Project

Swain's Lane
Plant Noise Assessment

Prepared for

Swain's Lane Limited
5 Paper Mill Buildings
City Garden Row
London
N11 8DW

By

Jody Tan

Published

18 March 2019

Telephone +44(0)1787 247595
Website www.srltsl.com
London, Birmingham, Manchester, Sudbury

Quality Assurance	
Project Title	Swain's Lane
Document Title	Plant Noise Assessment
Client	Swain's Lane Limited
Client Address	5 Paper Mill Buildings City Garden Row London N11 8DW
Author	Jody Tan BEng(Hons) MIOA
Checker	Heulwen Peters BSc(Hons) MIOA
Report Number	C14242A/T05C/JYT
Additional information	-

Revision History

Revision	Date	Comments
-	4 January 2019	Initial issue
A	1 February 2019	Updated assessment based on quieter plant
B	6 February 2019	Corrected typography error
C	18 March 2019	Updated assessment based on fewer condensers and removing East Block plant room

Summary

SRL Technical Services Limited has been commissioned by Swain's Lane Limited to do a plant noise assessment for the mixed-use development at Swain's Lane, London, N6.

A baseline noise survey was completed which established the background and ambient noise levels at a location representative of the nearest existing noise sensitive receptors.

One plant room is proposed at the development which will house both air conditioning and refrigeration condensers for the commercial units. The cumulative noise from condensers has been calculated at the receptor properties taking into consideration attenuation provided by distance and by the proposed 300mm acoustic louvers to the plant room.

The Camden Local Plan 2017 sets specific noise limits in terms of "green", "amber" and "red" trigger levels. Based on the baseline noise survey data collected, plant noise from the Swain's Lane development just falls within the "green" category. Camden classifies this as " where noise is considered to be at an acceptable level" when assessed to the nearest existing residential properties.

When plant noise is assessed to the residential dwellings on the Swain's Lane development itself, noise from the plantroom will meet the recommended indoor ambient noise levels defined in BS8233:2014.

The area is dominated by road traffic noise with ambient noise levels significantly higher than predicted plant noise levels - on this basis, plant noise will be largely inaudible at the nearest noise sensitive receptor. In addition, an assessment of noise done in accordance with BS4142:2014 is shown to be favourable, further reinforcing the conclusion that the expected noise from the condensers is acoustically acceptable.

Jody Tan BEng(Hons) MIOA
For and on behalf of
SRL Technical Services Limited
Tel: 01787 247595
Email: jtan@srltsl.com

Contents

1.0 Introduction

The proposed mixed-use development at Swain's Lane, London N6 containing eleven flats and eight retail spaces over two blocks, each up to three storeys in height. SRL Technical Services have been appointed by Swain's Lane limited to assess the noise impact of proposed plant associated with the retail units.

Condensers associated with the retail spaces will be installed in a plant room at the rear of the site, with acoustic louvres at ground floor level.

The site is located north of Swain's Lane and east of Highgate West Hill. Figure 1 below shows the site location relative to the local area.

Figure 1: Site location

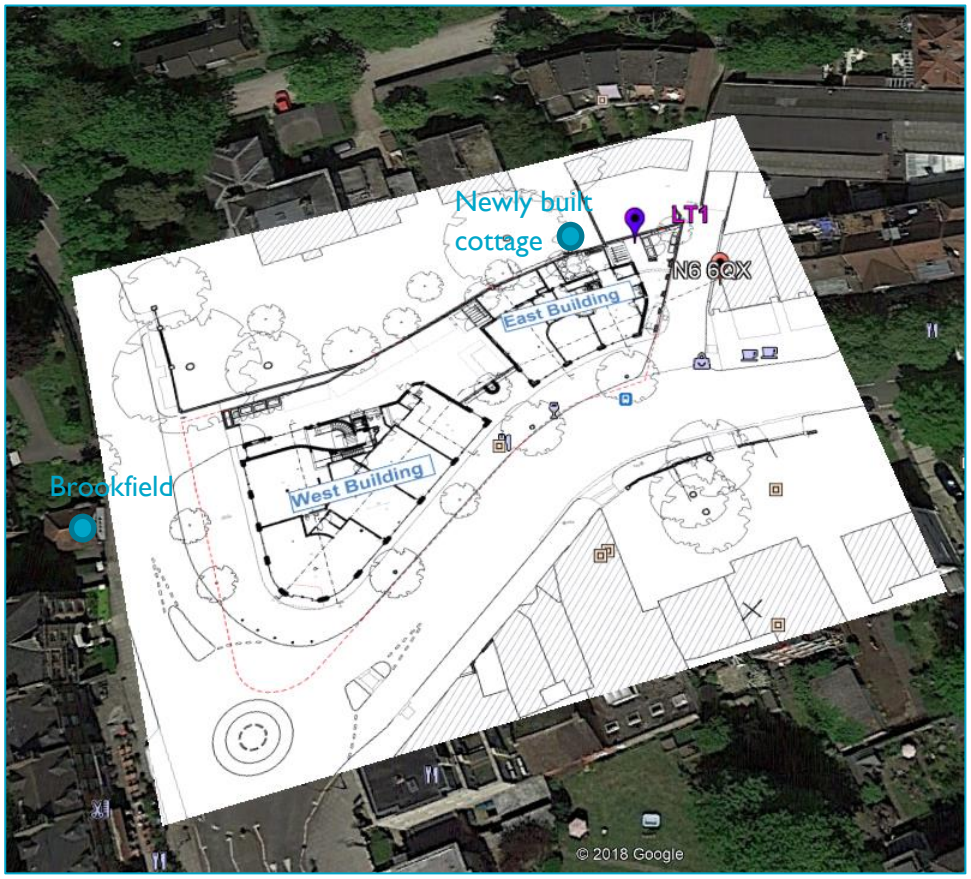
Image taken from Google Earth © 2019

2.0 Noise Climate

A noise survey at the site was completed in October and November 2017. During the survey we recorded noise levels at position marked LT1 (shown in figure 2), which is considered representative of the day time and night-time period at the nearest noise sensitive receptors. Full survey details are given in Appendix A.

The existing noise sensitive receptors which are most likely to be affected by noise from the plant room are the residential dwellings on Brookfield and the newly built single storey cottage (see figure 2).

Figure 2: Site plan and measurement location



Measurements were taken in a free field location approximately 1.5m above ground level. Noise levels were recorded at 15-minute intervals. Daytime noise levels during the weekday between 7am to 6pm were affected by noise from construction work at the development and have therefore been excluded from stated average and typical noise level data. Noise at all other times was dominated by road traffic from Swain's Lane and Highgate Hill.

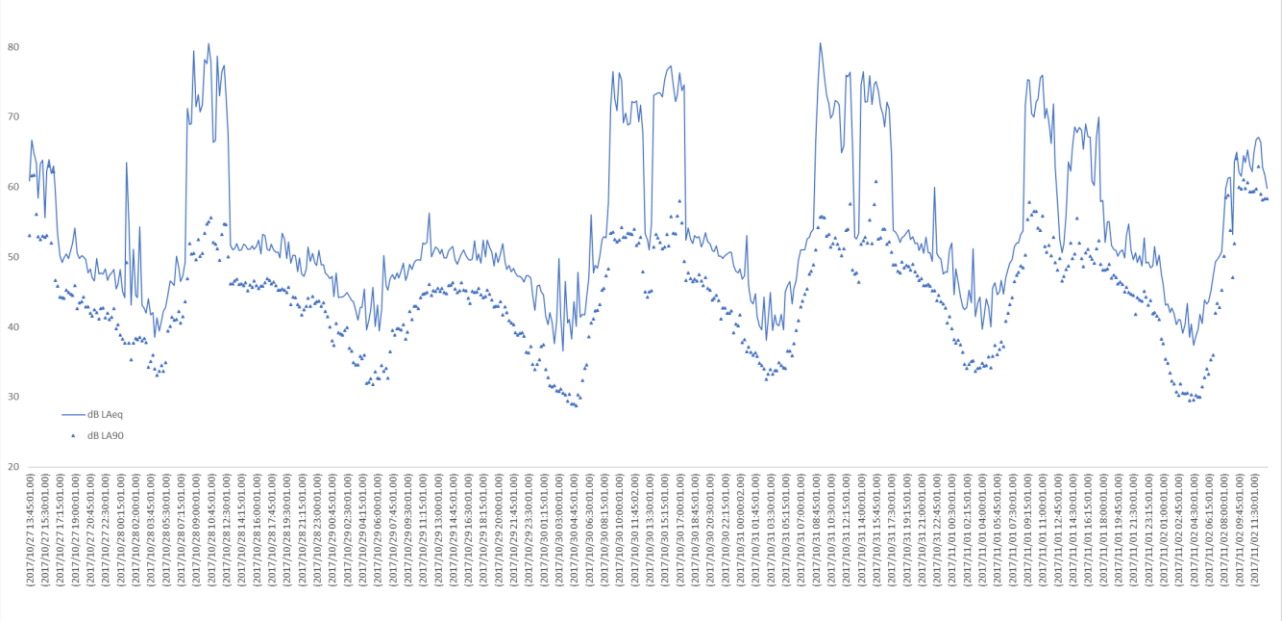
Table 1: Logger (LT1) Unattended Noise Measurements dB(A)

Date	Day / Night	Time	$L_{Aeq,T}$	Typical L_{A90}*
27/10/2017 to 02/11/2017	Daytime	18:00 - 23:00 weekdays 07:23:00 weekend	52	45
	Night-time	23:00 - 07:00	47	35

Full noise logger data is available on request.

* The air conditioning condensers in the retail units will not operate during the night time period, however the condensers for the refrigeration units are likely to operate during the night time period. I have assumed that the condensers operate during the weekends and have taken into consideration background noise levels during a typical weekend period.

Figure 3: Noise levels recorded at LT1



3.0 Noise Criteria

I have assessed the impact of plant noise in accordance with the noise thresholds as detailed in Appendix 3 of Camden's Local Area Plan 2017. This is reproduced in Table 2.

Table 2: Noise thresholds for proposed plant noise (taken from Table C in Appendix 3 of Camden's Local Area Plan 2017)

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 L_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dB L_{Amax}

**10dB should be 15 dB if the noise contains audible tonal elements.*

Based on the measured baseline noise levels and the guidance by Camden Council, I have summarised the noise thresholds in Table 3. Noise levels from the condensers must meet the criteria given below - it is anticipated that this will be conditioned in any consent for the site.

Table 3: Noise thresholds for plant noise at nearby noise sensitive receptors

	Typical background noise levels, dB L_{A90}	Green, dB L_{ATr}	Amber, dB L_{ATr}	Red, dB L_{ATr}
Daytime	45	≤ 30	31 - 35	> 35
Night-time	35	≤ 20	21 - 25	> 25

Green, Amber and Red are defined by Camden as follows:

- Green - where noise is considered to be at an acceptable level.
- Amber - where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in context of other merits of the development.
- Red - where noise is observed to have a significant adverse effect.

The adopted criteria previously mentioned relates to existing noise receptors, as it is important to prevent noise creep. For new residents (i.e. residents within the development itself), it is more appropriate to assess plant noise to the recommended guidance in BS4142:2014 and/or BS8233:2014.

BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound' provides a method to assess whether "sound of an industrial and/or commercial nature" is likely to have an adverse impact at noise sensitive receptors.

BS 4142's assessment methodology considers how loud the noise is and its character (e.g. whether it contains hisses, bangs or clicks). The assessment is then based on how loud (and how annoying) the source noise is compared with the existing background noise at the receptor.

The rating level is determined by applying these corrections to the specific level, and then the rating level is compared with the measured background level. The specific level in this case is the measured direct level of the plant, then corrected for distance to the receiver. The corrections can be applied for tonality, impulsivity, irregularity and any other acoustic features likely to attract attention.

The difference between the rating level and the typical background level can then be interpreted using the following guidance from BS 4142:2014, depending on the context:

- If the Rating Level is +10 dB or more above the background level, this indicates a significant adverse impact.
- A difference of around +5 dB is likely to be an indication of an 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.

BS8233:2014 provides recommended indoor ambient noise levels for residential dwellings. It mentions that daytime noise levels should not exceed 35 dB $L_{Aeq,\ 16\ hours}$ and the night time noise levels should not exceed 30 dB $L_{Aeq,\ 8\ hours}$.

4.0 Noise Assessment

The plant room will contain condensers that will serve the retail units within the East and West Building.

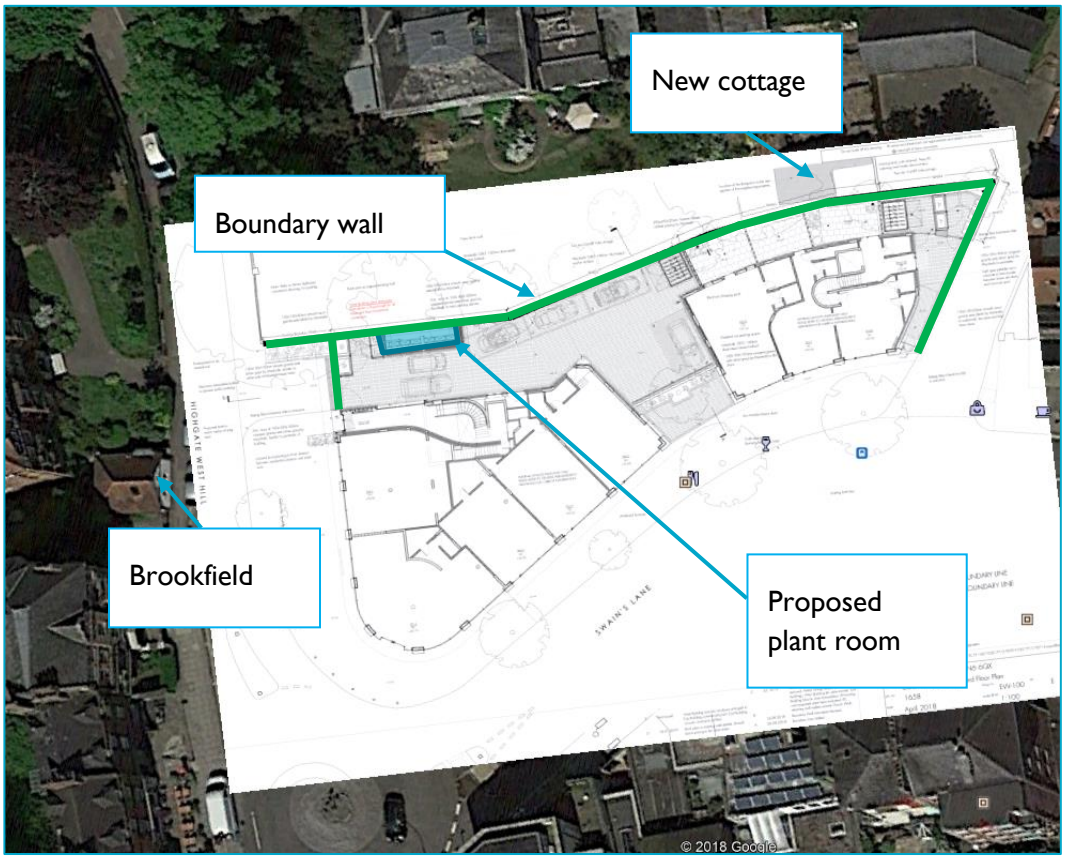
The following condensers are proposed to be installed within the plant room:

- 8 condensers for air cooling (RXYSCQ5TV1 with external control adaptor to execute low noise control)
- 4 condensers for refrigeration (JEHS-0200-M1)

The JEHS-0200-M1refrigeration condensers have a reported sound pressure level of 30 dB(A) at 10m and the RXYSCQ5TV1 air conditioning condensers with external control adaptor to execute low noise control have a reported sound pressure level of 47 dB(A) at 1m when operating at L2 mode.

The RXYSCQ5TV1 condensers will only operate during the day time period whilst the JEHS-0200-M1 condensers will operate 24 hours. The location of the plant rooms is in relation to the noise sensitive receptors shown in figure 4.

Figure 4: Location of plant rooms in relation to noise sensitive receptors



The plant room will have a concrete roof and wall structure. The southern, eastern and western façade of the plant rooms will be acoustically louvered to provide a minimum sound insulation performance of 21 dB R_w (Caice SH300 Acoustic Louvre).

4.1 Existing dwellings

I have calculated the cumulative plant noise at the nearest existing dwellings and compared it to Camden's requirements. This is summarised in Table 4.

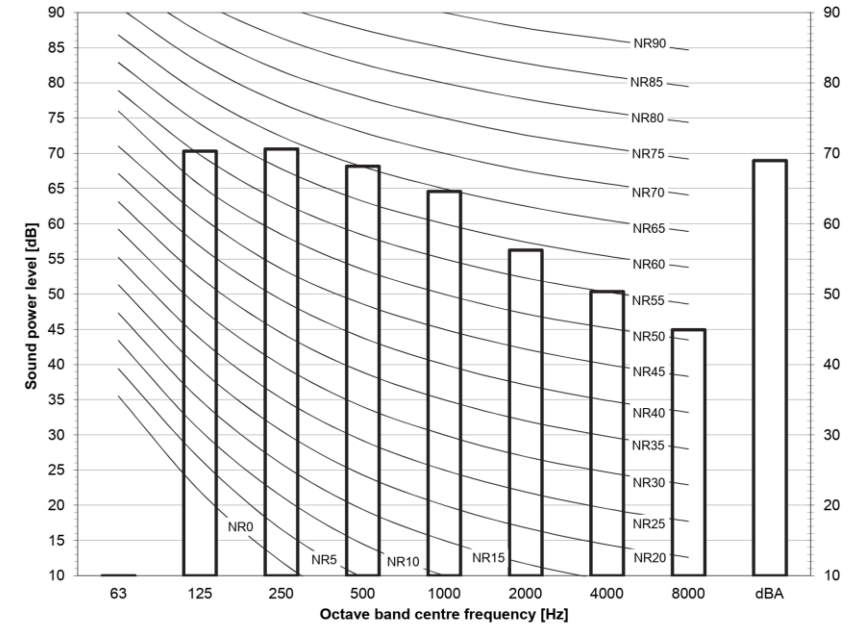
Table 4: Summary of cumulative plant noise to existing dwellings

Receptor	Calculated specific plant noise at receptor, dB L_{Aeq}	Potential acoustic feature correction, dB	Rating noise level, dB $L_{A,Tr}$	Camden's threshold for noise to be at an acceptable level, dB $L_{A,Tr}$
Brookfield (Day)	18	3 for intermittency	18+3=21	≤ 30
Brookfield (Night)	3	3 for intermittency	3+3=6	≤ 20
New cottage (Day)	15	3 for intermittency	15+3=18	≤ 30
New cottage (Night)	0.1	3 for intermittency	0.1+3=3	≤ 20

Manufacturers data for the air condensing units show that the noise produced by the units is not tonal in nature See Figure 5. I have assumed that the four refrigeration condenser units are also non-tonal in nature.

Figure 5: Sound power level of air conditioning condensers

RXYSCQ5TV1



As shown in Table 3, plant noise at the existing noise sensitive receptors is therefore within the green threshold. Camden classifies this as " *where noise is considered to be at an acceptable level*".

As discussed in Section 2, noise at the area is dominated by road traffic noise and measured to be 52 dB, L_{Aeq} during the day and 47 dB L_{Aeq} during the night. Plant noise will be largely inaudible at the existing nearest noise sensitive receptors. I therefore consider that in this instance, given the context of the noise environment and that the noise from plant results in a favourable BS4142:2014 assessment that the proposed noise from the condensers is acoustically acceptable.

4.2 New dwellings on Swain's Lane development

The closest noise sensitive dwellings are the first-floor flats facing the plant room. I have assessed plant noise to this dwelling to the recommendations in BS4142:2014 and BS8233:2014. My calculations are summarised in Table 5.

Table 5: Summary of cumulative plant noise to new dwellings

	Noise levels	Comment
Calculated plant noise at receptor	Day: 44 dB L_{Aeq} Night: 28 dB L_{Aeq}	Noise from plant room
Acoustic feature correction	+3 dB	+3 for intermittency
Rating level at receptor	Day: 44 + 3 = 47 dB L_{ATr} Night: 28 + 3 = 31 dB L_{ATr}	
Measured background noise levels	Day: 45 dB L_{A90} Night: 35 dB L_{A90}	Noise dominated by road traffic
Excess of rating over background noise levels	Day: 47 - 45 = 2dB Night: 31 - 35 = -4 dB	

During the daytime, the rating level for plant noise is expected to be 2 dB above the typical background noise level at the new dwellings. BS4142:2014 states that a difference of around +5 dB is likely to be an indication of an adverse impact. However, given the context of the site (daytime ambient noise level of up to 52 dB L_{Aeq} dominated by road traffic and receptors are new to the surrounding), noise from the plant room at the new dwellings will not be an issue. Also as previously discussed, BS8233:2014 recommends indoor ambient noise levels of up to 35 dB L_{Aeq} during the daytime. The calculated plant noise at the façade of the new dwellings is 44 dB L_{Aeq}. The dwellings will have double glazing windows installed and ventilation will be provided by mechanical ventilation system so plant noise will not exceed the recommended levels stated in BS8233:2014.

During the night time, the rating level for plant noise is 4 dB below the typical background noise level which according to BS4142:2014, is an indication that the specific sound source will have a low impact on the receptors.

Appendix A - Survey Details

A1. Location of Survey

Swain's Lane, London

A2. Date & Time of Survey

27 October to 02 November 2017

A3. Personnel Present During Survey

Jody Tan (SRL Technical Services Ltd)

Joe Conaghan (SRL Technical Services Ltd)

A4. Weather Conditions during Survey

Calm and dry during commissioning and decommissioning of survey

A5. Instrumentation

Description	Serial	Make	Model	Calibration Certificate Number	Date calibrated
Sound Level Meter	1404737	Norsonic	Nor 140	25971	21/08/2017
Calibrator (94.0dB)	1541905	Brüel & Kjaer	Type 4230	25969	21/08/2017
Pre-amp	13919	Norsonic	Type 1209	25971	21/08/2017
Microphone	128712	Norsonic	Type 1225	25970	21/08/2017
De-humidifier	330	Norsonic	Type 1284	N/A	21/08/2017

A6. Calibration Procedure

Before and after the survey the measurement, apparatus was check calibrated to an accuracy of ±0.3 dB using the type 4230 Sound Level Calibrator. The Calibrator produces a sound pressure level of 93.8 dB/ 94.0 dB re 2 x 10-5 Pa at a frequency of 1 kHz.

A7. Survey Procedure

Ambient noise levels were monitored and measured at position as shown on Figure 1. The measurements are tabulated in Appendix B, and explanations of the parameters used are listed in Appendix C.

Appendix B - Noise Measurement Parameter Definitions

L_{A90} - The "A" weighted sound pressure level that is exceeded for 90% of the measurement period. It is commonly used as the "Background Noise Level".

L_{Aeq} - The "A" weighted equivalent continuous sound pressure level. A representation of a continuous sound level containing the same amount of sound energy as the measured varying noise, over the measurement period. It can be considered as the "average" noise level.

Sudbury Consultancy
Holbrook House
Little Waldingfield
Sudbury
Suffolk
CO10 0TF
Tel: +44 (0)1787 247595

Manchester Consultancy
Lynnfield House
Church Street
Altrincham
Cheshire
WA14 4DZ
Tel: +44 (0)161 929 5585

London Consultancy
Citypoint, 12th Floor
1 Ropemaker Street
London
EC2Y 9HT
Tel: +44 (0)207 251 3585

Birmingham Consultancy
Cornwall Buildings
45 Newhall Street
Birmingham
B3 3QR
Tel: +44 (0)121 270 6680

South Africa Consultancy
Ground Floor, Liesbeek House
River Park
Gloucester Road
Mowbray
7700
South Africa
Tel: +27 (0)21 680 5305

Laboratory
Holbrook House
The Street
Sudbury
Suffolk
CO10 0TF
Tel: +44 (0)1787 247595

Website: www.srltsl.com
e-mail: srl@srltsl.com

SRL offers services in:
Acoustics
Air Quality
Air Tightness
BREEAM
Compliance
Fire
Laboratory and Site Testing

Registered Name and Address:
SRL Technical Services Limited
Holbrook House
Little Waldingfield
Sudbury
Suffolk
CO10 0TF

Registered Number: 907694 England