



AIRTIGHT & NOISECHECK LIMITED

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ACOUSTIC TESTING REPORT FOR

CORDAGE 14 LTD

SITE ADDRESS

PROPOSED MIXED USE SCHEME
EMSWORTH SURGERY
6 NORTH STREET
EMSWORTH
HAMPSHIRE
PO10 7DD

DESKTOP REPORT DATE – 12TH APRIL 2021



Acoustic Engineer:

Date: 12th April 2021

Michael Vine



AIRTIGHT & NOISECHECK BUILDING ACOUSTIC TESTING

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Customer Name:

Test Date: 12th April 2021

Cordage 14 Ltd

Site Address:

Proposed Mixed Use Development
6 North Street
Emsworth
Hampshire
PO10 7DD

Acoustic Engineer:

Mr. Michael Vine

Equipment used:

Due to circumstances beyond our control, a noise impact assessment was not possible and thus this assessment is based on measurements taken from a larger site facing a similar road network in 2011. This was discussed and agreed with Ms. Helen Le-Vallee of the Environmental Protection Team at East Hampshire District Council.

Measurement Procedure:

Due to not being able to undertake any measurements, this assessment is based on historic data from a similar site location close to a busy road, the procedures followed the criteria listed within this report. The data used has been taken from other 3-4 day assessment and data. The data viewed to best analyse this site were taken from:

1. Site adjacent to Worthing Road. Similar distance from the road network. Scheme was for the erection of 540 dwellings & 54 retirement apartments. This noise assessment assisted the successful application of this scheme, under DC/14/0590.

The microphone for the above site was circa 4m from Worthing Road.

The purpose of this report is to establish the acoustic criteria for the proposed dwelling. It will follow the relevant British Standards and associated literature to provide adequate calculations.

This report relates to a planning application for a mixed-use scheme at 6 North Street, Emsworth. The scheme comprises of conversion of the existing building into an office and a purpose-built mixed uses scheme immediately to the South of the office building. The mixed-use scheme will be commercial use at ground floor and 1 x residential dwellings above, on the 1st floor.

The scheme will face the High Street, albeit set back from the roadside and not the A259, but this road network is located circa 30m to the North of the proposed residential element of the scheme.

A line source equation will be applied to the measured values, assuming a source distance of 4m and a receptor distance of 30m, this equates to a -9dB acoustic feature correction. In addition to this a +3dB correction will be added to the values to assume the noise contribution from The High Street, therefore the total reduction taken from the measured levels will be -6dBA.



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Executive Summary:

Airtight & Noisecheck were commissioned by Cordage 14 Ltd to undertake a desktop Noise Impact Assessment to calculate the noise emissions associated with 6 North Street, Emsworth, Hampshire. Noise levels have been taken from a site in a similar location in relation to a similar road network (listed on page 17) in order to try and establish a fair reflection of the anticipated noise levels apparent in the microphone location, and as a result provide adequate mitigation measures to ensure the future residents are protected from external noise emissions apparent on site.

The site in question lies immediately to the West of the High Street and further South of the A259. The residential scheme will be located to the South of the proposed office conversion and as a result of this screened from the A259 road network (see site elevations plan). A planning application has been made to convert the current building (presently being used as a Doctor's surgery) into an office building and erect a purpose-built mixed-use development to the South of the office building. The mixed-use building will comprise of a commercial unit at ground floor level and a residential dwelling at 1st floor.

Based on measured noise levels and calculations for the various noise sources (listed on page 17), the good acoustic design of the habitable rooms & suitable ventilation methods there is no reason to suggest that the future residents will be adversely affected by the noise levels. The noise levels have been measured at similar locations and in close proximity to similar road networks.

The aspects of the acoustic design will be listed later in the report. It is clear that the noise associated with the road traffic noise was the dominant noise source and noise from any other uses will not be audible at the proposed façade. Furthermore, all bedrooms will be screened from the road traffic by the adjacent building and are located away from the road network.

Suitable mitigation measures will be implemented to the scheme in order to protect the residents from the noise break in from the road traffic. It will be necessary to ensure the thermal comfort of the residents is considered during the design & implementation stage. All bedrooms and windows are located to the side/rear of the dwellings and thus will be exposed to lower noise levels so it is anticipated that these windows can be opened throughout the daytime and nighttime period. Due to the potential higher noise levels at the front elevation of the site it may be prudent to ventilate the dwellings with an MVHR (or similar) system with a summer bypass or acoustic trickle vents to ensure a suitable thermal comfort. The windows on the rear facades can be opened to improve the thermal comfort throughout the dwellings, therefore the dwellings could ensure an adequate thermal comfort via these windows, but some measures may still apply to the rooms on the front elevation. To ensure a suitable thermal comfort the residents may accept higher noise levels for some periods of the day and night. There will be some screening from the road for the rooms located to the rear and also offer external shading for the scheme at certain times of the day. It is not considered that overheating will be an issue for this development.

It is clear that the noise sensitive rooms are situated with facades facing both the front and side elevations so the windows located to the side/rear can be opened to ensure the rooms can be naturally ventilated by opening windows.

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1 Objective/Client Brief:

1.1 To calculate the existing external noise levels associated with the site address and offer suitable mitigation measures in the absence of any actual data for the site. Noise data from another site has been referenced and used, this site details can be seen on Page 17 of this report. The site currently comprises of a doctor's surgery. A planning application has been made to convert the doctor's surgery into an office building and erect a purpose-built mixed-use building next to the offices.

Measurements have been taken at another, similar site location and the levels deemed most appropriate were used. It is important not to use data that is too low or too high and as such all data has been referenced against live data taken at a site that was approved using data from a similar road network. The L_{Amax} values from this site have been used, along with the $L_{Aeq\ 16\&8hour}$ values.

2 Assessment Criteria/Conceptual Model:

2.1 The NPPF came into effect in March 2012 and was updated in February 2019. It replaced other documents such as PPG24. The NPPF provides a number of objectives and aims that are directed towards avoiding significant adverse impacts and reducing others on quality of life and health. This document states that:

The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

The NPSE (Noise Policy Statement for England) states the following aims with respect to noise policy:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of the Government policy on sustainable development:

*avoid significant adverse impacts on health and quality of life.
mitigate and minimise adverse impacts on health and quality of life; and
where possible, contribute to the improvement of health and quality of life.*

BS8233: 2014 'Guidance of Sound Insulation and Noise Reduction for Buildings' defines a range of ambient noise levels for design purposes, in order that appropriate conditions are achieved in certain internal environments. These internal requirements are listed in the table below.

BS8233: Table 5 – Indoor Ambient noise levels in spaces when they are unoccupied.

Activity	Location	0700-2300	2300-0700
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Nighttime noise events can have a significant impact on sleep disturbance. There is no specific guidance presented in BS8233 regarding a noise limit to maximum nighttime noise ($L_{Amax, F}$). As part of this assessment the number of nighttime noise events will be considered in a qualitative manner with an internal $L_{Amax, F}$ of 45dB used as an initial screening tool to identify night-time noise events that may be of significance to sleeping conditions in bedrooms.

The noise sources apparent at the site is the activity associated with the road traffic using the A259 to the North & the High Street to the East.

Pro PG: Planning & Noise 2017 (Professional Practice Guidance on Planning & Noise) issued by ANC/IOA/CIEH has also been referenced. This document came into effect in May 2017. This document is a guidance document and not a Code of Practice or British Standard.



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This document states that there is a staged approach to such schemes, with the first phase being a risk assessment undertaken at the site, followed by a detailed assessment taking into account the recommended internal values by measuring the external noise levels.

NOEL – No Observed Effect Level This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observed Adverse Effect Level This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level This is the level above which significant adverse effects on health and quality of life occur.

The above figures are based on frequency of events, time of events, duration & exposure to the noise events. It is the effect these noise events have rather than the actual level that will indicate the adverse effect level.

3 Liaison with the Local Authority:

3.1 An email exchange has been had with Ms. Helen Le-Vallee of the Environmental Protection Team and she agrees that due to the unprecedented times, a desktop survey using similar data would be appropriate, other site descriptions can be seen on page 17 of this report. It is recommended that the acoustic criteria as listed in Table 5 of BS8233: 2014 is achieved for the development, with adequate ventilation for the properties. In addition, the internal L_{Amax} values would achieve the criteria set out in the WHO guidelines (identical to those listed in the Pro PG document).

3.2 The purpose of this report is to support a planning application for residential development. The site is currently used as a Doctor's Surgery over 3 floors.

4 Current & Future Acoustic Environment:

4.1 The building has been used as a Doctors surgery for a number of years. The immediate area is mixed-use with a large number of commercial and residential buildings in close proximity. Emsworth is a small but busy village setting. The site lies to the north of the centre and the acoustic criteria has remained steady for a number of years, with road traffic the dominant noise source in operation.

5 Site History:

5.1 The site is situated to the West of the High Street and South of the A259. As stated above, the site is located very close to the centre of Emsworth, which is a relatively busy setting with a constant flow of traffic during the daytime period and reduced flow during the evening & nighttime. The A259 is the main through road that runs from East to West and this is a busy road for long periods of the daytime and nighttime periods. There is a roundabout located to the North of the site to the traffic flow will be reduced accordingly to navigate the roundabout.

5.2 The proposed scheme appears a fair application for the size of the site. The office building will use the same footprint as the current building, with the mixed-use scheme built to reflect the local area, this building will be built over 2 floors.

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6 Acoustic Design Statement:

6.1 The proposed site is situated in close proximity to the local road network, whilst this can be a busy road network there will be some habitable rooms located on the elevation away from the road and thus be screened from the main road noise further. This report recommends mitigation measures to ensure that the impact of the external noise associated with nearby noise sources is minimised for the proposed residential dwellings. These steps include:

1. Orientation of dwellings – bedrooms located away from the road & screened from A259 by office building.
2. Shading offered by building during periods of the day – reducing overheating.
3. Windows located to the side/rear of the development allowing natural ventilation during the daytime & night time.
4. Natural ventilation offered by the opening of windows to habitable rooms – reducing overheating.
5. Acoustic trickle vents fitted to windows located on elevation facing the High Street – to ensure ventilation during periods when windows are not opened.
6. Thermal mass applied to the structure to reduce overheating.

6.2 The above measures are a clear indication of the steps taken by the client to reduce the potential impact of the noise sources in operation in the vicinity of the site. The thermal comfort of the properties can be controlled by the opening of the windows on other aspects of the dwellings, but this should be done in accordance with other measures to the habitable rooms located on the facade facing the road.

6.3 The initial site noise risk assessment (ProPG) has indicated that the daytime levels fall into the low to medium category and the night time noise levels fall into the low to medium risk category which indicates a good acoustic design process should ensure that the internal criteria can successfully be achieved. Other aspects of the development (rear/side facades) will be exposed to lower levels due to distance and screening. Pro PG states the following for sites that fall into the low category *‘At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development’.*

6.4 If the mitigation measures are implemented, then there is no reason to suggest that the future occupants of the scheme cannot be adequately protected from the external noise emissions. The mitigation measures apparent for this site are listed in the points above and later in the report, it is expected that providing these measures are implemented then the risk of an adverse noise impact will be avoided.

6.5 Based on the measured levels at a site situated near a similar road network (listed on Page 17), combined with the mitigation measures, screening and shading offered by the dwellings the site should be acceptable to a residential development providing the measures to be implemented to the dwelling are sufficient in reducing the noise impact from the road traffic noise. All windows will be openable at the owner’s discretion, however windows on the side/rear facade of the dwelling will be able to be opened in order to ensure good thermal comfort.

6.6 The acoustic trickle vents will not be required to offer whole house ventilation as other windows will also aide the thermal comfort of the dwellings, however a whole house system may be easier to implement. To avoid overheating & based on the calculations and further reductions offered by orientation and screening it is expected that the future residents can enjoy a reasonable standard of living with open windows as the dwelling is located further from the High Street and screened from the A259. The residents of the dwelling may accept slightly higher internal noise levels for some durations during the daytime period in order to achieve natural ventilation and suitable thermal comfort. The acoustic trickle vents can be implemented during periods when the windows are closed. The L_{Amax} values have also been considered and the glazing and other measures will also ensure these sound reduction requirements are achieved, it is not anticipated that the L_{Amax} values will have an adverse impact as the noise is associated with vehicular traffic rather than instantaneous noises.

6.7 A detailed list of the proposed building specifications and mitigation measures are listed later in the report.

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7 Calibration:

7.1 The measurement microphones for the other assessment were calibrated before and after testing and there were no drifts recorded during the assessments.

8 Site Layout:

8.1 The A259 is a busy through road that runs from East to West past Emsworth. The road is located to the North of Emsworth centre. The High Street meets the A259 at the roundabout. Emsworth is a relatively busy local area with a high number of mixed-use buildings including commercial, hospitality & residential buildings.

8.2 The proposed site is located immediately to the West of the High Street & to the South of the A259. The office building will occupy the current building footprint with the mixed-use section being built immediately to the South of this building.

8.3 The noise sources apparent are the vehicles using the local road network. There are no other commercial noise sources, air conditioning units or plant in operation as part of the planning application.

8.4 Another site has been used for the noise sources that will be in operation, suitable calculations have been performed for vehicle movements and public house garden. Suitable mitigation listed has been offered for similar sites. A brief description of this site can be seen on page 17.

9 Weather Conditions:

9.1 This assessment has used data from a previous assessment in a similar location and whilst the weather conditions were unknown it is likely that the weather was suitable for such an assessment to take place.

10 External Results:

10.1 After analysing the similar site, the levels below are deemed appropriate to ensure suitable mitigation measures are implemented so that the requirements of BS8233 & WHO can be met. The night time L_{Amax} values have also been derived so that they can be mitigated against.

L_{Aeq} 16hour & 8hour Values – Proposed Facade:

Mic Location	L_{Aeq} 16hour Value	Reduction needed for BS8233 compliance	L_{Aeq} 8hour Value	Reduction for BS8233 compliance	L_{Amax} value – night time	Reduction for WHO compliance
ML 1	58dBA	23dB	51dBA	21dB	73dBA	28dB

Please Note – The above values include the -6dBA acoustic feature correction due to the extra distance the proposed site will be from the A259, and the addition for the close proximity of The High Street.

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11 Results Conclusion:

11.1 The levels of reduction apparent for the site is listed in the table above.

11.2 The WHO guidelines for community noise - 2000 state that the internal L_{Amax} level (night time) should not exceed 45dB(A). If it exceeds this level on a regular basis then sleep disturbance may be caused. This is the internal level that should be achieved. The Pro PG document states that the internal level of 45dB should not be exceeded more than 10 times a night, therefore the necessary levels have been calculated on this basis and not just measuring the highest level apparent throughout the night time period. Thus, the sound reduction apparent for the site is 30dBA as measured during the night time period.

11.3 Based on the measured noise levels taken from the similar site (listed on page 17), the proposed mitigation measures, the location of the development and the type of noise apparent it is anticipated that the noise will fall between The NOEL value (No adverse effect level) and the LOAEL (Lowest observed adverse effect level) and as such the noise should not have a detrimental effect on the future residents providing adequate measures are implemented to the building fabric & elements. For noise sources at the LOAEL, it is anticipated that the noise will be noticeable but not be intrusive if suitable mitigation measures are implemented to the development.

11.4 Noise above the LOAEL are noticeable and intrusive. It is accepted that the noise associated with the local road network will be noticeable but due to the measured levels and type of noise (vehicular traffic) it is anticipated that the noise will not be intrusive to such an extent whereby it will change behavior. It is accepted however that suitable measures are required to the development to mitigate the noise emissions.

11.5 Table 3.3 on page 23 of the AVO guide states that internal noise below 50dBA L_{Aeq} 16hour, 42dBA L_{Aeq} 8hour & 65dBA L_{Amax} should not lead to an adverse change in behavior for certain periods of time. The calculated internal levels of the proposed site are shown below (in reality the levels will be lower due to a reduction in road traffic noise at the proposed site compared to the site data used and the fact that the bedrooms are located further way and partially screened) and it is anticipated that the residents will be able to naturally ventilate their homes for periods of the day time and night time period without having an adverse impact on their health. A balance between internal noise levels and overheating must be struck to ensure a suitable living environment.

Room & period	External Value	Reduction offered by screening	Reduction offered by open window	Calculated Internal Value
Lounge - Day	58dBA	-0dB	-13dB	45dBA
Bedroom One – Night	51dBA	-5dB	-13dB	33dBA
Bedroom Two - Night	51dBA	-10dB	-13dB	28dBA

11.6 The -5dB correction has been applied to the bedroom One values due to the bedroom being located further away from The High Street on the side elevation, not facing this road (facing North) and screened from the A259 by the office building. Bedroom Two will be located to the rear of the building and thus screened even further hence the -10dB correction for this location. It is anticipated that the screening may offer a higher level of sound reduction. The lounges will face the High Street, but it is anticipated that the noise associated with the proposed site will be lower than those associated with the site used for this assessment during the night time period in particular, therefore it is anticipated that the future residents will be exposed to lower levels than those shown above.

11.7 The levels shown in the table above indicate that a reasonable standard of living can be achieved with open windows. The residents can open and close their windows at their own discretion to achieve a suitable trade between overheating and noise ingress. The acoustic trickle vents can be implemented to the windows facing the High Street to ensure suitable ventilation at other times of the day when the windows are closed and for rooms located on the front façade.



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12 Results Summary:

12.1 The results indicate that providing the necessary mitigation measures can be applied to the building fabric then the future residents should not be adversely affected.

12.2 The mitigation measures listed within this report are robust and comprehensive. If they are implemented throughout the future residents should be able to enjoy a reasonable standard of living. Upon implementation of the comprehensive mitigation measures, the internal criteria of BS8233: 2014 should be met within the noise sensitive rooms at the proposed development.

12.3 The conclusions of this report are based on data taken from similar sites and referenced against data taken circa 1 mile from the proposed site (page 17). Based on these values and the acoustic feature corrections applied to the values it is considered that the proposed measures are fair for such a development.

12.4 Planning Pro PG states that a good acoustic design process is a vital part of new developments. The client has taken steps to ensure that the future occupants are protected from the dominant noise source, these steps include:

1. Orientation of dwellings – bedrooms located away from the road & screened from A259 by office building.
2. Shading offered by building during periods of the day – reducing overheating.
3. Windows located to the side/rear of the development allowing natural ventilation during the daytime & nighttime.
4. Natural ventilation offered by the opening of windows to habitable rooms – reducing overheating.
5. Acoustic trickle vents fitted to windows located on elevation facing the High Street – to ensure ventilation during periods when windows are not opened.
6. Thermal mass applied to the structure to reduce overheating.

12.5 The above-named document also states that the internal L_{Amax} value of 45dB should not be exceeded more than 10 times per night. Therefore, the highest L_{Amax} value has not been used but rather the necessary value that does not get exceeded by more than 10 times. If this criterion is met, then sleep disturbance should not be caused.

12.6 Careful implementation of this scheme and control of the site should ensure that the future residents of the proposed scheme will be adequately protected from the external noise sources in operation at the front and rear of the site.

12.7 Good acoustic design is a clear part of this assessment, the design aspect will be implemented to the entire site but in particular to the front façade. It is recommended that alternative measures are imposed to this façade to ensure thermal comfort. The measures to the facades can include acoustic trickle vents and also the windows could be opened for periods of the day whilst maintaining a reasonable standard of living and internal noise levels.

12.8 It is clear that the future residents may wish to open their windows at their own discretion, this may of course increase the internal noise levels. However, there is no reason to suggest that these higher levels will have an adverse impact on the residents. They may only open the windows during very hot times or for a small period of time, therefore the intrusion will be minimal. The installation of the acoustic trickle vents will ensure that during the noise sensitive periods, the residents can ensure a good thermal comfort without having to open the windows facing the noisier facades. Natural ventilation via opening of windows can be implemented throughout the daytime and night time period at the discretion of the residents.



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13 Building Specifications:

13.1 Some possible building specifications are listed below, including, façade, glazing, roof & ventilation. The final ventilation & thermal comfort specification is unknown so various options have been included.

13.2 There is a variety of ways to ventilate the dwellings and ensure thermal comfort without having to open the windows on the Eastern facade. One way would be to install acoustic trickle vents to the windows serving rooms facing the High Street. These will allow natural ventilation when the windows are closed and also be used in conjunction with natural ventilation offered by opening windows located on other facades to aide thermal comfort.

Location	Product	Sound Reduction - open	Sound reduction - closed
	RW Simon Acoustic EHA trickle vent	36dB	38dB

13.3 Façade Detail – The proposed façade is believed to be something similar to: - cavity brick wall construction. This system should achieve a sound reduction of between 50-52dB DnT, w + Ctr 'Code of Practice BS8233: 2014, Page 60 – Table E.1B – Airborne sound insulation of walls and partitions'.

13.4 Roof Detail – The proposed roof detail is believed to be similar to: Tiles on felt, pitched roof with 100mm mineral wool on plasterboard ceiling. This system should achieve a sound reduction of 43dB Rw 'BS8233: 2014, page 41 - Table 8 - The sound insulation of roofs.

13.5 Windows – New windows will be installed throughout the development. Based on the measured noise levels, the level of sound reduction required for the development is 28dBA.

Possible Units	Thickness	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Overall reduction (D _{nT,w} + C _{tr})
SG Solaglass 6-24-10	40mm	23	31	38	40	37	46	39-4dB
SG Solaglass 10-9-6.4	25.4mm	30	27	34	41	47	53	39-4dB

13.6 The above products have been included as examples of possible specifications that could be installed. There are a wide range of products that would be suitable.



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14 Conclusion:

14.1 The noise levels have been measured at another similar site in relation to similar levels of road traffic, and the noise levels that have been included indicate a fair reflection of the noise sources apparent to be the vehicular traffic using the local road network. The measurement procedure was deemed a fair representation of the current acoustic criteria apparent at the proposed residential scheme. A brief description of this site has been included within this report and this information can be seen on Page 17 of this report.

14.2 The noise levels included indicate that providing the necessary mitigation measures are implemented, with the sound reduction values as listed in the results tables in this report the future residents should not be affected by adverse external noise levels.

14.3 The necessary reductions that are required for the measurement locations are listed within this report, these are the minimum sound reduction levels that will be required for the windows facing the relevant roads, these are the necessary reductions that must be adopted by the developer to ensure the residents are not affected by the external noise levels.

14.4 There are existing residential dwellings in close proximity to the road, indicating that other residents are exposed to similar levels of external noise emissions.

14.5 The client and developer need to consider the options for the site and in particular ensuring a good balance between thermal comfort & internal noise levels for these facades. It is anticipated that the residents may wish to open these windows, and it is anticipated that by doing so they will not increase the adverse impact of the proposed residents.

14.6 The windows on the side/rear facade should be able to be open for longer periods of time due to the reduced noise levels, these windows serve the only bedrooms apparent within the dwelling, so this offers a suitable option for ventilation and thermal comfort. Some suitable solutions have been listed within this report. It is essential that a fair, yet robust acoustic design process is followed and it is clear that there are other residential dwellings in similar location to the proposed so it is possible that the future residents will be able to open their windows at their own discretion and at whichever time they choose, getting the balance right between the increased levels with windows open and a satisfactory thermal comfort is essential for this scheme.

14.7 Based on the calculations included in the report and the screening offered by the building it is anticipated that the noise levels within the amenity space located to the rear of the proposed dwelling will meet the recommended levels as listed with BS8233: 2014.



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APPENDIX

Continuous equivalent noise level, LAeq — The steady noise level (usually in dBA) which, over the period of time under consideration, contains the same amount of sound energy as the time varying noise.

LAm_{ax} - The maximum value that the A-weighted sound pressure level reaches during a measurement period.

dB (A) — The A-weighted sound pressure level.

Decibel (dB) — A unit used for many acoustic qualities to indicate the level of sound with respect to a reference level.

A-weighting — A frequency weighting that relates to the response of the human ear.

Background noise level — Prevailing noise level in a specified environment measured in the absence of the noise being studied.

Habitable Room — A room used for sleeping or recreation/relaxation.

D_{ne, w} Weighted element normalised level difference — A single-number quantity which characterises the airborne sound insulation of a small building elements.

EPU — Environmental Protection Unit

R_w Weighted sound reduction index — A single-number quantity which characterises the airborne sound insulation of a material or building element measured in the laboratory.

LA₁₀ — The A-weighted noise level exceeded for 10% of the measurement duration.

LA₉₀ - The A-weighted noise level exceeded for 90% of the measurement duration.

British Standards & associated documents:

Code of Practice: BS8233: 2014 - Sound Insulation and noise reduction for buildings.

World Health Organization (WHO) - Guidelines for Community Noise.

Pro PG: Planning & Noise – Professional Practice Guidance on Planning & Noise – May 2017

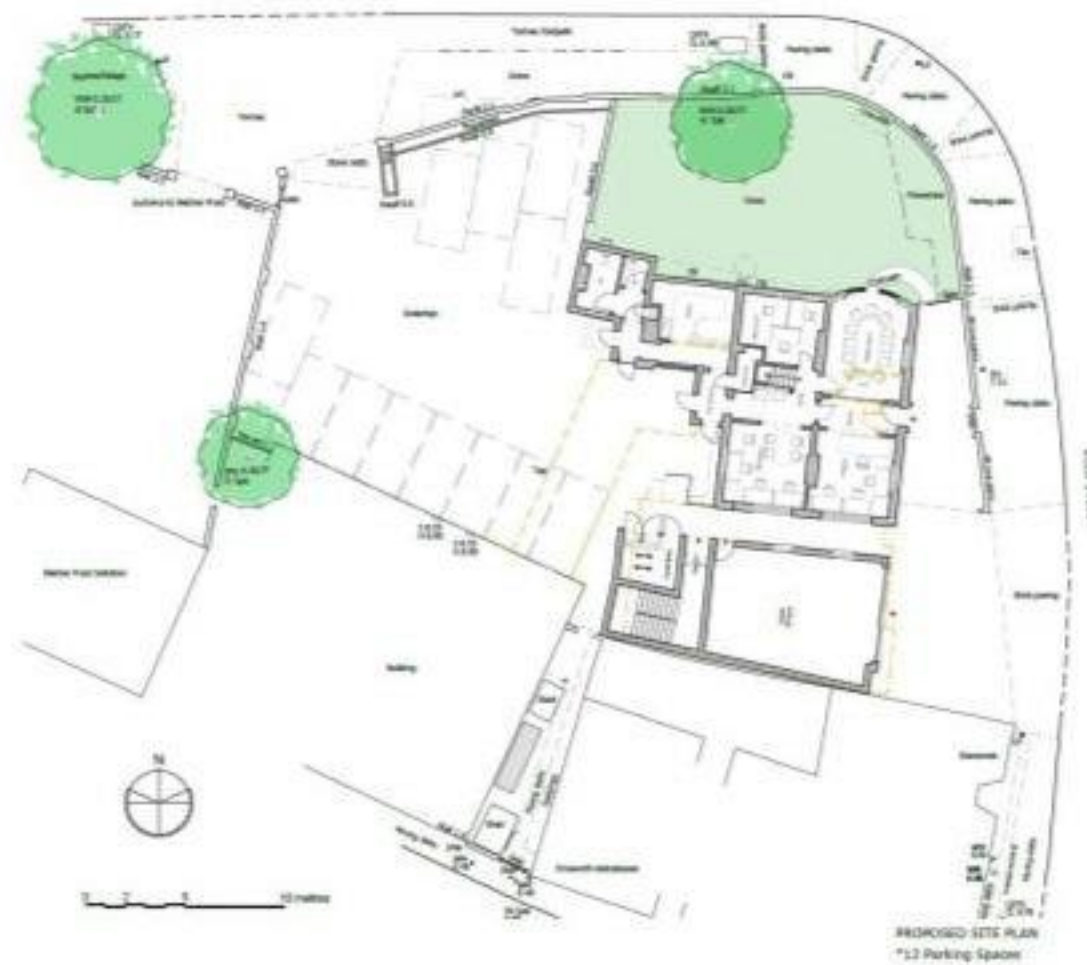
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15 Google Earth:



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16 Site Plan:



NOTES:
1. The site is located within the City of Edmonton, Alberta, and is subject to the City's zoning bylaws and other applicable regulations.
2. The site is currently zoned C-1 (Community Center) and is subject to the City's zoning bylaws and other applicable regulations.
3. The site is currently vacant and is not subject to any existing easements or other interests.
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10. The site is currently vacant and is not subject to any existing easements or other interests.

Client:
Corbridge 14 Ltd.

Project:
Edmonton Surgery,
6 North St,
Edmonton, AB

Date:
25.02.2021

Scale:
1:1000

Drawn by:
AC

Reviewed by:
Proposed Site Plan

Project No:
25.02

10.00

B



NOTES:
1. The site is located within the City of Edmonton, Alberta, and is subject to the City's zoning bylaws and other applicable regulations.
2. The site is currently zoned C-1 (Community Center) and is subject to the City's zoning bylaws and other applicable regulations.
3. The site is currently vacant and is not subject to any existing easements or other interests.
4. The site is currently vacant and is not subject to any existing easements or other interests.
5. The site is currently vacant and is not subject to any existing easements or other interests.
6. The site is currently vacant and is not subject to any existing easements or other interests.
7. The site is currently vacant and is not subject to any existing easements or other interests.
8. The site is currently vacant and is not subject to any existing easements or other interests.
9. The site is currently vacant and is not subject to any existing easements or other interests.
10. The site is currently vacant and is not subject to any existing easements or other interests.

Client:
Corbridge 14 Ltd.

Project:
Edmonton Surgery,
6 North St,
Edmonton, AB

Date:
25.02.2021

Scale:
1:1000

Drawn by:
AC

Reviewed by:
Proposed Floor Plans

Project No:
25.02

10.01

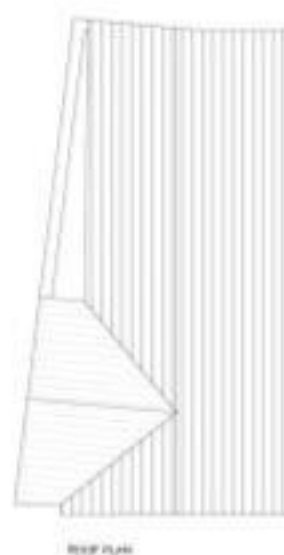
A



GROUND FLOOR PLAN



1st FLOOR PLAN



ROOF PLAN



[illegible]

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AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

The tables below show the assessments used for reference within this report. It shows the duration, scheme & a site plan of one of the assessments.

Site	Proposal	Duration	LAeq 16hour	LAeq 8hour	LAmx 8hour	Comments
Land West of Worthing Road	Residential development in close proximity to Worthing Road	3-4 Days	64dBA 64dBA 64dBA	58dBA 58dBA 56dBA	79dBA 79dBA 78dBA	Similar to proposed and similar distance to road.

Please note that only the LAmx 1hour values were recorded so the average has been taken rather than the highest 1hour value. In addition to this, other LAmx values for a public house have also been used.



AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

Noise Mapping:

Due to there not being any site-specific data, noise mapping has also been used to try and determine the levels at the façade. This mapping has assumed a PWL of 86.8dB for the road traffic using the A259 and a PWL of 70dB for the traffic using the High Street.

The results table based on these source values are shown below. The calculated levels are slightly less than those shown in this report, but these may actually be more accurate due to the lighter road traffic apparent at the site compared to the site-specific data used for this assessment.

The following tables show the calculated internal levels of the proposed dwellings at each of the façades to try and demonstrate that the residents should be able to naturally ventilate the dwellings by opening windows as they desire.

These tables assume a sound reduction of -13dB for an open window.

Receiver Name	Noise Levels	
	Day dB(A)	Night dB(A)
Rear facade	47.8	41.8
Receptor 2 - BR	41.5	35.5
Receptor 4 - facade	51.1	45.1
Source Noise Data - 4m from road	64.0	58.0

The table above shows the measured values at the 4 x receptor points for the site.

Receptor 4 – At the proposed residential façade – 4m from ground floor level – facing High Street.

Rear Façade – The rear of the building at a height of 4m – Bedroom Two

Receptor 2 – Bedroom One at a height of 8m

Day Time:

Location	Day Time Level	Sound reduction of an open window	Calculated Internal Value
Rear Façade	47.8	-13	34.8
Receptor 2 – side Bedroom	41.5	-13	28.5
Receptor 4 - Lounge	51.1	-13	38.1

Nighttime:

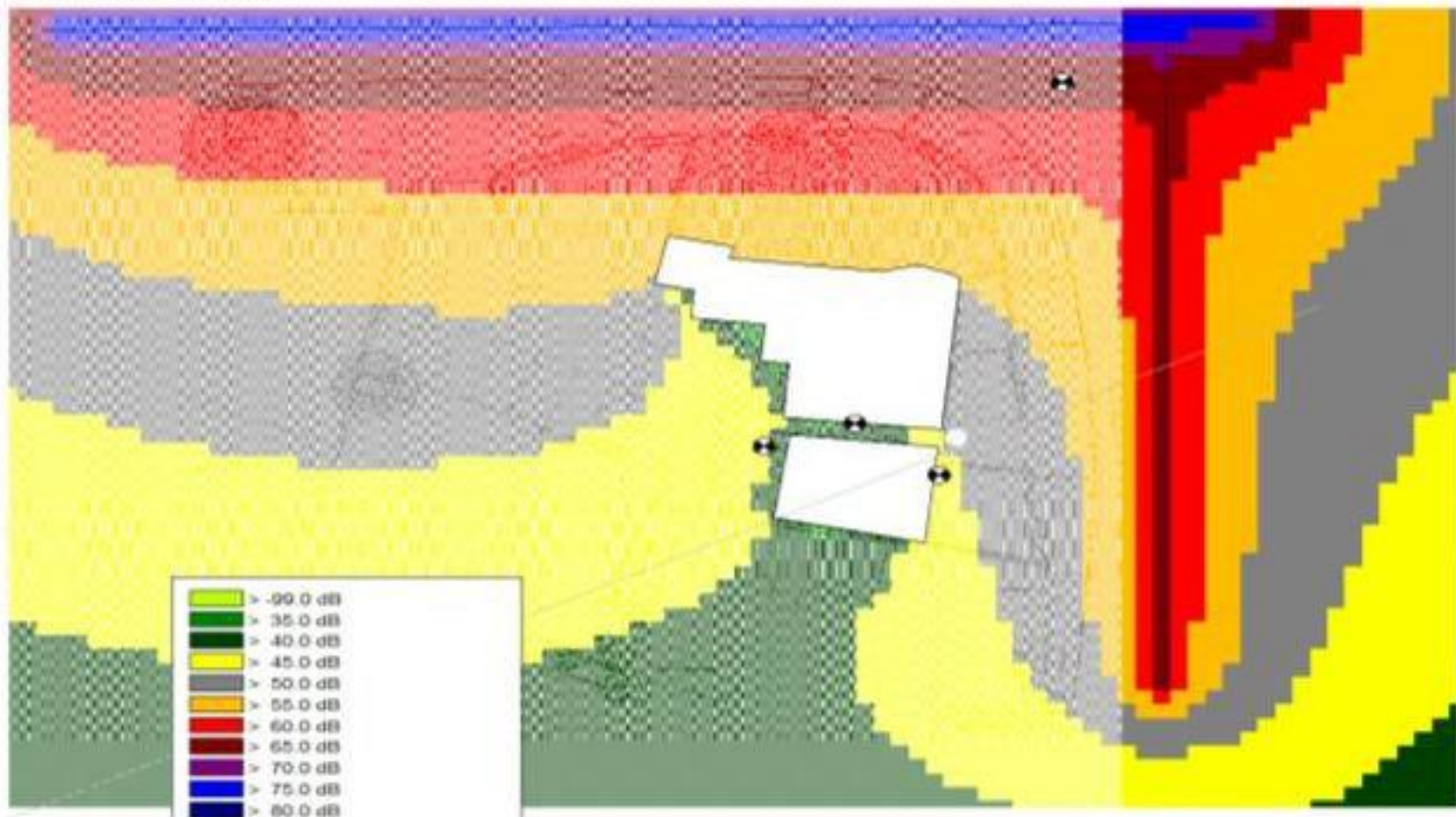
Location	Day Time Level	Sound reduction of an open window	Calculated Internal Value
Rear Façade	41.8	-13	28.8
Receptor 2 – Side Bedroom	35.5	-13	22.5
Receptor 4 – Lounge	45.1	-13	32.1

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

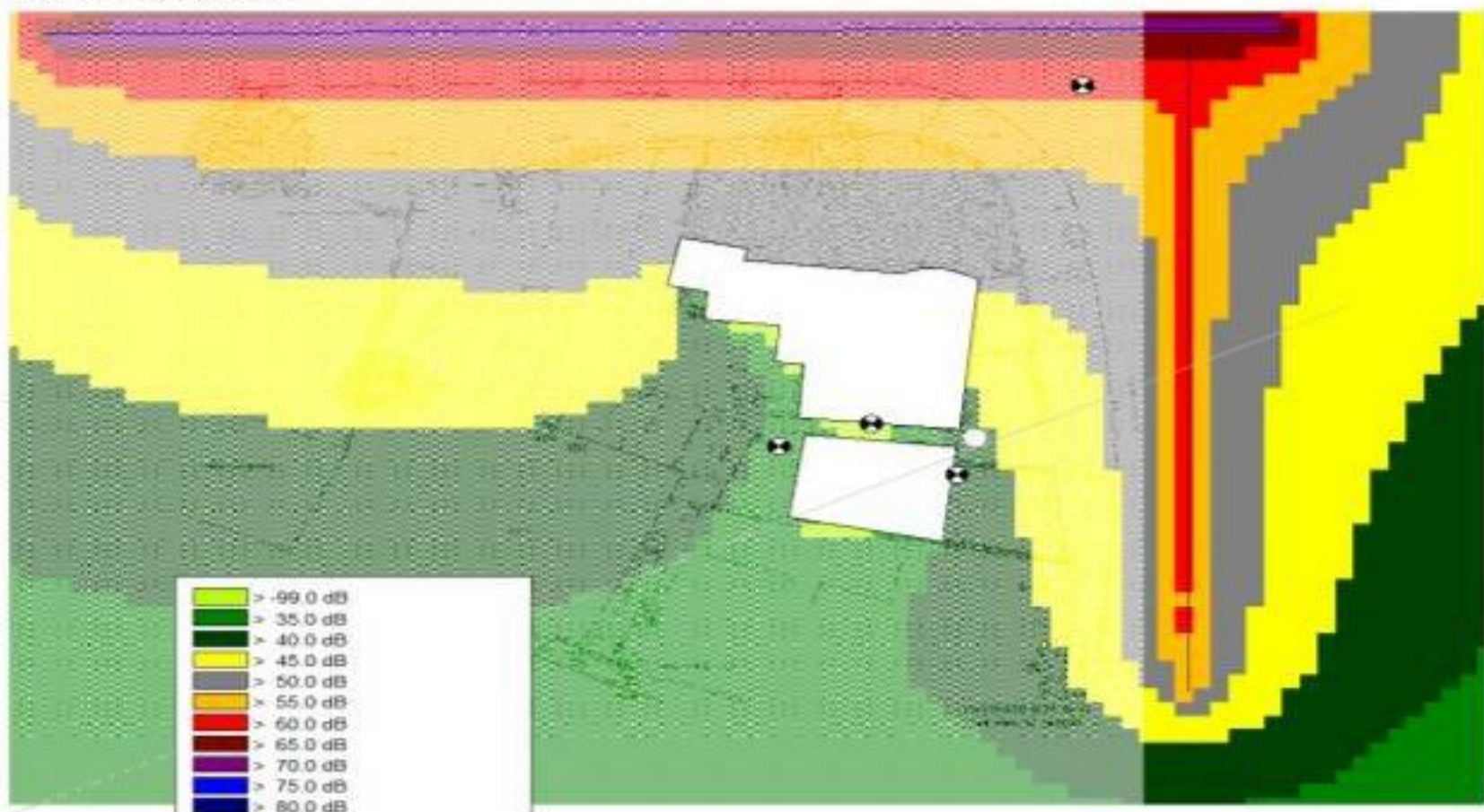
The tables above show the calculated internal levels with windows open in all rooms. All of the measured levels are below the levels as shown in table 3.3 in the AVO guide, this illustrates that whilst the internal noise levels will increase with the windows open, they should not have an adverse impact on the residents or cause a behavioural change to them. The levels shown above are towards the lower end of the sliding scale as shown in Table 3.3.

These levels are in line with the calculated values shown in this report, they will obviously reduce the further they are away from the road network and thus have an even lower impact.

Day Time Calculation:



Night Time Calculation:



AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING**Table A6.3.1** Measured Noise Levels at Position 1 – 4 metres from Worthing Road, dB

Date	Time	$L_{Aeq,1h}$	$L_{A10,1h}$	$L_{A90,1h}$	L_{Amax}
06/04/2011	23:00	58.9	51.9	59.7	78.9
07/04/2011	00:00	56.1	52.0	53.4	76.1
	01:00	54.0	52.5	53.1	73.2
	02:00	53.8	52.5	53.1	74.2
	03:00	55.1	50.8	53.0	77.6
	04:00	53.1	47.6	52.3	73.7
	05:00	59.9	46.8	61.1	79.4
	06:00	63.7	49.7	68.6	83.7
	07:00	66.3	52.3	70.8	79.0
	08:00	66.5	53.3	70.5	79.5
	09:00	64.4	52.4	68.6	80.0
	10:00	62.8	52.4	67.3	77.0
	11:00	63.0	52.7	67.0	84.3
	12:00	62.7	52.9	67.1	79.6
	13:00	62.5	53.1	66.7	80.6
	14:00	62.3	53.4	66.4	81.1
	15:00	62.6	53.6	66.5	79.1
	16:00	63.8	53.8	67.6	83.0
	17:00	64.7	54.2	68.1	87.1
	18:00	65.3	53.9	68.8	83.4
	19:00	64.1	53.4	68.1	84.8
	20:00	62.3	52.6	66.5	80.7
	21:00	61.1	52.3	65.7	76.5
	22:00	60.6	52.2	64.6	80.9
	23:00	58.2	52.4	59.4	77.5
08/04/2011	00:00	56.0	52.0	53.3	82.1
	01:00	53.4	46.0	53.2	76.3
	02:00	54.2	42.4	53.4	76.9
	03:00	55.0	52.9	53.4	73.2
	04:00	54.8	52.7	53.4	74.6
	05:00	59.1	50.7	59.6	77.4
	06:00	63.1	50.5	68.0	82.0
	07:00	65.5	52.0	69.9	80.6
	08:00	66.1	52.9	70.0	82.8
	09:00	63.8	52.0	68.3	79.8
	10:00	63.0	52.3	67.4	76.0
	11:00	62.9	52.4	67.3	76.8

Date	Time	$L_{Aeq,1h}$	$L_{Aeq,1h}$	$L_{Aeq,1h}$	L_{Amax}
	12:00	63.2	52.8	67.1	79.0
	13:00	63.4	52.9	67.2	83.9
	14:00	63.3	53.0	66.9	86.9
	15:00	63.2	53.9	67.1	83.0
	16:00	63.8	54.1	67.5	82.1
	17:00	64.7	54.3	68.3	80.8
	18:00	64.9	54.2	68.6	84.6
	19:00	64.1	53.3	68.3	78.4
	20:00	62.2	52.3	66.6	81.4
	21:00	60.4	51.5	64.7	77.9
	22:00	60.9	51.8	65.4	77.1
	23:00	60.1	51.5	63.0	82.7
09/04/2011	00:00	58.0	51.4	56.5	75.2
	01:00	56.7	51.2	53.2	80.8
	02:00	54.8	51.5	52.9	77.2
	03:00	54.4	51.5	52.8	74.8
	04:00	54.5	47.7	51.7	76.3
	05:00	56.6	44.3	53.7	78.1
	06:00	59.5	43.5	59.8	81.8
	07:00	61.9	46.5	66.3	80.7
	08:00	64.1	50.2	68.8	81.2
	09:00	64.9	51.8	69.2	80.6
	10:00	65.7	52.3	69.0	91.8
	11:00	66.9	53.6	68.8	96.6
	12:00	64.5	53.1	68.3	76.3
	13:00	63.9	52.9	67.9	87.3
	14:00	63.7	52.9	67.6	83.3
	15:00	63.7	53.3	67.8	81.8
	16:00	63.2	53.3	67.5	79.0
	17:00	65.0	53.4	68.6	92.0
	18:00	64.2	52.9	68.3	84.2
	19:00	63.2	52.5	67.8	82.3
	20:00	62.0	51.5	66.1	84.2
	21:00	60.2	50.1	64.5	76.6
	22:00	59.0	48.3	62.1	81.8
	23:00	59.5	46.8	63.6	82.1
10/04/2011	00:00	57.7	40.6	58.4	80.9
	01:00	55.8	36.1	52.8	75.1
	02:00	54.2	33.5	51.9	76.1
	03:00	53.8	32.6	49.4	78.8
	04:00	48.4	31.9	45.4	73.7



Date	Time	$L_{Aeq,15}$	$L_{A90,15}$	$L_{A10,15}$	L_{AFmax}
	05:00	54.5	38.0	51.5	76.2
	06:00	57.1	41.0	56.0	76.2
	07:00	59.7	45.4	62.0	78.2
	08:00	60.8	45.3	64.8	79.5
	09:00	62.6	47.9	67.5	76.4
	10:00	64.0	50.2	68.3	84.0
	11:00	63.5	50.6	67.7	81.3
	12:00	63.7	51.5	67.7	80.9
	13:00	63.0	50.7	67.2	83.9
	14:00	62.9	50.9	66.9	82.8
	15:00	63.7	51.5	67.1	91.2
	16:00	62.9	51.5	66.9	84.6
	17:00	62.3	51.7	66.6	79.9
	18:00	62.9	51.5	66.8	87.0
	19:00	62.2	50.4	66.6	84.5
	20:00	60.7	46.6	65.3	77.3
	21:00	60.9	40.9	64.1	87.2
	22:00	59.8	37.3	63.1	80.4
	23:00	56.0	32.1	58.5	77.6
11/04/2011	00:00	51.1	31.4	45.9	76.4
	01:00	48.2	31.1	38.9	73.5
	02:00	45.1	32.0	37.6	72.3
	03:00	49.5	30.7	40.1	77.1