

Technical Note

To: Gideon Amos, Sheldon Ven

From: Xavier Sanchez-Roemmele (GL Hearn Acoustics)

Subject: Brent Cross Sidings condensor noise levels

Reference: GH/006031 M13A

Date: 25 July 2022

1. Introduction

Report "CS098707-01 M02 BX Sidings compound TOC condition 10 discharge" dated 11 September 2019 included details pursuant to the discharge of Condition 10 of planning permission 18/5244/EIA of 14 December 2018 for the construction of a compound for use by railway staff and train drivers at Cricklewood Sidings, Land Rear of Brent Terrace (South), London NW2 1BX.

The report concluded that condition 10 would be met subject to specific attenuation measures being implemented. One of the mitigation options was to include a 2800mm high, circa 5600mm long barrier around condenser units CU3 and CU4.

2. Planning conditions

Planning condition 10

Prior to the installation of any fixed mechanical plant required in connection with the development hereby permitted a report shall be carried out by a competent acoustic consultant that assesses the likely noise impacts from that plant and identifies necessary mitigation measures to reduce any noise impacts to the levels stipulated by Condition 9. The report shall include all calculations and baseline data, and be set out so that the Local Planning Authority can fully audit the report and critically analyse its content and recommendations. The report shall be submitted to and approved in writing by the Local Planning Authority and implemented in its entirety prior to the first occupation of the GTR Accommodation Unit and retained as such thereafter.

Reason: To ensure that the proposed development does not prejudice the amenities of occupiers of neighbouring properties in accordance with Policy DM04 of the Local Plan Development Management Policies DPD (2012), the Council's Sustainable Design and Construction SPD (2013) and Policy 7.15 of the London Plan (2016).

Related to condition 10, condition 9 states the following:

Planning condition 9

The free field $L_{Aeq,T}$ level of noise emitted from the development from any new fixed plant, vehicles, equipment or noise generated within the buildings or externally on site shall not exceed 5dB below existing $L_{A90,T}$, when measured outside the nearest habitable room at the nearest noise sensitive receptor (where T is a 15 minute period during the night-time and 1 hour period during the daytime). If the noise emitted from any fixed plant has a distinguishable, discrete continuous note (whine, hiss, screech, hum tone) that are not present in the existing environment, then the noise level generated shall be at least 10dB(A) below the background level. Noise levels shall be as measured from any point 1 metre outside the window of any habitable room of a neighbouring noise sensitive receptor. Existing background noise levels used for comparison shall be as reported in the Planning Application.

Reason: To ensure that the proposed development does not prejudice the enjoyment of the occupiers of their homes in accordance with Policy DM04 of the Local Plan Development Management Policies DPD (2012) and Policy 7.15 of the London Plan (2016).

3. Baseline data

Typical representative background noise levels are taken from report “CS098707-01 M02 BX Sidings compound TOC condition 10 discharge” Please refer to the full survey data submitted at planning stage for details of hourly $L_{A90,1h}$ values.

4. Survey and assessment

On-site noise measurements of the operating condenser units CU3 and CU4 were undertaken, with the objective of determining in-situ noise levels with the abovementioned mitigation in place. The mitigation was also temporarily removed over a short period of time to allow noise levels to be measured in the absence of such mitigation.

During measurements and observations between 10.30 and 11.30 on Monday 20 July 2020, the condenser units were found to generate a range of noise levels. The highest noise levels were measured to be 62 dB(A) at 3 metres, and this occurred around 10 – 15% of the time, with no more than 3 minutes in any 15-minute period. Noises generated by the condenser units at other times during observation were considerably lower in level and can be considered negligible in comparison to the highest noise levels.

It is unlikely that the condenser units will be operating for 100% of the assessable time (defined in British Standard BS 4142 as a full 1-hour continuous period during the daytime and 15 continuous minutes during the night-time). However, a **worst-case scenario has been assessed** by assuming that the condenser units shall be operating uninterruptedly during the assessable periods. Therefore, the actual noise levels are expected to be lower in situ if the condenser units operate for less than 100% of the time.

Based on the measured and observed noise emissions, the noise levels predicted from the condenser units at the assessed Brent Terrace representative receptors with the current mitigation temporarily removed are given in Table 1, assuming a worst-case scenario with condenser units operating 100% of the assessable time. Predictions have been made to the first-floor positions at the receptors, which are more exposed to plant noise than ground floor positions – and therefore reflect a worst-case scenario. All reported noise levels refer to outdoor noise levels at 1 metre from the façade, free-field. Indoor noise levels would typically be around 10dB lower with windows open.

Table 1: Predicted noise emissions from condenser units, 100% on-time (no mitigation)

Position	Representative background noise level, L _{A90}	Plant noise limit, L _{Aeq} , as per planning condition	(100% on-time)
C (69 Brent Terrace, 1st Floor)	41 dB	31 dB	8 dB
E (30 Brent Terrace, 1st Floor)	40 dB	30 dB	32 dB
F (5 Brent Terrace, 1st Floor)	42 dB	32 dB	18 dB

Including noise levels from the fuel farm, water pump and other fixed plant associated with the sidings as described in report “CS098707-01 M02 BX Sidings compound TOC condition 10 discharge”, the predicted cumulative noise levels without mitigation are summarised in Table 2.

Table 2: Cumulative noise emissions without mitigation

Position	Representative background noise level, L _{A90}	Plant noise limit, L _{Aeq} , as per planning condition	Cumulative noise with 100% on-time CUs
C (69 Brent Terrace, 1st Floor)	41 dB	31 dB	13 dB
E (30 Brent Terrace, 1st Floor)	40 dB	30 dB	33 dB
F (5 Brent Terrace, 1st Floor)	42 dB	32 dB	20 dB

5. Proposed mitigation and resulting cumulative noise

To address the predicted exceedance in the area near 30 Brent Terrace (position E), an acoustic noise reduction kit for the specific installed units has been proposed as mitigation. Calculations have been undertaken to predict the resulting cumulative noise levels, with condenser units operating 100% of the time as a worst-case scenario, including the mitigation.

Table 3 on the next page shows the predicted cumulative noise levels including mitigation. We note that the use of the top attenuator only would not provide sufficient attenuation, and therefore the complete attenuation kit (on which the predictions are based) is recommended to be installed.

Table 3: Predicted cumulative noise emissions from fixed plant associated with the compound, including mitigation

Position	Representative background noise level, L_{A90}	Plant noise limit, L_{Aeq} , as per planning condition	Resultant cumulative noise level from condenser units after the installation of proposed acoustic enclosures
C (69 Brent Terrace, 1st Floor)	41 dB	31 dB	11 dB
E (30 Brent Terrace, 1st Floor)	40 dB	30 dB	27 dB
F (5 Brent Terrace, 1st Floor)	42 dB	32 dB	16 dB

6. Conclusion

The calculations indicate that the limits required by planning condition 9 will not be exceeded provided that the proposed full acoustic attenuation kit (as appended) is installed.

Regular maintenance in accordance with the manufacturer or supplier's instructions is recommended to minimise the risk of noise levels increasing over time.

On this basis, it is considered that removing the existing barrier around condenser units CU3 and CU4 will still comply with planning condition 9, provided all other mitigation measures stated in this technical memo and in report "CS098707-01 M02 BX Sidings compound TOC condition 10 discharge" have been implemented and are maintained or it is otherwise demonstrated that they are no longer necessary.

If you have any queries please do not hesitate to contact me.

[Xavier Sanchez-Roemmele](#) MIOA MAES MAAS MIEEE FASA MIoD
Acoustics Technical Director

GL Hearn Limited
65 Gresham Street
London EC2V 7NQ

M +44 (0)7736 495882
xavier.roemmele@glhearn.com
www.glhearn.com

Appended: Supplier acoustic attenuation kit data

Ambient Acoustics Ltd

Acoustic Kits

Mitsubishi PUHY and PURY units (YNW)

A range of Acoustic Kits designed for noise reduction. An industry first, these kits offer up to an 8dBA noise level reduction from standard.

Key Features

- Up to 8dBA noise reduction
- Mitsubishi approved
- No impact on machine functionality

Image of the CU without mitigation measures

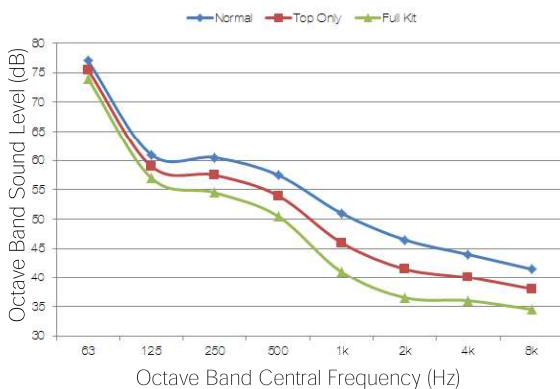
TYPES OF KIT

Both a 'full kit' and 'top only' kit are available. The 'full kit' comprises left, right and back louvres with a top attenuator. The 'top only' has a top attenuator only.

If space is an issue, then the 'top only' kit is available which can still reduce the noise level by up to 4dBA.

The noise level is calculated from an average of the noise at a height of 1m and distance of 1m from the front, back, left, right and 1m above the top. All noise measurements are performed in an anechoic chamber.

PURY-EP200YNW-A ACOUSTIC NOISE LEVEL DATA*



* Indication only

SUPPLY AND/OR INSTALLATION

Please contact Ambient Acoustics directly for supply and installation costs.

Installation costs will vary depending on location and number of units to be fitted with acoustic kits.

Ambient Acoustics Ltd
 PO Box 1585, Wedmore, Somerset, BS28 4WZ
 Tel: 01934 712802
 Mobile: 07488 706199 / 07860 249842
 Email: sales@ambientacoustics.co.uk

Ambient Acoustics is an independent supplier of acoustic attenuation products, all warranties and liabilities rest with Ambient Acoustics Ltd. The acoustic attenuation kits have been tested and approved by Mitsubishi Electric UK.

BASIC ACOUSTIC KIT COSTS



For all PUHY and PURY Series (YNW)

3 models are available, small, large and extra large. Small fits on the S-module outdoor units, large fits on the L-module outdoor units and extra large on the XL-module outdoor units.

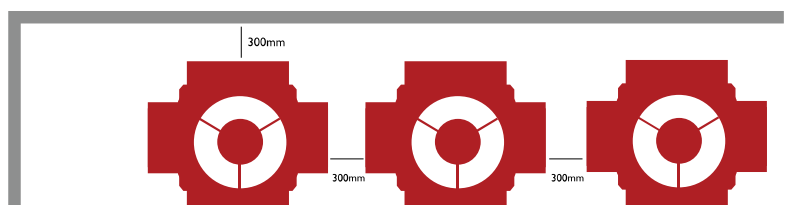
S-module	Complete acoustic kit target price	£2268.00
	Top attenuator only target price	£808.00
L-module	Complete acoustic kit target price	£2663.00
	Top attenuator only target price	£1098.00
XL-module	Complete acoustic kit target price	£3486.00
	Top attenuator only target price	£1616.00

All costs include delivery to mainland UK.

INSTALLATION

Due to the wrap around coil of the YNW, the louvres are attached to 4 sides of the unit. Therefore, when installing multiple module systems, a 300mm gap between each louvre is required.

See diagram below.



1 full kit per outdoor unit is required, unless specifying top attenuator only. In this case, space units as normal.