



AIRTIGHT & NOISECHECK LIMITED

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UPDATED NOISE IMPACT ASSESSMENT FOR

CORDAGE ESTATES LTD

SITE ADDRESS

THE HOLT
285 WARRINGTON ROAD
RAINHILL
PRESCOT
MERSEYSIDE
L35 8LA

ORIGINAL ASSESSMENT DATE: 28TH – 29TH JANUARY 2020

ASSESSMENT DATE: 3RD – 6TH SEPTEMBER 2020

REPORT DATE: 22ND NOVEMBER 2021

Acoustic Engineer:

Michael Vine

Date: 3rd – 6th September 2020

AIRTIGHT & NOISECHECK BUILDING ACOUSTIC TESTING

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Initial Assessment date: 28-29th January 2020

Test Date: 3rd – 6th September 2020

Customer Name:

Cordage Estates Ltd

Site Address:

The Holt
285 Warrington Road
Rainhill
Prescot
Merseyside
L35 8LA

Acoustic Engineer:

Mr. Michael Vine

Equipment used for each assessment:

Norsonic Environmental Analyser 121 – NOR121 serial No 29809, Calibration due July 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 of the Nor121

Measurement Microphone (Gras 40AF) – Serial No 51465 & (Nor 1225) serial no 72933 - Calibration due July 2022

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

Measurement Procedure:

The further external existing noise levels were recorded in two microphone locations for a 72hour period between Thursday 3rd to Sunday 6th September 2020 to ensure existing residents in close proximity to the proposed convenience store will be protected from noise created by any associated plant, deliveries and vehicle movements.

The results of both assessments will be compared to numerous standards and codes of practice, including BS4142: 2014 + A1: 2019 & BS8233: 2014 & the Knowsley Replacement Unitary Development Plan 2006 – ENV 2 'Noise & Vibration'.

The purpose of this report is to show the possible adverse impact the proposed plant, deliveries & vehicle movements will have on the residential dwellings located in close proximity to the proposed scheme. The dwellings are located to the side & rear of the proposed convenience store.

This NIA is in response to the comments made by the LPA regarding the original NIA (Job No 17698) undertaken between 28th – 29th January 2020. The purpose of this further NIA is to address the comments made by the LPA and ensure the concerns raised have been adhered to and the necessary measures implemented.

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Executive Summary:

The scheme for this project is ***Retention of Public House and new build C-store on part of car park***

Airtight & Noisecheck Ltd were instructed by Cordage Estates Ltd to undertake another acoustic survey at The Holt, 285 Warrington Road, Rainhill to determine if the proposed erection of a convenience store in close proximity of the public house and any associated plant will adversely affect the existing residential dwellings located in close proximity of the site, there are dwellings located to the North & West of the proposed store & plant location. The delivery bay will be located at the side of the proposed store (Eastern elevation near public house entrance).

An initial 24hour survey was undertaken in January 2020 that measured the noise levels at that time. The background noise levels were higher during this assessment and as such the results have been included in this assessment. These levels may be more accurate as they were taken prior to covid and any restrictions to traffic, travel and vehicle movements. A further 72hour noise assessment was undertaken to establish the current background noise levels associated with the site and to ensure that both the daytime & night time periods were accounted for. The proposed plant specification is unknown at this time so target values will be included within this report to ensure they are not exceeded and a suitable scheme to mitigate the plant noise is implemented.

The plant may run over a 24hour period and will be intermittent so the following acoustic feature correction may be applied to the plant (once the final specification is determined);

1. Intermittency
2. Directivity (dependent on location to planes)
3. Impulsiveness
4. Tonality

The plant will be located at ground floor level to the Northwest of the store, it will be enclosed by a barrier and will be circa 6m from the dwellings to the West and 20m from the dwellings to the North. The plant will be completely screened by the barrier for the dwellings and the boundary fence will also screen the site from the dwellings. The levels of the plant are unknown so once these are known suitable barrier details & mitigation measures for the plant can be implemented to ensure the target values are not exceeded.

The client will take robust & comprehensive measures for the scheme, including:

1. Suitable mitigation measures applied to plant
2. Acoustic fence erected along the Western & Northern boundaries
3. ANPR & robust car park management in operation for the car park area
4. Engines switched off during deliveries
5. Agreements to a suitable delivery timetable

A further BS4142: 2014 (+A1: 2019) – Methods for rating & assessing industrial and commercial sound assessment may be required once the plant specifications are known to ensure the correct rating levels are calculated and suitable mitigation measures are offered to reduce the noise accordingly.

If the necessary measures are applied to the plant, then there is no reason to suggest that the plant installed will have an adverse impact on the local residents. Calculations to determine the noise associated with deliveries, roll cage movements & vehicle movements are listed later in the report and it is anticipated that the noise associated with these sources will not have an adverse impact on the residential dwellings located to the West or North of the proposed store.

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In a direct response to comments made by the LPA, this NIA has undertaken Further calculations and noise measurements at the rear boundary of the site to assist with the current noise levels in this location. These levels have been used when comparing the vehicle movements and doors closing etc as this will be the location of the nearest noise sensitive dwellings in relation to the car parking location. It is shown that the vehicle movements and car doors closing should not increase the current noise levels and thus should not have an adverse impact on the residential dwellings located to the North of the site. A 2m high acoustic barrier will be erected along the Western & part of the Northern boundary to further reduce the noise impact.

In addition to this further NIA, the original assessment has indicated that the site is exposed to high noise levels emanating from the vehicular traffic using Warrington Road & therefore the impact of the proposed convenience store should not have an adverse impact on the properties located to the North or West of the store as they are already exposed to noise levels in excess of 57dBA from 0600hrs.

Assessment Criteria:

The NPPF came into effect in March 2012 and was updated in July 2021. It replaced other documents such as PPG24. The NPPF provides a number of objectives and aims that are directed towards avoiding significant adverse impacts and reducing others on quality of life and health. This document states that:

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

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

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

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

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

However, in this instance the rating levels and calculated levels are compared to the existing acoustic environment due to the numerous noise sources in operation and the variety of standards applicable. A bespoke assessment of these standards has been used. The noise source apparent at the site is the activity associated with the road traffic.

BS4142: 2014 (+ A1: 2019) – 'Methods for rating and assessing industrial and commercial sound' is the standard used to assess the plant noise. Detailed calculations will be required once the plant location & specification are known. Due to these aspects not being known at this time, target values have been used for the plant.

The categories below are also used to describe certain levels of noise intrusion.

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.

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1 Objective:

1.1 To determine if the proposed plant, vehicle movements & delivery schedule will have an adverse impact on the existing residential dwellings located in close proximity to the side & rear of the proposed scheme. The site currently comprises of a large detached Public House built over two floors, this building sits at the Southeast corner of the site, with the garden to the West and the car park located to the rear of the building.

2 Calibration:

2.1 The measurement microphones were calibrated both before and after testing and there was no drift recorded throughout the measurement period.

3 Site Layout & Microphone Position:

3.1 285 Warrington Road, Rainhill is in a predominantly residential area and is a large road running through the area. The road is to the South of the site with residential dwellings located to the West, South & further to the East. The site is located in Rainhill, which is a large village located in the borough of Knowsley, Merseyside. It lies approximately 2.9m to the South/Southwest of St Helens and 9.3m to the East of Liverpool. The Holt public house is located in Knowsley MBC. It is a large Public House that has been in operation for many years. It sits to the Southeast corner of the site, with Warrington Road to the South, Holt Lane to the East, dwellings to the rear (North) and to the West. There is a large number of existing dwellings located in the immediate vicinity of the site. The current car park is located to the rear of the building. The proposed scheme will use the same parking layout with the convenience store located to the South of the site with the delivery bay to the East between the two buildings.

3.2 The proposal is to retain the public house and erect a new convenience store immediately to the West of the public house in the current beer garden location.

3.3 The plant will be located to the Northwest of the new store and will be screened by a purpose-built barrier/acoustic mitigation to ensure the rating levels are below the BGN apparent. There are numerous factors that must be taken into account when determining the final level at the residential boundary and these are shown later in the report, but they include, distance to dwelling, orientation, screening, tonality, impulsiveness & intermittency.

3.4 Microphone One was located to the West of the existing building and on the Western boundary of the site, approximately 7m from the nearest residential façade. It was at least 2.5m from ground level and in excess of 3m from any other reflective surface. The purpose of this location was to determine the noise level at the approximate façade of the residential dwelling (and proposed plant location) that will be closest to the plant location.

3.5 Microphone Two was located at the Northwest corner of the site, on the residential boundary, approximately 5m from the nearest residential façade. It was at least 2.5m from ground level and in excess of 3m from any other reflective surface. The purpose of this location was to determine the noise level at the approximate façade of the rear residential dwellings that will be closest to the car parking bays.

The above microphone locations were the locations for the updated assessment, and they were used in direct response to the request of the LPA to determine the actual noise levels at the rear of the site. The microphone location for the initial assessment was at the proposed site location.

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4 Weather Conditions:

4.1 The assessment was undertaken once the first national lockdown had ended, with pupils back in school and traffic conditions were as close to normal as possible. The weather was predominantly dry and warm throughout the measurement period, with temperatures ranging between 15-19degrees on Thursday, 14-17degrees on Friday and 13-17degrees on Saturday. There was 1mm of rain on Thursday, 0.3mm of rain on Friday & Saturday. There were light winds throughout the measurement period.

4.2 The original assessment was undertaken prior to any lockdowns or restrictions in place due to Covid. There were no recent restrictions to road traffic or local businesses and as such these levels may have been more representative for the road traffic conditions apparent in the area.

5 Results – existing dwellings:

Time Period	Lowest LAeq value	Lowest LA90 Value (BS4142 report)
0700-2300hrs – 3 rd – 4 th	49dB(A) - LAeq 1hour	40dB(A) - LA90 1hour
2300-0700hrs – 3 rd – 4 th	38dB(A) - LAeq 15min	34dB(A) - LA90 15min
0700-2300hrs – 4 th – 5 th	51dB(A) - LAeq 1hour	42dB(A) - LA90 1hour
2300-0700hrs – 4 th – 5 th	43dB(A) - LAeq 15min	35dB(A) - LA90 15min
0700-2300hrs – 5 th – 6 th	52dB(A) - LAeq 1hour	43dB(A) - LA90 1hour
2300-0700hrs – 5 th – 6 th	42dB(A) - LAeq 15min	33dB(A) - LA90 15min

(Results obtained using the environmental sound level meter and where needed taking a logarithmic average of different values). The above results were taken during the updated assessment. They also represent the levels at the rear of the site, rather than at the proposed plant location. The LAeq values for the proposed site location are shown below and compared to the initial assessment.

5.1 The results were measured for a 72hour period to obtain the noise levels throughout that period. The noise levels were measured in 1hour & 15minute intervals. The results listed in the table above are the lowest LAeq value and LA90 values for both the day time (0700-2300) noise levels (measured in 1hour values) and for the night time (2300-0700) noise levels (measured in 15minute values) for comparison to the requirements of BS4142: 2014 + A1: 2019.

5.2 The hours of operation of the proposed A1 Retail Use will be 0700-2300hrs 7 days a week, however the refrigeration & condensers will run for 24hours (low noise mode during the night) and the AC units only in operation during the day time hours. Deliveries will occur during opening hours only, with the exception of newspapers that will be delivered before 0700hrs in a transit sized van.

5.3 The mitigation measures listed within this report will be working towards the figures listed in the table above. The noise will be measured against the parameters of BS4142: 2014 + A1: 2019 in relation to any new plant that may be installed.

Table 2 – Target Values at rear façade

Time Period	Lowest LA90 Value	Target Noise Level at Facade
Day Time - 0700-2300hrs	40dB(A) 1hour	<35dB(A)
Night Time - 2300-0700hrs	33dB(A) 15mins	<28dB(A)

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5.4 It is anticipated that the AC units will only be in operation during opening hours, so they will NOT be in operation during the night time period. The only plant that will be in operation during the night time is the refrigeration & condensers. All plant will be subject to acoustic feature corrections based on many factors, including reflections, tonality, intermittency so all of this will need to be calculated into the rating level. If the plant is to be located at the corner of two planes, then the directivity factor (Q) will be 4 so the directivity index will be +6dB.

5.5 The sound will decay over distance and the impact of the above corrections need to be assumed at the receptor location, so it is unlikely that the plant will be tonal at the receptor location, but this will need to be quantified once the plant specification is known.

5.6 The client has stated that suitable measures will be implemented to the plant/plant area to ensure the noise is mitigated accordingly. Such measures could include something similar to a Jakoustic Plus barrier. This is a dense barrier designed to significantly reduce noise break out, it will complete surround the plant from view. In addition, there will be an acoustic barrier erected along the Western & Northern boundary of the site to reduce the impact further. There are other methods of attenuation such as acoustic enclosures that could be built around the plant.

5.7 The table below shows the comparison in values between the initial assessment and the updated assessment. Further levels are shown thereafter as these will be the actual target values at the plant location.

L _{Aeq} – 3 rd – 4 th Sept 20	L _{Aeq} – 4 th – 5 th Sept 20	L _{Aeq} – 5 th – 6 th Sept 20	L _{Aeq} – 28 th – 29 th Jan 20
56.7	60.1	57.1	59.2
57.5	60.7	59.5	59.9
58.1	59.8	59.9	59
60.1	61.9	59.9	59.1
59.7	60.4	59.3	58.3
59.1	59.3	59.5	61.2
59.5	59.1	59.4	58.7
59.2	61.4	59.9	61.6
59.1	62.4	60.2	59.2
59.9	60.2	59.2	59.2
60.7	60.5	59.6	59.7
59.6	59.7	59.5	59
59.4	59.8	59.6	58.3
59.1	58.4	59.7	57.1
57	57.9	57.8	57.3
54.4	56.5	57.5	55.2
52.4	56.8	54.7	52.1
49.4	53.7	53	51.2
46.5	50.8	52.5	49.9
46.3	51.5	50.1	48.1
46.6	49	48.7	45.8
50.5	49.8	50.2	49.1
55.5	52.7	52	53.1
58.2	55.9	55.2	57.4

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6 Plant Noise Summary – Existing dwellings:

6.1 Due to the plant specification being unknown, the report includes target values that must not be exceeded, if this is achieved then there is no reason to suggest that the plant will have an adverse impact on the residential dwellings located to the North and West of the proposed scheme.

6.2 There are many factors that need to be accounted for when calculating the rating level, these include:

1. Sound reduction due to distance to dwelling
2. Tonality of plant
3. Intermittency of plant
4. Impulsiveness of plant
5. Screening offered by existing building

6.3 The results in this report were measured against criteria set out in British Standard BS4142: Method for Rating industrial noise affecting mixed residential and industrial areas 2014. This document states:

1- a difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.

2- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.

3- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level this is an indication of the specific sound source having a low impact, depending on the context.

6.4 It is clear that the noise levels reduce at night time and the lowest measured level at the rear of the site was 33dBA. The local authority requires that all new plant be no more than 5dBA below the lowest LA90 value and therefore the target value for the plant is 28dBA at the receptor location. Noise will decay naturally over distance so this must be taken into account when the final rating levels of the plant at residential facades is determined.

6.5 The necessary mitigation measures will be implemented to the plant/plant area to ensure the target values of this report will be achieved. The measures can include a number of options, ranging from an acoustic barrier surrounding the plant, acoustic enclosures mounted around the plant. These measures will ensure the correct level of mitigation is applied to the plant.

7 Existing Noise Climate

7.1 The site is situated next to the very busy Warrington Road. The measured noise levels associated with the road network are circa between 55- 58dBA from as early as 0600hrs and still in excess of 52-57dBA at 2300hrs over the weekend period. These values are similar to the initial assessment (56dBA at 0600hrs & 55dBA at 2300hrs).

7.2 The target values for each assessment (at the proposed plant location) are shown in the table below. This is based on the lowest 1hour values during the day time and the 15min values for the night time period.

Day Time – 1hour	3 rd – 4 th Sept 20	4 th – 5 th Sept 20	5 th – 6 th Sept 20	Target values	28 th – 29 th Jan 20	Target Value	Night Time – 15mins	3 rd – 4 th Sept 20	4 th – 5 th Sept 20	5 th – 6 th Sept 20	Target Value	28 th – 29 th Jan 20	Target value
L _{Aeq}	54	57	57		55			39	49	48		42	
L _{A90}	40	42	43	37dBA	46	41dBA		34	35	33	28dBA	38	33dBA

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7.3 It can be seen from the tables above that whilst the average L_{Aeq} values remained similar the L_{A90} values have dropped since the initial assessment. This may be due to the restrictions in place because of Covid and actually the original levels are more representative of the acoustic environment at the proposed site.

7.4 The target values in the above tables include the -5dB correction requested by the LPA. If these target values are achieved then there is no reason to suggest that the proposed plant will have an adverse impact on the local area. The L_{A90} during the updated assessment is the same at the proposed plant location as it is at the rear of the site, which is expected so if these values are achieved then the local residents should not be affected by the plant serving the convenience store.

8 Delivery Noise – Existing dwellings:

8.1 The centre of the delivery bay will be located to the East elevation of the store, with the centre of the delivery bay approximately 20metres from the closest residential façade (North). 20m is the distance that has been used for the arrival and leaving of the vehicles, the distance of 20m has also been used for delivery vehicle unloading. The existing levels to the rear of the site have been used for this assessment, please note that the levels at ML 2 are circa 5-8dB higher than those to the rear so the dwellings located to the West of the store will be exposed to higher noise levels throughout the day time and night time period (L_{A90} values similar).

8.2 It is understood there will be between 2-3 deliveries throughout the entire day time period, with the majority being in the morning, a reference period of 2hours has been used for the deliveries due to the varying arrival times. These delivery noise levels will be compared to the $L_{Aeq\ 1hour}$ value at the delivery time. There will be no deliveries to site before the store opens at 0700hrs with the exception of a newspaper delivery that will be prior to 0700hrs. This delivery will be in a transit sized van so the impact will be negligible.

Based on 2 deliveries between 0700-0900 – Dwelling to North

Table 3 - Vehicle Deliveries for existing dwelling

Residential Dwellings	Arrival	Reversing	Leaving	
SEL at 10m dB(A)	79	86	79	
No of events	2	2	2	
Distance, m	20	20	20	
Distance correction	-6	-6	-6	
Orientation reduction	0	0	0	
Reference period	2 hours	2 hours	2 hours	
Correction for reference period	-36	-36	-36	
Barrier correction	-10	-10	-10	Total
Total Noise at dwelling	27	34	27	35dB

Table 4 - Delivery Vehicle Unloading – For existing residential dwelling

Unloading Noise at 10m, dB L_{Aeq}	58
Distance, m	20
Distance correction	-6
Orientation reduction	0
Barrier Correction	-10
Time correction, 20mins per hour	-10
Unloading sound level at dwelling	32

Please note – A dense barrier should reduce the noise by -10dB. The deliveries will take place during the day time only and not during the night time.

Tables 5 & 6 - Combined delivery arrival, unloading & leaving

Noise Source	1	2	Total
Residential Dwellings	35	32	37

1 – Delivery Vehicle Movements

2 – Unloading

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Location	Combined Level	Ambient Noise Level	Difference	Assessment Indicates
Delivery Area	37dBA	51dBA 000hrs (Sunday)	-14dB	No impact

Table 7 – Combined Noise Levels at Dwellings

Combined Servicing Noise Level – Existing Dwellings	40dBA
Background LAeq 15mins (lowest)	51dBA
Combined BGN & specific	51dBA
Increase over BGN	0dB

Table 8 – Change in Sound Level

<i>Change in sound level dB</i>	<i>Change in Power</i>		<i>Change in apparent loudness</i>
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half/ Twice as loud
20	1/100	100	Much Quieter / Louder

Above table is taken from 'Engineering Noise Control' by Mr D. A Bies & C. H Hansen

8.3 It can be seen that the proposed delivery schedule & unloading activity should not have an adverse impact on the residential dwellings. It is also clear that the vehicle activity of the local road network is the dominant noise source and thus high levels of noise are apparent at the site from early in the morning.

8.4 It is evident that any barrier/fence will have almost no attenuation for any first-floor rooms in the residential dwellings, however it is clear that based on the existing noise levels associated with the site which is attributed to the vehicular traffic using the local road network and that the deliveries will take place during the day time and not during the night time. There are no principal windows from the adjacent dwellings facing the proposed store location as they all face the road network, so only the side elevation of the dwelling faces the store location. The measured noise levels indicate that the immediate area is exposed to levels in excess of 57dB LAeq 1hour from 6.00am at the side elevation and between 49-54dBA at the rear elevation. This indicates that the road network is very busy from this early time throughout the day and thus the dwellings are exposed to high noise levels throughout the early morning hours. The calculations indicate the delivery & unloading should not have an adverse impact on the receptors. There is a 2m high acoustic barrier being erected to the Western & Northern boundaries of the site so this will offer further sound reduction at the receptor location. It is accepted that the barrier will have little impact at 1st floor but the deliveries will take place during the day time and not during the night time so they will not cause sleep disturbance. In the absence of the barrier, the combined levels would be 47dBA which is -4dB below the lowest LAeq 15min value at 0700hrs and -1dB below the LAeq 15mins at 2245-2300hrs so further illustrating no adverse impact at the receptors.

8.5 It must be stated that no deliveries using larger vehicles will take place before 0700 but at a slightly later time of the day thus the potential impact will be even less due to the increase in noise levels throughout the day and lower sensitivity of the area due to time of day.

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9 Vehicle Movements in Car Park

9.1 Previous reports for this site have assessed the impact of vehicle movements using a distance between the centre of the car park and the nearest residential dwelling. The LPA have since stated that they require an assessment using a distance of 5m for the nearest residential dwelling. Therefore, the following calculations have been used. Please Note – The noise associated with the vehicle movements shown below were taken at the assessment site during the measurement procedure at a distance of 2m.

9.2 The table below is the source noise for vehicle movements taken on site in fair and dry weather. Due to the close proximity of the car park and vehicle movements (and car doors closing etc) a point source equation has been used to establish the noise levels at 5m.

Table 9 – Car Engine Noise Levels

L_{Aeq} level at 2m	Distance propagation (2m to 5m)	Level at 5m
65dBA	-8dBA	57dBA
L_{Amax} level at 2m		
72dBA	-8dBA	65dBA

9.3 In addition, the following reduction should be applied to take into account that the vehicle movements will not be constant for the entire measurement period. In any 1hour period (at 0700hrs) it is anticipated that the vehicle movements would account for 30minutes, therefore a further -3dB correction can be applied to the measured levels. The equation used for this is:

- $-10\log(\text{duration of event}/\text{duration of reference period})$ in seconds

9.4 This gives a level of 54dBA L_{Aeq} & 62dBA L_{Amax} in the absence of any further mitigation (this will be achieved by the installation of the acoustic barrier along the Western & Southern boundaries). Also, it must be worth reiterating that the western elevation of the site is already exposed to considerably higher levels during this time due to the closer proximity to the road network. The table below shows the current L_{Aeq} & L_{Amax} 15minute values between 0700-0900hrs over the 3-day period. These can be compared with the calculated levels above.

Tables 10-12 – L_{Aeq} & L_{Amax} current values

Time Period	L_{Aeq} Value	L_{Amax} Value
0700-0715	53	75
0715-0730	51	73
0730-0745	56	83
0745-0800	54	71
0800-0815	51	70
0815-0830	51	70
0830-0845	53	67
0845-0900	52	61

Time Period	L_{Aeq} Value	L_{Amax} Value
0700-0715	55	80
0715-0730	55	65
0730-0745	55	67
0745-0800	56	74
0800-0815	56	71
0815-0830	56	71
0830-0845	56	69
0845-0900	55	73

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Time Period	L_{Aeq} Value	L_{Amax} Value
0700-0715	54	76
0715-0730	52	76
0730-0745	54	82
0745-0800	54	72
0800-0815	52	63
0815-0830	53	62
0830-0845	56	76
0845-0900	55	77

9.5 It is clear to see that the calculated noise levels for the vehicle movements will not increase the current noise levels apparent at the site. It is clear to see that the site is currently exposed to similar noise levels as those calculated by the movements of the vehicles using the new car park area. There will be further noise mitigation measures applied to the site to reduce the impact further and it is clear that such measures will improve the scenario further. Based on the measured levels it is clear that the vehicle movements will not have an adverse impact on the neighbouring residential dwellings located to the North.

9.6 The L_{Amax} values of a car door closing also need to be looked at. The L_{Amax} level for a car door closing is shown below, this is at a distance of 1m and therefore the same reductions can be applied to establish the noise level at 5m (residential façade).

Table 13 – Car Doors L_{Amax} noise

L_{Amax} level at 1m	Distance propagation (1m to 5m)	Level at 5m
74-78dBA	-14dBA	60-64dBA

9.7 The calculated level of the car doors closing at 5m is shown as being between 60-64dBA, this value can then be compared with the L_{Amax} levels shown in tables 10-12 above. It is clear that the noise associated with the closing of car doors should not have an adverse impact on the residential dwellings located to the North of the proposed convenience store, and is predominantly lower than the current L_{Amax} levels apparent in site. In addition, the proposed acoustic barrier erected along the Western & Northern boundaries will reduce the noise even more and thus the calculated levels at the residential façade will be even less than the values shown in the table above.

9.8 The levels above have been taken directly from a car door closing and they are a fair assumption of the L_{Amax} values associated with such actions. These noise levels are clearly similar to those already apparent on site and therefore the impact of such noise sources would be negligible.

9.9 Based on both the L_{Aeq} & L_{Amax} calculations for vehicle movements and doors closing, it is clear that the noise associated with these noise sources will not have an adverse impact on the residential dwellings located to the North. The dwellings to the West are exposed to already higher noise levels so the impact here will also be negligible.

9.10 The erection of the acoustic barrier will reduce the noise associated with the car park even more. The barrier will have high levels of sound attenuation and offer a good level of sound reduction. Whilst the type of noise of a car door closing is different to vehicular traffic, the above equations offer clear calculated levels of the various noise sources in operation. The conclusions of these calculations is that the noise associated with the varying sources should be comparable to the current daily noise exposure experienced by the local residents with respect to both the public house activity and the vehicular traffic using the local road network.

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10 Table 14 - Roll Cage Calculations:

10.1 Based on 4 movements of cages (2 deliveries to store) between 0700-0900 – dwellings to North:

Residential Dwellings	Roll Cages
SEL at 10m dB(A)	88
No of events	4
Distance, m	20
Distance correction	-6
Orientation reduction	0
Reference period	2 hours
Correction for reference period	-36
Barrier correction	-10
Total Noise at dwelling	36

Table 15 - Delivery Vehicle Unloading – For existing residential dwelling

Unloading Noise at 10m, dB LAeq	58
Distance, m	20
Distance correction	-6
Orientation reduction	0
Barrier Correction	-10
Time correction, 20mins per hour	-5
Unloading sound level at dwelling	37

Table 16 - Combined roll cage movement & unloading

Noise Source	1	2	Total
Residential Dwellings	36	37	40

1 – Roll Cage Movements

2 – Unloading

Location	Combined Level	Ambient Noise Level	Difference	Assessment Indicates
Delivery Area & roll cage	40dBA	51dBA 0700hrs	-11dB	No impact

Table 17 – Combined Noise Levels

Combined Servicing Noise Level – Existing Dwellings	40dBA
Background LAeq (lowest)	51dBA
Combined BGN & specific	51dBA
Increase over BGN	0dB

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11 In addition to the above calculations, the movement of roll cages have been measured on another site (external literature) and they measure an L_{Aeq} of 64dB at 3m thus a calculated level of 48dB at 20m (with no further mitigation or barriers). The screening offered by the proposed acoustic barrier to the Western & Northern elevations must also be taken into account as this will reduce the impact further.

11.1 The very short duration of deliveries must also be taken into account; this short duration has been applied to the calculations, but it must be expressed that this type of delivery should not take place before 0700hrs and will be very short in duration.

11.2 The same external literature has measured a single delivery having a rating level of 62dBA (3m) which is a level of 46dB at 20m, this literature has many aspects of the delivery included in the calculation, including:

- Cages rolled off lorry and into store
- Movement inside lorry
- Roll cage movement inside lorry
- Lorry moving
- Empty cage movements back to lorry

11.3 It is accepted that the noise levels associated with a delivery will vary and there will be cases whereby the above values are higher. It can be assumed that empty roll cages may have an L_{Aeq} of 73-78dB at 3m, which would give a level of 56-61dB at 20m without any further mitigation. However, the event period must be taken into account compared to the reference period of 1hour. The level of reduction can be achieved using the following equation:

- $-10\log(\text{duration of event}/\text{duration of reference period})$ in seconds

11.4 A typical delivery to a site of this size would take circa 20mins, the roll cages will not be moving for the whole duration of the event due to other aspects taking place. Assuming that roll cages will be moving for no more than 10minutes (worst case scenario & anticipated to be less than this) a -8dB reduction can be applied to the rating level giving a value of between 48-54dB at the residential façade (with no further mitigation measures). The upper figure being +1dB above the lowest calculated L_{Aeq} 1hour apparent at 0700hrs. The measured levels within this report were taken at the residential boundary of the site which is a fair indication of the noise apparent at the site. The detailed calculations on the previous page lists a rating level for the roll cages in isolation of 36dB L_{Aeq} at the façade using an SEL of 88dB at 10m thus indicating no adverse impact. This is based on 4 events during the two-hour period which would relate to the arrival and departure from the store of 2 deliveries.

11.5 The information listed on this page has been included to illustrate that the levels used within this report are a fair reflection of the anticipated noise associated with delivery & unloading activity. Whilst it is appreciated the noise levels will vary due to numerous factors, this report indicates that with careful provision and control of deliveries there should be negligible/minimal impact on the neighbouring dwellings.

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12 Results Summary:

12.1 The report includes the target values for the plant due to the specification being unknown at present, providing these target values are achieved then there is no reason to suggest the plant noise will have an adverse impact on the local residents. This report includes suitable mitigation measures that can easily be installed to ensure the target values are achieved and once these are in place then the plant will not have an adverse impact on the residential dwellings located nearby.

12.2 The detailed calculations for the delivery noise, vehicle movements & roll cage movements indicate that the noise associated with these activities should not have an adverse impact on the residential dwellings to the West or North of the proposed store. The calculations have taken each event and combined the level to show a value compared to the existing climate. In each case, the calculated levels are below the existing climate and thus should not have an adverse impact on the residential dwellings. The further calculations also take the comments made by the LPA into account and offered suitable measures to indicate the rating levels at the facades. The target values for the plant also take into account the reduction in noise levels over time between assessments due to changes in site conditions and also with the -5dB below the lowest LA90 correction applied.

12.3 A good acoustic design process is a vital part of new developments such as this. The client will take steps to ensure that the existing dwellings are protected from the new retail unit, these steps include:

1. **Suitable mitigation measures applied to plant**
2. **Acoustic fence erected along the Western & Northern boundaries**
3. **ANPR & robust car park management in operation for the car park area**
4. **Engines switched off during deliveries**
5. **Agreements to a suitable delivery timetable**

12.4 The client has undertaken extensive traffic investigation and provided both traffic statements and travel plans for the store. Both documents indicate that under usual conditions the use of traffic associated with the store will not have an adverse impact on the local area and that the traffic will be contained within the proposed car park for the store. The client will also undertake suitable car park management to ensure this is the case. Both the traffic statement and travel plan offer robust and comprehensive conclusions that both the traffic and car park can be controlled effectively and as such the impact of the proposed store will be minimal on the local area.

12.4 The site will still be used as a public house, with deliveries, vehicle movements and a kitchen extraction system apparent so it is likely that the site will not be exposed to higher noise levels based on the convenience store. As part of the proposals the beer garden will be relocated to the rear of the public house and enclosed by a dense brick wall so this will not increase the noise levels at the residential boundary.

12.5 The proposed opening hours for the store are 0700-2300hrs 7 days a week so this report has used data from 0600hrs as a comparison to indicate that the noise associated with deliveries, vehicle movements & plant noise will not have an adverse impact on the local environment. The public house opening hours are 1200-2300 Sunday to Thursday and 1200-0000 on Friday and Saturday so the public house always has been and will be open later than the proposed convenience store, so the use of the store will not be during times that are currently not in use as part of people leaving the public house.

12.6 The measures to be implemented by the client for both the plant mitigation and general site mitigation will reduce the impact of the proposed store even further to ensure the residents are not adversely affected by the proposed convenience store. The mitigation measures will ensure the noise associated with the plant, deliveries to and from the store and noise associated with the car park is not intrusive on the local area.

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13 Acoustic Definitions:

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.

LAmx - 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) — (1) Degree of loudness. (2) A unit for expressing the relative intensity of sounds on a scale from zero for the average least perceptible sound to about 130 for the average pain 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.

British Standards & associated documents:

Planning Policy Guidance 24: Planning and Noise

Code of Practice: BS8233: 1999 - Sound Insulation and noise reduction for buildings.

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

BS4142: 2014 - Rating Industrial Noise affecting mixed residential and industrial areas

Equation used for delivery noise & vehicle movement calculations

$$LA_{eq}(T) = SEL + 10 \log N - 10 \log T$$

where LAeq (T) = Equivalent continuous sound pressure level over time period T

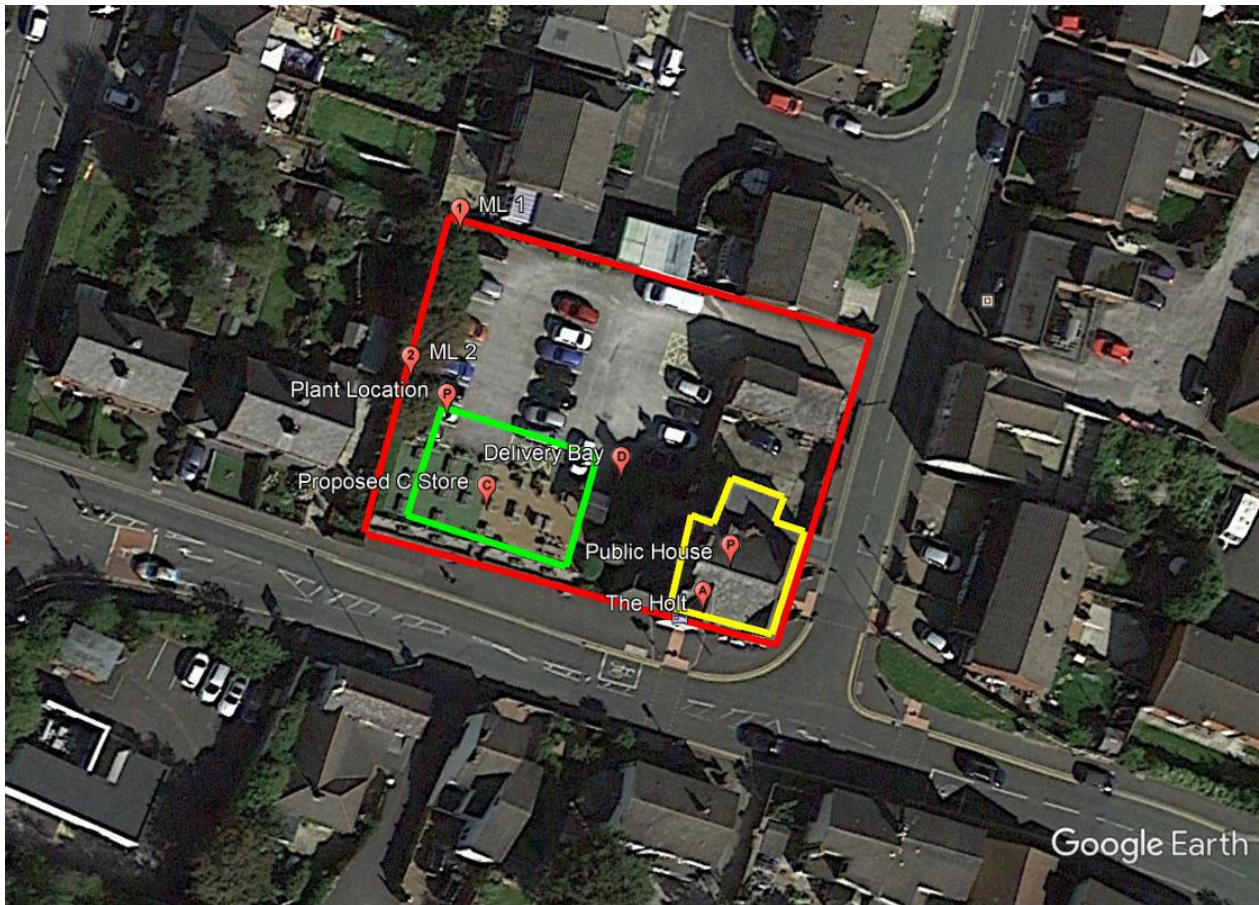
SEL = 'Single Event Level', i.e. the 1 second LAeq which has the same total A-weighted energy as the entire event

N = Number of events in time period T

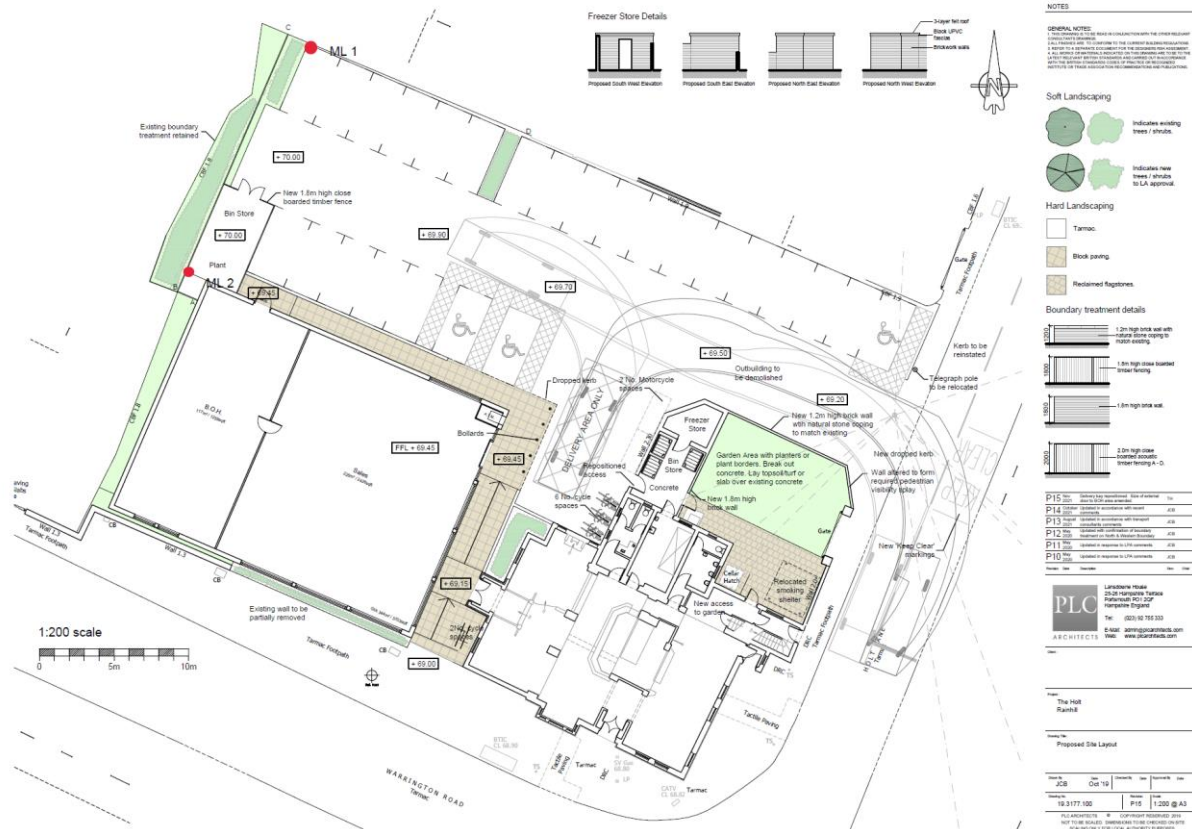
T = Time period in seconds

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14 Google Earth:



15 Site Plans:



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Time	LAeq	LA90	LAmx
(2020-09-06 07:01:32.160)	52.5	42.6	74.7
(2020-09-06 07:16:32.160)	51.2	43.6	72.8
(2020-09-06 07:31:32.160)	55.5	44.8	82.9
(2020-09-06 07:46:32.160)	53.9	44	71
(2020-09-06 08:01:32.160)	51.2	41.8	70.1
(2020-09-06 08:16:32.160)	50.8	41.8	70.2
(2020-09-06 08:31:32.160)	52.9	43.6	66.7
(2020-09-06 08:46:32.160)	52.1	44	61.4
(2020-09-06 09:01:32.160)	54.6	44.2	74.5
(2020-09-06 09:16:32.160)	52.4	46	64
(2020-09-06 09:31:32.160)	51.9	45	66.1
(2020-09-06 09:46:32.160)	51.3	42.2	67.1
(2020-09-06 10:01:32.160)	52.6	44.6	65.9
(2020-09-03 10:16:32.160)	54.3	48.6	68.3
(2020-09-03 10:31:32.160)	53.7	48.3	68.2
(2020-09-03 10:46:32.160)	54.4	49.4	66.5
(2020-09-03 11:01:32.160)	54.5	49	72.5
(2020-09-03 11:16:32.160)	54.3	49.2	70.3
(2020-09-03 11:31:32.160)	53.8	49.3	60.6
(2020-09-03 11:46:32.160)	55.8	49.9	77.2
(2020-09-03 12:01:32.160)	53.2	48.7	61.3
(2020-09-03 12:16:32.160)	53.1	47.3	73.9
(2020-09-03 12:31:32.160)	53.2	48	69
(2020-09-03 12:46:32.160)	55.1	48.5	74.7
(2020-09-03 13:01:32.160)	54.4	49.6	71.2
(2020-09-03 13:16:32.160)	55.1	49.6	68.9
(2020-09-03 13:31:32.160)	54	48.9	71.7
(2020-09-03 13:46:32.160)	53.9	49.2	67.7
(2020-09-03 14:01:32.160)	55.7	49.3	73.2
(2020-09-03 14:16:32.160)	54.4	50.3	65.2
(2020-09-03 14:31:32.160)	54.4	49.7	65.8
(2020-09-03 14:46:32.160)	54.2	49.1	71.7
(2020-09-03 15:01:32.160)	54.3	49.2	66.6
(2020-09-03 15:16:32.160)	54.2	50.3	69.3
(2020-09-03 15:31:32.160)	55.3	50	71.5
(2020-09-03 15:46:32.160)	55.3	50.6	69.7
(2020-09-03 16:01:32.160)	54.8	49.7	70.5
(2020-09-03 16:16:32.160)	59.7	49	78.5
(2020-09-03 16:31:32.160)	54.8	49.2	71.3
(2020-09-03 16:46:32.160)	54.3	49.2	69
(2020-09-03 17:01:32.160)	54.8	49.9	69.5
(2020-09-03 17:16:32.160)	54.9	50.1	68.8



(2020-09-03 17:31:32.160)	54.8	49.9	70.2
(2020-09-03 17:46:32.160)	55.5	50.1	68.6
(2020-09-03 18:01:32.160)	55.3	50	71.2
(2020-09-03 18:16:32.160)	55.1	50.3	68.4
(2020-09-03 18:31:32.160)	54.2	48	70.2
(2020-09-03 18:46:32.160)	53.7	47.9	74
(2020-09-03 19:01:32.160)	54.1	47.7	67
(2020-09-03 19:16:32.160)	53.7	47.6	63.6
(2020-09-03 19:31:32.160)	54.3	47.8	61.9
(2020-09-03 19:46:32.160)	53.6	48	64.4
(2020-09-03 20:01:32.160)	53.8	48.3	61.3
(2020-09-03 20:16:32.160)	53.6	47.8	64.9
(2020-09-03 20:31:32.160)	53.1	46.4	67.6
(2020-09-03 20:46:32.160)	55.4	45.7	80.2
(2020-09-03 21:01:32.160)	53.2	46.1	68
(2020-09-03 21:16:32.160)	52.5	45.5	67.4
(2020-09-03 21:31:32.160)	51.5	44.2	61.5
(2020-09-03 21:46:32.160)	50.7	42.7	63.7
(2020-09-03 22:01:32.160)	51.1	43.7	61.9
(2020-09-03 22:16:32.160)	49.9	41.8	64.4
(2020-09-03 22:31:32.160)	49.6	40.7	63.7
(2020-09-03 22:46:32.160)	47.7	38.9	60.2
(2020-09-03 23:01:32.160)	48.3	40	63.2
(2020-09-03 23:16:32.160)	46.9	41.8	60.3
(2020-09-03 23:31:32.160)	47.7	42.1	61.5
(2020-09-03 23:46:32.160)	46.4	41.3	59.6
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(2020-09-04 00:16:32.160)	44.8	37.3	64.2
(2020-09-04 00:31:32.160)	46.3	39	59.8
(2020-09-04 00:46:32.160)	43.1	36.3	57.7
(2020-09-04 01:01:32.160)	42.8	35.8	56.3
(2020-09-04 01:16:32.160)	41.6	36.9	60.1
(2020-09-04 01:31:32.160)	45.1	37.7	61.1
(2020-09-04 01:46:32.160)	40	35.4	52.5
(2020-09-04 02:01:32.160)	42.6	37.2	58.6
(2020-09-04 02:16:32.160)	42.5	35	57.1
(2020-09-04 02:31:32.160)	42.6	35.4	57.2
(2020-09-04 02:46:32.160)	42.3	34.4	59
(2020-09-04 03:01:32.160)	37.6	34.3	52
(2020-09-04 03:16:32.160)	42.4	35.6	59.9
(2020-09-04 03:31:32.160)	41	35.6	58
(2020-09-04 03:46:32.160)	42.7	35.9	60.7
(2020-09-04 04:01:32.160)	40.3	34.9	62.5
(2020-09-04 04:16:32.160)	43.4	36	63.8
(2020-09-04 04:31:32.160)	44.6	37.4	62.4
(2020-09-04 04:46:32.160)	46.1	39.4	60.1

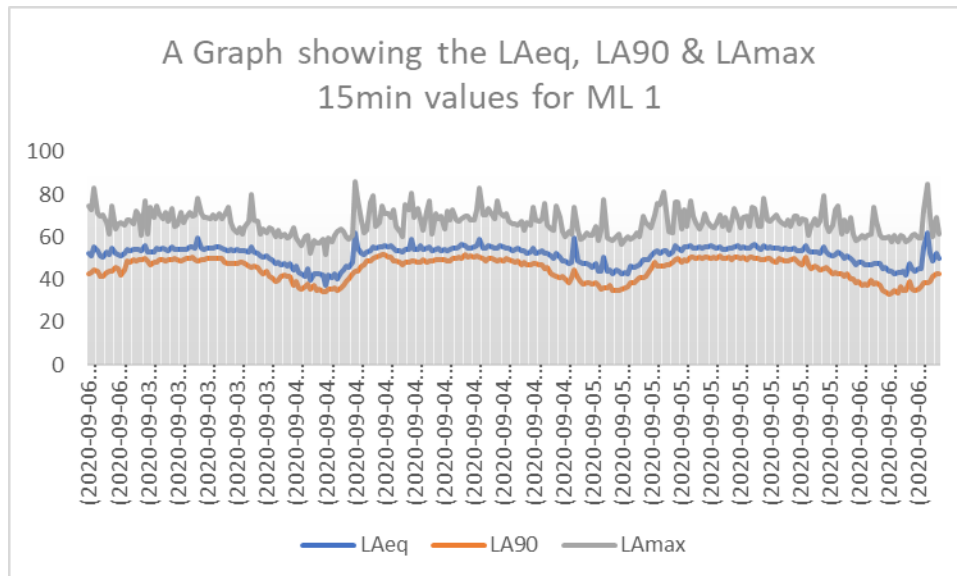
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(2020-09-04 06:01:32.160)	52.5	46.5	67.6
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(2020-09-04 06:31:32.160)	53.3	48.7	63.4
(2020-09-04 06:46:32.160)	53.7	48.9	76.5
(2020-09-04 07:01:32.160)	55.4	50.1	79.5
(2020-09-04 07:16:32.160)	54.8	50.6	65
(2020-09-04 07:31:32.160)	55.4	51.5	66.7
(2020-09-04 07:46:32.160)	55.7	51.7	74.4
(2020-09-04 08:01:32.160)	56	51.7	70.9
(2020-09-04 08:16:32.160)	55.7	50.9	70.9
(2020-09-04 08:31:32.160)	55.8	50.6	69
(2020-09-04 08:46:32.160)	55	49.1	73.1
(2020-09-04 09:01:32.160)	53.8	48.8	65.3
(2020-09-04 09:16:32.160)	53.9	48.5	62.6
(2020-09-04 09:31:32.160)	53.2	47.3	60
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(2020-09-04 11:31:32.160)	54.8	48.4	72.1
(2020-09-04 11:46:32.160)	55.5	49	77.2
(2020-09-04 12:01:32.160)	53.9	49.1	61.6
(2020-09-04 12:16:32.160)	54.1	49.2	71.1
(2020-09-04 12:31:32.160)	54.6	49.3	68.6
(2020-09-04 12:46:32.160)	53.9	49.4	69.8
(2020-09-04 13:01:32.160)	54.2	49.4	64
(2020-09-04 13:16:32.160)	53.8	49.1	72.1
(2020-09-04 13:31:32.160)	54.3	48.8	67.8
(2020-09-04 13:46:32.160)	55.1	50.1	72.9
(2020-09-04 14:01:32.160)	54.8	50.3	67.8
(2020-09-04 14:16:32.160)	55.3	50.5	67.6
(2020-09-04 14:31:32.160)	56.4	50	68.5
(2020-09-04 14:46:32.160)	56	51.6	70.1
(2020-09-04 15:01:32.160)	54.8	50.5	70.1
(2020-09-04 15:16:32.160)	54.8	51	68.3
(2020-09-04 15:31:32.160)	55.4	50.9	68.3
(2020-09-04 15:46:32.160)	55.9	51.1	72.8
(2020-09-04 16:01:32.160)	59.3	50.5	82.9
(2020-09-04 16:16:32.160)	54.7	50	70.6

(2020-09-04 16:31:32.160)	54.6	48.7	70.4
(2020-09-04 16:46:32.160)	56.1	50.3	73.7
(2020-09-04 17:01:32.160)	55.3	50.1	70.5
(2020-09-04 17:16:32.160)	55.1	49.2	68.8
(2020-09-04 17:31:32.160)	54.7	49	77
(2020-09-04 17:46:32.160)	55.9	49.3	71.4
(2020-09-04 18:01:32.160)	55.3	49.1	69.7
(2020-09-04 18:16:32.160)	54.9	49.8	70.9
(2020-09-04 18:31:32.160)	54.6	49.3	67.6
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(2020-09-04 20:01:32.160)	52.4	46.7	66.8
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(2020-09-04 21:31:32.160)	52.4	45	75.9
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(2020-09-04 22:01:32.160)	51.3	43	63.8
(2020-09-04 22:16:32.160)	50	42.4	63.3
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(2020-09-05 00:46:32.160)	47.4	38.1	59.7
(2020-09-05 01:01:32.160)	47.4	38.8	62
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(2020-09-05 02:46:32.160)	44	36.1	59.5
(2020-09-05 03:01:32.160)	44.7	37.2	58.8
(2020-09-05 03:16:32.160)	42.9	35	58.2
(2020-09-05 03:31:32.160)	44.6	35.1	60.1
(2020-09-05 03:46:32.160)	44	35	61.5

(2020-09-05 04:01:32.160)	42.6	35.8	56.5
(2020-09-05 04:16:32.160)	43.5	36.2	58.8
(2020-09-05 04:31:32.160)	42.9	36.9	60.3
(2020-09-05 04:46:32.160)	46.2	38.4	58.8
(2020-09-05 05:01:32.160)	45.5	38.7	60.3
(2020-09-05 05:16:32.160)	46.6	40	62.1
(2020-09-05 05:31:32.160)	47.1	41.1	60.3
(2020-09-05 05:46:32.160)	49.6	40.8	70
(2020-09-05 06:01:32.160)	49.5	41.5	67
(2020-09-05 06:16:32.160)	49.6	43.1	65.4
(2020-09-05 06:31:32.160)	51.1	45.3	64.2
(2020-09-05 06:46:32.160)	53.2	48.3	70.3
(2020-09-05 07:01:32.160)	53.6	46.2	75.9
(2020-09-05 07:16:32.160)	52.3	46.2	75.5
(2020-09-05 07:31:32.160)	53.7	46.4	81.5
(2020-09-05 07:46:32.160)	53.6	46.8	72
(2020-09-05 08:01:32.160)	52.1	47	62.8
(2020-09-05 08:16:32.160)	52.9	48.1	61.8
(2020-09-05 08:31:32.160)	55.9	49.2	76.2
(2020-09-05 08:46:32.160)	55.1	49.8	76.5
(2020-09-05 09:01:32.160)	53.9	48.4	64
(2020-09-05 09:16:32.160)	55.2	49.7	72.7
(2020-09-05 09:31:32.160)	55.2	49.1	65.2
(2020-09-05 09:46:32.160)	56.3	50.6	76.8
(2020-09-05 10:01:32.160)	55	50.9	69.6
(2020-09-05 10:16:32.160)	54.6	49.9	66.9
(2020-09-05 10:31:32.160)	55.3	50.5	63.7
(2020-09-05 10:46:32.160)	55	50.3	66.4
(2020-09-05 11:01:32.160)	55.5	50.5	70.9
(2020-09-05 11:16:32.160)	55.7	50.8	67.2
(2020-09-05 11:31:32.160)	55.8	50.2	65.3
(2020-09-05 11:46:32.160)	55.2	50.4	64.6
(2020-09-05 12:01:32.160)	55	50.1	66
(2020-09-05 12:16:32.160)	55.3	51	70.3
(2020-09-05 12:31:32.160)	54.4	50	65
(2020-09-05 12:46:32.160)	54.4	50.1	69.2
(2020-09-05 13:01:32.160)	55.1	50.4	63.3
(2020-09-05 13:16:32.160)	55	49.7	67.2
(2020-09-05 13:31:32.160)	55.6	50.4	73.2
(2020-09-05 13:46:32.160)	55.8	50.9	68.5
(2020-09-05 14:01:32.160)	54.9	50.1	64.6
(2020-09-05 14:16:32.160)	55.2	50.6	69.2
(2020-09-05 14:31:32.160)	54.7	49.2	70.1
(2020-09-05 14:46:32.160)	54.7	50.5	65
(2020-09-05 15:01:32.160)	55.9	50.6	74.1
(2020-09-05 15:16:32.160)	56.6	50.2	73.2

(2020-09-05 15:31:32.160)	55	50.2	65.1
(2020-09-05 15:46:32.160)	54.4	49.7	65.1
(2020-09-05 16:01:32.160)	56.3	49.6	78.5
(2020-09-05 16:16:32.160)	55.1	50.2	68.3
(2020-09-05 16:31:32.160)	55.3	49.9	67.2
(2020-09-05 16:46:32.160)	54.6	49	68.8
(2020-09-05 17:01:32.160)	54.6	48.1	70.4
(2020-09-05 17:16:32.160)	54.9	49.8	67.9
(2020-09-05 17:31:32.160)	54.4	49.7	67.1
(2020-09-05 17:46:32.160)	54.7	49.1	65.7
(2020-09-05 18:01:32.160)	54.2	49.1	67.8
(2020-09-05 18:16:32.160)	54	49.3	65
(2020-09-05 18:31:32.160)	55.1	50.1	70.1
(2020-09-05 18:46:32.160)	53.5	49	69.7
(2020-09-05 19:01:32.160)	53.4	47.4	66.4
(2020-09-05 19:16:32.160)	53.6	46.7	68.7
(2020-09-05 19:31:32.160)	55.9	50.6	68.3
(2020-09-05 19:46:32.160)	53.4	47.1	60.6
(2020-09-05 20:01:32.160)	53	45.3	64.8
(2020-09-05 20:16:32.160)	53.3	46.4	68.6
(2020-09-05 20:31:32.160)	52.8	45.5	65.9
(2020-09-05 20:46:32.160)	52.7	44.4	67.4
(2020-09-05 21:01:32.160)	55.2	45.2	79.2
(2020-09-05 21:16:32.160)	52.8	45.9	65.9
(2020-09-05 21:31:32.160)	51.9	44.7	62.6
(2020-09-05 21:46:32.160)	51.2	42.9	65.4
(2020-09-05 22:01:32.160)	52.1	43.6	72.7
(2020-09-05 22:16:32.160)	53.1	42.9	74.9
(2020-09-05 22:31:32.160)	51.8	42.9	61.3
(2020-09-05 22:46:32.160)	50.2	41.6	68.3
(2020-09-05 23:01:32.160)	51.1	43	62.4
(2020-09-05 23:16:32.160)	50.2	40.3	69
(2020-09-05 23:31:32.160)	49.1	40.3	61.3
(2020-09-05 23:46:32.160)	46.8	38.6	58.3
(2020-09-06 00:01:32.160)	48	38.9	59.1
(2020-09-06 00:16:32.160)	48	37.4	61
(2020-09-06 00:31:32.160)	47	38.1	59.6
(2020-09-06 00:46:32.160)	47.3	37.3	60.6
(2020-09-06 01:01:32.160)	46.7	40	61.2
(2020-09-06 01:16:32.160)	47.6	37.9	74.2
(2020-09-06 01:31:32.160)	47.9	38.8	67.6
(2020-09-06 01:46:32.160)	47.6	37.4	61.1
(2020-09-06 02:01:32.160)	45.3	35.2	59.8
(2020-09-06 02:16:32.160)	45.6	34.3	59.9
(2020-09-06 02:31:32.160)	44	33	60
(2020-09-06 02:46:32.160)	43.7	33.8	58

(2020-09-06 03:01:32.160)	42.7	34.7	61
(2020-09-06 03:16:32.160)	43.4	33.8	57.6
(2020-09-06 03:31:32.160)	43.1	36.5	60.8
(2020-09-06 03:46:32.160)	43.8	34.9	60.3
(2020-09-06 04:01:32.160)	42.4	35.2	57.9
(2020-09-06 04:16:32.160)	47.5	39.4	59.3
(2020-09-06 04:31:32.160)	45	35.5	60.8
(2020-09-06 04:46:32.160)	44.2	35.1	61.2
(2020-09-06 05:01:32.160)	45.1	35.8	59.5
(2020-09-06 05:16:32.160)	45.1	36.9	59.5
(2020-09-06 05:31:32.160)	55.2	38.4	72.6
(2020-09-06 05:46:32.160)	62.2	38.4	84.6
(2020-09-06 06:01:32.160)	52.2	38.9	69.9
(2020-09-06 06:16:32.160)	48.6	41.4	60.1
(2020-09-06 06:31:32.160)	52.2	42.8	69.1
(2020-09-06 06:46:32.160)	50.2	42.8	61.4



Time	LAeq	LA90	LMax
(2020-09-06 07:01:32.160)	55.1	41.9	70.9
(2020-09-06 07:16:32.160)	55.2	43.1	71.9
(2020-09-06 07:31:32.160)	58	45.1	75.5
(2020-09-06 07:46:32.160)	56.5	43.8	76.1
(2020-09-06 08:01:32.160)	56.4	42.3	71.8
(2020-09-06 08:16:32.160)	56.7	42	73.3
(2020-09-06 08:31:32.160)	58.6	44.2	72.4
(2020-09-06 08:46:32.160)	57.8	44.2	71.7
(2020-09-06 09:01:32.160)	56.5	44.4	70.9
(2020-09-06 09:16:32.160)	58	45.8	73.7
(2020-09-06 09:31:32.160)	58	45	72.6
(2020-09-06 09:46:32.160)	57.9	43.8	73.9
(2020-09-06 10:01:32.160)	58.5	45.7	73.3



(2020-09-03 10:16:32.160)	60.3	50.7	75.9
(2020-09-03 10:31:32.160)	60.2	51.2	76
(2020-09-03 10:46:32.160)	60.4	52.1	73.3
(2020-09-03 11:01:32.160)	59.3	50	69.9
(2020-09-03 11:16:32.160)	59.2	50.5	71
(2020-09-03 11:31:32.160)	58.9	50.7	71.7
(2020-09-03 11:46:32.160)	61.1	51.7	83.6
(2020-09-03 12:01:32.160)	59.2	50.4	72.5
(2020-09-03 12:16:32.160)	59.1	48.8	71.4
(2020-09-03 12:31:32.160)	57.3	48.9	72.2
(2020-09-03 12:46:32.160)	60	49.5	81.8
(2020-09-03 13:01:32.160)	59.8	50.4	81.9
(2020-09-03 13:16:32.160)	59.9	50.7	75.3
(2020-09-03 13:31:32.160)	58.2	49.2	75
(2020-09-03 13:46:32.160)	58.8	50.9	72.4
(2020-09-03 14:01:32.160)	60.7	50.7	79.6
(2020-09-03 14:16:32.160)	59.6	51.4	74.3
(2020-09-03 14:31:32.160)	59.4	50.2	70.6
(2020-09-03 14:46:32.160)	58.9	50.2	74.1
(2020-09-03 15:01:32.160)	58.8	49.7	71.9
(2020-09-03 15:16:32.160)	57.9	50.8	72.5
(2020-09-03 15:31:32.160)	59.5	50.2	71.4
(2020-09-03 15:46:32.160)	59.8	51.8	73.6
(2020-09-03 16:01:32.160)	58.9	50.4	73.7
(2020-09-03 16:16:32.160)	60.3	51	85.5
(2020-09-03 16:31:32.160)	60	50.8	79.2
(2020-09-03 16:46:32.160)	59.5	51.6	70
(2020-09-03 17:01:32.160)	59.6	51.1	75.5
(2020-09-03 17:16:32.160)	59.6	51.3	73
(2020-09-03 17:31:32.160)	60.3	52.9	75.3
(2020-09-03 17:46:32.160)	61.5	52.9	77.2
(2020-09-03 18:01:32.160)	61	52.7	79.8
(2020-09-03 18:16:32.160)	60.1	52.7	73.5
(2020-09-03 18:31:32.160)	60.1	50.5	75.1
(2020-09-03 18:46:32.160)	58.9	49.9	71.1
(2020-09-03 19:01:32.160)	59.2	49.1	72.3
(2020-09-03 19:16:32.160)	59.4	49.3	72
(2020-09-03 19:31:32.160)	59.9	49.5	70.7
(2020-09-03 19:46:32.160)	59.1	49.6	70.1
(2020-09-03 20:01:32.160)	59.3	49.4	72.9
(2020-09-03 20:16:32.160)	58.7	49.3	70.5
(2020-09-03 20:31:32.160)	58.3	47.8	71.7
(2020-09-03 20:46:32.160)	60.8	46.4	83.6
(2020-09-03 21:01:32.160)	57.7	46.8	73.1
(2020-09-03 21:16:32.160)	57.6	46.3	73
(2020-09-03 21:31:32.160)	57.1	44	73.3

(2020-09-03 21:46:32.160)	56.1	42.6	72.2
(2020-09-03 22:01:32.160)	57	44.1	71.9
(2020-09-03 22:16:32.160)	55.2	41.8	72.3
(2020-09-03 22:31:32.160)	54.9	40.6	71.7
(2020-09-03 22:46:32.160)	53.6	38.4	71.9
(2020-09-03 23:01:32.160)	53.8	39.4	74.3
(2020-09-03 23:16:32.160)	51.9	43.4	69.6
(2020-09-03 23:31:32.160)	53.1	43.7	69.8
(2020-09-03 23:46:32.160)	51.5	43.1	70
(2020-09-04 00:01:32.160)	52.8	41.7	72.8
(2020-09-04 00:16:32.160)	49.9	36.3	71.4
(2020-09-04 00:31:32.160)	51.2	37.6	69.2
(2020-09-04 00:46:32.160)	48	35	69.3
(2020-09-04 01:01:32.160)	47.6	34.8	68.4
(2020-09-04 01:16:32.160)	44.2	35.8	68.5
(2020-09-04 01:31:32.160)	49.7	36.7	70.9
(2020-09-04 01:46:32.160)	43.6	34.8	65.9
(2020-09-04 02:01:32.160)	45.8	36.3	69.3
(2020-09-04 02:16:32.160)	46.9	34.4	68.7
(2020-09-04 02:31:32.160)	47.9	34.4	69.1
(2020-09-04 02:46:32.160)	47.2	34.2	68.3
(2020-09-04 03:01:32.160)	38.7	34.2	62.7
(2020-09-04 03:16:32.160)	47	35.3	69
(2020-09-04 03:31:32.160)	46	35.2	70.9
(2020-09-04 03:46:32.160)	47.9	35.2	72.6
(2020-09-04 04:01:32.160)	44.8	34.5	68.7
(2020-09-04 04:16:32.160)	49.1	35.6	73
(2020-09-04 04:31:32.160)	50	37.1	73.1
(2020-09-04 04:46:32.160)	51.3	38.7	73.1
(2020-09-04 05:01:32.160)	51.2	39.5	70.6
(2020-09-04 05:16:32.160)	53.8	41.8	70.9
(2020-09-04 05:31:32.160)	55.1	43.2	74
(2020-09-04 05:46:32.160)	55.5	43.5	70.7
(2020-09-04 06:01:32.160)	56.9	46.1	73.6
(2020-09-04 06:16:32.160)	57	46.9	72.1
(2020-09-04 06:31:32.160)	58.4	48.9	71.5
(2020-09-04 06:46:32.160)	58.1	48.8	72.3
(2020-09-04 07:01:32.160)	59	49.6	73.2
(2020-09-04 07:16:32.160)	59.5	51	73.9
(2020-09-04 07:31:32.160)	59.9	52	77.8
(2020-09-04 07:46:32.160)	60.6	52.7	72.3
(2020-09-04 08:01:32.160)	60.2	53.7	74.1
(2020-09-04 08:16:32.160)	60.9	53.7	73.5
(2020-09-04 08:31:32.160)	61.2	52.3	72.4
(2020-09-04 08:46:32.160)	60.7	51.2	76.3
(2020-09-04 09:01:32.160)	60.1	50.7	73

(2020-09-04 09:16:32.160)	60.2	50.7	72.7
(2020-09-04 09:31:32.160)	59.5	49.2	71.8
(2020-09-04 09:46:32.160)	59.9	50.5	74
(2020-09-04 10:01:32.160)	59.7	50.2	75.5
(2020-09-04 10:16:32.160)	64.9	50.5	88.7
(2020-09-04 10:31:32.160)	58.9	50.8	69.9
(2020-09-04 10:46:32.160)	59.7	50.5	71.6
(2020-09-04 11:01:32.160)	61.2	50.4	76.7
(2020-09-04 11:16:32.160)	60.3	51.2	74.7
(2020-09-04 11:31:32.160)	59.9	49.9	73.4
(2020-09-04 11:46:32.160)	61.6	51.2	88.4
(2020-09-04 12:01:32.160)	59.7	50.4	71.9
(2020-09-04 12:16:32.160)	59.7	50.6	81.8
(2020-09-04 12:31:32.160)	59.7	50.8	72
(2020-09-04 12:46:32.160)	58.8	50.4	72.2
(2020-09-04 13:01:32.160)	59	49.7	70.2
(2020-09-04 13:16:32.160)	58	49.3	72.6
(2020-09-04 13:31:32.160)	58.8	49.7	69.8
(2020-09-04 13:46:32.160)	59.5	51.2	78.2
(2020-09-04 14:01:32.160)	60	51.7	74.7
(2020-09-04 14:16:32.160)	61	51.5	72.7
(2020-09-04 14:31:32.160)	63.4	51.5	78.5
(2020-09-04 14:46:32.160)	60.7	52.4	73
(2020-09-04 15:01:32.160)	59.8	51.3	72.6
(2020-09-04 15:16:32.160)	59.4	52.1	71.1
(2020-09-04 15:31:32.160)	60.4	51.6	78.7
(2020-09-04 15:46:32.160)	59.8	51.7	74.8
(2020-09-04 16:01:32.160)	66.1	52	94.1
(2020-09-04 16:16:32.160)	60.2	51	72.9
(2020-09-04 16:31:32.160)	59.8	50.2	71.8
(2020-09-04 16:46:32.160)	60.7	52.7	71.8
(2020-09-04 17:01:32.160)	60.2	51.5	74.9
(2020-09-04 17:16:32.160)	60.6	51.5	78.1
(2020-09-04 17:31:32.160)	60.3	50.8	73.6
(2020-09-04 17:46:32.160)	60.7	50.4	74.3
(2020-09-04 18:01:32.160)	60.2	51	72.9
(2020-09-04 18:16:32.160)	59.5	50.6	71
(2020-09-04 18:31:32.160)	59.8	50.5	72.5
(2020-09-04 18:46:32.160)	59.7	50.4	72
(2020-09-04 19:01:32.160)	59.7	49.8	73.2
(2020-09-04 19:16:32.160)	60.8	50.8	75.1
(2020-09-04 19:31:32.160)	60	48.6	75.4
(2020-09-04 19:46:32.160)	59.8	50.2	71.6
(2020-09-04 20:01:32.160)	58.2	48.3	74.3
(2020-09-04 20:16:32.160)	58.4	48.4	74.6
(2020-09-04 20:31:32.160)	59.2	49.5	73.8

(2020-09-04 20:46:32.160)	57.9	49.1	73.6
(2020-09-04 21:01:32.160)	58	48.1	72.1
(2020-09-04 21:16:32.160)	58.7	48.2	72.6
(2020-09-04 21:31:32.160)	58.1	45.9	82.3
(2020-09-04 21:46:32.160)	57.5	46.1	71.5
(2020-09-04 22:01:32.160)	57.3	42.9	76.4
(2020-09-04 22:16:32.160)	56.2	42.5	79.1
(2020-09-04 22:31:32.160)	57.9	41.7	80.8
(2020-09-04 22:46:32.160)	56.3	41.5	72.4
(2020-09-04 23:01:32.160)	54.8	41.4	70.6
(2020-09-04 23:16:32.160)	54.8	40.6	71.3
(2020-09-04 23:31:32.160)	53.9	38.5	75.8
(2020-09-04 23:46:32.160)	53.6	39.9	69.6
(2020-09-05 00:01:32.160)	60.6	44.2	81.4
(2020-09-05 00:16:32.160)	54.6	41.4	72
(2020-09-05 00:31:32.160)	53.7	38	70.4
(2020-09-05 00:46:32.160)	53.3	37.6	71.5
(2020-09-05 01:01:32.160)	53.2	38.2	71.2
(2020-09-05 01:16:32.160)	51.5	37.3	71.6
(2020-09-05 01:31:32.160)	50.8	36.7	70.7
(2020-09-05 01:46:32.160)	51.4	37.3	71.7
(2020-09-05 02:01:32.160)	49	37.1	70.4
(2020-09-05 02:16:32.160)	49.4	34.8	73.2
(2020-09-05 02:31:32.160)	54.9	35.7	81.9
(2020-09-05 02:46:32.160)	49.2	35.3	69.9
(2020-09-05 03:01:32.160)	49.7	36.2	72.5
(2020-09-05 03:16:32.160)	48.2	34.3	71.5
(2020-09-05 03:31:32.160)	50.3	34.2	72.9
(2020-09-05 03:46:32.160)	49.7	34.4	74.4
(2020-09-05 04:01:32.160)	47.2	35	68.6
(2020-09-05 04:16:32.160)	49.1	35.3	70.7
(2020-09-05 04:31:32.160)	47.6	36.2	71.7
(2020-09-05 04:46:32.160)	51.3	37.6	70.7
(2020-09-05 05:01:32.160)	50.2	37.6	72.9
(2020-09-05 05:16:32.160)	51.2	38.9	71.2
(2020-09-05 05:31:32.160)	51.7	40	72.9
(2020-09-05 05:46:32.160)	53.5	39.8	75.1
(2020-09-05 06:01:32.160)	53.7	41	73.2
(2020-09-05 06:16:32.160)	53.9	42.3	72.4
(2020-09-05 06:31:32.160)	55.9	44.6	77.2
(2020-09-05 06:46:32.160)	56.7	48.2	70.5
(2020-09-05 07:01:32.160)	56.5	45.6	72.3
(2020-09-05 07:16:32.160)	55.7	45.8	71.9
(2020-09-05 07:31:32.160)	56.7	46.1	72.3
(2020-09-05 07:46:32.160)	57.7	46.9	74.1
(2020-09-05 08:01:32.160)	58	47.4	74.5

(2020-09-05 08:16:32.160)	58.7	49.3	71.4
(2020-09-05 08:31:32.160)	59.7	50.9	74.9
(2020-09-05 08:46:32.160)	60	51.4	73.9
(2020-09-05 09:01:32.160)	59.6	49	76.5
(2020-09-05 09:16:32.160)	60.1	50.1	78.2
(2020-09-05 09:31:32.160)	59.6	49	73.8
(2020-09-05 09:46:32.160)	60.3	51.5	73.8
(2020-09-05 10:01:32.160)	59.8	52.2	70.6
(2020-09-05 10:16:32.160)	59.8	51	75.4
(2020-09-05 10:31:32.160)	60.5	50.6	73.3
(2020-09-05 10:46:32.160)	59.5	50.5	71.7
(2020-09-05 11:01:32.160)	59.8	51.8	77
(2020-09-05 11:16:32.160)	59.7	51.5	72.1
(2020-09-05 11:31:32.160)	59.6	50.9	72
(2020-09-05 11:46:32.160)	59.1	50.6	70.8
(2020-09-05 12:01:32.160)	59	50.1	70
(2020-09-05 12:16:32.160)	59.6	50.7	81.1
(2020-09-05 12:31:32.160)	58.8	50	74.8
(2020-09-05 12:46:32.160)	59.3	50	71.4
(2020-09-05 13:01:32.160)	60.2	51.8	73.1
(2020-09-05 13:16:32.160)	58.6	50.5	70.2
(2020-09-05 13:31:32.160)	60.6	50.8	84.1
(2020-09-05 13:46:32.160)	59.1	51.4	70.1
(2020-09-05 14:01:32.160)	59	50.3	72.1
(2020-09-05 14:16:32.160)	59.3	51.2	71.5
(2020-09-05 14:31:32.160)	59.7	49.7	73.5
(2020-09-05 14:46:32.160)	59.7	50.6	72
(2020-09-05 15:01:32.160)	60.8	49.7	86.6
(2020-09-05 15:16:32.160)	59.8	50.6	71
(2020-09-05 15:31:32.160)	60.1	51.7	76
(2020-09-05 15:46:32.160)	59.5	50.7	70.6
(2020-09-05 16:01:32.160)	61.3	49.7	84.6
(2020-09-05 16:16:32.160)	59.2	50.2	72.2
(2020-09-05 16:31:32.160)	59.8	50.9	80.5
(2020-09-05 16:46:32.160)	59.3	49.6	70.8
(2020-09-05 17:01:32.160)	58.6	48.8	73.6
(2020-09-05 17:16:32.160)	59.4	50.7	72.6
(2020-09-05 17:31:32.160)	59.5	50.4	71.2
(2020-09-05 17:46:32.160)	60	49.8	71.6
(2020-09-05 18:01:32.160)	59.3	50.7	74.6
(2020-09-05 18:16:32.160)	60	50.5	73.2
(2020-09-05 18:31:32.160)	60.2	50.6	81.3
(2020-09-05 18:46:32.160)	58.8	50.5	76.9
(2020-09-05 19:01:32.160)	59	48	72
(2020-09-05 19:16:32.160)	59.1	48	73.1
(2020-09-05 19:31:32.160)	60.8	51.6	73.3

(2020-09-05 19:46:32.160)	59.3	48.1	72.1
(2020-09-05 20:01:32.160)	59.1	46.2	73.1
(2020-09-05 20:16:32.160)	58.8	47.9	74.8
(2020-09-05 20:31:32.160)	58.9	47.9	70.8
(2020-09-05 20:46:32.160)	58.7	46.5	71.6
(2020-09-05 21:01:32.160)	61.7	47.4	90.8
(2020-09-05 21:16:32.160)	58.4	46.6	72
(2020-09-05 21:31:32.160)	57.6	45	72.7
(2020-09-05 21:46:32.160)	57.1	43.7	75.2
(2020-09-05 22:01:32.160)	57.9	44.7	77.4
(2020-09-05 22:16:32.160)	59.2	43.3	83.9
(2020-09-05 22:31:32.160)	57.7	43	73.4
(2020-09-05 22:46:32.160)	55.5	41.8	70.5
(2020-09-05 23:01:32.160)	56.9	44.8	72.5
(2020-09-05 23:16:32.160)	56	40.9	73.4
(2020-09-05 23:31:32.160)	55	40.4	72.7
(2020-09-05 23:46:32.160)	52.9	38.1	69.9
(2020-09-06 00:01:32.160)	54.2	38.7	73.7
(2020-09-06 00:16:32.160)	53.9	37.2	71.9
(2020-09-06 00:31:32.160)	52.8	37.9	70.9
(2020-09-06 00:46:32.160)	53.1	37.1	71.9
(2020-09-06 01:01:32.160)	51.9	38.5	72
(2020-09-06 01:16:32.160)	52.2	36.7	78
(2020-09-06 01:31:32.160)	53.1	37.7	71.1
(2020-09-06 01:46:32.160)	53.3	36.6	70.6
(2020-09-06 02:01:32.160)	51.2	34.7	68.9
(2020-09-06 02:16:32.160)	51.6	33.5	69.6
(2020-09-06 02:31:32.160)	50.2	32.8	73.2
(2020-09-06 02:46:32.160)	49.8	33.5	69.8
(2020-09-06 03:01:32.160)	48.2	34.8	71.9
(2020-09-06 03:16:32.160)	49.1	33.6	66.9
(2020-09-06 03:31:32.160)	48.2	35.9	69.8
(2020-09-06 03:46:32.160)	49.7	35.1	72.6
(2020-09-06 04:01:32.160)	47.7	34.8	68.6
(2020-09-06 04:16:32.160)	49.8	38.5	68.4
(2020-09-06 04:31:32.160)	50.1	34.9	72.2
(2020-09-06 04:46:32.160)	49.9	35.2	72.1
(2020-09-06 05:01:32.160)	50.8	36.2	70.5
(2020-09-06 05:16:32.160)	50.6	36.6	69.9
(2020-09-06 05:31:32.160)	52	38.1	74.2
(2020-09-06 05:46:32.160)	52.8	38.2	71.1
(2020-09-06 06:01:32.160)	52.4	38.4	73.8
(2020-09-06 06:16:32.160)	54.1	40.4	70.4
(2020-09-06 06:31:32.160)	55.6	43	72.7
(2020-09-06 06:46:32.160)	55.8	43.5	70.7

