

Resonate

HousingFirst Grosvenor Street Housing

Planning Stage Acoustic Report

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Glossary

A-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing. A-weighted levels are used as human hearing does not respond equally at all frequencies.
Background Level for the purposes of Part I (Commercial, industrial and trade premises)	The arithmetic average of the hourly LA90 levels that represents the background sounds in a noise sensitive area, in the absence of noise from any commercial, industrial or trade premises which appears to be intrusive at the point where the background level is measured, when measured according to Part I, section A4 of the Noise Protocol.
Day	Monday to Saturday (except public holidays), from 7 a.m. to 6 p.m. as defined in Environment Protection Regulations (Victoria).
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of that sound level.
dB(A)	Units of the A-weighted sound level.
Effective noise level (Publication 1826.4, Part I)	The level of noise emitted from the commercial, industrial or trade premises and adjusted if appropriate for character and duration as defined in EPA Publication 1826.4
Evening	Monday to Saturday, from 6 p.m. to 10 p.m.; and Sunday and public holidays, from 7 a.m. to 10 p.m. as defined in the Environment Protection Regulations (Victoria).
Frequency (Hz)	The number of times a vibrating object oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second.
Habitable Room	And room other than a kitchen, storage area, bathroom, laundry, toilet or pantry as defined in EPA Publication 1826.4
Leq	Equivalent Noise Level—Energy averaged noise level over the measurement time.
Night	Between 10 p.m. and 7 a.m. of the following day as defined in the Environment Protection Regulations (Victoria).
Noise Limit	The maximum effective noise level allowed in a noise sensitive area, as determined in accordance with the Noise Protocol;
Noise source	Premises or a place at which an activity is undertaken, resulting in the emission of noise
Environment Protection Regulations (Victoria)	The objectives of these Regulations are to further the purposes of, and give effect to, the Environment Protection Act 2017
Noise Protocol	Environmental Protection Authority 1862.3: Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues, published by the Authority on its website, as in force from time to time;
SPL	Sound Pressure Level—The incremental variation of sound pressure above and below atmospheric pressure and expressed in decibels. The human ear responds to pressure fluctuations, resulting in sound being heard.

Table of Contents

1	Introduction	2
2	Site Description	3
3	Legislative requirements	4
3.1	General Environmental Duty	4
3.1.1	Unreasonable noise	4
3.2	Environment Protection Regulations	4
4	Victorian Planning Provisions Clause 55.07-07 – Noise Impact Objectives (Standard B41)	6
5	Existing noise levels	7
5.1	Attended noise measurements	7
6	Acoustic criteria	8
6.1	Internal noise	8
6.1.1	Green Star Buildings – Maximum internal noise levels	8
6.2	Environmental noise emissions	8
7	Building envelope	11
7.1.1	Window and door seals	11
8	Mechanical service noise	12
8.1	Rooftop mechanical plant	12
8.2	Carpark exhaust fan	12
9	Conclusion	13

1 Introduction

This report is to be used in the town planning submission for the HousingFirst Grosvenor Street Housing project, located at 17 Grosvenor Street and 1A-F Woodstock Street Balaclava Victoria (the Subject Development). It details the acoustic requirements and indicative recommended treatments for the control of noise emitted from, and existing environmental noise impacting upon the Subject Development.

The main acoustic considerations addressed in this report are:

- Control of external environmental, traffic and tram noise ingress to meet the relevant internal acoustic amenity criteria.
- Control of environmental noise emissions to proposed development and adjacent land uses – this would include noise from external mechanical plant such as carpark exhaust fans or rooftop plant.

The design has been reviewed against the following legislation, standards and guidelines:

- AS/NZS 2107:2016 *Recommended design sound levels and reverberation times for building interiors, Environment Protection Regulations*
- EPA Victoria Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol)
- Victorian Planning Provisions Clause 55.07-07
- Green Star *Buildings*
- New South Wales Office of Environment and Heritage *Road Noise Policy* March 2011.

2 Site Description

The proposed development for HousingFirst is located at 17 Grosvenor Street and 1A-F Woodstock Street Balaclava and is shown below in Figure 1. The Subject Development is understood to be a three-storey, 68 dwelling residential building, spanning across two adjacent buildings - Building A and Building B. The Subject Development is also understood to contain underground carparking.

The project is located in a General Residential Zone (GRZ1) and is surrounded by Neighbourhood Residential (NRZ1) zones to the north, east and south. These residential zones are considered the key adjacent noise sensitive areas (NSAs) which will determine the amount of noise generated by the car-park exhaust fans and the rooftop plant and influence the location of noise sources i.e. plant.

The main sources of external noise to the project have been identified as follows:

- Traffic noise and tram pass-bys from Brighton Road
- Mechanical services and car parking activities from the Grosvenor Hotel immediately adjacent to the west of the proposed development and
- Activity noise from the Thirsty Camel drive-through bottle shop to the southwest of the proposed development



Figure 1 Project description and nearest noise sensitive areas

3 Legislative requirements

3.1 General Environmental Duty

Section 25(1) of the *Environment Protection Act 2017* (the Act) sets forth the General Environmental Duty, which states:

A person who is engaging in an activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable.

In the context of the Act, 'reasonably practicable' measures mean putting in controls to eliminate the risk of harm to human health and the environment so far as reasonably practicable. If eliminating the risk of harm is not reasonably practicable, then the risk of harm must be reduced so far as reasonably practicable. A number of matters must be considered in deciding what is reasonably practicable in the circumstances:

- the likelihood of those risks eventuating
- the degree of harm that would result if those risks eventuated
- what the person concerned knows, or ought reasonably to know, about the harm or risks of harm and any ways of eliminating or reducing those risks
- the availability and suitability of ways to eliminate or reduce those risks
- the cost of eliminating or reducing those risks.

EPA Victoria Publication 1856: *Reasonably practicable* explains that, when dealing with a common risk or harm, it is possible to demonstrate that the risk has been reduced so far as reasonably practicable if well-established effective practices or controls have been adopted to eliminate or manage risk. Where well-established practices or controls do not exist, then it is necessary to show that effective controls have been assessed and adopted.

3.1.1 Unreasonable noise

The Act also prohibits the emission of unreasonable noise and aggravated noise. The Act provides a definition for 'Unreasonable noise' in two parts. Section 3(1)(a) states that noise that is unreasonable having regard to the following:

- its volume, intensity or duration
- its character
- the time, place and other circumstances in which it is emitted
- how often it is emitted
- any prescribed factor.

Section 3(1)(b) states that noise is unreasonable noise if it is prescribed to be so. Under the *Environment Protection Regulations*, noise that exceeds the noise limits established in accordance with EPA Victoria Publication 1826.4 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol) is prescribed to be unreasonable noise.

Unreasonable noise occurs if noise meets the requirements of Section 3(1)(a) and/or Section 3(1)(b) of the Act.

3.2 Environment Protection Regulations

The EPA Victoria Environment Protection Regulations are subordinate legislation that support the Act. Under the Environment Protection Regulations, the assessment of noise from commercial, industrial and trade premises at noise sensitive areas must be carried out in accordance with EPA Victoria Publication 1826 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol), both in terms of establishing noise limits as noise sensitive areas and in terms of the measurement of noise from the subject premises.

Noise sensitive areas are defined in the Environment Protection Regulations as:

- The area within 10 m of the external walls of dwellings (including residential care facilities but excluding caretaker's houses), residential buildings and noise sensitive residential uses.
- The area within 10 m outside the external walls of any dormitories, wards, bedrooms and living rooms of caretaker's houses, hospitals, hotels, motels, residential hotels specialist disability accommodation, corrective institutions, tourist establishments, retirement villages and residential villages.
- The area within 10 m outside the external walls of classrooms or other rooms in which learning occurs at childcare centres, kindergartens, primary schools and secondary schools.
- Within the boundary of tourist establishments, campgrounds and caravan parks that are located in rural areas.

The Environment Protection Regulations also define Day, Evening and Night periods for the assessment of noise, reproduced in Table 1.

The Environment Protection Regulations define:

- Unreasonable noise as noise from commercial, industrial and time periods that exceeds the applicable noise limits from the Noise Protocol.
- Aggravated noise as noise commercial, industrial and time periods that exceeds:
 - 75 dB $L_{Aeq,30m}$ or the Noise Protocol noise limit by more than 15 dB during the day
 - 70 dB $L_{Aeq,30m}$ or the Noise Protocol noise limit by more than 15 dB during the evening
 - 65 dB $L_{Aeq,30m}$ or the Noise Protocol noise limit by more than 15 dB during the night.

Table 1 Applicable time periods

Time period	Details
Day	Monday to Saturday, 7 am to 6 pm
Evening	Monday to Saturday, 6 pm to 10 pm Sundays and public holidays, 7 am to 10 pm
Night	10 pm to 7 am any day

4 Victorian Planning Provisions Clause 55.07-07 – Noise Impact Objectives (Standard B41)

The proposed development will need to comply with Standard B41 of Victoria Planning Provisions (VPP) under Clause 55.07-07 – Noise impact objectives which stipulates the following:

Noise sources, such as mechanical plants should not be located near bedrooms of immediately adjacent existing dwellings or small second dwellings.

The layout of new dwellings and buildings should minimise noise transmission within the site.

Noise sensitive rooms (such as living areas and bedrooms) should be located to avoid noise impacts from mechanical plants, lifts, building services, non-residential uses, car parking, communal areas and other dwellings.

New dwellings should be designed and constructed to include acoustic attenuation measures to reduce noise levels from off-site noise sources.

Buildings within a noise influence area specified in Table B8 should be designed and constructed to achieve the following noise levels:

- Not greater than 35dB(A) for bedrooms, assessed as an LAeq,8h from 10pm to 6am.
- Not greater than 40dB(A) for living areas, assessed LAeq,16h from 6am to 10pm.

Buildings, or part of a building screened from a noise source by an existing solid structure, or the natural topography of the land, do not need to meet the specified noise level requirements.

Noise levels should be assessed in unfurnished rooms with a finished floor and the windows closed.

Table 2 – Standard B41 Table B8 – Noise Influence Area

Noise Source	Noise Influence Area
Zone Interface	
Industry	300 meters from the Industrial 1,2 and 3 zone boundary
Roads	
Freeways, tollways and other roads carrying 40,000 Annual Average Daily Traffic Volume	300 metres from the nearest trafficable lane
Railways	
Railway servicing passengers in Victoria	80 metres from the centre of the nearest track
Railway servicing freight outside Metropolitan Melbourne	80 metres from the centre of the nearest track
Railway servicing freight in Metropolitan Melbourne	135 metres from the centre of the nearest track

Based on the above table, we have identified that the project is within a noise influence area as it is approximately 250 meters from an Industrial 1 Zone. However, based on the significant distance attenuation to the industrial zone and based on our attended noise measurements and site observations, noise contribution from the industrial zone is not expected to affect the proposed development. We also note that the internal ambient noise level requirements outlined within the above VPP are in line with the AS2107 criteria presented in Section 6.1.

5 Existing noise levels

5.1 Attended noise measurements

Attended noise measurements were undertaken on three locations around the proposed development on Thursday 14 and Friday 15 December 2023, as shown in Figure 1. The monitoring locations were selected to capture various sources of external noise that could potentially affect the residents of the proposed development such as:

- Noise from the kitchen exhaust and other mechanical plant from the adjacent Grosvenor Hotel
- Noise due to the drive through bottle shop adjacent to the proposed development
- Traffic and light-rail noise from Brighton Road.

Table 3 presents a list of equipment used for the attended measurements. Field calibrations conducted before and after the measurement period deemed the measurements valid. The sound measurement equipment has traceable calibration certification.

Table 3 Equipment makes and model.

Equipment makes and model	Serial Number
NTi XL2 Sound Level Meter	A2A-09634-E0
Casella Cel-120/1 sound calibrator	0255131

Table 4 Attended measured noise levels 14 and 15 December 2023

Measurement Location (as per Figure 1)	Description	Measurement time	Ambient noise level, dB L _{Aeq} , 15 minutes	Maximum, dB L _{Amax}
L01	At the rear of the Grosvenor hotel, on the southern side of Grosvenor St	Between 8pm and 9pm	57	71
		Between 6am and 7am	63	88
L02	L02 – on Grosvenor St towards the intersection with Woodstock St	Between 8pm and 9pm	54	77
L03	L03 – adjacent to the drive through bottle shop on Brunning street	Between 8pm and 9pm	61	72
		Between 6am and 7am	62	83

6 Acoustic criteria

6.1 Internal noise

Internal ambient noise levels criteria are based on the requirements of Australian/New Zealand Standard (AS/NZS) 2107:2016¹. It should be noted that the recommended internal noise levels for this project are generally in line with the requirements of Clause 55.07-07 of the Victorian Planning Provisions outlined in Section 4.

Table 3 AS/NZS 2107:2016 Internal noise level criteria—Residential Buildings – houses and apartments in suburban areas or near minor roads

Type of occupancy/activity	Design sound level range, $L_{eq,t}$ dB(A)
Apartment common areas (e.g. foyer, lift lobby)	45 – 50
Living areas	30 – 40
Sleeping areas (night time)	30 – 35
Work areas	35 – 40

6.1.1 Green Star Buildings – Maximum internal noise levels

In addition to the above, the project is also targeting credits for Green Star Buildings which requires compliance with the following for maximum internal noise levels:

“Internal ambient noise levels in the regularly occupied areas must be no greater than the upper range value relevant to the activity type in each space as recommended in the current AS/NZS 2107:2016.”

For Class 2 and Class 3 buildings

In Class 2 and Class 3 dwellings the internal ambient noise levels can exclude those services under the direct control of the occupant such as split system air-conditioning units and switchable exhaust fans (e.g., toilet, kitchen hoods and laundries)

For Buildings with sleeping areas

In buildings with sleeping areas (e.g., Class 2, Class 3, Class 9a) noise levels must not exceed recommended Sleep Disturbance criteria as defined in the NSW EPA Road Noise Policy 2011:

- Up to two noise events per night: maximum internal noise levels below L_{Amax} 70 dB
- All other events: maximum internal noise levels below L_{Amax} 55 dB

6.2 Environmental noise emissions

Environmental noise emissions from the site (such as any mechanical plant or equipment that may emit noise) are required to comply with the requirements of the Environment Protection Regulations (Victoria) and the new EPA Noise Protocol at noise sensitive areas (NSA).

The Noise Protocol prescribes procedures for determining the statutory environmental noise limits that apply at noise sensitive areas, such as residential areas, with respect to noise due to commercial, industrial and trade operations.

The Noise Protocol noise limits are dependent on:

- Zoning Levels, which are based on the planning scheme zoning types within 70 m and 200 m radii of the noise sensitive area.

- The time of day i.e. different limits apply at different times of the day.
- The background noise level (L_{A90}) in the noise sensitive area, in the absence of noise due to commercial, industrial or trade operations.

The zoning levels have been determined based on planning map as shown in Figure 2.

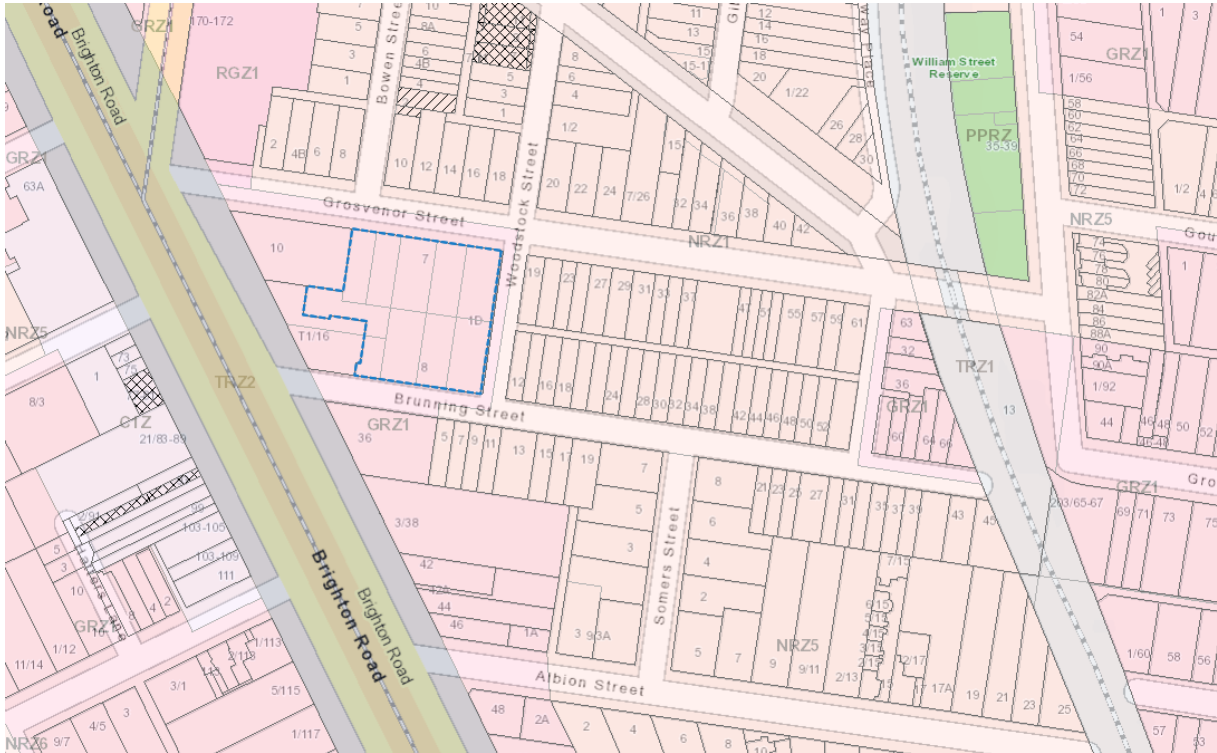


Figure 2 VicPlan planning scheme zoning types for HousingFirst, Grosvenor Street, Balaclava and its respective NSA

Typically, zoning levels are considered along with the background noise levels in the area to establish the applicable noise limits. Background noise levels can be classified as ‘Low’, ‘Neutral’ and ‘High’. In cases where background noise levels are sufficiently low such that does not influence the zoning levels, the background noise level is called ‘Neutral’. In ‘Neutral’ background noise conditions, the applicable noise limit is equal to the zoning levels. ‘High’ background levels will increase the applicable noise limits above the zoning levels and ‘Low’ background noise levels reduce the applicable noise limits below the zoning level.

For the purposes of this assessment, the background noise environment around the proposed site has been assumed to be ‘Neutral’ such that the adopted Noise Protocol noise limits are equal to the zoning levels which are determined based on planning map shown in Figure 2

Table 5 shows the zoning levels for Noise Protocol noise limits for Day, Evening and Night periods at nearby sensitive areas.

Table 5 Noise limits for mechanical plant at the nearest sensitive areas

Time Period	Time	Zoning Level	Classification	Noise Limit, L_{eq}
Day	7 am to 6 pm Monday to Saturday (except public holidays)	52	Neutral	52
Evening	6 pm to 10 pm Monday to Saturday 7 am to 10 pm Sunday and public holidays	46	Neutral	46

Time Period	Time	Zoning Level	Classification	Noise Limit, L _{eq}
Night	10 pm to 7 am Everyday	41	Neutral	41

7 Building envelope

An assessment of the external noise intrusion via the façade has been conducted based on the attended noise measurements presented in Table 4. For all apartments, we understand that it is possible that various glazing specifications will be nominated based on the following variables:

- External facade noise levels based on attended measurements as per Table 4
- Glazing size and type
- Facade area of each room
- Room volume
- Room type (living/bedroom)

Based on the worst-case scenario (bedroom façade consisting primarily of glazing and a sliding door or other operable elements), the glazing and sliding door construction (including the frame) will need to achieve a minimum R_w 34 rating to achieve the internal noise level criteria in accordance with Section 6.1.

We understand that it is typical that thermal and Environmentally Sustainable Design (ESD) glazing requirements result in an acoustic performance beyond the minimum acoustic requirements established in this report. The façade and glazing constructions will be reviewed during the detailed design stage, however, indicative glazing configurations are provided in Table 6

Table 6 Indicative glazing configurations

Façade R_w requirement ⁽¹⁾	Indicative Glazing Configurations
R_w 34	10.38 mm laminated glazing
	6.5 mm Vlam Hush
	10 mm glass / 12 mm air gap / 4 mm glass

(1) The fixed or operable glazing frames (including all seals and gaskets) should be selected, based on acoustic laboratory reports, to achieve the minimum R_w nominated.

7.1.1 Window and door seals

Where operable windows and glazed doors are proposed in external walls where an acoustic rating has been specified for the glazing, it will be necessary to fit the windows and doors with acoustic seals to ensure that flanking via the operable sections and frames does not degrade the acoustic performance of the glass.

8 Mechanical service noise

8.1 Rooftop mechanical plant

Various mechanical equipment such as AHUs, chillers, fans, and pumps are proposed to be located on the rooftop of the subject development. Noise mitigation measures to control noise emissions from the rooftop include but are not limited to:

- Design and careful selection of mechanical plant with low noise emissions,
- incorporation of solid barriers around the rooftop plant or provision of acoustically treated enclosures/louvres,
- locating and orienting the plant to block direct line of sight, and maximise distance to the NSA's.

8.2 Carpark exhaust fan

The location of the carpark exhaust fan is currently unknown. The proposed carpark exhaust fan and its location will be reviewed against the EPA Noise Protocol noise limits once available. Noise control measures to control carpark fan noise emissions to environmental noise criteria include:

- Selection of low noise carpark fans,
- incorporation of internal acoustic lining within the ductwork, and
- the use of a suitable attenuator on the discharge/intake.

The above treatments will be specified and incorporated into the mechanical design during the detailed design stage of the project to ensure noise emissions are compliant relevant environmental noise criteria.

9 Conclusion

This report provides a town planning acoustic report for the proposed HousingFirst Grosvenor Street Housing project located at 17 Grosvenor Street and 1A-F Woodstock Street Balaclava.

Relevant environmental noise limits for the development have been established in accordance with the requirements of the following:

- *Environmental Protection Regulations*, and,
- Environmental Protection Authority (EPA) Victoria Publication 1826: *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise Protocol).

Relevant internal acoustic amenity criteria for the Subject Development has been established in accordance with the following standards and guidelines:

- AS/NZS 2107:2016 *Recommended design sound levels and reverberation times for building interiors*,
- Victorian Planning Provisions Clause 55.07-07
- Green Star *Buildings*
- New South Wales Office of Environment and Heritage *Road Noise Policy* March 2011.

An assessment of the existing noise levels at the Subject Development was undertaken for the purposes of establishing façade sound insulation requirements to achieve internal acoustic amenity objectives.

Noise mitigation strategies to control mechanical noise emissions from the development are discussed in Section 8 and will be implemented in the design stages of the project to comply with the Noise Protocol.

Where the acoustic recommendations contained herein are implemented, Resonate Consultants anticipate that the Subject Development will achieve compliance with relevant noise limits and internal amenity criteria.