



**515 – 519 High Road, London
N17 6SB
Noise Impact Assessment**

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Report 1007N17			
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Mono Acoustics Limited established in 2020 and providing noise consultancy services to hospitality and entertainment industry.

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.

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1.0 INTRODUCTION

Mono Acoustics Limited has been commissioned by Samagumi Property Ltd to measure existing background noise levels and take an environmental noise impact assessment of proposed mechanical plant.

Planning permission is currently being sought for the installation of new external kitchen extract unit. The kitchen extract fan ventilation system includes air filtration and ducting vertically to a high-level discharge aperture. Its intended operation is to be aligned with the proposed opening hours of the restaurant, between 11:00 and 23:00 hours Monday to Sunday.

1.1 Site Description

The premises is located at number 515 – 519 on the west side of High Road, at the junction with Bruce Grove Road. The main road is situated to the east, while to the north, is a commercial shop with residential above. On the opposite side of the road to the south is Bruce Grove overground station. Adjacent to the building's façade to the west is a railway, and the residential windows overlook the railway tracks. The surrounding area is a mix of commercial and residential, with numerous shops on the ground floor and residential above them. The primary source of noise in the vicinity are dominated by trains and road traffic.

1.2 Nearest Noise-Sensitive Receptor

The nearest noise sensitive receptor to the proposed restaurant is situated on the first-floor level immediately above the premises, with rear windows located 2 meters from the proposed fan. Additionally, there are also residential premises within direct line of sight of the proposed flue exit, situated at least 35 meters to the west of the site, across the railway. These premises are screened by vegetation. Location map is shown in Appendix E.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 Local Authority Noise Criteria

Following previous correspondence on a similar project in the same area, London Borough of Haringey has previously sought to apply the following condition:

"Any extract ventilation fan shall be installed, together with any associated ducting, so as to prevent the transmission of noise and vibration into any neighbouring premises. The noise level from any plant together with any associated ducting, shall be 10 dB(A) or lower below the measured background noise level at 1 metre from the façade of the nearest noise sensitive premises. The method of assessment should be carried in accordance with BS4142:2014 'Rating industrial noise affecting mixed residential and industrial areas'".

2.2 Noise Break-out Assessment

The purpose of the assessment is to determine the impact of noise from the operation of the proposed plant at the nearest noise sensitive receptors. The assessment looks specifically at the worst affected dwellings close to the proposed development. Mono Acoustics has visited the site for investigation purposes to carry out an environmental noise survey and establish existing background noise levels at a location representative of the nearest noise sensitive receptors on 10 July 2023. The measured background noise levels have then been compared against the predicted noise level (Rating Level) of the proposed plant. This assessment has been undertaken in accordance with the methodology outlined within BS 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound" as typically required for planning purposes.

BS 4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound" presents a method for assessing the significance and possible adverse impact due to an industrial noise source, based on a comparison of the source noise levels and the background noise levels, both of which are measured or predicted at a noise sensitive receiver e.g., a residential property.

The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency or other unusual characteristic. This can result in a maximum total correction of +18dB being added if the new noise source demonstrates all the above characteristics. The rating level is then compared to the background noise level and the significance of the new noise source likelihood of any adverse impact is determined in accordance with the following advice:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound 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."

2.3 Methodology

In order to establish a representative background and ambient noise levels, the environmental noise survey was undertaken at a measurement location at the rear elevation of the premises near the residents. The survey was undertaken between 10 July 2023 at 18:10 and 11 July 2023

at 18:10 hours. The survey covers the most sensitive period of times in which the mechanical plant may be operational when background noise levels would be expected to be lower.

The sound level meter was positioned at 2.5 m above the ground, elevated to residential windows, and 1m from the residential windows. The monitoring positions are considered representative of background noise levels at the nearest identified noise sensitive properties and shown in Appendix F.

2.4 Measurement Equipment

The measurement equipment illustrated in Table 1 was used during the survey, all equipment complies with IEC 61672-3:2013, Class 1 and IEC 60942:2017, Class 1.

Name	Serial Number	Last Calibrated	Certificate No
NTI XL2- TA Acoustic Analyser	A2A-17797-E0	22 August 2022	UCRT22/2028
M2230 Measurement Microphone	8561	22 August 2022	UCRT22/2026
Larson Davis Class 1 Calibrator	17147	19 August 2022	UCRT22/2024

Table 1 – Equipment

2.5 Weather Conditions

Weather conditions throughout the entire noise survey period were noted to be warm (between 13 – 15 degrees Celsius), dry and partially (%40) cloudy during the measurement period, and a light wind (<5metres per second) from south. These conditions were maintained throughout most of the survey period and are considered reasonable for undertaking environmental noise measurements.

3.0 RESULTS

3.1 Background Noise Levels

Figure 2 shows the statistical analysis of the results of 24 hours period to determine a background sound level. For this distribution of the data an $L_{A90,15mins}$ of 49 dB was considered representative and in this instance was also the most commonly occurring value.

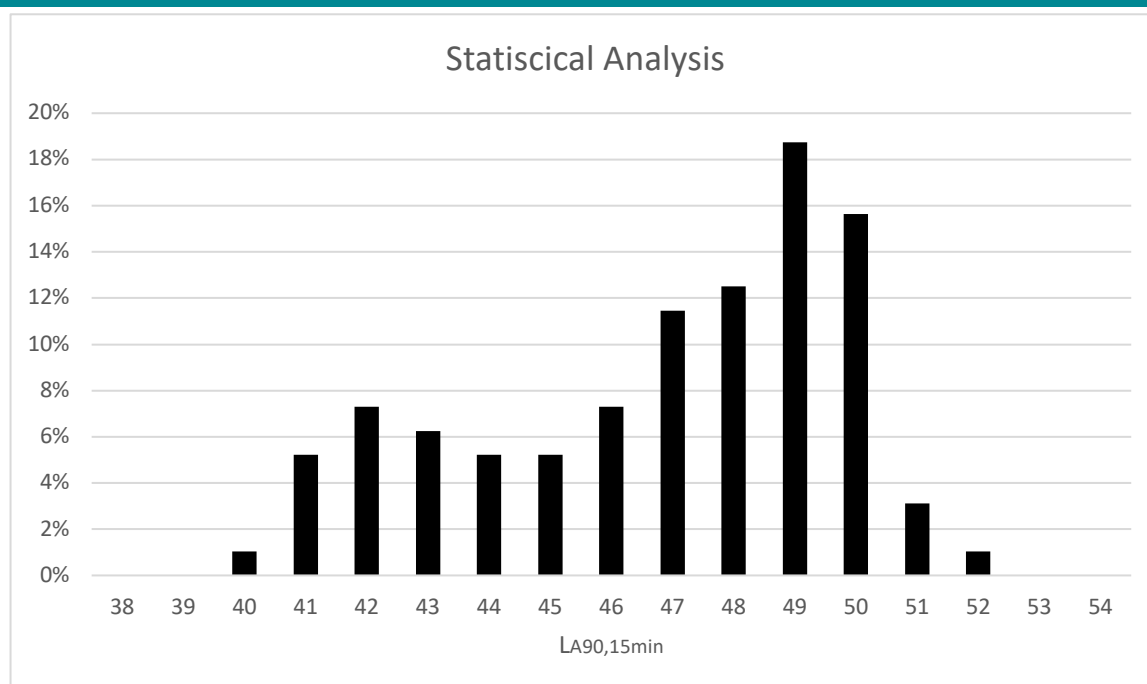


Figure 1 – Background Noise Levels

However, the lowest background sound level during the proposed trading hours is 44 dB. The measurement data is provided within Appendix C of this report.

3.2 Noise from Proposed Mechanical Equipment

The proposed new kitchen extract ventilation system is conventional and comprises the following items:

- Helios GBD 500/4/4
- Associated ductwork
- Air filtration and odour control units

It is proposed to install Helios GigaBox located externally rear side wall of the building with ducting to terminate for extraction. The 500mm diameter flue will be mounted with a discharge of approximately 45m to the nearest residential window.

Table 2 below shows A-weighted sound power levels of the fan provided by manufacturer. The manufactures data sheet for the proposed unit is provided within Appendix D of this report.

Model	Frequency (Hz)	125	250	500	1000	2000	4000	8000	Overall
Helios GBD 500/4/4	dB (A)	59	62	57	56	44	41	33	65

Table 2 –Sound power level data of Helios GBD 500/4/4

4.0 NOISE IMPACT ASSESSMENT

4.1 Rating Level

The nearest Noise Sensitive Receptors (NSR) identified are the residential properties first floor level immediately above the premises. Table 3 provides the predicted Rating Level at the nearest NSRs from kitchen extract system termination.

Results	dB(A)	Comments
Background Noise Level	44	Section 3.1
Predicted Specific Sound Level	34	Appendix B (calculations)
Acoustic Correction	-	-
Rating Level	34	Appendix B (calculations)
Excess of rating level over background sound level	(34-44) = -10	

Table 3 – Assessment

Detailed calculations for plant unit installation and all attenuation mechanisms are shown in Appendix B. Location for the new kitchen extract ventilation system components are shown on drawings in Appendix E.

In addition to the BS4142 assessment, further calculations will aim to assess whether the noise emissions from the proposed plant units would be expected to meet recognised British Standard recommendations for maximum internal noise levels.

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 30 dB(A) as being suitable internal resting/sleeping conditions.

According to BS8233:2014, a typical building façade with a partially open window offers a minimum of 13 dB attenuation. It can therefore be predicted that noise emissions from the plant would be expected to meet recommendations for internal noise, even with neighbouring windows partially open.

4.2 Uncertainty

The level of uncertainty in the data and calculations are considered to be insignificant.

5.0 NOISE CONTROL MEASURES

Necessary noise control measures explained below.

5.1 Additional Fan Casing

In order to control breakout noise from the fan case, additional fan case with suitable material to provide the minimum noise reductions as shown in Table 4.

	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Enclosure	dB (A)	10	20	20	21	19	15	12	10

Table 4– Spectral attenuation required from additional casing

5.2 Attenuator

In order to control the noise emissions from the kitchen extraction system, an attenuator should be fitted after the fan. Minimum insertion loss for the proposed attenuator to the kitchen extract is provided in Table 5 below.

	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Silencer	dB (A)	5	6	9	19	25	25	20	15

Table 5 – Specification details for attenuator

5.3 Vibration

In addition to the control of airborne noise transfer, it is important to consider the transfer of noise as vibration to adjacent properties as well as any sensitive areas of the same building. Location of the extract fan and associated ductwork are structurally linked to the residential flats above. Therefore, it is possible that vibration could transmit into the flats. In order to prevent the risk, appropriate vibration isolators be fitted to the extract fan and ductwork should be resiliently from the building structure as good practice.

6.0 CONCLUSION

A BS4142 noise assessment has been carried out at the site of a proposed kitchen extract installation at 515 -519 High Road, N17 6SB to evaluate the potential impact of the kitchen extract operation on the nearest sensitive receptors. The background noise level was measured at a location of the nearest sensitive receiver at typical and most sensitive times of operational periods of the extract system.

An assessment has been made in accordance with BS4142:2014+A1:2019 which has shown that the proposed extract operation is 10 dB below the measured background sound level.

According to BS4142 *“The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or 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.”

It has been concluded that noise emissions from the proposed kitchen extract system would not have an adverse impact on the nearest noise – sensitive receptors provided that the noise control strategies presented in **Section 5** are followed. Therefore, there will be no excessive noise breakout, and confirm that the local authority noise planning criteria will be met.

APENDIX A

Glossary of Acoustic terms

- **Decibel, dB:** A unit of logarithmic ratio between a sound pressure and a known reference pressure.
- **dB(A):** A weighted dB. A-weighting is an electronic frequency weighting network which attempts to build the human response to different frequencies into the reading indicated by a sound level meter, so that it will relate to this loudness of the noise.
- **Background sound level, $L_{A90,t}$:** A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of given time interval T measured using time weighting F and quoted the nearest whole number of decibels.
- **Ambient sound level, $L_{Aeq,T}$:** Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.
- **Residual sound level, $L_{Aeq,T}$:** Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
- **Specific sound level, $L_{Aeq,Tr}$:** Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval, T_r .
- **Rating level, $L_{Ar, Tr}$:** Specific sound level plus and adjustment for the characteristic features of the sound.

APPENDIX B

Calculations

Casing breakout

		63	125	250	500	1K	2K	4K	8K	Overall
Source (63 Hz estimate)	Helios GBD 500/4/4	53	59	62	57	56	47	41	33	
Distance Attenuation (dB)	2m	-6	-6	-6	-6	-6	-6	-6	-6	
SWL to SPL (against two planes)	-5	-5	-5	-5	-5	-5	-5	-5	-5	
Additional casing / acoustic enclosure (dBA)		10	-20	-20	-21	19	15	12	10	

Total SPL at Receiver (dBA)	32	28	31	25	26	21	18	12	34
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Duct termination

		63	125	250	500	1K	2K	4K	8K	Overall
Source (63 Hz estimate)	Helios GBD 500/4/4	56	61	73	74	74	73	69	60	
Duct Loss (rectangular unlined) dB/m	8m	0	-5	-3	-2	-1	-1	-1	-1	
Bend Loss Unlined 90°	2	0	-2	-16	-12	-6	-6	-6	-6	
Silencer	1	-5	-6	-9	-19	25	25	20	15	
End Reflection Loss	0.25m2	-11	-6	-3	0	0	0	0	0	
SWL Radiated from outlet		40	42	42	41	42	41	42	38	

Distance Attenuation (dB)	35m	-31	-31	-31	-31	31	31	31	31	
SWL to SPL (against one plane)	-8	-8	-8	-8	-8	-8	-8	-8	-8	

Total SPL at Receiver (dBA)	1	3	3	2	3	2	3	0	11
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Table 6– Source and overall attenuation calculations

Table 5 above, calculate the SPL in dBA at a resident window at a distance, r , metres from a fan ducting outlet of area s/m^2 from a length of duct, d , with a number of 90° bends and an inline silencer attenuator, and then open attenuation into the open air. The fan motor and silencer data has been obtained from manufacturer's official web page, and used for calculations.

*Duct loss dB/m data determined from: Ian Sharland, *"Woods Practical Guide to Noise Control,"* 5th ed., Colchester, 1988, p. 85.

**Bend loss data determined from: Ian Sharland, *"Woods Practical Guide to Noise Control,"* 5th ed., Colchester, 1988, p. 86.

***End reflection data determined from: Ian Sharland, *"Woods Practical Guide to Noise Control,"* 5th ed., Colchester, 1988, p. 89.

APPENDIX C

Measurement Data

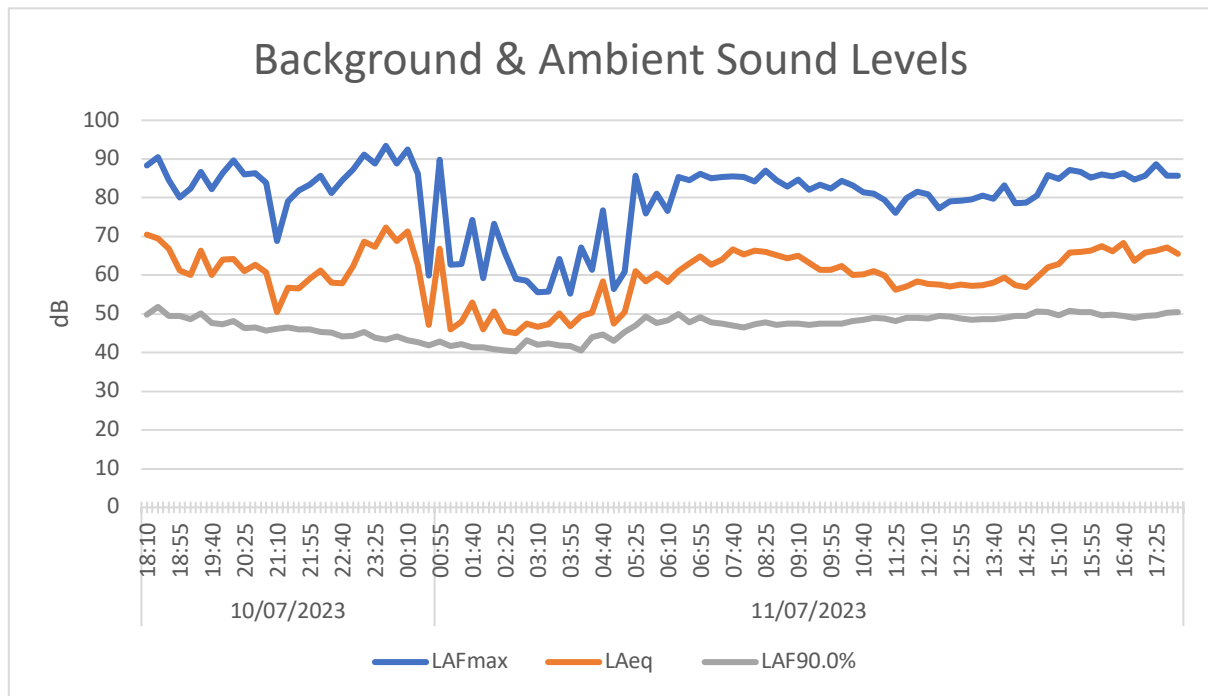


Figure 2 – Background and Ambient Noise Levels

APPENDIX D

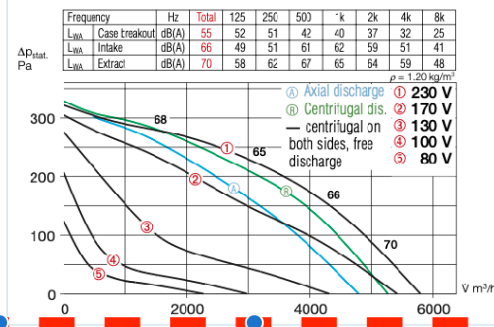
Manufacturers Data

Fan

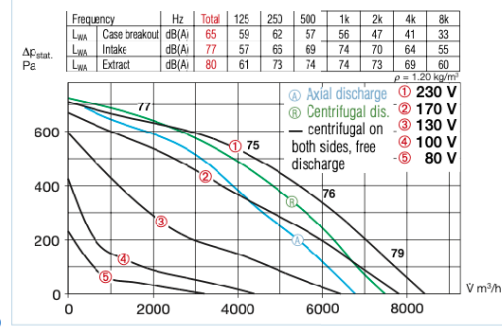


GigaBox centrifugal fan 500 mm ø

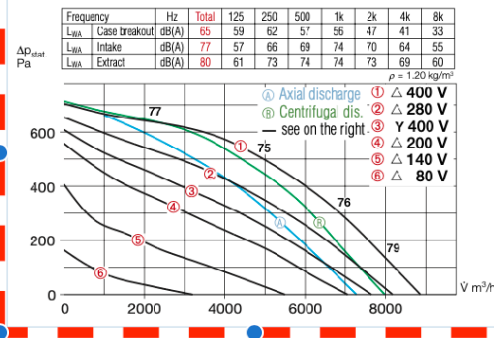
GBW 500/6



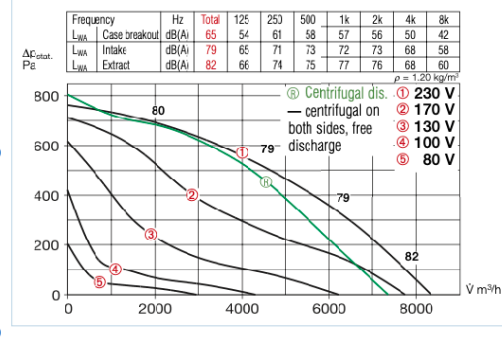
GBW 500/4



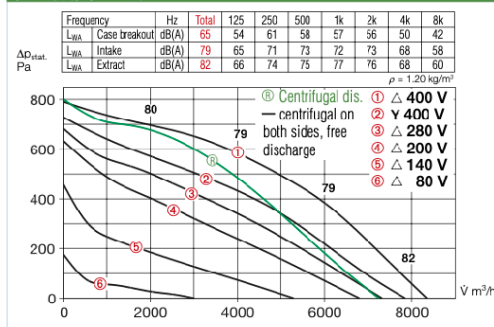
GBD 500/4/4



GBW 500/4 T120



GBD 500/4/4 T120



Motor protection

Motors have thermal contacts wired to the terminal block and must be connected to a motor protection unit.

Speed control

All types are speed controllable by voltage reduction using a transformer controller. The 3 phase models can also be 2 speed controlled by star/delta switch (accessories DS 2 or full motor protection unit M 4). The duties at different speeds are given in the performance curve.

Sound levels

Total sound power levels and the spectrum figures in dB(A) are given for:
 – sound level case breakout
 – sound level intake
 – sound level extract
 in the tables above the performance curve. Beside, the sound power level (on intake) is stated over the rated characteristic curve. In the table below you can also find the case breakout level at 4 m (freefield conditions).

Accessories of both types

Anti vibration mounts for installation indoors. Set of 4.
SDD-U Ref. No. 5627
Wall bracket for wall mounting.
GB-WK 500 Ref. No. 5626
External weather louvers to over exhaust: opening.
GB-WSG 500 Ref. No. 5639
Outdoor cover hood for outdoor installation.
GB-WSD 500 Ref. No. 5748
On/Off and 2-speed switch for 3-phase star/delta motors.
DS 2 ³⁾ Ref. No. 1351

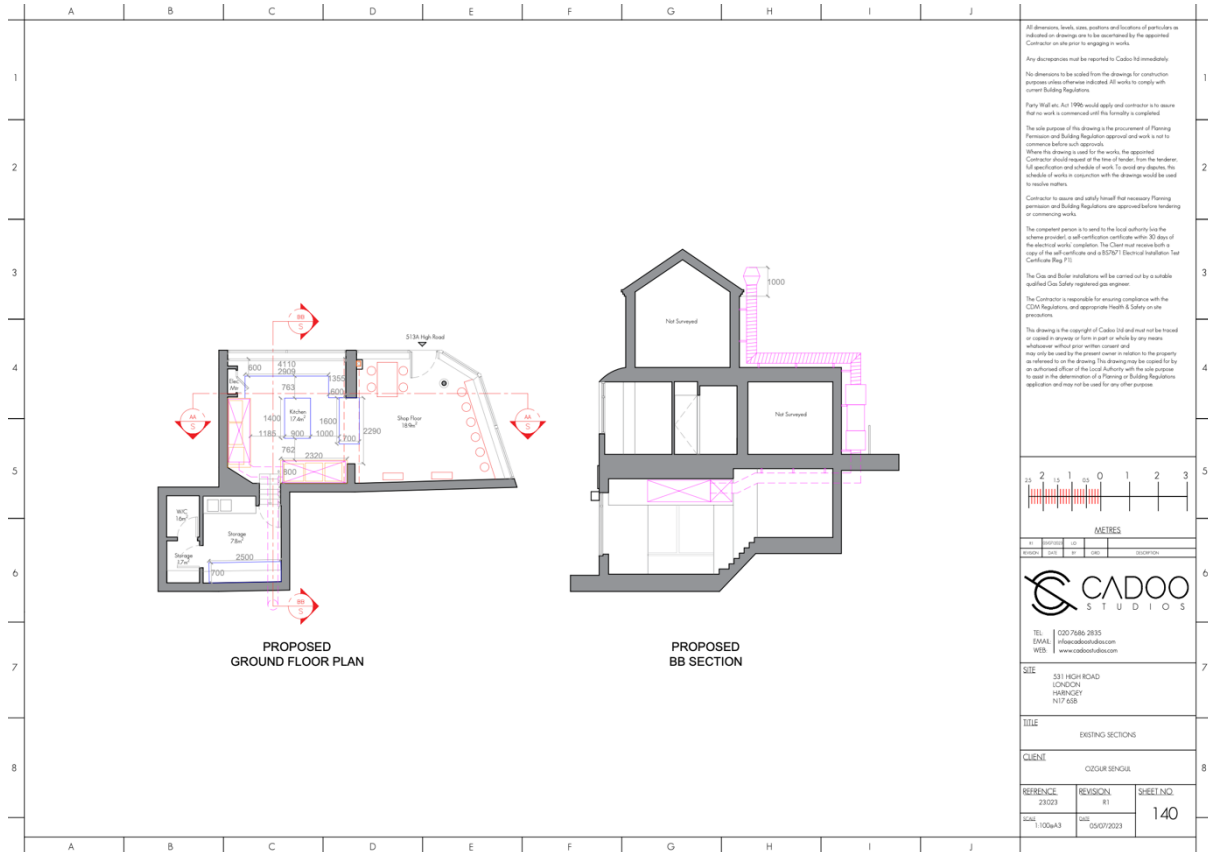
Specific accessories

for types GB..
Condensate collector with condensate spigot for pipe connection.
GB-KW 500 Ref. No. 5614
 (Condensate collector with condensate spigot included in delivery with GB.. T120).
for types GB.. T120
Rain drainage for outdoor installation (drill holes for rain drainage is already prepared).
GB-RA Ref. No. 9418

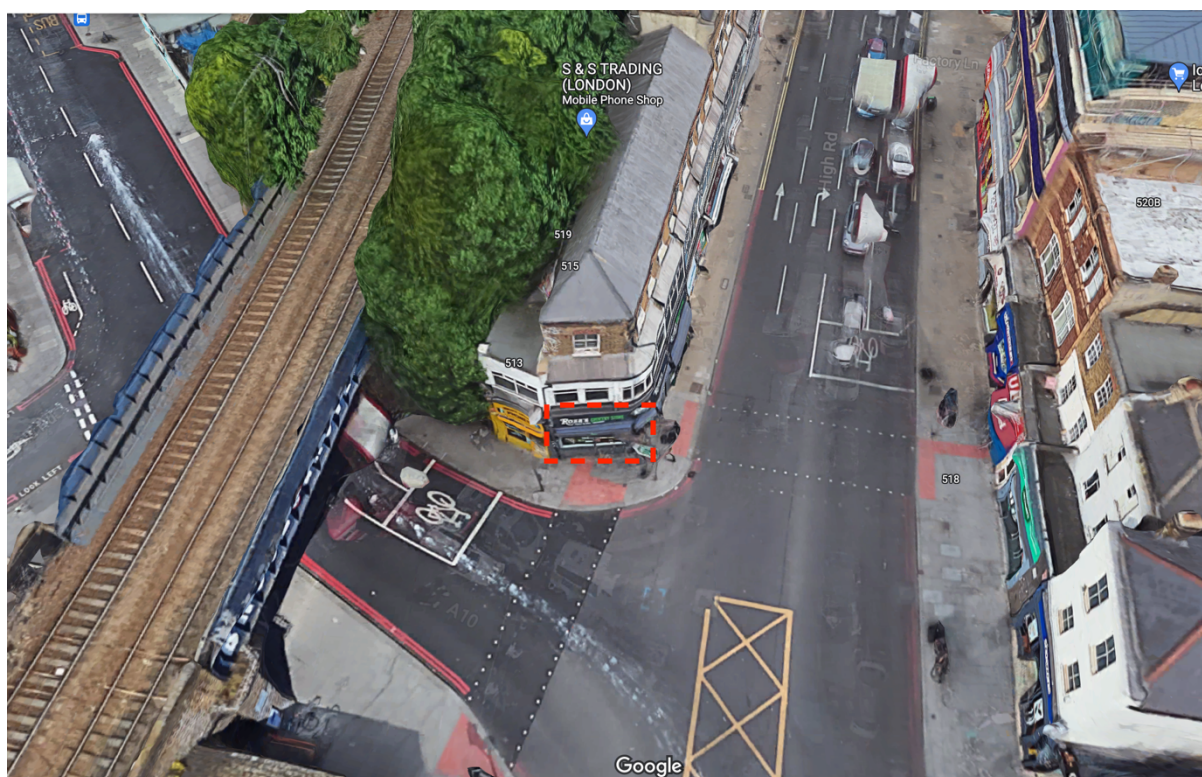
³⁾ full motor protection unit recommended: MD Ref. No. 5649

APPENDIX E

Designing Plan



Location Map



APPENDIX F

Pictures

