AIRTIGHT & NOISECHECK LIMITED

The Old Laundry, Bridge Street, Southwick, Hampshire, PO17 6DZ
Phone: 03450 666966 Email: info@airtightnoisecheck.co.uk

ACOUSTIC TESTING REPORT FOR

JAMES POLLARD
1 LAVENDER COTTAGE
LONG SUTTON
HOOK
HAMPSHIRE
RG27 1TQ

SITE ADDRESS

LAND NORTH OF 63 PRINCES ROAD
PETERSFIELD
HAMPSHIRE
GU32 3BH

REPORT DATE: 10TH SEPTEMBER 2021

Acoustic Engineer:

Michael Vine

Testing Date: 9-10th Sept 2021

AIRTIGHT & NOISECHECK BUILDING ACOUSTIC TESTING

Contents

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

Customer Name: Date: 9th – 10th September 2021

James Pollard
1 Lavender Cottage
Long Sutton
Hook
Hampshire
RG29 1TQ

Site Address:

Land North of 63 Princes Road
Petersfield
Hampshire
GU32 3BH

Acoustic Engineer:

Mr. Michael Vine

Equipment used:

Norsonic Environmental Analyser 121 – serial No 31375, Cal due March 2022

Analyser complies with the following standards:

IEC 60651 type 1
IEC 60804 type 1
IEC 61260 class 1
IEC 225
ANSI S1.4-1985 type 1
ANSI1.43 -1997 type 1
ANSI S1.11-1986 order 3type1D
DIN 45 657
Norsonic Production Standard set for the Nor121.

Measurement Microphone – Gras 40AF, serial No 62522 – calibration due March 2022

Acoustic Calibrator - (Type 1251) – Serial No 31652, Calibration due July 2022

Measurement Procedure:

The external ambient noise levels were recorded for a 24hour period in one location between Thursday 9th & Friday 10th September 2021 to measure the apparent noise levels at the proposed façade of the dwelling to measure the impact of the noise sources in operation.

Calculations for each microphone location has been used.

The purpose of the assessment is to determine the impact of the noise associated with the local road network located to the front (West) and side (North) of the proposed dwelling.

AIRTIGHT & NOISECHECK ACOUSTIC TESTING

Executive Summary:

1.1 Airtight & Noisecheck Ltd were instructed by James Pollard to undertake a detailed Noise Impact Assessment (NIA) at Land North of 63 Princes Road, Petersfield. A planning application has been made to build 1 x purpose-built dwelling in the vacant parcel of land to the North of No 63, to the South of Winchester Road & to the East of Princes Road. The site currently comprises of a vacant piece of garden.

Please Note – This Noise Impact Assessment was undertaken once the national lockdown had been lifted and the schools had reopened & traffic levels were back to normal in the area.

The noise levels were measured for a 24hour period at the Northeast facade of the proposed dwelling – facing the road network. The noise apparent to the front & side of the site was:

1. Road Traffic Noise from the local road network

The external noise levels were measured at the North-Eastern façade in order to assess the road traffic noise using Winchester Road to the North.

The noise levels at the site were representative for the duration & the measured levels & calculations indicate that if the mitigation measures are implemented then there is no reason to suggest that the future residents of the proposed dwellings will be adversely affected by the noise emissions created by the external sources. The mitigation measures will have to be implemented to the glazing and ventilation of the proposed development and they show that the criteria for internal noise can be met. The noise levels have been measured at all noise sensitive facades.

There is no reason to suggest that the future residents of the proposed residential development will be adversely affected by the noise emissions providing the mitigation measures are implemented to the noise sensitive rooms. The detailed mitigation measures are listed within this report.

The final ventilation scheme has not been decided so a variety of options have been included within the report.

The external noise levels are higher at the side elevation of the dwelling due to the vehicular traffic apparent at this location. Some elevations will be screened & further away from Winchester Road and thus, the noise levels in this location will be less than those facing the road network. Suitable mitigation measures will be able to protect the future residents of the proposed scheme.

The measured levels measured all noise associated with the front and rear aspects over a 24hour period, with suitable measures listed within this report.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

Acoustic Design Statement (ADS):

Whilst the site is situated in a predominantly residential area with relatively high levels of vehicular traffic noise, the proposed dwelling will be located slightly set back from the road network. The client will take steps and implement mitigation measures to ensure the impact of the external noise should not have an adverse impact on the future residential dwellings. These steps include:

1. Careful configuration of dwellings – some noise sensitive rooms located furthest from noise source
2. Alternative ventilation/cooling system (acoustic trickle vents & thermal mass) to ventilate the rooms facing the road thus maintaining the integrity of the façade & glazing.
3. Install a robust glazing system to the building to protect the residents from the external noise emissions.
4. Natural ventilation to be offered by opening windows to the rooms on all façades

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.
The initial risk assessment has indicated that the day time noise levels fall into the low to medium category & the night time falls into the low category, indicating that noise will not be a reason for refusal and that a good acoustic design process should ensure that the internal criteria can be achieved. The night time levels drop significantly due to the reduction in road traffic so natural ventilation should be acceptable during these times. A good acoustic design process is prudent for this site.

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. In addition, there is only a small bedroom located on the front façade.

Negligible Sites:

These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

Low Noise Level Sites:

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 Acoustic Design Statement (ADS) which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

Medium Noise Level Sites:

As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless 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, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.

The noise levels during the day time fall into the low to medium category for noise exposure, with a significant reduction during the night time levels due to a reduction in vehicular traffic. In addition, this report/ADS clearly demonstrates suitable and robust measures that will be implemented to the building elements to ensure the noise sources will not have an adverse impact on the proposed scheme. Whilst it is accepted that the noise source may be audible it is highly unlikely that the noise will be intrusive.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

Assessment Criteria:

The NPPF came into effect in March 2012 & updated in July 2021. It replaced other documents such as PPG24. The NPPF provides several 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 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 LAeq,16hour	-
Dining	Dining Room/Area	40dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35dB LAeq,16hour	30dB LAeq,8hour

Night time noise events can have a significant impact on sleep disturbance. There is no specific guidance presented in BS8233 regarding a noise limit to maximum night time noise ($L_{Amax,\,F}$). As part of this assessment the number of night time 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.

Paragraph 7.7.3.2 of BS 8233:2014 "Indoor ambient noise levels for dwellings". Also states that the desirable level for amenity spaces is an upper limit of 55dB LAeq, T and a lower limit of 50dB LAeq, T.

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.

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 considering the recommended internal values by measuring the external noise levels & listing suitable mitigation measures that are to be implemented to the building.

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.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

1 Objective:

1.2 To determine the noise levels associated over a 24hour period at the front facades of the dwelling that face the road network. The noise levels associated with these facades was measured to ensure that the future residents of the proposed scheme will not be adversely affected by the noise emissions created in the immediate area. The site currently comprises of a vacant parcel of land, next to an existing dwelling. A planning application has been made to build 1 x residential dwelling in the parcel of land located at the corner of Princes Road and Winchester Road.

1.2 The objective of the testing is to ensure that the future residents of the proposed scheme will be protected from the external noise emissions produced at the site, the dominant noise source apparent on site is located to the North (side) of the proposed development. The testing was undertaken once the schools had been reopened and traffic levels are back to normal in the area. The road was very busy during the measurement period.

2 Calibration:

2.1 The measurement microphones were calibrated before and after testing in each measurement location and there were no drifts recorded during the assessments.

3 Site Layout & Microphone Position:

3.1 The proposed site is a residential garden located to the South of Winchester Road in Petersfield. Winchester Road is a busy road located to the East of Petersfield and it is one of the main road that runs into the town. Princes Road is predominantly a residential street, with houses located to the South, East & West and the road network located to the North. The noise sources apparent were:

- Road traffic using Winchester Road – 15m from the residential façade
- Road traffic using Princes Road – 10m to the East of the façade

3.2 A proposed site layout has been attached to this report and it clearly shows the dwelling will be a detached dwelling with the front elevation facing Princes road, the side elevation facing Winchester Road & the other facades slightly screened form the noise sources. The microphone was located:

1- Northeast corner of the site, microphone approximately 2metres from ground floor level and more than 3m form any other reflective surface

3.3 The proposed dwelling will be located in a residential area. Winchester Road is a busy road linking the immediate area, but the area is predominantly residential with existing dwellings located on most sides. There is also a new build commercial building located to the North of the proposed site, on the other side of Winchester Road.

4 Weather Conditions:

4.1 The weather was dry during the measurement procedures, the temperatures ranged between 12-19degrees. There was a slight wind and some rain showers during the measurement procedures.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

5 Results:

5.1 The purpose of this measurement procedure was to calculate the noise levels apparent at the noise sensitive facades and ensure suitable mitigation measures are implemented so that the requirements of BS8233 & WHO can be met. The night time LA_{max} values have also been derives so that they can be mitigated against also.

LAeq 16hour & 8hour Values:

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 – Northeast Facade	59dBA	24dB	47dBA	17dB	67dBA	22dB

6 Results Conclusion:

6.1 The levels of reduction apparent for the dwelling is listed in the table above. The level of mitigation required at the development is 24dB. If this level of mitigation is met for each facade, then the future residents should be adequately protected from external noise emissions. The recommended internal levels can be achieved at the rear with windows open, so no further mitigation is required here.

6.2 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 average noise levels measured require a lower reduction so if this level is achieved then the average internal noise criteria will also be met.

6.3 The noise levels measured within this report offer a fair reflection of the noise levels apparent at the site. The noise source apparent at the front of the site is vehicular traffic using the local road network. If the above levels of mitigation are met, then the requirements of BS8233: 2014 & World Health Organisation – guidelines for community noise should be met.

6.4 Based on the measured noise levels, 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 and the LOAEL (Lowest observed adverse effect level) at the site 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. The levels on some elevations of the dwelling (Southern) will fall into the negligible level and therefore noise should not be considered a factor for refusal, it is anticipated that the residents will be able to open their windows at their own discretion throughout the day time and night time on the screened elevation.

6.5 The dominant noise source was the road traffic, so it may be so that an alternative ventilation strategy is implemented to the dwelling, please note that the dwelling will be naturally ventilated by the open windows on all facades, but certainly on other facades located away from the road network, so this is an effective form of controlling overheating.

6.6 Noise above the LOAEL is 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 mitigation measures are required to the development to mitigate the noise emissions to the front of the development.

6.7 Based on the relatively low noise levels at the site (during the night time in particular), it is anticipated that the future residents will be able to open all windows to offer natural ventilation, whilst the lower internal levels may not be reached at the front facades with windows open, a reasonable standard of living will certainly be experienced. In addition, acoustic trickle vents/alternative ventilation could be installed to the rooms located on the front facades to ensure ventilation when the windows are closed.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

6.8 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. Careful configuration of dwellings – some noise sensitive rooms located furthest from noise source
2. Alternative ventilation/cooling system (acoustic trickle vents & thermal mass) to ventilate the rooms facing the road thus maintaining the integrity of the façade & glazing.
3. Install a robust glazing system to the building to protect the residents from the external noise emissions.
4. Natural ventilation to be offered by opening windows to the rooms on all façades

6.9 The above-named document also states that the internal L_{Amax} value of 45dB should not be exceeded more than 10 times per night. This is the criteria that has been applied to the L_{Amax} values measured at the site. If this criterion is met, then sleep disturbance should not be caused.

6.10 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. All investigation leads to the area being residential with houses in very close proximity to the proposed and close to the noise sources.

6.11 The tables below show the predicted internal noise levels on the front facades with windows open & closed. It is critical to ensure a balance is struck between overheating and noise and therefore residents will accept slightly higher noise levels for shorter period of the day to alleviate the overheating. The acoustic trickle vents and thermal mass can help to ensure suitable levels of ventilation when the windows are closed.

Room – North & East facade	External Level	Sound Reduction of windows	Internal Level	Criteria Met
Lounge	59dBA	35dB	24dBA	Yes
Bedroom – LAeq	47dBA	35dB	12dBA	Yes
Bedroom - LAmax	67dBA	35dB	32dBA	Yes

6.12 The above table shows that the necessary noise levels can be achieved with windows closed and the acoustic trickle vents in operation. The table below shows the calculated levels at the site with windows open.

Proposed Dwelling:

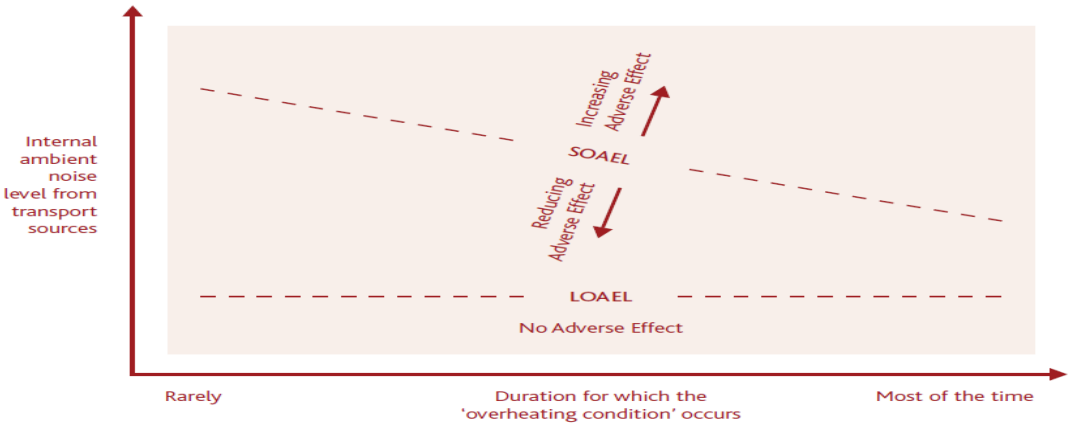
Room – North & East facade	External Level	Sound Reduction of open windows	Internal Level
Lounge	59dBA	-13dB	46dBA
Bedroom – LAeq	47dBA	-13dB	34dBA
Bedroom - LAmax	67dBA	-13dB	54dBA

6.13 Table 3.3 – Guidance for level 2 assessment of noise from transport services in the ANC AVO guide states that '*Noise causes a material change in behaviour e.g., having to keep windows closed most of the time'* if the following levels are exceeded for longer periods of time:

Internal ambient noise levels		
$L_{Aeq\ 16hour}$ 0700-2300	$L_{Aeq\ 8hour}$ 2300-0700	Individual noise events 2300-0700
>50dB	>42dB	Normally exceeds 65dB L_{AmaxT}

6.14 Using the above guidance (sliding scale as shown in the diagram below) the calculated internal levels at the site with the windows open are not likely to lead to a change in behaviour. It is anticipated that the future occupants will accept an increase in the noise levels for periods of time to ensure a good thermal comfort for the dwellings. They will not be exposed to these levels for long period of time as they will be able to open and close the windows at their own discretion throughout the day time and night time period. It is clear to see that the noise levels drop considerably during the night time period, indicating that the impact will be less during this time.

Figure 3-2 Qualitative guidance on combined effect of internal ambient noise level and duration for the overheating situation



6.15 Based on the measured levels and anticipated internal levels offered by natural ventilation, an alternative ventilation system may be prudent to the habitable rooms of the dwelling. A system such as an MVHR is required when natural ventilation may not be possible. However, due to being able to open windows on all elevations during quieter times, a system such as acoustic trickle vents could be an acceptable approach to the rooms on the front elevations.

6.16 The internal layout of the dwelling is unknow at present, but a good internal layout could also aide the noise impact, this combined with the measures listed in this report should ensure a suitable balance between overheating, noise & ventilation for the proposed dwelling.

6.17 It can be clearly seen that the windows on some facades will be exposed to lower noise levels and thus could be opened for longer periods of the day time and night time. There will be rooms locate away from the road network and thus the impact will be less in these rooms.

6.18 The levels above indicate that the internal levels of BS8233: 2014 to the front can be achieved with the windows closed thus showing that when the acoustic trickle vents will be used to ventilate the dwellings the noise criteria can be achieved. However, even with the windows open at the front façade the calculated internal levels are of a reasonable standard. Section 2.30 and Figure 2 of the Pro PG document states that the internal guidelines of BS8233: 2014 can be relaxed by 5dBA (40dBA $L_{Aeq\ 16hour}$ and 35dBA $L_{Aeq\ 8hour}$) when the dwellings are necessary or desirable and also that residents will accept a slight increase in noise levels to ensure natural ventilation. Whilst these levels may not be reached during the day time, the owners can still naturally ventilate their homes in this location during the night time period. A balance should be struck between overheating & noise levels, and this is the case on the front façade. The night time noise levels drop considerably, indicating a more reasonable acoustic environment during this time. For other times when the windows are closed, the acoustic trickle vents can be in operation.

6.19 The proposed dwelling will have high levels of thermal mass apparent within the perimeter detail, this will help with the thermal comfort for the dwellings. This in conjunction with the acoustic trickle vents and the ability of the majority of residents to be able to naturally ventilate their dwellings by opening windows on all façades should ensure a suitable acoustic criterial for the future residents of the scheme. It is recommended that the acoustic tickle vents be applied to all windows serving noise sensitive rooms.

6.20 The client has taken robust and recognized methods to ensure a suitable balance between internal noise levels and overheating and as such, neither should prove to have an adverse impact upon completion. The measures will be afforded to the glazing and fabric of the building and will ensure suitable internal noise levels, ventilation and thermal comfort.

6.21 In addition to the robust measures taken by the client, some rooms/elevations will be screened from the road noise by the building.

6.22 The amenity space for the development will be located to the rear of the dwelling. The measured $L_{Aeq\ 16hour}$ value at the proposed amenity space was 59dBA and this is only 4dB above the upper limit for amenity space as listed in Paragraph 7.7.3.2 of BS 8233:2014 "Indoor ambient noise levels for dwellings". There is currently no rigid boundary treatment enclosing the site, there are just some trees and exposed low-grade wire. A rigid timber boundary fence is recommended to enclose the amenity space form the road. Such a boundary fence should offer a sound reduction of circa -10Db. This coupled with the fact that Winchester Road is lower than the site ground level should ensure that the amenity space meets the necessary criteria as set out in BS8233: 2014 & also satisfy the conditions appropriate for this application.

6.23 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 within this report, 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. The levels shown above can be achieved with windows open on the proposed site, indicating that noise shouldn't change the behavior of the residents if exposed to them. However, the windows will not be open all of the time and therefore the noise levels will be lower during certain times of the day and night time period.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

7 Building Specifications:

7.1 Some possible building specifications are listed below, including, façade, glazing, roof & ventilation. Due to the status of the building the final ventilation scheme is unknown so various options have been included.

7.2 A possible approach to the front elevations could be the implementation of acoustic trickle vents to the windows & thermal mass to the façade, that offer a suitable sound reduction even when open.

Product	Sound Reduction - Open	Sound Reduction - Closed
Simon Acoustic Vent FV	32dB	40dB

8 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'.

9 Roof Detail – The proposed roof detail is believed to be similar to: Tiles on felt, pitched roof with 80mm PIR insulation between rafters & 37.5mm Insulated plasterboard to underside. This system should achieve a sound reduction of 43dB Rw 'BS8233: 2014, page 41 - Table 8 - The sound insulation of roofs'.

10 Windows - The proposed windows to be used is unknown but standard double-glazed systems offer a sound reduction of between 30-35dB so this should be adequate for the scheme. The windows to be installed need to achieve a sound reduction value in excess of 24dBA for the site. The specifications below offer these levels of reduction, but the exact proposed specification is unknown, and it is recommended that the window manufacturer provide the necessary documentation upon installation to ensure the correct materials have been used.

Possible Units	Thickness	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	Overall reduction
SG Solaglass 6-20-10	36mm	26	30	35	39	35	44	37-2=35dB
SG Solaglass 6-24-10	40mm	25	31	37	40	36	45	38-3=35dB

There are many other suitable products, and the client will have to show compliance for the windows before installation, the manufacturer will have the acoustic data for the windows. It may be prudent to install the higher level of glazing to all aspects of the proposed scheme to ensure suitable levels of mitigation are achieved.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

11 Results Summary:

11.1 The results indicate that whilst the noise emissions produced from the road traffic are the dominant source, mitigation measures can be applied to all facades of the building (windows) to protect the future residents from noise break in.

11.2 Based on the noise levels recorded there is no reason why future residents cannot be adequately protected from the external noise emissions. This is provided the correct materials are used to the external aspects of the site. The level of mitigation is less at the Southern façade of the building due to the screening offered by the building. The site falls into the low category for noise exposure during the night time and therefore noise should not be a reason for refusal and suitable measures should be applied to the building fabric & elements.

11.3 The mitigation measures listed within this report are suitable for the site. If they are implemented throughout the site, then 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 at land to the North of 63 Princes Road, Petersfield. The mitigation measures consider all the apparent noise sources on site and cover the concerns of the local authority & meet the relevant British Standards. The L_{Aeq} values have been listed and the necessary mitigation measures required to ensure these are met, in addition to this, detailed calculations have been performed to ensure that the acoustic criteria set out not only in BS8233: 2014 are met but also the requirements for night time noise events listed in World Health Organisation – Guidelines for community Noise are met in relation to L_{Amax} values caused from the noise sources.

11.4 The necessary acoustic feature corrections have been applied to the figures and as such the robust measures should ensure a suitable internal criterion for the future residents of the proposed scheme.

11.5 Both the measured levels and the calculated levels show similar levels of mitigation are required for the site. Providing the highest levels of sound reduction is achieved then there is no reason to suggest that the variety of noise sources will have an adverse impact on the proposed development.

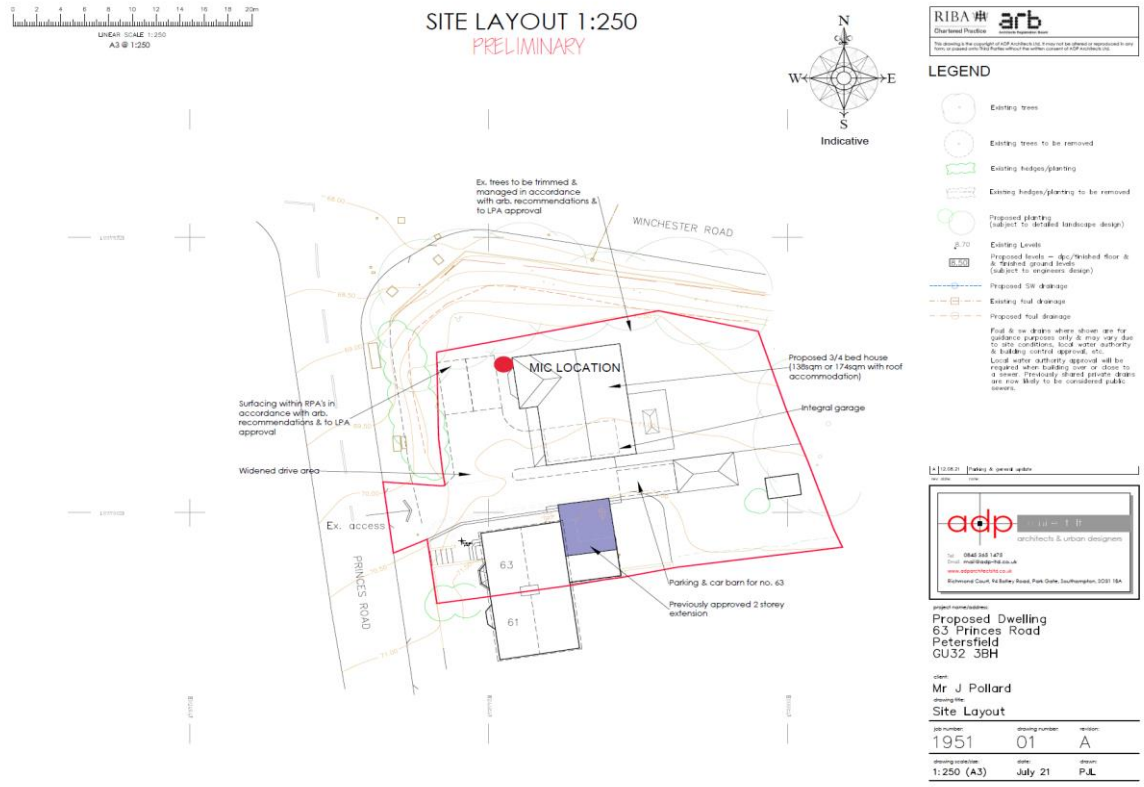
11.6 Based on the attended visit, the measured & calculated noise levels it is anticipated that the proposed scheme can be adequately protected from the noise sources apparent in the vicinity of the site. A good acoustic design will be pivotal in ensuring the internal criterion as stated in BS8233: 2014 and the client has indicated that they are prepared to ensure suitable mitigation for the proposed dwellings in relation to the external noise sources apparent in the vicinity of the site. The immediate area is residential which also indicates a suitable environment for existing housing stock.

11.7 The variety of measures listed for the site should ensure a suitable balance between overheating and internal noise levels. There will be times when the residents wish to open their windows to naturally ventilate these rooms and accept a slightly higher noise levels for a short period of time. The windows on all facades can be opened and offer natural ventilation to the entire dwellings, with the calculated internal levels higher at the North elevation, but even in this location the future residents should enjoy a reasonable standard of living. All rooms located on the other facades will be exposed to lower noise levels and thus these windows could be open for longer periods of the day time and night time period, even though the windows at the rear can be opened to offer natural ventilation without leading to internal noise levels that may be intrusive.

11.8 The internal layout for the dwelling is not yet known, but it is anticipated that there will be some noise sensitive rooms located at 2nd floor levels (in the roof space) and towards the Southern elevation. These rooms will be exposed to lower noise levels and thus the impact will be less here. It is not anticipated that an MVHR & wall mounted ventilation system will be required, but if further measures are insisted upon then this would be an effective form of noise mitigation.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

12 Site Plans:



Proposed Dwelling ¤ 63 Princes Road ¤ Petersfield ¤ J Pollard ¤ 1951-02

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

adp architects & urban designers
Tel: 0845 366 1476
Email: mail@adp-ltd.co.uk
www.adparchitectsltd.co.uk
Richmond Court, 94 Botley Road, Park Gate, Southampton, SO31 1BA

project name/address:
63 Princes Road
Petersfield
GU32 3BH

client:
Mr J Pollard

drawing title:
Location Plan

Copyright
Reproduced from Ordnance Survey's 1:1250 scale map with permission of Controller, HMSO Crown copyright. ADP Architects Ltd AR 100010061

job number: 1951
drawing number: L01
revision:
drawing scale/size: 1:1250 (A4)
date: July 21
drawn:

rev: date: note:

0 10 20 30 40 50 60 70 80 90 100m
LINEAR SCALE 1:1250
A4@1:1250

N
W E
S
Indicative

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

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.

LAmax - 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

Dne,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

Rw 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:

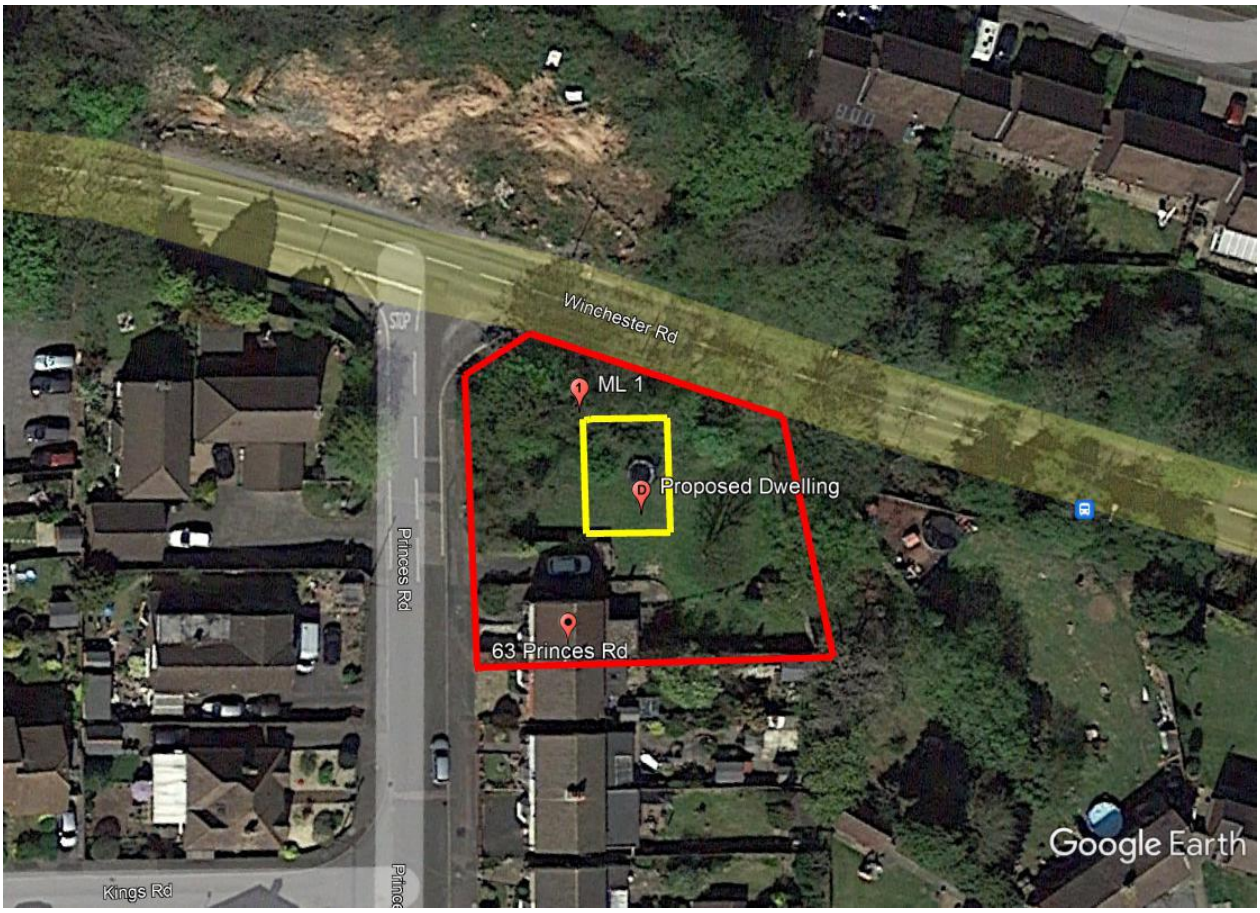
Code of Practice: BS8233: 2014 - Sound Insulation and noise reduction for buildings.

ProPG: Planning & Noise - Professional Practice Guidance on Planning & Noise - May 2017

ACOUSTICS VENTILATION AND OVERHEATING - Residential Design Guide – Jan 2020

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

13 Google Earth:



AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

Table 3-3 Guidance for Level 2 assessment of noise from transport noise sources[Note 1] relating to overheating condition

Internal ambient noise level [Note 2]			Examples of Outcomes [Note 5]	
$L_{Aeq,T}$ [Note 3] during 07:00 – 23:00 [Note 6]	$L_{Aeq,8h}$ during 23:00 – 07:00	Individual noise events during 23:00 – 07:00 [Note 4]		
> 50 dB	> 42 dB	Normally exceeds 65 dB $L_{AF,max}$	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time	Avoiding certain activities during periods of intrusion. Having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.
			Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods. As noise levels increase, small behaviour changes are expected e.g. turning up the volume on the television; speaking a little more loudly; having to close windows for certain activities, for example ones which require a high level of concentration. Potential for some reported sleep disturbance. Affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life. At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time. [Note 8]
≤ 35 dB	≤ 30 dB	Do not normally exceed $L_{AF,max}$ 45 dB more than 10 times a night	Noise can be heard, but does not cause any change in behaviour	Noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response[Note 9]. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.

Note 1 The noise levels suggested in Tables 3-2 and 3-3 assume a steady road traffic noise source but may be adapted for other types of transport.

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

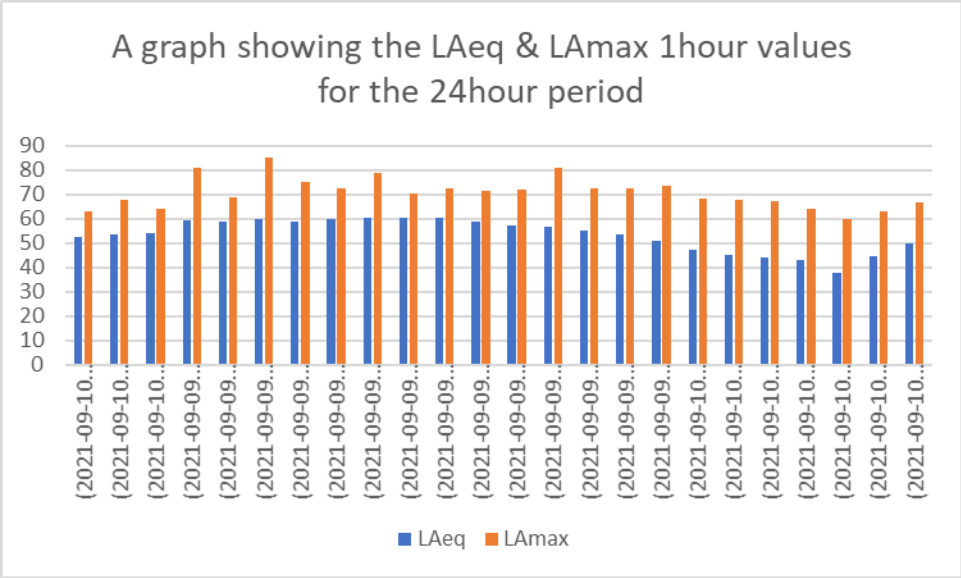
Table B-5 Examples of passive ventilation solutions providing enhanced sound insulation

Design option	Description and references	Approximate Level Difference (external free field level – internal reverberant level)	Improvement relative to a window providing a similar amount of ventilation
Standard opening windows	Window(s) open sufficiently to provide a ventilation free-area equivalent to 2% of the floor area. [42]	13 dB	0 dB
Open windows with sound attenuating balconies	Window(s) as above. Balconies may have a solid balustrade or be enclosed to a further degree (maintaining an open area for ventilation). Absorption may be provided to the balcony soffit or potentially to other surfaces. [49, 50, 51]	17 – 23 dB	4 – 10 dB
Attenuated or plenum windows	Dual windows (spaced by around 200mm) with staggered openings and absorptive linings to the cavity reveals. Various other configurations also possible in principle. [52, 53]	17 – 24 dB	4 – 11 dB
Attenuated vents/ louvres	Ventilation openings with integral means of attenuating sound. Typically this may be acoustic louvres or acoustically lined ducts/plena. [54, 55]	17 – 29 dB	4 – 16 dB
Attenuated windows or vents/ louvres with sound attenuating balconies	Combined use of balconies to provide screening and acoustically attenuated windows or vents. Refer to above for description of each element.	21 – 39 dB	8 – 26 dB

AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

1-hour values

Time Period	LAeq	LAmax
(2021-09-10 07:00:00.610)	52.3	63.2
(2021-09-10 08:00:00.610)	53.4	67.7
(2021-09-10 09:00:00.610)	53.9	64.1
(2021-09-09 10:00:00.610)	59.3	80.8
(2021-09-09 11:00:00.610)	58.8	69
(2021-09-09 12:00:00.610)	59.7	85.1
(2021-09-09 13:00:00.610)	59.1	75.2
(2021-09-09 14:00:00.610)	60	72.6
(2021-09-09 15:00:00.610)	60.5	78.9
(2021-09-09 16:00:00.610)	60.5	70.5
(2021-09-09 17:00:00.610)	60.2	72.7
(2021-09-09 18:00:00.610)	59.1	71.4
(2021-09-09 19:00:00.610)	57.3	72.1
(2021-09-09 20:00:00.610)	56.8	81
(2021-09-09 21:00:00.610)	55	72.5
(2021-09-09 22:00:00.610)	53.5	72.5
(2021-09-09 23:00:00.610)	50.8	73.7
(2021-09-10 00:00:00.610)	47.4	68.1
(2021-09-10 01:00:00.610)	45	68
(2021-09-10 02:00:00.610)	44.1	67.4
(2021-09-10 03:00:00.610)	42.9	64.1
(2021-09-10 04:00:00.610)	37.9	59.7
(2021-09-10 05:00:00.610)	44.8	62.9
(2021-09-10 06:00:00.610)	50.1	66.8



AIRTIGHT & NOISECHECK LIMITED ACOUSTICS TESTING

5min values

Time Period	LAeq	LAmax
(2021-09-10 07:00:00.610)	50.6	62
(2021-09-10 07:05:00.610)	49.5	61.8
(2021-09-10 07:10:00.610)	50.7	60.1
(2021-09-10 07:15:00.610)	51.9	60.8
(2021-09-10 07:20:00.610)	52.3	63.1
(2021-09-10 07:25:00.610)	51.5	61
(2021-09-10 07:30:00.610)	52.6	62.7
(2021-09-10 07:35:00.610)	53.2	61.1
(2021-09-10 07:40:00.610)	52.9	62.5
(2021-09-10 07:45:00.610)	53.3	61.8
(2021-09-10 07:50:00.610)	52.9	61.9
(2021-09-10 07:55:00.610)	53.8	63.2
(2021-09-10 08:00:00.610)	53.1	67.7
(2021-09-10 08:05:00.610)	52.7	59.6
(2021-09-10 08:10:00.610)	53.9	62.1
(2021-09-10 08:15:00.610)	54	62.7
(2021-09-10 08:20:00.610)	52.6	60.9
(2021-09-10 08:25:00.610)	53.6	61.4
(2021-09-10 08:30:00.610)	53.9	60.6
(2021-09-10 08:35:00.610)	54	60.8
(2021-09-10 08:40:00.610)	53.4	60.3
(2021-09-10 08:45:00.610)	53.1	60.5
(2021-09-10 08:50:00.610)	52.4	60.9
(2021-09-10 08:55:00.610)	53.8	61.5
(2021-09-10 09:00:00.610)	54	63.7
(2021-09-10 09:05:00.610)	54.8	61.9
(2021-09-10 09:10:00.610)	54.3	59.7
(2021-09-10 09:15:00.610)	53.8	60.8
(2021-09-10 09:20:00.610)	53.9	61.2
(2021-09-10 09:25:00.610)	54.4	63.6
(2021-09-10 09:30:00.610)	54.2	62.2
(2021-09-10 09:35:00.610)	52.9	64.1
(2021-09-10 09:40:00.610)	53.2	60.7
(2021-09-10 09:45:00.610)	54.4	62.6
(2021-09-10 09:50:00.610)	53.5	62.5
(2021-09-10 09:55:00.610)	53.3	60.5
(2021-09-09 10:00:00.610)	58.3	68.6
(2021-09-09 10:05:00.610)	60.3	80.8
(2021-09-09 10:10:00.610)	59.8	70.1
(2021-09-09 10:15:00.610)	57.7	66.5

(2021-09-09 10:20:00.610)	58.2	66.1
(2021-09-09 10:25:00.610)	58.7	70.1
(2021-09-09 10:30:00.610)	59.9	67.2
(2021-09-09 10:35:00.610)	60	66.9
(2021-09-09 10:40:00.610)	59	68.2
(2021-09-09 10:45:00.610)	59.6	67.3
(2021-09-09 10:50:00.610)	59.6	69.3
(2021-09-09 10:55:00.610)	60	76.5
(2021-09-09 11:00:00.610)	57.1	67
(2021-09-09 11:05:00.610)	58.9	68.8
(2021-09-09 11:10:00.610)	58.9	67.7
(2021-09-09 11:15:00.610)	57.4	65.9
(2021-09-09 11:20:00.610)	58.3	67.8
(2021-09-09 11:25:00.610)	59.6	68
(2021-09-09 11:30:00.610)	58.2	66.9
(2021-09-09 11:35:00.610)	58.4	66.8
(2021-09-09 11:40:00.610)	58.9	68
(2021-09-09 11:45:00.610)	60.2	69
(2021-09-09 11:50:00.610)	59.5	67.4
(2021-09-09 11:55:00.610)	58.7	66.7
(2021-09-09 12:00:00.610)	59	68.6
(2021-09-09 12:05:00.610)	57.7	69.8
(2021-09-09 12:10:00.610)	58.7	68.1
(2021-09-09 12:15:00.610)	59.2	67.3
(2021-09-09 12:20:00.610)	64.4	85.1
(2021-09-09 12:25:00.610)	59.5	67.2
(2021-09-09 12:30:00.610)	58.7	66.8
(2021-09-09 12:35:00.610)	58.8	69.3
(2021-09-09 12:40:00.610)	58.4	65.9
(2021-09-09 12:45:00.610)	59.1	70.9
(2021-09-09 12:50:00.610)	58.9	67.5
(2021-09-09 12:55:00.610)	58.4	68.1
(2021-09-09 13:00:00.610)	59.4	75.2
(2021-09-09 13:05:00.610)	58.1	67.2
(2021-09-09 13:10:00.610)	58.9	67.9
(2021-09-09 13:15:00.610)	58.5	67.5
(2021-09-09 13:20:00.610)	58.9	69.8
(2021-09-09 13:25:00.610)	58.6	66.5
(2021-09-09 13:30:00.610)	59.7	68
(2021-09-09 13:35:00.610)	59.4	68.3
(2021-09-09 13:40:00.610)	59.2	69.9
(2021-09-09 13:45:00.610)	58.9	65.7
(2021-09-09 13:50:00.610)	59.3	69.7
(2021-09-09 13:55:00.610)	59.7	70.1
(2021-09-09 14:00:00.610)	59	69.3

(2021-09-09 14:05:00.610)	59.3	71.5
(2021-09-09 14:10:00.610)	59.3	66.1
(2021-09-09 14:15:00.610)	60.2	68
(2021-09-09 14:20:00.610)	60.2	67
(2021-09-09 14:25:00.610)	60.6	72.6
(2021-09-09 14:30:00.610)	59.5	66.4
(2021-09-09 14:35:00.610)	59.9	66.9
(2021-09-09 14:40:00.610)	60.8	69.1
(2021-09-09 14:45:00.610)	61.5	70
(2021-09-09 14:50:00.610)	59.1	66.1
(2021-09-09 14:55:00.610)	59.1	67.3
(2021-09-09 15:00:00.610)	59.8	67.8
(2021-09-09 15:05:00.610)	59.2	67
(2021-09-09 15:10:00.610)	60.8	78.9
(2021-09-09 15:15:00.610)	61.5	70.5
(2021-09-09 15:20:00.610)	60.9	68.8
(2021-09-09 15:25:00.610)	60.5	67.1
(2021-09-09 15:30:00.610)	60.3	69.7
(2021-09-09 15:35:00.610)	60.2	67
(2021-09-09 15:40:00.610)	60.2	70
(2021-09-09 15:45:00.610)	60.6	70
(2021-09-09 15:50:00.610)	61	67.9
(2021-09-09 15:55:00.610)	60.7	68
(2021-09-09 16:00:00.610)	60.8	68.5
(2021-09-09 16:05:00.610)	61	67.8
(2021-09-09 16:10:00.610)	60.4	67.8
(2021-09-09 16:15:00.610)	60.6	70.5
(2021-09-09 16:20:00.610)	59.5	67.8
(2021-09-09 16:25:00.610)	60.1	67.2
(2021-09-09 16:30:00.610)	60.3	67.4
(2021-09-09 16:35:00.610)	60.9	68.8
(2021-09-09 16:40:00.610)	60.4	67.3
(2021-09-09 16:45:00.610)	60	67.6
(2021-09-09 16:50:00.610)	60.5	66.5
(2021-09-09 16:55:00.610)	61.2	68.7
(2021-09-09 17:00:00.610)	60.3	70.9
(2021-09-09 17:05:00.610)	59.8	67
(2021-09-09 17:10:00.610)	60.3	66.2
(2021-09-09 17:15:00.610)	60.2	67.3
(2021-09-09 17:20:00.610)	60.7	72.7
(2021-09-09 17:25:00.610)	60.2	66.1
(2021-09-09 17:30:00.610)	59.5	68.2
(2021-09-09 17:35:00.610)	60.3	66.8
(2021-09-09 17:40:00.610)	59.9	67.2
(2021-09-09 17:45:00.610)	59.9	69.3

(2021-09-09 17:50:00.610)	61	70
(2021-09-09 17:55:00.610)	59.5	70.9
(2021-09-09 18:00:00.610)	59.7	67.1
(2021-09-09 18:05:00.610)	59.6	66.8
(2021-09-09 18:10:00.610)	60.1	68.5
(2021-09-09 18:15:00.610)	58.7	68.3
(2021-09-09 18:20:00.610)	59.3	68.5
(2021-09-09 18:25:00.610)	58.9	66.4
(2021-09-09 18:30:00.610)	60.2	71.4
(2021-09-09 18:35:00.610)	57.4	65.9
(2021-09-09 18:40:00.610)	58.9	67.5
(2021-09-09 18:45:00.610)	58.2	65.9
(2021-09-09 18:50:00.610)	58.3	68
(2021-09-09 18:55:00.610)	59.3	70.6
(2021-09-09 19:00:00.610)	57.3	65.8
(2021-09-09 19:05:00.610)	57.8	68
(2021-09-09 19:10:00.610)	57.6	66.3
(2021-09-09 19:15:00.610)	58	67.9
(2021-09-09 19:20:00.610)	57.6	69.6
(2021-09-09 19:25:00.610)	57.6	68.3
(2021-09-09 19:30:00.610)	55.1	65.3
(2021-09-09 19:35:00.610)	58.7	69.5
(2021-09-09 19:40:00.610)	56.5	65.1
(2021-09-09 19:45:00.610)	55.8	65.7
(2021-09-09 19:50:00.610)	57.8	72.1
(2021-09-09 19:55:00.610)	56.7	67.9
(2021-09-09 20:00:00.610)	55.7	67.8
(2021-09-09 20:05:00.610)	57.2	67.7
(2021-09-09 20:10:00.610)	55.7	65.5
(2021-09-09 20:15:00.610)	61.9	81
(2021-09-09 20:20:00.610)	57.2	68.6
(2021-09-09 20:25:00.610)	55.3	64.8
(2021-09-09 20:30:00.610)	55.4	66
(2021-09-09 20:35:00.610)	56.9	66.3
(2021-09-09 20:40:00.610)	54.4	67
(2021-09-09 20:45:00.610)	55	65.7
(2021-09-09 20:50:00.610)	54.9	66.1
(2021-09-09 20:55:00.610)	54.8	65.8
(2021-09-09 21:00:00.610)	56.7	66.8
(2021-09-09 21:05:00.610)	52.9	63.7
(2021-09-09 21:10:00.610)	55.5	72.5
(2021-09-09 21:15:00.610)	55.5	69.2
(2021-09-09 21:20:00.610)	54.9	65.6
(2021-09-09 21:25:00.610)	54.9	66
(2021-09-09 21:30:00.610)	54.2	63.6

(2021-09-09 21:35:00.610)	56	65.3
(2021-09-09 21:40:00.610)	54.2	64
(2021-09-09 21:45:00.610)	54.9	65.4
(2021-09-09 21:50:00.610)	53.5	65.6
(2021-09-09 21:55:00.610)	55.4	65.6
(2021-09-09 22:00:00.610)	53.2	63.9
(2021-09-09 22:05:00.610)	54.2	64.8
(2021-09-09 22:10:00.610)	53.1	63.8
(2021-09-09 22:15:00.610)	55.9	67.2
(2021-09-09 22:20:00.610)	53.4	67.4
(2021-09-09 22:25:00.610)	54.3	70.1
(2021-09-09 22:30:00.610)	55.5	72.5
(2021-09-09 22:35:00.610)	53.6	65
(2021-09-09 22:40:00.610)	52.8	65
(2021-09-09 22:45:00.610)	52.6	66.4
(2021-09-09 22:50:00.610)	50.1	63.2
(2021-09-09 22:55:00.610)	49.5	60.9
(2021-09-09 23:00:00.610)	51.4	64.9
(2021-09-09 23:05:00.610)	48.4	63.9
(2021-09-09 23:10:00.610)	52.5	65.8
(2021-09-09 23:15:00.610)	53.2	66.3
(2021-09-09 23:20:00.610)	52.5	65.6
(2021-09-09 23:25:00.610)	53.7	73.7
(2021-09-09 23:30:00.610)	51.3	64.9
(2021-09-09 23:35:00.610)	49.3	63.6
(2021-09-09 23:40:00.610)	46.8	62.3
(2021-09-09 23:45:00.610)	48.1	62.8
(2021-09-09 23:50:00.610)	46	61.8
(2021-09-09 23:55:00.610)	48.8	62.4
(2021-09-10 00:00:00.610)	44.7	61
(2021-09-10 00:05:00.610)	47.6	62.4
(2021-09-10 00:10:00.610)	49.5	65.6
(2021-09-10 00:15:00.610)	45.6	61.1
(2021-09-10 00:20:00.610)	47	61.4
(2021-09-10 00:25:00.610)	44.5	65.1
(2021-09-10 00:30:00.610)	47.9	66.5
(2021-09-10 00:35:00.610)	48.4	63
(2021-09-10 00:40:00.610)	50.8	65.1
(2021-09-10 00:45:00.610)	40.4	59
(2021-09-10 00:50:00.610)	46.4	63.9
(2021-09-10 00:55:00.610)	48.3	68.1
(2021-09-10 01:00:00.610)	45.3	63.6
(2021-09-10 01:05:00.610)	45.2	61.4
(2021-09-10 01:10:00.610)	34.6	43.9
(2021-09-10 01:15:00.610)	47.1	63.6

(2021-09-10 01:20:00.610)	47.4	65.4
(2021-09-10 01:25:00.610)	46.5	68
(2021-09-10 01:30:00.610)	44.5	61.8
(2021-09-10 01:35:00.610)	34.6	42.1
(2021-09-10 01:40:00.610)	47.7	64.5
(2021-09-10 01:45:00.610)	40.3	58.5
(2021-09-10 01:50:00.610)	47.5	64.6
(2021-09-10 01:55:00.610)	35.3	44.7
(2021-09-10 02:00:00.610)	32	43.9
(2021-09-10 02:05:00.610)	45	66.9
(2021-09-10 02:10:00.610)	45.5	63.2
(2021-09-10 02:15:00.610)	38.9	53.2
(2021-09-10 02:20:00.610)	34.7	46.1
(2021-09-10 02:25:00.610)	46.1	64.4
(2021-09-10 02:30:00.610)	47.5	66.6
(2021-09-10 02:35:00.610)	35.3	45.5
(2021-09-10 02:40:00.610)	48.5	67.4
(2021-09-10 02:45:00.610)	41.3	60.7
(2021-09-10 02:50:00.610)	42.1	62.1
(2021-09-10 02:55:00.610)	44.6	61.3
(2021-09-10 03:00:00.610)	36.3	47
(2021-09-10 03:05:00.610)	42.8	62.2
(2021-09-10 03:10:00.610)	36	48.5
(2021-09-10 03:15:00.610)	41.9	59.6
(2021-09-10 03:20:00.610)	49.3	64.1
(2021-09-10 03:25:00.610)	45.7	62.3
(2021-09-10 03:30:00.610)	40.1	58
(2021-09-10 03:35:00.610)	38.7	56.5
(2021-09-10 03:40:00.610)	39	58.3
(2021-09-10 03:45:00.610)	32	43.5
(2021-09-10 03:50:00.610)	39.3	54.6
(2021-09-10 03:55:00.610)	45.5	63.9
(2021-09-10 04:00:00.610)	29.6	40.5
(2021-09-10 04:05:00.610)	41.9	59.7
(2021-09-10 04:10:00.610)	41.4	59.6
(2021-09-10 04:15:00.610)	37.9	56.4
(2021-09-10 04:20:00.610)	37.3	54.1
(2021-09-10 04:25:00.610)	33.8	50
(2021-09-10 04:30:00.610)	29.1	38.4
(2021-09-10 04:35:00.610)	40.2	55.9
(2021-09-10 04:40:00.610)	40.1	57.1
(2021-09-10 04:45:00.610)	37.3	53.1
(2021-09-10 04:50:00.610)	33.1	40.3
(2021-09-10 04:55:00.610)	32.9	42
(2021-09-10 05:00:00.610)	33.2	39.8

(2021-09-10 05:05:00.610)	40.1	56.3
(2021-09-10 05:10:00.610)	38.9	52.9
(2021-09-10 05:15:00.610)	42.9	58.2
(2021-09-10 05:20:00.610)	44.4	60.4
(2021-09-10 05:25:00.610)	45.5	61.2
(2021-09-10 05:30:00.610)	44.8	58.3
(2021-09-10 05:35:00.610)	45.2	61.7
(2021-09-10 05:40:00.610)	46.8	61.8
(2021-09-10 05:45:00.610)	47.1	61.1
(2021-09-10 05:50:00.610)	47.4	62.9
(2021-09-10 05:55:00.610)	46.6	59.1
(2021-09-10 06:00:00.610)	46.1	58.5
(2021-09-10 06:05:00.610)	48.3	60.2
(2021-09-10 06:10:00.610)	48.1	64.5
(2021-09-10 06:15:00.610)	48.7	59.2
(2021-09-10 06:20:00.610)	48.5	62.3
(2021-09-10 06:25:00.610)	49.3	60.8
(2021-09-10 06:30:00.610)	49.9	60.4
(2021-09-10 06:35:00.610)	53.9	63.6
(2021-09-10 06:40:00.610)	50.7	61.1
(2021-09-10 06:45:00.610)	50.7	60.6
(2021-09-10 06:50:00.610)	51.9	66.8
(2021-09-10 06:55:00.610)	49.7	61.5