NEWTOWN COMMERCIAL DEVELOPMENT

Environmental Noise Assessment

Prepared for: Melrose Bros Ltd. Client Ref: 12427

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1.0 Introduction

Melrose Bros Ltd. has appointed SLR Consulting Limited (SLR) to undertake a noise assessment for the development of a Site at Newtown.

Development proposals include the following:

- A Petrol Filling Station.
- A Public House.
- A Hotel.
- A Coffee Drive Thru.

To assess the noise impact of the proposals this Report includes:

- A baseline noise survey to inform the assessments.
- An assessment to determine the impact of commercial noise from the proposed development upon both existing and proposed residential receptors. This assessment has been completed with reference to BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.
- An assessment to determine the suitability of the site for hotel development. This assessment has been completed with reference to BS8233:2014 *Guidance on Sound Insulation and Noise Reduction for Buildings.*

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in Appendix 01.

2.0 Site Description

The proposed Development will be located on an area of open space.

The site is bounded:

- To the North-West by Llanidloes Road (A4811).
- Newtown Bypass (A489) to the South-West.
- Glandulas Holiday Park to the South-East.

A plan showing the location and layout of the proposed Development Site can be seen in Appendix 02.

In summary the proposed Development will consist of:

- A Petrol Filling Station.
- A Public House.
- A Hotel.
- A Coffee Drive Thru.

3.0 Scope and Guidance

3.1 Consultation with Powys Council

Powys Council was consulted via email to confirm their views and policies on noise-related issues for the application. The following assessment scope was presented:

- A baseline survey would be completed as set out in Section 4.0 of this Report.
- An assessment to determine the impact of commercial noise from the proposed development upon both existing and proposed residential receptors. This assessment would be completed with reference to BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.
- An assessment to determine the suitability of the site for hotel development. This assessment would be completed with reference to BS8233:2014 *Guidance on Sound Insulation and Noise Reduction for Buildings*.

A summary of relevant sections of BS4142:2014+A1:2019 and BS8233:2014 guidance is given below.

3.2 BS4142:2014+A1:2019

British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* is intended to be used to assess the potential adverse impact of sound, of an industrial and/or commercial nature, at nearby noise-sensitive receptor locations within the context of the existing sound environment.

Where the specific sound contains tonality, impulsivity and/or other sound characteristics, penalties should be applied depending on the perceptibility. For tonality a correction of either 0, 2, 4 or 6dB should be added and for impulsivity a correction of either 0, 3, 6 or 9dB should be added. If the sound contains specific sound features which are neither tonal nor impulsive, a penalty of 3dB should be added.

In addition, if the sound contains identifiable operational and non-operational periods, that are readily distinguishable against the existing sound environment, a further penalty of 3dB may be applied.

The assessment of impact contained in BS4142:2014+A1:2019 is undertaken by comparing the sound rating level, i.e. the specific sound level of the source plus any penalties, to the measured representative background sound level immediately outside the noise-sensitive receptor location. Consideration is then given to the context of the existing sound environment at the noise-sensitive receptor location to assess the potential impact.

Once an initial estimate of the impact is determined, by subtracting the measured background sound level from the rating sound level, BS4142:2014+A1:2019 states that the following should be considered:

- typically, the greater the difference, the greater the magnitude of the impact;
- a difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- a difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
- 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. It is an indication that the specific sound source has a low impact, depending on the context.

BS4142:2014+A1:2019 notes that:

"Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

To account for the acoustic character of proposed sound sources, BS4142:2014+A1:2019 provides the following with respect to the application of penalties to account for *"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 predominantly tonal the Joint Nordic Method gives a correction of between OdB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible;*
- Impulsivity A correction of up to +9dB 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 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible;
- **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. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied; and
- 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 3dB can be applied."

Finally, BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

3.3 BS8233:2014

The impact of environmental noise upon the proposed hotel at the Site will be assessed with reference to BS8233:2014.

BS8233:2014 provides recommendations for the control of noise in and around new buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate. The standard suggests suitable internal noise levels within different types of buildings, including hotel and rooms for residential purposes. BS8233:2014 states that *"The recommendations for ambient noise in hotel bedrooms are similar to those for living accommodation"* (Paragraph 7.7.5.1.1) these are shown in Table 3-1.

Table 3-1

Hotel Development Suitable Internal Noise Levels, dB

Activity	Location	07:00 to 23:00 L _{Aeq,16hr}	23:00 to 07:00 L _{Aeq,8hr}
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

BS8233:2014 states that the recommended limits can be relaxed by up to 5dB "where development is considered necessary or desirable" (Paragraph 7.7.2).

Whilst it may be considered desirable to achieve the BS8233:2014 recommended internal noise levels with windows open, it is stated that where the limit cannot be met with an open window "there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level" (Paragraph 7.7.2).

It is, therefore, not essential that the recommended internal noise levels are achievable with open windows if suitable alternative means of ventilation can be provided.

With regard to external noise, Section 7.7.3.2 of BS8233:2014 states that:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited".

3.3.1 Professional Practice Guidance: Planning and Noise

As BS8233:2014 does not specify internal limits for maximum noise levels within bedrooms during the nighttime, reference has been made to the guidance document *ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise, New Residential Development,* produced by the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH).

This document states: "For a reasonable standard in noise-sensitive rooms at night (e.g. bedrooms) individual noise events should not normally exceed 45dB L_{AFmax} more than 10 times a night."

4.0 Environmental Sound Survey

An environmental noise survey was completed by SLR, between Thursday 9th September and Monday 13th September 2021.

4.1 Survey Equipment

The sound monitoring equipment used during the survey is detailed in Table 4-1. All measurement instrumentation was calibrated before and after the measurements. No significant drift was observed. The calibration chain is traceable via the United Kingdom Accreditation Service to National Standards held at the National Physical Laboratory.

Location	Equipment	Serial Number
1	Cirrus CR:171C Type 1 Sound Level Meter	G061698
T	Cirrus CR:515 Acoustic Calibrator	59336
2	Cirrus CR:171B Type 1 Sound Level Meter	G080288
	Cirrus CR:515 Acoustic Calibrator	83349
3	Cirrus CR:831B Type 1 Sound Level Meter	C17175FF
	Cirrus CR:515 Acoustic Calibrator	59336

Table 4-1Survey Equipment

4.2 Sound Parameters

At each monitoring location the microphone was above the ground in free-field conditions, i.e. at least 3.5m from the nearest vertical, reflecting surface. The following noise level indices were recorded:

- L_{Aeq,T} The A-weighted equivalent continuous noise level over the measurement period.
- L_{A90} The A-weighted noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise.
- L_{A10} The A-weighted noise level exceeded for 10% of the measurement period. This parameter if often used to describe road traffic noise.
- L_{Amax} The maximum A-weighted noise level during the measurement period.

4.3 Monitoring Locations

The noise survey locations can be seen in Figure 4-1.



Figure 4-1 Sound Monitoring Locations



The baseline sound levels at the monitoring locations may be considered representative of the following receptors:

- Survey Location 1: Adjacent to Glandulas Holiday Park and at the location of the proposed Hotel.
- Survey Location 2: On the north side of Llanidloes Road. At this location only attended daytime
 measurements were completed. The data is not used in the assessment as the measured noise levels are
 not significantly different to those obtained at Location 3 where a longer dataset was obtained. For
 information Location 2 was meant to be at Himant to the north, but access could not be agreed prior to
 the survey.
- Survey Location 3: Site Location adjacent to Llanidloes Road.

4.4 Soundscape at the Monitoring Location and Context

The soundscape at each monitoring location was as follows:

- Location 1: bird song, local road traffic and high-altitude aircraft.
- Location 2: bird song, local road traffic, noise from nearby farming area.
- Location 3: bird song, local road traffic, breeze on nearby vegetation.

4.5 Assessment Periods

For the purpose of the assessments, the baseline sound levels have been split into the following time periods that will be assessed separately in this Report:

- For the BS4142:2014+A1:2019 assessment:
 - The time period that the Petrol Station will be at its busiest ('noisiest'): 17:00 18:00.
 - The day-time period that may be considered the most sensitive during the opening hours of the Site 22:00 23:00.
 - The time period that the only noise source at the Site would be fixed plant: 23:00 07:00.
- For the BS8233:2014 assessment:
 - The daytime period (07:00 23:00).
 - The night-Time period (23:00 07:00).

4.6 Results

4.6.1 Survey Results for the BS4142:2014: 2019 Assessment

The results to inform the BS4142:2014 assessment are presented in Tables 4-2 and 4-3. The full survey results can be seen in Appendix 04. The hours selected for assessment are as follows:

- Daytime Peak 17:00 18:00: The hour during the day when noise from the Site is expected to be highest (owing to traffic movements).
- Daytime Sensitive 22:00 23:00: The hour during the day when noise from the Site may have the greatest impact (owing to this hour being at a time when people may be going to bed).
- Night-Time 23:00 07:00: The night-time period when noise from the Site would be at its lowest, but people may be disturbed whilst sleeping.

Date	Period	L _{Aeq,T}	La90	Laio	L _{Amax}
	Daytime: 17:00 – 18:00	49.1	44.2	51.8	63.9
09/09/2021	Daytime: 22:00 – 23:00	39.6	27.4	43.6	53.8
	Night: 23:00 – 07:00	39.6	21.6	41.5	67.7
	Daytime: 17:00 – 18:00	50.1	46.2	52.3	69.2
10/09/2021	Daytime: 22:00 – 23:00	40.0	28.3	43.7	57.9
	Night: 23:00 – 07:00	40.5	24.6	42.6	60.7

Table 4-2Location 1 – BS4142:2014+A1:2019 Assessment Results

The following noise levels will be used in the BS4142:2014+A1:2019 assessment for Location 1 i.e., existing residents of Glandulas Holiday Park and the future residents at the Hotel:

- Daytime Peak (17:00 18:00) 44.2 dB, L_{A90}
- Daytime Sensitive (22:00 23:00) 27.4 dB, L_{A90}
- Night-Time (23:00 07:00) 21.6 dB, LA90

Date	Period	L _{Aeq,T}	La90	LA10	L _{Amax}
	Daytime: 17:00 – 18:00	58.0	43.4	61.8	79.7
09/09/2021	Daytime: 22:00 – 23:00	48.2	27.5	45.5	70.9
	Night: 23:00 – 07:00	48.0	23.0	42.0	75.3
	Daytime: 17:00 – 18:00	56.8	45.9	61.0	75.1
10/09/2021	Daytime: 22:00 – 23:00	48.9	28.8	47.7	71.6
	Night: 23:00 – 07:00	46.5	26.9	42.1	75.3
	Daytime: 17:00 – 18:00	55.6	41.7	59.6	84.0
11/09/2021	Daytime: 22:00 – 23:00	51.0	31.3	52.4	72.4
	Night: 23:00 – 07:00	46.5	24.5	44.1	72.9
	Daytime: 17:00 – 18:00	59.2	45.4	62.6	82.2
12/09/2021	Daytime: 22:00 – 23:00	51.1	35.9	49.3	70.0
	Night: 23:00 – 07:00	49.1	27.8	42.2	76.2
	Daytime: 17:00 – 18:00	57.9	45.7	62.4	73.8
13/09/2021	Daytime: 22:00 – 23:00	47.8	38.8	46.8	68.3
	Night: 23:00 – 07:00	50.0	37.7	47.3	74.8

Table 4-3 Location 3 - BS4142:2014+A1:2019 Assessment Results

The following noise levels are therefore appropriate for Location 3:

- Daytime Peak (17:00 18:00) 41.7 dB, L_{A90}
- Daytime Sensitive (22:00 23:00) 27.5 dB, L_{A90}
- Night-Time (23:00 07:00) 23.0 dB, L_{A90}

From a comparison with the noise levels at Location 1, the Location 3 noise levels are lower during the daytime peak, but higher for the daytime sensitive period and the night-time period. In the absence of data for the exiting receptor at Himant and the Development to the North the following noise levels will be used in the used in the BS4142:2014+A1:2019 assessment for Apple House:

- Daytime Peak (17:00 18:00) 41.7 dB, L_{A90}
- Daytime Sensitive (22:00 23:00) 27.4 dB, LA90
- Night-Time (23:00 07:00) 21.6 dB, L_{A90}

4.6.2 Uncertainty

In accordance with BS4142:2014+A1:2019 assessment the uncertainty associated with measured baseline sound levels requires discussion. Baseline sound level measurement uncertainty was minimised using the following steps:

- Measurement locations were representative of the nearest noise-sensitive receptors to the site;
- Measurements were undertaken using a suitable logging period considered to provide representative background sound levels;
- The sound measurements included an extended period;
- Measurements were rounded to the nearest one decimal place before the final calculations (see Table 4-6); and
- Instrumentation was appropriate and in accordance with Section 5 of BS4142:2014+A1:2019.

4.6.3 Survey Results for the BS8233:2014 Assessment

The results for the BS8233:2014 assessment are presented in Tables 4-4 to 4-5. The full survey results can be seen in Appendix 04.

Date	Period	L _{Aeq,T}	La90	L _{A10}	L _{Amax}
00/00/2024	Day (13:15 – 23:00)	45.7	39.1	47.3	71.8
09/09/2021	Night (23:00 – 07:00)	39.6	21.6	41.5	67.7
10/00/2021	Day (07:00 – 23:00)	48.4	41.9	49.9	83.5
10/09/2021	Night (23:00 – 07:00)	40.5	24.6	42.6	60.7
11/09/2021	Day (07:00 – 16:00)	48.9	44.0	51.4	70.8

Table 4-4 Location 1 – BS8233:2014 Assessment Results

The following noise levels will be used in the BS8233:2014 assessment for Location 1 (the Hotel location):

- Daytime 48.4 dB, LAeq, 16 hour
- Night-Time 40.5 dB, L_{Aeq,8 hour}
- Night-Time 67.7 dB, L_{Amax}

Date	Period	L _{Aeq,T}	Lago	LA10	L _{Amax}
00/00/2021	Day (13:25 – 23:00)	55.3	41.3	59.7	86.4
09/09/2021	Night (23:00 – 07:00)	48.0	23.1	42.0	75.3
10/00/2021	Day (07:00 – 23:00)	56.4	43.1	60.9	88.2
10/09/2021	Night (23:00 – 07:00)	46.5	27.0	42.1	75.3
11/00/2021	Day (07:00 – 23:00)	56.0	42.1	60.0	95.4
11/09/2021	Night (23:00 – 07:00)	46.5	24.5	44.1	72.9
12/00/2021	Day (07:00 – 23:00)	56.4	39.2	59.8	98.3
12/09/2021	Night (23:00 – 07:00)	49.1	27.8	42.3	76.2
12/00/2021	Day (07:00 – 23:00)	57.3	43.9	61.8	84.0
13/09/2021	Night (23:00 – 07:00)	50.0	37.8	47.3	74.8
14/09/2021	Day (07:00 – 12:15)	57.9	43.0	62.0	86.1

 Table 4-5

 Location 3 - BS8233:2014 Assessment Results

The following noise levels will be used in the BS8233:2014 assessment for Location 3:

- Daytime –56.4 dB, LAeq, 16 hour
- Night-Time 48.0 dB, L_{Aeq,8 hour}
- Night-Time –75.3 dB, L_{Amax}

5.0 **BS4142:2014+A1:2019 Assessment**

5.1 Noise Model Assumptions

The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA, which implements the full range of UK calculation methods. The calculation algorithms set out in ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation have been used and the model assumes:

- A ground absorption factor of 1.
- A reflection factor of 2.
- A daytime receiver height of 1.5m and a night-time receiver height of 4m.

5.2 Noise Sources

The noise sources associated with the Development are detailed in this section. At the point of completing this assessment the end user is unknown, and no detailed plans are available. Therefore fixed plant has not been included at this stage. As a Transport Assessment has been completed vehicular movements can be assessed. Table 5-1 details the vehicular noise sources associated with the proposals.

Table 5-1 Vehicle Noise Sources – dB(A)

Noise Source	Hour	Movements Events	Sound Power Level	Locatio
Car movements	17:00 – 18:00 (peak traffic hour) 22:00 – 23:00 (most noise sensitive hour day) 06:00 – 07:00 ("busiest" night-time hour)	276 ¹ 64 ² 170 ³	73.7 (A car pass-by measured by SLR)	Modelle reference exit of s Height c
Car door slam	17:00 – 18:00 (peak hour) 22:00 – 23:00 (most noise sensitive hour)	276 71 ⁴ will be as people exit cars at the filling station pumps. 71 will be as people enter cars at the filling station pumps. The remaining 134 will be at 67 of the parking spaces. 67 as people exit cars, and 67 as people enter cars. 64 ⁶ 64 will be at 32 of the parking spaces. 32 as people exit cars, and 32 as people enter cars.	88.5 (Measured by SLR)	Modelle Height o A car do Pumps: source v Parking source v and an o Modelle Height o A car do Parking source v and an o
	06:00 – 07:00 ("busiest" night-time hour)	87 ⁷ 21 will be as people exit cars at the filling station pumps. 21 will be as people enter cars at the filling station pumps. The remaining 43 (rounded up to 44) will be at 22 of the parking spaces. 22 as people exit cars, and 22as people enter cars.		Modelle Height o A car do Pumps: source o Parking source o and an o

¹ See the Transport Statement traffic flow data; 146 arrivals and 130 departures.

n

ed as a line source with movements over the ice time period, from the entrance of site to the site

of 0.5m

ed as a point source

of 0.5m

oor slam will last 1 second

Each of the 10 pumps will be attributed one point with an on-time of 20 seconds⁵

g Bays: 67 parking bays will be attributed a point with an on-time of 2 seconds to account for an exit entry

ed as a point source

of 0.5m

oor slam will last 1 second

g Bays: 32 parking bays will be attributed a point with an on-time of 2 seconds to account for an exit entry.

ed as a point source

of 0.5m

oor slam will last 1 second

Each of the 10 pumps will be attributed one-point with an on-time of 4 seconds⁸

g Bays: 22 parking bays will be attributed a point with an on-time of 2 seconds to account for an exit entry

² See the Transport Statement traffic flow data; hotel (21:00 – 22:00) 11, PH (22:00 – 23:00) 17, drive-thru (22:00 – 23:00) 36, PFS no data supplied past 19:00.

³ See the Transport Statement traffic flow data; hotel (07:00 – 08:00) 18, PH closed, drive-thru (06:00 – 07:00) 25, PFS (08:00 – 09:00) 127.

⁴ See the Transport Statement traffic flow data; Table 5.

 $[\]frac{8}{21car exits + 21car entries}/10 pumps) = 10 seconds on-time at each pump of a car door slam over the hour.$



 ⁵ (71 car exits + 71 car entries)/10 pumps) = 20 seconds on-time at each pump of car door slam over the hour.
 ⁶ See the Transport Statement traffic flow data.

⁷ No data between 06:00 and 07:00. 07:00 to 08:00 data used for DT and Hotel. One third of petrol peak hour.

6.0 **BS4142:2014+A1:2019 Assessment**

6.1 Specific Sound Level

The predicted sound levels are shown in Table 6-1 below.

Daytime sound levels have been predicted to 1.5m above ground level, which is the approximate height of a ground floor window. Night-time sound levels have been predicted to 4m above ground level, which is the approximate height of a first-floor bedroom window.

Location	Period		Predicted Sound Level, L _{Aeq,T}
	Daytime Peak	17:00 - 18:00	25.7
Glandulas Holiday Park	Daytime Sensitive	22:00 - 23:00	19.7
	Night-time	06:00 - 07:00	22.4
	Daytime Peak	17:00 - 18:00	8.5
Hirnant, Llanidloes Road	Daytime Sensitive	22:00 - 23:00	2.0
	Night-time	06:00 - 07:00	8.0
	Daytime Peak	17:00 - 18:00	14.2
Development to the north	Daytime Sensitive	22:00 - 23:00	6.8
	Night-time	06:00 - 07:00	13.8

Table 6-1 Predicted Specific Sound Levels

A graphical image of the specific sound level during each period assessed can be seen in Figures 6-1 to 6-3.





Figure 6-1 Daytime Peak 17:00 – 18:00 Specific Sound Level at a Grid Height of 1.5m – dB(A)



Figure 6-2 Daytime Sensitive 22:00 – 23:00 Specific Sound Level at a Grid Height of 1.5m – dB(A)





Figure 6-3 Night-Time 23:00 – 07:00 Specific Sound Level at a Grid Height of 4m – dB(A)

In accordance with BS4142:2014+A1:2019 when undertaking an assessment, the uncertainty associated with the predicted specific sound levels requires discussion. Specific sound level uncertainty has been minimised using the following steps:

- SLR undertook spot measurements of vehicle movements and car door slams in order to obtain reliable noise levels of vehicular noise sources.
- At this stage, the specific plant selections are currently unknown. However, it is recommended that any proposed plant should not exceed the background sound level at the nearest and most affected residential receptors. Using the lowest median background sound levels measured at positions representative of each receptor location, the plant noise limits are presented in Table 6-2 below.

Location	Period		Background Sound Level (LA90 dB)	Maximum Rating Level (dB)
	Daytime Peak	17:00 - 18:00	44	44
Glandulas Holidav Park	Daytime Sensitive	22:00 - 23:00	27	27
	Night-time	23:00 - 07:00	22	22
	Daytime Peak	17:00 - 18:00	42	42
Hirnant, Llanidloes Road	Daytime Sensitive	22:00 - 23:00	27	27
	Night-time	23:00 - 07:00	22	22
	Daytime Peak	17:00 - 18:00	42	42
Development to the north	Daytime Sensitive	22:00 - 23:00	27	27
the north	Night-time	23:00 - 07:00	22	22

Table 6-2 Plant Noise Limits

6.2 Sound Penalties

The character of each noise source, and the sound penalty that will be applied in the BS4142:2014+A1:2019 assessment are as follows:

- Tonality: It is not anticipated that any sound sources would have a tonal content. It is expected that once installed any fixed plant would have any identifiable tone designed out.
- Impulsivity: It is not anticipated that any of the noise sources would be impulsive.
- Other sound characteristics: It is not anticipated that the identified noise sources would have any sound characteristics that differ to those already existing or permitted at the site.
- Intermittentness: As noise sources at the site would be intermittent a 3dB penalty will be included in the assessment.

The following penalties will be applied to the specific sound level at each receptor:

- Glandulas Holiday Park: 3dB.
- Hirnant, Llandiloes Road: 3dB.
- Development to the north: 3dB.

6.3 Assessment

The penalties described in Section 6-2 have been added to the predicted sound levels shown in Table 6-1 to derive the rating levels at each of the nearest noise-sensitive receptors.

The results of the BS4142:2014 +A1:2019 assessment are shown in Table 6-3. In accordance with the standard, the rating levels and the representative background sound levels have been rounded to the nearest decibel.

Based on the accuracy of the prediction methodology, i.e. ISO9613-2, the uncertainty of the CadnaA model accuracy, i.e. barrier corrections for buildings, etc., it is considered that the results of the assessment are as accurate as reasonably practicable and considered to be within +/-3dB.



Receptor	Assessmen	t	Predicted Specific Sound Level, L _{Aeq,T}	Predicted Rating Level, L _{Ar,T}	Derived Background Sound Level LA90	Difference between Background Sound Level and Rating Level
	Daytime	17:00 - 18:00	26	29	52	-23
Glandulas Holiday Park	Daytime	22:00 - 23:00	20	23	44	-21
	Night-time	06:00 - 07:00	22	25	22	+3
	Daytime	17:00 - 18:00	9	12	42	-30
Hirnant, Llanidloes Road	Daytime	22:00 - 23:00	2	5	28	-19
	Night-time	06:00 - 07:00	8	11	23	-12
	Daytime	17:00 - 18:00	14	17	42	-25
Development to the north	Daytime	22:00 - 23:00	7	10	28	-18
	Night-time	06:00-07:00	14	17	23	-6

Table 6-3BS4142:2014+A1:2019 Assessment

It can be seen from Table 6-2 that:

- During the busiest daytime hour (17:00 to 18:00), the rating level of the development would be between 30dB below and 23dB below the background sound level at the Noise Sensitive Receptors assessed. In accordance with BS4142:2014+A1:2019, the proposed development would therefore typically have a low noise impact at the receptor locations during this period.
- During the most sensitive daytime hour (22:00 to 23:00), the rating level of the development would be between 21dB below and 18dB below the background sound level at the Noise Sensitive Receptors assessed. In accordance with BS4142:2014+A1:2019, the proposed development would therefore typically have a low noise impact at the receptor locations during this period.
- During the night-time hour between 06:00 and 07:00, the rating level of the development would be between 12dB below and 3dB above the background sound level at the Noise Sensitive Receptors assessed. In accordance with BS4142:2014+A1:2019, Hirnant, Llaindoes Road and the development to the North would typically have a low noise impact. At Glandulas Holiday Park the impact is still expected to be low, but it is recommended that an acoustic fence is positioned at the boundary of the Site with the Holiday Park to reduce any perceived impact.

7.0 **BS8233:2014 Assessment**

To determine the daytime and the night-time ambient noise environment for the proposed hotel, SLR has developed a noise model of the road network (considered the dominant noise source) in the area using the noise modelling software package CadnaA.

The noise survey results collected at each location have been used to calibrate the road noise model which contains the existing site contours. The model has been adjusted to ensure that the predicted noise level at each location matches the surveyed daytime and night-time noise levels measured.

The model has then been updated to include the future traffic noise sources associated with the proposed development. These noise sources are included in Table 5-1.

7.1 Daytime Noise Environment in External Amenity Areas

The impact of daytime environmental noise for the hotel has been determined in accordance with BS8233:2014. With reference to Section 3-3, Figure 7-1 illustrates the external amenity areas of the Site where noise levels are:

- Below the BS8233:2014 lower limit of 50.0dB(A) (shown dark green);
- Between 50.0dB(A) and the BS8233:2014 upper limit of 55.0dB(A) (shown light green); and
- Over the BS8233:2014 upper limit of 55.0 dB(A) (shown yellow and orange).





It can be seen from Figure 5-1 that:

• The external amenity around the hotel is predicted to experience a daytime L_{Aeq,16hr} hour noise level of 55dB(A) or less, with those areas shown light green predicted to experience noise levels of less than 55dB(A), and those in the dark green area predicted to experience noise levels of less than 50dB(A). It is not expected that mitigation of noise levels during the daytime in this area would be required.

7.2 Internal Noise Environment

7.2.1 Glazing Specification

Noise levels incident upon the façade will require mitigation to meet the internal noise limits stipulated in BS8233:2014.

Windows do not reduce noise equally across the entire frequency spectrum, so the frequency content of the sound will influence the overall sound reduction performance of a given window and by extension, the resulting noise levels within the receiving room.

However, many glazing manufacturers test their products under laboratory conditions using a typical road traffic noise frequency spectrum source. The resultant measured noise attenuation, in dB, gives a very useful guide to in-situ sound reduction performance of the window for situations where road traffic noise dominates. This performance index is known as the $R_W + C_{tr}$, and the sound reduction requirement set out above should be considered as an $R_W + C_{tr}$ noise level.

From an analysis of the data, it has been determined that the highest glazing specification is needed to meet the night-time maximum noise limit of 45dB(A).

The glazing specification required at each floor, for habitable rooms, is shown in Appendix 04.

In each Figure in Appendix 04 the decibel reduction required by the glazing at each façade can be seen by the numbering.

At this stage the height of the hotel has not been determined but four floors has been assumed.

7.2.2 Ventilation Specification

For the purpose of selecting the appropriate ventilator the reader should refer to the $D_{n,e,w}$ (C_{tr} value).

As referenced in ISO 717-1:1996 Acoustics – Rating of sound insulation in buildings and of building elements the $D_{n,e,w}$ is a single number quantity of airborne sound insulation and is a weighted element-normalized level difference that includes a correction for low frequency noise such as noise from road traffic. The number is standardised to a reference area of $10m^2$ and therefore gives a value higher than the actual insertion loss. Consequently, it is standard practice, when selecting an appropriate ventilator, to select a ventilator that has a $D_{n,e,w}$ (C_{tr} value) up to 6dB(A) higher than the required R_W +C_{tr} dB value.

At this stage it is not appropriate to advise on suitable ventilators as the ventilation strategy for the Site has not been developed. The strategy adopted however must have a $D_{n,e,w}$ (C_{tr} value) 6dB(A) higher than the required $R_w + C_{tr}$ dB value, so as not to lead to noise limits being exceeded.

8.0 **Conclusion**

Melrose Bros Ltd. has appointed SLR Consulting Limited (SLR) to undertake a noise assessment for the development of a Site at Newtown.

Development proposals include the following:

- A Petrol Filling Station.
- A Public House.
- A Hotel.
- A Coffee Drive Thru.

To assess the noise impact of the proposals this Report has included:

- A baseline noise survey to inform the assessments.
- An assessment to determine the impact of commercial noise from the proposed development upon both existing and proposed residential receptors. This assessment has been completed with reference to BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.
- An assessment to determine the suitability of the site for hotel development. This assessment has been completed with reference to BS8233:2014 *Guidance on Sound Insulation and Noise Reduction for Buildings.*

To assess the noise impact of the proposals this Report has included:

- An assessment to determine the impact of commercial noise from the proposed development upon both existing and proposed residential receptors. This assessment has been completed with reference to BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. The assessment has found:
 - During the busiest daytime hour (17:00 to 18:00), the rating level of the development would be between 30dB below and 23dB below the background sound level at the Noise Sensitive Receptors assessed. In accordance with BS4142:2014+A1:2019, the proposed development would therefore typically have a low noise impact at the receptor locations during this period.
 - During the most sensitive daytime hour (22:00 to 23:00), the rating level of the development would be between 21dB below and 18dB below the background sound level at the Noise Sensitive Receptors assessed. In accordance with BS4142:2014+A1:2019, the proposed development would therefore typically have a low noise impact at the receptor locations during this period.
 - During the night-time hour between 06:00 and 07:00, the rating level of the development would be between 12dB below and 3dB above the background sound level at the Noise Sensitive Receptors assessed. In accordance with BS4142:2014+A1:2019, Hirnant, Llaindoes Road and the development to the North would typically have a low noise impact. At Glandulas Holiday Park the impact is still expected to be low, but it is recommended that an acoustic fence is positioned at the boundary of the Site with the Holiday Park to reduce any perceived impact.
- An assessment to determine the suitability of the site for residential development. This assessment has been completed with reference to BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings. The assessment has found:



- The hotel is predicted to experience a daytime L_{Aeq,16 hour} noise level of 55dB(A) or less, with those areas shown light green predicted to experience noise levels of less than 55dB(A), and those in the dark green area predicted to experience noise levels of less than 50dB(A). It is not expected that mitigation of noise levels during the daytime in this area would be required.
- Glazing specifications have been recommended to achieve BS8233:2014 noise limits within habitable rooms.
- The ventilation strategy adopted however must have a $D_{n,e,w}$ (C_{tr} value) 6dB(A) higher than the required $R_w + C_{tr}$ dB value, so as not to lead to noise limits being exceeded.



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APPENDIX 01

Glossary of Terminology



In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table 01-1Sound Levels Commonly Found in the Environment

Sound Level	Location
OdB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10 ⁻⁵ Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L _{Aeq}	L _{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L ₁₀ & L ₉₀	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.
L _{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

APPENDIX 02

Site Location







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APPENDIX 03 Survey Data

Figure 03-01 Monitoring Location 1

Date & Time	L _{Aeq}	La90	La10	LAFmax
09/09/2021 13:15	41.9	36.4	44.7	52.3
09/09/2021 13:30	42.6	37.3	44.9	58.9
09/09/2021 13:45	43.4	36.8	46.8	55.3
09/09/2021 14:00	49.0	39.2	49.5	71.0
09/09/2021 14:15	45.4	41.1	47.9	58.5
09/09/2021 14:30	44.1	39.1	46.0	59.6
09/09/2021 14:45	44.6	39.9	47.2	54.8
09/09/2021 15:00	44.0	39.8	46.0	57.9
09/09/2021 15:15	41.0	36.5	43.5	54.6
09/09/2021 15:30	42.4	39.0	44.7	52.8
09/09/2021 15:45	44.5	39.8	47.0	56.8
09/09/2021 16:00	42.1	37.1	45.1	52.5
09/09/2021 16:15	43.6	39.6	45.4	62.3
09/09/2021 16:30	46.2	39.9	47.8	71.8
09/09/2021 16:45	47.2	41.3	50.3	60.1
09/09/2021 17:00	47.8	43.9	50.2	55.4
09/09/2021 17:15	49.2	44.2	51.9	62.0
09/09/2021 17:30	49.6	44.2	51.9	63.9
09/09/2021 17:45	49.7	45.2	51.6	63.6
09/09/2021 18:00	47.6	43.7	50.0	57.6
09/09/2021 18:15	47.8	42.1	50.6	59.2
09/09/2021 18:30	46.7	39.9	49.6	60.0
09/09/2021 18:45	46.9	41.4	50.2	57.1
09/09/2021 19:00	47.4	41.4	49.8	59.3
09/09/2021 19:15	46.7	40.4	49.3	62.8
09/09/2021 19:30	46.6	39.1	49.6	59.1
09/09/2021 19:45	45.8	38.1	48.5	60.6
09/09/2021 20:00	47.0	38.9	49.9	60.6
09/09/2021 20:15	47.8	38.3	47.5	70.7
09/09/2021 20:30	44.3	37.6	47.3	59.3
09/09/2021 20:45	44.3	36.4	47.3	57.2
09/09/2021 21:00	45.0	38.7	48.0	63.8
09/09/2021 21:15	44.1	37.3	47.0	55.3
09/09/2021 21:30	41.1	32.5	44.6	52.3
09/09/2021 21:45	41.7	33.0	45.0	55.0
09/09/2021 22:00	41.0	30.2	44.8	53.8
09/09/2021 22:15	39.8	30.0	43.9	51.9



Date & Time	L _{Aeq}	Lago	LA10	LAFmax
09/09/2021 22:30	39.7	24.3	43.3	53.6
09/09/2021 22:45	37.3	24.7	41.6	53.0
09/09/2021 23:00	39.2	24.7	42.9	54.3
09/09/2021 23:15	36.7	23.7	40.5	54.1
09/09/2021 23:30	41.9	23.2	45.5	57.1
09/09/2021 23:45	35.0	22.7	39.1	50.5
10/09/2021 00:00	37.3	21.3	42.3	53.0
10/09/2021 00:15	31.4	20.0	34.5	47.6
10/09/2021 00:30	32.6	20.0	36.4	49.7
10/09/2021 00:45	34.0	20.0	37.8	51.6
10/09/2021 01:00	35.0	20.2	37.1	54.9
10/09/2021 01:15	40.3	20.7	42.9	58.3
10/09/2021 01:30	35.1	20.0	37.0	53.7
10/09/2021 01:45	36.2	20.0	40.7	55.2
10/09/2021 02:00	37.8	20.0	41.4	55.2
10/09/2021 02:15	35.9	20.0	36.9	66.1
10/09/2021 02:30	37.1	20.1	41.1	53.1
10/09/2021 02:45	39.3	20.3	41.9	58.3
10/09/2021 03:00	38.5	21.6	42.0	53.3
10/09/2021 03:15	34.0	21.6	37.7	51.9
10/09/2021 03:30	36.7	21.4	40.0	53.1
10/09/2021 03:45	36.2	20.3	40.0	51.5
10/09/2021 04:00	37.1	20.8	41.5	52.0
10/09/2021 04:15	34.5	21.7	39.4	50.4
10/09/2021 04:30	39.3	26.3	40.9	54.7
10/09/2021 04:45	38.7	27.0	42.5	54.0
10/09/2021 05:00	37.4	23.0	42.2	51.1
10/09/2021 05:15	41.9	30.2	45.6	54.2
10/09/2021 05:30	40.9	30.0	44.3	55.2
10/09/2021 05:45	42.2	33.5	45.6	57.2
10/09/2021 06:00	43.9	30.3	47.5	66.5
10/09/2021 06:15	41.0	32.6	44.4	55.8
10/09/2021 06:30	44.5	37.0	47.2	59.8
10/09/2021 06:45	46.7	39.7	49.8	67.7
10/09/2021 07:00	47.6	41.4	50.7	57.4
10/09/2021 07:15	46.4	41.8	48.8	59.8
10/09/2021 07:30	47.2	41.2	49.2	62.9
10/09/2021 07:45	46.4	41.3	48.7	59.4
10/09/2021 08:00	47.2	42.5	49.8	55.4

Date & Time	LAeq	LA90	LA10	LAFmax
10/09/2021 08:15	48.2	41.5	50.5	64.7
10/09/2021 08:30	46.8	40.8	49.8	63.5
10/09/2021 08:45	49.6	39.9	48.6	74.0
10/09/2021 09:00	45.4	40.2	48.2	55.5
10/09/2021 09:15	46.0	40.9	48.8	57.7
10/09/2021 09:30	45.4	40.0	47.8	56.1
10/09/2021 09:45	44.5	39.9	46.5	61.1
10/09/2021 10:00	45.5	40.5	46.9	62.4
10/09/2021 10:15	45.0	40.2	47.5	57.9
10/09/2021 10:30	48.9	41.6	49.9	68.9
10/09/2021 10:45	46.9	42.3	49.1	55.6
10/09/2021 11:00	46.4	42.2	48.7	55.2
10/09/2021 11:15	46.4	40.9	49.4	56.8
10/09/2021 11:30	47.0	41.5	49.9	61.9
10/09/2021 11:45	47.5	41.9	50.1	62.8
10/09/2021 12:00	48.1	44.0	50.5	61.1
10/09/2021 12:15	49.2	45.7	51.7	59.5
10/09/2021 12:30	49.0	45.6	51.3	55.9
10/09/2021 12:45	48.3	43.8	50.8	58.3
10/09/2021 13:00	50.4	44.7	52.3	69.7
10/09/2021 13:15	49.9	46.0	52.0	61.9
10/09/2021 13:30	48.8	44.4	51.4	56.7
10/09/2021 13:45	58.3	45.9	52.6	83.5
10/09/2021 14:00	49.6	45.7	51.4	65.9
10/09/2021 14:15	49.2	44.2	52.0	57.3
10/09/2021 14:30	49.9	45.9	52.0	63.3
10/09/2021 14:45	48.9	44.9	51.2	61.7
10/09/2021 15:00	48.7	44.4	51.1	59.6
10/09/2021 15:15	51.3	44.4	52.0	71.4
10/09/2021 15:30	49.8	45.3	52.0	60.0
10/09/2021 15:45	49.2	45.2	51.6	61.7
10/09/2021 16:00	50.6	46.7	52.3	67.2
10/09/2021 16:15	49.7	45.9	51.9	62.2
10/09/2021 16:30	50.4	46.1	52.4	64.8
10/09/2021 16:45	50.2	45.7	52.7	61.5
10/09/2021 17:00	50.6	46.4	52.5	69.2
10/09/2021 17:15	49.7	46.7	51.7	56.8
10/09/2021 17:30	50.0	45.9	52.5	58.8
10/09/2021 17:45	49.9	45.9	52.1	61.1

Date & Time	LAeq	Lago	LA10	LAFmax
10/09/2021 18:00	49.2	44.5	51.4	65.7
10/09/2021 18:15	49.3	44.1	52.1	60.5
10/09/2021 18:30	48.8	43.9	51.6	58.8
10/09/2021 18:45	48.3	44.1	50.6	60.4
10/09/2021 19:00	45.9	40.6	48.5	58.2
10/09/2021 19:15	44.9	40.5	47.4	60.0
10/09/2021 19:30	43.1	36.4	45.8	58.1
10/09/2021 19:45	45.2	38.7	47.8	55.8
10/09/2021 20:00	45.0	38.9	47.8	62.0
10/09/2021 20:15	44.4	39.2	47.1	53.7
10/09/2021 20:30	43.5	37.8	46.4	53.2
10/09/2021 20:45	41.8	35.3	44.4	56.7
10/09/2021 21:00	41.5	33.6	45.1	54.5
10/09/2021 21:15	43.3	36.5	46.6	52.0
10/09/2021 21:30	44.5	35.7	47.8	60.8
10/09/2021 21:45	42.6	34.2	46.4	54.2
10/09/2021 22:00	39.3	28.1	42.7	51.7
10/09/2021 22:15	40.5	31.2	44.3	51.8
10/09/2021 22:30	40.5	26.3	43.8	57.9
10/09/2021 22:45	39.6	28.4	43.5	52.1
10/09/2021 23:00	38.3	22.3	42.6	52.9
10/09/2021 23:15	38.5	25.9	42.2	50.4
10/09/2021 23:30	37.5	24.2	42.0	51.1
10/09/2021 23:45	37.3	23.2	41.8	51.2
11/09/2021 00:00	36.7	24.7	40.1	55.0
11/09/2021 00:15	38.7	26.1	41.2	55.2
11/09/2021 00:30	40.2	25.9	44.2	54.5
11/09/2021 00:45	34.0	23.0	36.7	60.5
11/09/2021 01:00	36.2	22.8	39.9	50.9
11/09/2021 01:15	38.8	24.5	41.9	54.9
11/09/2021 01:30	39.6	26.7	43.3	54.4
11/09/2021 01:45	41.8	24.6	45.4	59.1
11/09/2021 02:00	34.6	24.4	38.0	52.2
11/09/2021 02:15	42.5	26.0	46.6	59.7
11/09/2021 02:30	35.3	26.1	39.1	54.0
11/09/2021 02:45	38.9	26.7	42.1	58.0
11/09/2021 03:00	36.5	25.4	40.9	53.8
11/09/2021 03:15	38.4	24.5	41.6	56.6
11/09/2021 03:30	41.2	23.1	45.0	57.9

Date & Time	LAeq	LA90	LA10	LAFmax
11/09/2021 03:45	39.1	22.0	42.6	55.7
11/09/2021 04:00	37.4	21.7	41.3	56.1
11/09/2021 04:15	40.1	22.1	43.6	57.7
11/09/2021 04:30	38.5	22.6	42.8	53.9
11/09/2021 04:45	35.4	23.4	38.6	52.8
11/09/2021 05:00	40.3	24.1	44.5	58.1
11/09/2021 05:15	43.6	28.8	47.2	58.0
11/09/2021 05:30	43.0	28.2	47.0	59.2
11/09/2021 05:45	40.8	22.4	44.9	53.3
11/09/2021 06:00	43.4	28.0	47.6	56.9
11/09/2021 06:15	44.3	32.9	48.0	60.0
11/09/2021 06:30	45.1	36.7	47.8	60.0
11/09/2021 06:45	45.7	35.0	48.7	60.7
11/09/2021 07:00	44.9	37.4	48.0	57.2
11/09/2021 07:15	46.6	40.3	49.6	59.3
11/09/2021 07:30	47.1	40.2	50.5	58.5
11/09/2021 07:45	48.8	41.2	51.7	60.0
11/09/2021 08:00	48.1	42.5	51.1	63.3
11/09/2021 08:15	48.9	43.8	51.6	59.8
11/09/2021 08:30	48.8	43.5	51.5	58.4
11/09/2021 08:45	47.5	42.2	50.4	55.6
11/09/2021 09:00	49.3	43.8	51.4	69.4
11/09/2021 09:15	46.5	42.1	48.6	56.9
11/09/2021 09:30	48.6	43.1	51.4	61.0
11/09/2021 09:45	50.6	43.3	52.4	70.8
11/09/2021 10:00	48.8	44.7	51.0	60.8
11/09/2021 10:15	50.6	46.3	52.9	62.9
11/09/2021 10:30	49.3	44.6	51.8	63.6
11/09/2021 10:45	50.1	45.4	52.6	68.9
11/09/2021 11:00	50.1	45.5	52.7	61.4
11/09/2021 11:15	50.9	45.3	52.8	69.5
11/09/2021 11:30	50.0	44.9	51.9	68.1
11/09/2021 11:45	49.0	44.5	51.6	59.6
11/09/2021 12:00	49.7	45.1	52.4	63.2
11/09/2021 12:15	49.4	44.7	52.3	60.8
11/09/2021 12:30	49.3	45.8	51.5	58.0
11/09/2021 12:45	49.5	45.1	51.6	62.3
11/09/2021 13:00	49.0	44.3	51.5	63.1
11/09/2021 13:15	48.4	44.0	50.9	56.5

Date & Time	LAeq	Lago	LA10	LAFmax
11/09/2021 13:30	47.9	43.8	50.3	59.2
11/09/2021 13:45	47.5	43.2	49.1	63.7
11/09/2021 14:00	49.1	44.2	51.8	58.5
11/09/2021 14:15	49.2	44.0	51.4	64.1
11/09/2021 14:30	49.1	44.5	51.4	63.3
11/09/2021 14:45	48.0	44.4	50.4	55.5
11/09/2021 15:00	49.0	44.3	51.6	59.1
11/09/2021 15:15	48.1	43.5	50.3	60.5
11/09/2021 15:30	47.1	43.3	49.3	54.4
11/09/2021 15:45	49.0	43.8	51.3	68.0
11/09/2021 16:00	47.8	42.2	50.4	58.3

Figure 03-02 Monitoring Location 2

Date & Time	LAeq	La90	LA10	LAFmax
09/09/2021 13:45	52.0	44.4	55.9	65.5
09/09/2021 14:00	56.3	46.2	55.2	78.2
09/09/2021 14:15	51.8	46.6	54.7	60.5
09/09/2021 14:30	52.5	45.9	55.5	65.7
09/09/2021 14:45	54.9	52.4	56.5	58.6

Figure 03-03 Monitoring Location 3

Date & Time	LAeq	L _{A90}	L _{A10}	LAFmax
09/09/2021 13:30	55.4	39.7	59.6	76.7
09/09/2021 13:45	54.1	39.6	59.0	66.3
09/09/2021 14:00	60.5	41.7	61.2	86.4
09/09/2021 14:15	55.7	43.2	60.3	66.3
09/09/2021 14:30	55.7	42.7	60.2	69.2
09/09/2021 14:45	56.8	42.7	61.4	72.3
09/09/2021 15:00	55.8	44.8	60.3	70.4
09/09/2021 15:15	53.5	40.3	58.4	66.9
09/09/2021 15:30	55.0	42.4	59.9	69.9
09/09/2021 15:45	55.5	43.4	59.8	68.6
09/09/2021 16:00	56.2	40.8	60.2	72.5
09/09/2021 16:15	55.6	42.9	60.0	78.5
09/09/2021 16:30	56.8	43.8	60.4	78.0
09/09/2021 16:45	56.2	44.3	60.8	68.3

Date & Time	LAeq	Lago	LA10	LAFmax
09/09/2021 17:00	57.3	43.3	61.5	74.0
09/09/2021 17:15	57.7	43.4	62.2	72.2
09/09/2021 17:30	57.8	42.9	61.8	77.7
09/09/2021 17:45	59.1	45.6	61.8	79.7
09/09/2021 18:00	56.2	43.6	61.2	71.7
09/09/2021 18:15	55.5	42.5	60.2	74.6
09/09/2021 18:30	55.8	39.0	60.6	74.5
09/09/2021 18:45	54.8	43.1	59.3	68.9
09/09/2021 19:00	55.2	43.9	59.9	71.9
09/09/2021 19:15	53.9	44.3	57.1	68.5
09/09/2021 19:30	56.3	37.3	59.0	79.3
09/09/2021 19:45	52.6	37.2	55.1	72.2
09/09/2021 20:00	54.9	38.7	59.2	71.4
09/09/2021 20:15	51.9	37.0	54.8	68.4
09/09/2021 20:30	53.0	36.5	56.4	74.9
09/09/2021 20:45	52.6	35.7	55.4	70.5
09/09/2021 21:00	53.3	37.5	56.6	69.9
09/09/2021 21:15	51.5	35.6	54.6	67.0
09/09/2021 21:30	51.3	31.9	54.9	71.1
09/09/2021 21:45	51.2	33.2	49.6	72.8
09/09/2021 22:00	50.7	31.7	49.8	70.9
09/09/2021 22:15	47.5	28.9	44.5	66.2
09/09/2021 22:30	47.1	26.0	46.5	66.8
09/09/2021 22:45	46.2	26.0	41.3	67.8
09/09/2021 23:00	45.4	25.8	43.7	64.6
09/09/2021 23:15	42.8	24.1	38.8	68.7
09/09/2021 23:30	50.4	24.7	47.8	72.2
09/09/2021 23:45	40.7	24.6	39.7	66.8
10/09/2021 00:00	42.1	23.5	41.7	67.4
10/09/2021 00:15	41.7	22.3	36.5	67.9
10/09/2021 00:30	38.2	21.7	37.6	65.3
10/09/2021 00:45	41.9	22.0	38.2	66.0
10/09/2021 01:00	40.9	22.6	37.3	68.9
10/09/2021 01:15	43.7	22.7	43.5	67.2
10/09/2021 01:30	34.4	21.9	37.8	49.3
10/09/2021 01:45	43.4	21.7	40.9	67.9
10/09/2021 02:00	47.3	22.2	42.4	70.5
10/09/2021 02:15	37.7	21.7	41.0	66.6
10/09/2021 02:30	44.5	22.6	42.6	69.4

Date & Time	LAeq	Lago	LA10	LAFmax
10/09/2021 02:45	49.8	22.1	41.1	71.5
10/09/2021 03:00	40.0	22.8	40.8	62.4
10/09/2021 03:15	41.7	23.0	37.7	65.9
10/09/2021 03:30	38.5	22.9	41.5	61.6
10/09/2021 03:45	46.5	22.6	41.7	73.3
10/09/2021 04:00	43.0	22.6	42.2	68.3
10/09/2021 04:15	40.8	23.1	40.7	64.4
10/09/2021 04:30	40.7	26.8	42.8	60.1
10/09/2021 04:45	43.5	29.8	45.1	64.6
10/09/2021 05:00	44.2	26.1	43.8	63.5
10/09/2021 05:15	50.3	32.0	51.4	68.7
10/09/2021 05:30	51.7	32.0	50.7	75.3
10/09/2021 05:45	52.3	36.7	53.6	70.0
10/09/2021 06:00	54.6	33.9	56.5	73.8
10/09/2021 06:15	49.6	34.9	50.4	67.2
10/09/2021 06:30	54.7	38.9	55.9	74.7
10/09/2021 06:45	54.2	39.6	57.5	70.2
10/09/2021 07:00	55.7	40.7	59.8	72.0
10/09/2021 07:15	56.0	41.4	60.8	74.4
10/09/2021 07:30	57.9	41.2	61.4	80.4
10/09/2021 07:45	57.6	41.9	62.0	71.9
10/09/2021 08:00	56.9	42.1	62.0	70.8
10/09/2021 08:15	58.6	41.9	63.1	78.4
10/09/2021 08:30	58.0	41.3	62.7	72.8
10/09/2021 08:45	58.1	41.3	62.0	77.1
10/09/2021 09:00	57.0	43.3	61.7	71.3
10/09/2021 09:15	56.0	43.3	60.6	69.0
10/09/2021 09:30	57.3	42.8	61.4	76.1
10/09/2021 09:45	55.7	42.5	60.5	69.9
10/09/2021 10:00	59.0	43.3	61.0	83.6
10/09/2021 10:15	57.0	43.0	60.3	76.3
10/09/2021 10:30	58.5	43.5	62.0	76.2
10/09/2021 10:45	56.8	41.9	61.6	70.4
10/09/2021 11:00	56.7	43.2	60.8	74.1
10/09/2021 11:15	57.3	42.2	61.1	75.9
10/09/2021 11:30	54.9	42.6	59.4	74.3
10/09/2021 11:45	56.7	42.4	61.4	72.7
10/09/2021 12:00	56.0	43.9	61.1	68.9
10/09/2021 12:15	57.2	46.2	61.6	68.9

Date & Time	LAeq	Lago	LA10	LAFmax
10/09/2021 12:30	56.7	45.5	61.3	71.9
10/09/2021 12:45	55.8	43.5	60.5	69.7
10/09/2021 13:00	57.8	44.0	62.0	74.5
10/09/2021 13:15	57.4	45.8	61.8	73.2
10/09/2021 13:30	56.7	44.4	61.0	75.0
10/09/2021 13:45	60.6	44.9	62.4	84.3
10/09/2021 14:00	57.0	44.8	61.4	69.2
10/09/2021 14:15	56.2	44.7	60.2	72.2
10/09/2021 14:30	56.5	46.1	60.6	69.7
10/09/2021 14:45	57.3	44.6	61.3	73.4
10/09/2021 15:00	56.4	43.9	61.0	70.7
10/09/2021 15:15	61.0	44.6	61.7	88.2
10/09/2021 15:30	58.6	44.9	61.9	77.7
10/09/2021 15:45	58.0	45.0	61.6	76.4
10/09/2021 16:00	57.9	45.8	62.1	73.4
10/09/2021 16:15	57.2	45.3	61.6	70.7
10/09/2021 16:30	57.4	45.7	61.5	73.9
10/09/2021 16:45	56.7	44.8	61.3	69.5
10/09/2021 17:00	57.9	46.3	61.6	75.1
10/09/2021 17:15	56.3	46.3	60.8	70.0
10/09/2021 17:30	56.7	45.4	61.1	73.1
10/09/2021 17:45	55.9	45.5	60.5	69.9
10/09/2021 18:00	55.7	44.2	60.4	70.1
10/09/2021 18:15	55.8	44.1	60.5	69.8
10/09/2021 18:30	54.9	44.3	60.1	68.1
10/09/2021 18:45	54.8	42.5	59.9	69.3
10/09/2021 19:00	55.1	40.2	60.5	67.8
10/09/2021 19:15	54.3	40.1	59.6	68.7
10/09/2021 19:30	52.3	36.2	57.0	72.7
10/09/2021 19:45	53.8	38.2	58.9	70.7
10/09/2021 20:00	52.2	38.8	56.1	67.6
10/09/2021 20:15	52.0	39.1	56.9	66.7
10/09/2021 20:30	51.2	38.3	52.9	69.5
10/09/2021 20:45	49.5	35.8	51.3	66.1
10/09/2021 21:00	51.8	33.8	54.1	70.8
10/09/2021 21:15	54.0	37.3	58.5	74.9
10/09/2021 21:30	53.3	35.3	57.6	71.6
10/09/2021 21:45	51.7	33.8	54.3	67.7
10/09/2021 22:00	47.1	29.3	44.7	69.5

Date & Time	LAeq	LA90	LA10	LAFmax
10/09/2021 22:15	50.5	31.6	50.3	71.5
10/09/2021 22:30	48.1	26.8	48.1	67.1
10/09/2021 22:45	49.3	28.2	47.3	71.6
10/09/2021 23:00	46.2	24.6	43.4	69.2
10/09/2021 23:15	47.5	26.9	44.7	68.9
10/09/2021 23:30	44.3	26.2	41.1	66.9
10/09/2021 23:45	42.1	25.9	41.2	66.4
11/09/2021 00:00	36.7	26.7	39.3	58.5
11/09/2021 00:15	43.2	28.0	41.7	67.8
11/09/2021 00:30	47.2	27.8	43.9	71.4
11/09/2021 00:45	40.8	25.2	36.4	67.4
11/09/2021 01:00	42.3	24.7	40.2	67.8
11/09/2021 01:15	43.9	26.8	41.9	70.9
11/09/2021 01:30	47.3	28.6	48.3	68.8
11/09/2021 01:45	50.6	27.0	46.2	73.5
11/09/2021 02:00	41.6	27.0	38.2	66.0
11/09/2021 02:15	49.9	29.0	46.5	71.8
11/09/2021 02:30	44.2	29.6	40.1	67.8
11/09/2021 02:45	49.1	29.8	42.2	75.3
11/09/2021 03:00	42.6	27.9	41.3	65.6
11/09/2021 03:15	42.7	27.2	41.9	66.2
11/09/2021 03:30	48.5	25.6	43.1	72.9
11/09/2021 03:45	43.1	23.1	39.9	70.1
11/09/2021 04:00	39.5	24.0	40.2	63.7
11/09/2021 04:15	43.7	24.0	43.7	66.9
11/09/2021 04:30	43.2	24.0	40.8	67.2
11/09/2021 04:45	41.5	24.9	36.8	66.8
11/09/2021 05:00	37.8	25.9	42.0	53.7
11/09/2021 05:15	44.6	30.5	46.3	68.0
11/09/2021 05:30	49.9	30.1	47.7	72.8
11/09/2021 05:45	47.4	25.0	47.0	66.4
11/09/2021 06:00	48.2	29.6	47.0	67.9
11/09/2021 06:15	49.4	33.7	48.1	70.8
11/09/2021 06:30	51.0	36.3	51.8	68.5
11/09/2021 06:45	50.6	35.7	50.6	68.2
11/09/2021 07:00	50.6	36.8	51.1	67.9
11/09/2021 07:15	54.3	39.0	56.1	72.5
11/09/2021 07:30	53.8	39.9	56.9	70.2
11/09/2021 07:45	55.8	40.4	59.5	73.9

Date & Time	LAeq	LA90	LA10	LAFmax
11/09/2021 08:00	53.4	42.0	57.2	70.8
11/09/2021 08:15	56.2	43.2	61.2	69.3
11/09/2021 08:30	55.3	41.7	60.4	69.3
11/09/2021 08:45	54.9	41.4	60.1	68.5
11/09/2021 09:00	55.3	42.7	60.4	72.4
11/09/2021 09:15	54.5	40.8	59.7	68.7
11/09/2021 09:30	56.6	42.8	60.9	74.7
11/09/2021 09:45	58.3	43.2	61.9	76.5
11/09/2021 10:00	56.3	44.3	61.0	69.9
11/09/2021 10:15	57.3	46.2	61.5	75.3
11/09/2021 10:30	56.2	44.6	60.8	75.7
11/09/2021 10:45	58.5	45.0	61.4	82.6
11/09/2021 11:00	56.6	45.0	61.5	70.6
11/09/2021 11:15	60.1	44.4	61.4	86.5
11/09/2021 11:30	56.3	44.9	60.9	69.1
11/09/2021 11:45	56.8	44.3	61.3	72.7
11/09/2021 12:00	57.5	45.4	61.6	76.6
11/09/2021 12:15	57.1	44.7	60.9	75.2
11/09/2021 12:30	55.6	45.5	60.2	68.7
11/09/2021 12:45	56.1	45.0	60.8	68.7
11/09/2021 13:00	55.3	43.9	60.0	74.8
11/09/2021 13:15	56.1	44.0	60.4	72.6
11/09/2021 13:30	55.9	44.1	60.7	68.0
11/09/2021 13:45	55.0	42.5	60.3	71.6
11/09/2021 14:00	56.6	43.5	60.5	74.4
11/09/2021 14:15	55.2	43.7	60.0	68.8
11/09/2021 14:30	55.3	43.7	60.2	68.8
11/09/2021 14:45	55.1	43.8	59.9	67.6
11/09/2021 15:00	56.1	43.8	60.6	70.9
11/09/2021 15:15	54.8	43.1	59.5	67.9
11/09/2021 15:30	54.0	42.6	58.9	67.5
11/09/2021 15:45	60.0	43.9	60.0	87.7
11/09/2021 16:00	55.2	42.1	60.1	72.0
11/09/2021 16:15	55.9	42.0	58.4	81.8
11/09/2021 16:30	65.9	41.4	60.0	95.4
11/09/2021 16:45	53.8	42.2	58.9	69.4
11/09/2021 17:00	55.4	42.7	60.2	73.3
11/09/2021 17:15	53.9	40.7	59.0	69.3
11/09/2021 17:30	57.0	41.2	58.4	84.0

Date & Time	LAeq	LA90	LA10	LAFmax
11/09/2021 17:45	55.7	42.1	60.9	69.3
11/09/2021 18:00	54.2	42.7	59.3	67.3
11/09/2021 18:15	54.1	39.5	59.3	68.3
11/09/2021 18:30	54.5	41.7	59.6	70.9
11/09/2021 18:45	55.4	40.4	60.6	69.9
11/09/2021 19:00	53.0	41.4	57.9	67.0
11/09/2021 19:15	54.6	38.6	58.9	74.0
11/09/2021 19:30	53.0	39.4	57.5	70.1
11/09/2021 19:45	52.7	38.3	57.1	71.4
11/09/2021 20:00	52.4	37.1	57.3	66.5
11/09/2021 20:15	52.5	38.6	57.4	66.7
11/09/2021 20:30	51.9	38.2	55.9	68.6
11/09/2021 20:45	52.1	37.6	56.5	68.1
11/09/2021 21:00	52.2	33.6	54.7	77.9
11/09/2021 21:15	50.6	34.4	51.0	71.5
11/09/2021 21:30	49.5	29.7	49.2	68.5
11/09/2021 21:45	49.5	32.5	50.5	67.4
11/09/2021 22:00	51.2	29.0	53.2	68.6
11/09/2021 22:15	51.0	32.5	52.6	71.9
11/09/2021 22:30	51.8	32.5	52.2	72.4
11/09/2021 22:45	49.9	30.1	52.0	70.4
11/09/2021 23:00	47.7	25.2	46.5	66.8
11/09/2021 23:15	48.9	24.6	44.5	72.9
11/09/2021 23:30	47.5	26.2	44.6	69.3
11/09/2021 23:45	47.1	24.8	47.0	67.2
12/09/2021 00:00	47.3	26.5	48.0	65.3
12/09/2021 00:15	47.4	27.8	42.8	71.5
12/09/2021 00:30	48.1	29.9	47.4	68.8
12/09/2021 00:45	45.8	26.9	44.3	66.1
12/09/2021 01:00	36.0	22.7	37.7	55.2
12/09/2021 01:15	46.5	22.8	43.1	68.4
12/09/2021 01:30	45.8	24.5	44.8	64.9
12/09/2021 01:45	44.6	22.8	41.3	66.8
12/09/2021 02:00	46.9	23.5	44.3	71.2
12/09/2021 02:15	44.1	23.5	41.1	68.8
12/09/2021 02:30	45.6	24.0	43.9	65.5
12/09/2021 02:45	49.8	26.7	49.7	69.0
12/09/2021 03:00	45.7	22.8	43.5	67.6
12/09/2021 03:15	43.5	23.3	39.9	70.8

Date & Time	L _{Aeq}	Lago	LA10	LAFmax
12/09/2021 03:30	48.7	24.3	46.8	71.3
12/09/2021 03:45	47.3	23.9	45.7	70.6
12/09/2021 04:00	48.0	23.3	45.8	70.2
12/09/2021 04:15	45.1	24.0	38.6	70.7
12/09/2021 04:30	46.8	21.8	42.7	67.1
12/09/2021 04:45	43.4	22.1	41.5	68.4
12/09/2021 05:00	42.5	22.9	39.8	65.7
12/09/2021 05:15	41.4	24.5	40.2	65.1
12/09/2021 05:30	46.0	24.8	43.9	66.8
12/09/2021 05:45	45.7	25.4	45.4	65.8
12/09/2021 06:00	46.7	31.2	44.2	67.0
12/09/2021 06:15	46.5	31.0	43.6	67.8
12/09/2021 06:30	46.6	30.9	43.3	69.4
12/09/2021 06:45	45.8	33.9	45.2	67.1
12/09/2021 07:00	46.1	34.6	44.5	66.7
12/09/2021 07:15	49.7	34.4	48.6	69.5
12/09/2021 07:30	49.5	37.0	50.3	66.9
12/09/2021 07:45	50.0	35.1	51.6	67.8
12/09/2021 08:00	50.0	34.0	51.1	67.0
12/09/2021 08:15	54.4	35.0	53.5	73.4
12/09/2021 08:30	51.3	34.4	53.8	68.7
12/09/2021 08:45	51.5	36.6	55.8	67.1
12/09/2021 09:00	51.2	36.2	55.3	67.6
12/09/2021 09:15	52.3	34.5	54.6	71.9
12/09/2021 09:30	53.1	35.6	58.2	68.2
12/09/2021 09:45	52.6	36.5	56.3	72.6
12/09/2021 10:00	54.5	37.4	60.0	68.6
12/09/2021 10:15	56.4	38.6	61.1	74.9
12/09/2021 10:30	56.0	37.7	60.4	79.0
12/09/2021 10:45	55.1	38.3	60.7	67.8
12/09/2021 11:00	56.3	38.3	60.1	77.0
12/09/2021 11:15	55.0	39.0	60.2	68.1
12/09/2021 11:30	54.6	38.7	60.1	67.2
12/09/2021 11:45	56.4	39.0	60.6	77.0
12/09/2021 12:00	55.2	39.3	60.4	67.4
12/09/2021 12:15	54.7	39.7	59.9	69.0
12/09/2021 12:30	54.6	38.9	59.6	71.8
12/09/2021 12:45	55.8	41.6	60.4	69.4
12/09/2021 13:00	66.6	40.0	60.5	98.3

Date & Time	LAeq	LA90	LA10	LAFmax
12/09/2021 13:15	56.7	40.6	61.3	76.1
12/09/2021 13:30	55.1	40.2	60.1	69.3
12/09/2021 13:45	64.7	40.1	60.8	93.3
12/09/2021 14:00	55.4	38.7	60.2	68.1
12/09/2021 14:15	55.7	38.9	60.8	71.8
12/09/2021 14:30	54.5	38.2	59.3	71.3
12/09/2021 14:45	53.6	37.6	59.1	66.9
12/09/2021 15:00	53.8	36.3	59.2	69.4
12/09/2021 15:15	55.4	37.9	59.5	74.8
12/09/2021 15:30	54.9	38.9	60.1	67.9
12/09/2021 15:45	57.5	39.4	60.0	80.0
12/09/2021 16:00	55.4	40.8	60.1	71.2
12/09/2021 16:15	54.4	42.1	59.7	68.0
12/09/2021 16:30	53.6	41.8	58.2	69.5
12/09/2021 16:45	55.2	47.3	59.5	68.5
12/09/2021 17:00	60.3	47.8	62.5	82.2
12/09/2021 17:15	59.1	46.1	63.2	79.5
12/09/2021 17:30	57.2	44.7	62.5	71.0
12/09/2021 17:45	59.6	41.6	62.7	80.3
12/09/2021 18:00	56.2	43.4	61.6	68.7
12/09/2021 18:15	56.9	42.0	62.0	70.9
12/09/2021 18:30	57.0	43.7	62.2	71.0
12/09/2021 18:45	57.1	46.0	60.6	75.2
12/09/2021 19:00	58.0	45.4	63.2	72.3
12/09/2021 19:15	56.6	44.5	61.3	71.6
12/09/2021 19:30	56.3	44.1	61.0	70.9
12/09/2021 19:45	56.0	46.7	60.2	69.4
12/09/2021 20:00	55.1	46.3	58.8	71.0
12/09/2021 20:15	53.3	45.4	55.1	69.2
12/09/2021 20:30	53.9	45.8	56.6	69.6
12/09/2021 20:45	55.3	43.5	57.3	73.0
12/09/2021 21:00	54.5	45.1	55.9	73.3
12/09/2021 21:15	56.1	48.5	57.8	75.2
12/09/2021 21:30	51.7	45.0	50.5	68.5
12/09/2021 21:45	56.0	41.3	55.4	82.3
12/09/2021 22:00	53.2	37.4	53.9	70.0
12/09/2021 22:15	48.8	34.4	45.7	69.9
12/09/2021 22:30	51.4	38.6	50.8	69.0
12/09/2021 22:45	49.6	31.5	47.7	68.6

Date & Time	LAeq	Lago	LA10	LAFmax
12/09/2021 23:00	39.0	26.8	38.2	63.4
12/09/2021 23:15	48.1	29.8	45.3	69.7
12/09/2021 23:30	45.4	36.3	44.9	69.8
12/09/2021 23:45	49.7	28.5	39.1	72.8
13/09/2021 00:00	46.5	30.3	42.5	67.9
13/09/2021 00:15	45.9	27.9	43.0	68.5
13/09/2021 00:30	43.3	25.9	33.2	69.0
13/09/2021 00:45	38.5	25.4	32.5	63.1
13/09/2021 01:00	49.3	27.7	42.8	74.9
13/09/2021 01:15	37.2	28.5	39.9	52.4
13/09/2021 01:30	40.3	27.4	41.9	63.2
13/09/2021 01:45	49.5	28.7	47.1	72.8
13/09/2021 02:00	43.4	25.7	36.2	69.0
13/09/2021 02:15	32.5	26.8	35.4	52.4
13/09/2021 02:30	45.8	29.1	40.3	69.0
13/09/2021 02:45	40.4	25.5	38.5	65.1
13/09/2021 03:00	42.7	26.1	40.3	66.5
13/09/2021 03:15	44.1	25.0	42.0	67.7
13/09/2021 03:30	49.1	25.3	38.5	72.6
13/09/2021 03:45	40.6	25.3	39.0	64.9
13/09/2021 04:00	37.6	25.2	40.9	52.5
13/09/2021 04:15	42.8	25.7	44.0	67.2
13/09/2021 04:30	43.0	25.7	41.9	67.6
13/09/2021 04:45	51.4	26.7	46.2	76.2
13/09/2021 05:00	48.2	29.4	48.0	69.4
13/09/2021 05:15	50.4	31.0	49.5	68.6
13/09/2021 05:30	50.9	39.6	51.5	69.4
13/09/2021 05:45	53.7	41.9	55.5	72.4
13/09/2021 06:00	53.7	39.0	52.9	75.9
13/09/2021 06:15	55.6	37.6	57.3	73.7
13/09/2021 06:30	53.3	39.6	55.3	70.2
13/09/2021 06:45	55.9	41.0	59.8	73.7
13/09/2021 07:00	57.1	42.5	61.6	74.0
13/09/2021 07:15	57.6	42.9	62.6	72.8
13/09/2021 07:30	58.4	45.0	63.4	70.9
13/09/2021 07:45	61.1	49.4	65.3	72.8
13/09/2021 08:00	61.0	48.2	65.1	76.6
13/09/2021 08:15	60.2	47.1	64.8	71.1
13/09/2021 08:30	60.6	47.1	65.0	74.7

Date & Time	L _{Aeq}	L _{A90}	L _{A10}	LAFmax
13/09/2021 08:45	60.4	46.6	64.7	73.5
13/09/2021 09:00	58.7	44.7	63.4	74.0
13/09/2021 09:15	58.4	44.1	63.2	70.9
13/09/2021 09:30	58.7	45.1	63.1	73.7
13/09/2021 09:45	56.5	44.4	61.1	73.9
13/09/2021 10:00	58.2	45.7	62.5	73.0
13/09/2021 10:15	57.4	45.9	61.8	72.1
13/09/2021 10:30	59.0	47.7	62.8	73.3
13/09/2021 10:45	57.8	44.3	62.4	72.0
13/09/2021 11:00	58.2	44.4	62.9	71.1
13/09/2021 11:15	58.1	45.7	62.8	70.5
13/09/2021 11:30	59.4	46.0	63.5	80.7
13/09/2021 11:45	57.8	44.7	62.5	73.6
13/09/2021 12:00	58.8	45.1	63.0	75.1
13/09/2021 12:15	59.1	44.7	62.9	79.6
13/09/2021 12:30	56.3	40.7	61.3	72.0
13/09/2021 12:45	56.3	42.8	61.3	72.6
13/09/2021 13:00	58.2	44.8	62.0	76.4
13/09/2021 13:15	56.7	43.9	61.7	68.0
13/09/2021 13:30	55.8	42.9	60.7	68.9
13/09/2021 13:45	57.6	43.9	62.2	69.9
13/09/2021 14:00	56.7	44.0	61.4	71.3
13/09/2021 14:15	56.0	42.3	60.9	69.9
13/09/2021 14:30	56.8	42.2	61.8	68.5
13/09/2021 14:45	59.0	42.9	61.6	81.2
13/09/2021 15:00	60.2	44.5	62.0	83.6
13/09/2021 15:15	57.5	43.9	62.0	72.9
13/09/2021 15:30	59.3	43.3	61.5	84.0
13/09/2021 15:45	58.0	45.1	62.3	71.0
13/09/2021 16:00	58.4	45.7	62.4	72.4
13/09/2021 16:15	56.8	43.7	61.8	68.9
13/09/2021 16:30	57.2	46.6	61.6	71.3
13/09/2021 16:45	59.1	46.1	62.0	80.8
13/09/2021 17:00	58.1	45.6	62.5	72.4
13/09/2021 17:15	58.1	46.3	62.4	69.3
13/09/2021 17:30	58.4	45.8	62.3	73.8
13/09/2021 17:45	56.8	43.4	61.7	70.1
13/09/2021 18:00	57.2	44.3	61.7	76.9
13/09/2021 18:15	55.6	41.9	60.2	70.5



Date & Time	LAeq	LA90	LA10	LAFmax
13/09/2021 18:30	55.2	42.1	60.2	71.3
13/09/2021 18:45	56.2	41.7	60.8	75.4
13/09/2021 19:00	54.7	41.0	59.6	72.5
13/09/2021 19:15	54.4	38.9	58.4	76.9
13/09/2021 19:30	54.8	40.7	59.7	72.6
13/09/2021 19:45	52.8	38.5	55.7	70.8
13/09/2021 20:00	53.9	38.5	56.7	73.3
13/09/2021 20:15	54.2	37.5	58.4	73.5
13/09/2021 20:30	52.6	38.2	56.7	67.7
13/09/2021 20:45	51.4	36.0	54.2	68.9
13/09/2021 21:00	51.9	35.9	55.5	68.0
13/09/2021 21:15	49.3	35.5	49.7	70.3
13/09/2021 21:30	47.5	32.7	45.0	68.4
13/09/2021 21:45	46.7	33.3	45.1	66.8
13/09/2021 22:00	47.6	38.6	47.5	64.8
13/09/2021 22:15	47.1	39.0	46.2	68.3
13/09/2021 22:30	46.6	38.5	45.3	66.0
13/09/2021 22:45	49.4	41.1	49.9	67.4
13/09/2021 23:00	50.0	44.8	48.9	71.3
13/09/2021 23:15	48.3	43.8	47.5	69.9
13/09/2021 23:30	49.0	44.5	48.5	70.9
13/09/2021 23:45	49.5	45.9	49.0	71.0
14/09/2021 00:00	47.6	37.5	45.8	69.9
14/09/2021 00:15	44.4	39.1	46.3	65.2
14/09/2021 00:30	51.7	37.8	46.5	72.9
14/09/2021 00:45	44.8	39.6	45.3	64.5
14/09/2021 01:00	44.9	40.7	47.0	51.7
14/09/2021 01:15	47.3	44.5	48.0	66.4
14/09/2021 01:30	43.3	33.8	44.1	66.5
14/09/2021 01:45	43.8	31.7	38.0	69.9
14/09/2021 02:00	44.3	36.7	40.6	68.3
14/09/2021 02:15	54.1	38.9	50.1	74.8
14/09/2021 02:30	49.5	44.3	52.0	66.5
14/09/2021 02:45	48.8	41.0	50.9	69.0
14/09/2021 03:00	50.5	28.1	42.9	74.2
14/09/2021 03:15	40.9	25.1	34.4	66.2
14/09/2021 03:30	43.5	25.5	42.3	70.0
14/09/2021 03:45	36.5	31.8	38.7	50.4
14/09/2021 04:00	36.2	25.7	38.5	50.6



Date & Time	LAeq	LA90	LA10	LAFmax
14/09/2021 04:15	45.3	28.8	45.0	67.2
14/09/2021 04:30	48.3	26.5	42.9	72.9
14/09/2021 04:45	46.3	26.3	43.4	67.0
14/09/2021 05:00	46.9	29.3	47.8	65.7
14/09/2021 05:15	51.5	32.2	52.8	70.5
14/09/2021 05:30	51.8	38.9	53.8	68.5
14/09/2021 05:45	53.3	37.7	56.2	69.6
14/09/2021 06:00	54.2	39.3	56.5	73.7
14/09/2021 06:15	54.2	37.3	57.1	73.5
14/09/2021 06:30	53.5	39.1	56.6	70.6
14/09/2021 06:45	55.9	42.5	60.6	71.7
14/09/2021 07:00	55.1	41.9	58.5	71.6
14/09/2021 07:15	58.3	43.3	62.1	78.4
14/09/2021 07:30	57.4	43.5	62.8	69.5
14/09/2021 07:45	59.0	45.6	63.4	72.8
14/09/2021 08:00	58.9	44.4	63.2	74.5
14/09/2021 08:15	59.7	45.6	64.2	74.2
14/09/2021 08:30	59.6	43.7	63.8	76.4
14/09/2021 08:45	59.1	44.2	63.2	73.9
14/09/2021 09:00	58.2	43.5	62.8	72.1
14/09/2021 09:15	56.2	39.8	61.6	69.5
14/09/2021 09:30	56.5	42.0	61.6	71.8
14/09/2021 09:45	57.0	41.7	61.8	71.0
14/09/2021 10:00	58.5	42.5	62.7	76.8
14/09/2021 10:15	57.7	43.0	61.9	74.2
14/09/2021 10:30	56.8	43.0	61.9	68.8
14/09/2021 10:45	61.7	43.5	62.3	86.1
14/09/2021 11:00	57.4	43.9	62.4	71.0
14/09/2021 11:15	55.9	40.5	61.1	69.9
14/09/2021 11:30	56.2	41.5	61.3	71.0
14/09/2021 11:45	55.9	39.8	61.3	71.3
14/09/2021 12:00	55.9	39.7	61.0	72.8
14/09/2021 12:15	56.3	41.3	61.2	72.6

SLR Ref No: 403.12427.00001 October 2021

APPENDIX 04

Glazing Specification

Melrose Bros Ltd.	
Environmental Noise Assessment	SLR Ref No:
Filename: 403.12427.00001 - Newtown Commercial Development Noise – 403.12427.00001 -	403.12427.00001
Newtown Commercial Development Noise Environmental Noise Assessment_Issued	October 2021



Melrose Bros Ltd.	
Environmental Noise Assessment	SLR Ref No:
Filename: 403.12427.00001 - Newtown Commercial Development Noise – 403.12427.00001 -	403.12427.00001
Newtown Commercial Development Noise Environmental Noise Assessment_Issued	October 2021



Melrose Bros Ltd.	
Environmental Noise Assessment	SLR Ref No:
Filename: 403.12427.00001 - Newtown Commercial Development Noise – 403.12427.00001 -	403.12427.00001
Newtown Commercial Development Noise Environmental Noise Assessment_Issued	October 2021



Melrose Bros Ltd.	
Environmental Noise Assessment	SLR Ref No:
Filename: 403.12427.00001 - Newtown Commercial Development Noise – 403.12427.00001 -	403.12427.00001
Newtown Commercial Development Noise Environmental Noise Assessment_Issued	October 2021



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Melrose Bros Ltd.	
Environmental Noise Assessment	SLR Ref No:
Filename: 403.12427.00001 - Newtown Commercial Development Noise – 403.12427.00001 -	403.12427.00001
Newtown Commercial Development Noise Environmental Noise Assessment_Issued	October 2021



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