

APPENDIX E

Environmental Noise Impact Assessment

Prepared by:

CRG Acoustics

Proposed Health Care Services and Indoor Sports and Recreation
“Glenvale Health Hub”
3 / 535 South Street, Glenvale
(Lot 3 on SP346114)

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

Prepared For:

Timon Pty Ltd

8 May 2026

crgref: 22112 report gym south

1.0 INTRODUCTION

This report is in response to a request by Timon Pty Ltd for an environmental noise impact assessment of a proposed Health Care Services and Indoor Sports and Recreation development along South Street in Glenvale.

In undertaking the above, noise monitoring was conducted and through modelling, predictions of onsite activity noise emissions were produced. Based upon the predicted noise impact levels, recommendations regarding acoustic treatment to the development have been provided.

2.0 SITE & DEVELOPMENT DESCRIPTION

The site is described as 3 / 535 South Street (Lot 3 on SP346114), Glenvale, and holds an approval for a medical use, and is bounded by South Street to the south, a road easement to the east, and residential uses to the north and west. For site location refer to Appendix A.

The proposal is to fitout Tenancy 1 for a 24 hour gym, and Tenancy 2 for a health care services use (Allied Health) operating between 6am and 9pm. Carparking is proposed at the southern end of the site with the building towards the northern end and vehicle access from a driveway crossover to the eastern road easement. For development plans refer to Appendix B.

Noise impacts from the proposed onsite gym and health care services activities have been assessed to ensure an acceptable level of acoustical amenity can be achieved at the surrounding noise sensitive receivers (for receiver locations refer to Figure 2 in Appendix A), which are as follows:

Receiver R1: Existing and under-construction detached single-storey dwellings to the immediate north at 4 / 535 South Street.

Receiver R2: Existing detached single-storey dwellings to the south across South Street.

Receiver R3: Existing single and two-storey townhouses to the immediate west at 541 South Street.

It is noted that there is an existing 1.8m high acoustic barrier between the subject site and receiver R3. Further, a 1.8m high acoustical barrier was recommended between the subject site and the northern dwelling receivers R1 currently being constructed (refer to the Environmental Noise Impact Assessment report completed by CRG Acoustics in August 2024 (CRGref: 22112 report REV 7). This barrier was recommended to mitigate activity noise from the previously approved medical centre layout over the subject site. These acoustical barriers have been included in the noise modelling presented in Section 5.

The expected gym patronage over a typical 24 hour period is presented over page.



Coogar Pty Ltd

Snap Fitness Griffith

16 Jondaryan St Griffith

NSW

Anthea/ Royce

As per our conversation below is the data that has been accumulated across our Snap Fitness Group.

Club Size 500sqm to 800sqm with a high membership base these Include clubs - Dalby, Toowoomba & Dubbo, Roma & Yeppoon

Average daily usage of club per 24-hour period – 176 visits including staff – this is on the busier clubs that have been established for some time and are at a high capacity on a Monday, from here the numbers tail off with Friday and weekends are generally 30% less than these numbers. Across these clubs the period of 5am to 7am and 3pm to 8pm are the busier times, we see at the highest point of no more than approx. 25 to 30 members in the club at once.

Hourly visits on a Monday in our busiest clubs

- 4am to 5am – 8
- 5am to 6am – 10
- 6am to 7am – 14
- 7am to 8am – 6
- 8am to 9am – 8
- 9am to 10am – 12
- 10am to 11am – 5
- 11am to midday – 6
- Midday to 1pm – 9
- 1pm to 2pm – 8
- 2pm to 3pm – 8
- 3pm to 4pm – 9
- 4pm to 5pm – 10
- 5pm to 6pm – 16
- 6pm to 7pm – 15
- 7pm to 8pm – 12
- 8pm to 9pm – 9
- 9pm to 10pm – 4
- 10pm to 11pm – 4
- 11pm to midnight – 3

3.0 NOISE SURVEYS

3.1 Instrumentation

The following equipment was used to measure the existing acoustical environment at the site locale:

- Rion NC 73 Calibrator;
- BWSA Sound Level Noise Logging Meter.

All instrumentation used in this assessment hold current calibration certificates from a certified calibration laboratory.

3.2 Ambient Noise Level Measurement Methodology

A noise logger was located to the southeast of the subject site across the road easement. The microphone was in a free-field position (at least 3.5m from the dwelling façade) approximately 1.4m above ground. For the logger location refer to Figure 2 in Appendix A.

The logger was set to record noise statistics in 15 minute blocks continually between Friday 26/08/2022 and Friday 2/09/2022.

Noise measurements were conducted generally in accordance with Australian Standard AS 1055:2018 – “Acoustics – Description & Measurement of Environmental Noise”. The operation of the sound level equipment was field calibrated before and after the measurement session, with no significant drift from the reference signal recorded.

Weather conditions during the monitoring period were obtained from the Bureau of Meteorology website from the Toowoomba weather station. Weather conditions during the monitoring period were fine except for 4mm of rain on Wednesday 31/08, with a temperature range between 3 and 20°C, a relative humidity range between 45 and 100%.

3.3 Background Noise Level Measurement Results

Table 1 below presents the measured rating background levels (RBLs) calculated from the logger data. Data collected on Wednesday 31/08 has been excluded from the results presented in Table 1 due to the occurrence of rain. Graphical presentation of the measured noise levels from the logger are presented in the Appendix C.

Background Noise Descriptor	Time period	Rating Background Level dB(A)
Daytime RBL L ₉₀	7am to 6pm	39
Evening RBL L ₉₀	6pm to 10pm	44 (35 AS2107:1997)
Night-time RBL L ₉₀	10pm to 7am	28

Table 1: Rating Background Levels calculated from logger data.

It is noted that the graphed data (refer to Appendix C) was affected by insect noise during the evening period, therefore, we have applied evening estimated average background noise levels stated in AS1055.2 – 1997 “Acoustics-Description and measurement of environmental noise” for “Noise area category R1 Areas with negligible transportation”.

4.0 NOISE CRITERION

Performance Outcome 8 of the Environmental Standards Code sets the following requirements for noise impacts:

Acceptable Outcome AO_{8.1} of the Environmental Standards Code sets a criterion based upon ambient noise levels, which equates to the following limits, based upon measured background noise levels:

Noise Source	Noise Limit, SPL dB(A) L _{eq} (15 min)
Time Varying Noise (i.e. car door closures)	
Day 7am to 6pm	44 (Measured L _{A90} level 39 + 5 dB) at facade
Evening 6pm to 10pm	40 (AS2107 L _{A90} level 35 + 5 dB) at facade
Night-time 10pm to 7am	31 (Measured L _{A90} level 28 + 3 dB) inside bedrooms, OR 36 at facade, assuming open window
Continuous Noise (i.e. mechanical plant; padmounted transformer)	
Day 7am to 6pm	39 (Measured L _{A90} level 39 + 0 dB) at facade
Evening 6pm to 10pm	35 (AS2107 L _{A90} level 35 + 0 dB) at facade
Night-time 10pm to 7am	28 (Measured L _{A90} level 28 + 0 dB) inside bedrooms OR 33 at facade, assuming open window

Table 2: Noise limit criterion for Toowoomba Regional Council's
"Environmental Standards Code".

Further to the above, under Acceptable Outcome AO_{8.1} of the Environmental Standards Code, Council applies a limit of 45 dB(A) L_{max} inside dwellings. This limit is based upon the sleep disturbance criteria cited by the World Health Organisation.

Acceptable Outcome AO_{8.1} of the Environmental Standards Code also cites the "Acoustic Quality Objectives" in the Environmental Protection (Noise) Policy 2008 (it is noted that the Policy is now superseded by the Environmental Protection (Noise) Policy 2019) as presented below:

Column 1	Column 2	Column 3			Column 4
Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) dB(A)			Environmental value
		L _{Aeq,adj,1hr}	L _{A10,adj,1hr}	L _{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	35	40	health and wellbeing, in relation to the ability to sleep
hospital, surgery or other medical institution (for indoors)	visiting hours	35			health and wellbeing

Table 3: Criterion from Schedule 1 of the Environmental Protection (Noise) Policy 2019.

5.0 PREDICTED NOISE IMPACTS

All noise source levels used have been collected from similar assessments. All short duration / fluctuating noise source levels assessed under the “Acoustic Quality Objectives” criterion have been corrected for impulsiveness or tonality as per Australian Standard AS 1055:2018 – “Acoustics-Description and measurement of environmental noise”.

The following noise source levels typically occur as part of the proposed gym and health care services uses and have been assessed within this report.

Activity/Noise Source	Distance To Source	Event Duration Noise Level, SPL dB(A)			
		L _{max}	L _{eq}	L _{01 1hr}	L _{01 1hr}
Car door closures	1m	85	80*	83*	85*
Car bypass	1m	74	68	70	73
Car starts	1m	76	73	74	75
People talking outside	1m	64	58	60	62
Amplified music from inside gym	2m	85	79**	83**	87**
Cable pull down with metal clang inside gym	1m	90	83*	87*	93*
Four walking machines inside gym	1m	75	71	72	74
Battle rope swing inside gym	2m	63	58	59	60
200kg heavy weight drop onto rubber flooring inside gym	1m	95	93**	96**	99**
Deliveries	1m	N/A	77*	80*	85*
Waste collection	1m	N/A	95*	102*	107*

* Denotes + 5 dB correction for impulsiveness in accordance with AS1055. ** Denotes + 5 dB correction for tonality in accordance with AS1055.

Table 4: Typical short duration noise source levels associated with the proposed uses.

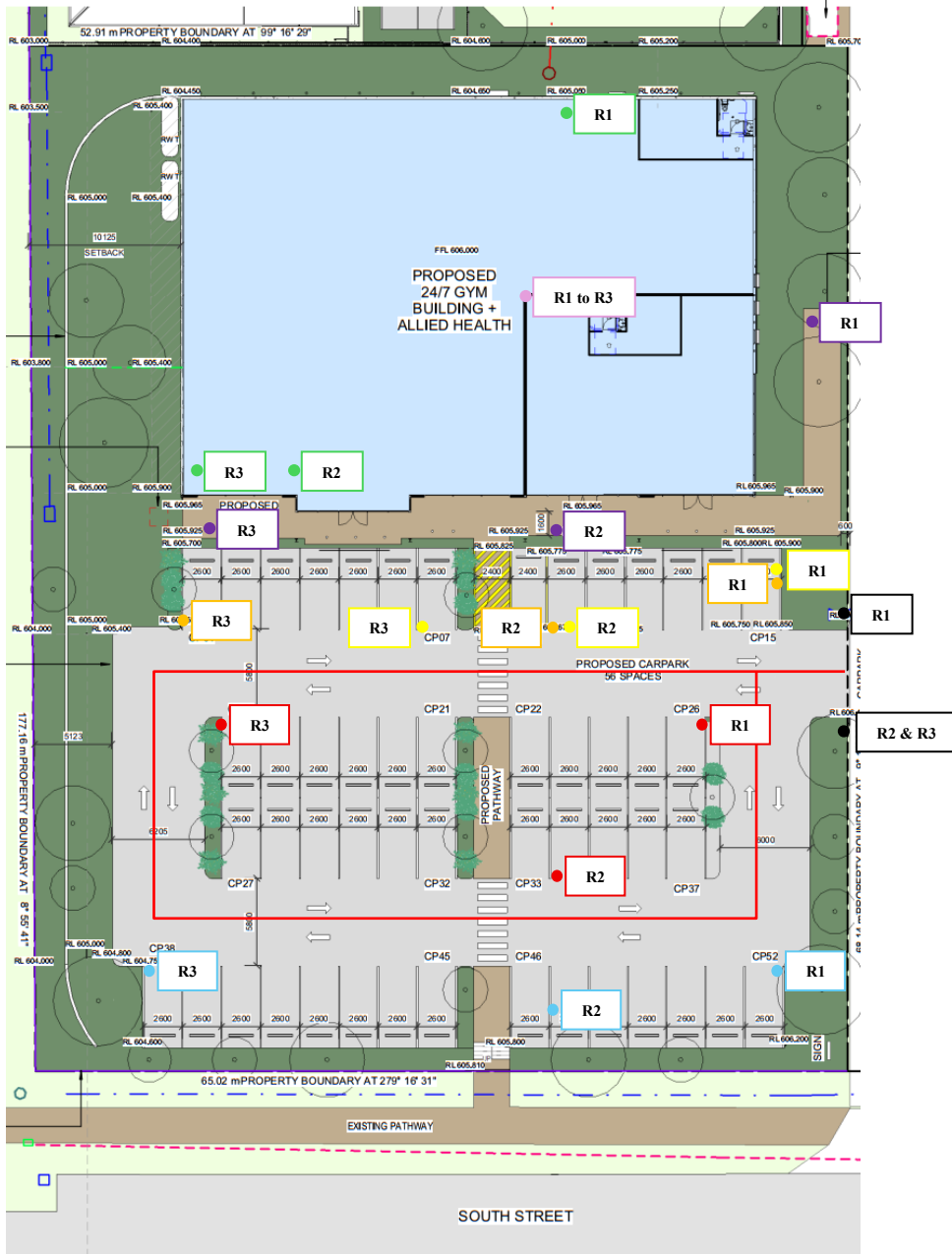
Traffic generation rates for the gym tenancy are based on patronage data provided by the client for similar gyms (refer to Section 2), with a peak patronage of 16 people. For the health care services tenancy, we have applied a rate of 10.4 vehicles per peak hour per 100m² gross floor area for the daytime / evening periods based the RTA Guide to Traffic Generating Developments document for “Extended hours medical centres”, with reduced rates for the 6am to 7am morning period.

For the L_{Aeq} levels we have presented the 15 minute duration and also the adjusted one hour duration. For assessment of the “Background Creep” criterion we have adopted the L_{Aeq 15 minute} levels. With regards to the L_{A10 1hr} and L_{A01 1hr} levels, in many cases, particularly during the night-time period, noise events such as car door closures may not register as L_{A10} or L_{A01} levels if the events do not occur for 10% or 1% of the time period respectively. For example, a 1 second event would have to occur 360 times during a one hour period to register as an L_{A10}, and 36 times during a one hour period to register as an L_{A01} as these noise descriptors are statistically defined. If the events do not occur for the minimum number of iterations (or time period) we have presented the results as “N/A” in Table 5.

Based upon the location of the onsite uses / activities (refer to Figure 5.1) in relation to the surrounding noise sensitive receivers (building façades and inside rooms with windows open), we predict the following noise impact levels as presented in Table 5 (L_{eq}, L₁₀ and L₀₁) and Table 6 (L_{max}). Combined impacts include all impacts (including the mechanical plant noise predictions presented in Table 6) except waste collection and deliveries which are typically infrequent occurrences.

The predicted levels assume that the recommended treatments detailed in Section 6 are incorporated into the development. For point source calculations which show the number of events during the assessment periods, applied correction for tonality / impulsiveness, distance between noise source and receivers, and any noise mitigation from building envelopes and acoustic barriers refer to Appendix C.

Figure 5.1: Noise modelling plan of onsite noise source locations (Not to Scale).



LEGEND

- People talking outside
- Car door closures / car starts NORTH
- Car door closures / car starts CENTRE
- Car door closures / car starts SOUTH (modelled for the daytime / evening periods only)
- Indoor gym activity
- Deliveries (modelled for the daytime / evening periods only)
- Waste collection (modelled for the daytime / evening periods only)
- ✓ Car bypasses
- Rooftop mechanical plant
- R1 Receiver numbers

DAYTIME AND EVENING PERIODS

Activity/Noise Source	Predicted Noise Impact, SPL dB(A)						
	Nearest Façade / Outdoor Recreation				Inside Windows Open		
	L _{eq} 15min	L _{eq} 1hr	L ₁₀ 1hr	L ₀₁ 1hr	L _{eq} 1hr	L ₁₀ 1hr	L ₀₁ 1hr
R1: Existing and under-construction detached single-storey dwellings to the immediate north							
Car door closures NORTH	22	24	N/A	N/A	17	N/A	N/A
Car door closures CENTRE	16	18	N/A	N/A	< 15	N/A	N/A
Car door closures SOUTH	18	20	N/A	N/A	< 15	N/A	N/A
Car bypass	29	26	34	37	18	27	30
Car starts NORTH	22	19	N/A	40	< 15	N/A	33
Car starts CENTRE	16	< 15	N/A	34	< 15	N/A	27
Car starts SOUTH	18	15	N/A	36	< 15	N/A	28
People talking outside	28	28	30	32	20	23	25
Amplified music from inside gym	26	31	35	39	23	27	31
Cable pull down with metal clang inside gym	26	28	36	42	20	28	34
Four walking machines inside gym	20	20	21	23	< 15	< 15	15
Battle rope swing inside gym	< 15	< 15	< 15	15	< 15	< 15	< 15
200kg heavy weight drop onto rubber flooring inside gym	21	23	N/A	48	16	N/A	40
Combined L_{eq} / Highest L₀₁ and L₀₁	34	36	36	48	28	28	40
Deliveries	37	39	45	50	32	38	43
Waste collection	53	52	N/A	77	45	N/A	70
R2: Existing detached single-storey dwellings to the south across South Street							
Car door closures NORTH	24	26	N/A	N/A	19	N/A	N/A
Car door closures CENTRE	27	29	N/A	N/A	22	N/A	N/A
Car door closures SOUTH	29	31	N/A	N/A	24	N/A	N/A
Car bypass	35	32	41	44	24	33	36
Car starts NORTH	24	21	N/A	42	< 15	N/A	35
Car starts CENTRE	27	24	N/A	45	16	N/A	37
Car starts SOUTH	29	26	N/A	47	18	N/A	39
People talking outside	23	23	26	28	16	19	21
Amplified music from inside gym	16	21	25	29	< 15	17	21
Cable pull down with metal clang inside gym	< 15	15	23	29	< 15	15	21
Four walking machines inside gym	< 15	< 15	< 15	< 15	< 15	< 15	< 15
Battle rope swing inside gym	< 15	< 15	< 15	< 15	< 15	< 15	< 15
200kg heavy weight drop onto rubber flooring inside gym	< 15	< 15	N/A	30	< 15	N/A	22
Combined L_{eq} / Highest L₀₁ and L₀₁	37	37	41	47	29	33	39
Deliveries	39	41	47	52	34	40	45
Waste collection	52	51	N/A	76	43	N/A	68
R3: Existing single and two-storey townhouses to the immediate west							
Car door closures NORTH	27	29	N/A	N/A	22	N/A	N/A
Car door closures CENTRE	25	27	N/A	N/A	20	N/A	N/A
Car door closures SOUTH	25	27	N/A	N/A	19	N/A	N/A
Car bypass	36	33	42	45	26	34	37
Car starts NORTH	27	24	N/A	45	17	N/A	38
Car starts CENTRE	25	22	N/A	43	15	N/A	36
Car starts SOUTH	24	21	N/A	42	< 15	N/A	35
People talking outside	27	27	30	32	19	22	24
Amplified music from inside gym	26	31	35	39	23	27	31
Cable pull down with metal clang inside gym	26	28	36	42	20	28	34
Four walking machines inside gym	20	20	21	23	< 15	< 15	15
Battle rope swing inside gym	< 15	< 15	< 15	15	< 15	< 15	< 15
200kg heavy weight drop onto rubber flooring inside gym	21	23	N/A	48	16	N/A	40
Combined L_{eq} / Highest L₀₁ and L₀₁	38	38	42	48	30	34	40
Deliveries	37	39	45	50	31	37	42
Waste collection	51	50	N/A	75	42	N/A	67
Applicable Criterion	B. Creep		Acoustic Quality Objectives				
Daytime / Evening Criterion	44 / 40		50	55	65	35	40
						45	

Table 5: Predicted L_{eq}, L₁₀ and L₀₁ short duration noise impacts at assessed noise sensitive receivers.

For the night-time period before 7am and after 10pm, the southern car parking spaces are not expected to be used (their use being infrequent / negligible) given they are furthest from the entries to both tenancies and have therefore not been assessed.

Waste collection and deliveries are predicted to exceed the night-time criterion and have been recommended to not be conducted during the night-time period.

NIGHT-TIME PERIOD

Activity/Noise Source	Predicted Noise Impact, SPL dB(A)						
	Nearest Façade / Outdoor Recreation				Inside Windows Open		
	L _{eq} 15min	L _{eq} 1hr	L ₁₀ 1hr	L ₀₁ 1hr	L _{eq} 1hr	L ₁₀ 1hr	L ₀₁ 1hr
R1: Existing and under-construction detached single-storey dwellings to the immediate north							
Car door closures NORTH	22	23	N/A	N/A	16	N/A	N/A
Car door closures CENTRE	15	17	N/A	N/A	< 15	N/A	N/A
Car bypass	25	22	N/A	37	< 15	N/A	30
Car starts NORTH	20	16	N/A	N/A	< 15	N/A	N/A
Car starts CENTRE	< 15	< 15	N/A	N/A	< 15	N/A	N/A
People talking outside	28	28	30	32	20	23	25
Amplified music from inside gym	26	31	35	39	23	27	31
Cable pull down with metal clang inside gym	26	28	36	42	20	28	34
Four walking machines inside gym	20	20	21	23	< 15	< 15	15
Battle rope swing inside gym	< 15	< 15	< 15	15	< 15	< 15	< 15
200kg heavy weight drop onto rubber flooring inside gym	21	23	N/A	48	16	N/A	40
Combined L_{eq} / Highest L₀₁ and L₀₁	33	35	36	48	28	28	40
R2: Existing detached single-storey dwellings to the south across South Street							
Car door closures NORTH	23	25	N/A	N/A	18	N/A	N/A
Car door closures CENTRE	26	28	N/A	N/A	21	N/A	N/A
Car bypass	31	28	N/A	44	21	N/A	36
Car starts NORTH	21	18	N/A	N/A	< 15	N/A	N/A
Car starts CENTRE	24	21	N/A	N/A	< 15	N/A	N/A
People talking outside	23	23	26	28	16	19	21
Amplified music from inside gym	16	21	25	29	< 15	17	21
Cable pull down with metal clang inside gym	< 15	15	23	29	< 15	15	21
Four walking machines inside gym	< 15	< 15	< 15	< 15	< 15	< 15	< 15
Battle rope swing inside gym	< 15	< 15	< 15	< 15	< 15	< 15	< 15
200kg heavy weight drop onto rubber flooring inside gym	< 15	< 15	N/A	30	< 15	N/A	22
Combined L_{eq} / Highest L₀₁ and L₀₁	34	33	26	44	26	19	36
R3: Existing single and two-storey townhouses to the immediate west							
Car door closures NORTH	26	28	N/A	N/A	21	N/A	N/A
Car door closures CENTRE	25	26	N/A	N/A	19	N/A	N/A
Car bypass	32	29	N/A	45	22	N/A	37
Car starts NORTH	24	21	N/A	N/A	< 15	N/A	N/A
Car starts CENTRE	23	19	N/A	N/A	< 15	N/A	N/A
People talking outside	27	27	30	32	19	22	24
Amplified music from inside gym	26	31	35	39	23	27	31
Cable pull down with metal clang inside gym	26	28	36	42	20	28	34
Four walking machines inside gym	20	20	21	23	< 15	< 15	15
Battle rope swing inside gym	< 15	< 15	< 15	15	< 15	< 15	< 15
200kg heavy weight drop onto rubber flooring inside gym	21	23	N/A	48	16	N/A	40
Combined L_{eq} / Highest L₀₁ and L₀₁	36	37	36	48	29	28	40
Applicable Criterion	B. Creep		Acoustic Quality Objectives				
Night-time Criterion	36			30	35	40	

Table 5 (Con't): Predicted L_{eq}, L₁₀ and L₀₁ short duration noise impacts at assessed noise sensitive receivers.

Activity/Noise Source	Predicted Noise Impact, SPL dB(A)
	Inside Windows Open
	L_{max}
R1: Existing and under-construction detached single-storey dwellings to the immediate north	
Car door closures NORTH	40
Car door closures CENTRE	34
Car bypass	28
Car starts NORTH	31
Car starts CENTRE	25
People talking outside	24
Amplified music from inside gym	27
Cable pull down with metal clang inside gym	29
Four walking machines inside gym	< 15
Battle rope swing inside gym	< 15
200kg heavy weight drop onto rubber flooring inside gym	34
Highest L_{max}	40
R2: Existing detached single-storey dwellings to the south across South Street	
Car door closures NORTH	42
Car door closures CENTRE	45
Car bypass	35
Car starts NORTH	33
Car starts CENTRE	36
People talking outside	20
Amplified music from inside gym	17
Cable pull down with metal clang inside gym	16
Four walking machines inside gym	< 15
Battle rope swing inside gym	< 15
200kg heavy weight drop onto rubber flooring inside gym	21
Highest L_{max}	45
R3: Existing single and two-storey townhouses to the immediate west	
Car door closures NORTH	45
Car door closures CENTRE	43
Car bypass	36
Car starts NORTH	36
Car starts CENTRE	34
People talking outside	24
Amplified music from inside gym	27
Cable pull down with metal clang inside gym	29
Four walking machines inside gym	< 15
Battle rope swing inside gym	< 15
200kg heavy weight drop onto rubber flooring inside gym	34
Highest L_{max}	45
Applicable Criterion	
L_{max} Criterion	45

Table 6: Predicted L_{max} noise impacts at assessed noise sensitive receivers.

Continuous onsite activity noise source levels have been compiled from similar previous investigations. All noise levels have been corrected for impulsiveness or tonality as per Australian Standard AS 1055:2018 – “*Acoustics-Description and measurement of environmental noise*”.

It should be stressed that air conditioner mechanical plant selections have yet to be undertaken, for this reason; we have applied noise levels from other similar commercial assessments as follows:

- Air conditioner units each generating 60 dB(A) at 2m assumed at a rooftop plant deck.

Based upon the assumed locations of the onsite mechanical plant (refer to Figure 5.1) in relation to the surrounding noise sensitive receivers (building façades, inside rooms with windows open), we predict the following noise impact levels as presented in Table 7 below.

The predicted levels assume that the recommended treatments detailed in Section 6 are incorporated into the development. For point source calculations refer to Appendix C.

Onsite Continuous Noise Source	Predicted Noise Impact, SPL L_{eq} dB(A)	
	Nearest Façade	Inside Windows Open
R1: Existing and under-construction detached single-storey dwellings to the immediate north		
Combined A/C plant with acoustical screening	31	24
R2: Existing detached single-storey dwellings to the south across South Street		
Combined A/C plant with acoustical screening	18	< 15
R3: Existing single and two-storey townhouses to the immediate west		
Combined A/C plant with acoustical screening	26	18
Applicable Criterion	B. Creep	Acoustic Quality Objectives
Daytime / Evening Criterion	39 / 35	35
Night-time Criterion	33	28

Table 7: Predicted continuous duration noise impacts at assessed noise sensitive receivers.

6.0 RECOMMENDED ACOUSTIC TREATMENTS

6.1 Onsite Operational Activity

The following acoustic treatments and management principles are recommended to mitigate onsite operational activity noise impacts:

- Hours of operation of the health care services be between 6am to 10pm, seven days per week.
- Hours of operation of the gym can be 24 hours per day, seven days per week.
- Maintain or upgrade the existing 1.8m high fence along the western site boundary to be free of gaps and holes (including no gaps between the ground and the base of the fence) and achieve a minimum surface mass of 11kg/m² as detailed in Sketch No.1 in Appendix A. Typical materials include 19mm lapped timber fence (40% overlap), 9mm FC sheet, toughened glass, Perspex, masonry, or a combination of the above (is required).
- Entry doors to the gym are to have automatic closers installed and maintained.
- The gym is to be air-conditioned to allow external windows and doors to be kept closed.
- The external glazing at the gym tenancy (i.e. doors and windows) is to achieve a minimum R_w rating of 35 (i.e. 10.38mm laminate in acoustic grade frames with acoustic grade Q-lon seals).
- External walls of the gym tenancy are to achieve a minimum R_w rating of 48 (i.e. tilt up concrete, blockwork, and / or a compliant light weight wall treatment - refer over page for a construction example).
- The roof / ceiling system of the gym tenancy is to achieve a minimum R_w rating of 48 (refer over page for a construction example).
- A minimum 16mm thick rubber floor matting is to be laid underneath all free weights areas and weights machines. If weight lifting above 40 kg is proposed, a sprung isolated floor (refer to Embelton for products) may be required to reduce structure borne regenerated noise. To determine the need for this, a test would be required.
- Signage is to be provided inside the gym warning members not to drop weights.
- Music is to be limited to inside the gym tenancy and to a source level of 74 dB(A) L_{eq} at 2m.
- Speakers are to be directed away from any windows / doors and are to be directed downwards from the ceiling. Speakers are also to be fixed on vibration isolation mounts.
- Deliveries be limited to the daytime and evening periods between 7am to 10pm.
- Waste collection be limited to the daytime periods between 7am to 6pm.
- Mechanical plant be designed and installed to comply with the noise criterion presented in Section 4. As final plant selection has not been completed, additional acoustic assessment/s should be undertaken once plant selections are finalised. Such assessments should be undertaken prior to Building Approval; and be conditioned within the Development Approval.

LIGHT-WEIGHT EXTERNAL WALL SYSTEM (Sourced from James Hardie)

(Hardies Sound Predictions have a ± 3 R_w rating; therefore a required R_w 48 needs a minimum R_w 51 Sound Prediction)

Sound Insulation Prediction (v9.0.20)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB

- Key No. 3695

Job Name:

Initials:lanM

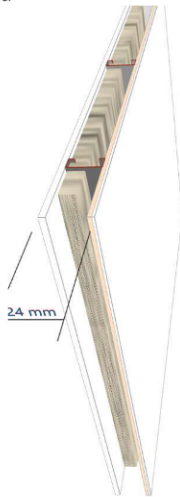
Job No.:

Date:4/05/2022

File Name:



Notes:



R_w 51 dB
C -2 dB
Ctr -7 dB

Mass-air-mass resonant frequency = 56 Hz

Panel Size = 2.7 m x 4.0 m

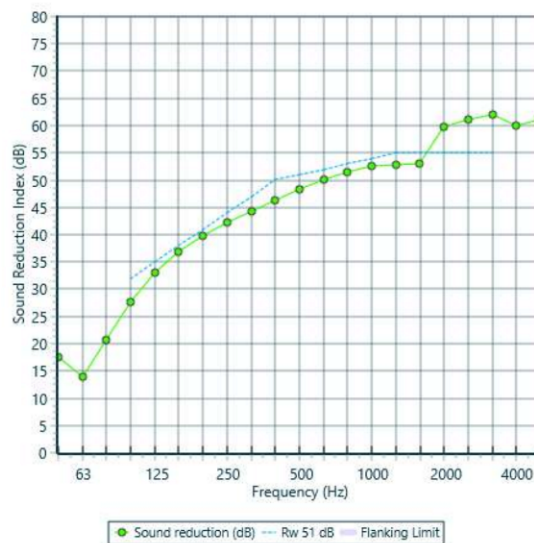
Partition surface mass = 42.8 kg/m²

System description

Panel 1 : 1 x 16 mm JH Scyon Linea

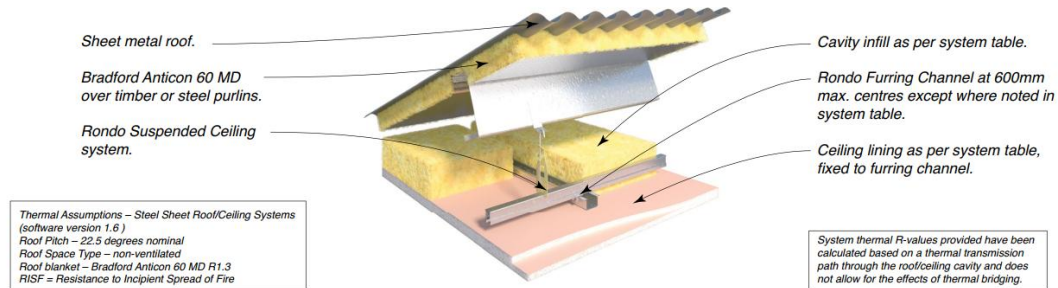
Frame: Steel Stud (1.0-1.6mm) (92 mm x 38 mm), Stud spacing 600 mm ; Cavity Width 92 mm , 1 x Bradford Fibertex HD Rockwool Thickness 50 mm
Panel 2 : 1 x 10 mm Plasterboard + 1 x 6 mm Villaboard 6mm

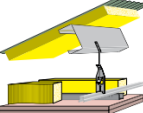
freq.(Hz)	R(dB)	R(dB)
50	17	
63	14	16
80	21	
100	28	
125	33	31
160	37	
200	40	
250	42	42
315	44	
400	46	
500	48	48
630	50	
800	52	
1000	53	52
1250	53	
1600	53	
2000	60	56
2500	61	
3150	62	
4000	60	61
5000	61	



SUSPENDED CEILING CONSTRUCTION (Sourced from the CSR Redbook 2023):

SYSTEM SPECIFICATIONS Roof/Ceiling – Pitched Steel Roof with Suspended Grid & Clip Fixed Furring



SYSTEM SPECIFICATION Refer to Book 2 and 3 for further information			ACOUSTIC REPORT: PKA – A124		Thermal	
FRL Report	SYSTEM N°	CEILING LININGS	CAVITY INFILL (Refer to TABLE B6)	R _w / R _w +C _{tr}	Steel Roofing with Anticon	
					R _t (SUM)	R _t (WIN)
60/60/60 +RISF 60 minutes EWFA 26162	CSR 6595 	1 x 13mm Gyprock Fyrcek Plasterboard. 1 x 16mm Gyprock Fyrcek Plasterboard (any order).	(a) 140 Gold Batts 2.5	51/43	5.1	4.9
			(b) 165 Gold Batts 3.0	51/43	5.6	5.4
			(c) 185 Gold Batts 3.5	52/44	6.0	5.9
			(d) 215 Gold Batts 4.1	52/44	6.6	6.5

6.2 Inter-tenancy Building Treatments

The following acoustic building treatments are recommended between the gym tenancy (Tenancy 1) and the health care services tenancy (Tenancy 2) within the building to mitigate onsite internal and structure borne noise impacts:

- There are to be two separate floor slabs (and foundation pier systems) for the building, being a single floor slab for Tenancy 1 and an additional separate floor slab for Tenancy 2. The two floor slabs are to be separated by a minimum gap of 20mm.
- There are to be two separate internal wall systems between the Tenancy 1 and Tenancy 2. The gap between the two separate walls is to be a minimum of 20mm. The walls are each to achieve a minimum R_w of 47 (i.e. tilt up concrete, blockwork, and / or a compliant light weight wall treatment - refer to the example given in Section 6.1).
- The two internal walls cited above are to run from the floor slabs, up to the roof sheeting, with no gaps or holes to ensure no noise breakout. Any gaps between the top of the walls and the corrugated metal sheeting are to be filled with insulation or acoustic caulking.
- The ceiling above the gym is to be a suspended system which has a minimum of two layers of plasterboard (i.e. 16mm and 13mm plasterboard) and is to have insulation bats directly above (i.e. refer to the example provided in Section 6.1).

7.0 DISCUSSION and CONCLUSIONS

This report is in response to a request by Timon Pty Ltd for an environmental noise impact assessment of a proposed Health Care Services and Indoor Sports and Recreation development along South Street in Glenvale. The lots holds a current approval for health services.

Based upon the assumed source levels and recommended treatments and management controls, proposed onsite activity noise (including combined L_{eq} impacts) impacting the surrounding noise sensitive receivers are predicted to be within the relevant external and internal “*Acoustic Quality Objectives*”, “*Background Creep*” and sleep disturbance L_{max} criterion, except for waste collection and deliveries. It is noted that deliveries are predicted to achieve the daytime and evening criterion.

To minimise the potential for annoyance we have recommended that waste collection be limited to the daytime period between 7am and 6pm, and deliveries between 7am and 10pm. Further, as waste collection activities are typically of short duration and of an infrequent nature such activities are unlikely to cause annoyance.

We have provided an indication of potential plant noise impact levels although, the levels are merely a guide as no plant selections have yet been completed. For this reason, we recommend that plant noise be assessed upon detailed design, and a certificate be provided to the Building Certifier confirming that all plant and equipment comply with the noise limit criteria. Based upon experience, we expect that all plant and equipment can be treated to comply with the noise limit criteria.

We have also provided internal inter-tenancy wall and roof / ceiling treatments to ensure noise, including structure borne, is sufficiently mitigated to the other tenancies within the building.

Overall, the proposed development will generally be within acceptable levels of the adopted criterion, subject to the acoustic treatments recommended in Section 6 being integrated into the design, construction, and operation of the facility.

Report Reviewed By:



JAY CARTER BSc
Director

Report Compiled by:



Matthew Lopez BEng
Consultant

APPENDIX A

Subject Site, Measurement and Assessed Offsite Receiver Locations

Figure No. 1: Subject Site Location (Google Maps).

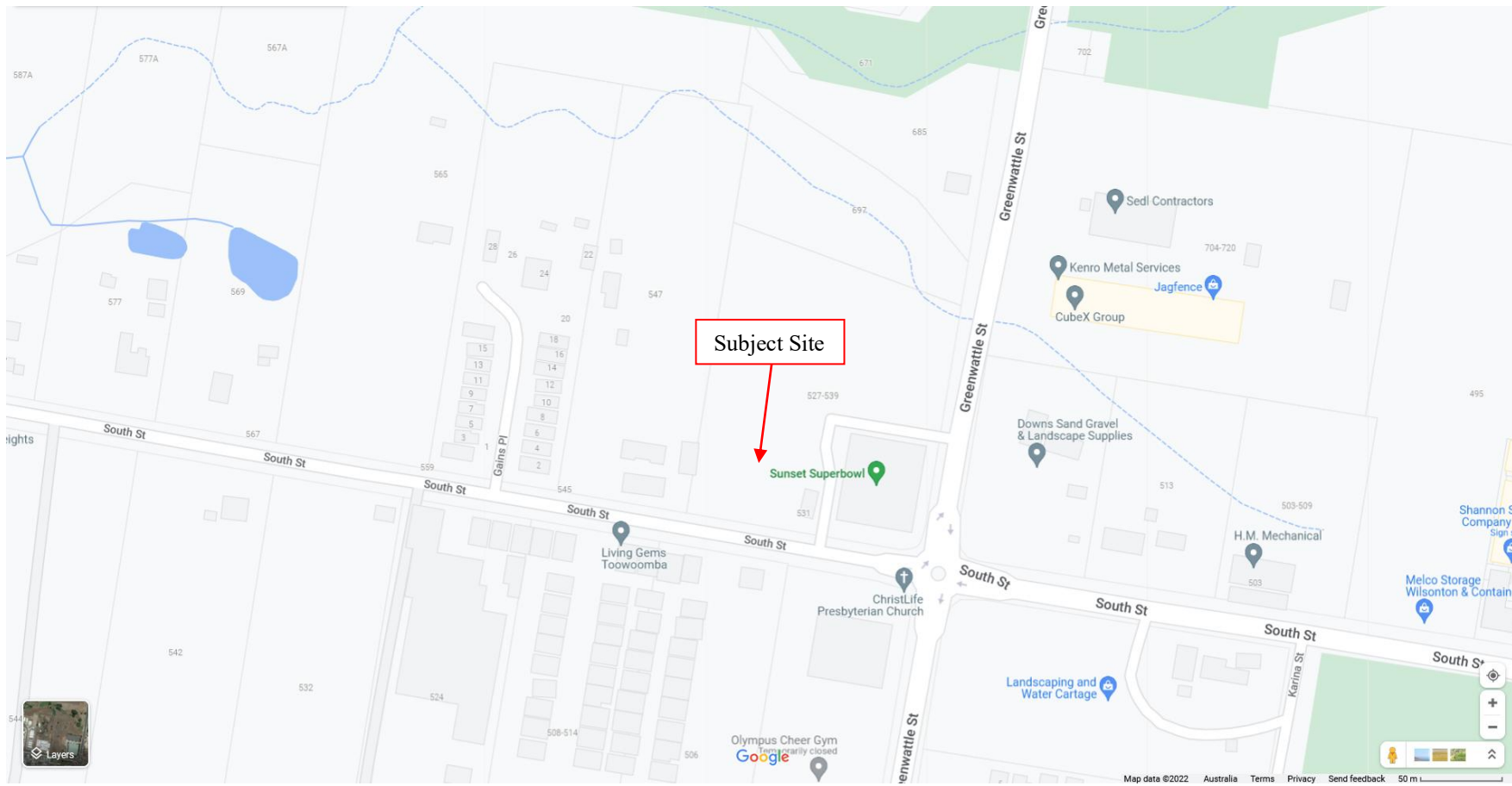
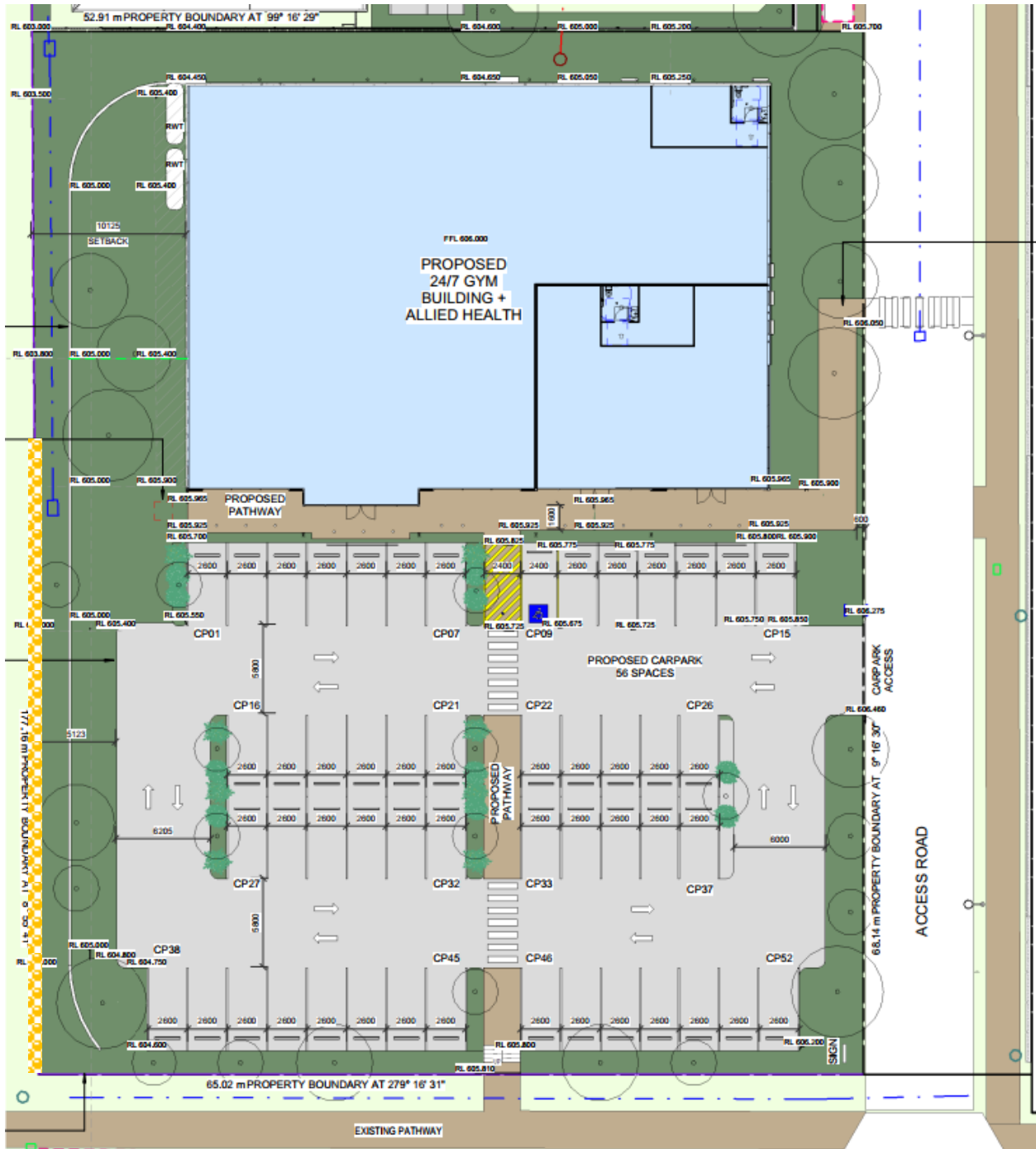


Figure No. 2: Subject Site, Logger Location, Assessed Offsite Receivers, and Surrounding Environs (QLD Globe).



Sketch No. 1: Layout and Recommended Acoustic Treatments (Not to Scale).

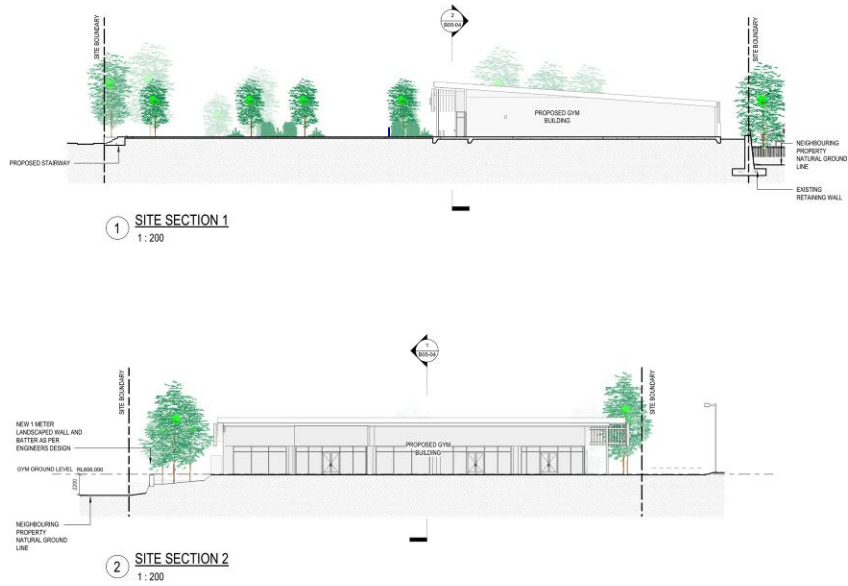


ACOUSTIC TREATMENT LEGEND

-  Maintain or upgrade the existing 1.8m high fence along the western site boundary to be free of gaps and holes (including no gaps between the ground and the base of the fence) and achieve a minimum surface mass of 11kg/m². Typical materials include 19mm lapped timber fence (40% overlap), 9mm FC sheet, toughened glass, Perspex, masonry, or a combination of the above (is required).

APPENDIX B

Development Plans



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GLENVALE HEALTH HUB

DA ISSUE

INDICATIVE SITE SECTIONS

Stage DA Revision C 24/03/26

B05-04

Designer JR

Project No. AP250207

View Scale 1:200 @ A1
Scale Bar 1:200 @ A1



LEGEND/NOTES
NOTE: ALL PROPOSED NLAs ARE SUBJECT TO MCL

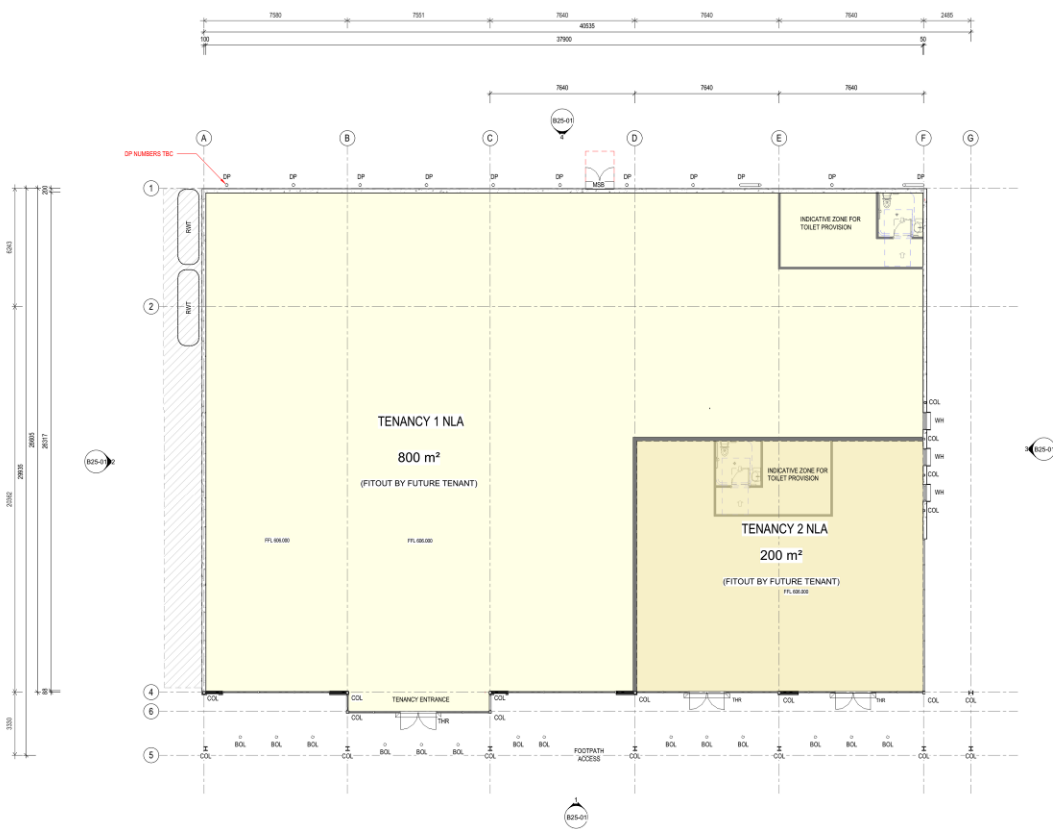
SANITARY PROVISIONS (FOR TENANCY 1 NLA)	
REQUIRED	
CLASS IN (GYM):	1 PERSON PER 3m ² * 800m ²
AS PER TABLE 0018 OF NCC 3.2.2	* 266 PERSONS
TOTAL PERSONS REQUIRED	266 PERSONS
REQUIRED SANITARY FACILITIES (AS PER TABLE F04.1 NCC 3.2.2)	
MALE	-WC 1
	-WASHBASIN 2
FEMALE	-WC 2
	-WASHBASIN 4
PROPOSED SANITARY FACILITIES (FOR TENANCY 1)	
1 UNSEX DISABLED WC	
1 DISABLED WASHBASIN	
SANITARY PROVISIONS (FOR TENANCY 2 NLA)	
REQUIRED	
CLASS IN (HEALTH CARE BUILDING):	1 PERSON PER 15m ² * 200m ²
AS PER TABLE 0018 OF NCC 3.2.2	* 20 PERSONS
TOTAL PERSONS REQUIRED	20 PERSONS
REQUIRED SANITARY FACILITIES (AS PER TABLE F04.1 NCC 3.2.2)	
MALE	-WC 2
	-WASHBASIN 1
FEMALE	-WC 2
	-WASHBASIN 1

NOTE
BOTH TENANCIES TO CONFIRM BATHROOM ALLOCATIONS.
SANITARY FACILITIES
IF NOT MORE THAN 15 PEOPLE ARE EMPLOYED, A UNSEX FACILITY MAY BE PROVIDED INSTEAD OF SEPARATE FACILITIES FOR EACH SEX (F04.1 OF NCC 3.2.2)

ABBREVIATION LEGEND
COL COLLARED
COL COLUMN
DOW DOWNPIPE
ESES ELEVATED SURFACE
FAT FAN WATER TANK
FWD FRESHWATER DRAIN
WH WINDHATCH

AREA TABLE

COVERED WALKWAY - EXTERNAL GFA	100.62 m ²
TENANCY 1 GFA	800.82 m ²
TENANCY 2 GFA	200.21 m ²
Grand total	1128.66 m ²



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GLENVALE HEALTH HUB BUILDING

DA ISSUE

FLOOR PLAN

Stage DA Revision D 24/03/26

B20-01

Designer JR

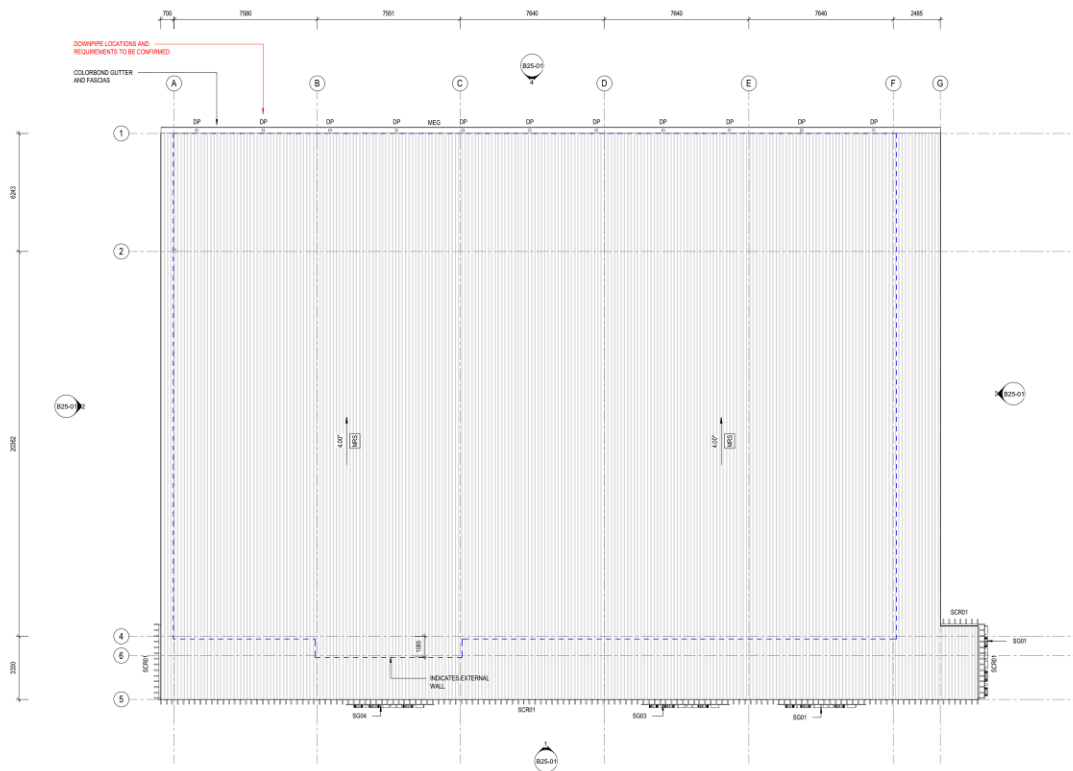
Project No. 250207

View Scale 1:100 @ A1
Scale Bar 1:100 @ A1



ABBREVIATION LEGEND

DP	DOWNPIPE
MES	METAL EAVED GUTTER
MRS	METAL ROOF SHEET
SCR1	SCREEN TYPE 1
SCR2	SCREEN TYPE 2
SCR3	SCREEN TYPE 3
SCR4	SCREEN TYPE 4



1 GYM ROOF PLAN
1:100

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GLENVALE HEALTH HUB BUILDING

DA ISSUE

ROOF PLAN

Stage DA

Revision D

24/03/26

Designer JR

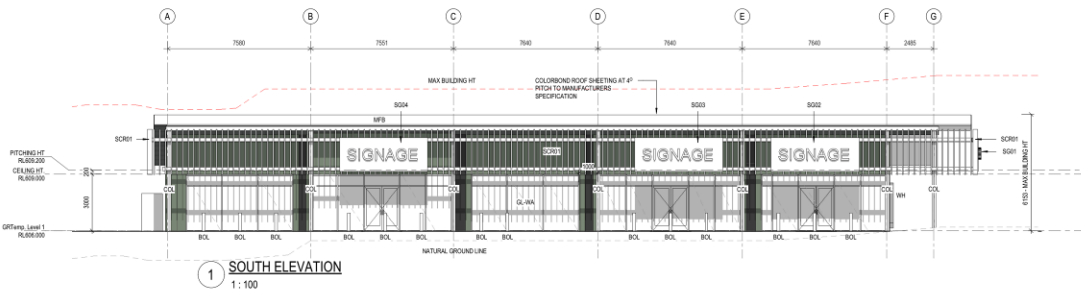
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Project No. 250207

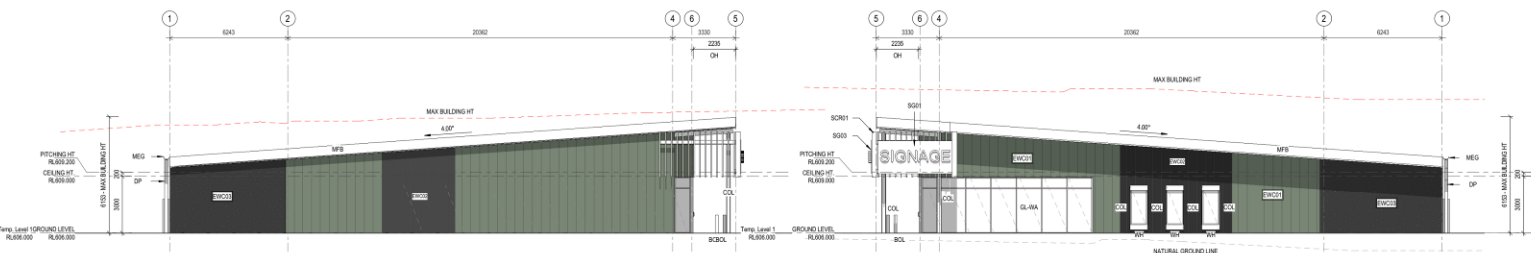
View Scale 1:100 @ A1
Scale Bar 1:50 @ A1

ABBREVIATION LEGEND

BOL	BULLHEAD
COL	COLUMN
DP	DOWNPIPE
EWG1	EXTERNAL WALL CLADDING TYPE 1
EWG2	EXTERNAL WALL CLADDING TYPE 2
EWG3	EXTERNAL WALL CLADDING TYPE 3
GL-RA	GLASS RAILING
MES	METAL EAVED GUTTER
MRS	METAL ROOF SHEET
MFCB	METAL FLASH BAND
SCR1	SCREEN TYPE 1
SCR2	SCREEN TYPE 2
SCR3	SCREEN TYPE 3
SCR4	SCREEN TYPE 4
WH	WINDHOLE

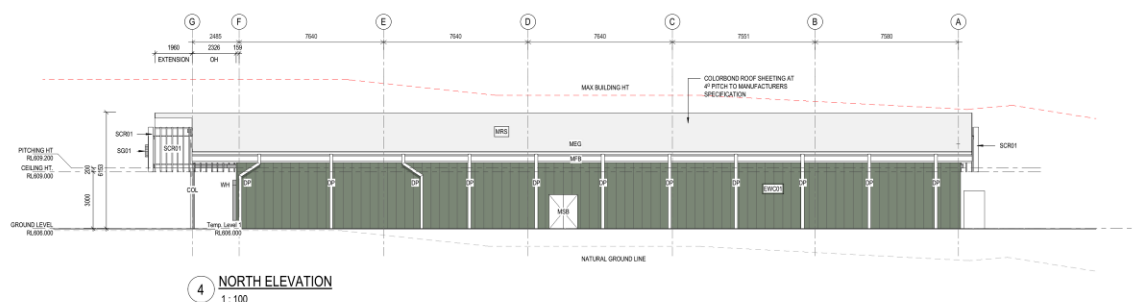


1 SOUTH ELEVATION
1:100



2 WEST ELEVATION
1:100

3 EAST ELEVATION
1:100



4 NORTH ELEVATION
1:100

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GLENVALE HEALTH HUB BUILDING

DA ISSUE

ELEVATIONS

Stage DA

Revision E

24/03/26

Designer JR

B25-01

Project No. 250207

View Scale 1:100 @ A1
Scale Bar 1:50 @ A1



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GLENVALE HEALTH HUB BUILDING
DA ISSUE

NLA PLAN
Stage DA Revision D 24/03/26

B60-01
Designer JR

Project No. 250207
View Scale 1:100 @ A1
Scale Bar 1:100 @ A1



AREA TABLE

COVERED WALKWAY - EXTERNAL GFA	100.62 m ²
TENANCY 1 GFA	819.82 m ²
TENANCY 2 GFA	206.21 m ²
Grand total	1126.65 m ²



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GLENVALE HEALTH HUB BUILDING
DA ISSUE

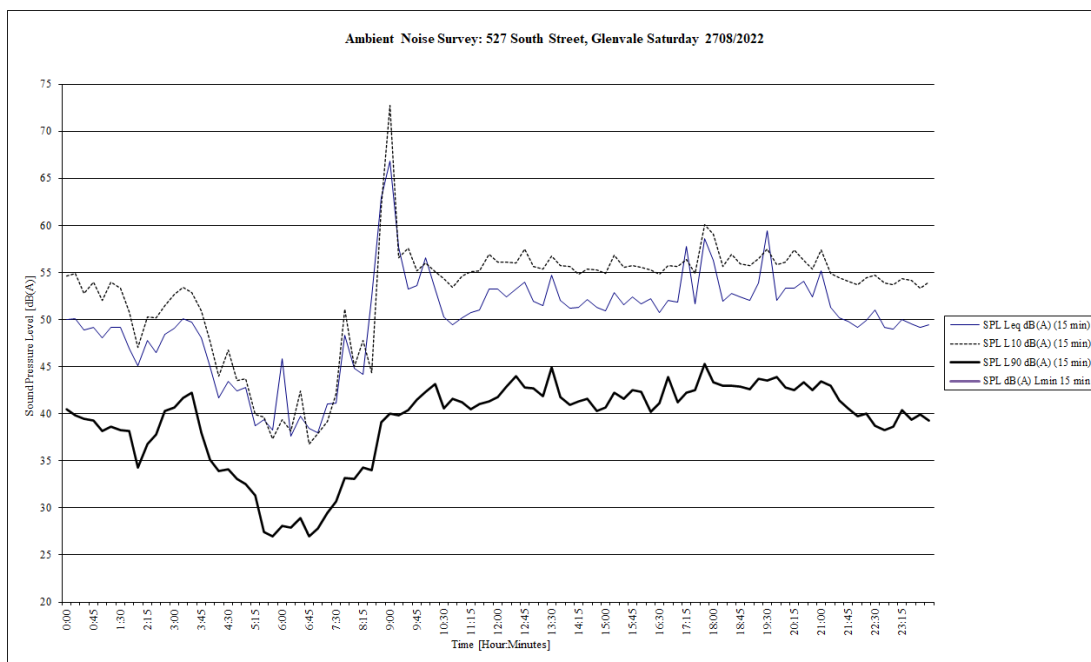
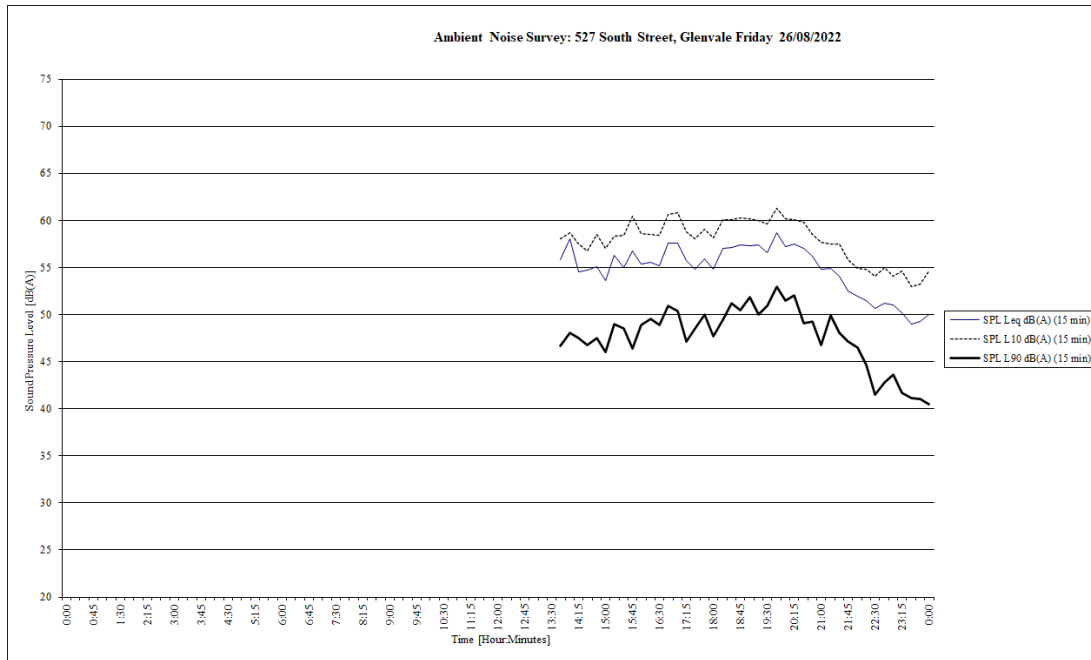
GFA PLAN
Stage DA Revision D 24/03/26

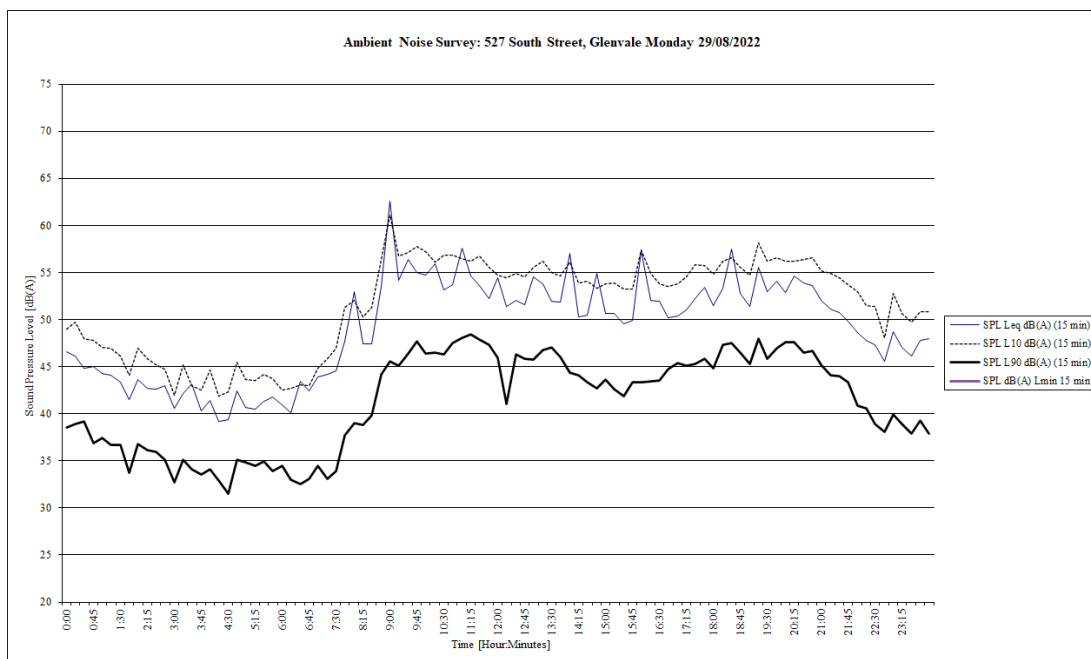
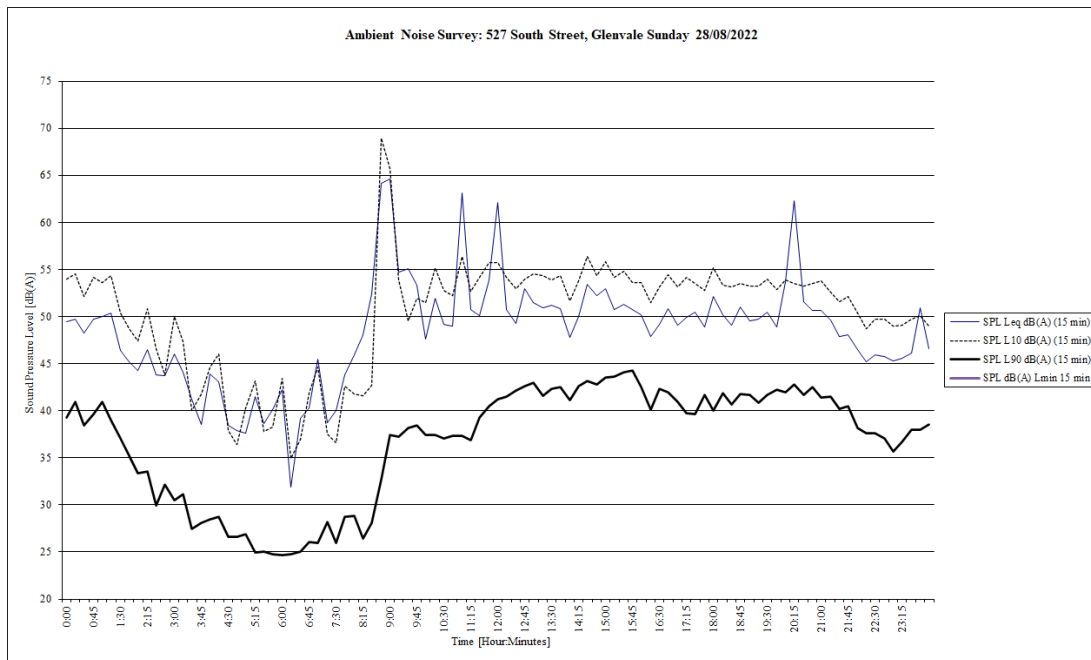
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Designer JR

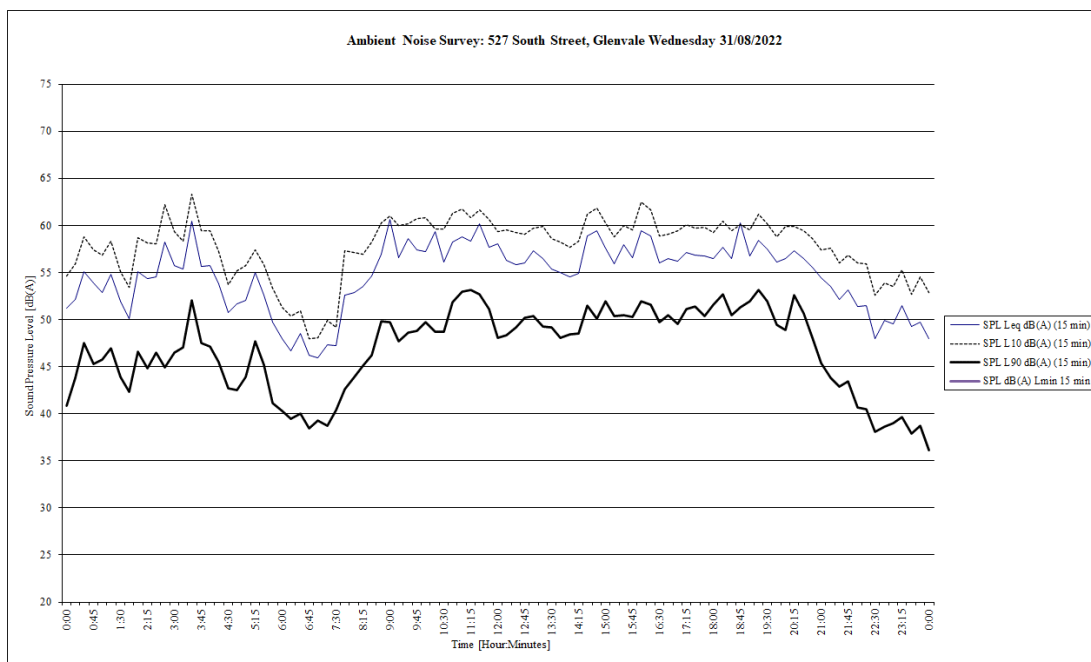
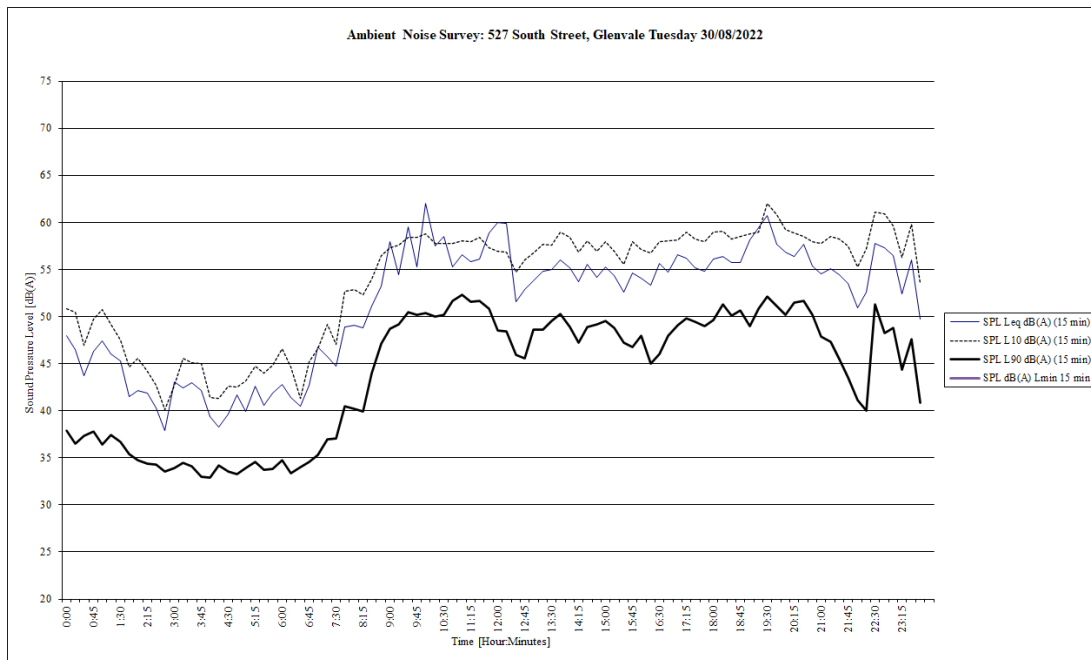
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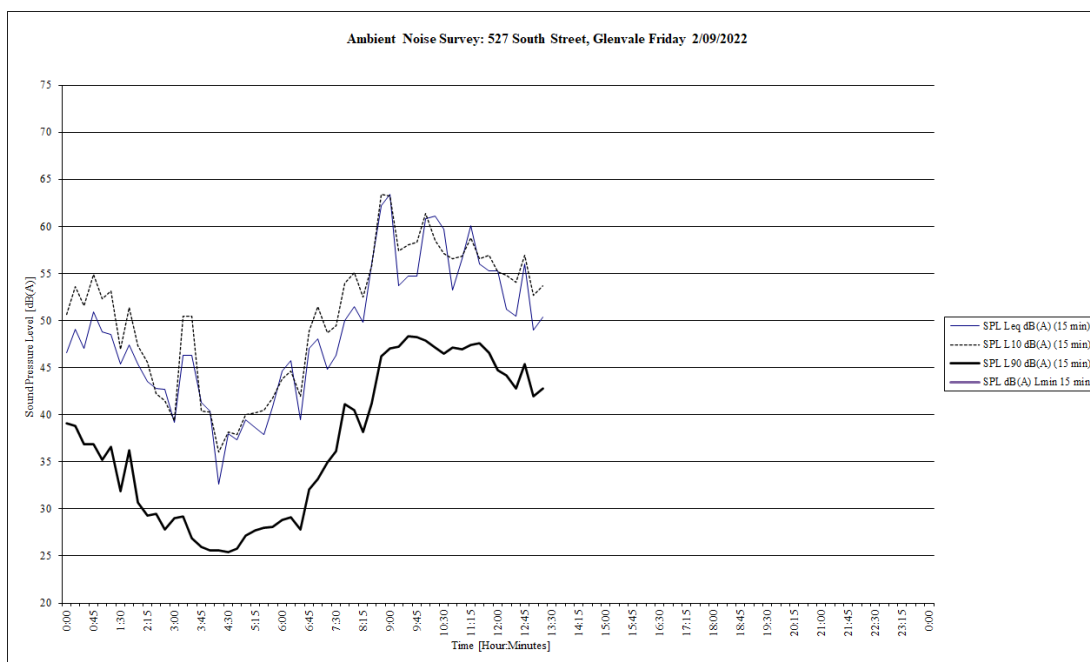
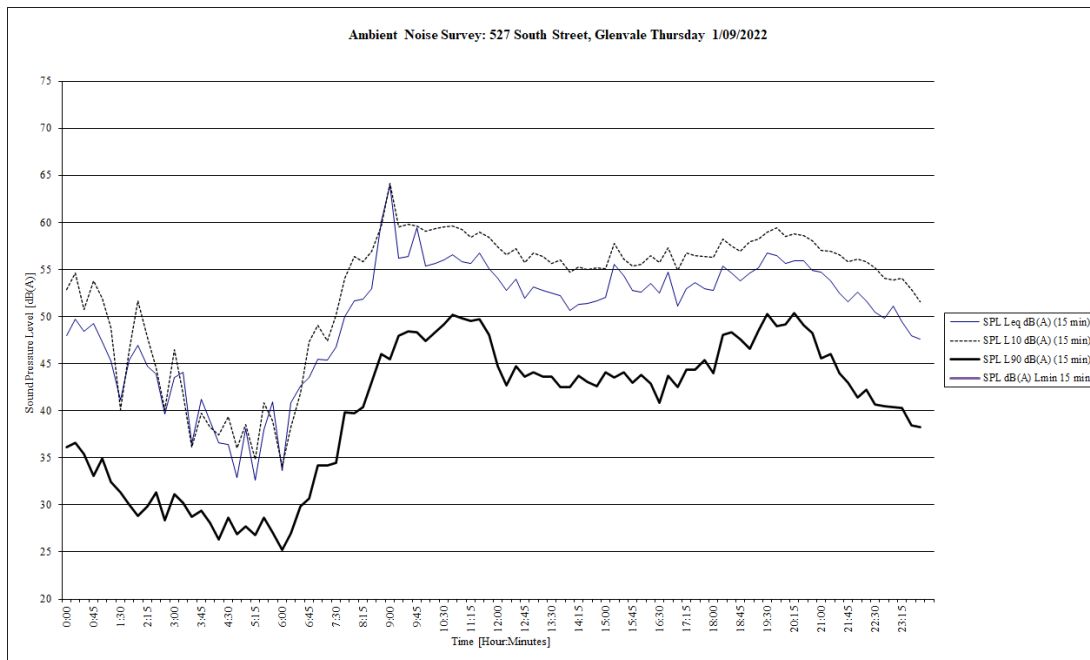
APPENDIX C

Measurement Results and Model Calculations / Predictions









ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if the duration of events do not occur for 10% or 1% of the 1 hour period)

DAYTIME AND EVENING

R1: Existing and under-construction detached single-storey dwellings to the immediate north

ONSITE CAR DOOR CLOSURE NORTH

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20			Events
Total time duration of combined events	15.0		30.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5			dB
Minimum distance to receiver		36.5			m	
Distance attenuation (-6 dB per doubling of distance)		-31			dB	
Offsite acoustic barrier screening		-6.0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	22	24	N/A	N/A	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		17	N/A	N/A	dB(A)	

76.7108 | 279.4043

ONSITE CAR DOOR CLOSURE CENTRE

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20			Events
Total time duration of combined events	15.0		30.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5			dB
Minimum distance to receiver		46			m	
Distance attenuation (-6 dB per doubling of distance)		-33			dB	
Onsite building screening		-10.0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	16	18	N/A	N/A	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		11	N/A	N/A	dB(A)	

44.29279 | 70.03306

ONSITE CAR DOOR CLOSURE SOUTH

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20			Events
Total time duration of combined events	15.0		30.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5			dB
Minimum distance to receiver		62.5			m	
Distance attenuation (-6 dB per doubling of distance)		-36			dB	
Offsite acoustic barrier screening		-6.0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	18	20	N/A	N/A	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		12	N/A	N/A	dB(A)	

60.26827 | 95.29255

ONSITE CAR MOVEMENT

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	68		70	73	dB(A)	
Duration of single event		10			Seconds	
Number of events in the measurement period	20		40			Events
Total time duration of combined events	201.6		403.2			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	62	58	70	73	dB(A)	
Tonality / Impulsiveness correction	0		0			dB
Minimum distance to receiver		41.5			m	
Distance attenuation (-6 dB per doubling of distance)		-32			dB	
Offsite acoustic barrier screening		-6.0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	26	23	34	37	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		15	27	30	34	dB(A)

366.5628 | 183.2814

ONSITE CAR STARTS NORTH

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74	75	dB(A)	
Duration of single event		3			Seconds	
Number of events in the measurement period	8		15			Events
Total time duration of combined events	22.5		45.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	75	dB(A)	
Tonality / Impulsiveness correction	0		0			dB
Minimum distance to receiver		36.5			m	
Distance attenuation (-6 dB per doubling of distance)		-31			dB	
Offsite acoustic barrier screening		-6.0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	22	19	N/A	40	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		12	N/A	33	40	dB(A)

160.812 | 805.4162

ONSITE CAR STARTS NORTH

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74	75	dB(A)	
Duration of single event		3			Seconds	
Number of events in the measurement period	8		15			Events
Total time duration of combined events	22.5		45.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	75	dB(A)	
Tonality / Impulsiveness correction	0		0			dB
Minimum distance to receiver		36.5			m	
Distance attenuation (-6 dB per doubling of distance)		-35			dB	
Building screening		0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	24	21	N/A	42	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		13	N/A	35	40	dB(A)

160.812 | 805.4162

ONSITE CAR DOOR CLOSURE NORTH

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20			Events
Total time duration of combined events	15.0		30.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5			dB
Minimum distance to receiver		42.5			m	
Distance attenuation (-6 dB per doubling of distance)		-33			dB	
Building screening		0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	27	29	N/A	N/A	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		22	N/A	N/A	dB(A)	

518.8847 | 820.4288

ONSITE CAR DOOR CLOSURE SOUTH

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20			Events
Total time duration of combined events	15.0		30.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5			dB
Minimum distance to receiver		33.5			m	
Distance attenuation (-6 dB per doubling of distance)		-31			dB	
Building screening		0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	29	31	N/A	N/A	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		24	N/A	N/A	dB(A)	

835.1397 | 1320.4721

ONSITE CAR MOVEMENT

	Creep	Acoustic Quality Objectives				
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	68		70	73	dB(A)	
Duration of single event		10			Seconds	
Number of events in the measurement period	20		40			Events
Total time duration of combined events	201.6		403.2			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	62	58	70	73	dB(A)	
Tonality / Impulsiveness correction	0		0			dB
Minimum distance to receiver		39.5			m	
Distance attenuation (-6 dB per doubling of distance)		-32			dB	
Building screening		0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	32	29	41	44	dB(A)	
Reduction through open window		-5			-5	dB
Impact inside open window (excludes façade correction)		22	33	36	38	dB(A)

160.812 | 805.4162

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if the duration of events do not occur for 10% or 1% of the 1 hour period)

DAYTIME AND EVENING

R1: Existing and under-construction detached single-storey dwellings to the immediate north

ONSITE CAR STARTS CENTRE	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	73		74	75	dB(A)
Duration of single event		3			Seconds
Number of events in the measurement period	8		15		Events
Total time duration of combined events	22.5		45.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	54	N/A	75	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		46			m
Distance attenuation (-6 dB per doubling of distance)		-33			dB
Onsite building screening		-10.0			dB
Facade reflection		2.5			dB
Impact at nearest façade	16	13	N/A	34	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		6	N/A	27	dB(A)

41.9(23) 39.9(61)

ONSITE CAR STARTS SOUTH	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	73		74	75	dB(A)
Duration of single event		3			Seconds
Number of events in the measurement period	8		15		Events
Total time duration of combined events	22.5		45.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	54	N/A	75	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		62.5			m
Distance attenuation (-6 dB per doubling of distance)		-36			dB
Offsite acoustic barrier screening		-6.0			dB
Facade reflection		2.5			dB
Impact at nearest façade	18	15	N/A	36	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		7	N/A	28	dB(A)

41.9(23) 39.9(61)

PEOPLE TALKING OUTSIDE	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	58		60	62	dB(A)
Duration of single event		720			Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	720.0		2880.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	57	60	62	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		20			m
Distance attenuation (-6 dB per doubling of distance)		-26			dB
Offsite acoustic barrier screening		-6.0			dB
Building screening		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	28	28	30	32	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		20	23	25	dB(A)

63.6(78) 56.1(76)

AMPLIFIED MUSIC INSIDE	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	74		78	82	dB(A)
Duration of single event		900			Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	900.0		3600.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	74	74	78	82	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		6			m
Distance attenuation (-6 dB per doubling of distance)		-10			dB
Inside to outside attenuation (walls / roof / ceiling)		-38			dB
Onsite building screening		0			dB
Speaker directivity		-3			dB
Facade reflection		2.5			dB
Impact at nearest façade	26	31	35	39	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		23	27	31	dB(A)

63.6(78) 56.1(76)

CABLE PULL DOWN MACHINES	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	78		82	88	dB(A)
Duration of single event		30			Seconds
Number of events in the measurement period	24		48		Events
Total time duration of combined events	720.0		1440.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	77	74	82	88	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		6			m
Distance attenuation (-6 dB per doubling of distance)		-16			dB
Inside to outside attenuation (walls / roof / ceiling)		-38			dB
Building screening		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	26	28	36	42	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		20	28	34	dB(A)

63.6(78) 56.1(76)

R2: Existing detached single-storey dwellings to the south across South Street

ONSITE CAR STARTS CENTRE	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	73		74	75	dB(A)
Duration of single event		3			Seconds
Number of events in the measurement period	8		15		Events
Total time duration of combined events	22.5		45.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	54	N/A	75	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		42.5			m
Distance attenuation (-6 dB per doubling of distance)		-33			dB
Building screening		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	27	24	N/A	45	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		16	N/A	37	dB(A)

49.1(99) 33.5(35)

ONSITE CAR STARTS SOUTH	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	73		74	75	dB(A)
Duration of single event		3			Seconds
Number of events in the measurement period	8		15		Events
Total time duration of combined events	22.5		45.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	54	N/A	75	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		33.5			m
Distance attenuation (-6 dB per doubling of distance)		-31			dB
Building screening		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	29	26	N/A	47	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		18	N/A	39	dB(A)

49.1(99) 33.5(35)

PEOPLE TALKING OUTSIDE	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	58		60	62	dB(A)
Duration of single event		720			Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	720.0		2880.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	57	60	62	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		65			m
Distance attenuation (-6 dB per doubling of distance)		-36			dB
Inside to outside attenuation		0			dB
Building screening		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	23	23	26	28	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		16	19	21	dB(A)

61.2(83) 53.7(81)

AMPLIFIED MUSIC INSIDE	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	74		78	82	dB(A)
Duration of single event		900			Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	900.0		3600.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	74	74	78	82	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		69			m
Distance attenuation (-6 dB per doubling of distance)		-31			dB
Inside to outside attenuation (10.38mm laminate glass)		-30			dB
Onsite building screening		0			dB
Speaker directivity		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	16	21	25	29	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		13	17	21	dB(A)

61.2(83) 53.7(81)

CABLE PULL DOWN MACHINES	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	78		82	88	dB(A)
Duration of single event		30			Seconds
Number of events in the measurement period	24		48		Events
Total time duration of combined events	720.0		1440.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	77	74	82	88	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		69			m
Distance attenuation (-6 dB per doubling of distance)		-37			dB
Inside to outside attenuation (10.38mm laminate glass)		-30			dB
Building screening		0			dB
Facade reflection		2.5			dB
Impact at nearest façade	13	15	23	29	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		7	15	21	dB(A)

61.2(83) 53.7(81)

ON SITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if the duration of events do not occur for 10% or 1% of the 1 hour period)

DAYTIME AND EVENING

R1: Existing and under-construction detached single-storey dwellings to the immediate north

FOUR WALKING MACHINES	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	71		72	74	dB(A)
Duration of single event	900				Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	900.0		3600.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	71	71	72	74	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver	6				m
Distance attenuation (-6 dB per doubling of distance)	-16				dB
Inside to outside attenuation (walls / roof / ceiling)	-38				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	20	20	21	23	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	12	13	15		dB(A)

BATLE ROPE SWING	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	58		59	60	dB(A)
Duration of single event	900				Seconds
Number of events in the measurement period	1		3		Events
Total time duration of combined events	900.0		2700.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	58	57	59	60	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver	6				m
Distance attenuation (-6 dB per doubling of distance)	-10				dB
Inside to outside attenuation (walls / roof / ceiling)	-38				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	13	12	14	15	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	4	6	7		dB(A)

200kg WEIGHT DROP	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	88		91	94	dB(A)
Duration of single event	1				Seconds
Number of events in the measurement period	24		48		Events
Total time duration of combined events	24.0		48.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	72	69	N/A	94	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver	6				m
Distance attenuation (-6 dB per doubling of distance)	-16				dB
Inside to outside attenuation (walls / roof / ceiling)	-38				dB
Rubber mat floor absorption	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	21	23	N/A	48	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	16	N/A	40		dB(A)

DELIVERIES	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	72		75	80	dB(A)
Duration of single event	900				Seconds
Number of events in the measurement period	1		2		Events
Total time duration of combined events	900.0		1800.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	72	69	75	80	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver	36				m
Distance attenuation (-6 dB per doubling of distance)	-31				dB
Offsite acoustic barrier screening	-6.0				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	37	39	45	50	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	32	38	43		dB(A)

WASTE COLLECTION	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	90		97	102	dB(A)
Duration of single event	180				Seconds
Number of events in the measurement period	1		1		Events
Total time duration of combined events	180.0		180.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	83	77	N/A	102	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver	40				m
Distance attenuation (-6 dB per doubling of distance)	-32				dB
Inside to outside attenuation closed roller door	0				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	53	52	N/A	77	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	45	N/A	70		dB(A)

COMBINED / HIGHEST IMPACTS					
Impact at nearest façade	34	36	36	48	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	28	28	40		dB(A)

R2: Existing detached single-storey dwellings to the south across South Street

FOUR WALKING MACHINES	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	71		72	74	dB(A)
Duration of single event	900				Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	900.0		3600.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	71	71	72	74	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver	69				m
Distance attenuation (-6 dB per doubling of distance)	-37				dB
Inside to outside attenuation (10.38mm laminate glass)	-30				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	7	7	8	10	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	-1	0	2		dB(A)

BATLE ROPE SWING	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	58		59	60	dB(A)
Duration of single event	900				Seconds
Number of events in the measurement period	1		3		Events
Total time duration of combined events	900.0		2700.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	58	57	59	60	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver	69				m
Distance attenuation (-6 dB per doubling of distance)	-31				dB
Inside to outside attenuation (10.38mm laminate glass)	-30				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	0	-2	1	2	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	-9	-7	-6		dB(A)

200kg WEIGHT DROP	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	88		91	94	dB(A)
Duration of single event	1				Seconds
Number of events in the measurement period	24		48		Events
Total time duration of combined events	24.0		48.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	72	69	N/A	94	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver	69				m
Distance attenuation (-6 dB per doubling of distance)	-37				dB
Inside to outside attenuation (10.38mm laminate glass)	-30				dB
Rubber mat floor absorption	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	8	5	N/A	30	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	-3	N/A	22		dB(A)

DELIVERIES	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	72		75	80	dB(A)
Duration of single event	900				Seconds
Number of events in the measurement period	1		2		Events
Total time duration of combined events	900.0		1800.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	72	69	75	80	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver	59				m
Distance attenuation (-6 dB per doubling of distance)	-35				dB
Inside to outside attenuation closed roller door	0				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	39	41	47	52	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	34	40	45		dB(A)

WASTE COLLECTION	Acoustic Quality Objectives				
	Creep LAeq	LAeq	LA10	LA01	
Noise source level for single event	90		97	102	dB(A)
Duration of single event	180				Seconds
Number of events in the measurement period	1		1		Events
Total time duration of combined events	180.0		180.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	83	77	N/A	102	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver	50				m
Distance attenuation (-6 dB per doubling of distance)	-34				dB
Inside to outside attenuation closed roller door	0				dB
Building screening	0				dB
Façade reflection	2.5				dB
Impact at nearest façade	52	51	N/A	76	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	43	N/A	68		dB(A)

COMBINED / HIGHEST IMPACTS					
Impact at nearest façade	37	37	41	47	dB(A)
Reduction through open window	-5				dB
Impact inside open window (excludes façade correction)	29	33	39		dB(A)

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if

DAYTIME AND EVENING

R3: Existing single and two-storey townhouses to the immediate west

ONSITE CAR DOOR CLOSURE NORTH	Creep		Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20		Events	
Total time duration of combined events	15.0		30.0		Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5		dB	
Minimum distance to receiver		12			m	
Distance attenuation (-6 dB per doubling of distance)		-22			dB	
Existing acoustic barrier screening		-10.7			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	27	29	N/A	N/A	dB(A)	
Reduction through open window	-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	22	N/A	N/A	N/A	dB(A)	

352.4942 372.5701

ONSITE CAR DOOR CLOSURE CENTRE	Creep		Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	dB(A)	
Duration of single event		1.5			Seconds	
Number of events in the measurement period	10		20		Events	
Total time duration of combined events	15.0		30.0		Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)	
Tonality / Impulsiveness correction	0		5		dB	
Minimum distance to receiver		14			m	
Distance attenuation (-6 dB per doubling of distance)		-23			dB	
Existing acoustic barrier screening		-11.3			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	25	27	N/A	N/A	dB(A)	
Reduction through open window	-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	20	N/A	N/A	N/A	dB(A)	

352.4975 358.138

ONSITE CAR DOOR CLOSURE SOUTH	Creep	Acoustic Quality Objectives			
	L _{Aeq}	L _{Aeq}	L _{A10}	L _{A01}	
Noise source level for single event	75		78	80	dB(A)
Duration of single event		1.5			Seconds
Number of events in the measurement period	10		20		Events
Total time duration of combined events	15.0		30.0		Seconds
	L _{Aeq}	L _{Aeq} 1hr	L _{A10} 1hr	L _{A01} 1hr	
Noise source level for assessment time period	57	54	N/A	N/A	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		15			m
Distance attenuation (-6 dB per doubling of distance)		-24			dB
Existing acoustic barrier screening		-11.5			dB
Façade reflection		2.5			dB
Impact at nearest façade	25	27	N/A	N/A	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		19	N/A	N/A	dB(A)

391.6687 465.9121

ONSITE CAR MOVEMENT	Creep		Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	68		70		73	dB(A)
Duration of single event			10			Seconds
Number of events in the measurement period	20			40		Events
Total time duration of combined events	201.6			403.2		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	62	58	70	73		dB(A)
Tonality / Impulsiveness correction	0			0		dB
Minimum distance to receiver			9.5			m
Distance attenuation (-6 dB per doubling of distance)			-20			dB
Existing acoustic barrier screening			-11.2			dB
Façade reflection			2.5			dB
Impact at nearest façade	33	30	42	45		dB(A)
Reduction through open window	-5		-5	-5		dB
Impact inside open window (excludes façade correction)	23	34	37	37		dB(A)

3177.525 1056.762

ONSITE CAR STARTS NORTH	Creep		Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74	75	dB(A)	
Duration of single event	3				Seconds	
Number of events in the measurement period	8	15			Events	
Total time duration of combined events	22.5	45.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	75	dB(A)	
Tonality / Impulsiveness correction	0	0			dB	
Minimum distance to receiver	12				m	
Distance attenuation (-6 dB per doubling of distance)	-22				dB	
Existing acoustic barrier screening	-10.7				dB	
Façade reflection	2.5				dB	
Impact at nearest façade	27	24	N/A	45	dB(A)	
Reduction through open window	-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	17	N/A	38	41	dB(A)	

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if

DAYTIME AND EVENING

R3: Existing single and two-storey townhouses to the immediate west

ONSITE CAR STARTS CENTRE	Creep		Acoustic Quality Objectives		
	L _{Aeq}	L _{Aeq}	LA10	LA01	
Noise source level for single event		73	74	75	dB(A)
Duration of single event		3			Seconds
Number of events in the measurement period	8	15			Events
Total time duration of combined events	22.5	45.0			Seconds
	L _{Aeq}	L _{Aeq} 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	54	N/A	75	dB(A)
Tonality / Impulsiveness correction	0	0			dB
Minimum distance to receiver		14			m
Distance attenuation (-6 dB per doubling of distance)		-23			dB
Existing acoustic barrier screening		-11.3			dB
Façade reflection		2.5			dB
Impact at nearest façade	25	22	N/A	43	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)	15	N/A	36	39	dB(A)

334.0895 167.0445

ONSITE CAR STARTS SOUTH	Creep	Acoustic Quality Objectives				
	L _{Aeq}	L _{Aeq}	LA10	LA01		
Noise source level for single event	73		74	75	dB(A)	
Duration of single event		3			Seconds	
Number of events in the measurement period	8		15			Events
Total time duration of combined events	22.5		45.0			Seconds
	L _{Aeq}	L _{Aeq} 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	57	54	N/A	75	dB(A)	
Tonality / Impulsiveness correction	0		0		dB	
Minimum distance to receiver		15			m	
Distance attenuation (-6 dB per doubling of distance)		-24			dB	
Existing acoustic barrier screening		-11.5			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	24	21	N/A	42	dB(A)	
Reduction through open window		-5	-5	-5	dB	
Impact inside open window (excludes façade correction)		14	N/A	35	dB(A)	

278.885 139.4425

PEOPLE TALKING OUTSIDE	Creep	Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01	
Noise source level for single event	58		60	62	dB(A)
Duration of single event		720			Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	720.0		2880.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	57	57	60	62	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver			13.5		m
Distance attenuation (-6 dB per doubling of distance)			-23		dB
Existing acoustic barrier screening			-10.2		dB
Building screening			0		dB
Façade reflection			2.5		dB
Impact at nearest façade	27	27	30	32	dB(A)
Reduction through open window		-5	-5	-5	dB
Impact inside open window (excludes façade correction)		19	22	24	dB(A)

465.1509 465.1509

AMPLIFIED MUSIC INSIDE	Creep		Acoustic Quality Objectives			
	L _{Aeq}	L _{Aeq}	LA10	LA01		
Noise source level for single event	74		78		82	dB(A)
Duration of single event			900			Seconds
Number of events in the measurement period	1	4				Events
Total time duration of combined events	900.0		3600.0			Seconds
	L _{Aeq}	L _{Aeq} 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	74	74	78	82		dB(A)
Tonality / Impulsiveness correction	0	5				dB
Minimum distance to receiver	15					m
Distance attenuation (-6 dB per doubling of distance)	-18					dB
Inside to outside attenuation (10.38mm laminate glass)	-30					dB
Existing acoustic barrier screening	0					dB
Speaker directivity	-3					dB
Façade reflection	2.5					dB
Impact at nearest façade	26	31	35	39		dB(A)
Reduction through open window	-5		-5	-5		dB
Impact inside open window (excludes façade correction)	23		27	31		dB(A)

397.9949 1258.57

CABLE PULL DOWN MACHINES	Creep		Acoustic Quality Objectives			
	LAeq		LAeq	LA10	LA01	
Noise source level for single event	78		82	88	dB(A)	
Duration of single event		30			Seconds	
Number of events in the measurement period	24		48		Events	
Total time duration of combined events	720.0		1440.0		Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		
Noise source level for assessment time period	77	74	82	88	dB(A)	
Tonality / Impulsiveness correction	0		5		dB	
Minimum distance to receiver		15			m	
Distance attenuation (-6 dB per doubling of distance)		-24			dB	
Inside to outside attenuation (10.38mm laminate glass)		-30			dB	
Existing acoustic barrier screening		0			dB	
Façade reflection		2.5			dB	
Impact at nearest façade	26	28	36	42	dB(A)	
Reduction through open window		-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	20	28	34		dB(A)	

ON SITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if

DAYTIME AND EVENING

R3: Existing single and two-storey townhouses to the immediate west

FOUR WALKING MACHINES	Creep	Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01	
Noise source level for single event	71		72	74	dB(A)
Duration of single event		900			Seconds
Number of events in the measurement period	1		4		Events
Total time duration of combined events	900.0		3600.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	71	71	72	74	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		15			m
Distance attenuation (-6 dB per doubling of distance)		-24			dB
Inside to outside attenuation (10.38mm laminate glass)		-30			dB
Existing acoustic barrier screening		0			dB
Façade reflection		2.5			dB
Impact at nearest façade	20	20	21	23	dB(A)
Reduction through open window	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	12	13	15	15	dB(A)

BATTLEROPESWING	Creep	Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01	
Noise source level for single event	58		59	60	dB(A)
Duration of single event		900			Seconds
Number of events in the measurement period	1		3		Events
Total time duration of combined events	900.0		2700.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	58	57	59	60	dB(A)
Tonality / Impulsiveness correction	0		0		dB
Minimum distance to receiver		15			m
Distance attenuation (-6 dB per doubling of distance)		-18			dB
Inside to outside attenuation (10.38mm laminate glass)		-30			dB
Existing acoustic barrier screening		0			dB
Façade reflection		2.5			dB
Impact at nearest façade	13	12	14	15	dB(A)
Reduction through open window	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	4	6	7	7	dB(A)

200kg WEIGHT DROP	Creep	Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01	
Noise source level for single event	88		91	94	dB(A)
Duration of single event		1			Seconds
Number of events in the measurement period	24		48		Events
Total time duration of combined events	24.0		48.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	72	69	N/A	94	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		15			m
Distance attenuation (-6 dB per doubling of distance)		-24			dB
Inside to outside attenuation (10.38mm laminate glass)		-30			dB
Rubber mat floor absorption		0			dB
Façade reflection		2.5			dB
Impact at nearest façade	21	23	N/A	48	dB(A)
Reduction through open window	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	16	N/A	40	40	dB(A)

DELIVERIES	Creep	Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01	
Noise source level for single event	72		75	80	dB(A)
Duration of single event		900			Seconds
Number of events in the measurement period	1		2		Events
Total time duration of combined events	900.0		1800.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	72	69	75	80	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		21.5			m
Distance attenuation (-6 dB per doubling of distance)		-27			dB
Acoustic barrier screening		-11.1			dB
Building screening		0			dB
Façade reflection		2.5			dB
Impact at nearest façade	37	39	45	50	dB(A)
Reduction through open window	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	31	37	42	42	dB(A)

WASTE COLLECTION	Creep	Acoustic Quality Objectives			
	LAeq	LAeq	LA10	LA01	
Noise source level for single event	90		97	102	dB(A)
Duration of single event		180			Seconds
Number of events in the measurement period	1		1		Events
Total time duration of combined events	180.0		180.0		Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	
Noise source level for assessment time period	83	77	N/A	102	dB(A)
Tonality / Impulsiveness correction	0		5		dB
Minimum distance to receiver		55			m
Distance attenuation (-6 dB per doubling of distance)		-35			dB
Inside to outside attenuation closed roller door		0			dB
Building screening		0			dB
Façade reflection		2.5			dB
Impact at nearest façade	51	50	N/A	75	dB(A)
Reduction through open window	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	42	N/A	67	67	dB(A)

COMBINED / HIGHEST IMPACTS					
Impact at nearest façade	38	38	42	48	dB(A)
Reduction through open window	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	30	34	40	40	dB(A)

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if the duration of events do not occur for 10% or 1% of the 1 hour period)
NIGHT-TIME
R1: Existing and under-construction detached single-storey dwellings to the immediate north

ONSITE CAR DOOR CLOSURE NORTH	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	75		78	80	85	dB(A)	
Duration of single event		1.5				Seconds	
Number of events in the measurement period	8		16			Events	
Total time duration of combined events	12.0		24.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	56	53	N/A	N/A	85	dB(A)	
Tonality / Impulsiveness correction	0		5		0	dB	
Minimum distance to receiver		36.5			36.5	m	
Distance attenuation (-6 dB per doubling of distance)		-31			-31	dB	
Offsite acoustic barrier screening		-6.0			-6.0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	22	23	N/A	N/A	48	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	16	N/A	N/A	40	dB(A)		

ONSITE CAR DOOR CLOSURE CENTRE	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	75		78	80	85	dB(A)	
Duration of single event		1.5				Seconds	
Number of events in the measurement period	8		16			Events	
Total time duration of combined events	12.0		24.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	56	53	N/A	N/A	85	dB(A)	
Tonality / Impulsiveness correction	0		5		0	dB	
Minimum distance to receiver		46			46	m	
Distance attenuation (-6 dB per doubling of distance)		-33			-33	dB	
Onsite building screening		-10.0			-10.0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	15	17	N/A	N/A	42	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	10	N/A	N/A	34	dB(A)		

ONSITE CAR MOVEMENT	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	68		70	73	74	dB(A)	
Duration of single event		10				Seconds	
Number of events in the measurement period	16		32			Events	
Total time duration of combined events	161.3		322.6			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	61	58	N/A	73	74	dB(A)	
Tonality / Impulsiveness correction	0		0		0	dB	
Minimum distance to receiver		41.5			41.5	m	
Distance attenuation (-6 dB per doubling of distance)		-32			-32	dB	
Offsite acoustic barrier screening		-6.0			-6.0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	25	22	N/A	37	36	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	14	N/A	30	28	dB(A)		

ONSITE CAR STARTS NORTH	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	73		74	75	76	dB(A)	
Duration of single event		3				Seconds	
Number of events in the measurement period	4		8			Events	
Total time duration of combined events	12.0		24.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	54	51	N/A	N/A	76	dB(A)	
Tonality / Impulsiveness correction	0		0		0	dB	
Minimum distance to receiver		36.5			36.5	m	
Distance attenuation (-6 dB per doubling of distance)		-31			-31	dB	
Offsite acoustic barrier screening		-6.0			-6.0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	20	16	N/A	N/A	39	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	9	N/A	N/A	31	dB(A)		

R2: Existing detached single-storey dwellings to the south across South Street

ONSITE CAR DOOR CLOSURE NORTH	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	75		78	80	85	dB(A)	
Duration of single event		1.5				Seconds	
Number of events in the measurement period	8		16			Events	
Total time duration of combined events	12.0		24.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	56	53	N/A	N/A	85	dB(A)	
Tonality / Impulsiveness correction	0		5		0	dB	
Minimum distance to receiver		59.5			59.5	m	
Distance attenuation (-6 dB per doubling of distance)		-35			-35	dB	
Building screening		0			0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	23	25	N/A	N/A	50	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	18	N/A	N/A	42	dB(A)		

ONSITE CAR DOOR CLOSURE CENTRE	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	75		78	80	85	dB(A)	
Duration of single event		1.5				Seconds	
Number of events in the measurement period	8		16			Events	
Total time duration of combined events	12.0		24.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	56	53	N/A	N/A	85	dB(A)	
Tonality / Impulsiveness correction	0		5		0	dB	
Minimum distance to receiver		42.5			42.5	m	
Distance attenuation (-6 dB per doubling of distance)		-33			-33	dB	
Building screening		0			0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	26	28	N/A	N/A	52	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	21	N/A	N/A	45	dB(A)		

ONSITE CAR MOVEMENT	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	68		70	73	74	dB(A)	
Duration of single event		10				Seconds	
Number of events in the measurement period	16		32			Events	
Total time duration of combined events	161.3		322.6			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	61	58	N/A	73	74	dB(A)	
Tonality / Impulsiveness correction	0		0		0	dB	
Minimum distance to receiver		39.5			39.5	m	
Distance attenuation (-6 dB per doubling of distance)		-32			-32	dB	
Building screening		0			0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	31	28	N/A	44	42	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	21	N/A	36	35	dB(A)		

ONSITE CAR STARTS NORTH	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	73		74	75	76	dB(A)	
Duration of single event		3				Seconds	
Number of events in the measurement period	4		8			Events	
Total time duration of combined events	12.0		24.0			Seconds	
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	Lmax		
Noise source level for assessment time period	54	51	N/A	N/A	76	dB(A)	
Tonality / Impulsiveness correction	0		0		0	dB	
Minimum distance to receiver		59.5			59.5	m	
Distance attenuation (-6 dB per doubling of distance)		-35			-35	dB	
Building screening		0			0	dB	
Facade reflection		2.5			0	dB	
Impact at nearest façade	21	18	N/A	N/A	41	dB(A)	
Reduction through open window		-5	-5	-5	-5	dB	
Impact inside open window (excludes façade correction)	11	N/A	N/A	33	dB(A)		

ON-SITE ACTIVITY NOISE PREDICTION CALCULATIONS: (L_{A10} 1hr and L_{A01} 1hr levels are represented as N/A if the duration of events do not occur for 10% or 1% of the 1 hour period)

NIGHT-TIME

R1: Existing and under-construction detached single-storey dwellings to the immediate north

ONSITE CAR STARTS CENTRE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74		76	dB(A)
Duration of single event		3				Seconds
Number of events in the measurement period	4		8			Events
Total time duration of combined events	12.0		24.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	54	51	N/A	N/A	76	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		46			46	m
Distance attenuation (-6 dB per doubling of distance)		-33			-33	dB
Onsite building screening		-10.0			-10.0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	13	10	N/A	N/A	33	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		3	N/A	N/A	25	dB(A)

PEOPLE TALKING OUTSIDE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	58		60	62	64	dB(A)
Duration of single event		720				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	720.0		2880.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	57	57	60	62	64	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		20			20	m
Distance attenuation (-6 dB per doubling of distance)		-26			-26	dB
Offsite acoustic barrier screening		-6.0			-6.0	dB
Building screening		0			0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	28	28	30	32	32	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		20	23	25	24	dB(A)

AMPLIFIED MUSIC INSIDE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	74		78	82	85	dB(A)
Duration of single event		900				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	900.0		3600.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	74	74	78	82	85	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		6			6	m
Distance attenuation (-6 dB per doubling of distance)		-10			-9.5	dB
Inside to outside attenuation (walls / roof / ceiling)		-38			-38	dB
Onsite building screening		0			0	dB
Speaker directivity		-3			-3	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	26	31	35	39	34	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		23	27	31	27	dB(A)

CABLE PULL DOWN MACHINES	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	78		82	88	90	dB(A)
Duration of single event		30				Seconds
Number of events in the measurement period	24		48			Events
Total time duration of combined events	720.0		1440.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	77	74	82	88	90	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		6			6	m
Distance attenuation (-6 dB per doubling of distance)		-16			-16	dB
Inside to outside attenuation (walls / roof / ceiling)		-38			-38	dB
Building screening		0			0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	26	28	36	42	36	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		20	28	34	29	dB(A)

R2: Existing detached single-storey dwellings to the south across South Street

ONSITE CAR STARTS CENTRE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74	75	76	dB(A)
Duration of single event		3				Seconds
Number of events in the measurement period	4		8			Events
Total time duration of combined events	12.0		24.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	54	51	N/A	N/A	76	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		42.5			42.5	m
Distance attenuation (-6 dB per doubling of distance)		-33			-33	dB
Building screening		0			0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	24	21	N/A	N/A	43	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		14	N/A	N/A	36	dB(A)

PEOPLE TALKING OUTSIDE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	58		60	62	64	dB(A)
Duration of single event		720				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	720.0		2880.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	57	57	60	62	64	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		65			65	m
Distance attenuation (-6 dB per doubling of distance)		-36			-36	dB
Inside to outside attenuation		0			0	dB
Building screening		0			0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	23	23	26	28	28	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		16	19	21	20	dB(A)

AMPLIFIED MUSIC INSIDE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	74		78	82	85	dB(A)
Duration of single event		900				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	900.0		3600.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	74	74	78	82	85	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		69			69	m
Distance attenuation (-6 dB per doubling of distance)		-31			-30.8	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Onsite building screening		0			0	dB
Speaker directivity		0			0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	16	21	25	29	24	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		13	17	21	17	dB(A)

CABLE PULL DOWN MACHINES	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	78		82	88	90	dB(A)
Duration of single event		30				Seconds
Number of events in the measurement period	24		48			Events
Total time duration of combined events	720.0		1440.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	77	74	82	88	90	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		69			69	m
Distance attenuation (-6 dB per doubling of distance)		-37			-37	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Building screening		0			0	dB
Facade reflection		2.5			0	dB
Impact at nearest façade	13	15	23	29	23	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		7	15	21	16	dB(A)

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (LA10 1hr and LA01 1hr levels are represented as N/A if the duration of events do not occur for 10% or 1% of the 1 hour period)

NIGHT-TIME

R1: Existing and under-construction detached single-storey dwellings to the immediate north

FOUR WALKING MACHINES	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	71		72	74		75	dB(A)
Duration of single event	900						Seconds
Number of events in the measurement period	1		4				Events
Total time duration of combined events	900.0		3600.0				Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		Lmax	
Noise source level for assessment time period	71	71	72	74		75	dB(A)
Tonality / Impulsiveness correction	0		0			0	dB
Minimum distance to receiver		6				6	m
Distance attenuation (-6 dB per doubling of distance)		-16				-16	dB
Inside to outside attenuation (walls / roof / ceiling)		-38				-38	dB
Building screening		0				0	dB
Façade reflection		2.5				0	dB
Impact at nearest façade	20	20	21	23		21	dB(A)
Reduction through open window		-5	-5	-5		-5	dB
Impact inside open window (excludes façade correction)		12	13	15		14	dB(A)

BATTLEROPESWING	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	58		59	60		63	dB(A)
Duration of single event	900						Seconds
Number of events in the measurement period	1		3				Events
Total time duration of combined events	900.0		2700.0				Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		Lmax	
Noise source level for assessment time period	58	57	59	60		63	dB(A)
Tonality / Impulsiveness correction	0		0			0	dB
Minimum distance to receiver		6				6	m
Distance attenuation (-6 dB per doubling of distance)		-10				-10	dB
Inside to outside attenuation (walls / roof / ceiling)		-38				-38	dB
Building screening		0				0	dB
Façade reflection		2.5				0	dB
Impact at nearest façade	13	12	14	15		15	dB(A)
Reduction through open window		-5	-5	-5		-5	dB
Impact inside open window (excludes façade correction)		4	6	7		8	dB(A)

200kg WEIGHT DROP	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	88		91	94		95	dB(A)
Duration of single event	1						Seconds
Number of events in the measurement period	24		48				Events
Total time duration of combined events	24.0		48.0				Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		Lmax	
Noise source level for assessment time period	72	69	N/A	94		95	dB(A)
Tonality / Impulsiveness correction	0		5			0	dB
Minimum distance to receiver		6				6	m
Distance attenuation (-6 dB per doubling of distance)		-16				-16	dB
Inside to outside attenuation (walls / roof / ceiling)		-38				-38	dB
Rubber mat floor absorption		0				0	dB
Façade reflection		2.5				0	dB
Impact at nearest façade	21	23	N/A	48		41	dB(A)
Reduction through open window		-5	-5	-5		-5	dB
Impact inside open window (excludes façade correction)		16	N/A	40		34	dB(A)

COMBINED / HIGHEST IMPACTS							
Impact at nearest façade	33	35	36	48	48	48	dB(A)
Reduction through open window		-5	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		28	28	40	40	40	dB(A)

R2: Existing detached single-storey dwellings to the south across South Street

FOUR WALKING MACHINES	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	71		72	74		75	dB(A)
Duration of single event	900						Seconds
Number of events in the measurement period	1		4				Events
Total time duration of combined events	900.0		3600.0				Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		Lmax	
Noise source level for assessment time period	71	71	72	74		75	dB(A)
Tonality / Impulsiveness correction	0		0			0	dB
Minimum distance to receiver		69				69	m
Distance attenuation (-6 dB per doubling of distance)		-37				-37	dB
Inside to outside attenuation (10.38mm laminate glass)		-30				-30	dB
Building screening		0				0	dB
Façade reflection		2.5				0	dB
Impact at nearest façade	7	7	8	10		8	dB(A)
Reduction through open window		-5	-5	-5		-5	dB
Impact inside open window (excludes façade correction)		-1	0	2		1	dB(A)

BATTLEROPESWING	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	58		59	60		63	dB(A)
Duration of single event	900						Seconds
Number of events in the measurement period	1		3				Events
Total time duration of combined events	900.0		2700.0				Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		Lmax	
Noise source level for assessment time period	58	57	59	60		63	dB(A)
Tonality / Impulsiveness correction	0		0			0	dB
Minimum distance to receiver		69				69	m
Distance attenuation (-6 dB per doubling of distance)		-31				-31	dB
Inside to outside attenuation (10.38mm laminate glass)		-30				-30	dB
Building screening		0				0	dB
Façade reflection		2.5				0	dB
Impact at nearest façade	0	-2	1	2		2	dB(A)
Reduction through open window		-5	-5	-5		-5	dB
Impact inside open window (excludes façade correction)		-9	-7	-6		-5	dB(A)

200kg WEIGHT DROP	Creep		Acoustic Quality Objectives			Lmax	
	LAeq	LAeq	LA10	LA01			
Noise source level for single event	88		91	94		95	dB(A)
Duration of single event	1						Seconds
Number of events in the measurement period	24		48				Events
Total time duration of combined events	24.0		48.0				Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr		Lmax	
Noise source level for assessment time period	72	69	N/A	94		95	dB(A)
Tonality / Impulsiveness correction	0		0			0	dB
Minimum distance to receiver		69				69	m
Distance attenuation (-6 dB per doubling of distance)		-37				-37	dB
Inside to outside attenuation (10.38mm laminate glass)		-30				-30	dB
Rubber mat floor absorption		0				0	dB
Façade reflection		2.5				0	dB
Impact at nearest façade	8	5	N/A	30		28	dB(A)
Reduction through open window		-5	-5	-5		-5	dB
Impact inside open window (excludes façade correction)		-3	N/A	22		21	dB(A)

COMBINED / HIGHEST IMPACTS							
Impact at nearest façade	34	33	26	44	52	48	dB(A)
Reduction through open window		-5	-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		26	19	36	45	45	dB(A)

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (L_{A10} 1hr and L_{A01} 1hr levels are represented as N/A if the duration is less than 10 seconds)

NIGHT-TIME

R3: Existing single and two-storey townhouses to the immediate west

ONSITE CAR DOOR CLOSURE NORTH	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		78	80	85	dB(A)
Duration of single event		1.5				Seconds
Number of events in the measurement period	8		16			Events
Total time duration of combined events	12.0		24.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	56	53	N/A	N/A	85	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		12			12	m
Distance attenuation (-6 dB per doubling of distance)		-22			-22	dB
Existing acoustic barrier screening		-10.7			-10.7	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	26	28	N/A	N/A	53	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	21	N/A	N/A	N/A	45	dB(A)

ONSITE CAR DOOR CLOSURE CENTRE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	75		78	80	85	dB(A)
Duration of single event		1.5				Seconds
Number of events in the measurement period	8		16			Events
Total time duration of combined events	12.0		24.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	56	53	N/A	N/A	85	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		14			14	m
Distance attenuation (-6 dB per doubling of distance)		-23			-23	dB
Existing acoustic barrier screening		-11.3			-11.3	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	25	26	N/A	N/A	51	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	19	N/A	N/A	N/A	43	dB(A)

ONSITE CAR MOVEMENT	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	68		70	73	74	dB(A)
Duration of single event		10				Seconds
Number of events in the measurement period	16		32			Events
Total time duration of combined events	161.3		322.6			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	61	58	N/A	73	74	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		9.5			9.5	m
Distance attenuation (-6 dB per doubling of distance)		-20			-20	dB
Existing acoustic barrier screening		-11.2			-11.2	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	32	29	N/A	45	43	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	22	N/A	37	36	36	dB(A)

ONSITE CAR STARTS NORTH	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74	75	76	dB(A)
Duration of single event		3				Seconds
Number of events in the measurement period	4		8			Events
Total time duration of combined events	12.0		24.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	54	51	N/A	N/A	76	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		12			12	m
Distance attenuation (-6 dB per doubling of distance)		-22			-22	dB
Existing acoustic barrier screening		-10.7			-10.7	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	24	21	N/A	N/A	44	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	14	N/A	N/A	N/A	36	dB(A)

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (L_{A10} 1hr and L_{A01} 1hr levels are represented as N/A if the duration is less than 10 seconds)

NIGHT-TIME

R3: Existing single and two-storey townhouses to the immediate west

ONSITE CAR STARTS CENTRE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	73		74	75	76	dB(A)
Duration of single event		3				Seconds
Number of events in the measurement period	4		8			Events
Total time duration of combined events	12.0		24.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	54	51	N/A	N/A	76	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		14			14	m
Distance attenuation (-6 dB per doubling of distance)		-23			-23	dB
Existing acoustic barrier screening		-11.3			-11.3	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	23	19	N/A	N/A	42	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	12	N/A	N/A	N/A	34	dB(A)

PEOPLE TALKING OUTSIDE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	58		60	62	64	dB(A)
Duration of single event		720				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	720.0		2880.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	57	57	60	62	64	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		13.5			13.5	m
Distance attenuation (-6 dB per doubling of distance)		-23			-23	dB
Existing acoustic barrier screening		-10.2			-10.2	dB
Building screening		0			0	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	27	27	30	32	31	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	19	22	24	24	24	dB(A)

AMPLIFIED MUSIC INSIDE	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	74		78	82	85	dB(A)
Duration of single event		900				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	900.0		3600.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	74	74	78	82	85	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		15			15	m
Distance attenuation (-6 dB per doubling of distance)		-18			-17.5	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Existing acoustic barrier screening		0			0	dB
Speaker directivity		-3			-3	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	26	31	35	39	34	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	23	27	31	27	27	dB(A)

CABLE PULL DOWN MACHINES	Acoustic Quality Objectives				L _{max}	
	Creep LAeq	LAeq	LA10	LA01		
Noise source level for single event	78		82	88	90	dB(A)
Duration of single event		30				Seconds
Number of events in the measurement period	24		48			Events
Total time duration of combined events	720.0		1440.0			Seconds
	LAeq	LAeq 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	77	74	82	88	90	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		15			15	m
Distance attenuation (-6 dB per doubling of distance)		-24			-24	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Existing acoustic barrier screening		0			0	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	26	28	36	42	36	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)	20	28	34	29	29	dB(A)

ONSITE ACTIVITY NOISE PREDICTION CALCULATIONS: (L_{A10} 1hr and L_{A01} 1hr levels are represented as N/A if the duration

NIGHT-TIME

R3: Existing single and two-storey townhouses to the immediate west

FOUR WALKING MACHINES	Creep	Acoustic Quality Objectives			L _{max}	
	L _{Aeq}	L _{Aeq}	LA10	LA01		
Noise source level for single event	71		72	74	75	dB(A)
Duration of single event		900				Seconds
Number of events in the measurement period	1		4			Events
Total time duration of combined events	900.0		3600.0			Seconds
	L _{Aeq}	L _{Aeq} 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	71	71	72	74	75	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		15			15	m
Distance attenuation (-6 dB per doubling of distance)		-24			-24	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Existing acoustic barrier screening		0			0	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	20	20	21	23	21	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		12	13	15	14	dB(A)

(69.49/72) (95.49/72)

BATTLE ROPE SWING	Creep	Acoustic Quality Objectives			L _{max}	
	L _{Aeq}	L _{Aeq}	LA10	LA01		
Noise source level for single event	58		59	60	63	dB(A)
Duration of single event		900				Seconds
Number of events in the measurement period	1		3			Events
Total time duration of combined events	900.0		2700.0			Seconds
	L _{Aeq}	L _{Aeq} 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	58	57	59	60	63	dB(A)
Tonality / Impulsiveness correction	0		0		0	dB
Minimum distance to receiver		15			15	m
Distance attenuation (-6 dB per doubling of distance)		-18			-18	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Existing acoustic barrier screening		0			0	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	13	12	14	15	15	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		4	6	7	8	dB(A)

(10.94/69) (14.96/62)

200kg WEIGHT DROP	Creep	Acoustic Quality Objectives			L _{max}	
	L _{Aeq}	L _{Aeq}	LA10	LA01		
Noise source level for single event	88		91	94	95	dB(A)
Duration of single event		1				Seconds
Number of events in the measurement period	24		48			Events
Total time duration of combined events	24.0		48.0			Seconds
	L _{Aeq}	L _{Aeq} 1hr	LA10 1hr	LA01 1hr	L _{max}	
Noise source level for assessment time period	72	69	N/A	94	95	dB(A)
Tonality / Impulsiveness correction	0		5		0	dB
Minimum distance to receiver		15			15	m
Distance attenuation (-6 dB per doubling of distance)		-24			-24	dB
Inside to outside attenuation (10.38mm laminate glass)		-30			-30	dB
Rubber mat floor absorption		0			0	dB
Façade reflection		2.5			0	dB
Impact at nearest façade	21	23	N/A	48	41	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		16	N/A	40	34	dB(A)

(132.98) (210.25/8)

COMBINED / HIGHEST IMPACTS						
Impact at nearest façade	36	37	36	48	53	dB(A)
Reduction through open window		-5	-5	-5	-5	dB
Impact inside open window (excludes façade correction)		29	28	40	45	dB(A)

MECH PLANT NOISE PREDICTION CALCULATIONS:

R1: Existing and under-construction detached single-storey dwellings to the immediate west

A/C Units	60	dB(A) @ 2m
Number of units	2	units
Total noise level	63	dB(A) @ 2m
Distance to receiver	18	m
Distance attenuation (-6 dB per doubling of distance)	-19	dB(A)
Acoustic screening	-15	dB(A)
Façade reflection	2.5	dB(A)
Impact at nearest façade	31	dB(A)
Reduction through open window	-5	dB(A)
Impact inside open window (excludes façade correction)	24	dB(A)

R2: Existing detached single-storey dwellings to the south across South Street

A/C Units	60	dB(A) @ 2m
Number of units	2	units
Total noise level	63	dB(A) @ 2m
Distance to receiver	80	m
Distance attenuation (-6 dB per doubling of distance)	-32	dB(A)
Acoustic screening	-15	dB(A)
Façade reflection	2.5	dB(A)
Impact at nearest façade	18	dB(A)
Reduction through open window	-5	dB(A)
Impact inside open window (excludes façade correction)	11	dB(A)

R3: Existing single and two-storey townhouses to the immediate west

A/C Units	60	dB(A) @ 2m
Number of units	2	units
Total noise level	63	dB(A) @ 2m
Distance to receiver	35	m
Distance attenuation (-6 dB per doubling of distance)	-25	dB(A)
Acoustic screening	-15	dB(A)
Façade reflection	2.5	dB(A)
Impact at nearest façade	26	dB(A)
Reduction through open window	-5	dB(A)
Impact inside open window (excludes façade correction)	18	dB(A)