

Project:	Postmens office - 30 Leighton road NW5 2QE	Date:	07/02/20
Client:	The W David and Sons Ltd 1991 Retirement Trust	Ref:	4566



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Report Title:	Environmental Noise Survey		
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Revision:	B		
Report Status:	Rev B		
Reference:	4566_ENS_B		

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1.0 Introduction

As part of proposed works to the buildings of address 30 Leighton road NW5 2QE it is proposed that a number of items of mechanical plant will be introduced within the site demise as part refurbishment and minor alterations to listed building, demolition of rear buildings and construction of a two-storey replacement building to the rear to be used as offices (B1).

Paragon Acoustic Consultants Ltd has been commissioned to conduct an environmental noise survey to obtain statistical noise data to characterise the existing local background and ambient noise climate at the site and to derive noise limits to atmosphere based on Local Authority Noise Policy and other relevant guideline documents. This information shall be used at the appropriate stage of the project to determine if the proposed new mechanical plant selections will meet with the derived noise limits and any noise mitigation required to achieve the Local Authority Noise Policy requirements.

The operational periods of the future plant are not known at this stage, the possibility of 24-hour operation has been considered within this assessment.

2.0 Site Description and Proposed Plant Location

2.1 Site Description

The site under consideration is situated at 30 Leighton Road NW5 2QE, within The London Borough of Camden.

To frontage of the site is located on the Leighton Road and extends to the south for approximately 55 metres. To the north lies Leighton Road, beyond which are typically located residential premises up to 5 storeys in height. To the south of the site lies car parking areas associated with a GP Clinic known as The Caversham Group Practice and beyond that the railway lines associated with the nearby Kentish Town that are understood to include both London Underground and National Rail associated tracks.

To the east and abutting the site on the Leighton road lie two storey offices of address 32 Leighton road. Beyond these offices lies the walkway entrance to The Caversham Group Practice, and beyond that lie two storey residential premises. Further south the site is abutted by the buildings and grounds of The Caversham Group Practice, being a medical Centre of address 4 Peckwater St, Kentish Town, London NW5 2UP.

To the west of the site on the northern elevation lie 3 storey residential properties with their frontage on Leighton road. To the south west of the site lies a builders yard associated with Meeres Civil Engineering Ltd located at 18 Leighton Road.

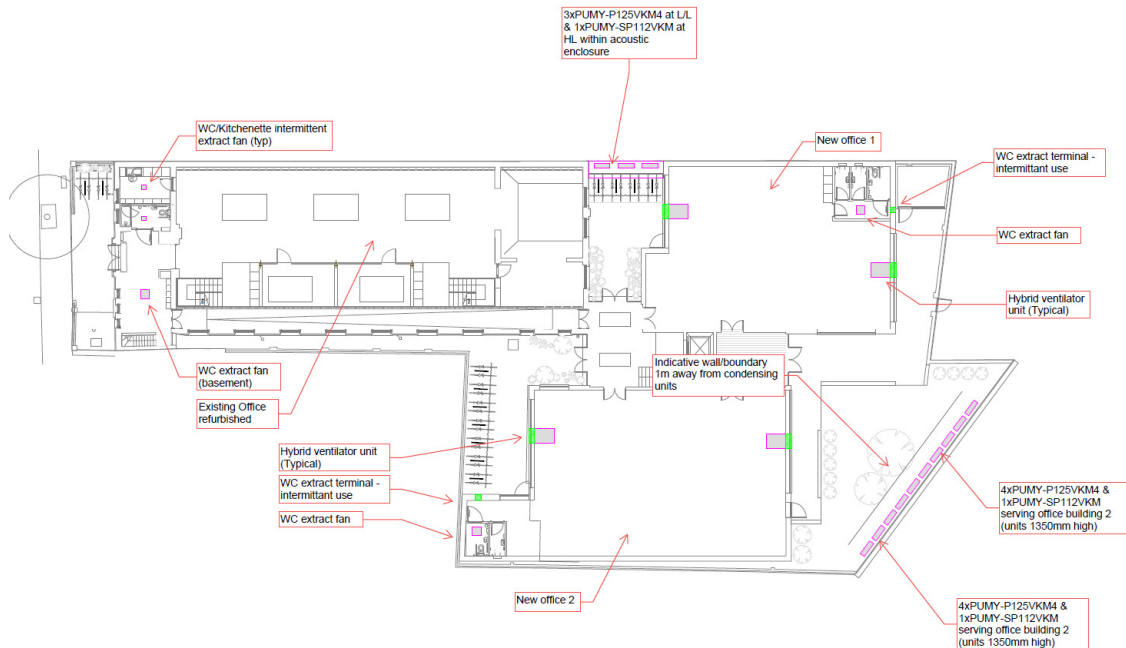
The site is illustrated by plan in Appendix A.

2.2 Proposed Plant Location

Extracts of drawings indicating the proposed plant location are shown below

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Figure 1: Proposed Plant Locations



3.0 Existing Noise Climate

3.1 Road Traffic

Noise emanating from vehicular road traffic was deemed to provide a significant contribution to the ambient noise climate proximal to the nearest affected residential premises. The overall noise comprises both individual “event” type emissions from vehicles passing along local roads, and also continuous low frequency “rumble” due to middle distance traffic flows.

3.2 Rail Traffic

Rail traffic noise events were observed manned start and end periods of the survey, emanating from the tracks to the south of the site. Train noise events will have been included within the readings taken.

3.3 Aircraft

Aircraft over flights were observed sporadically during the manned survey at the start and end of the period. Their contribution to the background noise climate will have been included within the measurements taken.

3.4 Mechanical Noise Sources

Noise emissions from mechanical plant were not observed during the measurement periods. However, any noise associated with plant will have been included in the readings taken.

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4.0 Environmental Noise Survey

4.1 Measurements

The noise monitoring took place between the following dates / times:

- Start : 10/01/2020 at 12:34 hours
- End : 13/01/2020 at 09:04 hours

The noise monitoring was generally un-manned and was undertaken at the location as described below.

- **MP1:** At the rear of the site

The measurement location is illustrated on the site layout drawing in Appendix A.

Various statistical broad-band and spectral sound pressure level measurements were obtained during the survey. A measurement time interval $T_m = 15$ minutes was used for sampling. Measurements of the percentile level $L_{A90,T}$ were made using time weighting F as per clause 3.4 of BS 4142:2014.

The quantities recorded included:

- **L_{Aeq} :** the equivalent continuous A-weighted sound pressure level over the measurement period
- **L_{Amax} :** the maximum A-weighted sound pressure level for the measurement period
- **L_{A10} :** the A-weighted sound pressure level exceeded for 10% of the measurement period
- **L_{A90} :** the A-weighted sound pressure level exceeded for 90% of the measurement period

4.2 Weather During Survey Period

The weather conditions at the start of the manned period of the survey were dry and cold with a slight breeze. At the end of the survey the weather conditions were similar. Precipitation is likely to have occurred during the survey period; however, it is considered that the data obtained provided sufficient data to give the lowest likely background noise level for the plant operational period.

4.3 Instrumentation

Sound pressure level measurements were obtained using the following instrumentation complying with the Type 1 specification of BS EN 60804, BS EN 60651, BS EN 60942, BS EN 61260, and BS EN 61672-1:

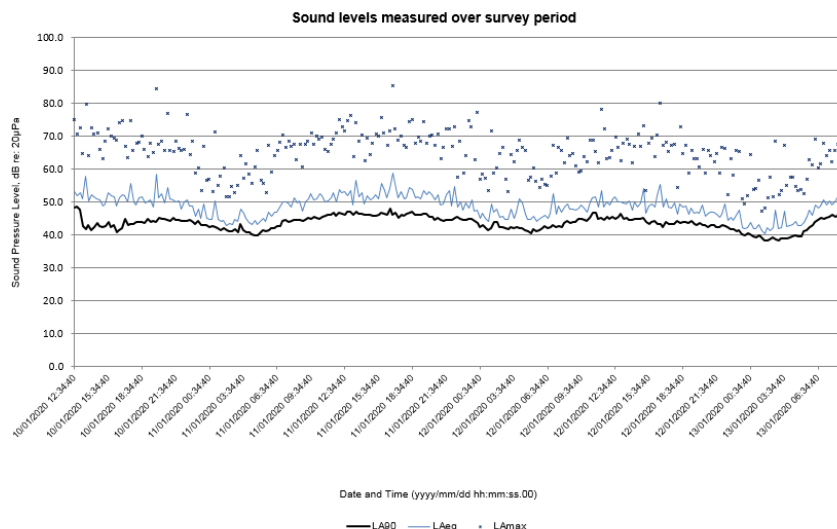
- SVAN 971 Sound level meter serial number 56213, pre-amplifier type SV18 serial number 57308, and type 7052E 1/2" microphone serial number 65483.

4.4 Results

The recorded survey data is shown within Appendix B. Broadband sound pressure level data over the survey period (L_{A90} background levels, L_{Aeq} and L_{Amax} measurements) are shown graphically below:

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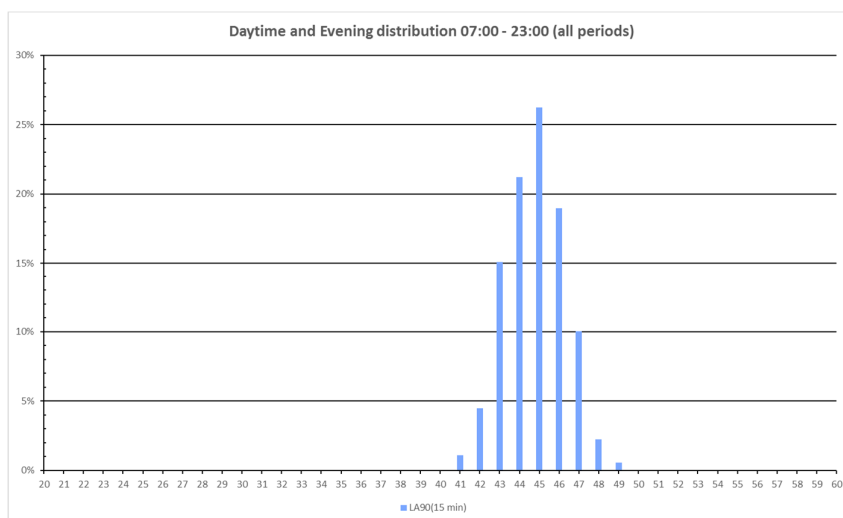
Figure 2: Graphical Survey Data



The LA₉₀ background noise levels have been statistically assessed for daytime/evening and night-time periods in order to determine the values of the “Typically Lowest Existing Representative Background Noise Level”.

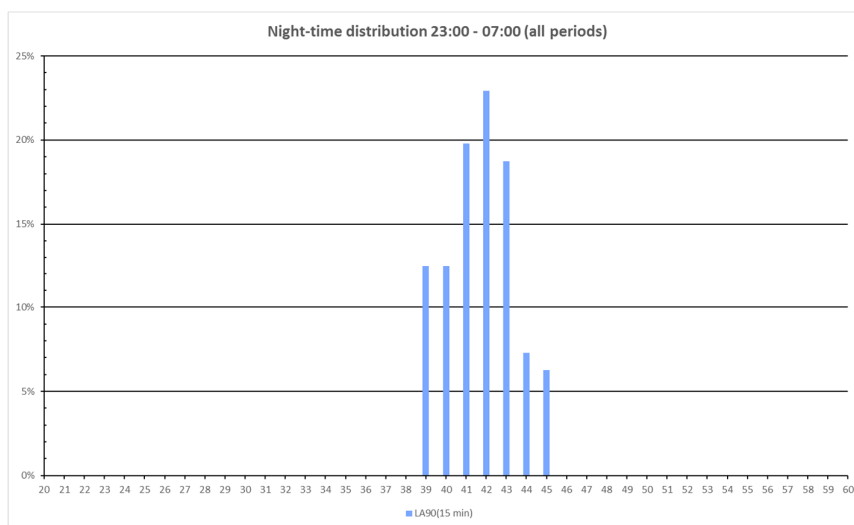
The following graphs show the results of the statistical assessment of LA₉₀ background noise levels for the 15 minute sampling periods:

Figure 3: L90 distribution for Daytime and Evening periods over the survey duration



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Figure 4: L90 distribution for Night time periods over the survey duration



For this distribution of data, the typically lowest existing representative background noise levels are considered to be as follows:

Table 1: Typically Lowest Existing Representative Background Noise Level

Measurement Position	Daytime / Evening 07:00-23:00 $L_{A90,(15 \text{ min})}$	Night-time 23:00-07:00 $L_{A90,(15 \text{ min})}$
MP1 measurement position	43 dB	39 dB

5.0 Evaluation of External Noise Criteria

The local vicinity contains properties of mixed usage, which must be given due consideration in terms of acceptable levels of noise exposure from the new plant.

5.1 Noise Sensitive Properties

It is necessary to consider the requirements of the Local Authority. Recent correspondence from the London Borough of Camden advised the following:

“For the correct criterion, reference should be made the Noise Thresholds in Appendix 3 of the Local Plan 2017, specifically Table C/ the “Design Criterion of 10dB below background which increases to 15 dB if the noise source requires acoustic correction.”

Table C of the Appendix 3 of the Local Plan 2017 *advises the following:*

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Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dB _{Lmax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L _{max}	'Rating level' greater than 5dB above background and/or events exceeding 88dB _{Lmax}

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

**levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

The document confirms that the 'Rating Level' shall be required to be 10 dB below the background and this should be increased to 15dB if the noise contains audible tonal elements.

The above document confirms that "levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises". As such, the proposed noise limits for commercial premises are confirmed as follows:

5.2 Commercial Properties

The methods described in BS4142:2014 use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. It is considered reasonable that commercial properties not used for residential purposes be assessed in line with the guidelines provided in BS 8233:2014. BS 8233:2014 provides guideline noise levels for internal areas of buildings, reproduced as follows:

Figure 5: BS8233:2014 table of typical noise levels in non-domestic buildings

Activity	Location	Design range dB $L_{Aeq, T}$
Speech or telephone communications	Department store	50 – 55
	Cafeteria, canteen, kitchen	
	Concourse	45 – 55
Study and work requiring concentration	Corridor, circulation space	40 – 50
	Library, gallery, museum	
	Staff/meeting room, training room	
Listening	Executive office	35 – 40
	Place of worship, counselling, meditation, relaxation	30 – 35

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Figure 6: BS8233:2014 table of indoor ambient noise levels

Table 2 Indoor ambient noise levels in spaces when they are unoccupied and privacy is also important

Objective	Typical situations	Design range $L_{Aeq,T}$ dB
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40 – 55
	Open plan office	45 – 50
	Night club, public house	40 – 45
	Ballroom, banqueting hall	35 – 40
	Living room	35 – 40

NOTE See Noise control in building services [28] and BS EN ISO 3382.

In view of the details presented above it is considered reasonable to adopt a noise criterion of 40 dB $L_{Aeq,T}$ for commercial office space and the medical centre in the proximity of the site.

It is also reasonable to consider a noise criterion external to commercial property windows that takes account of the internal design range, plus the loss expected through an openable window. In a research study conducted for DEFRA NANR116: "Open/Closed Window Research", numerous references are provided which quantify losses through open and partially open windows:

Figure 7: DEFRA NANR16 Summary of findings

Information Source	Summary of Findings
PPG 24 (1994) ^[2]	A reduction of 13 dB(A) from the facade level is assumed for an open window
WHO (1999) ^[4]	A reduction of 15 dB from the facade level is assumed for a partially open window. (no reference)
BS 8233 (1999) ^[5]	Windows providing rapid ventilation and summer cooling are assumed to provide 10 - 15 dB attenuation (no specific reference)
BRE Digest 338 (1988) ^[6]	A partly open window has an averaged level difference, $D_{1m,av100-3150}$ of 15 dB
DoE Design Bulletin 26 (1972) ^[7]	A reduction of 5 dB(A) with a window wide open
Nelson - Transportation Noise (1987) ^[8]	Sound insulation of an open single window is 5 – 15 dB. (theoretical)
Mackenzie & Williamson DoE Report (1972-73) ^{[9],[10]}	A vertical sliding sash window open 0.027 m ² (summer night-time ventilation) and 0.36 m ² (daytime summer ventilation) provided a sound level reduction of 16 and 11 dB(A) respectively. (Lab Study)
Kerry and Ford (1973 – 74) ^{[11],[12]}	A horizontal sliding sash window open 25 mm and 200 mm provided averaged sound reduction indices, R_{av} of 14 and 9 dB respectively. (Field Study)
Lawrence and Burgess (1982 – 83) ^{[13],[14]}	A vertical sliding sash open 9% of the total façade provided a sound reduction index R_w 10 dB. (Field study)
Hopkins (2004) ^[15]	Road traffic noise reductions through window openings resulted in reductions of between $D_{2m,n,T}$ 8 and 14 dB. (Field Study)

Table 1.1 Summary of open-window acoustic transmission literature

The findings of the study are referenced in this report to substantiate the use of a 13dB(A) loss through a partially open window.

5.3 External Noise Criteria

The derived external noise criteria which the new building services plant shall be required to achieve are shown below:

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Table 2: Limiting Noise Criteria applicable at the affected premises

Plant Location	Receptor	Daytime / Evening	Night-time
		07:00-23:00 L _{Art} ,(15 min)	23:00-07:00 L _{Art} ,(15 min)
Any Location on the site	Day – Gardens used for main amenity, outside living and dining and bedroom windows (façade).	33 dB ^[1] [2]	29 dB ^[1] [2]
	Night time – Outside bedroom windows (façade). ^[3]		In addition, no mechanical plant events shall exceed 57 dB LA _{max}
	Commercial premises	53 dB LA _{eq} ^[2]	

[1] Note: Noise levels to be assessed in accordance with BS4142:2014. L_{ArT} is the “Rating” noise level that includes corrections for the character of the noise. A 5dB penalty shall be included where noise emitted from the proposed development will contain tones sufficient to attract attention at the receiver position/s.

[2] Note: The limiting noise levels are deemed to be considered at a position 1 metre outside the nearest affected premises.

[3] Note: Levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

General note: It is taken that the noise Criteria apply at the surrounding third party premises. Noise levels may be exceeded external to windows of the client’s premises.

6.0 Review of Proposed Plant

6.1 Introduction

The new plant will comprise a number of air-cooled condensers, these being a mix of Mitsubishi models PUMY SP112VKM and PUMY P125VKM4. In addition, a number of toilet extract fans will be used.

Detailed calculations have been carried out in order to determine the likely level of airborne noise transmission outside the identified assessment locations due to the operation of the proposed new plant to be installed.

Section 2.2 details the plant location/s used in the assessment.

The following sections provide a record of the proposed new plant, the operational sound levels used as the basis for this assessment, and a specification for noise mitigation treatments.

At this stage, the scope of work herein is limited to the consideration of mechanical plant noise emissions to atmosphere and does not include evaluation of the transmission of noise via building envelopes to internal areas of nearby buildings. It is recommended that the client employ acoustic consultants to assess this aspect at the appropriate stage of the project.

6.1.1 Operational hours

It is understood that all plant (except for three condensers type PUMY SP112VKM that serve the comms room) will operate daytime office hours only, taken as a period between the hours of 07:00-23:00

The three condensers type PUMY SP112VKM will serve comms rooms and therefore these shall operate 24/7.

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6.2 Plant Noise Data

6.2.1 Condensers

The noise levels / acoustic data for the proposed new condensers are shown below:

Figure 8: Noise data for Mitsubishi models PUMY SP112VKM.

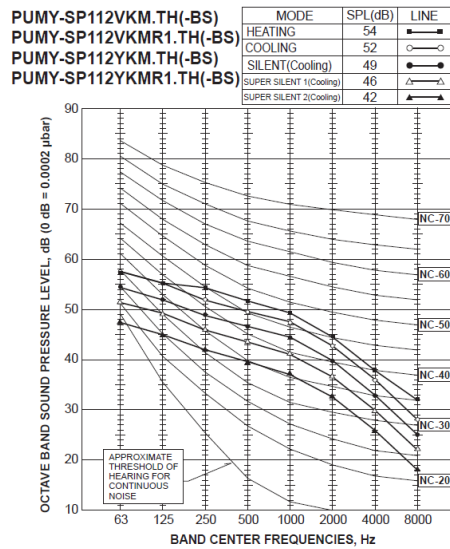
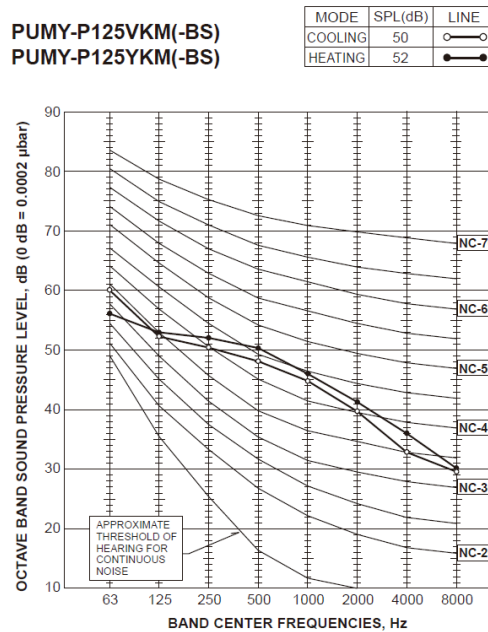


Figure 9: Noise data for Mitsubishi models PUMY P125VKM4.



6.2.2 Toilet Extract fans

The noise levels / acoustic data for the proposed new Toilet Extract fans are shown below:

Figure 10: Noise data for Toilet extract fans

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Unit Code	Sound Power Levels dB re 1pW								Breakout dBA @ 100% @ 3m	LwA	Breakout dBA @ 75% @ 3m	Breakout dBA @ 50% @ 3m	
	63	125	250	500	1K	2K	4K	8K					
DE1-ES	Induct Inlet	71	62	63	53	51	46	45	43	22	59	16	<16
	Induct Outlet	73	66	68	62	56	51	50	44		64		
	Breakout	53	52	46	42	31	28	25	12		43		

6.2.3 Small WC And Kitchenette Fans at Front of Building

Two small extract fans are located at the front of the building , these being fans by manufacturer Nuaire and model “Opus 40”. The noise levels / acoustic data for the proposed fans are shown below:

ELECTRICAL & SOUND											
Fan Unit	Frequency Hz								Open inlet dBA @ 3m	FLC amps	Power watts
	63	125	250	500	1K	2K	4K	8K			
Opus 40	45	47	53	49	47	48	43	33	36	0.1	14
Opus 60	48	57	57	55	54	55	51	44	43	0.32	43
Opus 95 Dual Fan	50	57	62	58	57	57	52	46	46	0.6	72

These units do not require atmosphere side attenuation.

6.2.4 Hybrid Ventilators

A number of hybrid ventilators are proposed for installation within the new offices. It is understood that the units will operate in ‘Passive mode’ for the majority of the time with ‘mixing and ‘cooling’ modes operating as required for short periods. Nonetheless, this practice has considered the units. The unit proposed is by Messrs Passivent and from conversations with their technical department they do not have spectral sound power noise data for the unit. The literature advises that “Acoustic performance: A-weighted Sound Power Level of 40.9dBLWA with ventilation at 80 litres/second. When the ventilation is boosted to 150 litres/second the A-weighted Sound Power Level is 57.5dBLWA”. On this basis this practice has used the noise data when the unit is on “Boost” and has estimated the sound power level of the fan as follows:

Table 3: Estimated Hybrid fan sound power level

Quantity	1/1 octave band centre frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
Estimated hybrid unit in duct sound power level	68	64	60	54	49	46	44	41

It is stressed that this is an estimate and without the full spectral acoustic data for the fan this cannot be guaranteed.

On the basis of these fan sound power level estimates these units do not require atmosphere side attenuation

6.3 Predicted Plant Noise Levels

Calculations have been carried out using the data presented earlier within this report to predict the resultant sound pressure levels due to airborne transmitted noise outside the nearest exposed noise assessment position and corresponding to the quietest period of plant operation.

Predictions are based on the plant operating normally at the noise levels detailed herein, and it is considered that the noise emitted from the proposed plant will not be intermittent, impulsive, contain tones or other characteristics sufficient to attract attention at the assessment locations.

The predictions show that for affected third party noise sensitive properties, the proposed plant will not maintain the derived noise limits due to plant located within the middle of the site. Following discussions with the mechanical services consultant a rationalised plant location and

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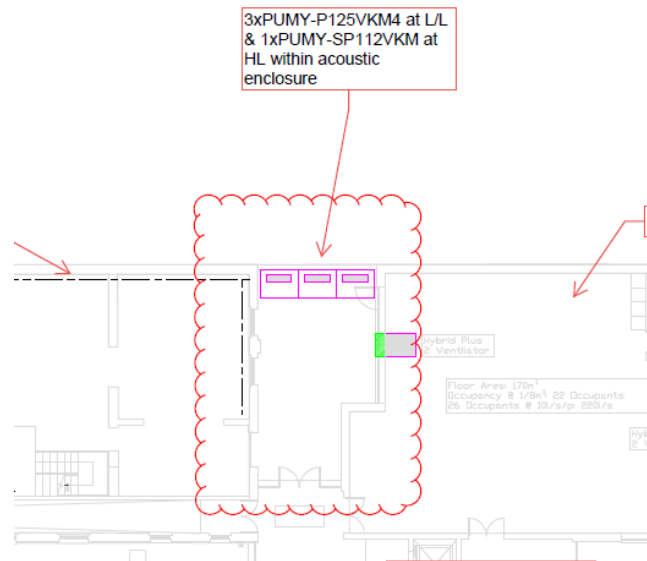
noise mitigation scheme has been discussed. The following Sections provide details of the plant noise mitigation.

7.0 Noise mitigation

7.1 Noise mitigation to Condenser plant

It is proposed that the condenser plant highlighted in the red clouded area indicated in the below sketch (also indicated in figure 1) is acoustically treated:

Figure 11: Condensers to be Acoustically Treated



These four condenser units shall be fitted with acoustic enclosures. An acoustic enclosure shall be used to house the condenser units. The enclosure shall have suitably ventilated and attenuated airways and provide attenuation to all directions including to below. A specialist supplier shall provide a fit for purpose acoustic enclosure to provide the following minimum acoustic performance:

Table 4: Minimum insertion loss requirements for enclosure in all directions including to below

Quantity	1/1 octave band centre frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
Minimum insertion loss (dB)	4	4	6	9	12	17	11	10

The insertion loss is hereby defined as the difference in sound pressure level with and without the enclosure in place. In order for this potential reduction in acoustic performance to be evaluated, the chosen enclosure supplier shall submit their product acoustic test data to Paragon Acoustic Consultants Limited prior to procurement / manufacture. Test data shall be provided for all of the proposed hardware products used in the construction of the enclosure and shall be obtained from an independent UKAS accredited test laboratory to provide proof that the foregoing acoustic performance will be maintained.

The dimensions of the enclosure are to be determined by the noise mitigation hardware supplier and agreed with the client.

Paragon Acoustic Consultants has considered the acoustic performance of the enclosure. The introduction of this type of structure has implications in other areas of design. As such, the client

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shall employ the services of other specialists to take responsibility for other areas of design associated with the introduction of such a structure. The following list is provided as an example of other areas to be considered as a minimum:

Airflow to and from condensing units: The installation of an enclosure will restrict the airflow around the condensing units. This will potentially give rise to two adverse effects as follows:

- The resistance to airflow will increase
- Heated discharge air from the condenser coils may re-circulate back into the condenser coils

The supplier of close fitting enclosure and the mechanical services consultant shall guarantee that their enclosures shall not adversely affect the performance of condensing units.

Structural: A suitably qualified consultant shall assess all structural loading as necessary.

Aesthetics: The visual appearance of the enclosures is to be agreed by the client's architect. The architect shall also consider all necessary statutory approvals and address design issues not covered by the relevant specialist consultant.

Alteration to existing services: The installation of each enclosure may require alteration to certain of the existing mechanical and electrical services in the vicinity of the proposed enclosure. In addition, the condensing units may require to be moved into close fitting enclosures. The client shall co-ordinate any such works.

Delivery and installation access: The enclosure supplier shall make appropriate arrangements for the delivery and installation of enclosures, including equipment such as cranes and scaffolding requirements.

Guarantees: The client shall obtain the necessary guarantees that the enclosure will meet the minimum insertion loss requirements as specified by this practice in the foregoing section. In addition, the client shall obtain all other guarantees as required.

Maintenance / repair / replacement: The enclosures shall allow maintenance / repair / replacement of the condensing unit equipment enclosed.

Warrantees: The client shall ensure that the warrantees provided by the condensing unit supplier/manufacturer are not invalidated by the introduction of the noise mitigation works.

Submission of final enclosure designs: The final design of the enclosures shall be submitted to Paragon Acoustic Consultants for comment prior to manufacture.

7.2 Toilet Extract fan noise mitigation

The following attenuators shall be included to systems shown:

Table 5: Attenuator Specification.

Ref	Description	Duty		Approximate Size (mm)			Minimum Insertion Losses							
		Vol (m3/s)	Max res (Pa)	Width	Height	Length	Octave Band Centre Frequency							
							63	125	250	500	1k	2k	4k	8k
A1	All Toilet extract fan exhaust to atmosphere	tba	20	tba	tba	tba	3	5	12	25	25	25	20	10
Attenuator construction to be suitable for the application														

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Dimensions are not stated in the above Table. Attenuator suppliers may have their own preferred standard sizes. The insertion loss requirements and maximum pressure drops stated in the Table shall be maintained

The above Table includes attenuators for the control of noise to atmosphere only. Others shall undertake assessment to determine any enhancements to the attenuation with respect to control of noise to internal areas of the building. In addition, others shall assess all paths of noise to internal areas of the building and shall select suitable roomside attenuators.

7.3 Vibration

It is recommended that the client provisions for appropriate vibration isolation mountings for the proposed mechanical plant items. It is recommended that the plant be installed on vibration isolation mounts providing a minimum of 98% isolation efficiency at all forcing frequencies using an isolation mount system approved by the plant supplier. In addition, all pipework should be suitably isolated from the building structure.

7.4 Predicted Plant Noise Levels following Noise Mitigation

Calculations have been carried out to using CadnaA 3 d modelling software to predict the noise levels at the nearest exposed noise assessment position including the insertion loss effect of the noise mitigation indicated previously. The predicted results are summarised below:

Table 6: Predicted Noise Levels at nearest affected premises

Plant under consideration	Worst case assessment locations	Approx. distance to receiver	Direct line of sight?	Predicted Lp	Derived noise limit
Daytime operational plant 07:00-23:00 All condenser plant and toilet extract fans, all with noise mitigation measures confirmed herein.	Residential properties with their frontage on Leighton road	23 m	No	33 dB LArT	33 dB ^[1] ^[2] Daytime 07:00-23:00
	The Caversham Group Practice	xx m	Yes / No	39 dB	53 dB LAeq
Night time operational plant 23:00- 07:00 Three condensers serving comms rooms type PUMY SP112VKM	Residential properties with their frontage on Leighton road	23 m	No	28 dB LArT	29 dB ^[1] ^[2] Night time 23:00-07:00

[1] Note: Noise levels to be assessed in accordance with BS4142:2014. LArT is the "Rating" noise level that includes corrections for the character of the noise. A 5dB penalty shall be included where noise emitted from the proposed development will contain tones sufficient to attract attention at the receiver position/s.

[2] Note: The limiting noise levels are deemed to be considered at a position 1 metre outside the nearest affected premises.

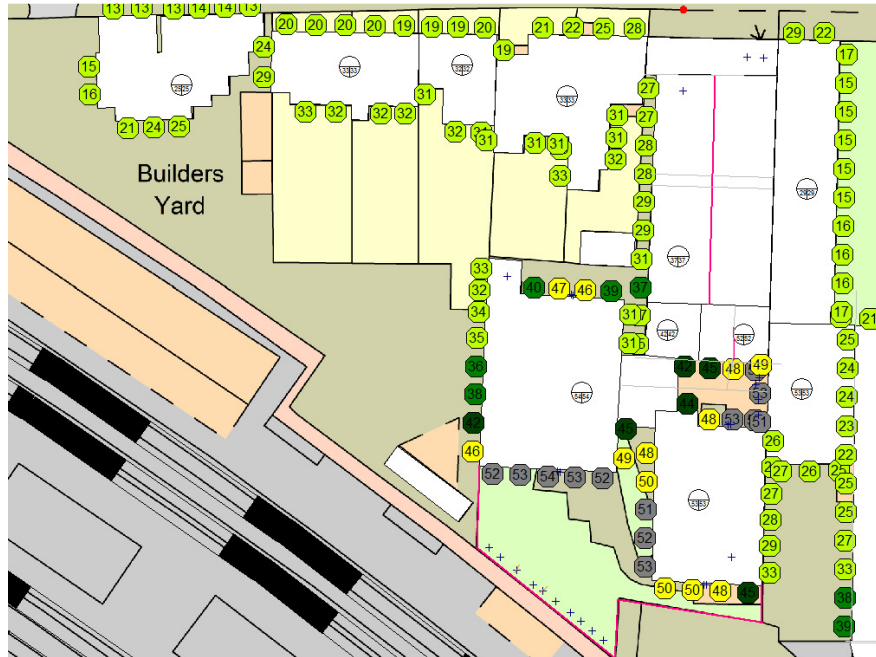
BREEAM UK New Construction Technical Manual SD5078:BREEAM UK New Construction 2018 3.0 includes section POL 05. POL 05 requires that: The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least 5dB lower than the background noise throughout the day and

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night. As the Local Authority Noise Policy is based on a 'Rating Level' that shall be required to be 10 dB below the background noise level, it is predicted that the One Credit shall be gained under the BREEAM assessment.

The following screenshots are provided for the CadnaA 3 D acoustic model

Figure 12: CadnaA 3 D acoustic model daytime – plan



Octagonal markers indicate predicted noise levels

Figure 13: CadnaA 3 D acoustic model daytime – 3d view



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8.0 Conclusions

A background noise survey has been undertaken to determine the noise climate likely to exist in the vicinity of the Postmens office - 30 Leighton road NW5 2QE, where the positioning of new mechanical plant is proposed.

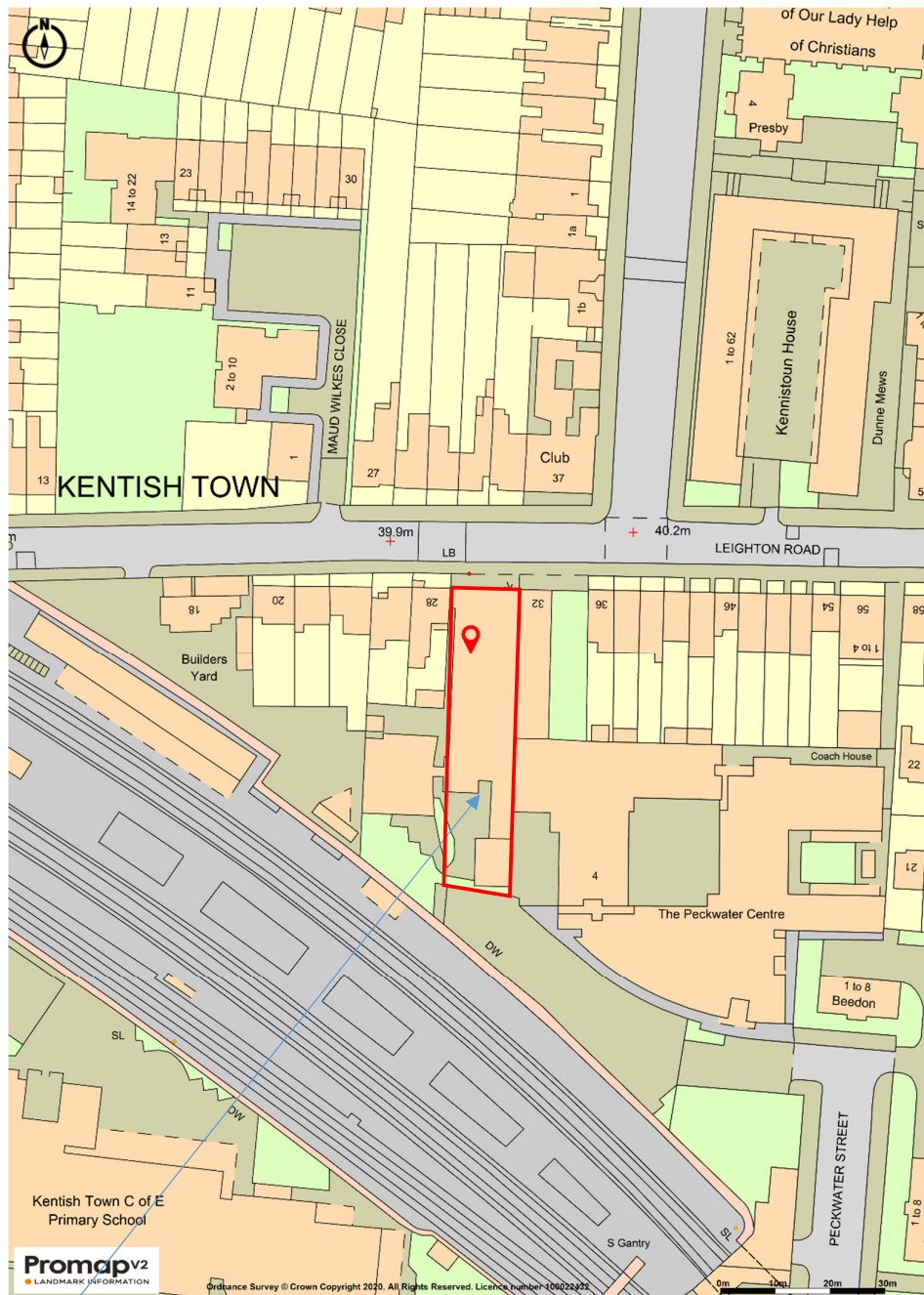
Appropriate external criteria have been identified on the basis of Local Authority noise policy, and predictions of the proposed mechanical plant noise emissions have been undertaken. Predictions indicate that the noise mitigation measures will be required to a limited number of plant items in order to meet with the derived noise limits and as such specification for the noise mitigation measures has been provided herein.

Following implementation and achievement of the noise mitigation recommended, it is predicted that its noise emissions will meet the existing noise policy operated by the Local Authority. On this basis, reservations are not expected from the planning authority on the grounds of noise.

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Appendix A: Site Plan

Red outline – approximate site



MP1

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Appendix B: Recorded Survey Data

1st day					2nd day					3rd day					4th day				
LAF(max)	LAEq	L10	L50	L90	LAF(max)	LAEq	L10	L50	L90	LAF(max)	LAEq	L10	L50	L90	LAF(max)	LAEq	L10	L50	L90
0.00	0.00	0.00	0.00	0.00	11/01/2020 07:04:00	70.44	50.24	50.20	44.20	12/01/2020 07:04:00	67.34	52.53	54.30	43.10	13/01/2020 07:04:00	68.04	50.82	49.30	45.10
0.00	0.00	0.00	0.00	0.00	11/01/2020 07:15:00	66.66	50.21	50.80	44.80	12/01/2020 07:15:00	59.00	46.23	48.90	42.50	13/01/2020 07:15:00	64.17	49.09	49.70	45.40
0.00	0.00	0.00	0.00	0.00	11/01/2020 07:34:00	68.70	49.94	48.80	44.20	12/01/2020 07:34:00	66.63	48.79	50.30	42.70	13/01/2020 07:34:00	65.92	50.34	50.90	45.50
0.00	0.00	0.00	0.00	0.00	11/01/2020 07:49:00	67.00	48.52	48.60	44.30	12/01/2020 07:49:00	65.87	47.06	48.90	42.60	13/01/2020 07:49:00	62.30	49.05	50.60	46.20
0.00	0.00	0.00	0.00	0.00	11/01/2020 08:04:00	67.70	51.30	50.50	44.80	12/01/2020 08:04:00	61.95	48.64	51.90	43.80	13/01/2020 08:04:00	66.04	50.18	50.40	45.60
0.00	0.00	0.00	0.00	0.00	11/01/2020 08:19:00	63.10	49.92	50.00	44.60	12/01/2020 08:19:00	69.49	49.44	49.80	44.30	13/01/2020 08:19:00	67.87	51.82	53.20	46.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 08:34:00	67.43	50.32	49.90	44.50	12/01/2020 08:34:00	61.03	47.99	50.30	43.60	13/01/2020 08:34:00	69.68	53.50	54.80	47.10
0.00	0.00	0.00	0.00	0.00	11/01/2020 08:49:00	60.76	47.36	49.10	44.40	12/01/2020 08:49:00	64.94	47.84	49.60	44.10	13/01/2020 08:49:00	68.64	52.48	53.40	47.60
0.00	0.00	0.00	0.00	0.00	11/01/2020 09:04:00	67.82	50.12	50.00	44.50	12/01/2020 09:04:00	61.26	47.66	50.10	44.00	13/01/2020 09:04:00	67.11	55.87	55.00	47.40
0.00	0.00	0.00	0.00	0.00	11/01/2020 09:19:00	68.52	51.09	50.40	45.30	12/01/2020 09:19:00	59.38	48.31	50.00	45.10	13/01/2020 09:19:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 09:34:00	71.02	51.24	51.30	45.00	12/01/2020 09:34:00	69.50	49.17	51.40	45.10	13/01/2020 09:34:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 09:49:00	67.66	50.88	51.80	45.50	12/01/2020 09:49:00	63.88	48.32	50.50	44.80	13/01/2020 09:49:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 10:04:00	70.17	50.99	50.80	45.40	12/01/2020 10:04:00	62.14	47.12	48.90	44.30	13/01/2020 10:04:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 10:19:00	69.17	52.59	52.80	45.10	12/01/2020 10:19:00	68.86	50.00	52.70	45.20	13/01/2020 10:19:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 10:34:00	69.92	51.91	50.40	45.60	12/01/2020 10:34:00	68.90	51.49	54.30	46.70	13/01/2020 10:34:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 10:49:00	66.23	50.06	50.80	45.90	12/01/2020 10:49:00	65.46	51.68	53.80	46.80	13/01/2020 10:49:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 11:04:00	65.47	50.43	51.40	46.10	12/01/2020 11:04:00	61.90	48.47	51.00	45.00	13/01/2020 11:04:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 11:19:00	67.42	51.38	50.90	46.10	12/01/2020 11:19:00	78.37	53.44	52.30	45.30	13/01/2020 11:19:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 11:34:00	69.18	52.87	55.40	46.90	12/01/2020 11:34:00	72.16	48.43	49.90	44.80	13/01/2020 11:34:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 11:49:00	71.33	50.18	50.10	46.00	12/01/2020 11:49:00	69.36	49.99	52.00	45.60	13/01/2020 11:49:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 12:04:00	75.30	53.90	55.60	46.90	12/01/2020 12:04:00	63.55	49.31	50.90	45.10	13/01/2020 12:04:00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	11/01/2020 12:19:00	73.12	52.89	51.50	46.50	12/01/2020 12:19:00	66.05	51.00	53.90	45.50	13/01/2020 12:19:00	0.00	0.00	0.00	0.00
10/01/2020 12:36:00	75.10	53.16	53.90	48.30	11/01/2020 12:34:00	71.85	53.17	52.10	46.30	12/01/2020 12:34:00	69.88	51.70	54.10	46.00	13/01/2020 12:34:00	0.00	0.00	0.00	0.00
10/01/2020 12:49:00	70.79	52.00	53.90	48.60	11/01/2020 12:49:00	74.55	52.10	51.90	47.10	12/01/2020 12:49:00	66.66	50.00	53.00	45.50	13/01/2020 12:49:00	0.00	0.00	0.00	0.00
10/01/2020 13:04:00	72.53	52.97	54.20	47.70	11/01/2020 13:04:00	75.25	53.65	52.90	47.10	12/01/2020 13:04:00	62.79	50.09	53.80	46.40	13/01/2020 13:04:00	0.00	0.00	0.00	0.00
10/01/2020 13:19:00	64.78	50.93	51.10	42.70	11/01/2020 13:19:00	63.84	49.27	50.80	46.30	12/01/2020 13:19:00	68.08	49.82	50.30	45.10	13/01/2020 13:19:00	0.00	0.00	0.00	0.00
10/01/2020 13:34:00	79.62	57.98	52.40	41.70	11/01/2020 13:34:00	74.16	56.74	59.60	47.30	12/01/2020 13:34:00	69.04	49.55	51.50	45.40	13/01/2020 13:34:00	0.00	0.00	0.00	0.00
10/01/2020 13:49:00	64.42	50.88	52.30	43.20	11/01/2020 13:49:00	75.02	55.73	59.00	46.70	12/01/2020 13:49:00	69.41	49.55	49.50	44.00	13/01/2020 13:49:00	0.00	0.00	0.00	0.00
10/01/2020 14:04:00	72.51	52.28	54.90	41.50	11/01/2020 14:04:00	70.32	53.07	53.10	46.50	12/01/2020 14:04:00	61.89	47.71	49.20	44.70	13/01/2020 14:04:00	0.00	0.00	0.00	0.00
10/01/2020 14:19:00	70.79	51.67	54.00	42.40	11/01/2020 14:19:00	62.79	49.38	50.40	46.20	12/01/2020 14:19:00	66.98	49.98	50.60	44.90	13/01/2020 14:19:00	0.00	0.00	0.00	0.00
10/01/2020 14:34:00	71.05	51.17	53.90	43.70	11/01/2020 14:34:00	69.70	51.93	52.20	46.20	12/01/2020 14:34:00	70.82	48.47	50.20	45.00	13/01/2020 14:34:00	0.00	0.00	0.00	0.00
10/01/2020 14:49:00	68.18	50.84	53.90	43.80	11/01/2020 14:49:00	64.66	50.73	52.30	46.20	12/01/2020 14:49:00	69.89	49.78	50.30	45.10	13/01/2020 14:49:00	0.00	0.00	0.00	0.00
10/01/2020 15:04:00	63.32	48.96	50.80	42.40	11/01/2020 15:04:00	68.02	51.23	51.80	45.80	12/01/2020 15:04:00	73.36	54.11	56.00	45.20	13/01/2020 15:04:00	0.00	0.00	0.00	0.00
10/01/2020 15:19:00	68.56	49.45	49.60	43.80	11/01/2020 15:19:00	70.57	52.22	54.10	45.80	12/01/2020 15:19:00	53.74	46.53	48.30	44.10	13/01/2020 15:19:00	0.00	0.00	0.00	0.00
10/01/2020 15:34:00	72.33	52.84	54.40	44.00	11/01/2020 15:34:00	70.21	51.14	50.20	46.30	12/01/2020 15:34:00	68.13	48.96	48.90	43.50	13/01/2020 15:34:00	0.00	0.00	0.00	0.00
10/01/2020 15:49:00	68.18	50.89	53.90	43.80	11/01/2020 15:49:00	75.02	55.73	59.00	46.70	12/01/2020 15:49:00	69.41	49.55	49.50	44.00	13/01/2020 15:49:00	0.00	0.00	0.00	0.00
10/01/2020 16:04:00	69.34	51.68	51.70	43.30	11/01/2020 16:04:00	71.29	53.53	55.40	46.40	12/01/2020 16:04:00	69.91	48.44	50.30	44.20	13/01/2020 16:04:00	0.00	0.00	0.00	0.00
10/01/2020 16:19:00	68.80	48.97	50.70	41.00	11/01/2020 16:19:00	67.19	51.44	51.80	46.40	12/01/2020 16:19:00	70.55	52.01	54.10	43.90	13/01/2020 16:19:00	0.00	0.00	0.00	0.00
10/01/2020 16:34:00	74.26	51.33	52.50	41.40	11/01/2020 16:34:00	71.76	54.08	54.40	48.00	12/01/2020 16:34:00	80.09	55.29	52.90	43.30	13/01/2020 16:34:00	0.00	0.00	0.00	0.00
10/01/2020 16:49:00	74.68	52.17	54.40	42.00	11/01/2020 16:49:00	85.40	59.00	60.00	46.80	12/01/2020 16:49:00	67.17	48.50	48.80	42.60	13/01/2020 16:49:00	0.00	0.00	0.00	0.00
10/01/2020 17:04:00	67.87	50.95	53.80	44.90	11/01/2020 17:04:00	72.26	54.21	56.30	46.80	12/01/2020 17:04:00	68.18	51.99	51.60	44.10	13/01/2020 17:04:00	0.00	0.00	0.00	0.00
10/01/2020 17:19:00	63.66	50.03	50.10	43.20	11/01/2020 17:19:00	68.96	51.23	51.70	45.20	12/01/2020 17:19:00	65.51	48.67	48.80	43.40	13/01/2020 17:19:00	0.00	0.00	0.00	0.00
10/01/2020 17:34:00	74.63	55.80	55.80	41.40	11/01/2020 17:34:00	70.13	53.19	53.60	46.10	12/01/2020 17:34:00	67.17	48.21	48.60	43.30	13/01/2020 17:34:00	0.00	0.00	0.00	0.00
10/01/2020 17:49:00	66.01	50.07	53.00	43.40	11/01/2020 17:49:00	67.13	50.90	51.90	45.80	12/01/2020 17:49:00	67.63	49.71	49.40	43.60	13/01/2020 17:49:00	0.00	0.00	0.00	0.00
10/01/2020 18:04:00	68.42	51.33	52.30	44.10	11/01/2020 18:04:00	72.26	54.21	56.30	46.80	12/01/2020 18:04:00	69.18	51.99	51.60	44.10	13/01/2020 18:04:00	0.00	0.00	0.00	0.00
10/01/2020 18:19:00	68.42	51.33	52.30	44.10	11/01/2020 18:19:00	74.47	54.41	57.80	46.70	12/01/2020 18:19:00	73.15	49.63	48.30	43.60	13/01/2020 18:19:00	0.00	0.00	0.00	0.00
10/01/2020 18:34:00	70.09	51.58	52.90	43.90	11/01/2020 18:34:00	75.09	53.97	52.80	47.10	12/01/2020 18:34:00	69.18	48.66	49.20	44.00	13/01/2020 18:34:00	0.00	0.00	0.00	0.00
10/01/2020 18:49:00	66.15	48.69	50.00	43.60	11/01/2020 18:49:00	68.06	51.04	51.10	46.00	12/01/2020 18:49:00	67.18	48.85	48.90	44.00	13/01/2020				