

AMENDED IN RED

By: Jocelyn Bowyer

Date: 29/03/2023



PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

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26 JEAYS STREET, BOWEN HILLS: NOISE IMPACT ASSESSMENT

Project ID: 14130

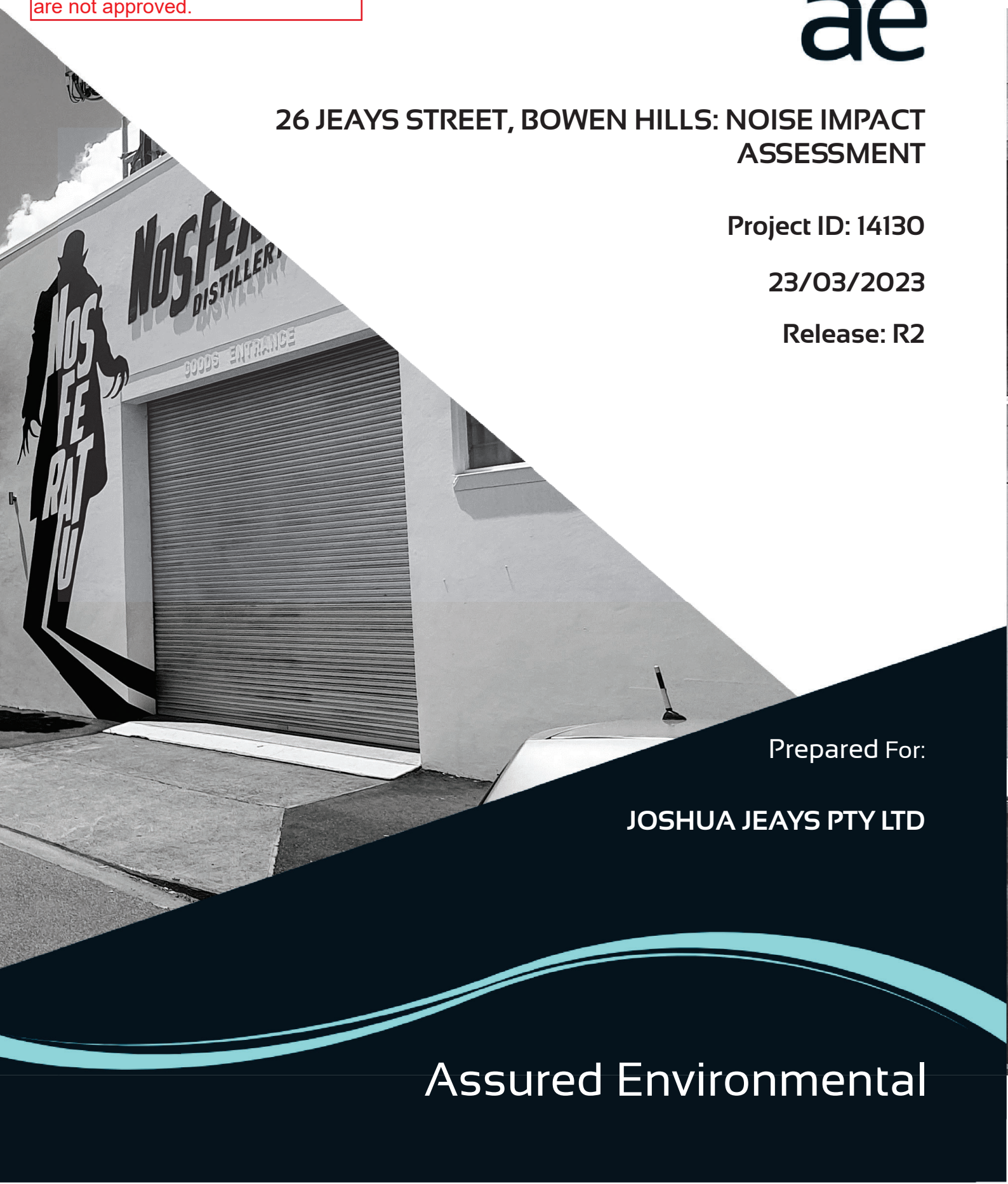
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Table 1: History of Revisions

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R2	23/03/2023	J. Dixon	Comments

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GLOSSARY

A-Weighting	A response provided by an electronic circuit which modifies sound in such a way that the resulting level is similar to that perceived by the human ear.
dB (decibel)	This is 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 the reference pressure (0.00002 N/m ²).
dB(A) or dBA	This is a measure of the overall noise 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.
Free-field	Refers to a sound pressure level determined at a point away from reflective surfaces other than the ground with no significant contribution due to sound from other reflective surfaces; generally, as measured outside and away from buildings.
L _{Aeq}	This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. Noise levels often fluctuate over a wide range with time. Therefore, when a noise varies over time, the L _{Aeq} is the equivalent continuous sound which would contain the same sound energy as the time varying sound. Many studies show that human reaction to level-varying sounds tends to relate closer to the L _{Aeq} noise level than any other descriptor.
L _{A10} , L _{A90} , L _{An}	Noise level exceeded for n% of the measurement period with A-weighted, calculated by statistical analysis - where n is between 0.01% and 99.99%. For example, L _{A10} is the noise level just exceeded for 10% of the measurement period, calculated by statistical analysis and used to determine traffic noise and L _{A90} is the noise level exceeded for 90% of the measurement period, A-weighted and calculated by statistical analysis and used to determine background noise levels.
L _{AFmax}	A-weighted, fast response, maximum, sound level.
L _{AFmin}	A-weighted, fast response, minimum, sound level.
RBL	Rating background noise level – the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
SWL	Sound Power Level in decibels is ten times the logarithm of the ratio of the sound power to the sound power reference level of 1 pico Watt.



ABBREVIATIONS

BCC	Brisbane City Council
EDQ	Economic Development Queensland
PDA	Priority Development Area



1 INTRODUCTION

1.1 Background

In February 2013, the Urban Land Development Act 2007 (ULDA Act) was repealed and replaced with the Economic Development Act 2012 (ED Act). Economic Development Queensland (EDQ) is a specialist land use planning and property development unit within the Department of State Development, Manufacturing, Infrastructure and Planning (DSPMIP), with the primary focus to facilitate economic development throughout Queensland.

The Subject Site is located within the Bowen Hills Priority Development Area (PDA), which is designated under the EDQ.

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by Joshua Jeays Pty Ltd C/o Plan A to undertake a noise impact assessment for a proposed hotel use at 26 Jeays Street, Bowen Hills (Subject Site).

The assessment has been conducted in accordance with the following documents:

- Environmental Protection Policy (Noise) (2019);
- Bowen Hills PDA Development Scheme (2019);
- Brisbane City Council City Plan 2014
- Mixed Use Code;
- ~~Special Industry use~~ and a Hotel use Code; and
- Brisbane City Council City Plan 2014 Industry Code.

In accordance with the requirements of the above guidelines, computational modelling and first principal calculations have been undertaken to support the assessment of the potential for adverse impacts because of the development.

1.3 This Report

This report summarises the methodology, results, and conclusions of the impact assessment.

Special Industry
Use - Distillery not
an approved use

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By: Jocelyn Bowyer
Date: 29/03/2023



2 PROJECT DESCRIPTION

2.1 Subject Site and Surrounding Land Use

The subject site is located at 26 Jeays Street, Bowen Hills on two Lots (Lots 45 on RP9986 and Lot 45 on RP9986). The site, along with the surrounding lots are zoned Mixed Use under the Bowen Hills Development Plan. The development parcels are surrounded by the land uses outlined below:

- North: Mixed Use;
- East: Mixed Use;
- South: Mixed Use; and
- West: Mixed Use.

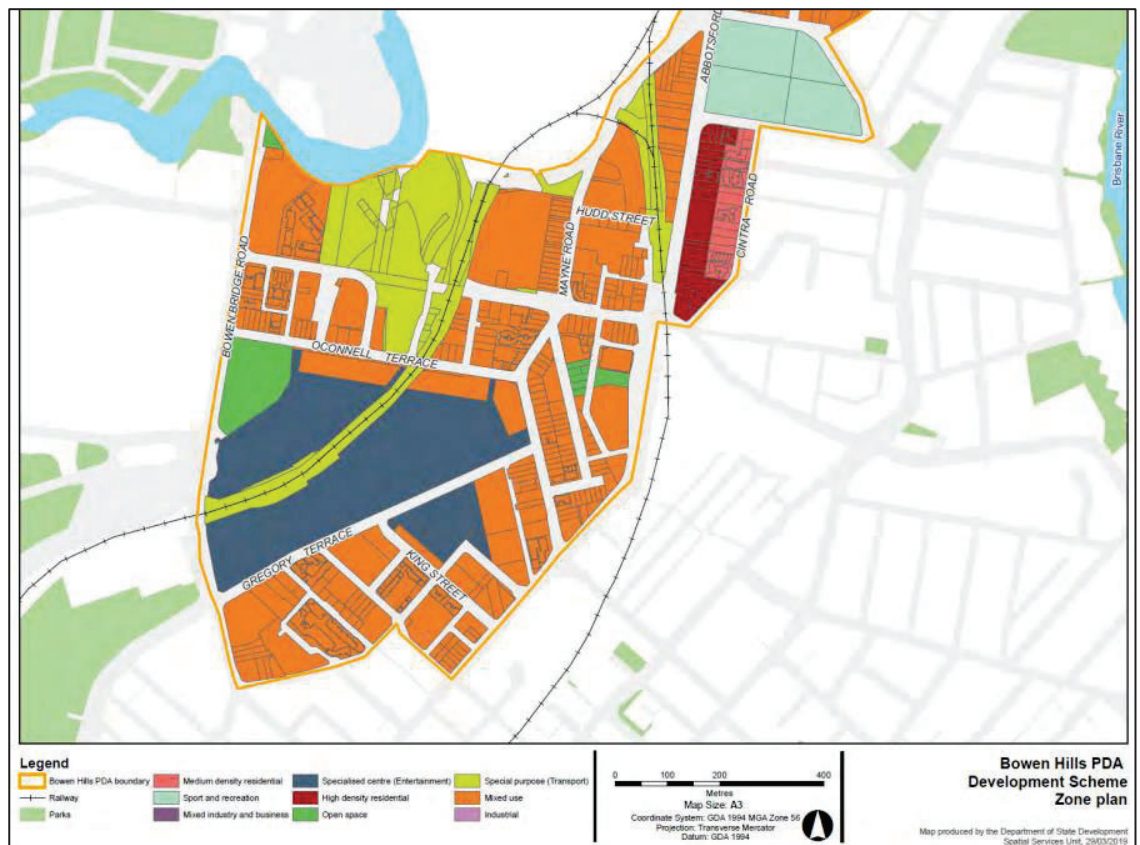


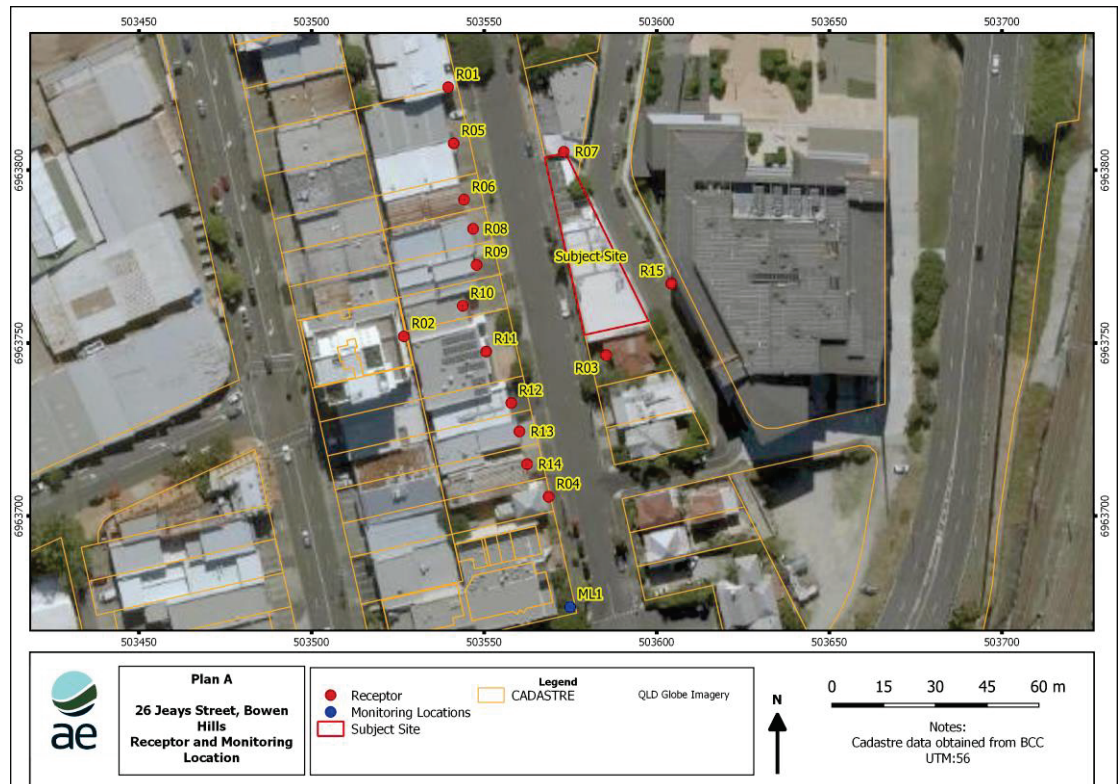
Figure 1: Surrounding Land Use

2.2 Sensitive Receptors

In total there are 16 immediate surrounding sensitive receptors, both commercial and residential, as shown in Table 2.

Table 2: Receptor Location and Description

Layout Reference



Receptor	Description	Heights
R01	Residential	0 m to 2.7 m at each floor
R0	Residential	0 m to 30 m at each floor
R03	Residential	1.5 m
R04	Residential	1.5 m
R05	Commercial	1.5 m
R06	Commercial	1.5 m
R07	Commercial	1.5 m
R08	Commercial	1.5 m
R09	Commercial	1.5 m
R10	Commercial	1.5 m
R11	Commercial	1.5 m
R12	Commercial	1.5 m
R13	Commercial	1.5 m
R15	Commercial	0 to 30 m at each floor



3 EXISTING ENVIRONMENT

3.1 Noise Monitoring Methodology

Background noise monitoring was undertaken at a single representative location from the 7 - 10 February 2022 as shown in Figure 1. The monitoring location was selected to provide background noise levels representative of the surrounding land uses, which is shown in Table 2

Noise measurements were undertaken in accordance with the requirements of Australian Standard AS 1055-2018 '*Acoustics – Description and measurement of environmental noise*' using a Type 2 environmental noise logger. The instrument was situated in a free-field position and an averaging time of 15 minutes adopted for the monitoring. The microphone was positioned at a height of 1.2 metres above ground level and fitted with a windshield throughout the measurements.

Noise monitoring has a potential to be affected by rainfall and wind speeds above 5 m/s. Review of meteorological data from the BOM Brisbane Station (ID: 040913) indicates that no hours were affected by rainfall or high wind speeds. The serial number and calibration information for the instruments used are presented in Table 3

Table 3: Equipment Information

Instrument	Serial No.	NATA Calibration Current to:	Pre-/Post Calibration (dB)
Rion NL-21	2506232	27/07/2022	93.6/93.6
Pulsar 106 (Calibrator)	696		N/A

3.2 Noise Monitoring Results

Table 4 provides a summary of noise levels of each period for a variety of statistical noise parameters. The periods are defined as follows:

- Day – 7 am to 6 pm;
- Evening – 6 pm to 10 pm; and
- Night – 10 pm to 7 am.

Table 4: Baseline Noise Monitoring Data for Each Day

Date	Period	L _{max}	L ₁₀	L ₉₀	L _{eq}	minL _{A90,1-hour}	median L _{Aeq,1-hour}
07-02-22	Day	-	-	-	-	-	-
	Evening	76.3	60.4	46.5	52.6	43.5	52.4
	Night	80.5	57.3	41.8	49.9	38.7	47.9
08-02-22	Day	83.0	62.7	48.6	54.4	47.0	54.7
	Evening	85.5	60.0	44.9	51.4	42.7	51.2
	Night	89.1	59.0	40.5	51.9	37.5	48.0
09-02-22	Day	84.1	63.5	48.1	56.0	46.5	54.2
	Evening	85.8	61.5	45.6	53.9	43.3	52.2
	Night	80.0	58.2	40.9	50.3	37.7	47.9

A summary of the noise monitoring data by period is presented in Table 5.

Table 5: Baseline Noise Monitoring Data for Whole Monitoring Period

Period	L _{max}	L ₁₀	L ₉₀	L _{eq}	RBL
Day	84	56	48	55	47
Evening	86	53	46	53	43
Night	89	50	41	51	38

A time history of the noise monitoring data is presented in Figure 2.

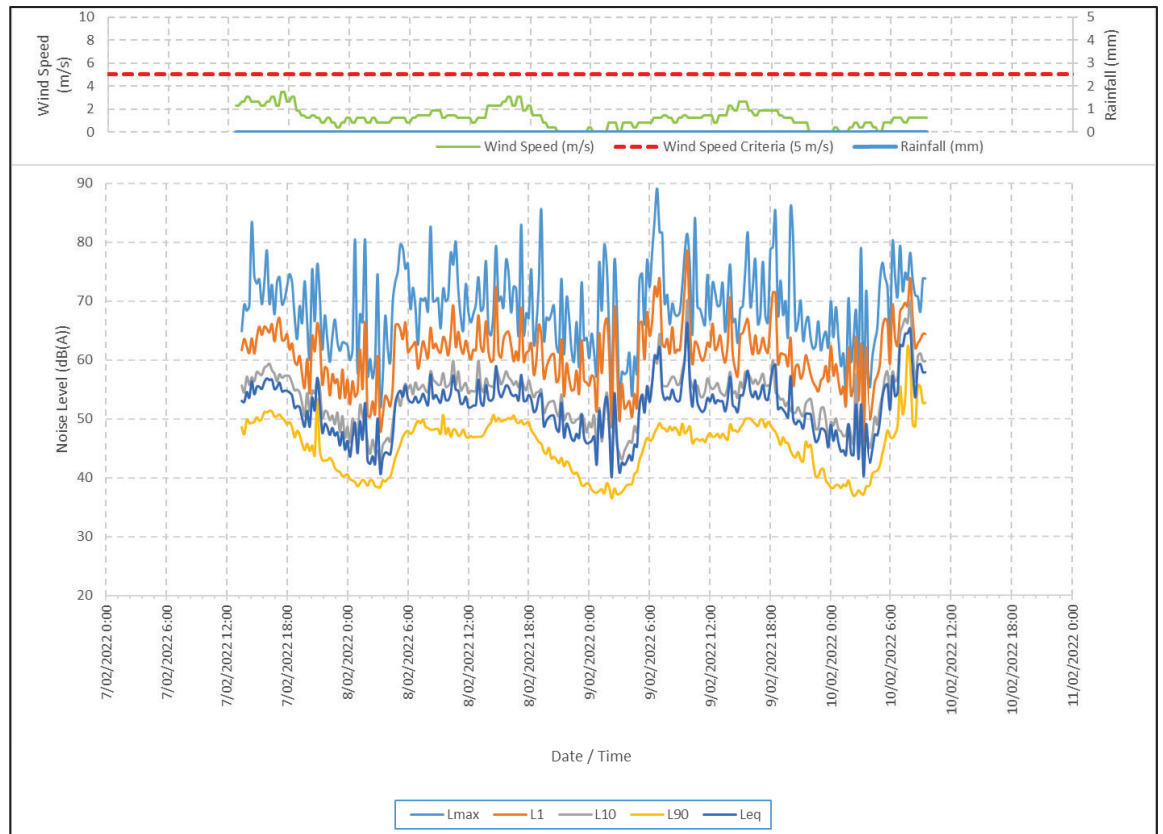


Figure 2: Time History of Monitoring Data

4 REGULATORY REQUIREMENTS

4.1 Overview

The Subject Site is located in the Bowen Hills Priority Development Area (PDA). The PDA is approximately 108 hectares bound by Bowen Bridge Road and Enoggera Creek to the west, the Mayne Rail Yards and Breakfast Creek to the north, Water Street and St Pauls Terrace to the south and Breakfast Creek, Cintra Road and Markwell Street to the east as shown in Figure 3.

In February 2013, the Urban Land Development Act 2007 (ULDA Act) was repealed and replaced with the Economic Development Act 2012 (ED Act). Economic Development Queensland (EDQ) is a specialist land use planning and property development unit within the Department of State Development, Manufacturing, Infrastructure and Planning (DSPMIP), with the primary focus to facilitate economic development throughout Queensland.

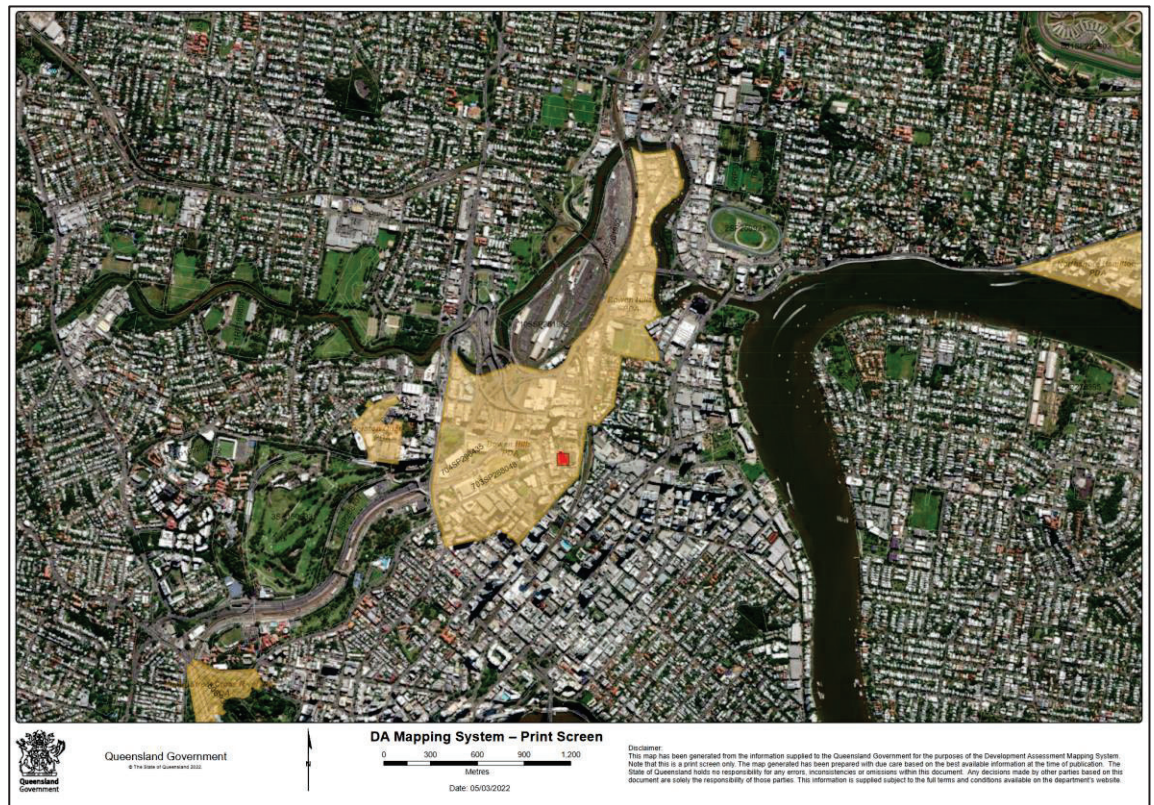


Figure 3: Bowen Hills Priority Development Area

Development Applications within the PDA are to be assessed against the Economic Development Queensland's (EDQ) Environmental Values and Sustainable Resource Use Guideline 14 (2015). This guideline outlines the values and strategies for protecting the environment and optimising resource use in Priority Development Areas (PDAs) in Queensland.

4.2 Environmental Values and Sustainable Resource Use Guideline 14

Table 6 provides the strategies and resources recommended to be used to address noise impact concerns as provided in the Environmental Values and Sustainable Resource Use Guideline 14.

Table 6: Pollution Strategies for Development Applications within PDAs

Source of Pollution	Strategy	Resources and References
Noise	- Identify surrounding and/or internal land uses that have the potential to impact on the acoustic amenity of the development e.g. transport corridors, resource projects. - Manage sensitive land uses according to acceptable acoustic standards.	- SPP 5/10: Air, Noise and Hazardous Materials - Environmental Protection (Noise) Policy 2008 - Queensland Development Code: Mandatory Part 4.4 - Buildings in transport noise corridors (DSDIP) - Road traffic noise management code of practice (DTMR) - AS 2021: 2000 Acoustics – Aircraft noise intrusion - Building siting and construction - Relevant local noise management criteria

It can be seen from Table 6 that any future development in the PDA should comply with the following:

- State guideline (SPP 5/10) which refers to the Environmental Protection Policies;
- Environmental Protection Policy for Noise (EPP(Noise)); and
- Local government planning schemes (i.e. Brisbane City Plan 2014).

The following sections provide an overview of each criteria.

4.3 State Planning Policy 5/10

This policy provide direction for the preparation and amendment of local planning instruments, structure plans and master plans where there are no local planning instruments . The State Planning Policy 5/10 Air, Noise and Hazardous Materials (the Policy) seeks to ensure that local planning instruments, structure plans and master plans:

- protect the health, wellbeing, amenity and safety of communities and individuals from e impacts of air, noise and odour emissions, and from the impacts of hazardous materials; and
- strategically plan and manage the interface between land zoned for industry and land zoned for sensitive land uses to support and protect industrial land uses in appropriate locations.

This approval process includes assessment against the Environmental Protection (Air) Policy 2008 and the Environmental Protection (Noise) Policy 2019 under the Environmental Protection Act 1994. In addition, facilities that store hazardous materials are managed under the Dangerous Goods Safety Management Act 2001. This framework does not apply when:

- preparing planning instruments (e.g. a local planning scheme)
- assessing the impacts of sensitive land uses (like houses) that encroach on industrial land uses.

As such, this guidelines does not apply to the site and will be assesses against the EPP (Noise) and BCC City Plan 2014.



4.4 Environmental Protection (Noise) Policy

The EPP (Noise) provides acoustic quality objectives for a range of receptors with respect to the potential impact of an activity upon on the health and well-being and biodiversity of the receptors. Specifically, the objectives are intended to enhance or protect the following environmental values:

- The qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystem.
- The qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following:
 - sleep
 - study or learn
 - be involved in recreation, including relaxation and conversation.
- The qualities of the acoustic environment that are conducive to protecting the amenity of the community.

Table 7 presents a summary of the acoustic quality objectives applicable to the receptors surrounding the Project.

Table 7: EPP(Noise) Schedule 1 Acoustic Quality Objectives

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) <i>dB(A)</i>			Environmental value
		<i>L</i> _{Aeq,adj,1hr}	<i>L</i> _{A10,adj,1hr}	<i>L</i> _{A1,adj,1hr}	
Residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
	night-time	30 (45)	35 (50)	40 (55)	health and wellbeing (ability to sleep)
Commercial and retail activity (for indoors)	When the activity is open for business	45 (60)	-	-	health and wellbeing (ability to converse)

Note: Brackets () denote the external noise criteria assuming a 15 dB(A) façade transmission loss.

The adopted project noise level criteria based on the EPP(Noise) 2019 are shown in Table 8.

Table 8: Project Noise Level Criteria (Outdoors)

Receiver Type	Receptors	<i>L</i> _{Aeq,adj,1 hr} <i>dB(A)</i>			<i>L</i> _{A1, adj, 1 hr} <i>dB(A)</i>
		Day	Evening	Night	Night
Residential Dwellings ^{a)}	R01-R04	50	50	45	55
Commercial and retail activity	R05-R15	60	-		

Note: Assuming 15 dB(A) façade transmission loss is accounted for

a) Criteria based on existing monitoring values to conserve the existing amenity



In addition to the above acoustic quality objectives, the EPP (Noise) 2019 requires that, where reasonable to do so, background creep should be prevented or minimised [Section 9(2)(b)]. While specific noise limits to achieve this outcome are not provided in the EPP (Noise) 2019, reference is made to the previous objectives provided in the now repealed EPP (Noise) 2008 as follows:

- (a) *for noise that is continuous noise measured by $L_{A90,T}$ —more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or*
- (b) *for noise that varies over time measured by $L_{Aeq,adj,T}$ —more than 5 dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.*

Given the results of the baseline noise monitoring (see Section 3), Table 9 below presents indicative noise levels targets that may be considered appropriate to prevent or minimise background creep at nearby sensitive uses.

Table 9: Noise Level Targets for the Prevention of Background Creep

Monitoring Location	Receptors	Parameter	Day	Evening	Night
ML1	R01-R04	Continuous Noise ($L_{A90,T}$)	48	46	41
		Variable Noise ($L_{Aeq,adj,T}$)	48 + 5 = 53	46 + 5 = 51	41 + 5 = 46

Since the EPP(Noise) 2019 does not nominate noise levels in relation to Background Creep, the noise level targets shown in Table 9 are not used as criteria in this assessment. However, the predicted noise levels have been included to provide a qualitative comment in relation to the requirements of the EPP(Noise) 2019 Clause 9 (2)(b).

4.5 Brisbane City Council City Plan 2014

4.5.1 Hierarchy of Assessment Benchmarks

Where there is inconsistency between provisions in the planning scheme, the following rules apply:

- the strategic framework;
- relevant codes as specified in Schedules 6 and 10 of the Regulation;
- overlays;
- neighbourhood plan codes;
- zone codes prevail over use codes and other development codes; and
- provisions of Part 10 may override any of the above.

4.5.2 Relevant Code

The relevant code applicable to this development is Schedule 6; SC6.21 Noise impact assessment planning scheme policy

4.5.3 Overlays

The Subject Site is not located in an industrial amenity overlay.

4.5.4 Bowen Hill Neighbourhood Plan

The neighbourhood plan described the following in regard to noise.

Further, a number of noise generating activities can operate without approval on site, as PDA Accepted Development. Where involving no building work, not located on a heritage place and not for a 'Sensitive Use', the following uses are PDA Accepted Development and do not require an application.

- Food and Drink Outlet (at ground level and not exceeding 250 m² GFA)
- Indoor Sport and Recreation
- Shop (at ground level and not exceeding 250 m²)

4.5.5 Mixed-Use Code

In order to determine the suitability of the development, this assessment will address the performance outcomes PO1 of the Mixed-Use Code.

Table 10: Mixed Use Code Performance Outcomes and Acceptable Outcomes for Noise

Performance Outcome	Acceptable Outcome
PO1 Development: a. has hours of operation which are controlled so that the use does not detrimentally impact on the amenity of adjoining residents; b. does not result in noise emissions that exceed the noise (planning) criteria in Table 9.3.3.3.F, low frequency noise criteria in Table 9.3.3.3.G and night-time noise criteria in Table 9.3.3.3.H in a sensitive zone or a nearby sensitive use, except music noise where located in a Special entertainment precinct identified in a neighbourhood plan. Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	AO1.1 Development: a. for accommodation activities, dwelling unit or emergency services has unlimited hours of operation; b. for a club, if licensed, bar, function facility, hotel or nightclub entertainment facility does not generate noise which is clearly audible and detectable, or impacts on the amenity of a resident, in a dwelling or other sensitive use; Note—Development for a club, if licensed, bar, function facility, hotel or nightclub entertainment facility is not expected to achieve this outcome. c. for any other use: a. where in the Principal centre zone or Major centre zone has unlimited hours of operation; b. where in the District centre zone, Neighbourhood centre zone or Mixed use zone: i. has hours of operation, including for deliveries, which are limited to 6am to 10pm; or ii. does not generate noise which is clearly audible and disturbing in a dwelling or other sensitive use ; c. where in any other zone: i. has hours of operation, including for deliveries, which are limited to 6am to 8pm; or ii. does not generate noise which is clearly audible and disturbing in a dwelling or other sensitive use.



As the development will produce noise and may affect nearby sensitive receptor the following noise criteria applicable to the Subject Site as provided in Table 8.3.3.3.F, Table 8.3.3.3.G, and 8.3.3.3.H of the Mixed-Use Code.

Table 11: 9.3.3.3.F—Noise (planning) criteria

Criteria location	Intrusive noise criteria	Acoustic amenity criteria		
	Day, evening and night $L_{Aeq,adj,T}$ are not greater than the RBL plus the value in this column for the relevant criteria location, where T equals: day – 11hr, evening – 4hr, night – 9hr	Day	Evening	Night
At a sensitive use in the Mixed Use Zone	5 dB(A)	60 dB(A)	55 dB(A)	50 dB(A)

Table 12: Low frequency Noise Criteria (Table 9.3.3.3.G of the City Plan)

Criteria Location	Day (7am–6pm) $L_{Ceq,adj,11hr}$ is not greater than the following values at the relevant criteria location:	Evening (6pm–10pm) $L_{Ceq,adj,4hr}$ is not greater than the following values at the relevant criteria location:	Night (10pm–7am) $L_{Ceq,adj,9hr}$ is not greater than the following values at the relevant criteria location:
At sensitive use in the Mixed-Use zone	75 dB(C)	75 dB(C)	70 dB(C)

Table 13: Night-time Noise Criteria (Table 9.3.3.3.H of the City Plan)

Criteria Location	Where the existing $L_{Aeq,9hr}$ night at the criteria location is:	Average of the highest 15 single L_{Amax} events over a given night (10pm–7am) period is not greater than the following values at the relevant criteria location	The absolute highest single L_{Amax} event over a given night (10pm–7am) period is not greater than the following values at the relevant criteria location
At the sensitive use of the Mixed Use Zone.	Not Applicable	65 dB(A)	70 dB(A)

Table 14 outlines the site-specific intrusive noise criteria derived from the rating background level plus 3 dB(A). Details of the existing environment are discussed in Section 3

Amplified music has significant contribution from low frequencies and are assessed against a low frequency separate criterion. When assessing against this criteria, all low frequency sources will be assessed in isolation.

Table 14: BCC Derived Noise Criteria for Hotel Operations

Receptor	Rating Background Level plus 5 dB(A)			L _{Amax} Night	Low Frequency		
	Day	Evening	Night		Day	Evening	Night
All surrounding sensitive receptors (L _{Aeq})	47 + 5 = 52	43 + 5 = 48	38 + 5 = 43	-	-	-	-
All surrounding sensitive receptors (L _{Amax})	-	-	-	single event: 65 dB(A) highest: 70 dB(A)	-	-	-
All surrounding receptors (L _{Ceq})	-	-	-	-	75 dB(C)	75 dB(C)	70 dB(C)

4.6 Noise Criteria Summary for Project

For the purpose of this assessment the continuous noise criteria will not be assessed for the following reasons

- L_{A90} values are not readily available for most noise sources; and
- A majority of noise sources are variable in nature for example forklifts, patron noise and loading.

Table 15 shows the adopted criteria, which is the minimum criteria of either EPP(Noise) or BCC Mixed-use criteria, as discussed in Sections 4.4 and 4.5 respectively. BCC City Plan 2014 criteria was not applied to commercial businesses as, under the mixed use code they are not defined as a sensitive use.

Table 15: Project Noise Sources

Receptor	Rating Background Level plus 5 dB(A)			L _{Amax} Night	Low Frequency		
	Day	Evening	Night		Day	Evening	Night
Surrounding residential sensitive receptors (L _{Aeq})	50	48	45	55	-	-	-
Surrounding Commercial sensitive receptors (L _{Amax})	60	60	60	55	-	-	-
All surrounding receptors (L _{Ceq})	-	-	-	-	75 dB(C)	75 dB(C)	70 dB(C)



5 NOISE ASSESSMENT

5.1 Noise Modelling Methodology

For the purposes of predicting impacts associated with noise emissions from the Subject Site on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software CadnaA (version 2021 build 181.5161) developed by DataKustik. CadnaA incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. All predictions have been undertaken in accordance with the CONCAWE calculation method.

Table 16 summarises the model configuration used for the modelling.

Table 16: Model Configuration

Parameter	Approach
Standards	CONCAWE
Time Periods	Day (07:00 – 18:00 hours)
	Evening (18:00 – 22:00 hours)
	Night (22:00 – 07:00 hours)
Digital Terrain	LIDAR data at 1 m intervals. Triangulation calculation applied.
Ground Absorption	Default absorption for hard surface. Aerial mapping used to include soft ground.
Meteorology	Day and Evening: Stability class D at 3 m/s
	Night: Stability class F at 2 m/s
	Worst case source to receptor

The noise model was developed in three stages:

1. Identifying the noise sources associated with the development, especially those sources internal to the building structure;
2. Using the building construction calculate the transmission loss of the building structure using INSUL
3. Model the external noise from the building in CadnaA software.

5.2 Development Operation

The proposed development is to install a hotel within the existing warehouse at the Subject Site. This warehouse is a smaller section (Lease D) of the larger building that is being leased out as shown in Figure 4.

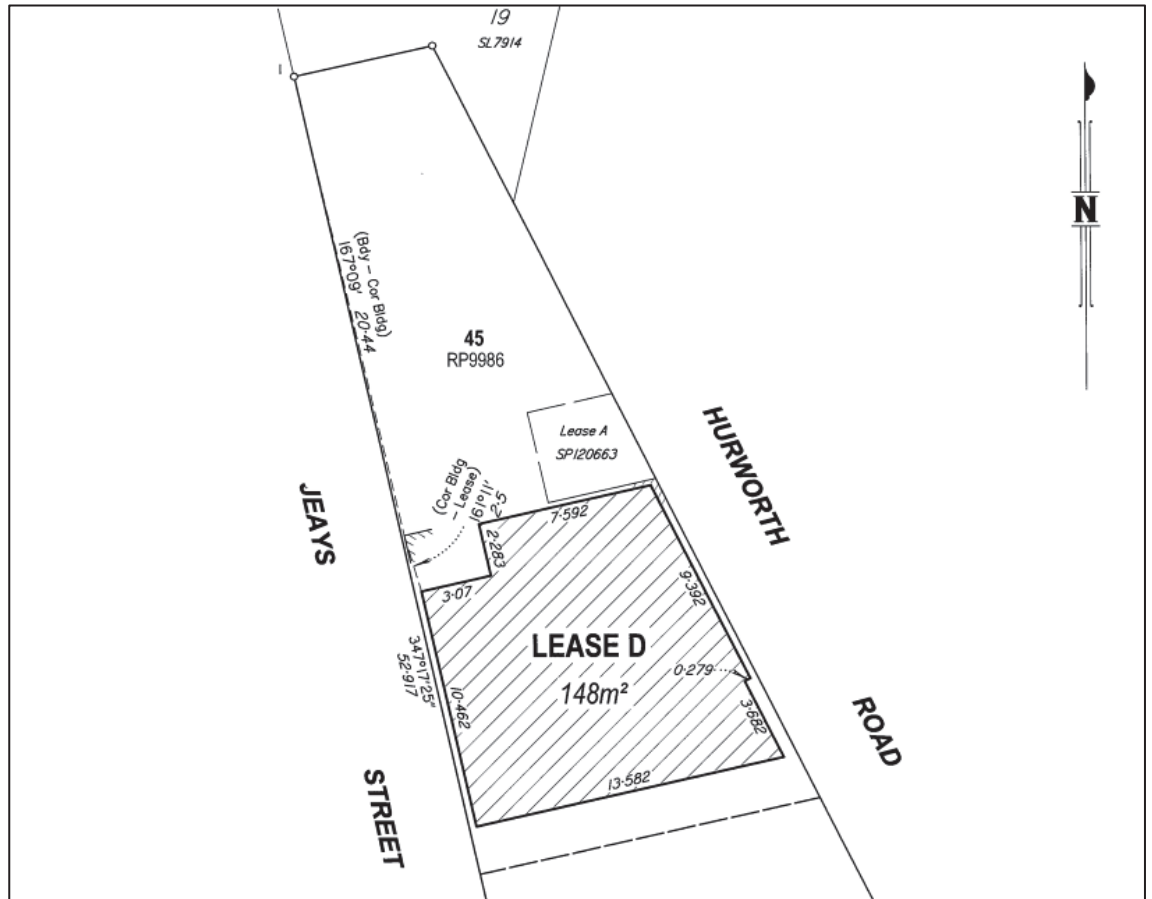


Figure 4: Leased Section of the Building Denoted by Cross Hatched Area

Figure 5 provides the proposed floor plan for the Subject Site. As shown, there is a separated area for the kitchenette, bathroom, and stairway for second floor access.

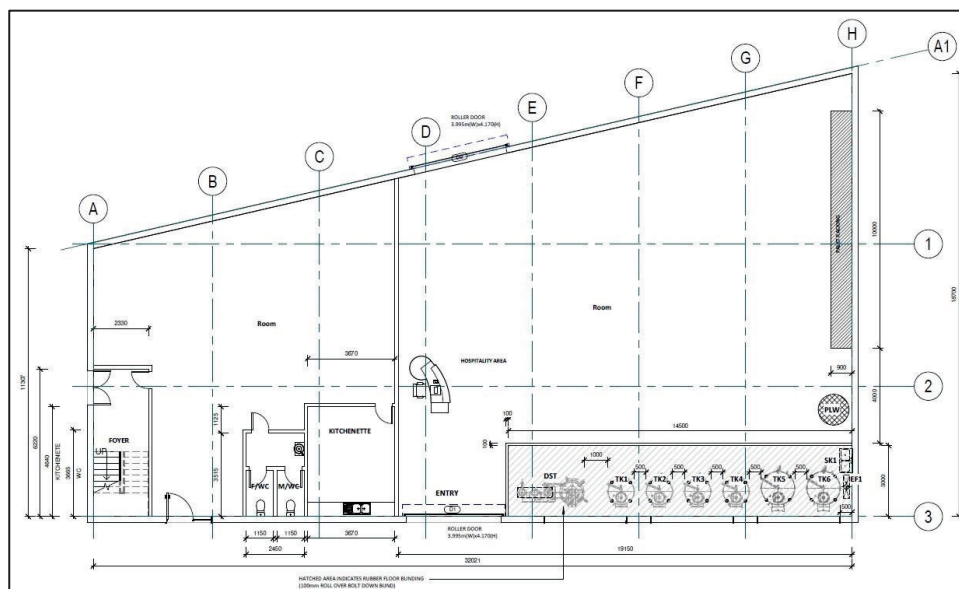


Figure 5: Floor Plan

The operational details were provided by the client and summarised in Table 17.

Table 17: Operational Conditions

Operational parameter	Client Comment
Operation Hours	Operation hours include the following Cellar door use not approved Cellar door 16:00-22:00 Thursday-Saturday; Production 06:30-17:00 Mon-Friday AMENDED IN RED By: Jocelyn Bowyer Date: 29/03/2023 
Amplified Music	Music played inside only at low ambient levels
Number of Patrons	Client suggested 50 per night
Outdoor areas	The client would like to apply for a curb side licenced area – approximately 19 m x 1 m in size
Deliveries	5-8 deliveries or pickups per week
Storage of product	Product is stored in glass bottles, 5 L plastic drums, or offsite
Number of staff	Two full time staff and a maximum four casuals

5.3 Noise Sources

Table 18 provides a summary of the noise sources adopted for this assessment and the operational details of each source. Where annoying noise characteristics have been identified the adjustment has been included in the L_{Aeq} column. The sound power levels have been taken from the following sources

- Equations for the prediction of noise emissions due to patrons in a social situation for small to medium crowds are presented in Hayne et al. (2011)^a. The L_{Aeq} sound power level emitted by a group of people is given by the expression $L_{WAeq} = 15\log N + 64$ dB(A). Frequency spectrum will be obtained from AE's internal database.
- Amplified music is to be restricted to low ambient jazz music with no onsite bands. A typical entertainment volume of 75 dB(C), measured approximately three meters away from the source will be used for entertainment sources. As only low ambient noise is expected within the building, only a single source will be modelled. This data is obtained from the Queensland Government 'Entertainment noise limits and compliance with licence conditions'.
- The following information was taken from the document 'Planning Use Summary' provided by the client.
- Electric Forklift – 70 dB(A) with intermittent operation from 6 am to 8 pm. The frequency spectrum used in the model was obtained from AE's database. 10 decibels were added to the forklift to account for impact noise.
- ~~Distiller mixing and agitation – 34 dB(A) operating 2-3 hours per day.~~ The SWL was provided by the client.

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Distiller mixing and agitation not approved

a) ^a Hayne, M/J., Taylor, J.C., Rumble, R.H. & Mee, D.J. (2011) 'Prediction of noise from small to medium sized crowds', *Proceedings of Acoustics 2011*, 2-4 November, Gold Coast, Australia



- ~~Distiller pump~~ – 45 dB(A). The frequency spectrum used in the model was obtained from AE's database
- No glass bottles are to be disposed at night.
- 50 patrons (internal) during normal operation
 - Client would like to apply for a Curb side licenced area approximately 19 m x 1 m This will be assessed on the eastern and western curbs at the same time for the most conservative assumption. It is assumed 2 patrons/ m², which will allow space for other pedestrians, resulting in 10 patrons each side.
- All other sources taken from AE's database, which are sourced from of typical levels taken by AE personnel or from verified sources including Australian Standards and published datasets.

The following plans have been used to determine source heights and layout:

- Floor Plans – received 8/02/2022.;
- Planning Use Summary– received 8/02/2022; and
- Client email ' FW: 26 Jeays Street, Bowen Hills' received /02/2022.



Table 18: Sound Power Levels

Activity	Noise Source	Qty	Height (m)	Usage Period (%)			Sound Power Level (dB(A))		Noise Characteristics (as per the Noise Measurement Manual)
				Day	Evening	Night	L _{Aeq}	L _{Amax} ^{a)}	
Internal noise	Patrons ^{b)}	50	- ^{e)}	18	100	0	89	-	+5 for impulsiveness
	Entertainment	1	- ^{e)}	18	100	0	96	-	-
	Electric Forklift	1	- ^{e)}	40	40	0	80	-	-
	Distiller (mixing and agitation)	6	- ^{e)}	8	8	8	34	-	-
	Pumps	6	- ^{e)}	8	8	8	45	-	-
	Delivery Truck Idling	1	- ^{e)}	5	5	0	90	-	+5 tonality adjustment
External noise	Delivery Truck Idling	1	1.5	5	5	0	90	-	+5 tonality adjustment
	Electric Forklift	1	1	40	0	0	80	-	-
	Air conditioner	1	0.5	100	100	0	75	-	-
	Food truck Generator (full load)	1	0.5	18	100	0	73	-	-
	Patrons	8	1.7	18	100	0	79	-	+5 for impulsiveness
	Glass Smashing	1	1.5	1 minute	1 minute	0	104	-	-
Low frequency	Food truck Generator (full load)	1	0.5	18	100	0	87 ^{c)}	-	-
	Entertainment	1	-	18	100	0	96 ^{c)}	-	-

a) L_{Amax} assessment only applies to 'specified noise sources' which are defined as impact noises; hammering; loading/unloading; dropping items; beepers, alarms, bells, phones, sirens; power tools; valve releases; air brakes; door slamming. Note—People noise and vehicle pass-by noise (engine, exhaust, induction, tyres) are specifically excluded.

b) Estimate number of patrons. Additional modelling will be conducted to find the maximum number

c) L_{Ceq} value not L_{Aeq}

d) In CadnaA, internal noise source heights cannot be set. Modelled as vertical area sources to represent noise emanating from the building structure

Source locations are shown in Figure 6, internal noise sources are not shown as they cannot be set in CadnaA. Vertical area sources and area sources are used to represent the noise break out from the building.



Figure 6: Location of Noise Sources

5.4 Building Components

AE personal visited the site on the 7 February 2022 and carried out a review of the existing building components.

Table 19: Building Construction

Building Component and Reference	Description
Walls	270mm thick cinderblock brick walls
Roof	Metal profiled roof with acoustic insulation. The type and properties of the acoustic insulation is unknown
Windows	Glass Louvers
Roller door	Profiled metal roller door
Floor	Hard smooth concrete

Transmission loss for building components identified were modelled in INSUL (version 9.0.23) with results summarised in Table 20. Large windows are constructed out of glass louvers. As such, they're considered fully opened in the model and will have no transmission loss.

Table 20: Transmission Loss

Component	Material			Octave Spectrum (dB)							R _w
				63	125	250	500	1K	2K	4K	
Walls	Hollow	Concrete	Blocks	39	43	43	44	52	57	62	51
Metal door	roller	Custom orb	0.55mm	8	11	15	19	23	20	21	21
Roof	Custom orb	0.55mm		48	52	49	52	56	60	48	61 ^{a)}
	Kingspan RW	30/40mm									

Absorption for the room was calculated using general formulae found in Bies and Hansen *"Engineering and Noise Control"*. The average absorption for the room was calculated to be $\alpha = 0.75$, which is typical of large empty room with hard reflective surfaces. This equates to a reverberation time of 0.4 seconds. The underside of the roof is lined with a rigid insulation panel with polyethylene facing in towards the room. This surface provides the most absorption out of all the surfaces in the room. Realistically, the room will have patrons, which will increase the absorption within the building, therefore the calculated reverberation time and absorption is considered conservative.

The absorption coefficient describes what part of a sound wave energy gets absorbed by the obstacle. It can have a value between 0 and 1. $\alpha = 0$, which means that no sound is absorbed - an acoustic equivalent of a mirror. $\alpha = 1$ means that no sound is reflected - this happens, for example, if you happen to open the window. Therefore, all windows for the room have been modelled as opened, which has an absorption coefficient of 1 or completed absorptive.

For the purpose of the assessment, the room absorption provided assumes that all the windows and doors are open as shown in Table 21.

Table 21: Absorption Calculations

Name	Room	Octave Spectrum (dB)						A _w
		125	250	500	1000	2000	4000	
Overall Absorption								0.75

5.5 Modelling Assumptions

The following assumptions have been included in the model:

- As shown in the plans, there is a small kitchenette and toilet which is separated from the main production area. It's assumed that all of operations, both ~~distilling operations~~ and patrons' activity, are contained to the main production area.
- It's assumed all doors and windows are kept open as the worst-case scenario

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Distilling operation
not approved



-
- The building breakout noise was modelled as a vertical area source to take into consideration the entire façade of the building as well as an area source to represent the roof.
 - Two outdoor areas will be modelled at the same time, with 10 people along Hurworth Street and 10 along Jeays Street. As the bulk of the building will block the noise between both locations, modelling them together should not affect results. Food and delivery trucks are modelled in a similar fashion.
 - Delivery trucks were modelled to load in the building and outside on the curb. Due to the size of the site no truck movements are modelled.
 - Air conditioners are assumed to be installed with the rest of the mechanical plant located to the front of the building.

As discussed previously the warehouse is a small lease of the Subject Site. The other leased section of the building contains an office, which is low impact (small number of workers, in a quiet environment all contained indoors). As such noise associated with the office use (except external noise sources) will not be assessed as part of this assessment.

6 PREDICTED RESULTS

As Bowen Hills PDA Development Scheme does not reference the noise criteria in the BCC City Plan 2014 (such as the noise criteria in the Centre or Mixed-Use Code) or the EPP (Noise). As such, any exceedances will not affect the development.

6.1 Normal operations

Table 22 and Table 23, presents predicted L_{Aeq} , L_{Amax} , and low frequency at sensitive receptors. Review of the noise levels confirms the following:

- compliance with the noise limits is predicted to be achieved for the day, evening, and night periods;
- compliance is achieved with the maximum night-time noise level, indicating sleep disturbance is not expected;
- low frequency noise related to those produced from both amplified music and food truck generator. Compliance with the low frequency noise criteria is achieved at all receptors;
- The entertainment noise is not expected to be audible at the sensitive receptors, complying with AO1.1 of the Centre and Mixed Use Code; and
- evening noise levels are highest due to the number of activities undertaken during operational hours, however predicted night-time noise levels take into consideration the infrequent agitation of the ~~distiller~~ AMENDED IN RED
By: Jocelyn Bowyer
Date: 29/03/2023
 Distillery agitation not approved
- No bottles are to be disposed of externally at night

Table 22: Predicted Results (50 patrons inside and 20 outside)

Receptor	Predicted Operational Noise Levels, L_{Aeq}				Noise Criteria (Day/Evening/ Night)	Comply (Y/N)
	Day	Eve	Night	$L_{Amax}^{b)}$		
R01 ^{a)}	36	40	<10	<10	50/48/45/55	Y Y Y
R02 ^{a)}	42	45	<10	<10	50/48/45/55	Y Y Y
R03	37	42	<10	<10	50/48/45/55	Y Y Y
R04	37	40	<10	<10	50/48/45/55	Y Y Y
R05	45	48	<10	<10	50/48/45/55	Y Y Y
R06	46	49	<10	<10	60/-/-	Y Y Y
R07	50	54	<10	<10	60/-/-	Y Y Y
R08	47	50	<10	<10	60/-/-	Y Y Y
R09	47	50	<10	<10	60/-/-	Y Y Y
R10	46	49	<10	<10	60/-/-	Y Y Y
R11	46	49	<10	<10	60/-/-	Y Y Y
R12	44	47	<10	<10	60/-/-	Y Y Y
R13	42	45	<10	<10	60/-/-	Y Y Y
R15 ^{a)}	40	42	<10	<10	60/-/-	Y Y Y

a) Receptor placed at each floor of the sensitive receptor. Maximum results presented.

b) Commercial business only operate during daytime hours

Receptor	Predicted Operational Noise Levels, L_{Aeq}				Noise Criteria (Day/Evening/ Night)	Comply (Y/N)
	Day	Eve	Night	$L_{Amax}^{b)}$		
c) L_{Amax} assessment only applies to 'specified noise sources' which are defined as: impact noises, hammering, loading/unloading, dropping items, beepers, alarms, bells, phones, sirens, power tools, valve releases; air brakes and door slamming.						

Table 23: Predicted Low Frequency Results (50 patrons inside and 20 outside)

Receptor	Predicted Operational Noise Levels, L_{Aeq}			Noise Criteria (Day/Evening/ Night)	Comply (Y/N)
	Day	Eve	Night		
R01 ^{a)}	11	<10	<10	75/75/70	Y Y Y
R02 ^{a)}	31	<10	<10	75/75/70	Y Y Y
R03	18	<10	<10	75/75/70	Y Y Y
R04	27	<10	<10	75/75/70	Y Y Y
R05	33	<10	<10	75/75/70	Y Y Y
R06	35	<10	<10	75/75/70	Y Y Y
R07	38	<10	<10	75/75/70	Y Y Y
R08	37	<10	<10	75/75/70	Y Y Y
R09	37	<10	<10	75/75/70	Y Y Y
R10	36	<10	<10	75/75/70	Y Y Y
R11	36	<10	<10	75/75/70	Y Y Y
R12	34	<10	<10	75/75/70	Y Y Y
R13	32	<10	<10	75/75/70	Y Y Y
R15	30	<10	<10	75/75/70	Y Y Y
R16 ^{a)}	33	<10	<10	75/75/70	Y Y Y
a) Receptor placed at each floor of the sensitive receptor. Maximum results presented.					



7 CONCLUSION

Assured Environmental (AE) was appointed by Plan A Town Planning to undertake a noise assessment for the proposed hotel at 26 Jeays Street, Bowen Hills

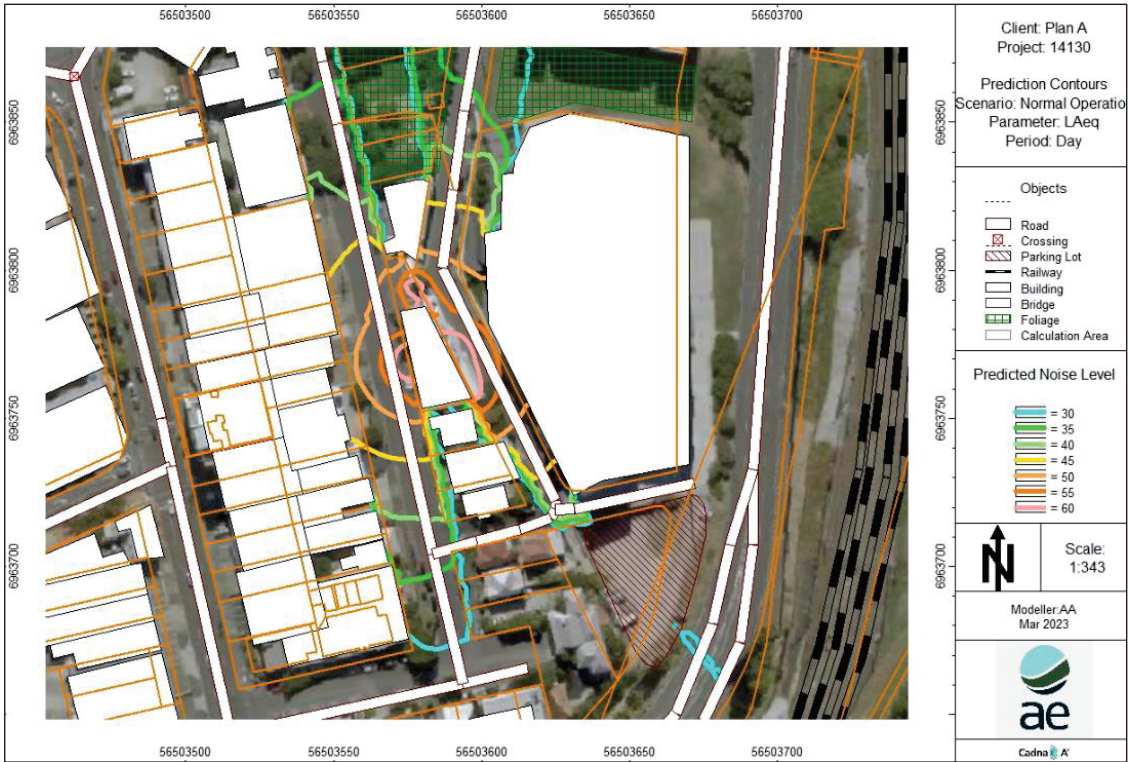
The Subject Site is located within a commercial area, with some sensitive receptors to the north, south and west of the facility

Although the Bowen Hills PDA Development Scheme does not reference the noise criteria a noise impact assessment has been undertaken to confirm the suitability of acoustic amenity for nearby sensitive uses. Specifically, the assessment has considered the potential for adverse impacts upon existing residential and commercial uses as a result of noise emissions associated with the proposed development.

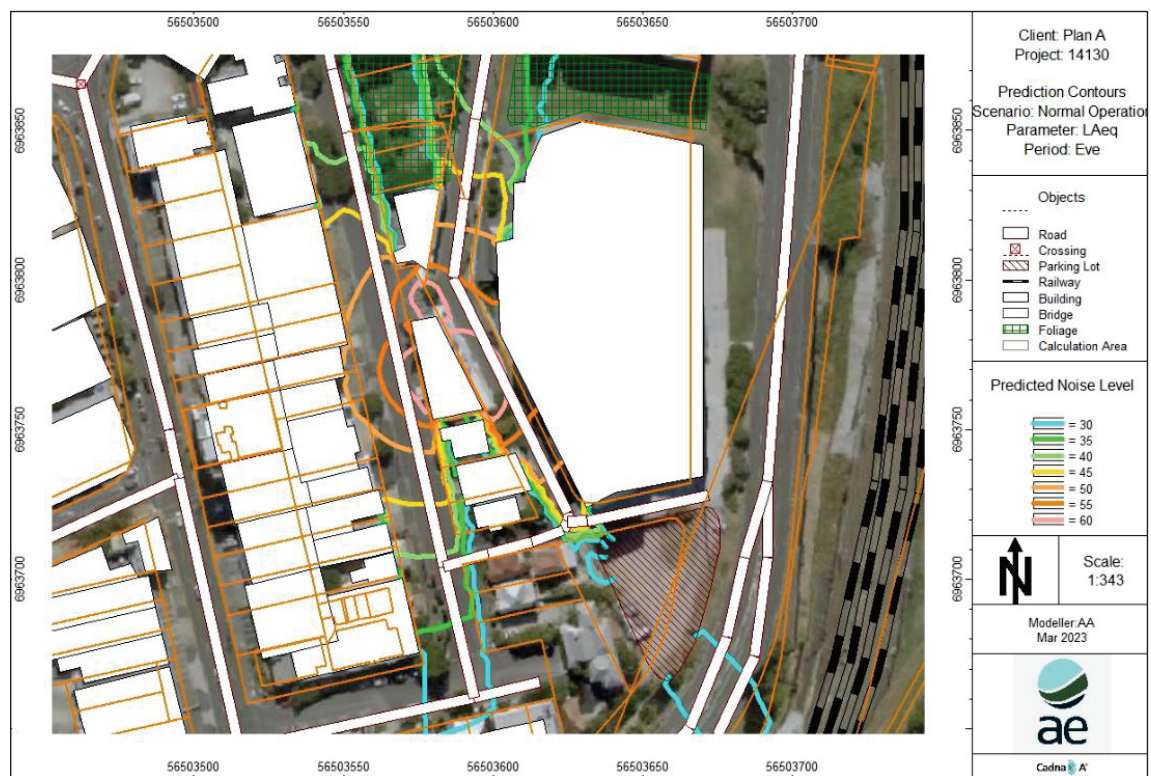
Predictive noise modelling has been undertaken for the proposed development to assess the potential impacts of noise emissions. The results of the predictive noise modelling have determined compliance with the adopted noise criteria is expected to be achieved based on the operation of the hotel.

The premises is expected to involve dining and entertainment activities associated with the Hotel use. In lieu of a restriction to patrons on site, which are not typical for a Hotel use, restrictions to the amplified music (such as a sound limiting device) are considered sufficient acoustic treatments for the Hotel use in this case.

APPENDIX A: NOISE CONTOURS



Predicted LAeq Noise Level Contour at 1.5 m– Day



Predicted LAeq Noise Level Contour at 1.5 m - Evening



Predicted L_{Aeq} Noise Level Contour at 1.5 m - Night



Predicted L_{Ceq} Predicted Low Frequency Noise Level Contours at 1.5 m - Day



Predicted L_{Ceq} Predicted Low Frequency Noise Level Contours at 1.5 m - Evening



Predicted L_{eq} Predicted Low Frequency Noise Level Contours at 1.5 m– Night