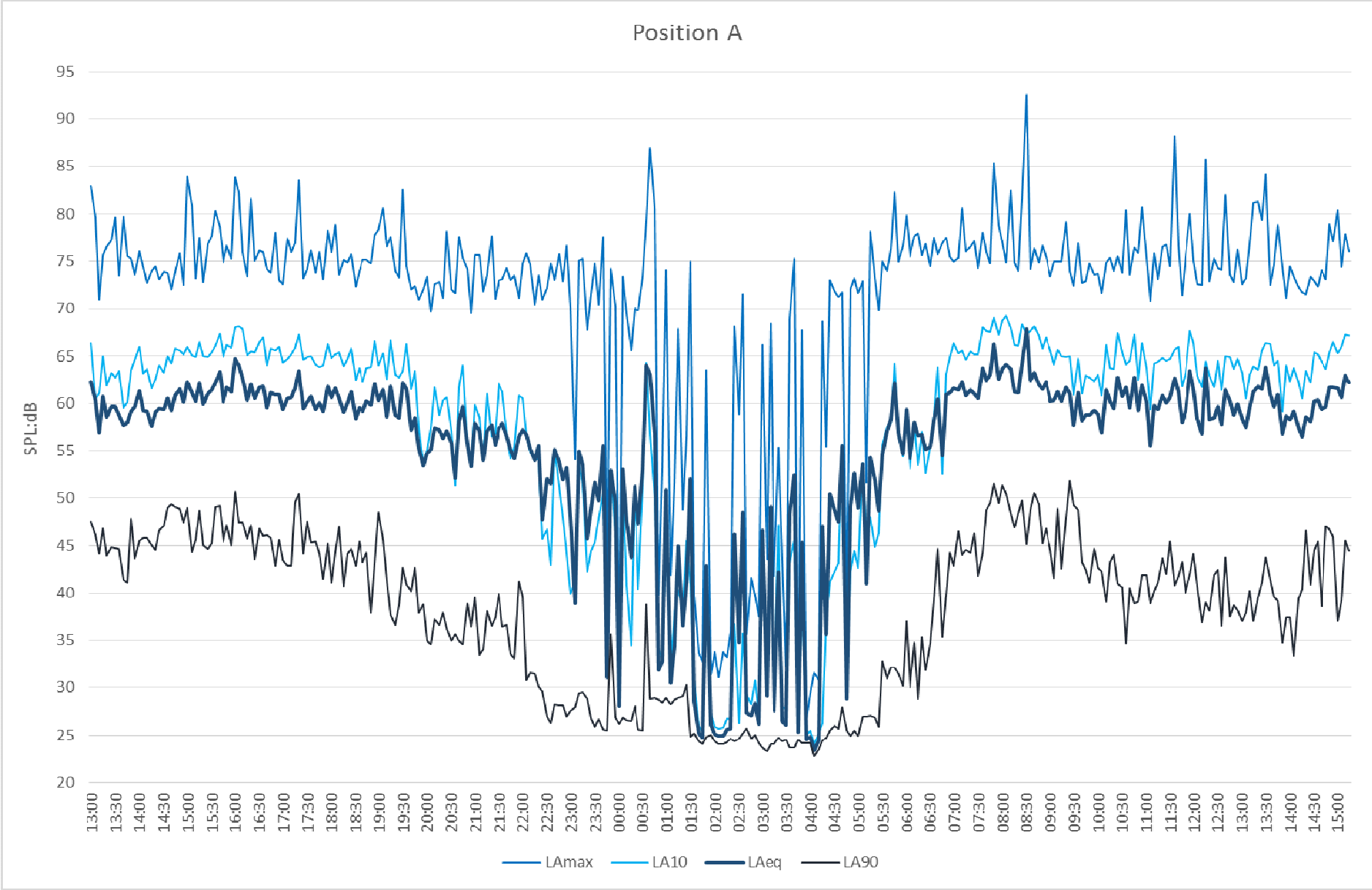
Appendix B – Graphs, Tables & Diagrams

4360/NC1 – Published Aircraft Noise Contours with site location marked

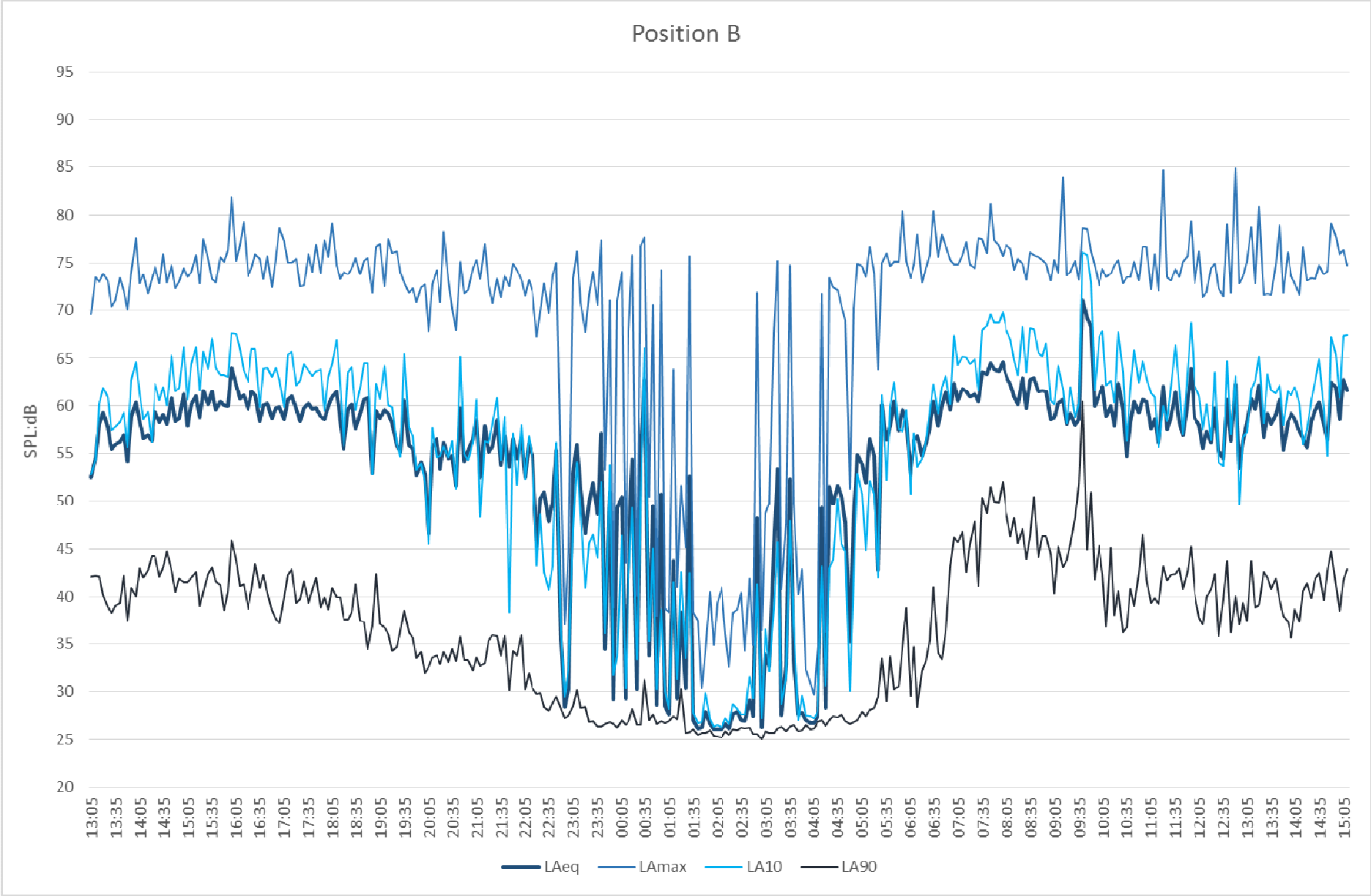


2007 Contours taken from Cardiff Airport's Consultation Document

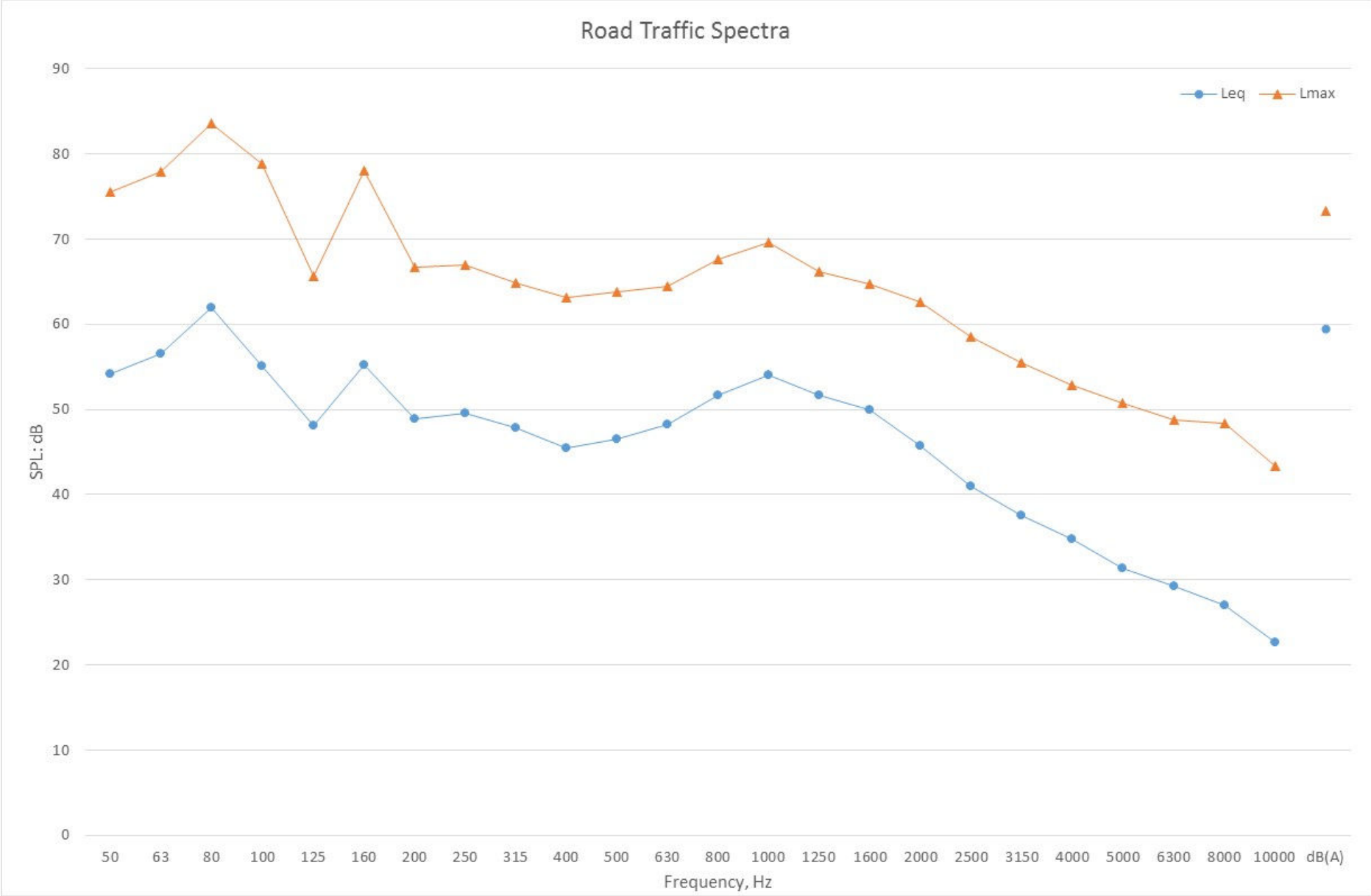
Time History 4365/TH1 – Continuous Monitoring Time History at Position A



Time History 4365/TH2 – Continuous Monitoring Time History at Position B



Graph 4365/G1 – Source Road Octave Third-Octave Band L<sub>Max</sub> and L<sub>eq</sub> Spectra at Position B



**Graph 4365/G2 – Source Aircraft Flyover Third-Octave Band L<sub>Max</sub> and L<sub>eq</sub> Spectra at Position B**

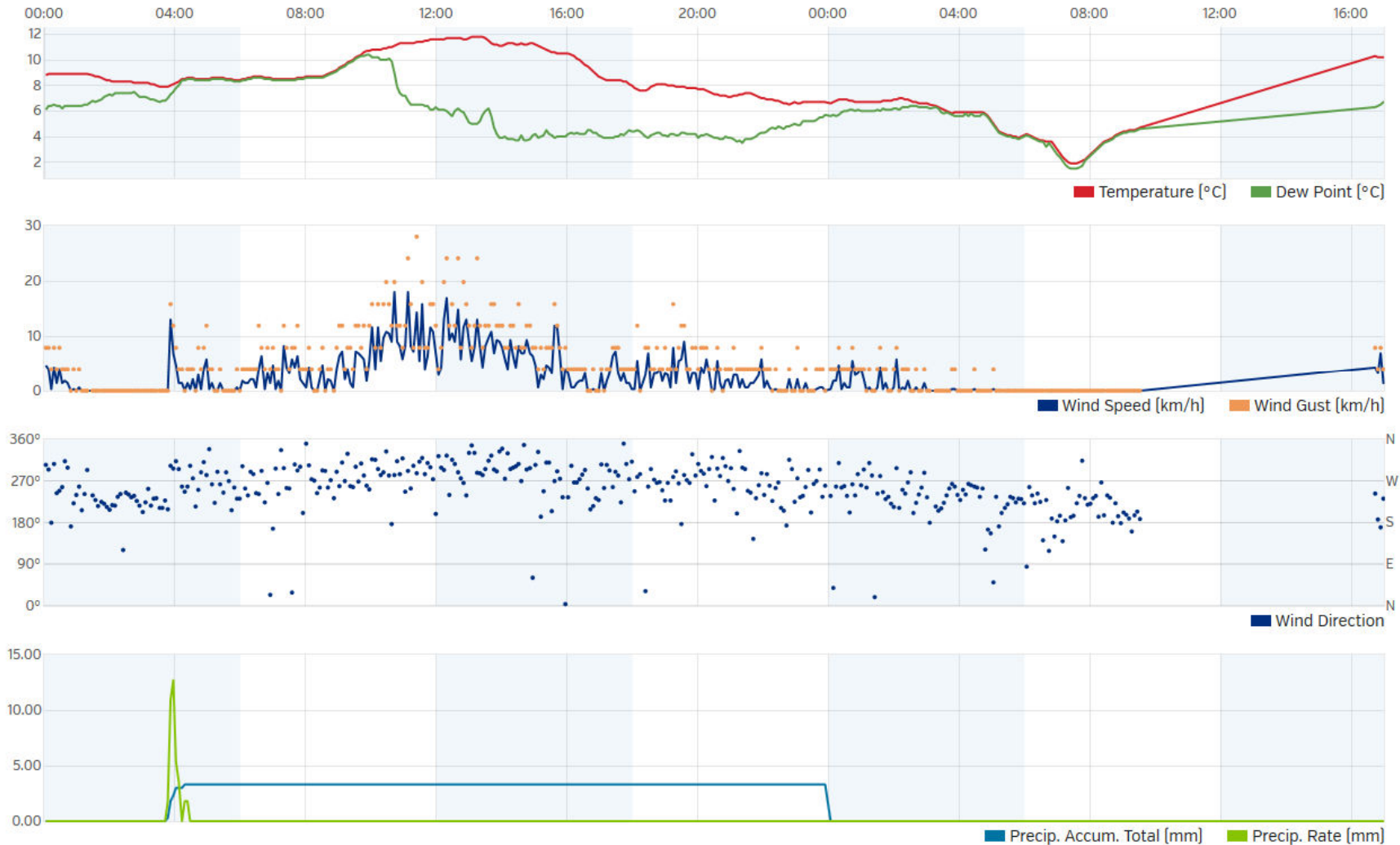




### 4360/WH1 – Approximate Weather History Graph; 27/10/2016 – 28/10/2016

#### Weather History Graph

November 10, 2016 - November 11, 2016



Data taken from [www.wunderground.com](http://www.wunderground.com). Weather Station: IWALESSA2, located in St Athan [N 51 ° 24 ' 9 " , W 3 ° 24 ' 59 " ]

**Noise Map 4365/NM1 –  $L_{eq,16hr}$  Daytime (0700-2300hrs); Undeveloped Site**

