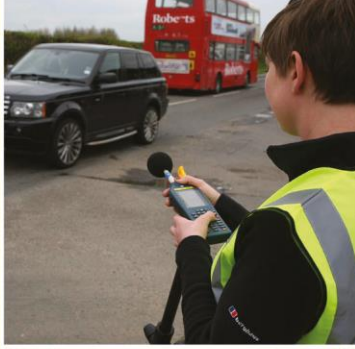




FUNTLEY ROAD, HAMPSHIRE

NOISE ASSESSMENT

SEPTEMBER 2020

REPORT REF: 24695-04-NA-01 REV A

Noise, Vibration, Air Quality and Odour

FUNTLEY ROAD, HAMPSHIRE

NOISE ASSESSMENT

SEPTEMBER 2020

REPORT REF: 24695-04-NA-01 REV A

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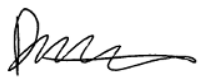

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Registration of Amendments

REV	Comments and changes
First issue Sep 2020	Final Issue for Planning
A Sep 2020	Updated Site Plan

CONTENTS

1.0 INTRODUCTION
2.0 SITE DESCRIPTION
3.0 NOISE CRITERIA
4.0 NOISE SURVEY
5.0 NOISE ASSESSMENT
6.0 CONCLUSIONS

APPENDICES

A. SITE LOCATION PLAN AND NOISE MONITORING POSITIONS
B. INDICATIVE SITE LAYOUT PLAN
C. DESCRIPTION OF NOISE UNITS
D. NOISE MEASUREMENTS
E. DFT COUNT POINT LOCATION
F. NOISE CONTOUR MAPS
G. INDICATIVE SOUND INSULATION PERFORMANCE OF DIFFERENT WINDOW CONFIGURATIONS

1.0 INTRODUCTION

1.1 Mewies Engineering Consultants Ltd (M-EC Acoustic Air) has been commissioned by Reside Developments Ltd (Dorking) to prepare a noise assessment for the proposed residential development on land at Funtley Road, Hampshire. A site location plan is provided in Appendix A.

Assessment Scope

1.2 The noise assessment has been undertaken with regard to Professional Practice Guidance on Planning & Noise (ProPG), prepared jointly by the Association of Noise Consultants , the Institute of Acoustics and the Chartered Institute of Environmental Health, which seeks to secure good acoustic design for new residential development within England's planning system, and British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.

1.3 A site description is provided in Section 2.0 of this report. Relevant national guidance on noise is presented in Section 3.0. Section 4.0 contains the results of the noise survey, and the assessment of noise impacts upon new residential development is presented in Section 5.0 together with recommendations for mitigation. Our conclusions are presented in Section 6.0.

1.4 M-EC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from M-EC.

1.5 M-EC accepts no responsibility or liability for:

a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;

b) The issue of this document to any third party with whom approval for use has not been agreed.

2.0 SITE DESCRIPTION

Existing Site

2.1 The application site is located on land at Funtley Road, Hampshire, and is bound by Funtley Road adjacent to the north eastern site boundary, the West Coastway Railway Line, which is in a cutting, adjacent to the eastern site boundary, the M27 Motorway to the south, and Honey Lane to the west. The principle sources of noise affecting the site will be road traffic using Funtley Road and the M27, coupled with any contributions coming from the West Coastway Railway Line.

2.2 A site location plan is provided in Appendix A.

Development Proposals

2.3 The development proposals are for an outline application to provide up to 125 one, two, three and four-bedroom dwellings including 6 Self/Custom build plots, Community Building or Local Shop (Use Class E & F.2) with associated infrastructure, new community park, landscaping and access.

2.4 An indicative site layout plan is provided in Appendix B.

3.0 NOISE CRITERIA

Noise Terms and Units

3.1 Noise levels are measured and assessed using the decibel scale (dB), which provides a measure of the air pressure changes due to vibrating sources such as vehicle engines or machinery. Due to the vast range of air pressures that the human ear is capable of detecting, the decibel measurement uses a logarithmic scale that compresses the data into a more manageable scale for assessment purposes. A detailed explanation of the derivation of the decibel scale is presented in Appendix C.

3.2 Due to the logarithmic nature of the dB scale, the addition of two or more noise levels has to be done logarithmically rather than arithmetically. For example, two equal sound sources each producing 50 dB, when operated simultaneously, do not result in a noise level of 100 dB but instead produce a combined level of 53 dB, i.e. a rise of 3 dB for each doubling of sound energy. Subjectively, a 3 dB change does not represent a doubling or halving of loudness; to make a sound appear twice or half as loud requires a change of 10 dB.

3.3 The subjective loudness of noise can be measured by applying a filter or weighting that equates to the frequency response of the human ear. This is referred to as an A-weighting and when applied results in noise levels expressed as dB(A). dB(A) noise levels reflect the human perception of loudness.

National Planning Policy Framework

3.4 The latest National Planning Policy Framework (NPPF) 2019 sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.

3.5 Paragraph 170 of the NPPF advises that, with respect to noise, planning policies and decisions should contribute to and enhance the natural and local environment by *"...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution ...*"

3.6 Further, paragraph 180 advises that "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; and*

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

3.7 The NPPF's footnote to point a) above explicitly refers to the Explanatory Note to the *Noise Policy Statement for England* (Department for Environment, Food & Rural Affairs, 2010).

Noise Policy Statement for England

3.8 The guidance of the Noise Policy Statement for England (NPSE) applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise, but does not apply to noise in the workplace (occupational noise). It introduces the concepts of 'No Observed Effect Level' (NOEL), which is the level below which there is no detectable effect on health and quality of life due to the noise; the 'Lowest Observed Adverse Effect Level' (LOAEL), which is the level above which adverse effects on health and quality of life can be detected; and the 'Significant Observed Adverse Effect Level' (SOAEL), which is the level above which significant adverse effects on health and quality of life occur.

3.9 In March 2014 the Department for Communities & Local Government updated its on-line planning guidance to assist with interpretation of the original NPPF and the NPSE. The guidance covers general matters such as relevance of noise issues, noise concerns and factors, how to determine impacts, and mitigation. To assist with recognising when noise could be a concern, the guidance summarises the noise exposure hierarchy as follows, based on the likely average response

Table 1: Noise Exposure Hierarchy Based on Likely Average Response

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, 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.	Significant Observed Adverse Effect	Avoid

Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

3.10 For steady external noise sources, BS8233:2014 states that it is generally desirable that the internal ambient noise level does not exceed the guideline values in Table 2.

Table 2: Indoor ambient noise levels for dwellings

Activity	Location	Daytime 07:00 to 23:00	Night-time 23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

NOTE 1 *Table 2 provides recommended levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Groundborne noise is assessed separately and is not included as part of these targets, as human response to groundborne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.*

NOTE 2 *The levels shown in Table 2 are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the levels recommended in Table 2.*

NOTE 3 *These levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Years Eve.*

NOTE 4 *Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,P}$ depending on the character and number of events per night. Sporadic noise events could require separate values.*

NOTE 5 *If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.*

NOTE 6 *Attention is drawn to the building regulations (30, 31, 32).*

NOTE 7 *Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.*

3.11 For traditional external areas that are used for amenity space, such as gardens and patios, the BS says it is desirable that "*the external noise does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$.*"

3.12 However, due to the nationwide difficulty in satisfying an external noise criterion of 55 dB $L_{Aeq,T}$ in urban areas where transportation noise is prevalent, BS8233:2014 provides an over-arching consideration of how to treat outdoor garden areas in the following way:

"… it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses."

Professional Practice Guidance on Planning & Noise, New Residential Development, May 2017

3.13 The Professional Practice Guidance on Planning & Noise (ProPG), prepared jointly by the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH), seeks to secure good acoustic design for new residential development within England's planning system.

3.14 The guidance includes a framework to enable situations where noise is not an issue to be clearly determined, and to help identify the extent of risk at noisier sites. However, the guidance does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.

3.15 The scope of the guidance is also restricted to sites that are exposed predominantly to noise from transportation sources. Where industrial or commercial noise is present on the site but is "not dominant", its contribution may be included in the noise level used to establish the degree of risk. Where industrial or commercial noise is present on the site and is considered to be "dominant", then the risk assessment should not be applied to the industrial or commercial noise component and regard should be had to the guidance in BS4142:2014.

3.16 The ProPG advocates a 2-stage approach covering:

- Stage 1 – an initial noise risk assessment of the proposed development site;
- Stage 2 – a systematic consideration of four key elements.

3.17 The four key elements to be undertaken in parallel during Stage 2 of the assessment are:

1. demonstrating a "Good Acoustic Design Process";
2. observing internal "Noise Level Guidelines";

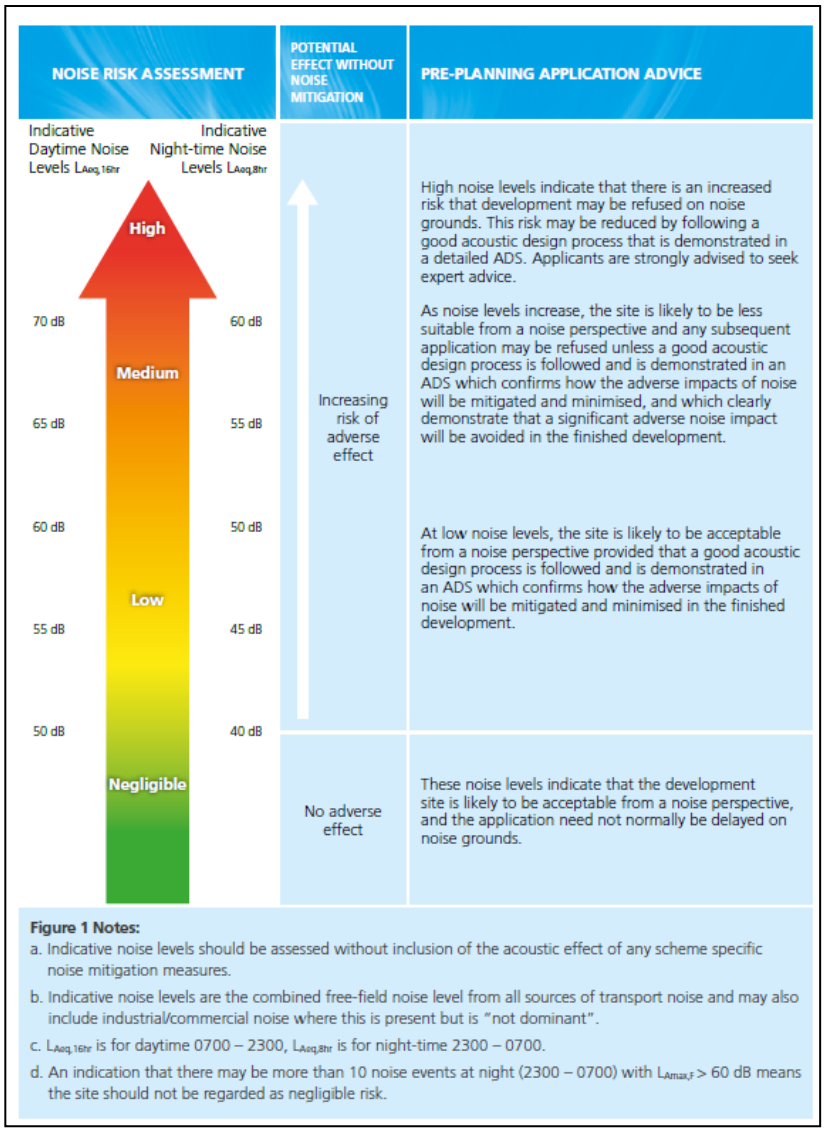
3. undertaking an "External Amenity Area Noise Assessment"; and

4. consideration of "Other Relevant Issues".

3.18 The overall approach is underpinned by the preparation of an "Acoustic Design Statement" (ADS), for which guidance is contained in ProPG Supplementary Document 2, Good Acoustic Design. An ADS for a site assessed as high risk should be more detailed than for a site assessed as low risk, and an ADS should not be necessary for a site assessed as negligible risk. The ProPG's Supplementary Document 1, Planning & Noise Policy Guidance provides additional information regarding other planning guidance.

3.19 The process for the Initial Site Noise Risk Assessment is summarised in Figure 1. The site's day and night-time noise exposures are used to define whether the site falls into a negligible, low, medium or high risk noise category. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds.

Figure 1: Initial Site Noise Risk Assessment



3.20 Elements 1 and 2 of the Stage 2 assessments utilise the noise levels at new dwellings to determine the good acoustic design to avoid 'unreasonable' acoustic conditions and prevent 'unacceptable' acoustic conditions. The internal noise level guidelines used by ProPG are largely those previously set out under BS8233:2014 (Table 2) but with some additional guidance intended to assist with the determination of 'unreasonable' and 'unacceptable' acoustic conditions, which, for clarity, are highlighted by the use of blue italic font in the notes to Table 3.

Table 3: ProPG Internal Noise Level Guidelines

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\,hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\,hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\,hr}$	30 dB $L_{Aeq,8\,hr}$ 45 dB $L_{Amax,F}$ (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).

NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form **(see Section 3.D)**.

3.21 Element 3 of the ProPG's Stage 2 assessment applicable to External Amenity Area Noise Assessment similarly extends the current guidance applicable to outdoor areas in the following manner:

3(i) "If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

3(ii) The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB LAeq,16hr.

3(iii) These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.

3(iv) Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process.

3(v) Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:

- *a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or*
- *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, publicly accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations."*

3.22 The final element of Stage 2 is an assessment of other relevant issues, which may include the following matters:

4(i) "compliance with relevant national and local policy;

4(ii) magnitude and extent of compliance with ProPG;

4(iii) likely occupants of the development;

4(iv) acoustic design v unintended adverse consequences;

4(v) acoustic design v wider planning objectives."

3.23 Upon completion of the ProPG's Stage 1 and 2 assessments, the findings should enable one of four possible recommendations to be presented to the decision maker, namely to grant permission without conditions, grant with conditions, 'avoid' or 'prevent'.

Calculation of Road Traffic Noise 1988

3.24 The Calculation of Road Traffic Noise 1988 (CRTN) is a technical memorandum issued by the Department of Transport and Welsh Office that describes the procedures for calculating road traffic noise. Relevant to this assessment, CRTN contains a method for determining the $L_{A10,18hr}$ noise level, from 18hr AAWT (Annual Average Weekday Traffic) traffic data.

3.25 Using the $L_{A10,18hr}$ noise level, daytime $L_{Aeq,16hr}$ and night-time $L_{Aeq,8hr}$ noise levels can then be calculated using formulae contained within the '*Method for Converting the UK Road Traffic Noise Index LA10,18hr to the EU Noise Indices for Road Noise Mapping'* (2006) and shown in Table 4.

Table 4: $L_{A10,18hr}$ to $L_{Aeq,T}$ Conversions

Time period	Non-motorway conversion
07.00 – 21.00	$L_{day} = 0.95 \times L_{A10\ 18hr} + 1.44$
21.00 – 23.00	$L_{evening} = 0.97 \times L_{A10\ 18hr} - 2.87$
23.00 – 07.00	$L_{night} = 0.90 \times L_{A10\ 18hr} - 3.77$
07.00 – 23.00	$L_{Aeq\ 16hr} = 10_{log10}\ ((12 \times (10^{Lday/10}) + 4 \times (10^{Levening/10})/16)$

4.0 NOISE SURVEY

4.1 Ambient noise levels at the proposed site during the day and night-time were monitored from Wednesday 9th to Thursday 10th September 2020. Noise levels from Funtley Road (Position 1) and the West Coastway Railway Line (Position 2) were monitored continuously over a 24-hour period at approximately 8m from the carriageway edge of the road, and along the eastern site boundary with the railway. Further sample measurements were undertaken along the western site boundary, adjacent to the neighbouring Three Meadows Cattery (Position 3), and along the southern site boundary, approximately 15m from the carriageway edge of the M27 (Position 4). The noise monitoring position is identified in Appendix A.

4.2 Noise levels were recorded using the following equipment, which was calibrated to a reference signal of 94 dB immediately prior to and after the survey and exhibited zero drift.

- Norsonic 140 type 1 sound level meter;
- Svan 971 type 1 sound level meter; and
- Norsonic 1251 acoustic calibrator

4.3 The microphone was positioned at a height of 1.5m in a free-field location, i.e. excluding the effect of reflections from buildings or structures. During the survey period, the weather conditions were sunny and warm, with south westerly winds of 1 m/s during Wednesday, and sunny and warm, with no wind on the Thursday.

4.4 During the survey periods, the predominant noise source affecting the site was at all times road traffic using Funtley Road and the M27, with contributions coming from ongoing construction work to the north of Position 1. At no point was there any audible contributions coming from the neighbouring Three Meadows Cattery, and certainly no dominant noise that would warrant assessment under BS4142.

4.5 The measured noise levels are presented in Appendix D, and are summarised below in Table 5.

Table 5: Measured Noise Levels, Free-field dB(A)

Situation	Time	L_{Aeq}	L_{Amax}	L_{A01}	L_{A10}	L_{A90}
Position 1 Day	1338-2300	59.6	87.7	68.8	59.5	40.4
Position 1 Night	2300-0700	50.7	77.6	50.1	39.9	32
Position 1 Day	0700-1408	59.9	90.8	69.7	62.8	46.6
Position 2 Day	1345-2300	47.2	76.2	52.7	47.7	38.9
Position 2 Night	2300-0700	41.4	62	44.6	40.7	34.9
Position 2 Day	0700-1415	47.5	68	54	49.6	41.8
Position 3	1225-1320	47.1	62.4	53.9	49	41.6
Position 4	1220-1320	66.6	87.2	71.4	68.8	62.9

4.6 The day and night-time $L_{Aeq\ T}$ measured at 8m from the carriageway edge of Funtley Road were 60 dB $L_{Aeq,16hour}$ during the day, and 51 dB $L_{Aeq,8hour}$ at night (rounding to the nearest whole number for assessment purposes), with a night-time L_{Amax} of 78 dB.

4.7 The day and night-time $L_{Aeq\ T}$ measured along the site boundary with the railway line were 61 dB $L_{Aeq,16hour}$ during the day, and 41 dB $L_{Aeq,8hour}$ at night, with a night-time L_{Amax} of 62 dB.

4.8 The measured noise levels at Position 3, adjacent to the neighbouring Three Meadows Cattery were lower, with a daytime $L_{Aeq\ T}$ of 47 dB.

4.9 Noise levels at Position 4 were higher due to monitoring locations proximity to the M27, with a daytime $L_{Aeq\ T}$ measured at 15m from the carriageway edge of the M27 of 67 dB.

5.0 NOISE ASSESSMENT

5.1 Future sound levels across the proposed development site have been established by creating a 3D noise model of the area using Cadna-A noise modelling software, which is used for the prediction and assessment of environmental noise.

5.2 Cadna-A is an internationally accepted suite of software that is used for the prediction and assessment of environmental noise. The software takes account of various inputs, including topography, buildings and road noise sources, and calculates sound levels in accordance with national and international standards; in this case, the relevant UK standards are the procedures set out within the Calculation of Road Traffic Noise (CRTN) 1988, and ISO 9613 'Acoustics – Attenuation of sound during propagation outdoors'. Modelled results are outputted as colour noise contour maps.

5.3 Ground level data has been informed by LIDAR data, provided by the Environmental Agency (https://environment.data.gov.uk/DefraDataDownload/?Mode=survey) and included within the noise model.

5.4 Due to the ongoing world-wide pandemic, and reduced traffic flows associated with the various local lockdowns resulting from COVID-19, baseline Annual Average Daytime Traffic (AADT) flows and % heavy goods vehicles for the M27 adjacent to the site have been obtained from the Department for Transport (DfT) website (https://roadtraffic.dft.gov.uk/#6/55.254/-11.107/basemap-regions-countpoints). This information has been used to calculate noise contributions from the M27 across the site, which resulted in higher noise levels than those measured at Position 4. Therefore, the calculated noise levels from the M27 have been used within the following assessment to define mitigation measures. The DfT count point location is identified in Appendix E. The data is available for a baseline scenario in 2019, and the available information is presented in Table 6.

Table 6: Annual Average Daytime Traffic Flows

Road	Year	AADT	%HGV	kph
M27	2019	89495	6.04	112

5.5 A road's basic noise level (BNL) represents the free–field noise level at a distance of 10m from the carriageway edge based on the traffic flow, the percentage heavy vehicle composition and the average vehicle speeds. Therefore, calculation of the BNL for the M27 will provide an indication of the noise level adjacent to the road, and the calculated BNL is presented in Table 7.

Table 7: Calculated BNL18hour, dB

Road	$L_{A10,18hr}$
M27	83.3

5.6 Using the $L_{A10,18hr}$ noise levels shown in Table 7, daytime $L_{Aeq,16hr}$ and night-time $L_{Aeq,8hr}$ noise levels have been calculated using the formulae presented within Table 4 of Section 3, and the resultant day and night-time $L_{Aeq,T}$ are shown below in Table 8.

Table 8: Calculated/Measured Day and Night-time $L_{Aeq,T}$, dB

Road	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$
M27	80	71.2

5.7 The calculated day and night-time $L_{Aeq,T}$ at 10m from the carriageway edge of the M27 are 80 dB and 71 dB respectively. As a worst case assessment, the daytime L_{Amax} of 87 dB recorded adjacent to the M27 at Position 4, will be utilised within the model to define the night-time L_{Amax} mitigation measures.

5.8 With reference to the noise criteria outlined in Section 3.0, Cadna-A has been used to create noise models for the following scenarios, to predict and assess sound levels across site:

- Daytime $L_{Aeq,16\ hour}$ external sound levels at ground (1.5m) height;
- Night-time $L_{Aeq,8\ hour}$ external sound levels at first floor (4m) height; and
- Night-time L_{Amax} external sound level at first floor (4m) height.

Assessment

5.9 An Initial Site Noise Risk Assessment as required by the ProPG is presented in Table 9. Based on the maximum noise exposure levels recorded on site, the site adjacent to Funtley Road during the day, and the West Coastway Railway Line during the night falls within the category of Low risk, for which the guidance indicates that, *"At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process if followed and is demonstrated in an ADS which confirms how the adverse impact of noise will be mitigated and minimised in the finished development."*

5.10 During the night-time for Funtley Road, and the daytime for the West Coastway Railway Line, the noise exposure increases to a Medium risk, for which the guidance states, *"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 demonstrates that a significant adverse noise impact will be avoided in the finished development."*

Table 9: Initial Site Noise Risk Assessment

Risk Category	Negligible		Low		Medium		High	
Period	Day	Night	Day	Night	Day	Night	Day	Night
ProPG L_{Aeq} threshold dB	<50	<40	50-60	40-50	60-70	50-60	>70	>60
Site Noise Level L_{Aeq} dB, Funtley Road			60			51		
Risk Assessment			**Low**			**Medium**		
Site Noise Level L_{Aeq} dB, Railway				41	61			
Risk Assessment				**Low**	**Medium**			

5.11 The following sections deal with the mitigation measures required by an ADS, namely the acoustic design needed to achieve internal noise level guidelines and the consideration of any other relevant matters.

Mitigation

5.12 As discussed in Section 3.0, BS8233:2014 and ProPG guidance provides recommended guideline values for living rooms, bedrooms and private gardens.

5.13 A summary of noise level criteria is provided below:

- Living rooms (daytime) $L_{Aeq,T}$ 35dB;
- Bedrooms(daytime) $L_{Aeq,T}$ 35dB;
- Bedrooms(night-time) $L_{Aeq,T}$ 30dB;
- Bedrooms (night-time) L_{AFmax} 45dB; and
- Outdoor living areas $L_{Aeq,1hr}$ 55 dB.

External Sound Levels

5.14 The noise criterion often the most difficult to meet adjacent to busy transportation routes is the BS8233 outdoor noise criterion of 55 dB L_{Aeq} applicable to private amenity spaces such as gardens. The daytime $L_{Aeq\ 16hour}$ site noise contour shown on drawing 24695_04_120_02 in Appendix F, indicates that the use of standard 1.8m high close boarded timber fencing along garden boundaries enables the outdoor criteria of 55dB L_{AeqT} to be met for all private gardens across the development site.

5.15 Where fencing is to be used for acoustic screening, the following specification is recommended as a minimum:

- Good quality timber with no warping, knots etc;
- At least 25mm thick in all places;
- Close-boarder and continued across the front of posts to minimise gaps;

- Boards should overlap 25mm as a minimum;
- No gaps should be present between gravel board and the ground; and
- Minimum mass of 10 to 15km/m^3.

Internal Sound Levels

5.16 Internal sound levels for new dwellings closest to Funtley Road, the West Coastway Railway Line and the M27, i.e. at an indicative distance of 5m from the carriageway edge of Funtley Road, 80m from the nearest track of the railway line, and 310m from the carriageway edge of the M27, as shown on the indicative site layout plan provided in Appendix B, would be as shown in Tables 10, 11 and 12.

5.17 The Tables also show the outdoor-to-indoor level difference (L_A) that windows to habitable rooms must provide in order to achieve BS8233's noise limits, e.g. an internal noise level of 35 dB L_{Aeq} during the day for living rooms and 30 dB L_{Aeq} and 45 dB L_{Amax} during the night for bedrooms. The window's required sound reduction index (R) can be calculated from the following equation:

Sound reduction index, $R = L_1 - L_2 + 10\log(S/A)$

Where,	L_1	=	facade noise level;
	L_2	=	internal noise level, e.g. noise standard to be met;
	S	=	surface area of relevant portion of the building envelope, i.e. the window (m^2); and
	A	=	absorption in the room (m^2).

5.18 For a typical example of window area S = 2 m^2 and room absorption A = 10 m^2, and assuming these factors remain constant over the whole frequency range used for sound reduction purposes, the correction to be added to the level difference L_A to derive the sound reduction index R (or R_{TRA} where this is specific to road traffic or other transportation noise) is –7 dB. The sound reduction index may also be presented in terms of the weighted sound reduction index R_W, which is typically between 3 to 7 (average 5) dB higher than R_{TRA}. Therefore, for design purposes, the R_{TRA} will be 7 dB lower than the L_A, and the R_W can be estimated by adding 5 dB to the calculated R_{TRA}.

5.19 The above approach takes account of the sound reduction requirements needed to satisfy the internal noise standards within occupied dwellings, i.e. taking account of the window area and including the absorption that will be present from normal occupation, e.g. with carpets, curtains and furnishings etc. Any compliance monitoring that could take place prior to dwellings being occupied and furnished would need to take account of the loss of room absorption at this stage. That is to say, internal measurements within empty rooms would need to allow 7 dB to compensate for the lack of sound absorption and the reverberations from hard internal surfaces.

Table 10: Internal and External Noise Levels at 5m from Funtley Road, dB

Day L_{Aeq}						Night L_{Aeq}					
Facade	Internal		L_A	R_{TRA}	Vent^n	Facade	Internal		L_A	R_{TRA}	Vent^n
	Windows closed	Windows partly open					Windows closed	Windows partly open			
64	31	49	29	22	Yes	54	21	39	24	17	Yes
						Night L_{Amax}					
						82	49	67	37	30	Yes

Notes:
1. Façade noise level includes +3 dB correction for façade reflection effects.
2. Internal noise level with windows closed assumes 33 dB(A) reduction for thermal double glazed windows as per old PPG24.
3. Internal noise level with windows partly open assumes 15 dB(A) reduction as per WHO guidelines.
4. The minimum required sound level difference L_A is derived from the façade noise level minus the internal noise limit, i.e. BS8233's noise levels.
5. The minimum required sound reduction index, R_{TRA} is derived from the level difference L_A minus 7.
6. The need for ventilation is determined by whether the internal noise level can be met with windows partly open for ventilation.

5.20 For new dwellings facing Funtley Road at an indicative distance of 5m from the carriageway edge, the noise levels in Table 10 show that in order to achieve BS8233's internal L_{Aeq} and L_{Amax} noise levels, windows will need to provide a minimum sound reduction (R_{TRA}) of 22 dB for living rooms, and 30 dB for bedrooms. Data for the sound insulation performance of different window configurations in Appendix G, indicates that appropriate window designs capable of providing sound reductions of 22 dB and 30 dB are normal thermal double glazing having a configuration of 4/12/4 or 4/16/4 for living rooms, and a configuration 6/12/7 in acoustic laminate for bedrooms, where the information is presented in terms of the thickness of one pane of glass in mm, followed by the size of the air gap, followed by the thickness of the second pane of glass. Window manufacturers will be able to provide certification showing which of their window designs are capable of achieving the required sound reductions.

5.21 Background ventilation must be provided in accordance with the Building Regulations Approved Document F. To achieve this, window mounted trickle vents or through-wall ventilators that are acoustically attenuated to provide an equivalent sound reduction to the glazing may be installed.

5.22 The ProPG recommends that "*Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however, any facade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the 'open' position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded*". This means that the acoustic vent when 'open' should provide a sound reduction no less than that provided by the window.

5.23 With regard to the sound reduction performance of the acoustic ventilator, which is commonly presented as a $D_{n,e,w}$ rating, it is not possible to give a direct conversion between the $D_{n,e,w}$ and R_{TRA} or R_w ratings applicable to windows because these will vary from one product to another and from

one composite wall arrangement to another. The $D_{n,e,w}$ is the weighted average composite loss of a typical wall with the vent installed - the sound reduction (R) of the vent alone is likely to be less. Therefore, when selecting a vent based upon the $D_{n,e,w}$ value it is always necessary to go for one that gives a value higher than the R_{TRA} or R_w needed for the window. As a rough guide, the R_w can range from being 5 to 10 dB lower than the $D_{n,e,w}$ therefore, if the vent is selected with a $D_{n,e,w}$ at least 7 dB higher than the required R_w for the window then this should not lessen the sound reduction performance of the window.

5.24 For example, for normal thermal double glazed windows providing an R_{TRA} of 25 dB, which equates to an R_w of approximately 30 dB, the vent, when open, should be selected to at least provide 37 dB $D_{n,e,w}$, i.e. window R_{TRA} + 5 = R_w; R_w + 7 = required minimum $D_{n,e,w}$, whereas the equivalent acoustic vent for a window providing 30 dB R_{TRA} should be capable of providing at least 42 dB $D_{n,e,w}$ when open .

5.25 For new dwellings adjacent to the railway, the noise levels in Table 11 show that in order to achieve BS8233's internal L_{Aeq} and L_{Amax} noise levels, windows will need to provide a minimum sound reduction (R_{TRA}) of no more than 22 dB R_{TRA}. Therefore, normal thermal double glazing having a configuration of 4/12/4 or 4/16/4, coupled with an acoustic vent providing a sound reduction of 37 dB $D_{n,e,w}$ when open will be more than sufficient to enable all internal noise standards to be achieved.

Table 11: Internal and External Noise Levels at 80m from the Railway, dB

Day L_{Aeq}						Night L_{Aeq}					
Facade	Internal		L_A	R_{TRA}	Vent^n	Facade	Internal		L_A	R_{TRA}	Vent^n
	Windows closed	Windows partly open					Windows closed	Windows partly open			
57	24	42	22	15	Yes	50	17	35	20	13	Yes
						Night L_{Amax}					
						74	41	59	29	22	Yes

5.26 For new dwellings overlooking the M27 at a distance of approximately 310m, the noise levels in Table 12 show that in order to achieve BS8233's internal L_{Aeq} and L_{Amax} noise levels, windows will need to provide a minimum sound reduction (R_{TRA}) of no more than 15 dB R_{TRA}. Once again, normal thermal double glazing having a configuration of 4/12/4 or 4/16/4, coupled with an acoustic vent providing a sound reduction of 37 dB $D_{n,e,w}$ when open will be more than sufficient to enable all internal noise standards to be achieved.

Table 12: Internal and External Noise Levels at 310m from the M27, dB

Day L_{Aeq}						Night L_{Aeq}					
Facade	Internal		L_A	R_{TRA}	Vent^n	Facade	Internal		L_A	R_{TRA}	Vent^n
	Windows closed	Windows partly open					Windows closed	Windows partly open			
57	24	42	22	15	Yes	50	17	35	20	13	Yes
						Night L_{Amax}					
						65	32	50	20	13	Yes

5.27 Dwellings further into the site will experience lower noise levels due to the additional distance attenuation and screening provided by new dwellings adjacent Funtley Road, the West Coastway Railway Line and the M27. As a consequence, acceptable internal noise levels will be achieved using normal thermal double glazing, and the outdoor noise criterion will be met at all locations.

Summary

5.28 The above acoustic design statement demonstrates that relevant recommended external and internal noise standards can be met within the proposed development, and there are no other outstanding noise issues. Therefore, the overall conclusion of the noise assessment is that the decision maker may grant planning permission with conditions where appropriate.

6.0 CONCLUSIONS

6.1 Mewies Engineering Consultants Ltd (M-EC Acoustic Air) has been commissioned by Reside Developments Ltd (Dorking) to prepare a noise assessment for the proposed residential development on land at Funtley Road, Hampshire.

6.2 An Initial Site Noise Risk Assessment required by the ProPG, shows that the site adjacent to Funtley Road during the day, and the West Coastway Railway Line during the night falls within the category of Low risk, for which the guidance indicates that, *"At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process if followed and is demonstrated in an ADS which confirms how the adverse impact of noise will be mitigated and minimised in the finished development."*

6.3 During the night-time for Funtley Road, and the daytime for the West Coastway Railway Line, the noise exposure increases to a Medium risk, for which the guidance states, *"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 demonstrates that a significant adverse noise impact will be avoided in the finished development."*

6.4 The proposed general mitigation strategy for the site includes all or a combination of:

- Selection of glazing, acoustically attenuated ventilation and building fabric with a sufficient sound reduction index; and
- Installation of 1.8m high acoustically sound fencing at garden boundaries having an unscreened, or partial unscreened view to Funtley Road, the West Coastway Railway Line and the M27.

6.5 The assessment confirms that a good standard of acoustic design, in accordance with the latest ProPG guidance can be achieved, using reasonable and practicable design measures.

6.6 It is considered that with the implementation of the specified mitigation strategy, sound levels across the proposed development can be readily attenuated to achieve acceptable external and internal sound levels.

APPENDIX A

M-EC
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

SITE LOCATION PLAN & NOISE MONITORING POSITIONS

Project: **Funtley Road, Funtley**

File Ref: **24695**

O.S. Grid Ref: **455826,108304**

APPENDIX B

FUNTLEY ROAD

Community shop and hall

Play Area (LEAP)

Community Park

MP 83

1 Plan View

Scale: 1:1000

m 0 10 20 30 40 50 60 70 80 90 100
Scale 1:1,000

REV	DATE	DRAWN/CHECKED	DESCRIPTION
P1	30.09.20	DO/RR	Planning issue

STATUS: PLANNING ISSUE

PROJECT: RD173 Funtley Road, Fareham

DRAWING: Illustrative masterplan

DATE	DRAWN/CHECKED	SCALE @ A1	DRAWING NO.	REVISION NO.
02.09.20	DO/RR	1:1000	RD1731-F3-L100	P1

Rummey design

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Masterplanners • Urban Designers • Landscape Architects

APPENDIX C

DESCRIPTION OF NOISE UNITS

- The sounds that we hear are a result of successive air pressure changes. These air pressure changes are generated by vibrating sources, such as motor vehicle engines, and they travel to a receiver, i.e. the human ear, as air pressure waves.

- The human ear is capable of detecting a vast range of air pressures, from the lowest sound intensity that the normal ear can detect (about 10^{-12} watts/m^2) to the highest that can be withstood without physical pain (about 10 watts/m^2). If we were to use a linear scale to represent this range of human sensitivity it would encompass a billion units. Clearly this would be an unmanageable scale yielding unwieldy numbers.

- The scale can be compressed by converting it to a logarithmic or Bel scale, the number of Bels being the logarithm to the base 10 of one value to another (as applied by Alexander Graham Bell to measure the intensity of electric currents). The Bel scale gives a compressed range of 0 to 12 units which in practice is a little too compressed. A change of 1 Bel represents a doubling or halving of loudness to the average listener. A more practical operating range of 0 to 120 is obtained by multiplying by 10, i.e. 10 x Bel, which produces the scale units known as decibels or dB.

- Examples of typical sound intensity levels within the decibel range of 0 to 120 dB are listed below:

Four engine jet aircraft at 100m	120 dB
Riveting of steel plate at 10m	105 dB
Pneumatic drill at 10m	90 dB
Circular wood saw at 10m	80 dB
Heavy road traffic at 10m	75 dB
Telephone bell at 10m	65 dB
Male speech, average at 10m	50 dB
Whisper at 10m	25 dB
Threshold of hearing, 1000 Hz	0 dB

- Due to this logarithmic scale noise levels have to be combined logarithmically rather than arithmetically. For example, two equal sound sources of 70 dB each, when operated simultaneously, do not produce a combined level of 140 dB but instead result in a level of 73 dB, i.e. a rise of 3 dB for each doubling of sound intensity. Subjectively, a 3 dB change does not represent a doubling or halving of loudness; to make a sound appear twice as loud requires an increase in sound pressure level of about 10 dB.

- The sensitivity of the human ear to different acoustic frequencies of sound can be taken into account when measuring or calculating noise by applying a filter or weighting which equates to the frequency response of the human ear. This is referred to as an A-weighting and when applied results in noise levels expressed as dB(A). dB(A) noise levels reflect the human perception of loudness.

- Due to the often broadband and variable nature of environmental noises such as traffic, people exposed to different levels of noise do not make consistently different judgements about the noise climate until the difference in average noise level is about 3 dB(A). This is equivalent to a doubling of sound energy or, for example, a doubling of traffic flow. However, individuals are able to detect much lesser changes in noise exposure in any given situation and under ideal conditions can detect differences of as little as 1dB.

- Noise levels that fluctuate over time can be measured using a variety of noise indices. One index that correlates fairly well with community annoyance due to road traffic noise is the $L_{A10\ (18\text{-hour})}$ noise index. The L_{A10} is the A-weighted sound level exceeded for 10% of the time, and the $L_{A10\ (18\text{-hour})}$ is the arithmetic mean of the 18 hourly L_{A10} values during the period 6am to midnight (0600 to 2400 hours).

- An alternative index used in the UK to characterise intermittent sources of noise such as railways or construction sites is the equivalent continuous noise level, L_{Aeq}. It is a measure of the total sound energy generated by a fluctuating sound signal within a given time period and can be derived by 'spreading' the total sound energy evenly over the same time period as the fluctuating signal, hence the term 'equivalent continuous noise level'.

- Other useful noise units include the L_{Amax}, which is the maximum A-weighted sound level often used to characterise single events, and the L_{A90} which is the level of noise exceeded for 90% of the time and is an indicator of the background noise levels in the absence of specific sources such as traffic.

APPENDIX D

Noise Measurements

Date	Time	L_{Aeq}	L_{Amax}	L_{A01}	L_{A10}	L_{A90}
Position 1 Day						
09/09/2020	13:38:54	59	77.3	69.3	63.8	45
09/09/2020	13:43:54	59.6	69.8	68.2	64.2	46.8
09/09/2020	13:48:54	56.9	67.6	66	61.5	47.8
09/09/2020	13:53:54	58.2	68.5	66.6	61.9	47.3
09/09/2020	13:58:54	59.9	68.8	67.7	64.3	49.5
09/09/2020	14:03:54	61.8	76.9	69.9	65.7	48.7
09/09/2020	14:08:54	60.4	68.2	66.8	65	50
09/09/2020	14:13:54	56.7	66.6	65.4	60.2	49.1
09/09/2020	14:18:54	59	69.7	67	63.4	49.1
09/09/2020	14:23:54	59.6	73	71.8	63.4	49
09/09/2020	14:28:54	59	69.6	68.2	63.6	48.6
09/09/2020	14:33:54	61.7	74.2	72.2	65.4	49.6
09/09/2020	14:38:54	60.8	74	72.4	63.3	51.3
09/09/2020	14:43:54	59.2	70.4	68.5	63.1	49
09/09/2020	14:48:54	58.9	69.9	67.5	64.4	49.2
09/09/2020	14:53:54	56.9	68.3	66.5	61.1	48.3
09/09/2020	14:58:54	62.5	87.7	71.2	66.2	49.6
09/09/2020	15:03:54	59	72.9	70	63.3	47.5
09/09/2020	15:08:54	59.5	70.9	68.8	64.6	48.9
09/09/2020	15:13:54	60.1	72.9	70.6	64.6	49.3
09/09/2020	15:18:54	58.6	71.6	68.6	63.4	48.4
09/09/2020	15:23:54	59.4	77.2	70.2	63.1	49.6
09/09/2020	15:28:54	58.6	70.9	68.2	63.5	48.5
09/09/2020	15:33:54	59.3	70.5	68.8	64.2	48.3
09/09/2020	15:38:54	59.1	72.2	69.6	63.6	50
09/09/2020	15:43:54	60	72.2	70.5	65.5	48.6
09/09/2020	15:48:54	60.3	73.7	70	64.8	50.3
09/09/2020	15:53:54	62.5	82.3	75.6	64	50
09/09/2020	15:58:54	62.1	76	71.7	66.5	49.6
09/09/2020	16:03:54	62.8	74.8	72.9	67.7	49.5
09/09/2020	16:08:54	60	76.3	70.5	63.9	49.6
09/09/2020	16:13:54	59.4	73.6	69.5	64.1	48.4
09/09/2020	16:18:54	62.4	76.1	73.5	66.7	48.9
09/09/2020	16:23:54	68.2	79.2	78.4	73	49.3
09/09/2020	16:28:54	68.5	79.8	78.8	73.1	52.9
09/09/2020	16:33:54	68.8	79.9	79	74	49.1
09/09/2020	16:38:54	60.3	75.3	70.8	65.2	45.9
09/09/2020	16:43:54	59.6	72.3	69.5	65.1	45.3
09/09/2020	16:48:54	59.3	75.5	70.2	64.4	41.4
09/09/2020	16:53:54	60.5	74	70.9	66	44.1
09/09/2020	16:58:54	60.5	74	70.5	65.1	45.6
09/09/2020	17:03:54	62.8	82.5	72.7	66.1	42.6
09/09/2020	17:08:54	60.8	73.5	70.9	65.5	45.6

09/09/2020	17:13:54	62.5	75	72.5	67.5	40.6
09/09/2020	17:18:54	61.7	74	71.3	66.9	40.1
09/09/2020	17:23:54	61.8	78.1	71.7	67.2	40
09/09/2020	17:28:54	61.2	73.6	71.5	66.7	40
09/09/2020	17:33:54	61.3	74	71.3	66.3	41.4
09/09/2020	17:38:54	62.2	75.7	72.7	67.2	40.8
09/09/2020	17:43:54	61	73.7	71.4	66.3	42
09/09/2020	17:48:54	59.9	73.1	70.9	65.1	40.9
09/09/2020	17:53:54	63.5	78.8	73.8	68.4	41.3
09/09/2020	17:58:54	60.3	76.2	71.4	65.2	40.1
09/09/2020	18:03:54	59.5	73.8	70.9	63.9	41
09/09/2020	18:08:54	60.5	74.1	71.4	65.4	41.2
09/09/2020	18:13:54	59.2	74.4	69.8	64.3	40.5
09/09/2020	18:18:54	59.5	73.1	70.4	64	41.1
09/09/2020	18:23:54	60.6	76.4	71.1	65.3	43.1
09/09/2020	18:28:54	59.6	72.3	70.2	64.4	43.2
09/09/2020	18:33:54	58.8	71.8	70.1	63.2	43.2
09/09/2020	18:38:54	58.3	74.7	70.1	62	42.4
09/09/2020	18:43:54	57.9	73.6	70.3	61	42.8
09/09/2020	18:48:54	61	75.4	71.8	66.3	42.3
09/09/2020	18:53:54	57.5	72.5	70.1	60	42.5
09/09/2020	18:58:54	58.5	73.4	70.7	62.8	41.5
09/09/2020	19:03:54	57.9	71.7	70	61.6	39.9
09/09/2020	19:08:54	58.1	73.4	70.9	60.4	39.3
09/09/2020	19:13:54	55.5	70.2	68.4	57.8	37.2
09/09/2020	19:18:54	59	72.2	70.2	63.4	37.3
09/09/2020	19:23:54	59.8	74.5	70.8	64.6	36.4
09/09/2020	19:28:54	58.6	72.8	70.9	62.4	35.3
09/09/2020	19:33:54	56.5	74.7	69.2	59.5	35.4
09/09/2020	19:38:54	56.8	71.7	69.4	59.5	35.6
09/09/2020	19:43:54	59.2	76.3	72.1	62	35.7
09/09/2020	19:48:54	55.5	74.1	68.8	57	34
09/09/2020	19:53:54	54	70.7	67.9	54.2	35.4
09/09/2020	19:58:54	55.2	72.6	68.5	56.3	34.8
09/09/2020	20:03:54	55.8	78.5	68.1	50.1	33.3
09/09/2020	20:08:54	56.3	73.4	70.3	56.8	32.1
09/09/2020	20:13:54	55.5	73.8	70.3	50.8	31.2
09/09/2020	20:18:54	52.2	71.1	67	52.5	30.6
09/09/2020	20:23:54	54.8	70	68.3	56.9	31.8
09/09/2020	20:28:54	56.5	73.6	70.5	58.6	31.2
09/09/2020	20:33:54	55.8	77.8	67.4	54.5	29.3
09/09/2020	20:38:54	51.5	71	67	48.4	30.5
09/09/2020	20:43:54	58.4	81.9	71.1	53	30.3
09/09/2020	20:48:54	52.6	71	66.8	50.8	30.1
09/09/2020	20:53:54	57	74.7	70.8	58.1	30.9
09/09/2020	20:58:54	52.7	69.3	67	52.1	31.4

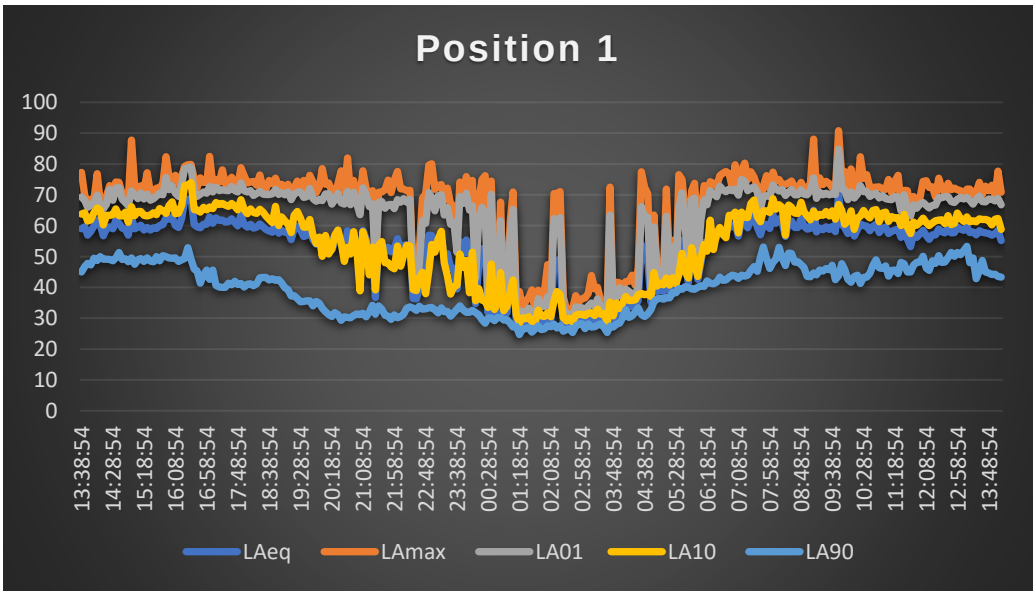
09/09/2020	21:03:54	48.7	70	63.6	38.9	31.2
09/09/2020	21:08:54	58.5	77.8	72.3	58.1	31.6
09/09/2020	21:13:54	55.8	72.1	70.2	54.5	30.5
09/09/2020	21:18:54	50.2	70	66.2	44.1	32
09/09/2020	21:23:54	52.8	71.4	67.1	53.1	34.2
09/09/2020	21:28:54	36.7	47.6	46.5	39.2	31.3
09/09/2020	21:33:54	53.5	70.8	67.5	53.5	34
09/09/2020	21:38:54	54	70.9	67.8	54.8	32.9
09/09/2020	21:43:54	51.4	71.7	65.6	48	31
09/09/2020	21:48:54	53	74.8	66.8	48	30.7
09/09/2020	21:53:54	51.5	70.7	66.9	46.6	29.6
09/09/2020	21:58:54	52.7	74.8	65.5	46	31.1
09/09/2020	22:03:54	55.8	77.6	68.4	53.4	30.2
09/09/2020	22:08:54	52.2	72	67.6	46.9	30.6
09/09/2020	22:13:54	53.6	71.9	68.8	50.3	31.3
09/09/2020	22:18:54	53.8	71.4	67.6	53.6	33.3
09/09/2020	22:23:54	53.6	71.5	68.5	53.4	33.7
09/09/2020	22:28:54	36.4	43.6	42.6	39.3	33.3
09/09/2020	22:33:54	36.3	49.8	42	39	32.5
09/09/2020	22:38:54	39.5	51.9	47.3	43.1	33.9
09/09/2020	22:43:54	48.1	69	61.7	44.9	33
09/09/2020	22:48:54	48	70.3	60.8	37.9	33.1
09/09/2020	22:53:54	56.9	79.7	70.7	45.4	33.4
09/09/2020	22:58:54	56.8	80.1	69.1	53.9	33.5
Average		59.6	72.7	68.8	59.5	40.4
Maximum		68.8	87.7	79	74	52.9
Position 1 Night-time						
09/09/2020	23:03:54	51.9	71.8	64.8	51.4	32.7
09/09/2020	23:08:54	55	73	69.7	55.7	31.7
09/09/2020	23:13:54	56.2	73.3	70	58.2	33.4
09/09/2020	23:18:54	49.8	68.3	63.5	48	32.1
09/09/2020	23:23:54	50.9	72.2	65.8	43.6	32.2
09/09/2020	23:28:54	46.3	67	60.5	37.8	30.7
09/09/2020	23:33:54	46.1	66.5	61.2	40.2	31.8
09/09/2020	23:38:54	39.5	57.2	51.3	40.7	32.9
09/09/2020	23:43:54	54.8	74.1	69.5	50.8	34
09/09/2020	23:48:54	50.9	69.7	67.2	46.4	32.7
09/09/2020	23:53:54	55.4	75.9	70.5	48.7	31.9
09/09/2020	23:58:54	50.7	72.2	65	38.2	31.9
10/09/2020	00:03:54	52.7	74.7	66.5	51.4	32.5
10/09/2020	00:08:54	34.7	47	42.8	35.7	31.8
10/09/2020	00:13:54	47.4	68.3	62	39.6	31.1
10/09/2020	00:18:54	52.5	75	66	35.9	29.5
10/09/2020	00:23:54	52.8	76.2	64	35.5	28.4
10/09/2020	00:28:54	31.8	37	35.8	33.5	30
10/09/2020	00:33:54	54.6	74.5	70.2	47.6	30

10/09/2020	00:38:54	31.1	37.6	34.9	32.8	29.2
10/09/2020	00:43:54	32.9	42.8	39.1	34.9	30.3
10/09/2020	00:48:54	47	67.6	61.6	44.8	30.4
10/09/2020	00:53:54	31	36.2	34.2	32.4	29.4
10/09/2020	00:58:54	31.7	37.3	35.3	33.9	29.5
10/09/2020	01:03:54	41.5	61.2	56.4	38.3	28.4
10/09/2020	01:08:54	50.2	70.9	65.3	42.4	27.1
10/09/2020	01:13:54	29.4	35.8	33.7	31.1	27.3
10/09/2020	01:18:54	26.9	38.7	31.8	28.4	24.7
10/09/2020	01:23:54	28.6	33.4	32.2	30.1	26.6
10/09/2020	01:28:54	28.3	35.5	30.9	29.8	26.6
10/09/2020	01:33:54	28.8	36.7	33.3	30.5	26.9
10/09/2020	01:38:54	27.4	39.2	30.2	28.9	25.5
10/09/2020	01:43:54	27.8	31.7	30.2	28.9	26.5
10/09/2020	01:48:54	30.3	39.1	36.4	32.6	27.6
10/09/2020	01:53:54	29.1	36.4	34	30.8	26.3
10/09/2020	01:58:54	28.8	38.8	33.8	30.6	26.5
10/09/2020	02:03:54	30.4	47.4	37	31.8	27.6
10/09/2020	02:08:54	29.1	36.4	33.7	30.5	27.2
10/09/2020	02:13:54	48.9	70.4	62.3	35.7	28.1
10/09/2020	02:18:54	47.9	70.4	61	38.7	26.8
10/09/2020	02:23:54	49.4	71	62.6	37.6	27.6
10/09/2020	02:28:54	28.4	37	33.9	30.1	25.8
10/09/2020	02:33:54	27.9	32.8	30.6	29.1	26.3
10/09/2020	02:38:54	28.3	32.8	31.4	29.9	26.6
10/09/2020	02:43:54	27.4	33.3	30.4	28.8	25.4
10/09/2020	02:48:54	29.5	37.3	33.7	31	27.4
10/09/2020	02:53:54	29.9	35.3	33.5	31.3	28.2
10/09/2020	02:58:54	29.9	36.4	33.4	31.2	28.2
10/09/2020	03:03:54	28.8	36.6	32.7	30.9	26.6
10/09/2020	03:08:54	30	38	33.9	31.6	28.2
10/09/2020	03:13:54	29.9	43.8	34.9	31.8	27.1
10/09/2020	03:18:54	29.3	39.5	33.9	30.9	27.2
10/09/2020	03:23:54	30.8	40	36.3	32.9	27.8
10/09/2020	03:28:54	29.9	35.7	33.6	31.3	28.2
10/09/2020	03:33:54	29.6	34.5	33.4	31.5	27
10/09/2020	03:38:54	27.2	34.6	30.4	28.7	25.4
10/09/2020	03:43:54	49.9	72.5	63.5	35.2	27.5
10/09/2020	03:48:54	29.1	33.2	32.2	30.8	27.1
10/09/2020	03:53:54	32	41.7	37.8	34.9	28.1
10/09/2020	03:58:54	31.7	41.5	39.9	33.2	28.4
10/09/2020	04:03:54	33.1	40.2	36.6	35.1	30.3
10/09/2020	04:08:54	35.1	41.9	39.4	37	32.7
10/09/2020	04:13:54	33.7	42	38.7	35.8	30.3
10/09/2020	04:18:54	33.8	44	37.9	35.8	30.8
10/09/2020	04:23:54	34.1	40.6	37.7	36	32

10/09/2020	04:28:54	35.8	46.3	39.9	37.6	33.4
10/09/2020	04:33:54	53.9	77.5	66.2	38	31.2
10/09/2020	04:38:54	49.5	72.5	62.5	37.6	30.6
10/09/2020	04:43:54	48.5	70.3	62.7	37.8	31.4
10/09/2020	04:48:54	35.1	40.2	38.8	37	32.8
10/09/2020	04:53:54	45.4	63.5	59.6	44.8	35.3
10/09/2020	04:58:54	38.7	46.2	43.6	40.4	36.3
10/09/2020	05:03:54	39.4	45.8	42.8	41.4	36.5
10/09/2020	05:08:54	38.7	45.9	42.6	40.8	36.2
10/09/2020	05:13:54	49.8	71.9	63	43	36.7
10/09/2020	05:18:54	38.9	46.8	42.8	40.7	36.6
10/09/2020	05:23:54	42.4	55.3	53.2	43.1	38.3
10/09/2020	05:28:54	39.8	44.3	42.5	41.1	38.2
10/09/2020	05:33:54	53.5	76.5	65.6	44.1	39.6
10/09/2020	05:38:54	55.2	75	70.6	51	39.4
10/09/2020	05:43:54	46.7	64.6	59.6	45.2	40.2
10/09/2020	05:48:54	41.7	48	45	43	40
10/09/2020	05:53:54	53.9	71.3	68.3	52.9	39.5
10/09/2020	05:58:54	53.8	73.7	69	47.9	39.4
10/09/2020	06:03:54	42.6	60.9	48.8	43.5	40
10/09/2020	06:08:54	48.1	64	61.8	49.6	40.5
10/09/2020	06:13:54	54.5	73	68.4	53.9	40.3
10/09/2020	06:18:54	52.7	70.7	66.8	51.7	42.1
10/09/2020	06:23:54	58.6	74.3	71.3	61.8	41.4
10/09/2020	06:28:54	55.3	73.7	70.4	52.3	41.1
10/09/2020	06:33:54	56.3	72.7	69.4	57.5	41.7
10/09/2020	06:38:54	58.9	76.2	72.8	59.4	43.3
10/09/2020	06:43:54	58.2	77	71.7	57.2	42.3
10/09/2020	06:48:54	57.5	77.6	71	56.1	42.4
10/09/2020	06:53:54	59.9	76.8	71.9	63.4	43.3
10/09/2020	06:58:54	59.6	72.4	71.3	63.3	43.9
Average		50.7	54.8	50.1	39.9	32
Maximum		59.9	77.6	72.8	63.4	43.9
Position 1 Day						
10/09/2020	07:03:54	60.6	79.8	71.8	64.4	43.7
10/09/2020	07:08:54	56.6	71.7	69.9	57.7	42.9
10/09/2020	07:13:54	61.9	78.1	75	64.4	44
10/09/2020	07:18:54	61.1	80.3	74.4	62.7	43.6
10/09/2020	07:23:54	59.3	74.9	71.3	62.6	43.9
10/09/2020	07:28:54	62	77.5	72.1	67.2	45.5
10/09/2020	07:33:54	63.1	75.7	72.6	68.3	46.8
10/09/2020	07:38:54	59.5	72.7	70.9	62.9	45.2
10/09/2020	07:43:54	57	66.6	65.3	61.3	49.9
10/09/2020	07:48:54	60.2	72.8	69.5	64.8	53.1
10/09/2020	07:53:54	60.5	76.2	69.7	64.8	49.3
10/09/2020	07:58:54	59.1	72	69.5	64.3	46.1

10/09/2020	08:03:54	63.5	77.4	73.2	68.8	48.1
10/09/2020	08:08:54	60.8	74.7	72	65.3	49.1
10/09/2020	08:13:54	62.2	75	71.2	66.8	53
10/09/2020	08:18:54	60.9	73.3	71.7	65.9	49.5
10/09/2020	08:23:54	56.5	73.4	69.8	56.9	47.1
10/09/2020	08:28:54	61.5	73.8	70.8	66.7	51.1
10/09/2020	08:33:54	61.5	74.5	71.8	65.9	51
10/09/2020	08:38:54	59.4	72.4	70	64.1	48.2
10/09/2020	08:43:54	59.4	72.1	70	64	48.3
10/09/2020	08:48:54	62.2	74	71.7	67.6	47.4
10/09/2020	08:53:54	59.8	72.1	70.2	64.5	46.4
10/09/2020	08:58:54	58.9	71.7	70	63.2	43.5
10/09/2020	09:03:54	59.1	73.8	71.5	61.9	43.4
10/09/2020	09:08:54	65	88.1	75.5	64.7	44.7
10/09/2020	09:13:54	58	70.8	68.9	62.7	44.1
10/09/2020	09:18:54	59.2	75.5	70.8	63.7	45.6
10/09/2020	09:23:54	58.7	73.3	70	63.4	45.3
10/09/2020	09:28:54	59.6	74.4	70.5	64.6	46.1
10/09/2020	09:33:54	58.8	73.6	70	63.2	45.7
10/09/2020	09:38:54	59.7	72.4	70.4	64.8	47.2
10/09/2020	09:43:54	58.1	71.5	70.1	62.1	42.5
10/09/2020	09:48:54	70.2	90.8	84.8	66.9	43.7
10/09/2020	09:53:54	60.5	76.1	72	64.9	47.7
10/09/2020	09:58:54	59.3	77.6	71.5	60.5	45.8
10/09/2020	10:03:54	57.4	71.1	68.4	61.6	42.6
10/09/2020	10:08:54	60.3	78.4	70.9	64.8	41.7
10/09/2020	10:13:54	56.6	71.7	69	58.8	43.5
10/09/2020	10:18:54	58.8	71.9	70.2	62.5	43.9
10/09/2020	10:23:54	60.6	82.3	73	63	41.3
10/09/2020	10:28:54	60	75.3	71	64.9	43.2
10/09/2020	10:33:54	59.8	76.5	71.1	63.5	43.3
10/09/2020	10:38:54	58.4	72.2	69.5	62.5	44.6
10/09/2020	10:43:54	59.7	72.4	70.1	64.9	47.1
10/09/2020	10:48:54	60.5	72.5	70.5	65.2	48.9
10/09/2020	10:53:54	57.8	72.6	69	61.3	46.3
10/09/2020	10:58:54	59.2	72	69.8	64.1	46.1
10/09/2020	11:03:54	59.5	71.8	68.8	64.4	47
10/09/2020	11:08:54	57.4	75	68.5	61.4	43.6
10/09/2020	11:13:54	58.2	70.6	68.4	62.9	45.5
10/09/2020	11:18:54	58.6	74.5	69.5	62.4	45.6
10/09/2020	11:23:54	58.9	76.3	69.3	62.6	44.5
10/09/2020	11:28:54	56.2	67.1	64.8	60	48.1
10/09/2020	11:33:54	58.7	71.5	70	63.7	47.6
10/09/2020	11:38:54	55.7	71.4	65.4	59.5	45
10/09/2020	11:43:54	53.2	64.5	63.1	57.4	45
10/09/2020	11:48:54	57.2	69.5	66.8	61.2	47.2

10/09/2020	11:53:54	56.2	67.5	65.6	60.1	48.1
10/09/2020	11:58:54	57.3	69	67	61.1	48.2
10/09/2020	12:03:54	58.5	74.4	67.5	62.4	50.1
10/09/2020	12:08:54	56.8	74.6	66.6	61	46.2
10/09/2020	12:13:54	55.6	72.4	65.7	60	45.5
10/09/2020	12:18:54	57	72.6	66.6	60.9	48.6
10/09/2020	12:23:54	57	69.3	66.7	61.6	47.8
10/09/2020	12:28:54	58.9	75.4	69.1	61.8	50.3
10/09/2020	12:33:54	58.1	72.1	69.1	61.9	48.1
10/09/2020	12:38:54	57.7	70.6	69.4	60.7	48.2
10/09/2020	12:43:54	59.2	73.7	69.5	63.3	49.7
10/09/2020	12:48:54	57.7	71.7	67.8	60.3	51.3
10/09/2020	12:53:54	57.8	72.2	67.5	60.8	50.1
10/09/2020	12:58:54	59.6	71.7	68.5	64.1	51.3
10/09/2020	13:03:54	58.9	71.3	69.2	62.3	50.6
10/09/2020	13:08:54	58.5	69.7	68.7	61.4	51.9
10/09/2020	13:13:54	59.7	71.9	69.2	62.8	53.3
10/09/2020	13:18:54	57.8	71.9	68.2	61.3	48
10/09/2020	13:23:54	58	70.2	67	61.6	49.6
10/09/2020	13:28:54	57	70.9	68.5	61.3	42.8
10/09/2020	13:33:54	58.4	74	69.6	62.2	45.4
10/09/2020	13:38:54	57.9	70	67.8	62	48.7
10/09/2020	13:43:54	57.7	72.8	67.7	62	45
10/09/2020	13:48:54	57.4	71.3	68.7	61.7	44.7
10/09/2020	13:53:54	56.9	73.1	68.5	60.2	44.2
10/09/2020	13:58:54	57.4	69.8	68	62.1	44.3
10/09/2020	14:03:54	58.5	77.7	68.9	62.3	43.5
10/09/2020	14:08:54	55.2	70.8	66.8	58.8	43.3
Average		59.9	73.4	69.7	62.8	46.6
Maximum		70.2	90.8	84.8	68.8	53.3



Date	L_{Aeq}	L_{Amax}	L_{A01}	L_{A10}	L_{A90}
Position 2 Day					
(2020/09/09 13:45:01.00)	48.3	59.7	57.4	51.3	42.5
(2020/09/09 13:50:01.00)	47.8	59.8	58.6	48.6	43.2
(2020/09/09 13:55:02.00)	46	60.9	52.6	48.4	42
(2020/09/09 14:00:01.00)	46.9	54.2	52	48.7	43.9
(2020/09/09 14:05:01.00)	45.3	54	51.6	46.9	42.7
(2020/09/09 14:10:01.00)	44.9	52.2	49.7	47.6	41.4
(2020/09/09 14:15:02.00)	44.4	50	49.3	47.5	41.2
(2020/09/09 14:20:01.00)	45.7	59	50.1	48.1	41.7
(2020/09/09 14:25:02.00)	48.3	58.8	55.9	51.6	42.8
(2020/09/09 14:30:02.00)	48.2	61.2	56.5	51.3	43.2
(2020/09/09 14:35:03.00)	45.2	54.5	51	47.5	41.4
(2020/09/09 14:40:02.00)	45.9	55.6	52.5	49.2	41.4
(2020/09/09 14:45:02.00)	47.3	60.3	59.1	48.3	41.2
(2020/09/09 14:50:01.00)	45.5	54.6	51.2	47.9	42
(2020/09/09 14:55:02.00)	46.1	52.7	51	48.6	42.4
(2020/09/09 15:00:02.00)	45.7	51.8	50.3	48.2	41.4
(2020/09/09 15:05:02.00)	46.6	56.7	53	49.6	41.8
(2020/09/09 15:10:02.00)	49.4	65.1	61	51.5	42.3
(2020/09/09 15:15:01.00)	46.1	56.5	53	48.6	41.8
(2020/09/09 15:20:02.00)	46.5	56.4	52.5	49.7	42
(2020/09/09 15:25:02.00)	46	56.9	53.8	49.1	40
(2020/09/09 15:30:02.00)	47.7	58.2	56.6	49.7	42.4
(2020/09/09 15:35:01.00)	45.3	59.5	52.6	47.8	41.3
(2020/09/09 15:40:02.00)	46.4	54.1	50.1	48.7	43
(2020/09/09 15:45:02.00)	47.7	59.5	57.7	49.8	42.5
(2020/09/09 15:50:02.00)	48.3	60.1	57.7	50.8	41.8
(2020/09/09 15:55:02.00)	49.3	65.9	58.5	51.4	43.1
(2020/09/09 16:00:02.00)	58.7	76.2	72.9	56.4	43.8
(2020/09/09 16:05:02.00)	46	51	49.8	48.3	43.2
(2020/09/09 16:10:02.00)	60.7	76.2	72.8	64	43.3
(2020/09/09 16:15:02.00)	46.9	52.1	50.8	49.2	42.4
(2020/09/09 16:20:02.00)	47.6	53.4	52	49.8	44.6
(2020/09/09 16:25:02.00)	48.5	67	53.8	50.1	44.5
(2020/09/09 16:30:02.00)	47.6	59.3	57.7	49.3	42.4
(2020/09/09 16:35:02.00)	45.3	52.4	51	48.2	40
(2020/09/09 16:40:02.00)	45.9	51.7	50.8	49	40.9
(2020/09/09 16:45:02.00)	48.4	59.3	58.1	50.8	41
(2020/09/09 16:50:02.00)	46.7	54.2	50.8	49.4	40.9
(2020/09/09 16:55:02.00)	47.4	59	57.7	49.4	40.4
(2020/09/09 17:00:01.00)	46.9	54.7	52.5	49.1	43.3
(2020/09/09 17:05:02.00)	47.8	55	53.8	50.7	43
(2020/09/09 17:10:02.00)	46.2	52.1	51.2	49.3	40.2
(2020/09/09 17:15:02.00)	46.8	52.6	51.8	50	39.3
(2020/09/09 17:20:02.00)	48.3	62.8	57.2	50.7	40.8

(2020/09/09 17:25:02.00)	48.4	61.5	56.6	51.1	40.7
(2020/09/09 17:30:02.00)	48.7	57.7	54.8	52.7	39.6
(2020/09/09 17:35:02.00)	50.2	61.1	59.9	52.1	42.6
(2020/09/09 17:40:02.00)	48.1	57.7	53.4	51.7	39.9
(2020/09/09 17:45:02.00)	46.8	61.5	55.1	49.7	40.7
(2020/09/09 17:50:02.00)	47.8	59.9	56.8	50.7	39.1
(2020/09/09 17:55:02.00)	44.4	52.1	50.1	48	38.7
(2020/09/09 18:00:02.00)	45.9	54.4	51.2	48.7	39.7
(2020/09/09 18:05:01.00)	44	51	49.7	47.1	38.5
(2020/09/09 18:10:02.00)	46	53.9	52.3	49.2	39.8
(2020/09/09 18:15:02.00)	50	63.6	61.7	52.3	40.4
(2020/09/09 18:20:02.00)	46	52	50.5	49	40.4
(2020/09/09 18:25:02.00)	45.8	59	52.2	48.6	40.2
(2020/09/09 18:30:02.00)	46.5	56.4	55.4	49.5	40.7
(2020/09/09 18:35:02.00)	44.6	54.2	52.5	48.4	39.5
(2020/09/09 18:40:02.00)	46.7	57.3	55.9	50	39.5
(2020/09/09 18:45:02.00)	44.8	51.2	50.2	48.3	39.7
(2020/09/09 18:50:01.00)	44.3	51.5	50.2	48.1	39
(2020/09/09 18:55:02.00)	43.3	52.3	51.3	47.1	38.1
(2020/09/09 19:00:01.00)	43.2	55.3	50.1	46.6	37
(2020/09/09 19:05:02.00)	45.2	56.8	54.6	49.3	36.9
(2020/09/09 19:10:02.00)	43	50.5	49.6	47.2	35.8
(2020/09/09 19:15:01.00)	44.6	56.7	52.8	47.5	37.1
(2020/09/09 19:20:02.00)	45.2	56.5	53.5	48.4	36
(2020/09/09 19:25:02.00)	43.2	52.5	51.1	47.2	36.6
(2020/09/09 19:30:02.00)	45.6	57.9	56.2	49	36.3
(2020/09/09 19:35:02.00)	44.5	59.1	51.1	48.3	36.7
(2020/09/09 19:40:02.00)	42.8	55	48.6	46.7	35
(2020/09/09 19:45:02.00)	40.7	47.5	46.6	44.4	34.9
(2020/09/09 19:50:02.00)	45.6	58.8	56.5	47.3	37.1
(2020/09/09 19:55:02.00)	40.6	52.5	50.6	43.9	34.5
(2020/09/09 20:00:02.00)	39.8	51.4	47.2	43.6	34.9
(2020/09/09 20:05:02.00)	42.9	53.3	51.3	47.9	33.8
(2020/09/09 20:10:01.00)	36.7	45.5	43.9	39.2	33.5
(2020/09/09 20:15:02.00)	42.2	50.6	49.4	45.8	36.3
(2020/09/09 20:20:02.00)	42.4	51.1	50.3	45.8	36.7
(2020/09/09 20:25:02.00)	42.6	60.3	50.4	46.8	34.5
(2020/09/09 20:30:02.00)	44.7	57	54.9	47.9	34.4
(2020/09/09 20:35:02.00)	38.4	50.8	46.4	41.7	34.3
(2020/09/09 20:40:02.00)	40.7	49.6	47.3	44.4	35.1
(2020/09/09 20:45:02.00)	46.3	60.9	59.1	48.7	34.8
(2020/09/09 20:50:02.00)	40.3	49.9	48.2	43.7	35.6
(2020/09/09 20:55:02.00)	39.6	49.3	47.1	42.6	35.7
(2020/09/09 21:00:02.00)	43	55.2	53.8	46.1	35.7
(2020/09/09 21:05:02.00)	40.6	50.3	49.2	44.6	34.6
(2020/09/09 21:10:02.00)	39.2	52.2	48.6	41.4	35.3

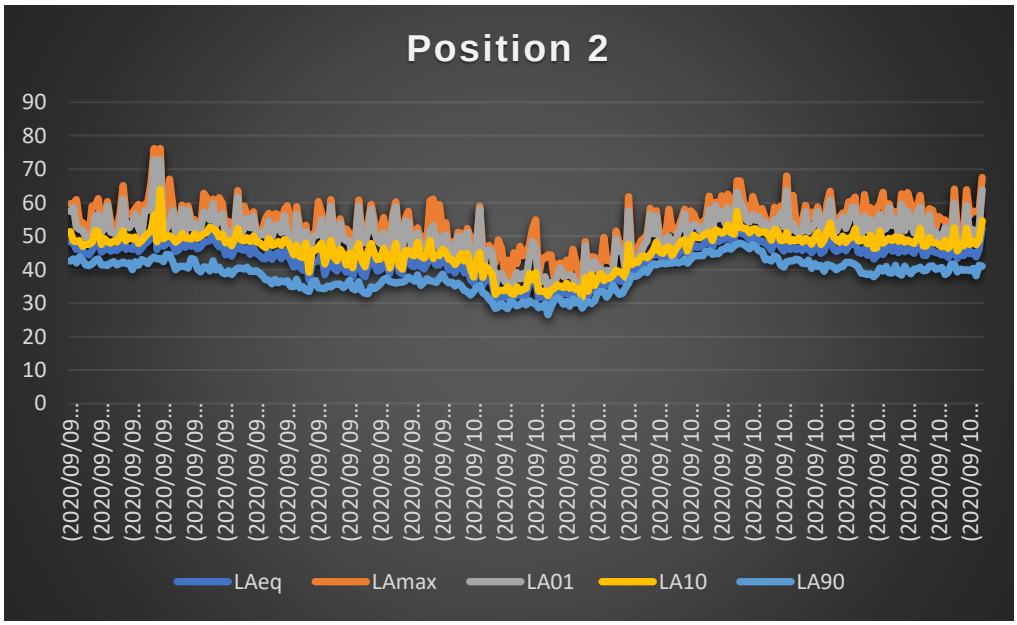
(2020/09/09 21:15:02.00)	41.5	51	48.6	44.9	36.8
(2020/09/09 21:20:02.00)	37.9	47.1	43.4	40.5	34.3
(2020/09/09 21:25:02.00)	40.8	49.5	48.2	45.4	33.9
(2020/09/09 21:30:02.00)	45.9	60.8	59	47.7	36.4
(2020/09/09 21:35:02.00)	38.8	50.6	48	42.6	33.6
(2020/09/09 21:40:03.00)	37.9	49.3	48	40.8	32.9
(2020/09/09 21:45:02.00)	41.1	54	51.5	45.4	32.8
(2020/09/09 21:50:02.00)	44.8	59.5	58	47.8	34.9
(2020/09/09 21:55:02.00)	41.5	54.3	51.4	44.7	34.3
(2020/09/09 22:00:02.00)	39.6	49.8	48.7	42.9	34.9
(2020/09/09 22:05:02.00)	39.9	51.7	47.7	43.2	35.8
(2020/09/09 22:10:02.00)	42.4	55.6	51	46.4	37.1
(2020/09/09 22:15:02.00)	41	49.7	48.5	44.3	37.5
(2020/09/09 22:20:02.00)	38.8	48.6	44.7	40.4	36.4
(2020/09/09 22:25:02.00)	42.8	56.9	55.4	44.8	36.2
(2020/09/09 22:30:02.00)	45.9	60.2	58.8	47.8	35.9
(2020/09/09 22:35:02.00)	39.3	50.1	46.6	41.2	36.2
(2020/09/09 22:40:02.00)	38.7	46.6	45.4	40.2	36.2
(2020/09/09 22:45:01.00)	43.3	55.6	54.7	45.6	36.6
(2020/09/09 22:50:02.00)	43.8	57.4	54.1	45.8	37.8
(2020/09/09 22:55:02.00)	41.1	49.2	46.7	44.4	37.2
Average	47.2	55.5	52.7	47.7	38.9
Maximum	60.7	76.2	72.9	64	44.6
Position 2 Night-time					
(2020/09/09 23:00:02.00)	40.9	50.7	47.1	44.2	36.5
(2020/09/09 23:05:02.00)	44.9	52.5	51	48.2	38.4
(2020/09/09 23:10:02.00)	40.9	48.5	46.7	44	35.3
(2020/09/09 23:15:02.00)	40.2	50	47.2	43.4	36.2
(2020/09/09 23:20:02.00)	41.7	48.7	46.1	44.5	37.3
(2020/09/09 23:25:02.00)	44.4	60.6	51.6	48.7	36.6
(2020/09/09 23:30:02.00)	42.6	61.1	53.1	43.3	36.5
(2020/09/09 23:35:02.00)	41.3	50.7	49.2	44.4	36.1
(2020/09/09 23:40:01.00)	41.4	59.5	46.2	44.2	37.4
(2020/09/09 23:45:02.00)	43.1	51.4	49.8	46.1	38.6
(2020/09/09 23:50:02.00)	42.5	54	50.4	45.2	36.8
(2020/09/09 23:55:01.00)	39.9	46.5	45.1	43.1	36
(2020/09/10 00:00:02.00)	40.4	48.3	47.4	42.9	36.2
(2020/09/10 00:05:01.00)	39	46	43.8	41.5	35.1
(2020/09/10 00:10:02.00)	40.8	51.2	50	42.6	35.9
(2020/09/10 00:15:01.00)	41.5	50.9	49.7	44.8	35.2
(2020/09/10 00:20:02.00)	39	47.3	44.5	42.5	33.7
(2020/09/10 00:25:02.00)	40.7	52.3	51.2	44.8	33.5
(2020/09/10 00:30:01.00)	37	49.7	43.1	40.3	32.4
(2020/09/10 00:35:02.00)	35.9	43.9	40.8	37.8	33.4
(2020/09/10 00:40:02.00)	39.1	47.7	46.9	42.6	34.7
(2020/09/10 00:45:01.00)	44.8	59	58.1	45	35.3

(2020/09/10 00:50:01.00)	35.4	45.6	40.1	37.7	33
(2020/09/10 00:55:01.00)	37.3	44.9	44.2	41	32.6
(2020/09/10 01:00:01.00)	37	47.2	46	39.8	31.2
(2020/09/10 01:05:02.00)	35.9	46.2	45.3	38.6	30.2
(2020/09/10 01:10:01.00)	30.9	42.1	34.8	32.6	28.4
(2020/09/10 01:15:02.00)	32.2	48.9	38.7	33.8	28.8
(2020/09/10 01:20:02.00)	32.3	46.4	38.8	33.7	29.9
(2020/09/10 01:25:02.00)	31.7	38.9	36.4	33.7	29
(2020/09/10 01:30:02.00)	31.7	42.8	36.2	34.9	28.3
(2020/09/10 01:35:02.00)	31.9	36.3	34.4	33	30.6
(2020/09/10 01:40:03.00)	31.5	45	36.4	32.6	29.7
(2020/09/10 01:45:02.00)	33.1	41.8	39.1	34.9	29.2
(2020/09/10 01:50:02.00)	32.2	46.9	37.2	33.6	29.6
(2020/09/10 01:55:02.00)	32.7	44.2	38.8	34	30.5
(2020/09/10 02:00:02.00)	32.4	44.9	36.9	34.4	29.4
(2020/09/10 02:05:02.00)	35.5	47.2	43.6	38.8	30.7
(2020/09/10 02:10:02.00)	36.7	52.2	48.4	36.9	30
(2020/09/10 02:15:02.00)	36.7	54.9	46.6	39.1	29.8
(2020/09/10 02:20:02.00)	31.5	37.9	35.6	33.6	28.6
(2020/09/10 02:25:02.00)	31.8	43.4	37.3	33.6	28.9
(2020/09/10 02:30:02.00)	32.1	43.4	37.9	33.6	29.7
(2020/09/10 02:35:01.00)	30.2	44.4	34.3	32.2	26.5
(2020/09/10 02:40:02.00)	32.2	44.4	36.1	33.9	28.9
(2020/09/10 02:45:01.00)	32.9	37.5	35.7	34.3	31
(2020/09/10 02:50:02.00)	33.9	41.6	38.1	35.5	31.7
(2020/09/10 02:55:02.00)	33.5	42	40.5	35	31
(2020/09/10 03:00:02.00)	32.8	38.8	37.9	34.6	29.6
(2020/09/10 03:05:02.00)	33.8	42.8	38.2	35.9	30.5
(2020/09/10 03:10:02.00)	32.2	39.3	38.5	34.4	29.1
(2020/09/10 03:15:02.00)	33.6	46.1	38	35.3	31.3
(2020/09/10 03:20:02.00)	32.2	42.6	35.2	34	30
(2020/09/10 03:25:02.00)	32.7	38.1	35.9	34.4	30.8
(2020/09/10 03:30:02.00)	30.1	36.4	33.4	31.5	28.5
(2020/09/10 03:35:02.00)	36	48.4	47.1	37.6	29.8
(2020/09/10 03:40:02.00)	32.2	36.6	35.1	33.6	30.5
(2020/09/10 03:45:02.00)	35.1	43.9	41.8	38.5	29.8
(2020/09/10 03:50:02.00)	33.7	43.7	42.5	35.3	30.7
(2020/09/10 03:55:02.00)	35.4	42.5	39.8	37.3	32.9
(2020/09/10 04:00:02.00)	36.9	41.8	40.3	38.8	33.6
(2020/09/10 04:05:01.00)	35.4	49.6	38.8	36.7	33.4
(2020/09/10 04:10:02.00)	35.5	42.7	39.8	37.5	31.7
(2020/09/10 04:15:01.00)	35.6	42.7	39.5	37.5	33.3
(2020/09/10 04:20:02.00)	36.9	41.5	40	38.3	35.4
(2020/09/10 04:25:01.00)	38.9	51.5	49.2	39.8	33.8
(2020/09/10 04:30:02.00)	36.6	47.8	45.5	39.4	32.6
(2020/09/10 04:35:02.00)	36.5	47.6	45.5	38.7	32.9

(2020/09/10 04:40:03.00)	36.3	40.7	39.2	37.7	34.7
(2020/09/10 04:45:02.00)	45.1	61.8	57.6	47.5	35.9
(2020/09/10 04:50:02.00)	40.1	44.3	42.8	41.5	38.1
(2020/09/10 04:55:02.00)	40.3	45.9	43.7	42.2	38
(2020/09/10 05:00:02.00)	40.5	46.5	43.4	42.2	38.2
(2020/09/10 05:05:02.00)	42	48.7	45.1	43.8	39
(2020/09/10 05:10:01.00)	42.4	49.3	47.4	44.1	40.1
(2020/09/10 05:15:02.00)	42.1	50.6	48.6	43.5	39.1
(2020/09/10 05:20:02.00)	44.7	58.3	56.6	44.4	40.7
(2020/09/10 05:25:02.00)	44.2	53.1	50.7	46	41.8
(2020/09/10 05:30:02.00)	45.9	57.6	56	48.2	41.4
(2020/09/10 05:35:01.00)	44.1	50	48.3	45.3	41.8
(2020/09/10 05:40:02.00)	43.5	48	45.9	44.8	41.9
(2020/09/10 05:45:02.00)	44.1	51.2	48.8	46.5	41.7
(2020/09/10 05:50:01.00)	44.7	58	49.9	46.8	42.1
(2020/09/10 05:55:02.00)	43.2	52.1	46.7	44.1	41.9
(2020/09/10 06:00:02.00)	44.2	51.6	48	45.9	42.5
(2020/09/10 06:05:01.00)	44.6	52.4	51.1	47	42
(2020/09/10 06:10:02.00)	45.6	55	52.9	48.5	42.3
(2020/09/10 06:15:01.00)	47	58	56.8	49	43.1
(2020/09/10 06:20:01.00)	43.8	52	49.3	45.5	41.9
(2020/09/10 06:25:02.00)	46.1	57.6	52.8	48.5	43
(2020/09/10 06:30:02.00)	47.4	56.6	53.4	50.3	44.2
(2020/09/10 06:35:02.00)	46.7	54.1	53.2	49.6	44.1
(2020/09/10 06:40:02.00)	46.8	53.2	51.8	49.5	44.2
(2020/09/10 06:45:02.00)	47.3	54.4	52.8	50.2	44.2
(2020/09/10 06:50:02.00)	48.2	55	52.3	50.7	45.5
(2020/09/10 06:55:02.00)	49.2	62	58	51.2	45.6
Average	41.4	48.2	44.6	40.7	34.9
Maximum	49.2	62	58.1	51.2	45.6
Position 2 Day					
(2020/09/10 07:00:02.00)	46.6	54	50.8	48.7	44.6
(2020/09/10 07:05:02.00)	49.4	60.1	59.2	51.9	44.8
(2020/09/10 07:10:02.00)	48.4	57.3	55.2	51.4	44.7
(2020/09/10 07:15:02.00)	49	62.1	57.4	50.9	46
(2020/09/10 07:20:02.00)	49.1	58.6	53.9	51.3	46.1
(2020/09/10 07:25:02.00)	51.1	62.5	58.4	53.4	47
(2020/09/10 07:30:02.00)	49	60.4	53.2	51	46.1
(2020/09/10 07:35:01.00)	48.8	54.1	53.1	50.6	47.1
(2020/09/10 07:40:02.00)	53.4	66.6	63.1	57.4	47.6
(2020/09/10 07:45:02.00)	51	66.5	60	52.6	47.9
(2020/09/10 07:50:01.00)	50.7	60.1	58.2	52.4	47.5
(2020/09/10 07:55:02.00)	50.1	58.7	54.8	52.3	46.9
(2020/09/10 08:00:02.00)	49	55.2	54.2	51	46.2
(2020/09/10 08:05:02.00)	50.4	61.9	56.5	52.1	47.5
(2020/09/10 08:10:02.00)	49.8	58.8	54.7	52.2	46.8

(2020/09/10 08:15:02.00)	48.3	57	55.8	50.9	45.6
(2020/09/10 08:20:02.00)	48.6	58.2	53.4	51.3	45.5
(2020/09/10 08:25:02.00)	47.8	55.4	54.3	51.3	42.9
(2020/09/10 08:30:01.00)	47.3	54	52.4	50.3	43.1
(2020/09/10 08:35:02.00)	45.8	52.3	51.3	48.8	42.5
(2020/09/10 08:40:02.00)	48.8	58.6	55	51.9	44.1
(2020/09/10 08:45:01.00)	48.2	55.1	53.6	51.7	43.6
(2020/09/10 08:50:02.00)	46.8	59	56.9	48.7	41.4
(2020/09/10 08:55:01.00)	45.5	55.5	52.8	48.8	40.7
(2020/09/10 09:00:02.00)	50.5	68	63.6	51.1	42.4
(2020/09/10 09:05:02.00)	46	54	51.5	48.5	42.5
(2020/09/10 09:10:02.00)	46.7	62.2	53.7	49	42.6
(2020/09/10 09:15:02.00)	46	54.1	51.4	48.6	43.1
(2020/09/10 09:20:02.00)	46.5	52.1	50.8	49.4	42.9
(2020/09/10 09:25:02.00)	45.7	54.7	51.4	48.2	41.9
(2020/09/10 09:30:02.00)	47.3	59.2	57.3	49.3	41.8
(2020/09/10 09:35:02.00)	46.2	55.3	51.3	48.8	42.8
(2020/09/10 09:40:01.00)	45	57.2	52.3	47.6	40.3
(2020/09/10 09:45:02.00)	46.5	56	54	49.7	41.8
(2020/09/10 09:50:02.00)	47.9	58.7	57.4	51.2	40.9
(2020/09/10 09:55:02.00)	44.8	53.9	51.6	47.5	41.2
(2020/09/10 10:00:02.00)	45.5	52.2	51.4	48.9	39.5
(2020/09/10 10:05:02.00)	48.2	59.8	56.9	51.3	41.5
(2020/09/10 10:10:02.00)	50.5	63.4	60.7	53.9	41.2
(2020/09/10 10:15:02.00)	46.2	55.3	52.8	49.7	40.8
(2020/09/10 10:20:01.00)	45.4	52.5	51.4	49	40
(2020/09/10 10:25:02.00)	45.9	55.6	53.7	48.2	40.7
(2020/09/10 10:30:01.00)	47.4	56.9	55.7	50	40.9
(2020/09/10 10:35:02.00)	45.6	56	52.3	48.1	42.2
(2020/09/10 10:40:02.00)	47.1	60.2	54.4	49.4	42.2
(2020/09/10 10:45:02.00)	47.6	60.3	58.6	49.6	42
(2020/09/10 10:50:02.00)	48.9	61.7	58.5	52.2	41.5
(2020/09/10 10:55:02.00)	45.2	51.6	50.7	48.7	40.8
(2020/09/10 11:00:02.00)	44.8	51.2	50.4	48.6	38.9
(2020/09/10 11:05:02.00)	46.3	62.4	56	49.1	38.8
(2020/09/10 11:10:02.00)	44.3	57.2	51.6	47.7	38.5
(2020/09/10 11:15:02.00)	46.6	58.5	55.1	50.3	38.7
(2020/09/10 11:20:01.00)	43.1	49.6	48.6	46.4	37.9
(2020/09/10 11:25:02.00)	44	58.1	53.6	46.5	38.7
(2020/09/10 11:30:01.00)	48.1	59.7	56.6	51.5	40.4
(2020/09/10 11:35:02.00)	44.5	63.1	51.8	47.9	39.6
(2020/09/10 11:40:02.00)	45.9	54.2	52.3	48.7	40.9
(2020/09/10 11:45:02.00)	47	59.7	58.6	49.3	39
(2020/09/10 11:50:01.00)	45.5	56.1	53.2	48.7	39
(2020/09/10 11:55:01.00)	46.8	57.4	55.2	49.8	41.3
(2020/09/10 12:00:02.00)	45	53	50.8	48.5	38.9

(2020/09/10 12:05:02.00)	48.1	62.6	59.5	49.6	38.3
(2020/09/10 12:10:02.00)	45.3	55.4	51.6	48.2	41
(2020/09/10 12:15:02.00)	47.1	63	57.5	48.9	39.7
(2020/09/10 12:20:02.00)	45.5	59.6	53.8	48.3	38.7
(2020/09/10 12:25:02.00)	44.8	56.6	51	47.8	40.2
(2020/09/10 12:30:02.00)	46.5	58.6	57	49.2	40.2
(2020/09/10 12:35:02.00)	49.1	62.2	58.6	52.3	40.7
(2020/09/10 12:40:02.00)	44.3	54.1	51.1	47	39.7
(2020/09/10 12:45:02.00)	44.2	50.6	49.4	47	39.8
(2020/09/10 12:50:02.00)	47.1	58.2	56.3	49.5	41
(2020/09/10 12:55:02.00)	45.4	57.8	50.6	48.1	41.1
(2020/09/10 13:00:02.00)	45.1	52.6	51.2	48.1	40.1
(2020/09/10 13:05:02.00)	44.8	55.8	49.3	47.4	40.3
(2020/09/10 13:10:02.00)	44.4	55	49.9	46.8	40.6
(2020/09/10 13:15:02.00)	44.8	54.8	52.5	48.8	38.5
(2020/09/10 13:20:02.00)	43.6	50.4	48.6	46.4	39.1
(2020/09/10 13:25:02.00)	44.6	50.4	49.2	47.4	41.7
(2020/09/10 13:30:02.00)	49.6	64.1	59.8	52.5	41.6
(2020/09/10 13:35:02.00)	43.3	52	47.6	45.6	39.3
(2020/09/10 13:40:02.00)	44.7	51.4	48.6	47.2	40.2
(2020/09/10 13:45:02.00)	44.2	51.9	49.1	47.1	39.8
(2020/09/10 13:50:02.00)	48.9	63.9	59.1	52.3	40
(2020/09/10 13:55:02.00)	44.7	56.2	50	47.5	39.7
(2020/09/10 14:00:02.00)	45.1	57.5	51.9	48.6	40.3
(2020/09/10 14:05:02.00)	43.8	57.3	50.2	47.4	38.1
(2020/09/10 14:10:02.00)	46.1	57.4	52.3	48.8	41.3
(2020/09/10 14:15:02.00)	52.3	67.5	63.9	54.6	41
Average	47.5	57.4	54	49.6	41.8
Maximum	53.4	68	63.9	57.4	47.9

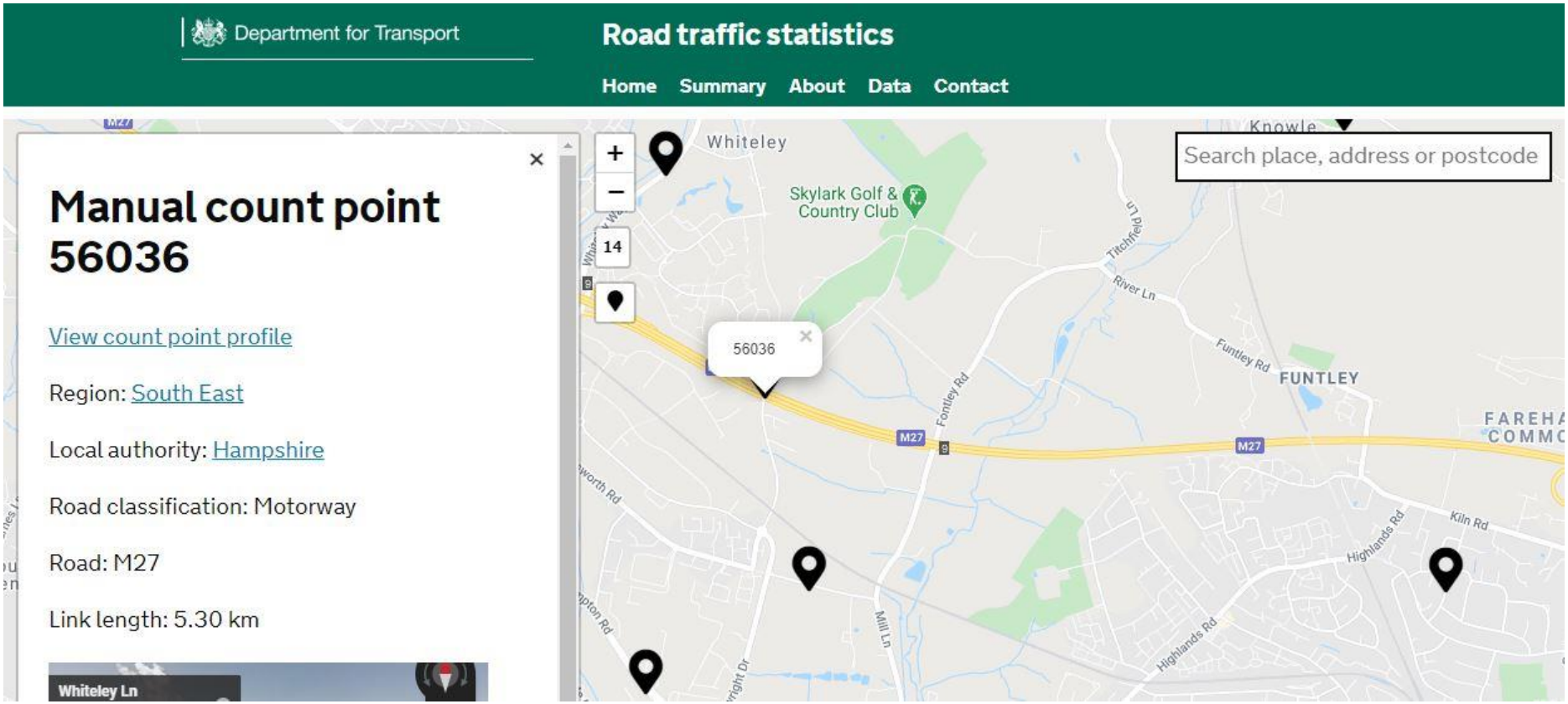


Date	Time	L_{Aeq}	L_{Amax}	L_{A01}	L_{A10}	L_{A90}
Position 3						
09/09/2020	12:25:40	44.6	59.1	50.9	46.6	41.5
09/09/2020	12:30:40	46	53.3	51.1	48.4	43.1
09/09/2020	12:35:40	46.8	54.8	52.4	48.9	43.9
09/09/2020	12:40:40	49.4	59.8	57.3	52.7	41.2
09/09/2020	12:45:40	50.6	62.4	58.8	53.1	42.5
09/09/2020	12:50:40	47.4	59.9	55.6	50.7	41.9
09/09/2020	12:55:40	43.8	60.1	50.8	45.8	40.4
09/09/2020	13:00:40	45.3	59.8	52.6	46.9	41.5
09/09/2020	13:05:40	44.5	55.6	51.8	47.1	41
09/09/2020	13:10:40	43.4	54.4	50	45.7	40.1
09/09/2020	13:15:40	49.4	62.1	59	54	41.1
09/09/2020	13:20:40	46.2	60.2	56.7	48.1	41.1
Average		47.1	58.5	53.9	49	41.6
Maximum		50.6	62.4	59	54	43.9

Date	L_{Aeq}	L_{Amax}	L_{A01}	L_{A10}	L_{A90}
Position 4					
(2020/09/09 12:20:22.00)	65.9	78.3	70.7	67.9	62.6
(2020/09/09 12:25:01.00)	66.2	72.3	71.1	68.2	62.6
(2020/09/09 12:30:01.00)	66.5	72.2	71	68.8	62.9
(2020/09/09 12:35:01.00)	66.6	73.9	71.6	69	63
(2020/09/09 12:40:01.00)	66.2	72.6	71.3	68.8	62.3
(2020/09/09 12:45:01.00)	66.8	76.2	71.1	69	63.7
(2020/09/09 12:50:01.00)	66.3	71.8	70.8	68.6	62.7
(2020/09/09 12:55:01.00)	66.7	73.8	71.3	69.1	63.5
(2020/09/09 13:00:01.00)	66.5	72.9	71.3	68.6	62.8
(2020/09/09 13:05:01.00)	68	87.2	74	69.4	63.5
(2020/09/09 13:10:01.00)	66.6	72.9	71.3	68.9	63.2
(2020/09/09 13:15:01.00)	66	73.2	71	68.3	62.3
(2020/09/09 13:20:01.00)	66.8	73.8	71.8	69.6	62.1
Average	66.6	74.7	71.4	68.8	62.9
Maximum	68	87.2	74	69.6	63.7

APPENDIX E

DfT Count Point Location



APPENDIX F

NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

- 0–45dB(A)
- 45–50dB(A)
- 50–55dB(A)
- 55–56dB(A)
- 56–57dB(A)
- 57–58dB(A)
- 58–59dB(A)
- 59–60dB(A)
- 60–65dB(A)
- 65–70dB(A)
- 70–75dB(A)
- >75dB(A)

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-		HJ	NF	NF	25.09.20

PROJECT:

FUNTLEY ROAD, FUNTLEY

DRAWING TITLE:

EXTERNAL DAYTIME LAeq SOUND LEVELS WITHOUT MITIGATION

CLIENT:

RESIDE DEVELOPMENTS LTD (DORKING)

DRAWING NUMBER:

24695_04_120_01

REVISION:	SHEET SIZE:	SCALE:
-	A3	-

STATUS:

-

M-EC ACOUSTIC AIR

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Email: group@m-ec.co.uk
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File Location: T:\M-EC Job Book\24695\drawings\04\120\24695_04_120_01 External daytime sound levels (no mitigation).dwg

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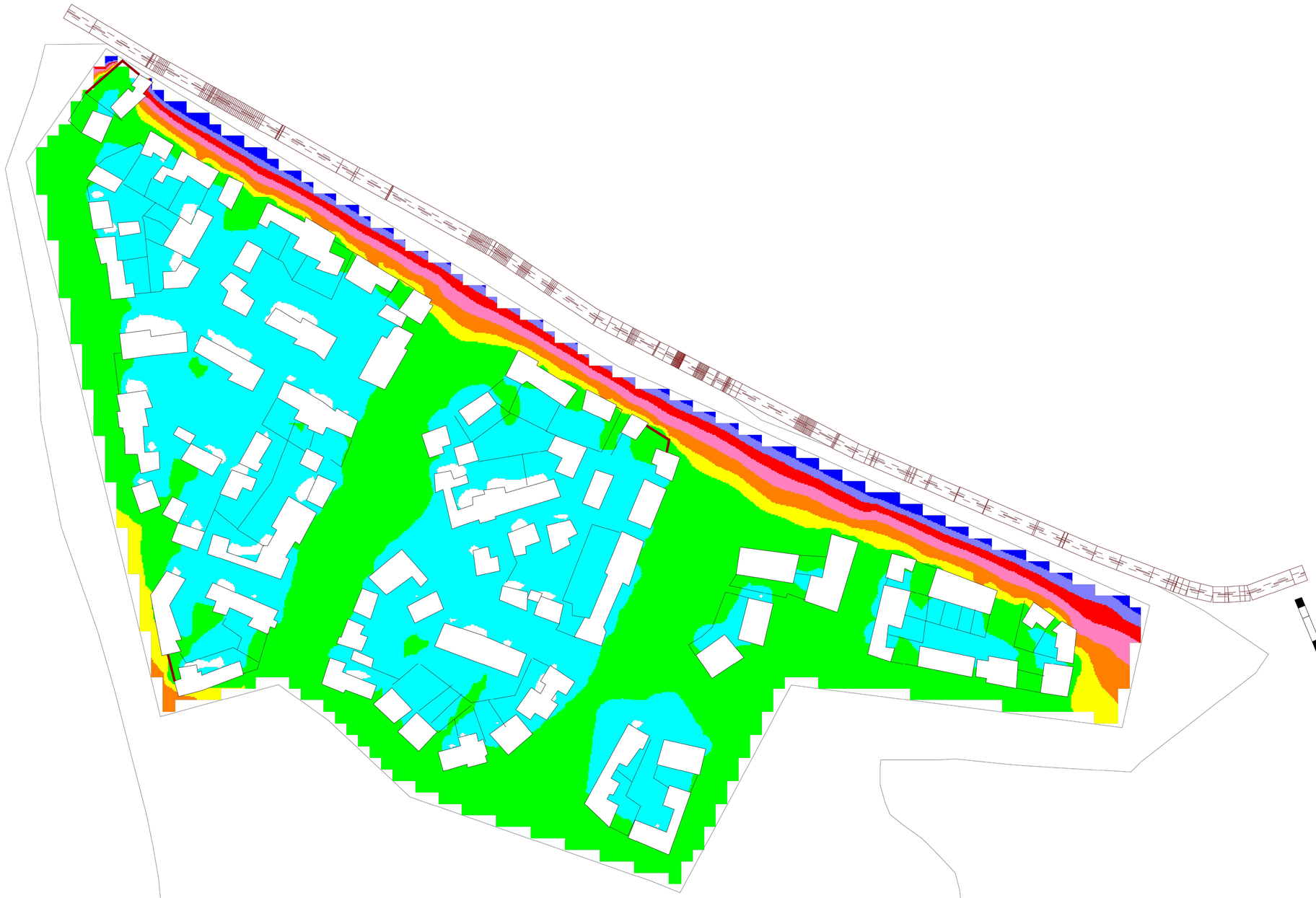

NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

- 0–45dB(A)
- 45–50dB(A)
- 50–55dB(A)
- 55–56dB(A)
- 56–57dB(A)
- 57–58dB(A)
- 58–59dB(A)
- 59–60dB(A)
- 60–65dB(A)
- 65–70dB(A)
- 70–75dB(A)
- >75dB(A)

1.8m Acoustic Fencing

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-		HJ	NF	NF	25.09.20

PROJECT:

FUNTLEY ROAD, FUNTLEY

DRAWING TITLE:

EXTERNAL DAYTIME LAeq SOUND LEVELS WITH 1.8M ACOUSTIC FENCING

CLIENT:

RESIDE DEVELOPMENTS LTD (DORKING)

DRAWING NUMBER:

24695_04_120_02

REVISION:	SHEET SIZE:	SCALE:
-	A3	-

STATUS:

-

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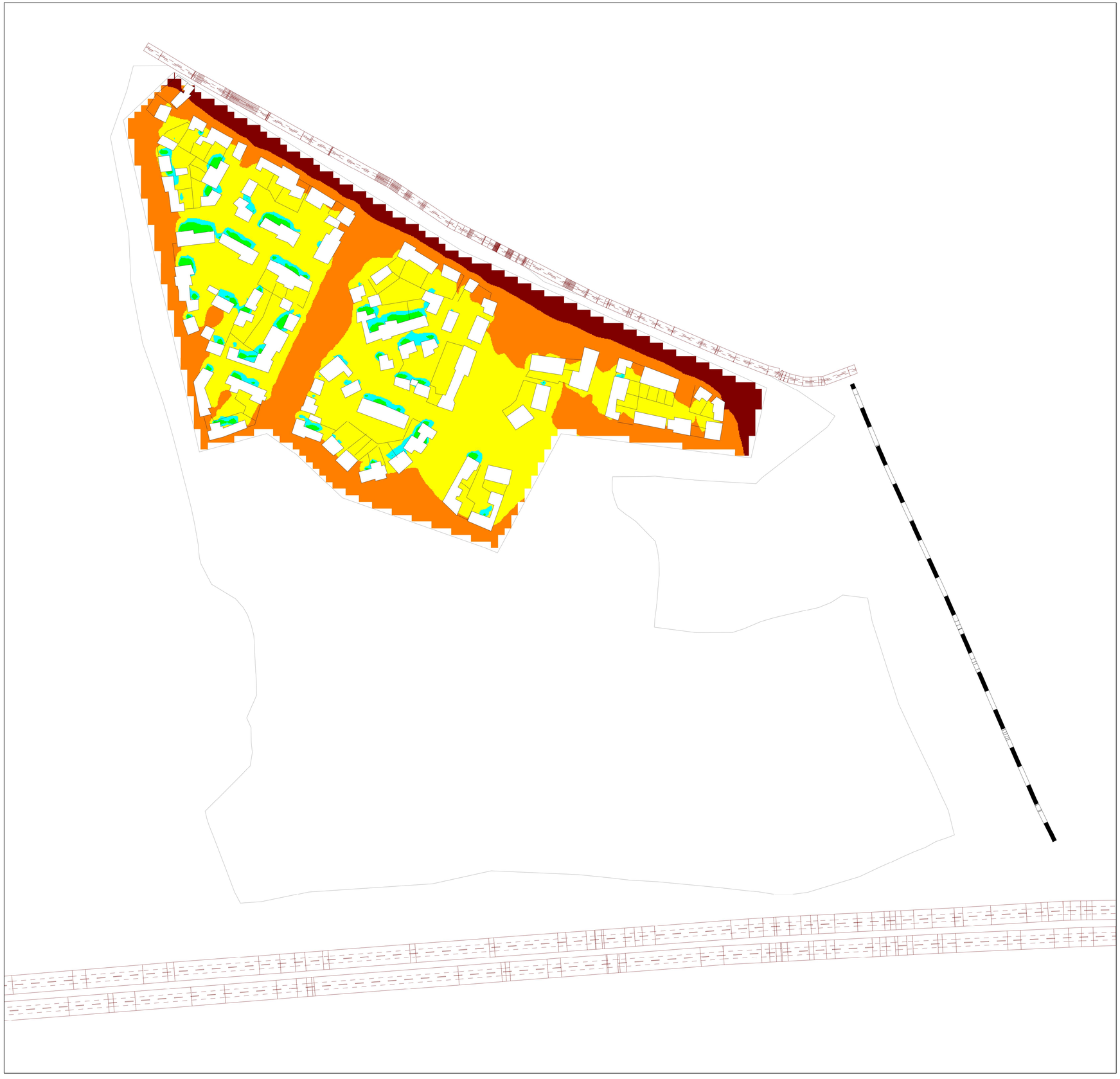

NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

- 0–40dB(A)
- 40dB(A)
- 40–45dB(A)
- 45–50dB(A)
- 50–56dB(A)
- 56–57dB(A)
- 57–58dB(A)
- 58–59dB(A)
- 59–60dB(A)
- >60dB(A)

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-		HJ	NF	NF	25.09.2020

PROJECT:

FUNTLEY ROAD, FUNTLEY

DRAWING TITLE:

EXTERNAL NIGHT-TIME LAeq
SOUND LEVELS

CLIENT:

RESIDE DEVELOPMENTS LTD
(DORKING)

DRAWING NUMBER:

24695_04_120_03

REVISION:	SHEET SIZE:	SCALE:
-	A3	-

STATUS:

-

M-EC ACOUSTIC AIR

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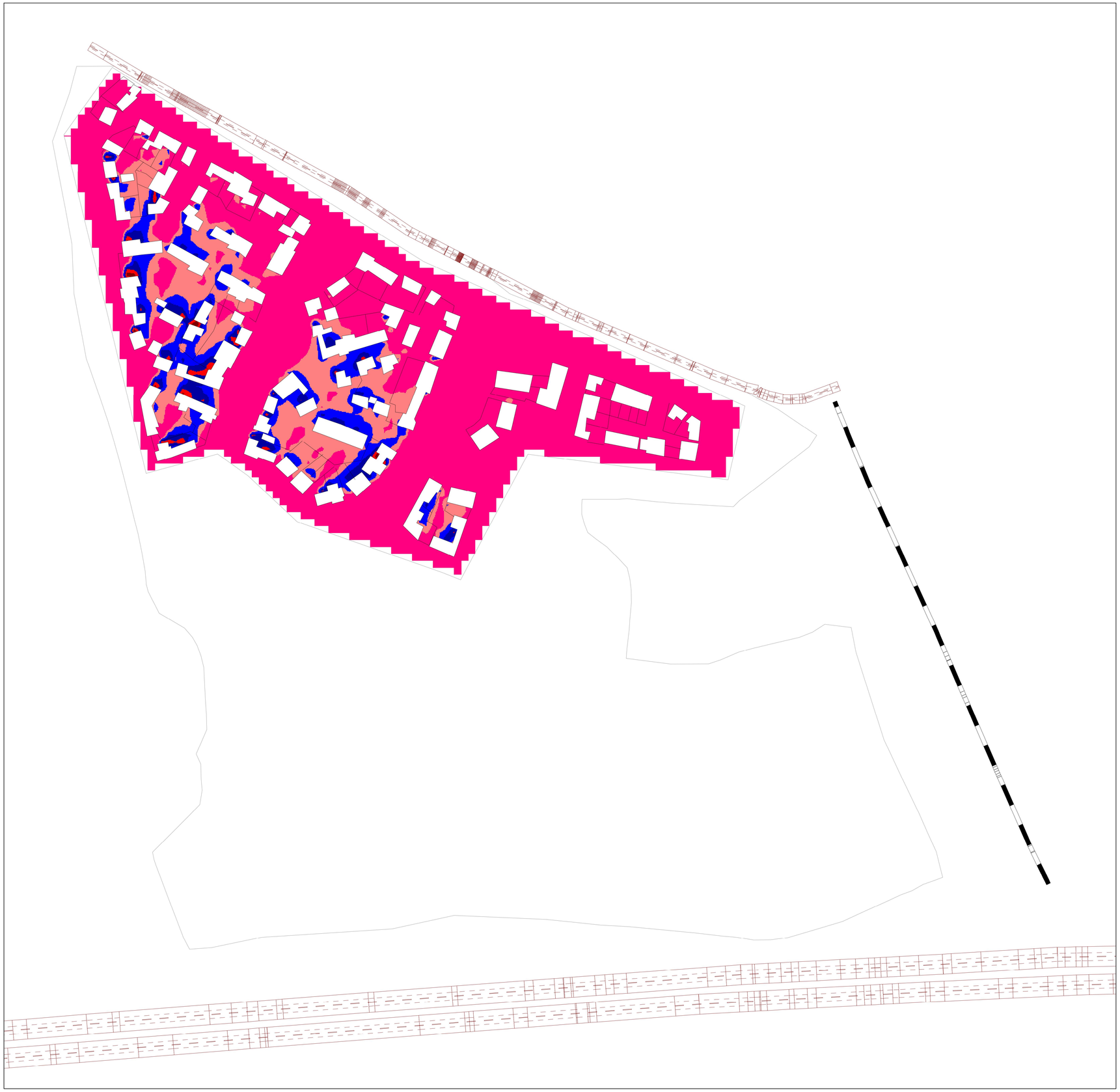
Website: www.m-ec.co.uk

File Location: T:\M-EC Job Book\24695\drawings\04\120\24695_04_120_03 External night time sound levels.dwg

Printed:28.09.2020



NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

- 0–40dB(A)
- 40dB(A)
- 40–45dB(A)
- 45–50dB(A)
- 50–56dB(A)
- 56–57dB(A)
- 57–58dB(A)
- 58–59dB(A)
- 59–60dB(A)
- >60dB(A)

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-		HJ	NF	NF	25.09.2020

PROJECT:

FUNTLEY ROAD, FUNTLEY

DRAWING TITLE:

EXTERNAL NIGHT-TIME LAmax SOUND LEVELS

CLIENT:

RESIDE DEVELOPMENTS LTD (DORKING)

DRAWING NUMBER:

24695_04_120_04

REVISION:	SHEET SIZE:	SCALE:
-	A3	-

STATUS:

-

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APPENDIX G

INDICATIVE SOUND INSULATION PERFORMANCE OF DIFFERENT WINDOW CONFIGURATIONS

Third octave band centre frequency Hz	Sound Insulation (dB) for Glass Thickness (mm)																					
	4/16/4 or 4/12/4		6/12/6		6/12/6.4 PVB		10/12/4		10/12/6		10/12/6.4 PVB		Acoustic Laminate									
													6/12/7		6/12/11		10/12/16		13/12/13		16/12/16	
100	25		17		19		23		27		27		25		26		26		30		31	
125	24	24	26	20	24	21	28	25	27	26	28	27	27	26	25	26	28	27	27	28	34	32
160	23		22		21		26		24		26		26		25		26		27		33	
200	21		18		19		19		24		26		23		25		24		31		34	
250	21	20	18	19	19	20	23	22	29	27	30	29	24	25	28	28	28	27	38	34	38	37
315	19		24		24		26		31		32		28		32		31		39		39	
400	22		27		28		31		33		34		30		35		34		41		43	
500	25	25	29	29	32	31	33	33	34	34	36	36	34	33	39	38	38	37	44	44	46	45
630	30		33		34		36		37		40		37		43		41		48		48	
800	33		37		38		39		39		41		42		46		44		51		50	
1000	36	35	39	38	40	39	41	40	41	40	42	41	45	44	47	47	45	45	53	52	48	46
1250	38		39		40		41		41		41		46		47		46		52		43	
1600	40		39		39		41		39		41		46		46		44		49		43	
2000	41	38	34	36	35	37	45	43	37	38	42	42	45	46	43	43	42	44	45	47	46	46
2500	35		37		39		45		40		44		48		42		44		48		50	
3150	31		42		44		42		43		49		51		47		51		52		53	
4000	40	35	47	45	49	47	44	44	47	46	53	52	52	52	54	51	56	54	57	55	59	57
R_m dB	29		30		31		34		34		36		36		37		39		42		42	
R_w dB	31		33		34		36		38		40		38		41		42		45		46	
R_{TRA} dBA	25		26		27		29		32		34		31		33		37		38		41	

Notes: 1. The glass thickness is presented in terms of the thickness of one pane of glass, followed by the size of the air gap, followed by the thickness of the second pane of glass, all dimensions in millimetres.

2. 6.4mm PVB glass denotes a laminated glass consisting of a tough plastic interlayer made of polyvinyl butyral (PVB) bonded together between two panes of glass.

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