



NOISE IMPACT ASSESSMENT
MECHANICAL PLANT

80 HIGH STREET, HAMPTON HILL

EDGEWEST LAMBETH LTD

RP01 - 11243 REV 1

NOISE IMPACT ASSESSMENT – MECHANICAL PLANT

PROJECT: 80 HIGH STREET, HAMPTON HILL

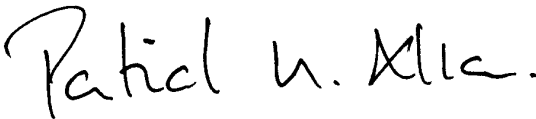
CLIENT: EDGEWEST LAMBETH LTD

CLIENT ADDRESS: FEWHURST FARM
BILLINGSHURST
WEST SUSSEX
RH14 9DF4

REPORT REF: RP01-11243

COMPANY DETAILS: CASS ALLEN ASSOCIATES,
BEDFORD I-LAB,
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PREPARED BY:



Patrick M Allen BSc DipM MIOA MAES MEWI

Revision	Date	Comment
0	14/12/10	Initial Issue
1	20/12/10	Model updated to reflect plant layout changes

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4	3D COMPUTER MODELLING PRINTOUTS
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6	SCHEDULE OF ATTENUATION

1 IDENTIFICATION

- 1.1 My name is Patrick Miles Allen. I am a Bachelor of Science with Honours in Electroacoustics from the University of Salford and am a full member of the Institute of Acoustics (MIOA). I am a founding member of the Expert Witness Institute (MEWI) and am a Law Society registered witness.
- 1.2 I am a Director of Cass Allen Associates Ltd and have been professionally engaged as an acoustic consultant since 1987. I have advised a wide range of clients throughout the retail, leisure, commercial and industrial sectors including: Bovis, Kier, Skanska, Tesco, Mace, The Home Office, HM Customs & Excise, Transport for London, McDonald Restaurants, J D Wetherspoon, Greene King, Royal Mail, Scottish Power, Sussex Police, Welsh Water.
- 1.3 I have advised on over 500 projects in the food and drink sector for a wide variety of clients. My experience includes assessment of both the predicted noise impact prior to a site being developed and also analysis of the actual impact once the site has commenced trading.
- 1.4 In gathering acoustic data and preparing this report I have visited the site on two occasions.

2 INTRODUCTION

- 2.1 Cass Allen Associates Ltd has been instructed to assess the noise impact of mechanical plant proposed to be installed at 80 High Street, Hampton Hill. The proposed plant will replace the current plant installed on the site, which was required for the previous use as *The Jenny Lind* public house.



Photo 1) General view of front of site

- 2.2 A change of use is now proposed from the current A4 public house class to A5 hot food takeaway.
- 2.3 The site is shown in the photograph above and it can be seen that it lies adjacent to a busy local road and between a Budgens and Sainsbury's supermarket, both of which have extensive mechanical plant already installed.

3 NOISE POLICY BACKGROUND

- 3.1 From correspondence with Chris Hurst (Principal EHO at LB Richmond) I understand that the Council will assess the acceptability of the mechanical plant noise in accordance with BS4142 and BS8233, and that the Council will require a:

BS4142 rating level of between 0 to -5 dependent upon sensitivity and also compliance with the reasonable to good internal noise standards in BS8233

(extract from email – Chris Hurst to Patrick Allen, 9.12.10)

- 3.2 In view of the previous use of the site as a pub, the adjacent supermarkets and the existing mechanical plant associated with all three uses, the site is not believed to be especially noise sensitive. We have therefore designed the mechanical plant to a rating level of 0. Similarly we have selected the 'reasonable' standards of BS8233 as being appropriate in this case.

4 SITE SURVEY

- 4.1 To establish current ambient noise levels at the rear of the site (which is where the plant is proposed to be located – see appendix 2 for proposed plant layout) a 24 hour noise survey was carried out on 7th and 8th December 2010 (see appendix 3 for results and instrumentation/weather data). Weather conditions were acceptable for acoustic measurement and the measurements are considered representative.



Photo 2) General view of side of site

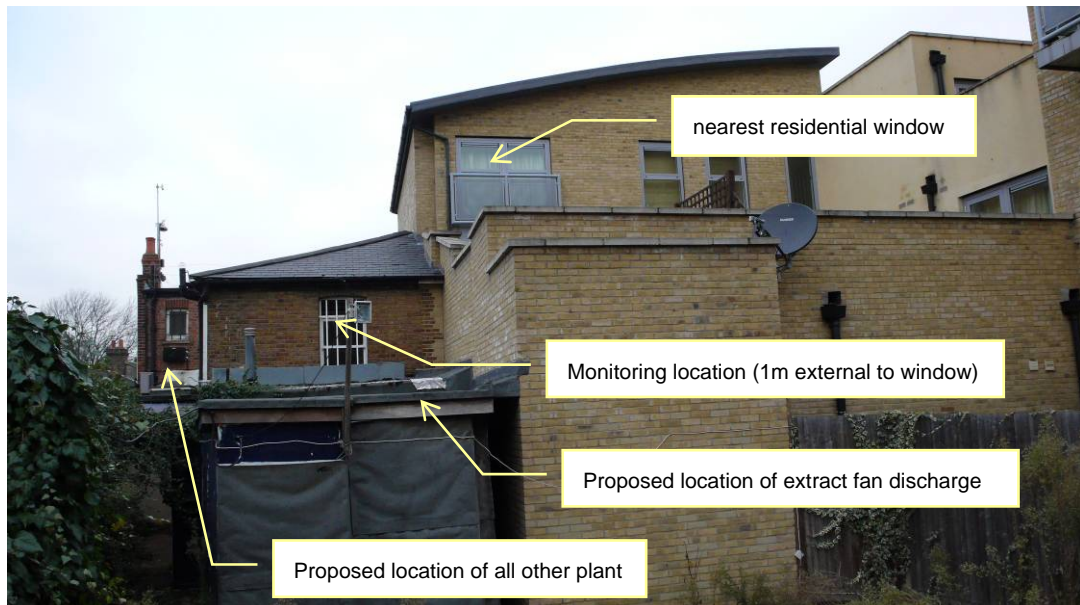


Photo 3) General view of rear of site

5 DATA ANALYSIS

- 4.1 The chart in Appendix 3 shows that the ambient noise at the rear of the site varies between approximately 40-54 dB L_{A90} during the day (0700-2300hrs) and 31-45 dB L_{A90} during the night (2300-0700hrs). It follows from section 3.2 above that the BS4142 plant noise criteria for this project are thus:

- Plant noise should not exceed 40dB L_{Aeq} at any residential window during the day
 - Plant noise should not exceed 31dB L_{Aeq} at any residential window during the night
- 4.2 It should be noted that the above criteria take a robust 'worst case' approach with respect to ambient noise. For example, the ambient noise levels only fall to 31dB L_{A90} between around 0200-0300hrs, which is when the majority of the population would already be asleep. It should also be noted that the +5dB rating penalty set out in BS 4142 has not been applied in this case. This is because of the generally broad band and constant nature of the noise emissions from this type of plant.
- 4.3 The 'reasonable' BS8223 criteria are set out in table 5 of BS8233 and recommend that noise levels should not exceed 40dB L_{Aeq} inside living rooms during the day and 35dB L_{Aeq} inside bedrooms during the night. A worst case situation would be when residents have their windows open for ventilation. In this situation PPG24 'Planning and Noise' suggests that a 13dBA level difference should be assumed across an open window, which means that the BS8233 noise criteria for this project are thus:
- Plant noise should not exceed 53dB L_{Aeq} outside any living room window during the day
 - Plant noise should not exceed 48dB L_{Aeq} outside any bedroom window during the night
- 4.4 It can thus be seen that the BS4142 criteria are significantly more onerous than the BS8233 criteria in this case. Therefore only the BS4142 criteria are considered in the rest of this report, since compliance with the BS4142 criteria will automatically mean that the BS8233 criteria will be achieved. Furthermore, it is also the case that even if the 'good' BS8233 criteria were selected in preference to the 'reasonable' criteria, then compliance with the BS4142 criteria would also ensure compliance with the BS8233 'good' criteria.
- 4.5 To assess noise emissions from the proposed plant a 3D model has been developed. This uses the manufacturers' noise data for the plant and calculates the resultant noise level at residential windows surrounding the site taking into account acoustic screening provided by the plant screen and existing buildings. There are two categories of plant – those items that will only run whilst the premises are open (up to 2300hrs), which includes:
- Extract fan
 - Supply fan
 - 3 off air conditioning condensers
- The second category of plant contains those items of equipment that operate on demand and which could operate at any time. This comprises:
- 3 off fridge/freezer/cool store condensers
- Details of the proposed plant are given in Appendix 5.
- 4.6 The results of the modelling are shown in Appendix 4 for both night and day scenarios and are summarised in the table below:

Scenario	Maximum Project Criteria dBA	Predicted range of Noise Levels at 1m external to nearby residential windows dBA
Day (0700-2300hrs)	40	32 - 39
Night (2300-0700hrs)	31	13 - 31

Table 1. – predicted noise level at 1m external to nearby residential windows.

4.7 It can be seen from the above table that the project noise criteria are calculated to be achieved and therefore the proposed mechanical plant is believed to be acoustically acceptable.

4.8 Whilst detailed acoustic design is beyond the scope of our instruction and would normally be carried out once planning permission had been achieved, a number of mitigation measures have been incorporated into the scheme (and the model) as the design has progressed. These include:

- Substitution of quieter condensers
- Relocation of condensers from rear flat roof to a less sensitive flat roof
- 1800mm high acoustic screen with acoustically absorptive inner face surrounding the condensers
- Localised absorptive screening to condensers to block out the line of sight from the condensers to the tall block of flats behind Sainsburys' that overlook the plant area
- Atmospheric attenuators (with performance set out in Appendix 6) fitted to extract and supply fans
- Fan jacket/enclosure to limit noise from the fan casing and associated ductwork to 50dBA @ 1m

6 CONCLUSIONS

- 7.1 A noise survey has been carried out to measure the typical noise levels surrounding the proposed location of the new mechanical plant.
- 7.2 The Council has been consulted regarding the required noise standards for the development and these have been incorporated into the design process.
- 7.3 A noise model has been developed which indicates that the currently proposed mechanical plant will achieve the Council's noise requirements, assuming that the mitigation measures set out in section 4.8 and appendix 6 are incorporated into the scheme. The final plant noise levels can be controlled through the imposition of a suitably worded planning condition, as recommended by PPG24 'Planning & Noise'.
- 7.4 In summary, therefore, the proposed mechanical plant is believed to be acoustically acceptable and does not constitute a reason to withhold planning permission.



APPENDIX 1

APPENDIX 1 – GLOSSARY OF ACOUSTIC TERMS

Airborne sound: sound or noise radiated directly from a source into the surrounding air (in contrast to structure-borne sound).

Ambient noise: totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far (defined in BS4142).

Attenuation refers to the reduction of sound by some means, e.g. a mechanical attenuator, (such as might be found in a ducted ventilation system), or in the atmosphere with increasing distance from a source. The reduction of sound energy in the atmosphere is subject to ‘inverse-square’ law, which dictates that the energy density at a given distance from a sound source is inversely proportional to the square of the distance from the source (also see ‘direct sound’ below).

Decibel (dB): a unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. The threshold of normal hearing is in the region of 0dB, and 130dB is the threshold of pain. A change of 1dB is only perceptible under controlled conditions. The minimum perceptible change under normal conditions is 3dB and actually indicates a doubling or halving of sound energy intensity. A change of 5dB would be clearly noticeable to the average listener. A change of 10dB roughly corresponds to a subjective ‘halving’ or ‘doubling’ of loudness.

The table below gives indicative noise levels (sound pressure levels) from a variety of sources:

Source, distance	Level (dB)
Jet aircraft, 50 m away	140
Threshold of pain	130
Threshold of discomfort	120
Chainsaw, 1 m distance	110
Disco, 1m from speaker	100
Diesel truck, 10 m away	90
Kerbside of busy road, 5 m	80
Vacuum cleaner, distance 1 m	70
Conversational speech, 1 m	60
Average home	50
Quiet library	40
Quiet bedroom at night	30
Background in TV studio	20
Rustling leaves in the distance	10
Threshold of human hearing	0

Indicative levels of sound

The decibel is a logarithmic quantity, meaning the normal arithmetic rules of mathematics cannot be directly applied. Therefore the addition of two logarithmic

quantities is performed by taking the logarithm of the sum of the inverse-logarithms, as shown in the following equation for adding two decibel levels:

$$L_1 + L_2 = 10 \log_{10} \left[10^{(L_1/10)} + 10^{(L_2/10)} \right]$$

where

L_1 & L_2 are quantities in dB

This means that

30dB + 30dB \approx 33dB, and;

3 x 20dB \approx 25dB, and;

40dB – 25dB \approx 40dB

dB(A):	A-weighted decibels, i.e. decibel level incorporating a frequency weighting (A-weighting), which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3dB(A) is the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 35dB(A); normal conversation about 60dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A). Other weighting curves also exist, including B, C, D & G-weighting, intended for various different purposes.
Direct sound:	sound that arrives at the receiver having travelled directly from the source without having been reflected by another physical object. The direct sound emitted by a source is subject to inverse-square law (see 'attenuation' above).
Free-field:	a situation in which the radiation from a sound source is completely unaffected by the presence of any reflecting boundaries.
Hertz (Hz):	unit of frequency, equal to one cycle per second. Frequency of sound waves refers to the number of pressure fluctuations per second. Frequency is related to the pitch of a sound.
$L_{An,T}$:	the A-weighted level of noise exceeded for n% of the specified measurement period (T).
$L_{A10,T}$:	the A-weighted level of noise exceeded for 10% of the specified measurement period (T). It gives an indication of the upper limit of fluctuating noise such as that from road traffic. $L_{A10,18h}$ is the arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06.00 to 24.00 (defined in CRTN).
$L_{A90,T}$:	the A weighted noise level exceeded for 90% of the specified measurement period (T). In BS4142: 1990 it is used to define background noise level.

$L_{Aeq,T}$: the equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{Amax} : the highest A weighted noise level recorded during a noise event. The time weighting used – F (for Fast), or S (for Slow) – should be stated.

**Level difference
(D, in dB)**

the difference between the sound level measured in one position when compared with another. Typically used to measure the in-situ sound insulation between adjacent rooms.

NB. The ‘weighted standardised level difference’ $D_{nT,w}$ is commonly used to provide a single-figure rating of the overall sound insulation between dwellings and includes a corrective factor to account for different levels of absorption in rooms and allow direct comparison in various situations (defined in BS EN ISO 140-4).

Masking: the process whereby the threshold of hearing for one sound is raised due to the presence of another, thus rendering the first sound inaudible.

**Octave-band or
third-octave
band (1/1 or 1/3)**

the continuous spectrum of audible frequencies can be separated into proportional ‘bands’ to facilitate ease of computation and analysis (the bandwidth being proportional to the band centre-frequency). Third-octave bands (1/3-octave) split each octave into 3 bands, which allows greater accuracy.

Rating level: the noise level of an industrial noise source that includes an adjustment for the character of the noise (defined in BS4142).

Reverberation: the sound in an enclosed space that results from repeated reflections at the boundaries.

**Reverberation
Time (RT):**

the time required for the steady sound pressure level in an enclosed space to decay by 60dB.

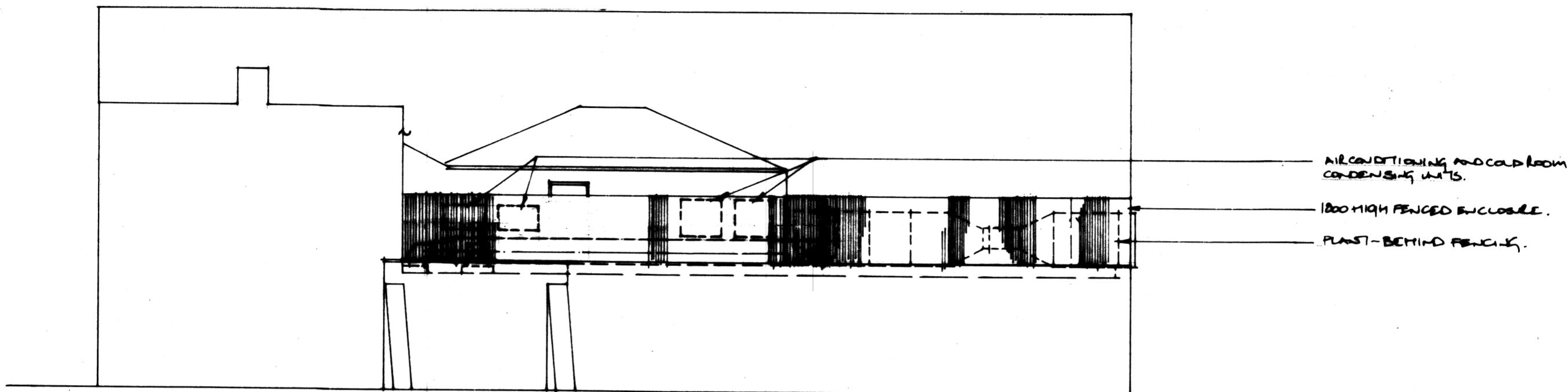
R_w (or WSRI): Weighted sound reduction index (see SRI entry below) – single number laboratory-measured rating used to describe the sound insulation of building elements.

Sound absorption: the process whereby sound energy is converted into heat, leading to a reduction in the sound pressure level. Directly related to reverberation in an enclosed space, i.e. more absorption = lower reverberant level and shorter reverberation time.

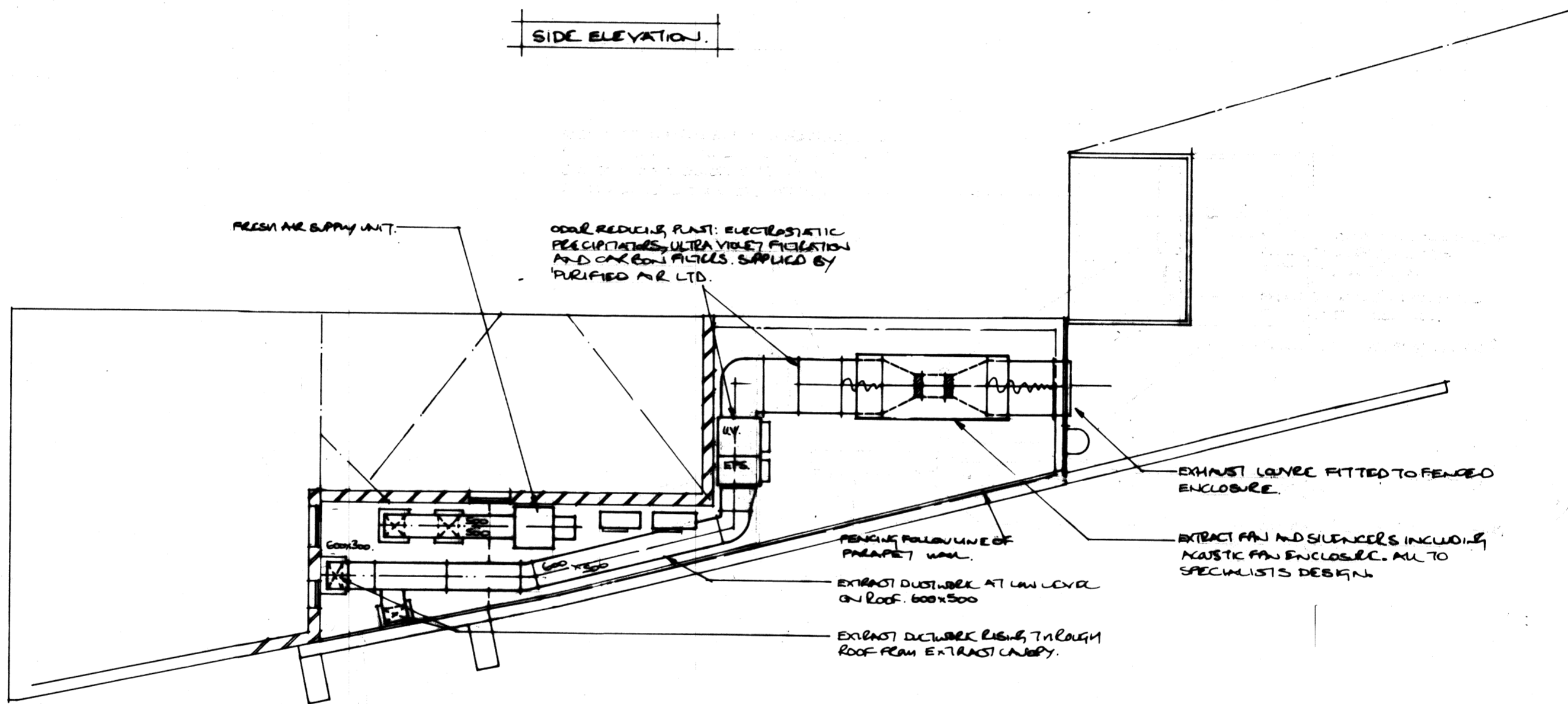
Sound insulation:	a general term referring to the property by which a material reduces sound energy passing through it.
Sound intensity	the energy per unit area (m^2) of the sound field at a given position radiated by a noise source measured in Wm^{-2} . Sound intensity level (SIL or L_i) is the sound intensity converted to decibels in relation to the reference intensity of $10pWm^{-2}$.
Sound pressure	root-mean-square value of the variation in air pressure measured in pascals (Pa), above and below atmospheric pressure caused by sound. Sound pressure level (SPL or L_p) is the sound pressure converted to decibels in relation to the reference pressure of $20\mu Pa$.
Sound power	the total energy radiated by a noise source measured in watts (W). Sound power level (SWL or L_w) is the sound power converted to decibels in relation to the reference power of $10pW$.
Sound Reduction Index (SRI or R):	a laboratory-measured rating of the airborne sound insulation properties of building elements.
Spectrum adaptation terms, C and C_{tr}	value in decibels, to be added to a single-number rating (e.g. $D_{nT,w}$ or R_w) to take account of the characteristics of particular sound spectra (defined in BS EN ISO 717). The term 'C' represents the spectrum adaptation with regards to a pink noise spectrum; the term C_{tr} represents the spectrum adaptation with regards to a traffic noise spectrum (for urban traffic). This is used in the measurement of building acoustics to account for situations where, e.g. the noise incident on a façade is mostly composed of road traffic (C_{tr}), or in the measurement of internal insulation to penalise constructions that have a low level of insulation against low-frequency noise and/or low insulation performance in a single 1/3-octave frequency band.
Structure-borne Sound:	sound that reaches the receiver after travelling from the source via a building or machine structure.
Tonality	Broadly-speaking, a sound can be described as tonal if the level in a single third-octave band is more than 5dB higher than the levels in the third-octave bands either side in the frequency spectrum. There are also many other defined methods for determining tonality, e.g. narrowband analysis. Tonal noise is known to be more subjectively annoying than non-tonal noise (ref. BS4142).



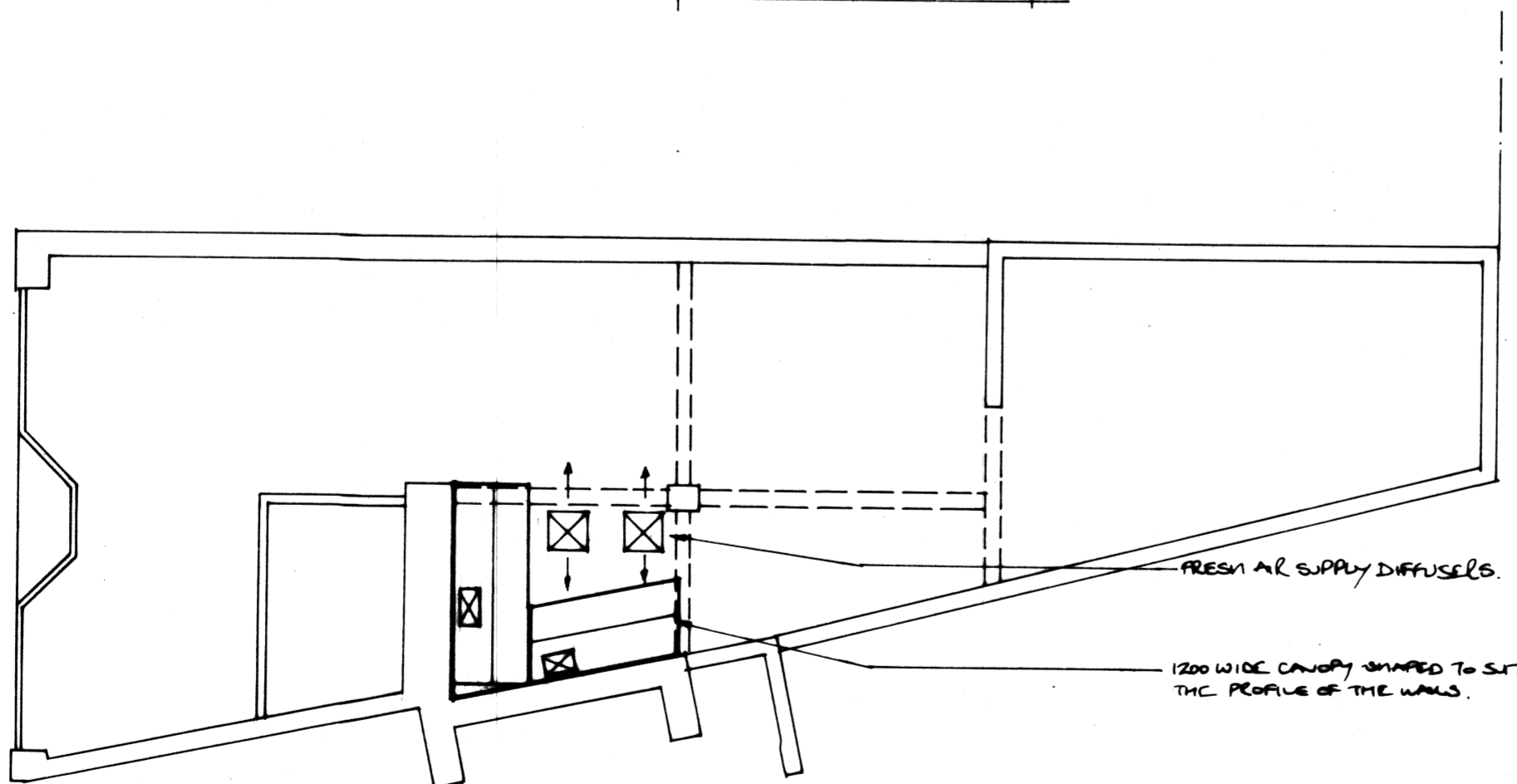
APPENDIX 2



SIDE ELEVATION.



FIRST FLOOR ROOF PLAN.



GROUND FLOOR PLAN.

A. CONDENSING UNITS RE-SITED ONTO SIDE WALL. ADDITIONAL FAN ACOUSTIC HOUSING ADDED. FENCING ADDED TO SHIELD LOW LEVEL DUCTWORK 16/12/10.

REVISIONS DATE.

TITLE
PROPOSED KITCHEN VENTILATION SYSTEMS.

SITE
JENNY LIND - 80 HIGH STREET
HAMPTON MILL - TW12 1NY

CLIENT
ANDREW J M SAUER ESQ.

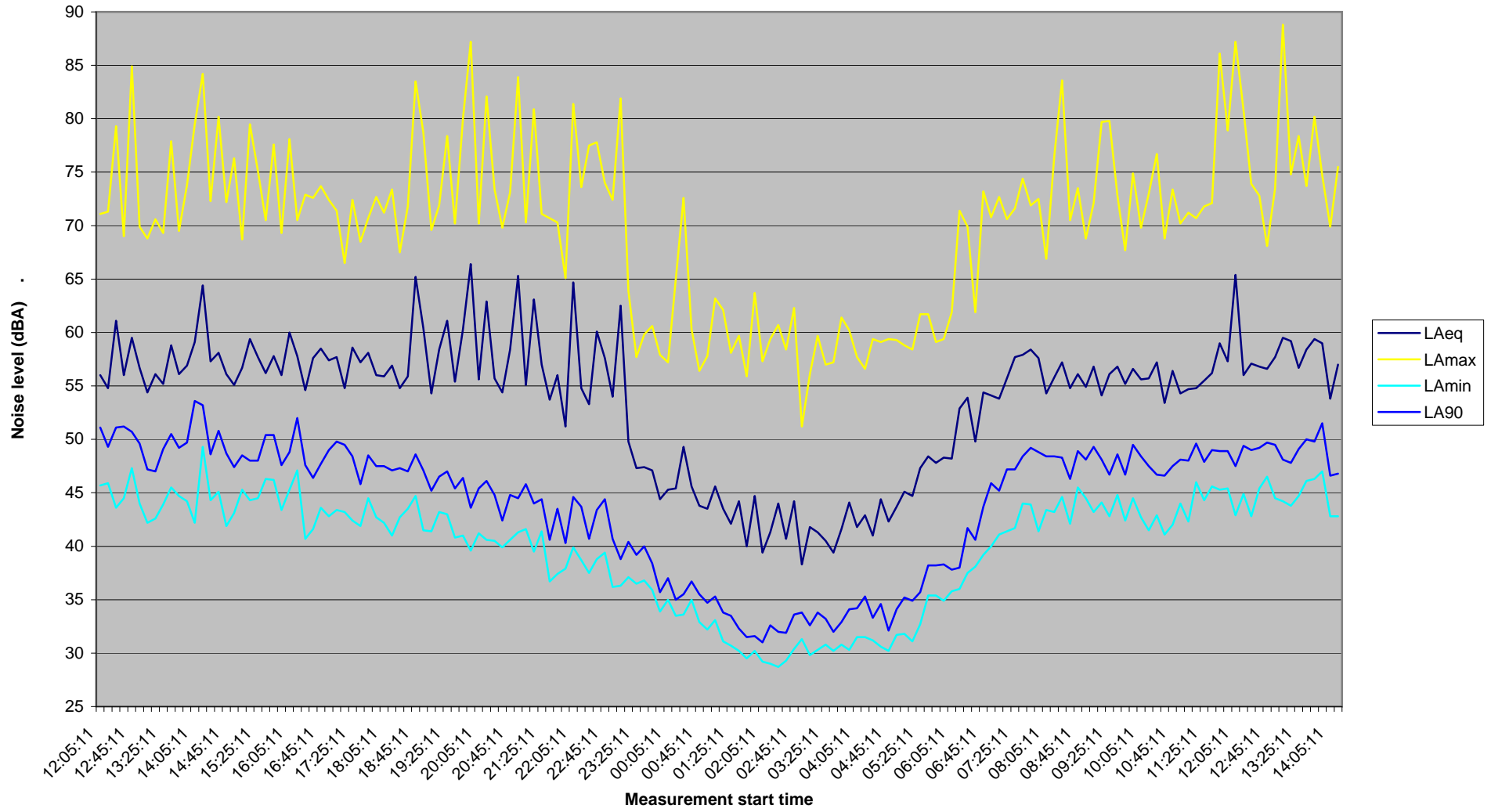
RJR Services Ltd
Vickers House
Priestley Road
Basingstoke
Hants RG24 9NP

DATE 29/11/10. SCALE 1:100 @ A2. DWT 30189/1A



APPENDIX 3

rear of 80 High Street, Hampton Hill
Survey data 7-8 December 2010



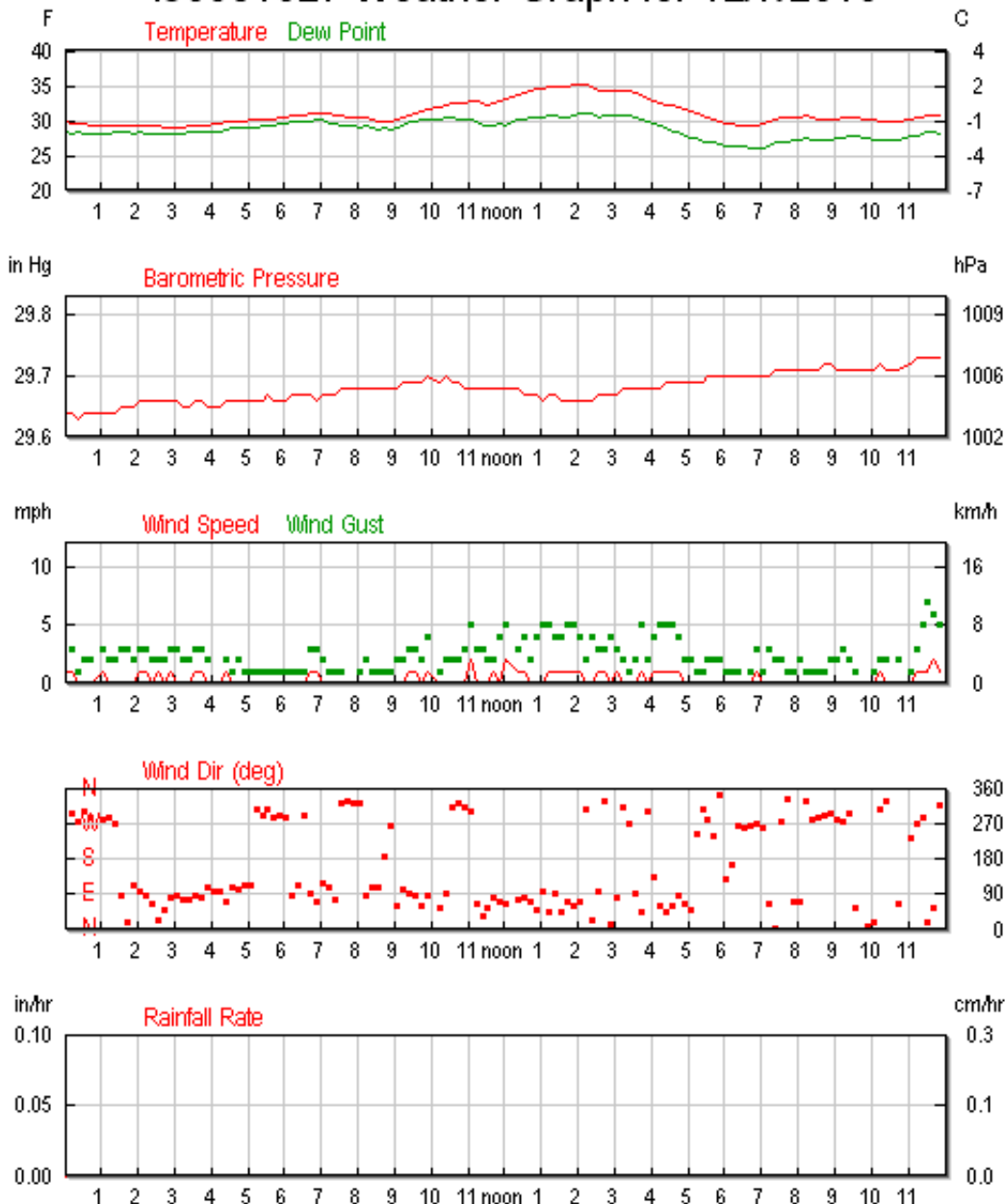
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2	07/12/2010 12:15	12:15:11	0:10:00	54.8	82.6	71.3	45.9	62.1	57.5	53.7	49.3	47.1
3	07/12/2010 12:25	12:25:11	0:10:00	61.1	88.9	79.3	43.6	75.5	62.7	53.8	51.1	47.4
4	07/12/2010 12:35	12:35:11	0:10:00	56.0	83.8	69.0	44.5	64.5	58.4	54.1	51.2	47.1
5	07/12/2010 12:45	12:45:11	0:10:00	59.5	87.3	84.9	47.3	66.3	62.5	55.8	50.7	48.5
6	07/12/2010 12:55	12:55:11	0:10:00	56.7	84.5	69.9	44.0	66.5	60.6	53.2	49.6	45.3
7	07/12/2010 13:05	13:05:11	0:10:00	54.4	82.2	68.8	42.2	61.7	57.3	53.0	47.2	43.3
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9	07/12/2010 13:25	13:25:11	0:10:00	55.2	83.0	69.3	43.9	64.5	58.0	53.1	49.1	46.2
10	07/12/2010 13:35	13:35:11	0:10:00	58.8	86.6	77.9	45.5	69.5	61.1	54.4	50.5	48.5
11	07/12/2010 13:45	13:45:11	0:10:00	56.1	83.9	69.5	44.7	66.5	58.9	52.5	49.2	46.1
12	07/12/2010 13:55	13:55:11	0:10:00	56.9	84.7	73.8	44.2	67.2	59.6	53.9	49.7	46.2
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15	07/12/2010 14:25	14:25:11	0:10:00	57.3	85.1	72.3	44.3	68.4	60.1	52.8	48.6	45.9
16	07/12/2010 14:35	14:35:11	0:10:00	58.1	85.9	80.2	45.1	67.6	60.4	54.7	50.8	46.7
17	07/12/2010 14:45	14:45:11	0:10:00	56.1	83.9	72.2	41.9	67.8	57.6	53.2	48.7	43.7
18	07/12/2010 14:55	14:55:11	0:10:00	55.1	82.9	76.3	43.1	64.3	57.6	51.8	47.4	44.7
19	07/12/2010 15:05	15:05:11	0:10:00	56.7	84.5	68.7	45.3	65.5	60.4	53.6	48.5	46.7
20	07/12/2010 15:15	15:15:11	0:10:00	59.4	87.2	79.5	44.3	72.2	61.3	53.6	48.0	45.2
21	07/12/2010 15:25	15:25:11	0:10:00	57.7	85.5	75.1	44.5	68.6	61.3	52.3	48.0	45.9
22	07/12/2010 15:35	15:35:11	0:10:00	56.2	84.0	70.5	46.3	66.1	58.7	53.6	50.4	48.7
23	07/12/2010 15:45	15:45:11	0:10:00	57.8	85.6	77.6	46.2	67.3	60.8	54.1	50.4	48.3
24	07/12/2010 15:55	15:55:11	0:10:00	56.0	83.8	69.3	43.4	66.1	59.1	52.1	47.6	45.4
25	07/12/2010 16:05	16:05:11	0:10:00	60.0	87.8	78.1	45.3	72.4	63.4	53.1	48.8	46.6
26	07/12/2010 16:15	16:15:11	0:10:00	57.8	85.6	70.5	47.1	66.5	60.9	55.1	52.0	48.5
27	07/12/2010 16:25	16:25:11	0:10:00	54.6	82.4	72.9	40.7	63.9	58.2	51.3	47.6	43.8
28	07/12/2010 16:35	16:35:11	0:10:00	57.6	85.4	72.6	41.6	68.1	61.0	52.8	46.4	42.8
29	07/12/2010 16:45	16:45:11	0:10:00	58.5	86.3	73.7	43.6	70.9	60.8	52.6	47.7	45.0
30	07/12/2010 16:55	16:55:11	0:10:00	57.4	85.2	72.4	42.8	65.6	60.9	54.6	49.0	45.4
31	07/12/2010 17:05	17:05:11	0:10:00	57.7	85.5	71.4	43.4	68.6	60.3	54.0	49.8	46.4
32	07/12/2010 17:15	17:15:11	0:10:00	54.8	82.6	66.5	43.2	61.8	58.1	52.9	49.5	45.9
33	07/12/2010 17:25	17:25:11	0:10:00	58.6	86.4	72.4	42.4	68.1	62.5	53.8	48.4	44.8
34	07/12/2010 17:35	17:35:11	0:10:00	57.2	85.0	68.5	41.9	66.1	61.4	53.5	45.8	42.9
35	07/12/2010 17:45	17:45:11	0:10:00	58.1	85.9	70.7	44.5	67.8	62.5	53.1	48.5	45.5
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38	07/12/2010 18:15	18:15:11	0:10:00	56.9	84.7	73.4	41.0	69.0	58.1	51.9	47.1	43.9
39	07/12/2010 18:25	18:25:11	0:10:00	54.8	82.6	67.5	42.7	62.7	58.3	52.5	47.3	44.9
40	07/12/2010 18:35	18:35:11	0:10:00	55.9	83.7	71.8	43.5	68.1	56.7	50.8	47.0	44.7
41	07/12/2010 18:45	18:45:11	0:10:00	65.2	93.0	83.5	44.7	81.0	60.0	53.6	48.6	46.3
42	07/12/2010 18:55	18:55:11	0:10:00	60.4	88.2	78.7	41.5	75.0	60.2	51.9	47.1	43.0
43	07/12/2010 19:05	19:05:11	0:10:00	54.3	82.1	69.6	41.4	66.9	56.1	49.8	45.2	42.9
44	07/12/2010 19:15	19:15:11	0:10:00	58.4	86.2	71.9	43.2	69.8	63.1	50.6	46.5	44.4
45	07/12/2010 19:25	19:25:11	0:10:00	61.1	88.9	78.4	43.0	73.5	63.6	52.4	47.0	44.0
46	07/12/2010 19:35	19:35:11	0:10:00	55.4	83.2	70.2	40.8	67.5	57.1	50.2	45.4	41.7
47	07/12/2010 19:45	19:45:11	0:10:00	60.3	88.1	80.0	41.0	71.3	63.6	51.8	46.4	42.4
48	07/12/2010 19:55	19:55:11	0:10:00	66.4	94.2	87.2	39.6	82.4	57.4	49.9	43.6	40.6
49	07/12/2010 20:05	20:05:11	0:10:00	55.6	83.4	70.2	41.2	67.3	58.4	50.0	45.4	42.0
50	07/12/2010 20:15	20:15:11	0:10:00	62.9	90.7	82.1	40.6	77.9	62.0	50.8	46.1	42.3
51	07/12/2010 20:25	20:25:11	0:10:00	55.7	83.5	73.4	40.5	66.7	59.3	50.5	44.8	41.9
52	07/12/2010 20:35	20:35:11	0:10:00	54.4	82.2	69.8	39.9	67.5	56.8	48.5	42.4	41.0
53	07/12/2010 20:45	20:45:11	0:10:00	58.4	86.2	73.1	40.6	69.3	62.7	50.5	44.8	41.6
54	07/12/2010 20:55	20:55:11	0:10:00	65.3	93.1	83.9	41.3	81.1	63.6	49.4	44.5	42.2

55	07/12/2010 21:05	21:05:11	0:10:00	55.1	82.9	70.3	41.6	66.2	57.6	50.5	45.8	42.7
56	07/12/2010 21:15	21:15:11	0:10:00	63.1	90.9	80.9	39.5	77.0	63.5	51.2	44.0	40.4
57	07/12/2010 21:25	21:25:11	0:10:00	57.0	84.8	71.1	41.4	68.0	60.4	49.9	44.4	42.4
58	07/12/2010 21:35	21:35:11	0:10:00	53.7	81.5	70.7	36.7	62.7	57.5	49.2	40.6	38.1
59	07/12/2010 21:45	21:45:11	0:10:00	56.0	83.8	70.3	37.4	67.3	59.6	49.6	43.5	38.7
60	07/12/2010 21:55	21:55:11	0:10:00	51.2	79.0	65.1	37.9	61.1	55.4	46.9	40.3	38.5
61	07/12/2010 22:05	22:05:11	0:10:00	64.7	92.5	81.4	39.9	78.4	67.1	52.9	44.6	40.8
62	07/12/2010 22:15	22:15:11	0:10:00	54.8	82.6	73.6	38.7	66.8	57.0	49.3	43.7	39.7
63	07/12/2010 22:25	22:25:11	0:10:00	53.3	81.1	77.5	37.5	65.1	55.0	46.4	40.7	38.9
64	07/12/2010 22:35	22:35:11	0:10:00	60.1	87.9	77.8	38.8	75.4	59.0	49.2	43.4	40.7
65	07/12/2010 22:45	22:45:11	0:10:00	57.6	85.4	74.0	39.4	71.5	57.5	49.3	44.4	41.3
66	07/12/2010 22:55	22:55:11	0:10:00	54.0	81.8	72.4	36.2	66.0	57.3	46.6	40.7	37.3
67	07/12/2010 23:05	23:05:11	0:10:00	62.5	90.3	81.9	36.3	76.7	60.8	48.7	38.8	37.1
68	07/12/2010 23:15	23:15:11	0:10:00	49.8	77.6	63.9	37.1	57.6	54.0	46.7	40.4	38.3
69	07/12/2010 23:25	23:25:11	0:10:00	47.3	75.1	57.7	36.5	55.4	52.0	43.3	39.2	37.7
70	07/12/2010 23:35	23:35:11	0:10:00	47.4	75.2	59.8	36.8	56.3	50.9	44.3	40.0	37.8
71	07/12/2010 23:45	23:45:11	0:10:00	47.1	74.9	60.6	35.9	56.7	51.3	42.1	38.4	36.6
72	07/12/2010 23:55	23:55:11	0:10:00	44.4	72.2	57.9	33.9	53.8	49.1	38.7	35.7	34.6
73	08/12/2010 00:05	00:05:11	0:10:00	45.3	73.1	57.2	35.0	54.7	49.2	40.8	37.0	35.8
74	08/12/2010 00:15	00:15:11	0:10:00	45.4	73.2	65.0	33.5	54.9	49.5	40.2	35.0	34.1
75	08/12/2010 00:25	00:25:11	0:10:00	49.3	77.1	72.6	33.6	61.9	48.9	39.4	35.5	34.4
76	08/12/2010 00:35	00:35:11	0:10:00	45.6	73.4	60.3	35.0	55.8	49.7	39.6	36.7	35.8
77	08/12/2010 00:45	00:45:11	0:10:00	43.8	71.6	56.4	32.9	53.7	47.8	39.4	35.5	33.8
78	08/12/2010 00:55	00:55:11	0:10:00	43.5	71.3	57.8	32.2	55.2	47.1	37.3	34.7	33.3
79	08/12/2010 01:05	01:05:11	0:10:00	45.6	73.4	63.2	33.1	56.8	49.3	38.6	35.3	33.8
80	08/12/2010 01:15	01:15:11	0:10:00	43.5	71.3	62.1	31.1	55.9	46.1	37.1	33.8	32.0
81	08/12/2010 01:25	01:25:11	0:10:00	42.1	69.9	58.1	30.7	53.3	45.3	36.5	33.5	31.5
82	08/12/2010 01:35	01:35:11	0:10:00	44.2	72.0	59.7	30.2	56.1	48.5	35.8	32.3	30.9
83	08/12/2010 01:45	01:45:11	0:10:00	40.0	67.8	55.9	29.5	52.6	40.1	34.2	31.5	30.4
84	08/12/2010 01:55	01:55:11	0:10:00	44.7	72.5	63.7	30.2	57.8	46.8	35.3	31.6	30.8
85	08/12/2010 02:05	02:05:11	0:10:00	39.4	67.2	57.3	29.2	52.0	39.2	33.7	31.0	30.0
86	08/12/2010 02:15	02:15:11	0:10:00	41.3	69.1	59.4	29.0	54.6	41.2	36.1	32.6	30.3
87	08/12/2010 02:25	02:25:11	0:10:00	44.0	71.8	60.7	28.7	57.1	46.5	36.0	32.0	29.7
88	08/12/2010 02:35	02:35:11	0:10:00	40.7	68.5	58.4	29.3	53.1	41.5	35.6	31.9	30.0
89	08/12/2010 02:45	02:45:11	0:10:00	44.2	72.0	62.3	30.4	55.5	46.3	38.1	33.6	31.2
90	08/12/2010 02:55	02:55:11	0:10:00	38.3	66.1	51.2	31.3	47.1	40.3	36.7	33.8	31.9
91	08/12/2010 03:05	03:05:11	0:10:00	41.8	69.6	56.1	29.8	53.4	45.4	35.5	32.6	30.5
92	08/12/2010 03:15	03:15:11	0:10:00	41.3	69.1	59.7	30.3	53.6	40.8	37.0	33.8	31.4
93	08/12/2010 03:25	03:25:11	0:10:00	40.5	68.3	57.0	30.8	53.1	40.4	36.2	33.2	31.4
94	08/12/2010 03:35	03:35:11	0:10:00	39.4	67.2	57.2	30.2	51.5	39.4	34.7	32.0	30.9
95	08/12/2010 03:45	03:45:11	0:10:00	41.6	69.4	61.4	30.8	53.0	41.8	36.4	32.9	31.4
96	08/12/2010 03:55	03:55:11	0:10:00	44.1	71.9	60.2	30.3	56.8	46.3	37.8	34.1	31.3
97	08/12/2010 04:05	04:05:11	0:10:00	41.8	69.6	57.7	31.5	53.5	44.9	36.6	34.2	32.8
98	08/12/2010 04:15	04:15:11	0:10:00	42.9	70.7	56.6	31.5	54.3	44.8	37.9	35.3	32.8
99	08/12/2010 04:25	04:25:11	0:10:00	41.0	68.8	59.4	31.2	53.8	41.3	36.3	33.3	31.9
100	08/12/2010 04:35	04:35:11	0:10:00	44.4	72.2	59.1	30.6	56.0	47.3	38.8	34.6	31.7
101	08/12/2010 04:45	04:45:11	0:10:00	42.3	70.1	59.4	30.2	54.6	44.1	36.4	32.1	31.1
102	08/12/2010 04:55	04:55:11	0:10:00	43.7	71.5	59.3	31.7	55.9	45.0	36.9	34.1	32.8
103	08/12/2010 05:05	05:05:11	0:10:00	45.1	72.9	58.8	31.8	55.6	49.5	39.4	35.2	33.2
104	08/12/2010 05:15	05:15:11	0:10:00	44.7	72.5	58.4	31.1	56.3	48.9	38.4	34.9	32.7
105	08/12/2010 05:25	05:25:11	0:10:00	47.3	75.1	61.7	32.7	58.3	51.5	39.7	35.7	33.6
106	08/12/2010 05:35	05:35:11	0:10:00	48.4	76.2	61.7	35.4	58.3	52.2	44.3	38.2	36.5
107	08/12/2010 05:45	05:45:11	0:10:00	47.8	75.6	59.1	35.4	56.5	52.1	43.5	38.2	36.4
108	08/12/2010 05:55	05:55:11	0:10:00	48.3	76.1	59.4	34.9	57.6	52.5	44.0	38.3	35.7
109	08/12/2010 06:05	06:05:11	0:10:00	48.2	76.0	61.9	35.8	57.1	52.8	42.3	37.8	36.4

110	08/12/2010 06:15	06:15:11	0:10:00	52.9	80.7	71.4	36.0	65.9	53.8	44.3	38.0	36.9
111	08/12/2010 06:25	06:25:11	0:10:00	53.9	81.7	69.9	37.5	64.6	57.0	48.5	41.7	38.8
112	08/12/2010 06:35	06:35:11	0:10:00	49.8	77.6	61.9	38.1	59.0	53.3	47.2	40.6	39.0
113	08/12/2010 06:45	06:45:11	0:10:00	54.4	82.2	73.2	39.2	66.3	56.2	49.5	43.7	40.6
114	08/12/2010 06:55	06:55:11	0:10:00	54.1	81.9	70.8	40.0	64.3	57.0	50.8	45.9	42.6
115	08/12/2010 07:05	07:05:11	0:10:00	53.8	81.6	72.7	41.1	64.8	55.5	50.2	45.2	42.9
116	08/12/2010 07:15	07:15:11	0:10:00	55.7	83.5	70.6	41.4	67.5	58.2	51.4	47.2	43.4
117	08/12/2010 07:25	07:25:11	0:10:00	57.7	85.5	71.6	41.7	68.1	60.9	53.6	47.2	43.0
118	08/12/2010 07:35	07:35:11	0:10:00	57.9	85.7	74.4	44.0	70.5	59.3	53.2	48.4	45.4
119	08/12/2010 07:45	07:45:11	0:10:00	58.4	86.2	71.9	43.9	67.8	62.9	54.2	49.2	46.2
120	08/12/2010 07:55	07:55:11	0:10:00	57.6	85.4	72.5	41.4	67.9	60.8	53.9	48.8	46.1
121	08/12/2010 08:05	08:05:11	0:10:00	54.3	82.1	66.9	43.4	62.8	57.3	52.3	48.4	46.6
122	08/12/2010 08:15	08:15:11	0:10:00	55.8	83.6	76.5	43.2	64.8	58.8	52.4	48.4	44.9
123	08/12/2010 08:25	08:25:11	0:10:00	57.2	85.0	83.6	44.6	65.5	58.8	53.0	48.3	46.0
124	08/12/2010 08:35	08:35:11	0:10:00	54.8	82.6	70.5	42.1	65.5	57.1	50.8	46.3	43.7
125	08/12/2010 08:45	08:45:11	0:10:00	56.1	83.9	73.5	45.5	65.5	59.1	52.8	48.9	47.3
126	08/12/2010 08:55	08:55:11	0:10:00	54.9	82.7	68.8	44.5	64.8	58.2	51.9	48.1	45.5
127	08/12/2010 09:05	09:05:11	0:10:00	56.8	84.6	72.1	43.2	68.0	58.4	53.3	49.3	44.7
128	08/12/2010 09:15	09:15:11	0:10:00	54.1	81.9	79.7	44.1	60.8	56.5	51.7	48.1	45.3
129	08/12/2010 09:25	09:25:11	0:10:00	56.1	83.9	79.8	42.8	66.2	58.8	51.1	46.7	44.2
130	08/12/2010 09:35	09:35:11	0:10:00	56.8	84.6	72.8	44.8	67.5	59.8	52.4	48.6	46.1
131	08/12/2010 09:45	09:45:11	0:10:00	55.2	83.0	67.7	42.4	64.3	59.0	52.0	46.7	43.8
132	08/12/2010 09:55	09:55:11	0:10:00	56.6	84.4	74.9	44.5	67.1	58.7	53.5	49.5	46.9
133	08/12/2010 10:05	10:05:11	0:10:00	55.6	83.4	69.8	42.7	64.4	59.1	52.6	48.4	44.3
134	08/12/2010 10:15	10:15:11	0:10:00	55.7	83.5	73.0	41.5	66.6	58.3	51.7	47.5	43.3
135	08/12/2010 10:25	10:25:11	0:10:00	57.2	85.0	76.7	42.9	70.2	57.6	51.1	46.7	44.3
136	08/12/2010 10:35	10:35:11	0:10:00	53.4	81.2	68.8	41.1	59.9	56.0	52.2	46.6	43.7
137	08/12/2010 10:45	10:45:11	0:10:00	56.4	84.2	73.4	42.0	67.0	59.5	52.2	47.5	43.3
138	08/12/2010 10:55	10:55:11	0:10:00	54.3	82.1	70.2	44.0	63.7	56.7	52.2	48.1	45.7
139	08/12/2010 11:05	11:05:11	0:10:00	54.7	82.5	71.2	42.3	64.4	57.5	51.8	48.0	44.4
140	08/12/2010 11:15	11:15:11	0:10:00	54.8	82.6	70.7	46.0	63.9	57.1	52.6	49.6	47.5
141	08/12/2010 11:25	11:25:11	0:10:00	55.5	83.3	71.8	44.3	66.9	58.0	51.3	47.9	45.9
142	08/12/2010 11:35	11:35:11	0:10:00	56.2	84.0	72.1	45.6	66.3	59.1	52.6	49.0	47.1
143	08/12/2010 11:45	11:45:11	0:10:00	59.0	86.8	86.1	45.3	67.6	59.4	54.1	48.9	46.4
144	08/12/2010 11:55	11:55:11	0:10:00	57.3	85.1	78.9	45.4	68.6	59.4	52.4	48.9	47.0
145	08/12/2010 12:05	12:05:11	0:10:00	65.4	93.2	87.2	42.9	81.1	58.5	52.6	47.5	44.0
146	08/12/2010 12:15	12:15:11	0:10:00	56.0	83.8	80.8	44.9	62.1	58.1	53.1	49.4	46.9
147	08/12/2010 12:25	12:25:11	0:10:00	57.1	84.9	73.9	42.8	68.1	59.0	53.6	49.0	46.0
148	08/12/2010 12:35	12:35:11	0:10:00	56.8	84.6	72.8	45.4	66.9	60.2	53.0	49.2	46.8
149	08/12/2010 12:45	12:45:11	0:10:00	56.6	84.4	68.1	46.5	64.9	60.3	53.8	49.7	47.8
150	08/12/2010 12:55	12:55:11	0:10:00	57.7	85.5	73.5	44.5	67.7	60.3	54.3	49.5	46.1
151	08/12/2010 13:05	13:05:11	0:10:00	59.5	87.3	88.8	44.2	68.1	57.9	52.3	48.1	45.8
152	08/12/2010 13:15	13:15:11	0:10:00	59.2	87.0	74.8	43.8	70.3	63.2	52.6	47.8	45.4
153	08/12/2010 13:25	13:25:11	0:10:00	56.7	84.5	78.4	44.7	64.7	60.1	54.1	49.1	46.4
154	08/12/2010 13:35	13:35:11	0:10:00	58.4	86.2	73.7	46.1	68.4	62.0	53.7	50.0	47.9
155	08/12/2010 13:45	13:45:11	0:10:00	59.4	87.2	80.2	46.3	70.8	60.4	53.9	49.8	47.3
156	08/12/2010 13:55	13:55:11	0:10:00	59.0	86.8	74.7	47.0	69.6	61.8	54.7	51.5	49.1
157	08/12/2010 14:05	14:05:11	0:10:00	53.8	81.6	69.9	42.8	63.1	57.1	51.2	46.6	44.2
158	08/12/2010 14:15	14:15:11	0:07:39	57.0	83.6	75.5	42.8	68.8	59.4	51.9	46.8	44.0

Instrumentation - RION NL-32 SLM s/n 00530374

190581027 Weather Graph for 12/7/2010



Tabular Data for December 7, 2010

Time	Temp.	Dew Point	Pressure	Wind	Wind Speed	Wind Gust	Humidity	Rainfall Rate (Hourly)	Conditions	Clouds
00:03	-0.9 °C	-1.8 °C	1003.6hPa	NW	1.6km/h	6.4km/h	94%	0.0mm	OVC	BKN
00:13	-1.1 °C	-1.9 °C	1003.6hPa	WNW	1.6km/h	4.8km/h	94%	0.0mm	OVC	BKN
00:23	-1.2 °C	-1.8 °C	1003.3hPa	Calm		1.6km/h	95%	0.0mm	OVC	BKN
00:33	-1.2 °C	-1.9 °C	1003.6hPa	Calm		3.2km/h	95%	0.0mm	OVC	BKN
00:43	-1.3 °C	-2.0 °C	1003.6hPa	Calm		3.2km/h	95%	0.0mm	OVC	BKN
01:03	-1.3 °C	-2.1 °C	1003.6hPa	WNW	1.6km/h	4.8km/h	95%	0.0mm	BKN	BKN
01:13	-1.3 °C	-2.1 °C	1003.6hPa	Calm		3.2km/h	95%	0.0mm	BKN	BKN
01:23	-1.3 °C	-1.8 °C	1003.6hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
01:33	-1.3 °C	-1.8 °C	1003.9hPa	Calm		4.8km/h	96%	0.0mm	BKN	BKN
01:43	-1.3 °C	-1.9 °C	1003.9hPa	Calm		4.8km/h	96%	0.0mm	BKN	BKN
01:53	-1.4 °C	-1.9 °C	1003.9hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
02:03	-1.3 °C	-1.9 °C	1004.3hPa	East	1.6km/h	4.8km/h	96%	0.0mm	OVC	BKN

08/12/2010

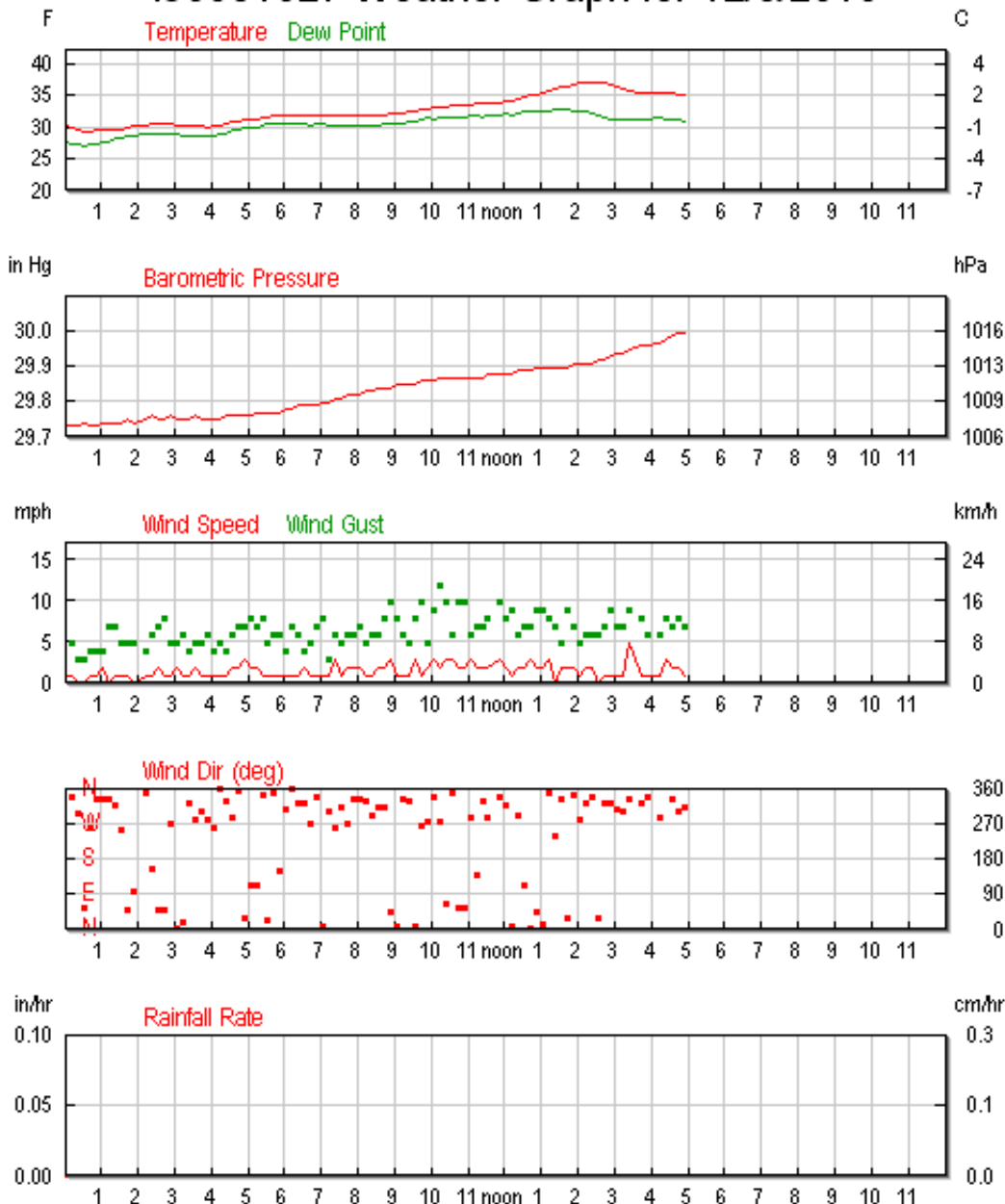
Weather Station History : Weather U...

02:13	-1.4 °C	-1.9 °C	1004.3hPa	East	1.6km/h	4.8km/h	96%	0.0mm	OVC	BKN
02:23	-1.4 °C	-1.9 °C	1004.3hPa	Calm		3.2km/h	96%	0.0mm	OVC	BKN
02:33	-1.4 °C	-1.9 °C	1004.3hPa	NNE	1.6km/h	3.2km/h	96%	0.0mm	OVC	BKN
02:43	-1.4 °C	-2.0 °C	1004.3hPa	Calm		3.2km/h	96%	0.0mm	OVC	BKN
02:53	-1.5 °C	-2.1 °C	1004.3hPa	East	1.6km/h	4.8km/h	96%	0.0mm	OVC	BKN
03:03	-1.4 °C	-2.0 °C	1004.3hPa	Calm		4.8km/h	96%	0.0mm	BKN	BKN
03:13	-1.4 °C	-2.0 °C	1003.9hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
03:23	-1.3 °C	-1.9 °C	1003.9hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
03:33	-1.3 °C	-1.8 °C	1004.3hPa	East	1.6km/h	4.8km/h	96%	0.0mm	BKN	BKN
03:43	-1.3 °C	-1.8 °C	1004.3hPa	East	1.6km/h	4.8km/h	96%	0.0mm	BKN	BKN
03:53	-1.3 °C	-1.8 °C	1003.9hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
04:03	-1.2 °C	-1.8 °C	1003.9hPa	Calm		0.0km/h	96%	0.0mm	BKN	BKN
04:13	-1.2 °C	-1.8 °C	1003.9hPa	Calm		0.0km/h	96%	0.0mm	BKN	BKN
04:23	-1.1 °C	-1.6 °C	1004.3hPa	ENE	1.6km/h	3.2km/h	96%	0.0mm	BKN	BKN
04:33	-1.0 °C	-1.6 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
04:43	-1.0 °C	-1.6 °C	1004.3hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
04:53	-0.9 °C	-1.5 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
05:03	-0.9 °C	-1.4 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
05:13	-0.9 °C	-1.4 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
05:23	-0.8 °C	-1.4 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
05:33	-0.8 °C	-1.3 °C	1004.6hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
05:43	-0.8 °C	-1.3 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
05:53	-0.7 °C	-1.2 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
06:03	-0.6 °C	-1.2 °C	1004.3hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
06:13	-0.5 °C	-1.1 °C	1004.6hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
06:23	-0.4 °C	-1.0 °C	1004.6hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
06:33	-0.4 °C	-1.0 °C	1004.6hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
06:43	-0.4 °C	-0.9 °C	1004.6hPa	East	1.6km/h	4.8km/h	96%	0.0mm	BKN	BKN
06:53	-0.3 °C	-0.9 °C	1004.3hPa	ENE	1.6km/h	4.8km/h	96%	0.0mm	BKN	BKN
07:03	-0.3 °C	-0.9 °C	1004.6hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
07:13	-0.4 °C	-1.1 °C	1004.6hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
07:23	-0.4 °C	-1.1 °C	1004.6hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
07:33	-0.6 °C	-1.3 °C	1005.0hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
07:43	-0.7 °C	-1.4 °C	1005.0hPa	Calm		0.0km/h	95%	0.0mm	BKN	BKN
07:53	-0.7 °C	-1.4 °C	1005.0hPa	Calm		0.0km/h	95%	0.0mm	BKN	BKN
08:03	-0.7 °C	-1.4 °C	1005.0hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
08:13	-0.7 °C	-1.3 °C	1005.0hPa	Calm		3.2km/h	96%	0.0mm	BKN	BKN
08:23	-0.8 °C	-1.5 °C	1005.0hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
08:33	-0.9 °C	-1.7 °C	1005.0hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
08:43	-0.9 °C	-1.5 °C	1005.0hPa	Calm		1.6km/h	96%	0.0mm	BKN	BKN
08:53	-0.9 °C	-1.7 °C	1005.0hPa	Calm		1.6km/h	95%	0.0mm	BKN	BKN
09:03	-0.9 °C	-1.4 °C	1005.0hPa	Calm		3.2km/h	96%	0.0mm	SCT	BKN
09:13	-0.7 °C	-1.3 °C	1005.3hPa	Calm		3.2km/h	96%	0.0mm	SCT	BKN
09:23	-0.4 °C	-1.1 °C	1005.3hPa	East	1.6km/h	4.8km/h	96%	0.0mm	SCT	BKN
09:33	-0.3 °C	-1.0 °C	1005.3hPa	East	1.6km/h	4.8km/h	95%	0.0mm	SCT	BKN
09:43	-0.2 °C	-0.9 °C	1005.3hPa	Calm		3.2km/h	95%	0.0mm	SCT	BKN
09:53	-0.1 °C	-0.9 °C	1005.6hPa	East	1.6km/h	6.4km/h	94%	0.0mm	SCT	BKN
10:13	0.2 °C	-0.8 °C	1005.3hPa	Calm		1.6km/h	93%	0.0mm	FEW	BKN
10:23	0.3 °C	-0.7 °C	1005.6hPa	Calm		3.2km/h	93%	0.0mm	FEW	BKN

10:33	0.4 °C	-0.7 °C	1005.3hPa	Calm		3.2km/h	92%	0.0mm	FEW	BKN
10:43	0.5 °C	-0.8 °C	1005.3hPa	Calm		3.2km/h	91%	0.0mm	FEW	BKN
10:53	0.5 °C	-0.8 °C	1005.0hPa	Calm		4.8km/h	91%	0.0mm	FEW	BKN
11:03	0.6 °C	-0.8 °C	1005.0hPa	NW	3.2km/h	8.0km/h	90%	0.0mm	BKN	BKN
11:13	0.6 °C	-1.0 °C	1005.0hPa	Calm		4.8km/h	89%	0.0mm	BKN	BKN
11:23	0.4 °C	-1.3 °C	1005.0hPa	Calm		4.8km/h	88%	0.0mm	BKN	BKN
11:33	0.4 °C	-1.4 °C	1005.0hPa	Calm		3.2km/h	88%	0.0mm	BKN	BKN
11:43	0.5 °C	-1.3 °C	1005.0hPa	East	1.6km/h	3.2km/h	88%	0.0mm	BKN	BKN
11:53	0.7 °C	-1.2 °C	1005.0hPa	Calm		6.4km/h	87%	0.0mm	BKN	BKN
12:03	0.8 °C	-1.3 °C	1005.0hPa	ENE	3.2km/h	8.0km/h	86%	0.0mm	SCT	BKN
12:23	1.1 °C	-0.8 °C	1005.0hPa	ENE	1.6km/h	4.8km/h	87%	0.0mm	SCT	BKN
12:33	1.3 °C	-0.8 °C	1004.6hPa	East	1.6km/h	6.4km/h	86%	0.0mm	SCT	BKN
12:43	1.4 °C	-0.7 °C	1004.6hPa	Calm		3.2km/h	86%	0.0mm	SCT	BKN
12:53	1.6 °C	-0.7 °C	1004.6hPa	Calm		6.4km/h	85%	0.0mm	SCT	BKN
13:03	1.7 °C	-0.6 °C	1004.3hPa	Calm		8.0km/h	85%	0.0mm	BKN	BKN
13:13	1.8 °C	-0.5 °C	1004.6hPa	NE	1.6km/h	8.0km/h	85%	0.0mm	BKN	BKN
13:23	1.8 °C	-0.4 °C	1004.6hPa	East	1.6km/h	6.4km/h	85%	0.0mm	BKN	BKN
13:33	1.8 °C	-0.6 °C	1004.3hPa	NE	1.6km/h	6.4km/h	84%	0.0mm	BKN	BKN
13:43	1.8 °C	-0.6 °C	1004.3hPa	ENE	1.6km/h	8.0km/h	84%	0.0mm	BKN	BKN
13:53	1.9 °C	-0.6 °C	1004.3hPa	ENE	1.6km/h	8.0km/h	84%	0.0mm	BKN	BKN
14:03	1.9 °C	-0.4 °C	1004.3hPa	ENE	1.6km/h	6.4km/h	85%	0.0mm	BKN	BKN
14:13	1.9 °C	-0.4 °C	1004.3hPa	Calm		3.2km/h	85%	0.0mm	BKN	BKN
14:23	1.7 °C	-0.4 °C	1004.3hPa	Calm		6.4km/h	86%	0.0mm	BKN	BKN
14:33	1.5 °C	-0.6 °C	1004.6hPa	East	1.6km/h	4.8km/h	86%	0.0mm	BKN	BKN
14:43	1.4 °C	-0.5 °C	1004.6hPa	NNW	1.6km/h	4.8km/h	87%	0.0mm	BKN	BKN
14:53	1.4 °C	-0.5 °C	1004.6hPa	Calm		6.4km/h	87%	0.0mm	BKN	BKN
15:03	1.5 °C	-0.4 °C	1004.6hPa	East	1.6km/h	4.8km/h	87%	0.0mm	SCT	BKN
15:13	1.5 °C	-0.4 °C	1005.0hPa	Calm		3.2km/h	87%	0.0mm	SCT	BKN
15:23	1.4 °C	-0.6 °C	1005.0hPa	Calm		1.6km/h	87%	0.0mm	SCT	BKN
15:33	1.2 °C	-0.7 °C	1005.0hPa	Calm		3.2km/h	87%	0.0mm	SCT	BKN
15:43	1.1 °C	-0.8 °C	1005.0hPa	NE	1.6km/h	8.0km/h	87%	0.0mm	SCT	BKN
15:53	0.9 °C	-1.1 °C	1005.0hPa	Calm		3.2km/h	87%	0.0mm	SCT	BKN
16:03	0.7 °C	-1.2 °C	1005.0hPa	SE	1.6km/h	6.4km/h	87%	0.0mm	BKN	BKN
16:13	0.5 °C	-1.4 °C	1005.0hPa	ENE	1.6km/h	8.0km/h	87%	0.0mm	BKN	BKN
16:23	0.4 °C	-1.5 °C	1005.3hPa	NE	1.6km/h	8.0km/h	87%	0.0mm	BKN	BKN
16:33	0.3 °C	-1.8 °C	1005.3hPa	ENE	1.6km/h	8.0km/h	86%	0.0mm	BKN	BKN
16:43	0.2 °C	-1.9 °C	1005.3hPa	East	1.6km/h	6.4km/h	86%	0.0mm	BKN	BKN
16:53	0.1 °C	-2.2 °C	1005.3hPa	Calm		3.2km/h	85%	0.0mm	BKN	BKN
17:03	-0.2 °C	-2.4 °C	1005.3hPa	Calm		3.2km/h	85%	0.0mm	SCT	BKN
17:13	-0.3 °C	-2.4 °C	1005.3hPa	Calm		1.6km/h	86%	0.0mm	SCT	BKN
17:23	-0.6 °C	-2.6 °C	1005.3hPa	Calm		1.6km/h	86%	0.0mm	SCT	BKN
17:33	-0.7 °C	-2.6 °C	1005.6hPa	Calm		3.2km/h	87%	0.0mm	SCT	BKN
17:43	-0.8 °C	-2.7 °C	1005.6hPa	Calm		3.2km/h	87%	0.0mm	SCT	BKN
17:53	-0.9 °C	-2.8 °C	1005.6hPa	Calm		3.2km/h	87%	0.0mm	SCT	BKN
18:03	-1.1 °C	-3.0 °C	1005.6hPa	Calm		1.6km/h	87%	0.0mm	FEW	BKN
18:13	-1.2 °C	-2.9 °C	1005.6hPa	Calm		1.6km/h	88%	0.0mm	FEW	BKN
18:23	-1.3 °C	-3.0 °C	1005.6hPa	Calm		1.6km/h	88%	0.0mm	FEW	BKN
18:33	-1.3 °C	-3.0 °C	1005.6hPa	Calm		0.0km/h	88%	0.0mm	FEW	BKN
18:43	-1.3 °C	-3.2 °C	1005.6hPa	Calm		1.6km/h	87%	0.0mm	FEW	BKN

18:53	-1.3 °C	-3.2 °C	1005.6hPa	West	1.6km/h	4.8km/h	87%	0.0mm	FEW	BKN
19:03	-1.2 °C	-3.1 °C	1005.6hPa	Calm		1.6km/h	87%	0.0mm	BKN	BKN
19:13	-1.0 °C	-2.9 °C	1005.6hPa	Calm		4.8km/h	87%	0.0mm	BKN	BKN
19:23	-0.8 °C	-2.7 °C	1006.0hPa	Calm		3.2km/h	87%	0.0mm	BKN	BKN
19:33	-0.7 °C	-2.6 °C	1006.0hPa	Calm		3.2km/h	87%	0.0mm	BKN	BKN
19:43	-0.7 °C	-2.6 °C	1006.0hPa	Calm		1.6km/h	87%	0.0mm	BKN	BKN
19:53	-0.7 °C	-2.6 °C	1006.0hPa	Calm		1.6km/h	87%	0.0mm	BKN	BKN
20:03	-0.6 °C	-2.5 °C	1006.0hPa	Calm		3.2km/h	87%	0.0mm	FEW	BKN
20:13	-0.6 °C	-2.3 °C	1006.0hPa	Calm		1.6km/h	88%	0.0mm	FEW	BKN
20:23	-0.7 °C	-2.6 °C	1006.0hPa	Calm		1.6km/h	87%	0.0mm	FEW	BKN
20:33	-0.8 °C	-2.6 °C	1006.0hPa	Calm		1.6km/h	88%	0.0mm	FEW	BKN
20:43	-0.9 °C	-2.4 °C	1006.3hPa	Calm		1.6km/h	89%	0.0mm	FEW	BKN
20:53	-0.8 °C	-2.4 °C	1006.3hPa	Calm		3.2km/h	89%	0.0mm	FEW	BKN
21:03	-0.8 °C	-2.4 °C	1006.0hPa	Calm		3.2km/h	89%	0.0mm	SCT	BKN
21:13	-0.7 °C	-2.3 °C	1006.0hPa	Calm		4.8km/h	89%	0.0mm	SCT	BKN
21:23	-0.7 °C	-2.2 °C	1006.0hPa	Calm		3.2km/h	89%	0.0mm	SCT	BKN
21:33	-0.6 °C	-2.2 °C	1006.0hPa	Calm		1.6km/h	89%	0.0mm	SCT	BKN
21:53	-0.8 °C	-2.4 °C	1006.0hPa	Calm		0.0km/h	89%	0.0mm	SCT	BKN
22:03	-0.9 °C	-2.5 °C	1006.0hPa	Calm		1.6km/h	89%	0.0mm	SCT	BKN
22:13	-1.0 °C	-2.4 °C	1006.3hPa	NW	1.6km/h	3.2km/h	90%	0.0mm	SCT	BKN
22:23	-1.0 °C	-2.4 °C	1006.0hPa	Calm		3.2km/h	90%	0.0mm	SCT	BKN
22:43	-1.1 °C	-2.4 °C	1006.0hPa	Calm		3.2km/h	90%	0.0mm	SCT	BKN
23:03	-0.8 °C	-2.2 °C	1006.3hPa	Calm		1.6km/h	90%	0.0mm	FEW	BKN
23:13	-0.7 °C	-2.1 °C	1006.7hPa	West	1.6km/h	4.8km/h	90%	0.0mm	FEW	BKN
23:23	-0.6 °C	-2.0 °C	1006.7hPa	WNW	1.6km/h	8.0km/h	90%	0.0mm	FEW	BKN
23:33	-0.4 °C	-1.9 °C	1006.7hPa	NNE	1.6km/h	11.3km/h	90%	0.0mm	FEW	BKN
23:43	-0.4 °C	-1.9 °C	1006.7hPa	NE	3.2km/h	9.7km/h	90%	0.0mm	FEW	BKN
23:53	-0.5 °C	-1.9 °C	1006.7hPa	NW	1.6km/h	8.0km/h	90%	0.0mm	FEW	BKN

190581027 Weather Graph for 12/8/2010



Tabular Data for December 8, 2010

Time	Temp.	Dew Point	Pressure	Wind	Wind Speed	Wind Gust	Humidity	Rainfall Rate (Hourly)	Conditions	Clouds
00:03	-0.6 °C	-2.1 °C	1006.7hPa	NW	1.6km/h	6.4km/h	90%	0.0mm	CLR	BKN
00:13	-0.7 °C	-2.2 °C	1006.7hPa	NNW	1.6km/h	8.0km/h	90%	0.0mm	CLR	BKN
00:23	-0.9 °C	-2.2 °C	1006.7hPa	Calm		4.8km/h	91%	0.0mm	CLR	BKN
00:33	-1.1 °C	-2.3 °C	1007.0hPa	Calm		4.8km/h	91%	0.0mm	CLR	BKN
00:43	-1.1 °C	-2.2 °C	1006.7hPa	West	1.6km/h	6.4km/h	92%	0.0mm	CLR	BKN
00:53	-1.0 °C	-2.2 °C	1006.7hPa	NNW	1.6km/h	6.4km/h	92%	0.0mm	CLR	BKN
01:03	-1.0 °C	-2.0 °C	1007.0hPa	NNW	3.2km/h	6.4km/h	93%	0.0mm	BKN	BKN
01:13	-0.9 °C	-1.9 °C	1007.0hPa	Calm		11.3km/h	93%	0.0mm	BKN	BKN
01:23	-0.9 °C	-1.7 °C	1007.0hPa	NW	1.6km/h	11.3km/h	94%	0.0mm	BKN	BKN
01:33	-0.8 °C	-1.7 °C	1007.0hPa	WSW	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
01:43	-0.7 °C	-1.5 °C	1007.3hPa	NE	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
01:53	-0.6 °C	-1.4 °C	1007.0hPa	Calm		8.0km/h	94%	0.0mm	BKN	BKN

08/12/2010

Weather Station History : Weather U...

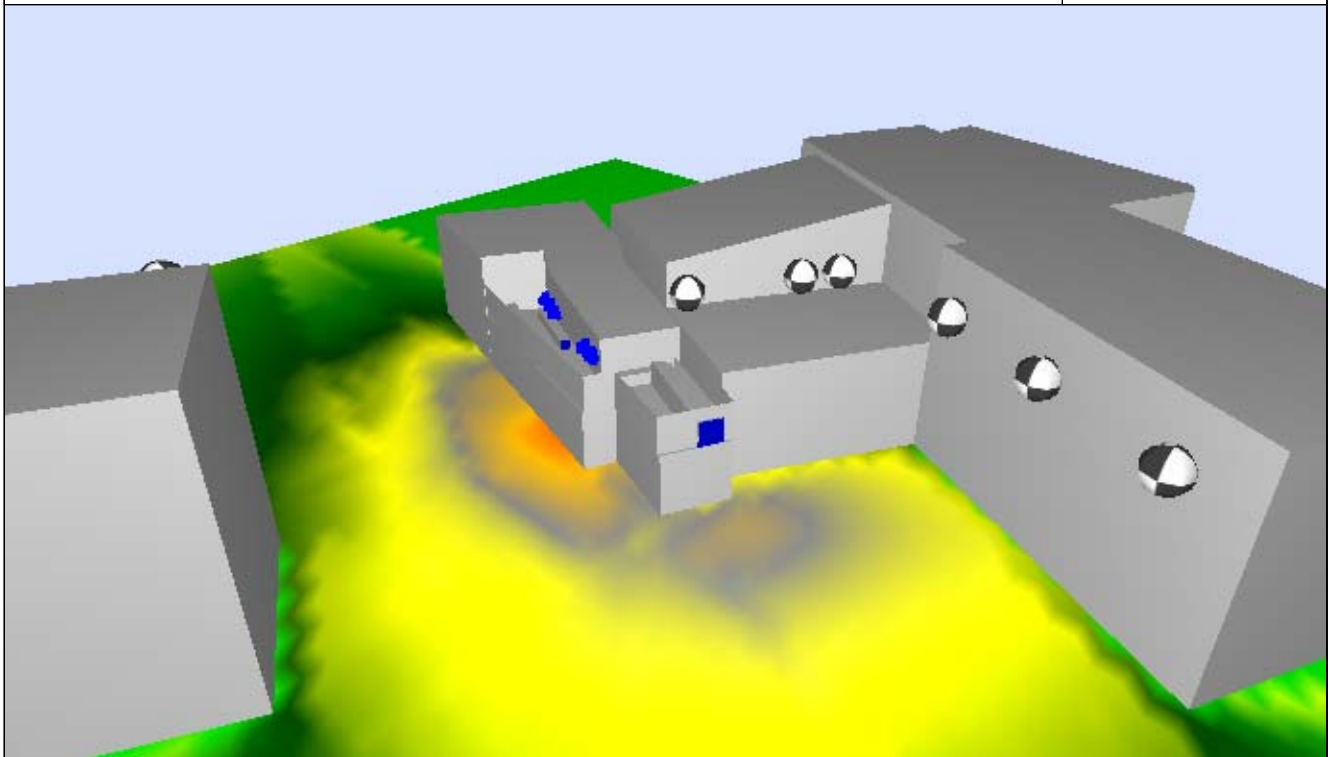
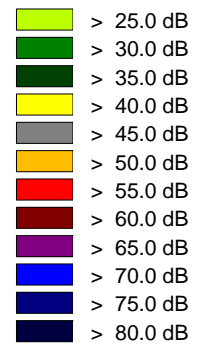
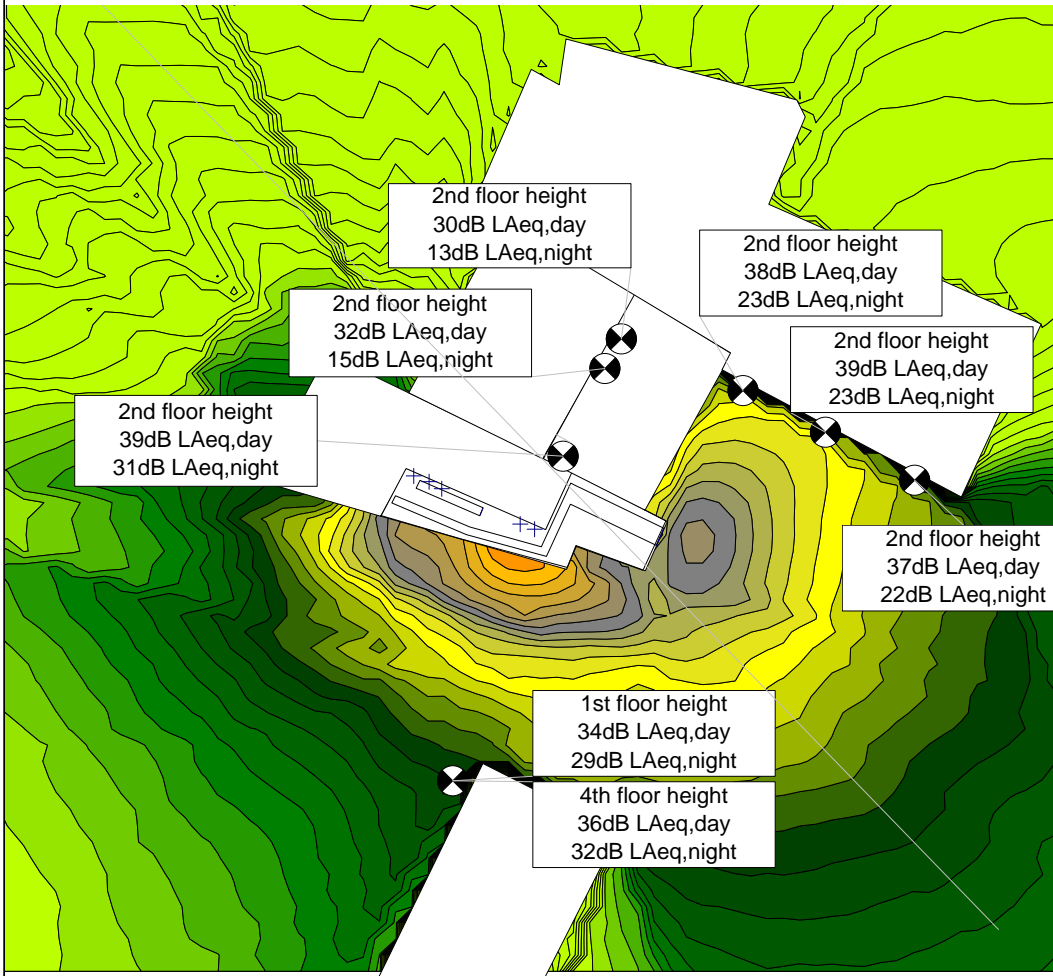
02:13	-0.5 °C	-1.3 °C	1007.3hPa	North	1.6km/h	6.4km/h	94%	0.0mm	BKN	BKN
02:23	-0.4 °C	-1.3 °C	1007.7hPa	SSE	1.6km/h	9.7km/h	94%	0.0mm	BKN	BKN
02:33	-0.4 °C	-1.3 °C	1007.3hPa	NE	3.2km/h	11.3km/h	94%	0.0mm	BKN	BKN
02:43	-0.4 °C	-1.3 °C	1007.3hPa	NE	1.6km/h	12.9km/h	94%	0.0mm	BKN	BKN
02:53	-0.4 °C	-1.3 °C	1007.7hPa	West	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
03:03	-0.5 °C	-1.3 °C	1007.3hPa	North	3.2km/h	8.0km/h	94%	0.0mm	BKN	BKN
03:13	-0.6 °C	-1.4 °C	1007.3hPa	NNE	1.6km/h	9.7km/h	94%	0.0mm	BKN	BKN
03:23	-0.6 °C	-1.4 °C	1007.3hPa	NW	1.6km/h	6.4km/h	94%	0.0mm	BKN	BKN
03:33	-0.6 °C	-1.4 °C	1007.7hPa	WNW	3.2km/h	8.0km/h	94%	0.0mm	BKN	BKN
03:43	-0.6 °C	-1.4 °C	1007.3hPa	NW	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
03:53	-0.7 °C	-1.5 °C	1007.3hPa	WNW	1.6km/h	9.7km/h	94%	0.0mm	BKN	BKN
04:03	-0.6 °C	-1.4 °C	1007.3hPa	West	1.6km/h	6.4km/h	94%	0.0mm	OVC	BKN
04:13	-0.5 °C	-1.3 °C	1007.3hPa	North	1.6km/h	8.0km/h	94%	0.0mm	OVC	BKN
04:23	-0.4 °C	-1.2 °C	1007.7hPa	NNW	1.6km/h	6.4km/h	94%	0.0mm	OVC	BKN
04:33	-0.3 °C	-1.0 °C	1007.7hPa	WNW	3.2km/h	9.7km/h	95%	0.0mm	OVC	BKN
04:43	-0.2 °C	-0.9 °C	1007.7hPa	North	3.2km/h	11.3km/h	95%	0.0mm	OVC	BKN
04:53	-0.1 °C	-0.8 °C	1007.7hPa	NNE	4.8km/h	11.3km/h	95%	0.0mm	OVC	BKN
05:03	0.0 °C	-0.7 °C	1007.7hPa	ESE	3.2km/h	12.9km/h	95%	0.0mm	BKN	BKN
05:13	0.1 °C	-0.7 °C	1008.0hPa	ESE	3.2km/h	11.3km/h	95%	0.0mm	BKN	BKN
05:23	0.2 °C	-0.6 °C	1008.0hPa	NNW	1.6km/h	12.9km/h	95%	0.0mm	BKN	BKN
05:33	0.2 °C	-0.4 °C	1008.0hPa	NNE	1.6km/h	8.0km/h	95%	0.0mm	BKN	BKN
05:43	0.3 °C	-0.4 °C	1008.0hPa	North	1.6km/h	9.7km/h	95%	0.0mm	BKN	BKN
05:53	0.3 °C	-0.4 °C	1008.0hPa	SSE	1.6km/h	9.7km/h	95%	0.0mm	BKN	BKN
06:03	0.3 °C	-0.4 °C	1008.4hPa	NW	1.6km/h	6.4km/h	95%	0.0mm	BKN	BKN
06:13	0.3 °C	-0.4 °C	1008.4hPa	North	1.6km/h	11.3km/h	95%	0.0mm	BKN	BKN
06:23	0.3 °C	-0.3 °C	1008.7hPa	NNW	1.6km/h	9.7km/h	95%	0.0mm	BKN	BKN
06:33	0.4 °C	-0.4 °C	1008.7hPa	NW	3.2km/h	6.4km/h	94%	0.0mm	BKN	BKN
06:43	0.4 °C	-0.5 °C	1008.7hPa	West	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
06:53	0.4 °C	-0.4 °C	1008.7hPa	NNW	1.6km/h	11.3km/h	94%	0.0mm	BKN	BKN
07:03	0.4 °C	-0.4 °C	1009.0hPa	North	1.6km/h	12.9km/h	94%	0.0mm	BKN	BKN
07:13	0.3 °C	-0.6 °C	1009.0hPa	NW	1.6km/h	4.8km/h	94%	0.0mm	BKN	BKN
07:23	0.3 °C	-0.6 °C	1009.4hPa	West	4.8km/h	9.7km/h	94%	0.0mm	BKN	BKN
07:33	0.3 °C	-0.5 °C	1009.4hPa	NW	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
07:43	0.3 °C	-0.5 °C	1009.7hPa	West	3.2km/h	9.7km/h	94%	0.0mm	BKN	BKN
07:53	0.3 °C	-0.5 °C	1009.7hPa	NNW	3.2km/h	9.7km/h	94%	0.0mm	BKN	BKN
08:03	0.3 °C	-0.5 °C	1009.7hPa	NNW	3.2km/h	11.3km/h	94%	0.0mm	BKN	BKN
08:13	0.3 °C	-0.6 °C	1010.0hPa	NNW	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
08:23	0.3 °C	-0.6 °C	1010.0hPa	WNW	1.6km/h	9.7km/h	94%	0.0mm	BKN	BKN
08:33	0.3 °C	-0.5 °C	1010.4hPa	NW	3.2km/h	9.7km/h	94%	0.0mm	BKN	BKN
08:43	0.4 °C	-0.4 °C	1010.4hPa	NW	3.2km/h	12.9km/h	94%	0.0mm	BKN	BKN
08:53	0.4 °C	-0.4 °C	1010.4hPa	NE	4.8km/h	16.1km/h	94%	0.0mm	BKN	BKN
09:03	0.5 °C	-0.3 °C	1010.7hPa	North	1.6km/h	12.9km/h	94%	0.0mm	BKN	BKN
09:13	0.5 °C	-0.3 °C	1010.7hPa	NNW	1.6km/h	9.7km/h	94%	0.0mm	BKN	BKN
09:23	0.6 °C	-0.3 °C	1010.7hPa	NNW	1.6km/h	8.0km/h	94%	0.0mm	BKN	BKN
09:33	0.7 °C	-0.2 °C	1010.7hPa	North	4.8km/h	12.9km/h	94%	0.0mm	BKN	BKN
09:43	0.8 °C	-0.1 °C	1011.1hPa	West	1.6km/h	16.1km/h	94%	0.0mm	BKN	BKN
09:53	0.9 °C	0.1 °C	1011.1hPa	West	3.2km/h	8.0km/h	94%	0.0mm	BKN	BKN
10:03	1.1 °C	0.1 °C	1011.1hPa	NNW	4.8km/h	14.5km/h	93%	0.0mm	BKN	BKN
10:13	1.1 °C	0.1 °C	1011.4hPa	West	3.2km/h	19.3km/h	93%	0.0mm	BKN	BKN

10:23	1.1 °C	0.1 °C	1011.4hPa	ENE	4.8km/h	16.1km/h	93%	0.0mm	BKN	BKN
10:33	1.2 °C	0.2 °C	1011.4hPa	North	4.8km/h	9.7km/h	93%	0.0mm	BKN	BKN
10:43	1.2 °C	0.2 °C	1011.4hPa	ENE	3.2km/h	16.1km/h	93%	0.0mm	BKN	BKN
10:53	1.2 °C	0.2 °C	1011.4hPa	NE	3.2km/h	16.1km/h	93%	0.0mm	BKN	BKN
11:03	1.3 °C	0.3 °C	1011.4hPa	WNW	4.8km/h	9.7km/h	93%	0.0mm	BKN	BKN
11:13	1.4 °C	0.4 °C	1011.4hPa	SE	3.2km/h	11.3km/h	93%	0.0mm	BKN	BKN
11:23	1.4 °C	0.2 °C	1011.4hPa	NNW	3.2km/h	11.3km/h	92%	0.0mm	BKN	BKN
11:33	1.5 °C	0.3 °C	1011.7hPa	WNW	3.2km/h	12.9km/h	92%	0.0mm	BKN	BKN
11:53	1.5 °C	0.3 °C	1011.7hPa	NNW	4.8km/h	16.1km/h	92%	0.0mm	BKN	BKN
12:03	1.6 °C	0.4 °C	1011.7hPa	NW	3.2km/h	12.9km/h	92%	0.0mm	BKN	BKN
12:13	1.7 °C	0.3 °C	1011.7hPa	North	1.6km/h	14.5km/h	91%	0.0mm	BKN	BKN
12:23	1.8 °C	0.4 °C	1012.1hPa	WNW	3.2km/h	9.7km/h	91%	0.0mm	BKN	BKN
12:33	1.9 °C	0.6 °C	1012.1hPa	ESE	3.2km/h	11.3km/h	91%	0.0mm	BKN	BKN
12:43	2.1 °C	0.6 °C	1012.1hPa	North	4.8km/h	11.3km/h	90%	0.0mm	BKN	BKN
12:53	2.2 °C	0.7 °C	1012.4hPa	NE	3.2km/h	14.5km/h	90%	0.0mm	BKN	BKN
13:03	2.3 °C	0.7 °C	1012.4hPa	North	3.2km/h	14.5km/h	89%	0.0mm	SCT	BKN
13:13	2.5 °C	0.7 °C	1012.4hPa	North	4.8km/h	12.9km/h	88%	0.0mm	SCT	BKN
13:23	2.6 °C	0.8 °C	1012.4hPa	Calm		11.3km/h	88%	0.0mm	SCT	BKN
13:33	2.8 °C	0.8 °C	1012.4hPa	NNW	3.2km/h	8.0km/h	87%	0.0mm	SCT	BKN
13:43	2.9 °C	0.8 °C	1012.4hPa	NNE	3.2km/h	14.5km/h	86%	0.0mm	SCT	BKN
13:53	3.1 °C	0.7 °C	1012.8hPa	NNW	3.2km/h	11.3km/h	84%	0.0mm	SCT	BKN
14:03	3.2 °C	0.7 °C	1012.8hPa	WNW	1.6km/h	8.0km/h	84%	0.0mm	CLR	BKN
14:13	3.2 °C	0.6 °C	1012.8hPa	NW	3.2km/h	9.7km/h	83%	0.0mm	CLR	BKN
14:23	3.2 °C	0.4 °C	1012.8hPa	NNW	3.2km/h	9.7km/h	82%	0.0mm	CLR	BKN
14:33	3.2 °C	0.4 °C	1013.1hPa	Calm		9.7km/h	82%	0.0mm	CLR	BKN
14:43	3.2 °C	0.2 °C	1013.1hPa	NNW	1.6km/h	11.3km/h	81%	0.0mm	CLR	BKN
14:53	3.0 °C	0.1 °C	1013.4hPa	NW	1.6km/h	14.5km/h	81%	0.0mm	CLR	BKN
15:03	2.9 °C	-0.1 °C	1013.8hPa	NW	1.6km/h	11.3km/h	81%	0.0mm	CLR	BKN
15:13	2.7 °C	-0.1 °C	1013.8hPa	NW	1.6km/h	11.3km/h	82%	0.0mm	CLR	BKN
15:23	2.6 °C	-0.1 °C	1014.1hPa	NNW	8.0km/h	14.5km/h	83%	0.0mm	CLR	BKN
15:43	2.3 °C	0.1 °C	1014.4hPa	NW	1.6km/h	12.9km/h	85%	0.0mm	CLR	BKN
15:53	2.3 °C	0.1 °C	1014.4hPa	NNW	1.6km/h	9.7km/h	85%	0.0mm	CLR	BKN
16:13	2.3 °C	0.2 °C	1014.8hPa	WNW	1.6km/h	9.7km/h	86%	0.0mm	BKN	BKN
16:23	2.3 °C	0.0 °C	1015.1hPa	North	4.8km/h	12.9km/h	85%	0.0mm	BKN	BKN
16:33	2.3 °C	0.0 °C	1015.5hPa	NNW	3.2km/h	11.3km/h	85%	0.0mm	BKN	BKN
16:43	2.2 °C	-0.1 °C	1015.8hPa	NW	3.2km/h	12.9km/h	85%	0.0mm	BKN	BKN
16:53	2.2 °C	-0.1 °C	1015.8hPa	NW	1.6km/h	11.3km/h	85%	0.0mm	BKN	BKN

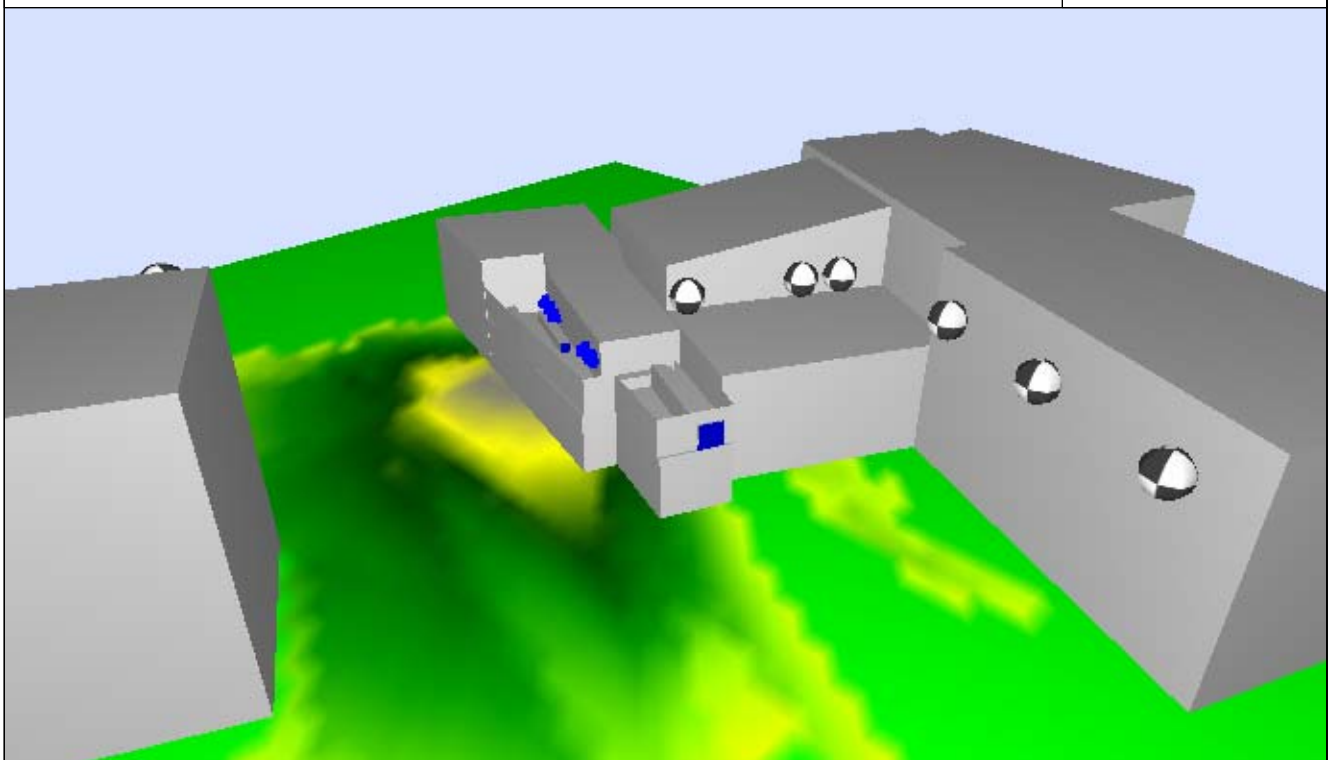
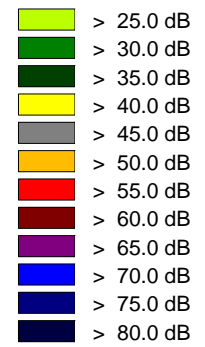
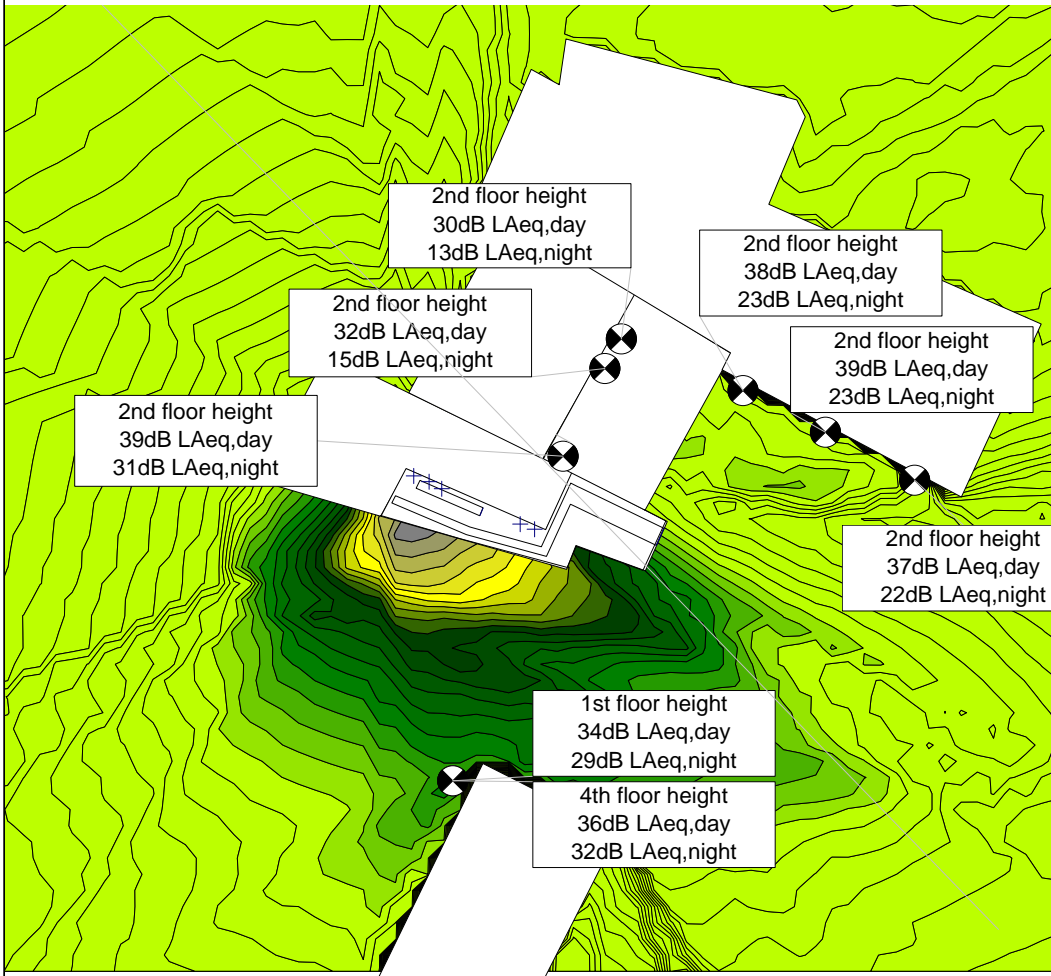


APPENDIX 4

CD03-11243 - Plant noise levels (contours = day-time, 7.5m height)
 80 High Street, Hampton Hill - Edgewest Lambeth Ltd



CD04-11243 - Plant noise levels (contours = night-time, 7.5m height)
 80 High Street, Hampton Hill - Edgewest Lambeth Ltd





APPENDIX 5

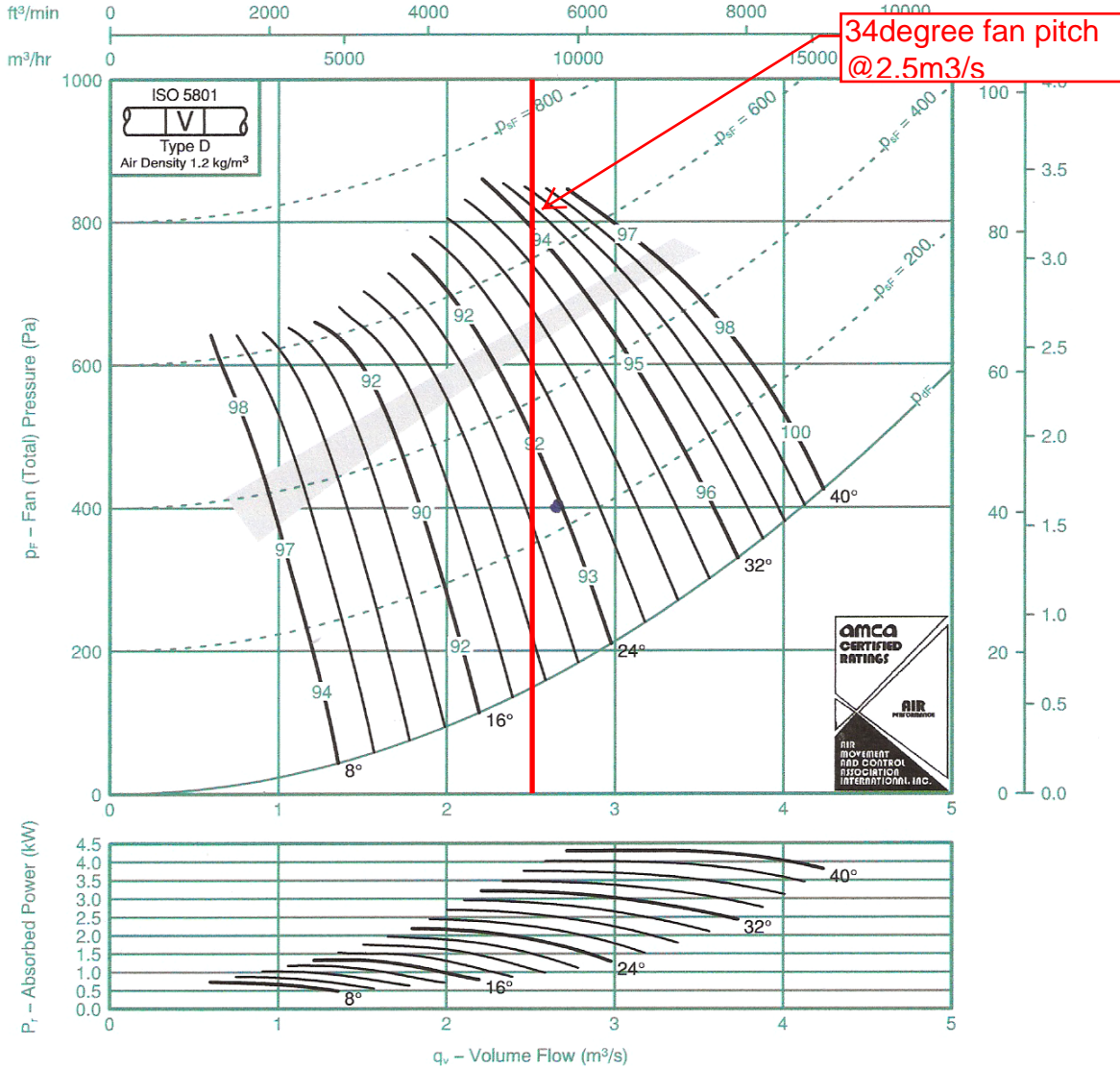


Fan Code: 45JM/20/2/6/...

450 mm 2910 rev/min 6 Blades 50 Hz

Performance Data ISO 5801: The AMCA Certified Ratings Seal applies to air performance only

Performance shown is for installations type D—Ducted inlet, Ducted outlet. Performance ratings do not include the effects of appurtenances.

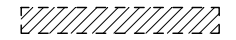


Sound Data BS848 Part 2 1985:

Single figures on performance curves are overall inlet sound power levels, derived from measurements taken in Woods laboratory specifically under ducted conditions. For sound power levels in eight octave bands, apply the following corrections to the overall level. Use upper corrections when operating point is above shaded area, or lower corrections when operating point is below shaded area.

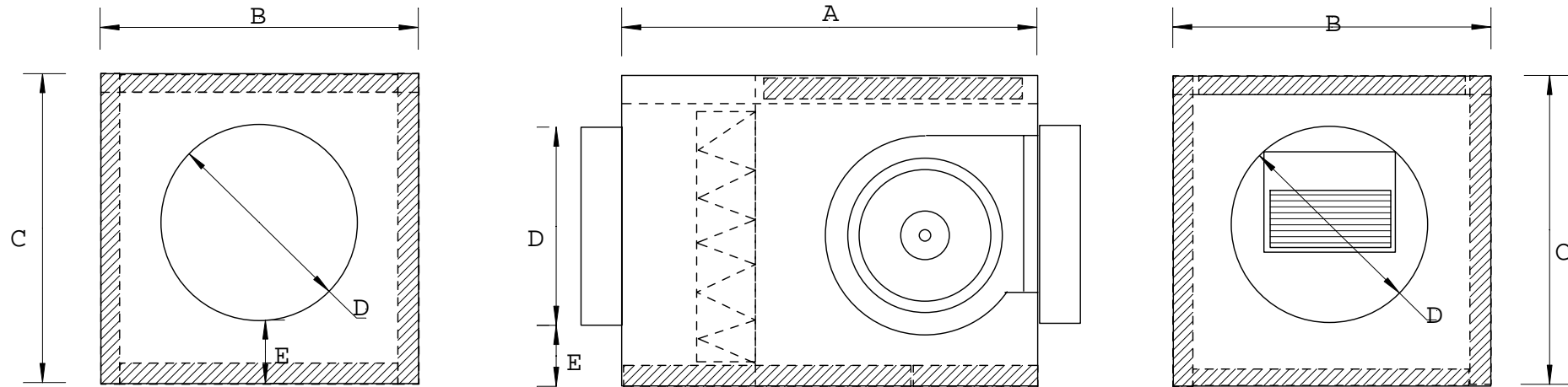
Inlet Levels									Outlet Levels								
Pitch Angle	Octave Band Centre Frequency (Hz)								Pitch Angle	Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k		63	125	250	500	1k	2k	4k	8k
8	-17	-17	-13	-6	-4	-8	-17	-25	8	-14	-16	-1	-5	-4	-7	-16	-23
	-18	-19	-13	-7	-5	-5	-13	-18		-16	-19	-1	-6	-5	-4	-12	-16
16	-1	-14	-7	-5	-8	-9	-14	-18	16	-10	-14	-5	-4	-8	-9	-13	-18
	-13	-15	-8	-6	-7	-8	-12	-15		-1	-15	-6	-5	-7	-8	-12	-14
24-40	-8	-8	-7	-7	-10	-1	-16	-19	24-40	-7	-7	-6	-6	-9	-10	-14	-18
	-8	-9	-6	-7	-10	-10	-15	-18		-6	-9	-4	-6	-9	-10	-14	-17

QCF - DUCT MOUNTED ACOUSTIC FAN/FILTER BOXES



25mm insulation

SERVICEABLE ACCESS
FROM TOP OR BOTTOM



Supply fan

DIMENSIONS IN MM												SOUND POWER LEVELS							
MODEL	A	B	C	D	E	WGT	KW	FLC	SC	RPM	PH	63	125	250	500	1k	2k	4k	8k
QCF 150-4	500	405	250	150	50	17kgs	0.07	0.33	0.825	1320	1	63	64	65	64	63	60	56	49
QCF 150-2	500	405	250	150	50	17kgs	0.26	1.18	2.95	2100	1	68	69	70	69	68	65	61	54
QCF 200	550	420	345	200	90	18kgs	0.125	0.55	1.375	1200	1	66	67	68	67	66	63	57	50
QCF 250	600	500	345	250	65	20kgs	0.2	1.09	2.73	1350	1	63	65	66	65	62	60	56	51
QCF 315-4	625	600	425	315	80	26kgs	0.373	3.2	8	1300	1	60	61	62	61	59	58	53	45
QCF 315-6	625	600	425	315	80	26kgs	0.245	1.8	4.5	950	1	72	74	75	74	71	68	64	59
QCF 355-4	675	600	485	355	85	35kgs	0.373	5	12.5	1380	1	73	74	75	74	72	60	64	60
QCF 355-6	675	600	485	355	85	35kgs	0.245	2.1	5.25	850	1	68	69	70	69	67	63	59	54
QCF 400-4	725	655	555	400	75	44kgs	0.6	6.3	15.75	1300	1	73	74	75	74	72	68	64	59
QCF 400-6	725	655	555	400	75	44kgs	0.245	2.5	6.25	900	1	67	68	69	68	65	62	58	53
QCF 450-4	730	685	585	450	80	46kgs	0.55	6.2	15.5	1350	1	76	78	79	78	75	72	68	63
QCF 450-6	730	685	585	450	80	46kgs	0.37	4	10	900	1	70	72	73	72	69	66	62	57
QCF 500-6/1	800	700	650	500	90	57kgs	0.736	7.4	18.5	925	1	77	81	79	76	75	73	69	64
QCF 500-6/3	800	700	650	500	90	57kgs	1.1	4.3	11.07	925	3	78	82	80	77	76	74	70	65

Super Digital Inverter Heat Pump Systems, Ceiling Units

Digital Inverter features, plus:

- Increased energy efficiency/cost savings
- Slimline design and automatic louvre control
- Enhanced compressor and fan motor design
- Extended pipe runs/greater installation flexibility
- More steps for precise inverter control
- Operating range down to -15°C (cooling)
- EER values up to 4.17 in cooling mode
- All units have energy efficiency label A
- High-performance heating, even at -15°C
- Increased heat exchanger efficiency
- Low sound levels, to 30 dB(A)
- **Ideal for R22 replacement**



Outdoor unit RAV		SP564AT-E	SP804AT-E	SP1104AT-E	SP1404AT-E
Indoor unit (ceiling) RAV		SM562CT-E	SM802CT-E	SM1102CT-E	SM1402CT-E
Remote control		RBC-AMT32E	RBC-AMT32E	RBC-AMT32E	RBC-AMT32E
Cooling capacity range	kW	5.0 (1.2-5.6)	7.0 (1.9-8.0)	10.0 (2.6-12.0)	12.5 (2.6-14.0)
Heating capacity range	kW	5.6 (0.9-7.4)	8.0 (1.3-10.6)	11.2 (2.4-13.0)	14.0 (2.4-16.5)
Power input, cooling/heating	kW	1.56/1.47	2.21/2.16	2.67/2.62	3.73/3.65
EER, cooling/COP, heating	W/W	3.06/3.79	3.05/3.66	3.75/4.27	3.35/3.84
Annual power consumption, cooling	kWh	780	1105	1335	1865
Energy label, cooling/heating		B/A	B/A	A/A	A/A
UK conditions - cooling capacity	kW	5.44	7.76	11.65	13.59
UK conditions - sensible cooling capacity	kW	4.22	5.85	7.73	8.75
UK conditions - heating capacity	kW	5.21	7.08	9.68	12.29

Indoor unit (ceiling) RAV		SM562CT-E	SM802CT-E	SM1102CT-E	SM1402CT-E
Air flow (low/medium/high)	l/s	167/186/217	243/278/308	353/400/458	385/433/500
Air flow (low/medium/high)	m³/h	601/670/781	875/1001/1109	1271/1440/1649	1386/1559/1800
Sound pressure level (low/medium/high)*	dB(A)	30/33/36	33/36/38	35/38/41	37/40/43
Sound power level (low/medium/high)	dB(A)	45/48/51	48/51/53	50/53/56	52/55/58
Dimensions, height x width x depth	mm	210 x 910 x 680	210 x 1180 x 680	210 x 1595 x 680	210 x 1800 x 680
Weight	kg	21	25	33	33

3 off required for air conditioning

Outdoor unit RAV		SP564AT-E	SP804AT-E	SP1104AT-E	SP1404AT-E
Air flow	l/s (m³/h)	667 (2400)	833 (3000)	1683 (6060)	1716 (6180)
Sound pressure level, cooling/heating*	dB(A)	47/48	48/49	49/50	51/52
Sound power level, cooling/heating	dB(A)	64/65	65/66	66/67	68/69
Dimensions, height x width x depth	mm	550 x 780 x 290	890 x 900 x 320	1340 x 900 x 320	1340 x 900 x 320
Weight	kg	44	63	93	93
Operating range, cooling	°C	-15 to 43	-15 to 43	-15 to 43	-15 to 43
Operating range, heating	°C	-20 to 15	-20 to 15	-15 to 15	-15 to 15
Pipe connections, gas - liquid	in	1/2 - 1/4	5/8 - 3/8	5/8 - 3/8	5/8 - 3/8
Pipe length, maximum/minimum	m	50/5	50/5	75/5	75/5
Pipe length, pre-charged	m	20	30	30	30
Additional R410A charge	m	20	40	40	40
Maximum height difference	m	30	30	30	30
Max. operating current, cooling	A	7.24	10.36	11.24	16.21
Suggested fuse size	A	10	10	20	20
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50	220/240-1-50	220/240-1-50
Supply to		Outdoor unit	Outdoor unit	Outdoor unit	Outdoor unit
Interconnecting cables		3 + E	3 + E	3 + E	3 + E

Cat. No.	Silensys Model	Sound Power dBA
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Medium Temperature

259709	H14Z-CAE9460Z	59
259708	H21Z-CAJ9480Z	59
259714	H38Z-CAJ4517Z	65
259715	H38Z-TAJ4517Z	65
259716	H48Z-CAJ4519Z	74
259717	H49Z-TAJ4519Z	74
259720	H54Z-FH4524Z	74
259721	H54Z-TFH4524Z	74
259713	H116Z-TAG4546Z	79
259718	H166Z-TAG4573Z	79

Low Temperature

259706	B09Z-CAJ2440Z	59
259725	B22Z-TFH2480Z	64
259726	B29Z-TFH2511Z	75
259705	B43Z-TAG2516Z	77
259704	B53Z-TAG2522Z	79

Sound Pressure Level at Distance [metres]								
1	2	3	4	5	6	7	8	10

51	45	42	39	37	36	34	33	31
51	45	42	39	37	36	34	33	31
57	51	48	45	43	42	40	39	37
57	51	48	45	43	42	40	39	37
66	60	57	54	52	51	49	48	46
66	60	57	54	52	51	49	48	46
66	60	57	54	52	51	49	48	46
66	60	57	54	52	51	49	48	46
71	65	62	59	57	56	54	53	51
71	65	62	59	57	56	54	53	51

two off required

51	45	42	39	37	36	34	33	31
56	50	47	44	42	41	39	38	36
67	61	58	55	53	52	50	49	47
69	63	60	57	55	54	52	51	49
71	65	62	59	57	56	54	53	51

One off required

Actrol reserves the right to change specifications without notice.

Sound Pressure Level (SPL) and Sound Power Level (SWL)

The Sound Power Level is a measure of how much acoustic power is produced by the equipment. The Sound Pressure Level is the resulting noise level from the operation of the equipment. The Sound Pressure Level depends on the location of the sound source, how many reflecting surfaces are nearby (how reverberant the space is) and the distance between the equipment and the receiver.

The Sound Power Level is an intrinsic property of the equipment where as the Sound Pressure Level depends on the Sound Power Level and the environment. For example, the Sound Power Level maybe thought of as the Watts of a light bulb, while the Sound Pressure Level is similar to the overall brightness - it depends on the environment (e.g. size of room, colour of walls) as well as the power of the light bulb.

Generally, the Sound Pressure Level is lower than the Sound Power Level. In a 'Free Field' with no reflecting surfaces such as walls nearby, the Sound Pressure Level is approximately 8 dBA lower than the Sound Power Level at one metre from the equipment (assuming source is on a hard surface).

Please refer to pages 430 to 438 of the Edition 9 Actrol Catalogue & Technical Manual for more details on how to achieve low noise refrigeration installations.



APPENDIX 6

SCHEDULE OF RECOMMENDED SOUND ATTENUATION

CLIENT Edgewest Lambeth
PROJECT 80 High Street, Hampton Hill
REF SP01 11243 **REV** 0
DATE 17th December 2010

System	Ref	Minimum Dynamic Insertion Loss (dB)							Comments
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Supply fan - atmosphere side		5	8	11	15	16	17	16	Churchill QCF 500-6/3
Extract fan - atmosphere side		6	13	23	30	36	35	30	Woods 45JM/20/2/6 - 96dB SWL - 2.5m ³ /s, 34 degree pitch angle
Extract fan - casing breakout & duct breakout									Noise levels measured at 1m from the fan casing or associated transitions and ductwork should not exceed 50dBA @ 1m. Detailed design is beyond the scope of this report however this is likely to require the fan casing and transitions to be enclosed/jacketed, and ductwork up to the room-side and atmospheric attenuators to be lagged.
Extract fan - room-side									Specification of room-side attenuators is beyond the scope of a planning submission report, however, it is recommended that noise levels should not exceed NR45 inside the kitchen
Condensers									Localised absorptive screening to block off line of sight from any part of the condensers to any residential windows (nominal 3dBA attenuation assumed in model)



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