



BRAIDEN ACOUSTICS LTD

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NOISE IMPACT ASSESSMENT

Prepared For : Birds Food Ltd

Date : 24 Nov 2025

Site : 104 Barlow Moor Road, Didsbury

Report No. : 11449

1 INTRODUCTION

Braiden Acoustics has been commissioned by Birds Food Ltd to undertake an acoustic survey at the site of 104 Barlow Moor Road, Didsbury to support a planning application for the change of use of the ground and basement floors to a take away and ancillary uses.

As part of the conversion process, there will be new external plant, in the form of kitchen ventilation.

1.1 AIM

This report will assess noise from all external plant in relation to the nearest sensitive receptor (NSR) and propose any acoustic mitigation, where necessary, so that noise levels are within acceptable limits. Also, noise transfer via the separating floor will also be assessed.

2 DESCRIPTION OF SITE

The application site is the ground and basement floor of 104 Barlow Moor Road in Didsbury, which is within a terraced row of buildings.



Figure 1
Street view of site

2.1 SITE LOCATION AND SURROUNDING USES

The site bounded by Barlow Moor Road to the south and Tripps Mews to the north (rear). The shop is flanked by two other commercial uses: Elegance Hair and Beauty at 106 Barlow Moor Road and Yes Lah (Filipino restaurant) at 102 Barlow Moor Road.

There are further commercial uses within the terraced row, with residential accommodation above.

There is further residential accommodation to the rear, on the other side of Tripps Mews.

The nearest sensitive receptor (NSR) is the apartment above the ground floor unit.

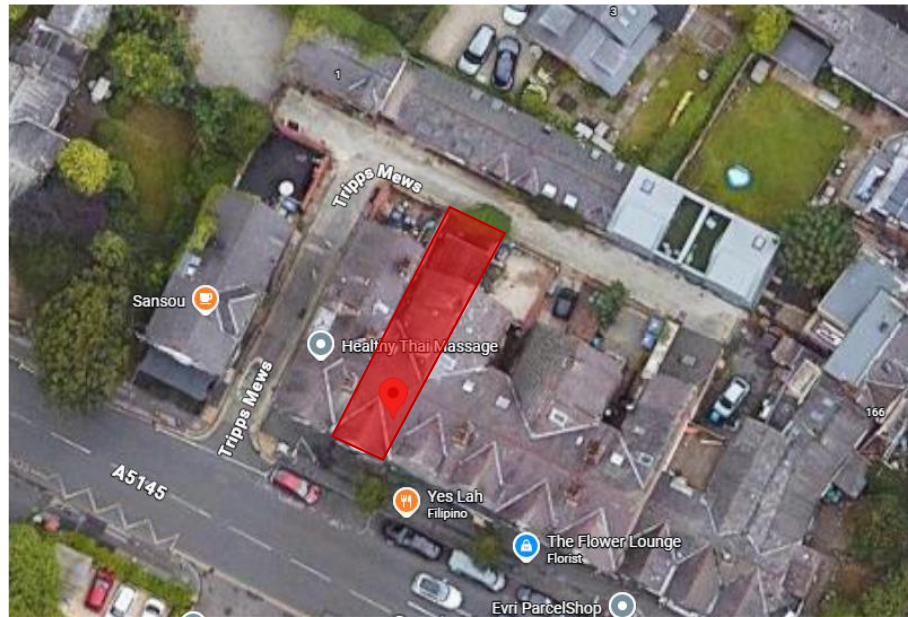


Figure 2
Site location and surrounding uses

2.2 EXISTING USE

The site was previously a convenience store but had been closed for some considerable time.

2.3 PROPOSED USE

The proposed use is a take away with associated external plant.

2.3.1 Ground Floor

The proposed ground and basement floors will include a cooking area, food prep station, washing facilities, toilets, office and staff room.

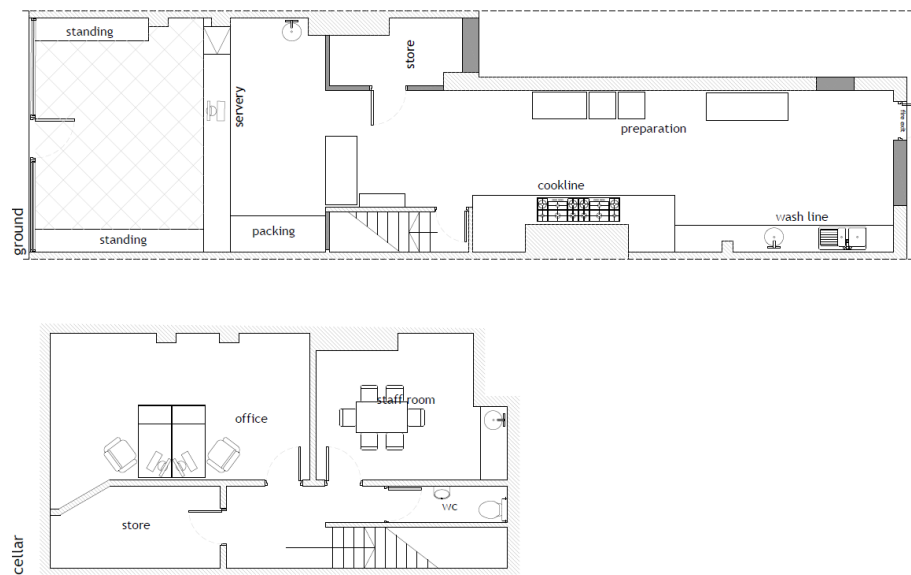


Figure 3
Proposed floor plans



2.3.2 Opening hours

The proposed opening hours are:

Sun – Wed 12 - 10pm

Thurs – Sat 12 - 10.30pm

2.3.3 Building services

2.3.3.1 Kitchen ventilation

The kitchen ventilation system comprises of air extraction.

Kitchen Extract

Fläktwoods 40 MaXfan Compac

Extract Silencer

2D silencer

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3m**
Inlet*	84	85	91	88	88	85	82	77	95	71
Outlet*	86	86	94	89	89	86	83	78	97	73
Breakout*	76	71	74	68	63	57	58	55	79	49

* Lw dB re 10^{-12} W
Sound data at requested duty.

** dBA re 2×10^{-5} Pa

Figure 4
Sound Power data for extract fan

3 ACOUSTIC CRITERIA AND METHODOLOGY

3.1 BS 4142

BS 4142:1999 “Method for rating industrial noise affecting mixed residential and industrial areas” [1] assesses industrial noise with regards to nearby residential dwellings. The guidance is commonly used to compare the equivalent noise from an industrial source only (specific noise level), L_{Aeq} , to the background noise level, L_{A90} , at the nearest sensitive receptor (NSR).

This Standard has been recently updated, BS 4142:2014 “Methods for rating and assessing industrial and commercial sound” [2]. Whereas the old standard added 5dB ‘penalty’ to the Specific Noise Level (SNL) if the noise source has a ‘character’ that can draw attention that may be described as tonal, intermittent or impulsive, the new standard gives clearer guidance on noise ‘character’. Furthermore, the previous Standard gave only one 5 dB penalty whereas the new Standard may not. When added to the specific noise level it forms the rating level. The new Standard gives the guidance for the following types of noise character:

Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.

NOTE 1 The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases the amount of masking varies as the residual sound changes in level and possibly character. The source’s tonal and/or impulsive characteristics could also vary with time.



Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.

Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity

A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Once a penalty for noise character is added to the Specific Noise Level then this is termed the Rating Level.

The background level is then compared to the rating level. It is usual that the rating level due to the source should be below the background noise level at the nearest sensitive receptor; indeed BS 4142 states:

“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.”

3.1.1 Council BS4142 criterion

Hitherto, there has been no mention of a BS4142 noise criterion.

However, section 11 d) of BS 4142:2014 says

“Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact”

Therefore, minimally, the Rating Level should not exceed the Background Level to ensure any potential noise has a low or no impact.

3.2.1 Residential

The British Standard BS 8233:2014 “Guidance on sound insulation and noise reduction for buildings” gives guidance on recommended indoor ambient noise levels for residential dwellings.



Room	Criterion	$L_{Aeq,T}$	
		night	day
Bedroom	Sleeping	30	35
Dining Room/Area	Dining	--	40
Living Room	Resting	--	35

Table 1

Recommending indoor ambient noise level thresholds from anonymous noise (taken from Table 4, BS 8233:2014)

Internal levels are simply predicted by the subtraction of the estimated sound reduction index (SRI) of the building façade from the external free field noise measurements. When considering the SRI of a particular façade it is usual to only consider the glazing as this is the weakest element acoustically.

Table 2 in BS 8233:2014 give a range of target noise levels for a variety of internal spaces, such as offices. The upper limits should not be breached in order for the occupants of the space to not be disturbed. However, for open-plan offices for example, a minimum noise level can be useful to provide masking for acoustic privacy.



Table 2

Target internal noise levels of unoccupied spaces

As Table 2 above shows, the noise levels within an open plan office should be between 45 – 50 dB(A).

4 MEASUREMENT DETAILS

4.1 BACKGROUND NOISE LEVELS

4.1.1 Monitoring overview

Personnel: John Braiden, BSc & MSc Acoustics, MIOA.

Equipment: NTi XL2 integrated real time analyser & B&K 4231 calibrator.

Time / Date: Monday 27nd October from approximately 15:30 for 10 hours.

The sound level meter was calibrated before after the measurements with no drift reported.

Monitoring was unmanned.

Background noise (L_{A90}), 'average' noise levels (L_{Aeq}) and maximum noise levels (L_{Amax}) were taken in 15-minute intervals.



4.1.2 Weather

The weather was conducive for noise monitoring with light winds and some precipitation.

There was some occasional light cloud cover.

Temperatures ranged from 11-12 degC.

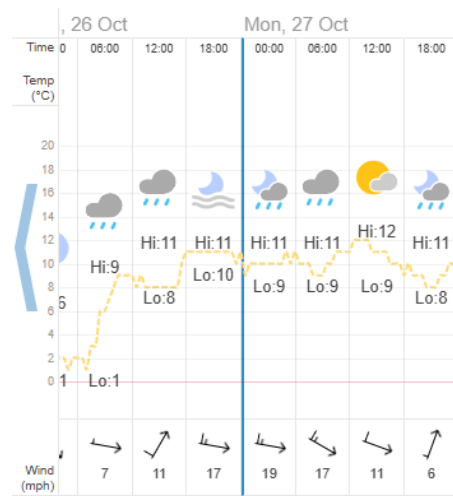


Figure 5
Weather forecast

4.1.3 Monitoring location

There was one monitoring location which was 1m from a Velux window, as shown in Figure 6.



Figure 6
Monitoring Location



4.1.4 Monitoring results

4.1.4.1 Position 1 – Velux window

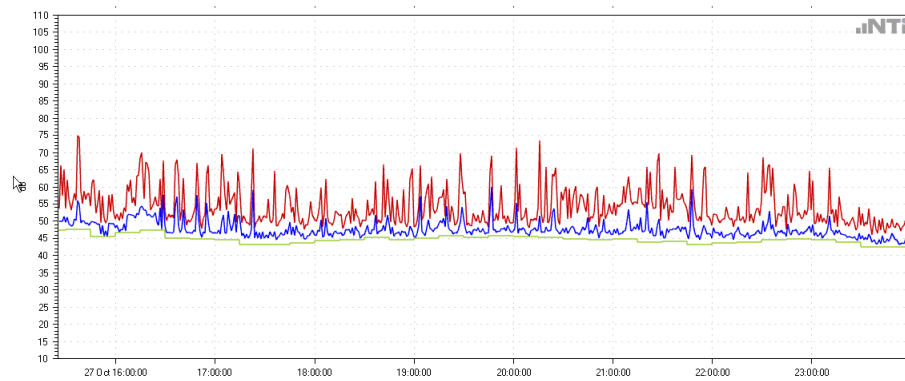


Figure 7
Time history at ML 1

Due to the secluded position of Monitoring Location 1 (ML 1) noise levels were relatively low. However, there were some airplane passes, hence the impulsive nature of the time history, shown in Figure 7.

The Background Noise Level at Monitoring Location 1 was relatively constant and ranged between 43 to 48 dB L_{A90} .

A histogram of the daytime Background Noise Levels was derived to determine the ‘typical’ daytime level.

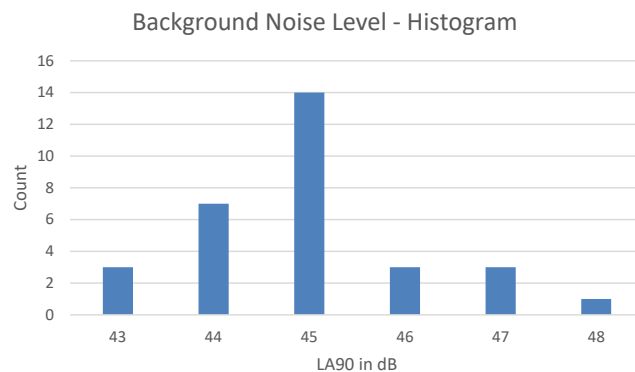


Figure 8
BNL @ ML1

Figure 8 above shows that typical Background Noise Level at Monitoring Location 1 was 45 dB L_{A90} .

5 ACOUSTIC ASSESSMENT

The potential noise issues to be assessed are:

1. Noise from external plant
 - a. kitchen supply
2. Noise transfer via separating floor

Initially, each external noise source is individually assessed using BS4142, at their closest noise sensitive receptor (NSR).



5.1 EXTERNAL PLANT

5.1.1 Locations of external plant

The kitchen extract flue will rise vertically at the rear of the building past kitchen windows on the first floor and terminate 1m above the eaves.



Figure 9
Location of condensers

The Nearest sensitive receptor (NSR) with direct line of sight is a Velux window, some 9m from the proposed flue.

5.1.2 Background noise level

The typical Background Noise Levels are given in Section 4.1.4

45 dB L_{A90}

5.1.3 BS4142 assessments

For the kitchen extract there will be a BS4142 assessment.

The following will be taken into account:

- Number of reflecting surfaces (for calculation only)
- Shielding
- Distance attenuation
- Acoustic characteristics such as, intermittency, tonality and impulsivity.

5.1.3.1 Kitchen Extract

A penalty for intermittency was applied, as the unit is likely to switch on and off.



BS 4142 Noise Assessment Kitchen Extract	Value	dB
Total Specific Noise Level @ NSR		36
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		39
Background Noise Level		45
Rating minus Background		-6

Table 3
BS 4142 Kitchen Extract

Table 4 shows that the Rating Level for the Large condenser is 6 dB below the typical BNL and therefore of 'low impact'.

****Therefore, the kitchen extract will NOT require further mitigation****

5.1.4 NOISE BREAK-OUT FROM EXTRACT FAN / DUCT

To prevent internal noise break-out from the fan and ductwork, acoustic wrap should be properly installed. Such a product is:

Muftilag 10B/20

<https://www.hvinsulation.com/product/mufti-lag-original-10b-20-1200mm-x-2m-x-44mm/>

5.2 SOUND TRANSMISSION VIA SEPARATING FLOOR

From noise measurements at other restaurants / take aways, it has been shown that noise levels do not exceed 80 dB $L_{Aeq,15min}$. Above the first floor of the proposed take away is residential accommodation. Therefore, assuming daytime internal noise within the accommodation should not exceed 35 dB $L_{Aeq,day}$, the separating floor should achieve an 'on site' sound reduction index of at least:

$$45 \text{ dB } D_{nT,w} + C_{tr}$$

In order to achieve the appropriate sound insulation, it is recommended to install on the ground floor ceiling:

- Remove existing ceiling
- Exton TNF 70 firebatt slabs friction fitted between the joists (install as per manufacturer's recommendations)
- 2 x 15mm Soundbloc or Fireline boards screwed to the underside of the joists
- Independent ceiling to form a minimum 125mm void that does not touch the upper ceiling
- 2 x 15mm Soundbloc screwed directly to the underside of the independent ceiling
- 100mm Isover APR 1200 mineral wool in the cavity



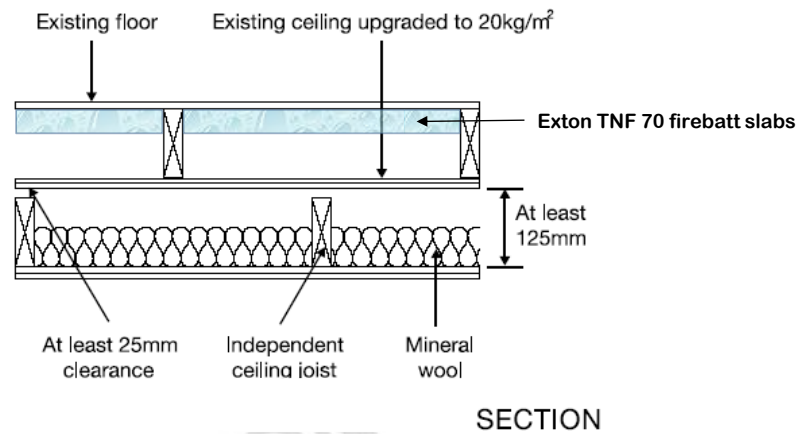


Figure 10
Proposed floor design

The above design, when installed correctly, should achieve at least 50 dB.

NM if the ceiling needs additional support, acoustic hangers MUST be used.**



Figure 11
Acoustic hanger

5.2.1 Junction with internal stud wall

Internal stud walls should **not** penetrate the upgraded acoustic ceiling but rather abut up to it.

5.2.2 Penetrations in the separating floor

Piped services (excluding gas pipes) and ducts etc. that pass through separating floors should be surrounded with absorbent material for their full height and enclosed above and below the floor



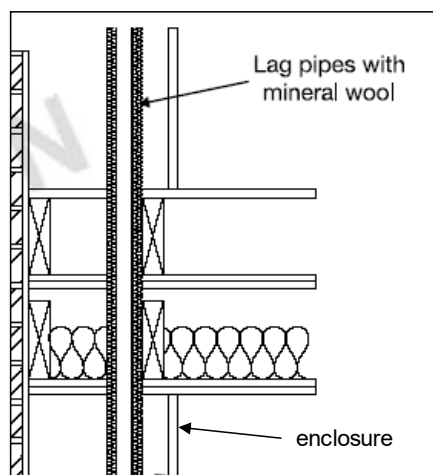


Figure 12
Enclosed and lagged pipework that penetrates a separating floor

Penetrating pipework should be lagged with acoustic wrap (minimum 25mm unfaced mineral wool) and boxed in (enclosed) with at least 1no. 15mm Soundbloc.

Alternatively, it is suggested to use Rockwool Techwrap – see manufacturer for installing instructions

<http://www.rockwool.co.uk/products/u/2014.product/9884/building-insulation/rockwool%C2%AE-techwrap2-and-techtube->

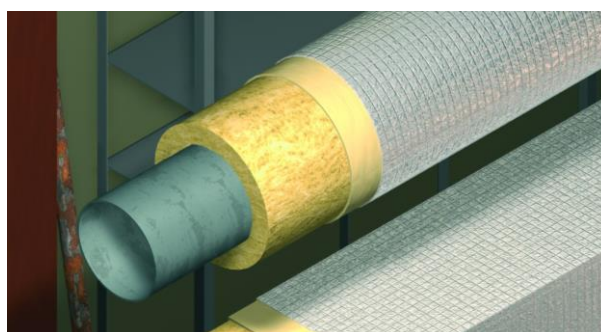


Figure 13
Cutaway drawing of Rockwool Techwrap

6 CONCLUSION

An acoustic survey has taken place at 104 Barlow Moor Road, Didsbury to determine noise emissions from external plant.

The assessment revealed the following external noise sources:

- Kitchen extract

The BS 4142 “Methods for rating and assessing industrial and commercial sound” shows that Rating Levels are below the typical Background Level for all external plant pending the following recommendations:

- Acoustic wrap for the extract fan and internal duct run using Muftilag 10B/20
- 2D silencer for the atmosphere side of the extract fan

In addition, an acoustic independent ceiling should be installed to minimise internal noise transfer via the separating floor.



7 REFERENCES

- [1] BS 4142: 1997
Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.
- [2] BS 4142: 2014
Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.



Appendix



A1 OCTAVE BAND CALCULATION

A1.1 Extract

104 Barlow Moor Road, Didsbury		Duct Calculation	Kitchen Extract	Octave band centre frequency							Total level
Item	Quantity	Description	Details	63	125	250	500	1000	2000	4000	
1a		Sound Pressure Level @ Xm	SWL data used	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1b		Sound Power Level of unit	40 Maxfan Compac, Lw out	86.0	86.0	94.0	75.0	89.0	86.0	83.0	96.8
2		PLENUM Insetion Loss	no								
3	5 m	Duct Length in metres	Round > 300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	1	Number of bends	500mm round bend	-1	-1	-2	-3	-3	-3	-3	
5	mm	Branch area	10log(branch mm2/duct mm2)	0	0	0	0	0	0	0	
6		Silencer attenuation (1)	CDA.2D (200-550 dia)	-4	-7	-10	-15	-19	-16	-12	
7		Silencer attenuation (2)	no silencer or n/a	0	0	0	0	0	0	0	
8		Att due to end reflection	500 mm end reflection	-8	-4	-1	0	0	0	0	
9		Louvre attenuation	no acoustic louvre or n/a	0	0	0	0	0	0	0	
		A weighting	yes	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
10		Sound power at termination		46.8	57.9	72.4	53.8	67.0	68.2	69.0	75.8
		Directivity	0.25m2 @ 100° - 0 surface	-1	-1	-7	-7	-16	-33	-33	
11	Q 1	No. of reflective surfaces	0 surfaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	9 m	Distance Attenuation	20*log10(r)	-19.08	-19.08	-19.08	-19.08	-19.08	-19.08	-19.08	
		Air absorption	15°C; 80% humidity	0.00	0.00	-0.01	-0.02	-0.04	-0.07	-0.21	
		Numerical correction	SPL = SWL - 20log(r) + DI - 11	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	-11.00	
	δ 0	Barrier	no	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		SPL(A) at NSR	$L_{p,NSR}$	15.7	26.8	35.3	16.7	20.9	5.0	5.7	36.1 dB

