

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL



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acousticworks)))

Proposed Residential Age Care Facility
Lumina Precinct
48 Village Boulevard
Southport

ACOUSTIC REPORT



Client:

Infinite Care (Developments) Pty Ltd

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1. Introduction

This report is in response to a request by Infinite Care (Developments) Pty Ltd for an environmental noise assessment of a proposed residential aged care facility located at 48 Village Boulevard, Southport. To facilitate the assessment, unattended noise monitoring and attended measurements were conducted for the following:

- Ambient noise levels to determine the criteria for onsite activities.

This revision has been issued in response to the City of Gold Coast Council information request (ref. DEV2021/1181, dated 23 June 2021).

2. Site Description

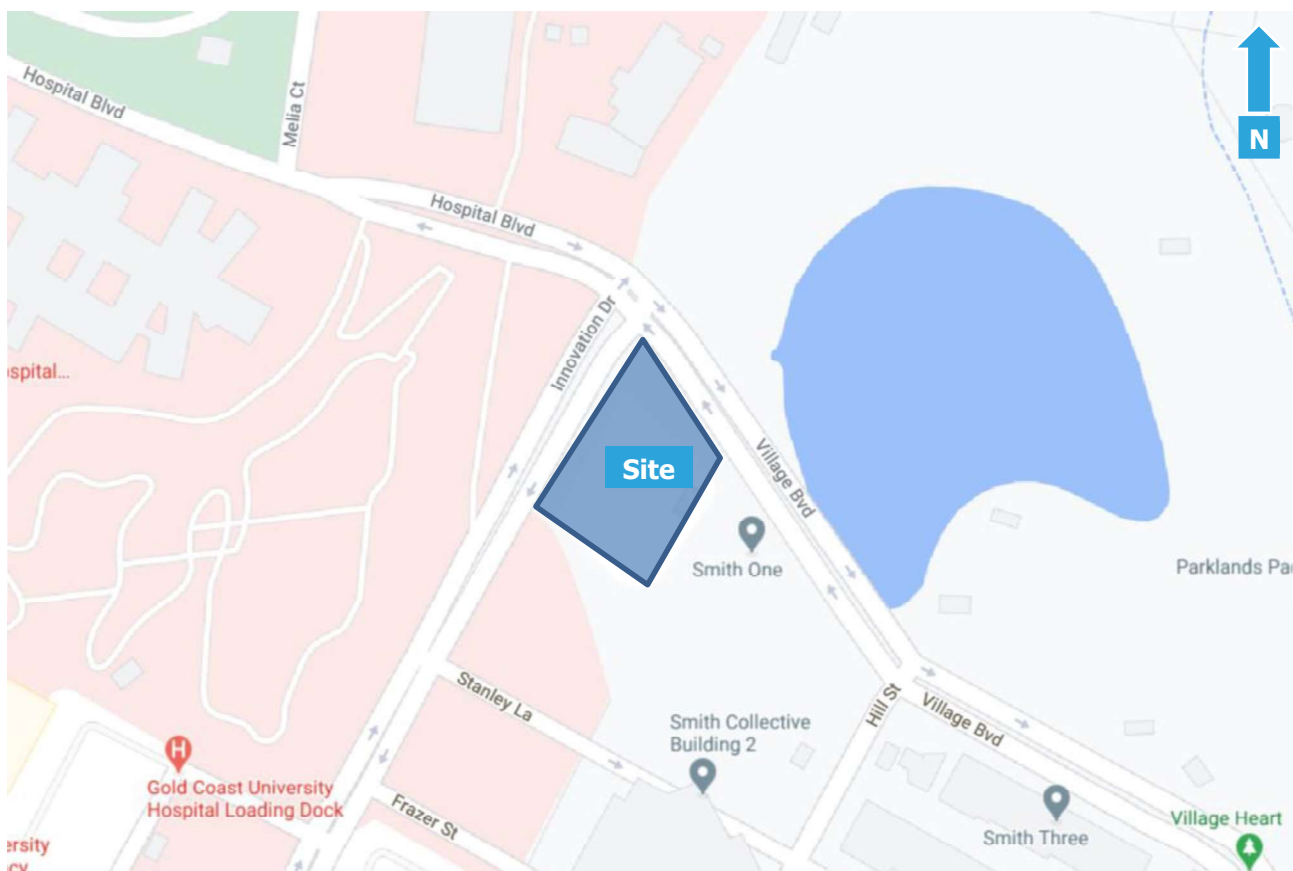
2.1 Site Location

The site is described by the following:

Village Boulevard, Southport
Lot 16 of SP275512

Refer to Figure 1 for site location.

Figure 1: Site Location (not to scale)



A comprehensive site survey was conducted on the 24 February 2021 and identified the following:

- a) A seven storey residential building bounds the site to the south east.
- b) Village Boulevard separates the site from the Parklands Paceway.

- c) A carpark bounds the site to the south west.
- d) Innovation Drive separates the site from the Gold Coast University Hospital (GCUH)

2.2 Proposal

The proposal is to construct a residential aged care facility as follows:

- Site Area: 3,311m²
- Shops, Café and Retirement facility offices are located on the ground floor.
- 142 Proposed residential aged care units on levels 1-4
- Commercial Tennant on level 5

Refer to the Appendices for development plans.

2.3 Acoustic Environment

The site and surrounding area are primarily affected by road noise.

3. Equipment

The following equipment was used to record noise levels:

- Rion NL42 Environmental Noise Monitor
- Norsonic NOR140 Sound Level Meter
- BSWA Technology Co. Ltd Sound Calibrator

The Rion NL42 Environmental Noise Monitors and Norsonic NOR140 Sound Level Meter hold current NATA Laboratory Certification and were field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Receivers and Noise Monitoring

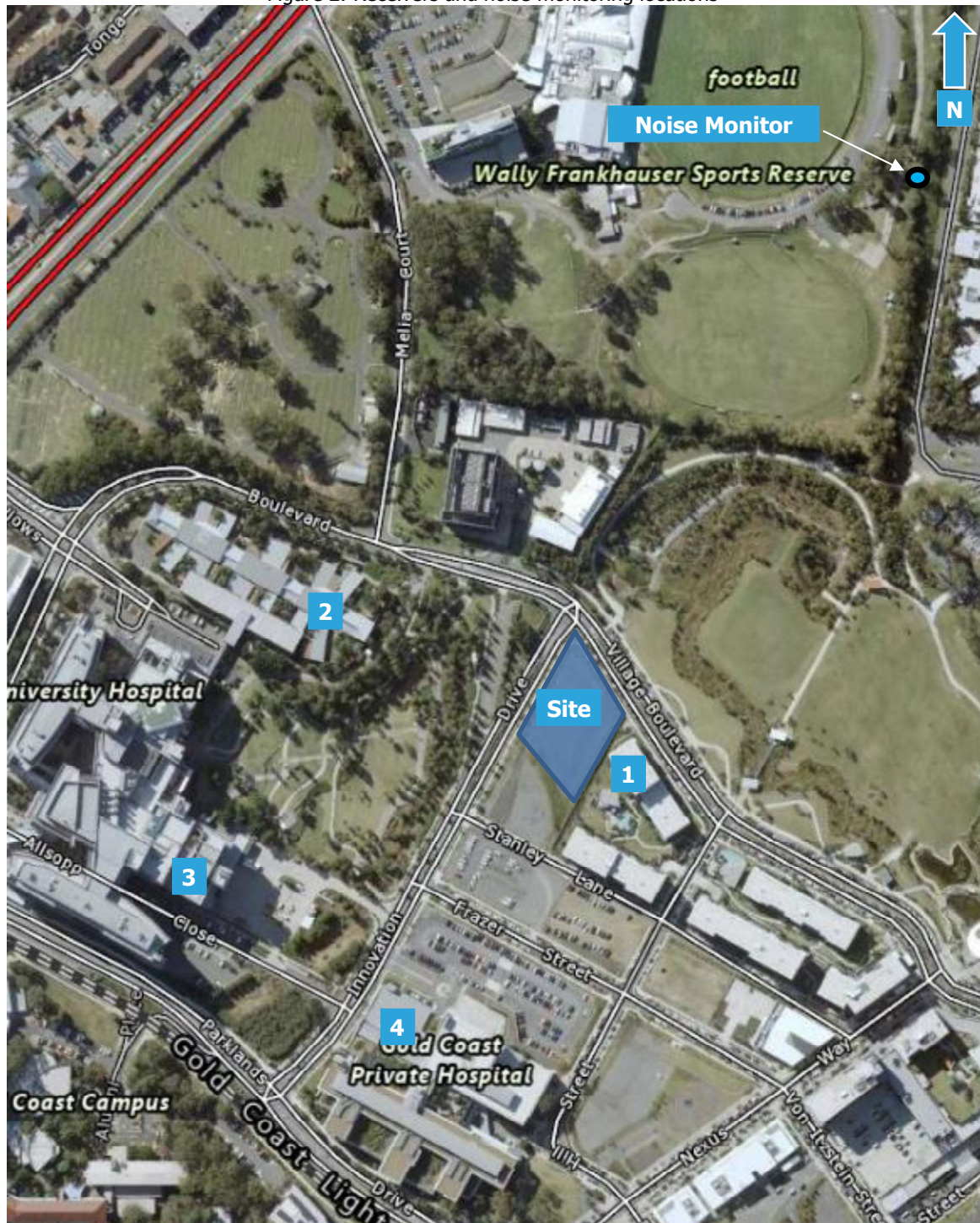
4.1 Receiver Locations

The nearest residential receiver locations were identified as follows;

1. A seven storey residential building at 40 Village Boulevard to the south east.
2. The two storey Block F at the Gold Coast University Hospital to the north west.
3. Multi storey Block D at the Gold Coast University Hospital on the south west.
4. Multi storey Gold Coast Private Hospital to the south.

These locations were chosen as being representative of the nearest residential receivers to the proposed development. Refer to Figure 2 for these locations.

Figure 2: Receivers and noise monitoring locations



4.2 Unattended Noise Monitoring

The Rion NL42 environmental noise monitor was placed on site at 180 Musgrave Road to measure ambient noise levels. The monitor was located in a free field position with the microphone approximately 1.4 metres above ground surface level. The noise monitor was set to record noise levels between the 24 February and 3 March 2021

The environmental noise monitor was set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS1055:1997 *Acoustics – Description and measurement of*

environmental noise with road traffic conducted in accordance with Australian Standard *AS2702:1984 'Acoustics – Methods for the measurement of road traffic noise'*.

4.3 Attended Noise Measurements

To ensure a reasonable acoustic amenity is maintained for the proposed development attended noise measurements were conducted on 15 July 2021. The results of the assessment are presented in section 8.

Attended noise measurements were conducted in accordance with Australian Standard *AS1055:1997 Acoustics – Description and measurement of environmental noise*.

5. Measured Noise Levels

The following tables present the measured ambient noise levels from the unattended noise surveys. Any periods of inclement weather or extraneous noise were omitted from the measured data prior to determining the results.

The ambient levels measured at the monitoring location are as follows;

Table 1: Measured ambient noise levels – all time periods

Day	Date	L90 dB(A)		
		Day	Eve	Night
Wednesday	24/02/21	44	42	43
Thursday	25/02/21	43	43	42
Friday	26/02/21	45	45	41
Saturday	27/02/21	41	43	42
Sunday	28/02/21	41	43	42
Monday	1/03/21	44	44	42
Tuesday	2/03/21	44	46	43
Wednesday	3/03/21	45	-	43
Overall value		43	44	42

Refer to the appendix for graphical representation.

6. Noise Criteria

6.1 Environmental Noise Criteria

The noise criteria as applied by City of Gold Coast are as follows;

6.1.1 Acoustic Quality Objectives

Table 2 presents the acoustic quality objectives at noise sensitive receptors as detailed in Schedule 1 of the EPP (Noise) 2008.

Table 2: Acoustic Quality Objectives at Noise Sensitive Properties

Sensitive Receptor	Time of Day	Acoustic Quality Objectives, dB(A)		
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$
Dwelling (outdoors)	Day and Evening (7am – 10pm)	50	55	65
Dwelling (Indoors)	Day and Evening (7am – 10pm)	35	40	45
	Night (10pm – 7am)	30	35	40

6.1.2 Background Creep

The Background Creep criteria are as follows;

Time-varying noise:

$$L_{Aeq,adj,T} \leq \text{Ambient } L_{A90,T} + 5\text{dB(A)}$$

Steady-state noise:

$$L_{A90,T} \leq \text{Ambient } L_{A90,T}$$

The time period (T) is a time interval of at least 15 minutes, or if the noise continues for less than 15 minutes, the duration of the noise source.

Based on the results of ambient noise monitoring, the project specific background creep noise limits are shown in Table 3.

Table 3: Background creep noise limits

Time Period	Noise Level Limits SPL dB(A)	
	$L_{Aeq,T}$	$L_{A90,T}$
Day 7am – 6pm	48	43
Evening 6pm – 10pm	49	44
Night 10pm – 7am	47	42

7. Environmental Assessment

7.1 Noise levels due to Patrons

Noise associated with patrons is based on a technical paper '*Prediction of Noise from Small to Medium Sized Crowds*' (Hayne et al, 2011). The paper was based upon attended noise measurements conducted at a sample of premises to account for range of patron numbers. Based on the measured levels, the resulting analysis determined that the Sound Power Level (LAeq, T) of a small-medium crowd could be predicted by the following equation:

$$L_{WAeq} = 15 \log (\text{number of patrons}) + 64 \text{ dB(A)} \text{ (approx. maximum 100 patrons)}$$

The Lmax value is predicted by the following equation:

$$L_{WMax} = 11 \log (\text{number of patrons}) + 81 \text{ dBA} \text{ (approx. maximum 100 patrons)}$$

Using the above formulae, the predicted overall patron sound power level is presented in Table 4.

Table 4: Predicted sound power levels of patrons – General weekly services

Area	Time Period	Expected maximum number of guests	Predicted LAeq Sound Power Level dB(A)	Predicted LMax Sound Power Level dB(A)
Café	Day	30	86	97

The predicted equivalent source sound pressure level (at 1m) is taken to be 8 dB lower than the sound power levels presented in Table 4.

7.2 Onsite Activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume that the nominated activities are located at the closest representative point within the development site to each receiver location. Any relevant shielding, building transmission loss or recommended acoustic screens are taken into account for these activities.

7.2.1 Acoustic Quality Objectives

The average maximum noise source levels and predicted levels at the receiver locations are shown in Table 5. Note: L_{A10} and L_{A1} results are not shown in cases where the total duration of the events is less than the minimum time required e.g. $L_{A10(1hr)}$ requires noise events to occur for at least 360 seconds of an hour long period. L_{Aeq} results are not shown where the calculated total is less than 0dBA.

Table 5: Acoustic quality objective noise levels, 1 hour

Receiver	Receivers																															
	1. 40 Village Boulevard (SE) 2. Block F Gold Coast University Hospital (NW) 3. Block D Gold Coast University Hospital (SW) 4. Gold Coast Private Hospital (S) 5. Proposed Development																															
	Description	Source @1m dB(A)	Correction dB(A)*	Corrected dB(A)	No. of events per 1hr Day	No. of events per 1hr Eve	No. of events per 1hr Night	Duration per event	Distance (m)	Inc	Barrier (height (m))	Barrier screening dB	Building TL or shield dB	Topo screening dB	Dist atten. @-6dB/dd	LAeq adj,1hr ext. dB(A) Day	LAeq adj,1hr int. dB(A) Day	LAeq adj,1hr ext. dB(A) Eve	LAeq adj,1hr int. dB(A) Eve	LAeq adj,1hr ext. dB(A) Night	LAeq adj,1hr int. dB(A) Night	Amenity LAeq Compliance			LA10 Compliance			LA1 Compliance				
																						Day/eve	Day/eve indoor	Night indoor	Day/eve	Day/eve indoor	Night indoor	Day/eve	Day/eve indoor	Night indoor		
1	Criteria																					50	35	30	55	40	35	65	45	40		
	Car door closure	75	2	77	36	24	12	2	15						-24	36	26	34	24	31	21	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car start	74	2	76	36	24	12	2	15						-24	35	25	33	23	30	20	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car passby	69		69	36	24	12	15	9	3	-7				-19	34	24	32	22	29	19	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car on ramp	74		74	36	24	12	10	9	3	-7				-19	37	27	35	25	32	22	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Voice conversation	65		65	4	4	4	900	20			-5			-26	33	23	33	23	33	23	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Café Patron (30 people)	78		78	4	4	4	900	60			-11			-36	31	21	31	21	31	21	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Delivery van	88	2	90	4	0	0	60	36						-31	46	36					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Total															48	38	41	31	39	29	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
2	Criteria																					50	35	30	55	40	35	65	45	40		
	Car door closure	75	2	77	36	24	12	2	138						-43	17	7	15	5	12	2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car start	74	2	76	36	24	12	2	138						-43	16	6	14	4	11	1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car passby	69		69	36	24	12	15	129						-42	19	9	17	7	14	4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car on ramp	74		74	36	24	12	10	175			-11			-45	8		6		3		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Voice conversation	65		65	4	4	4	900	173			-11			-45	9		9		9		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Café Patron (30 people)	78		78	4	4	4	900	142			-11			-43	24	14	24	14	24	14	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Delivery van	88	2	90	4			60	146						-43	35	25					Yes	n/a	n/a	Yes	n/a	n/a	Yes	n/a	n/a		
	Total															36	26	26	16	25	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
3	Criteria																					50	35	30	55	40	35	65	45	40		
	Car door closure	75	2	77	36	24	12	2	216						-47	13	3	11	1	8		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car start	74	2	76	36	24	12	2	216						-47	12	2	11	1	8		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car passby	69		69	36	24	12	15	210						-46	14	4	13	3	10		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car on ramp	74		74	36	24	12	10	246						-48	16	6	14	4	11	1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Voice conversation	65		65	4	4	4	900	241						-48	17	7	17	7	17	7	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Café Patron (30 people)	78		78	4	4	4	900	247						-48	30	20	30	20	30	20	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Delivery van	88	2	90	4			60	213						-47	32	22					Yes	n/a	n/a	Yes	n/a	n/a	Yes	n/a	n/a		
	Total															34	24	31	21	31	21	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
4	Criteria																					50	35	30	55	40	35	65	45	40		
	Car door closure	75	2	77	36	24	12	2	205						-47	13	3	11	1	8		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car start	74	2	76	36	24	12	2	205						-46	13	3	11	1	8		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car passby	69		69	36	24	12	15	198						-46	15	5	13	3	10		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car on ramp	74		74	36	24	12	10	213						-47	17	7	16	6	13	3	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Voice conversation	65		65	4	4	4	900	204						-46	19	9	19	9	19	9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Café Patron (30 people)	78		78	4	4	4	900	247			-11			-48	19	9	19	9	19	9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Delivery van	88	2	90	4			60	197						-46	32	22					Yes	n/a	n/a	Yes	n/a	n/a	Yes	n/a	n/a		
	Total															33	23	24	14	23	13	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
5	Criteria																					50	35	30	55	40	35	65	45	40		
	Car door closure	75	2	77	36	24	12	2	6.3			-23			-16	21	11	19	9	16	6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car start	74	2	76	36	24	12	2	6.3			-23			-16	20	10	18	8	15	5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car passby	69		69	36	24	12	15	6.3			-23			-16	22	12	20	10	17	7	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Car on ramp	74		74	36	24	12	10	6.3			-7			-16	41	31	39	29	36	26	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Voice conversation	65		65	4	4	4	900	6.3			-24			-16	25	15	25	15	25	15	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Café Patron (30 people)	78		78	4	4	4	900	6.3			-24			-16	38	28	38	28	38	28	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	Delivery van	88	2	90	4			60	6.3			-23			-16	39	29					Yes	n/a	n/a	Yes	n/a	n/a	Yes	n/a	n/a		
	Total															44	34	42	32	40	30	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		

*Correction due to tonality and impulsiveness as per AS1055:1997.

Compliance is predicted with the Acoustic Quality Objectives criteria with the need for additional acoustic treatments.

7.2.2 Background Creep

The noise source levels and predicted levels at the receiver locations are shown as follows;

Table 6: Background Creep noise levels, 15 minute

Receiver	Receivers	Source Leq@1m dB(A)	Correction dB(A)*	Corrected dB(A)	No. of events per 15min Day	No. of events per 15min Eve	No. of events per 15min Night	Duration per event	Distance (m)	inc	Barrier (height (m))	Barrier screening dB	Building TL or shield dB	Topo screening dB	Dist atten. @-6dB/dd	LAeq adj, T ext. dB(A) Day	LAeq adj, T int. dB(A) Day	LAeq adj, T ext. dB(A) Eve	LAeq adj, T int. dB(A) Eve	LAeq adj, T ext. dB(A) Night	LAeq adj, T int. dB(A) Night	LAeq 15 min Compliance		
	Description																					Day	Eve	Night
1	Criteria																					48	49	47
	Voice conversation	65		65	1	1	1	900	20				-5		-27	33	23	33	23	33	23	Yes	Yes	Yes
	Café Patron (30 people)	78		78	1	1	1	900	60				-11		-36	31	21	31	21	31	21	Yes	Yes	Yes
	Delivery van	88	2	90	1			60	36						-32	46	36					Yes	n/a	n/a
	Total															47	37	35	25	35	25	Yes	Yes	Yes
2	Criteria																					48	49	47
	Voice conversation	65		65	1	1	1	900	173				-11		-45	9		9		9		Yes	Yes	Yes
	Café Patron (30 people)	78		78	1	1	1	900	142				-11		-43	24	14	24	14	24	14	Yes	Yes	Yes
	Delivery van	88	2	90	1			60	146						-43	35	25					Yes	n/a	n/a
	Total															35	25	24	14	24	14	Yes	Yes	Yes
3	Criteria																					48	49	47
	Voice conversation	65		65	1	1	1	900	241						-48	17	7	17	7	17	7	Yes	Yes	Yes
	Café Patron (30 people)	78		78	1	1	1	900	247						-48	30	20	30	20	30	20	Yes	Yes	Yes
	Delivery van	88	2	90	1			60	213						-47	32	22					Yes	n/a	n/a
	Total															34	24	30	20	30	20	Yes	Yes	Yes
4	Criteria																					48	49	47
	Voice conversation	65		65	1	1	1	900	204						-46	19	9	19	9	19	9	Yes	Yes	Yes
	Café Patron (30 people)	78		78	1	1	1	900	247				-11		-48	19	9	19	9	19	9	Yes	Yes	Yes
	Delivery van	88	2	90	1			60	197						-46	32	22					Yes	n/a	n/a
	Total															33	23	22	12	22	12	Yes	Yes	Yes
5	Criteria																					48	49	47
	Voice conversation	65		65	1	1	1	900	6				-24		-16	25	15	25	15	25	15	Yes	Yes	Yes
	Café Patron (30 people)	78		78	1	1	1	900	6				-24		-16	38	28	38	28	38	28	Yes	Yes	Yes
	Delivery van	88	2	90	1			60	6				-23		-16	39	29					Yes	n/a	n/a
	Total															42	32	38	28	38	28	Yes	Yes	Yes

*Correction due to tonality and impulsiveness as per AS1055:1997.

Compliance is predicted with the Background Creep criteria with the need for additional acoustic treatments.

Carpark activity is calculated to a time period of 15 seconds in Table 7.

Table 7: Onsite Background Creep Noise Levels, 15sec

Receiver	Receivers	Source Leq@1m dB(A)	Correction dB(A)*	Corrected dB(A)	No. of events per 15sec Day	No. of events per 15sec Eve	No. of events per 15sec Night	Duration per event	Distance (m)	inc	Barrier (height (m))	Barrier screening dB	Building TL or shield dB	Topo screening dB	Dist atten. @-6dB/dd	LAeq adj,T ext. dB(A) Day	LAeq adj,T int. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T int. dB(A) Eve	LAeq adj,T ext. dB(A) Night	LAeq adj,T int. dB(A) Night	LAeq 15 sec Compliance		
	Description																					Day	Eve	Night
1	Criteria																					48	49	47
	Car door closure	75	2	77	1	1	1	2	15						-24	44	34	44	34	44	34	Yes	Yes	Yes
	Car start	74	2	76	1	1	1	2	15						-24	43	33	43	33	43	33	Yes	Yes	Yes
	Car passby	69		69	1	1	1	15	9	3	-7				-20	42	32	42	32	42	32	Yes	Yes	Yes
	Car on ramp	74		74	1	1	1	10	9	3	-7				-20	45	35	45	35	45	35	Yes	Yes	Yes
	Total															50	40	50	40	50	40	No	No	No
2	Criteria																					48	49	47
	Car door closure	75	2	77	1	1	1	2	138						-43	25	15	25	15	25	15	Yes	Yes	Yes
	Car start	74	2	76	1	1	1	2	138						-43	24	14	24	14	24	14	Yes	Yes	Yes
	Car passby	69		69	1	1	1	15	129						-42	27	17	27	17	27	17	Yes	Yes	Yes
	Car on ramp	74		74	1	1	1	10	175			-11			-45	16	6	16	6	16	6	Yes	Yes	Yes
	Total															31	21	31	21	31	21	Yes	Yes	Yes
3	Criteria																					48	49	47
	Car door closure	75	2	77	1	1	1	2	216						-47	21	11	21	11	21	11	Yes	Yes	Yes
	Car start	74	2	76	1	1	1	2	216						-47	21	11	21	11	21	11	Yes	Yes	Yes
	Car passby	69		69	1	1	1	15	210						-46	23	13	23	13	23	13	Yes	Yes	Yes
	Car on ramp	74		74	1	1	1	10	246						-48	24	14	24	14	24	14	Yes	Yes	Yes
	Total															29	19	29	19	29	19	Yes	Yes	Yes
4	Criteria																					48	49	47
	Car door closure	75	2	77	1	1	1	2	205						-47	21	11	21	11	21	11	Yes	Yes	Yes
	Car start	74	2	76	1	1	1	2	205						-46	21	11	21	11	21	11	Yes	Yes	Yes
	Car passby	69		69	1	1	1	15	198						-46	23	13	23	13	23	13	Yes	Yes	Yes
	Car on ramp	74		74	1	1	1	10	213						-47	26	16	26	16	26	16	Yes	Yes	Yes
	Total															29	19	29	19	29	19	Yes	Yes	Yes
5	Criteria																					48	49	47
	Car door closure	75	2	77	1	1	1	2	6			-23			-16	29	19	29	19	29	19	Yes	Yes	Yes
	Car start	74	2	76	1	1	1	2	6			-23			-16	28	18	28	18	28	18	Yes	Yes	Yes
	Car passby	69		69	1	1	1	15	6			-23			-16	30	20	30	20	30	20	Yes	Yes	Yes
	Car on ramp	74		74	1	1	1	10	6			-11			-16	45	35	45	35	45	35	Yes	Yes	Yes
	Total															46	36	46	36	46	36	Yes	Yes	Yes

*Correction due to tonality and impulsiveness as per AS1055:2018.

On the condition the recommendations in Section 9 are implemented, compliance is predicted with the Background Creep criteria.

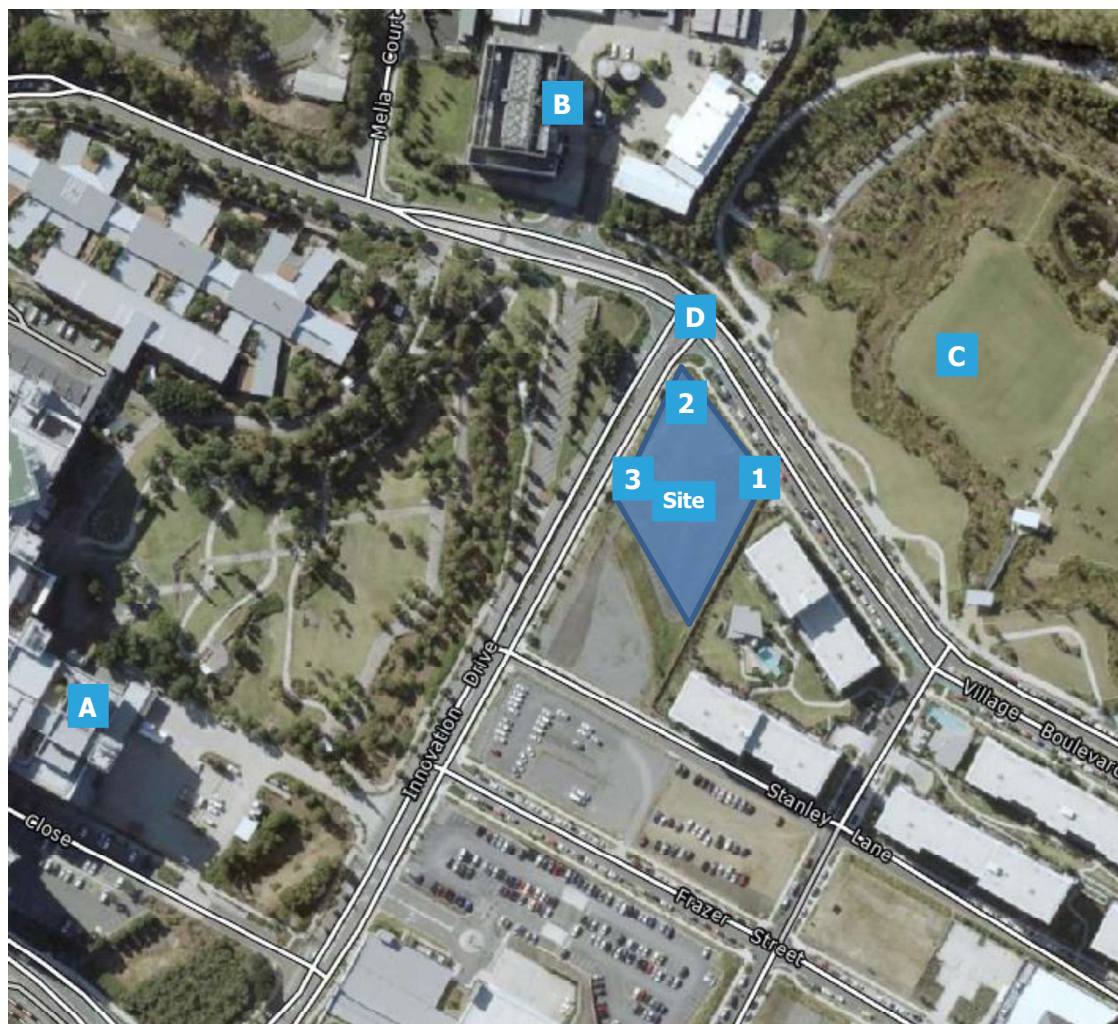
8. Offsite Noise Impacts

8.1 Offsite noise sources

The nearest offsite sources are located to the north of the site. The nearest offsite sources were identified as follows;

- A. Gold Coast University Hospital (GCUH), operational 24/7
- B. GCUH Block P, central energy plant and Block M engineering workshop
- C. Parklands Paceway Park
- D. Road traffic noise from Village Boulevard

Figure 3: Noise sources and measurement locations



8.2 Measured noise levels

Acoustic Works conducted attended measurements onsite on Thursday 15 July 2021 between the hours of 3:30pm and 4:30pm to assess noise impacts from the surrounding area on the proposed development site. Table 8 presents the measured noise levels from Gold Coast University Hospital, the park, and road traffic noise from Village Boulevard and Innovation Drive. Measurement locations are shown in Figure 3.

Noise from mechanical plant on the roof of the Hospital and Block P were audible and measurable at the subject site. Road traffic noise from Village boulevard was also audible and measurable at the site. The audible noise sources included light vehicle pass by, cars starting and car door closures. The results of the measurements are shown in Table 8.

Table 8: Attended measurements – Source noise levels

Site monitoring location	Activity assessed	Measurement distance from source	Measured maximum activity noise level dBA Leq 15 minutes	Comments
1. Southeast Corner of boundary	Parklands Paceway, Road Noise from Village Boulevard	10m from Village Boulevard, 65m from Parklands Paceway	53	Constant mechanical noise from the hospital. Birds and traffic noise frequently throughout the measurement.
2. Northeast corner of boundary	Block P and M of GCUH, Parklands Paceway, Road Noise from Village Boulevard	15m from Village Boulevard, 77m from Parklands Paceway, 100m from Block P and M GCUH	57	Noise was general the same as location 1 with the mechanical noise loader due to being closer, there was a plane and helicopter passby during the measurement, the park was loader than the previous measurement
2. Northwest corner of boundary	Block F and D of GCUH, Road Noise from Innovation Drive	10m from Village Boulevard, 130m from Block F GCUH and 200m from M GCUH	55	Mechanical noise was constant throughout measurement and was loader than location due to proximity to GCUH. The park noise was audible during measurement.

The predominant noise from all measurement locations were the mechanical plants on the roof of Block D and Block P of Gold Coast University Hospital.

8.3 Assessment

Noise from Gold Coast University was found to be audible and measurable at the subject site, mostly due to the mechanical plants.

Based on the results of the measurements, the maximum noise level used for assessment purposes is 57dBA Leq 15minutes.

The acoustic quality objectives for noise measured indoors at a noise sensitive location is 35dBA Leq during the daytime and evening and 30dBA Leq during the night period. The hours of operation of Gold Coast University Hospital are 24/7, therefore the criterion would be 30dBA Leq 1hr inside residential dwellings during the night period (equivalent to 40dBA outside) and 35dBA Leq 1hr during the daytime and evening (equivalent to 45dBA outside).

Hence the measured noise from Gold Coast University Hospital and road traffic along Village Boulevard of 57dBA would exceed the noise criteria. Thus, recommendations on reducing the impact from Pacific Fair on the development are required and presented in section 9.

9. Recommendations

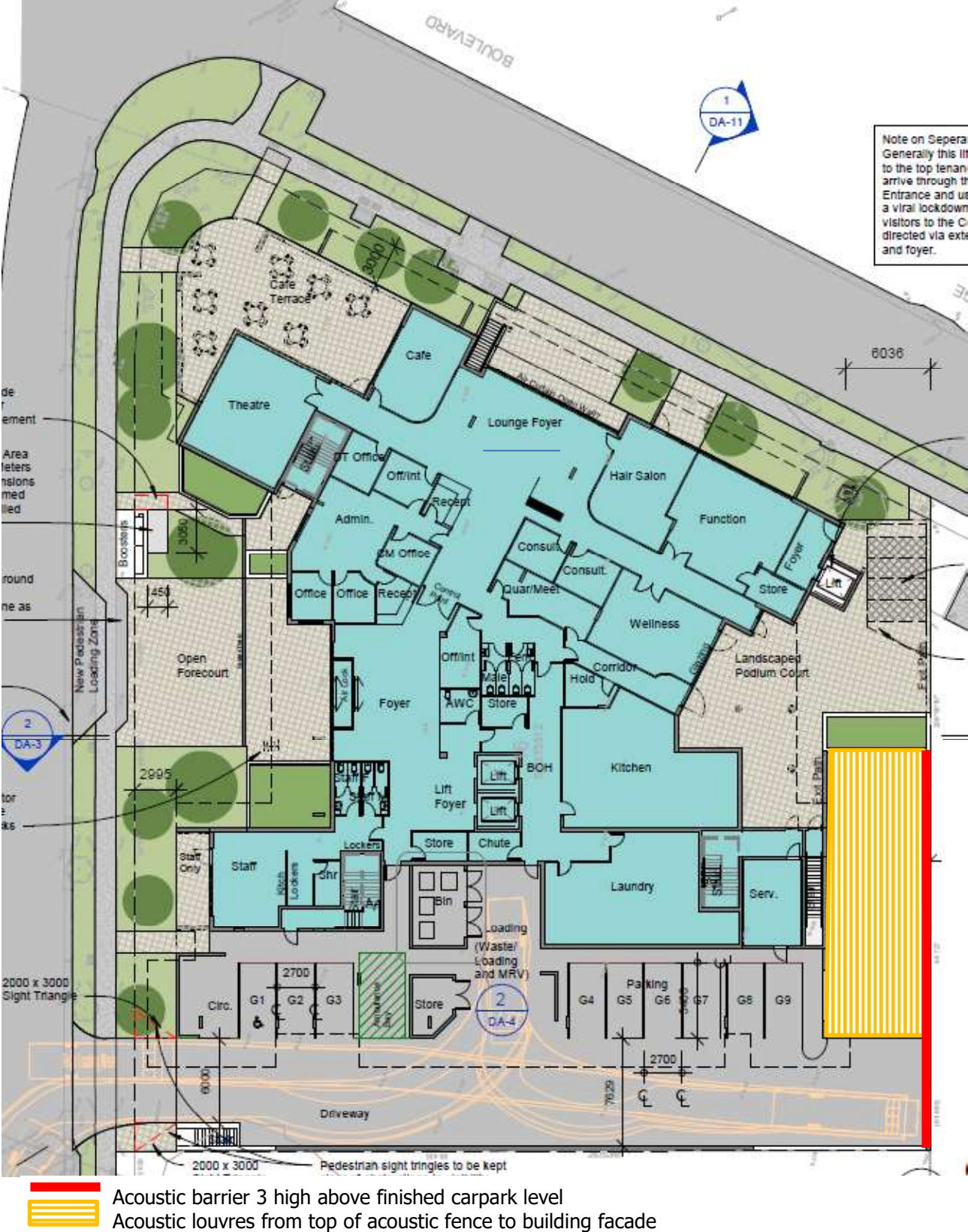
9.1 Ground Level Carparks

9.1.1 Acoustic barriers

Acoustic barriers are recommended to be constructed on ground level along the site boundaries as shown in Figure 4. The barriers are recommended to be built to a height of 3 metres above the finished carpark level.

The acoustic barriers shall be constructed using materials that achieve a minimum surface density of at least 10kg/m². Suitable materials may include lapped 19mm thick pine palings with 40% overlap, 9mm fibre cement sheet, masonry, aerated concrete, 6.38mm laminate glass or other materials which satisfy the minimum surface density requirement. The barriers shall be free of gaps and holes.

Figure 4: Recommended acoustic barriers (ground level)



9.1.2 Acoustic louvres

Acoustic louvres would be required above the exposed carpark areas and carpark ramp as shown in Figure 4. The louvres would extend from the top of the acoustic barrier to the façade of the building. The louvres can be angled at any inclination.

Note the typical acoustic louvre thickness is 200mm, however may be between 150-300mm depending on the selected manufacturer such as Flexshield, Fantech or similar. Other louvres manufacturers may also be used provided that they satisfy the technical requirements for sound transmission loss and static pressure.

The minimum required insertion loss for the louvres would be as follows;

Description	Octave band centre frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Minimum sound transmission loss dB (must be STL values not noise reduction)	1	3	7	11	12	9	7	6

Figure 5: Typical example of acoustic louvres (not for construction)



9.2 Offsite Noise

Offsite noise impact from Gold Coast University Hospital is deemed to be significant. In order to satisfy the internal acoustic quality objective level of 30dBA for night time, construction requirements have been laid out as follows in section 9.2.1.

9.2.1 Construction requirements

Due to offsite activity from Gold Coast University Hospital the following construction requirements are laid out as follows;

Table 9: Recommended construction Rw ratings

Level	Room	Rw Ratings				Glazing		Acoustic seals
		Wall	Roof	Glazing	Sliding door	Glazing 1	Sliding door	
Level 1-4	Northwest Sleeping	50	-	33	33	10.38 lam	10.38 lam	Yes
Level 1-4	Northeast Sleeping	50	-	33	33	10.38 lam	10.38 lam	Yes
Level 1-4	Southwest Sleeping	50	-	33	33	10.38 lam	10.38 lam	Yes
Level 1-4	Dining	50	-	33	-	10.38 lam	10.38 lam	Yes
Level 1-4	Sitting	50	-	33	-	10.38 lam	10.38 lam	Yes

9.2.1.1 Wall construction

All blockwork/masonry wall systems will achieve minimum Rw of 45. For lightweight construction, the recommended wall constructions are as follows;

- **Rw 50** – 1 layer of 13mm sound rated plasterboard externally, minimum 76mm steel stud with 88mm R2.5 insulation (24kg/m³) in the cavity and 1 layer of 13mm sound rated plasterboard internally.

Note that these are not the only allowable methods of construction for the development alternative systems are available upon request. Penetrations through the external walls shall not reduce the overall acoustic performance of the installed wall system.

9.2.1.2 Roof/ceiling construction

The recommended roof constructions are as follows;

- **Rw 48** – Minimum 0.42mm sheet metal roof, Bradford Anticon 60 MD insulation over battens, 13mm standard plasterboard internally with 215mm Bradford Gold Batts R4.1 in the cavity.

Note that these are not the only allowable methods of construction for the development alternative systems are available upon request. Penetrations through the roof shall not reduce the overall acoustic performance of the installed roof system.

9.2.1.3 Glazing requirements

The minimum glazing treatments are required to comply with the following:

- The recommendations would apply to habitable rooms only i.e. bedrooms, living rooms, dining rooms, open plan kitchens, sitting rooms, study etc.

- The recommendations do not apply to laundries, garages, bathrooms, toilets, hallways.
- The recommendations only apply to floor 1 and 2.
- The minimum glass thickness specified shall not be reduced regardless of the Rw performance of the glazing system.
- Glazing specified with acoustic seals requires a Q-Lon seal or an equivalent product, mohair seals are not acceptable.
- The glazier may be required to provide NATA test reports on request to verify compliance with the minimum Rw ratings. Generic reports are not acceptable.

9.3 Onsite Activities

Compliance is predicted for onsite activities without the need for any additional acoustic treatment and/or management controls.

9.4 Onsite Mechanical Plant

No information regarding mechanical services was available at the time of the assessment. We recommend that any new mechanical plant is designed to comply with the noise criteria stated in Section 6.1.2 with an assessment by qualified acoustic consultant to be conducted prior to installation.

10. Conclusion

An environmental noise assessment was conducted for the proposed residential aged care facility located at 48 Village Boulevard, Southport. On the condition the recommendations detailed in Section 9 are implemented, compliance is predicted with City of Gold Coast assessment criteria.

If you should have any queries please do not hesitate to contact us.

Report Prepared By



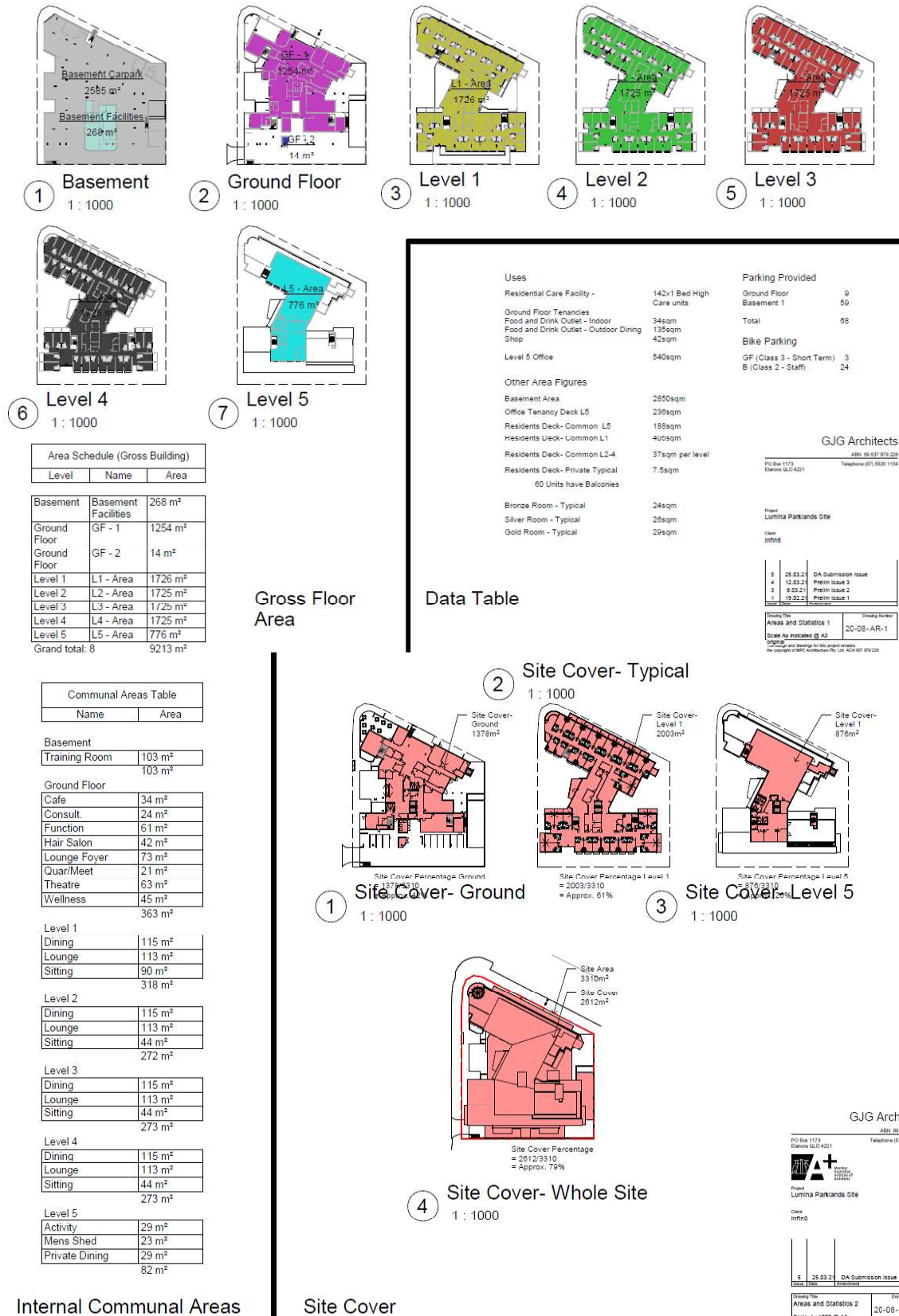
Kayleigh Duce

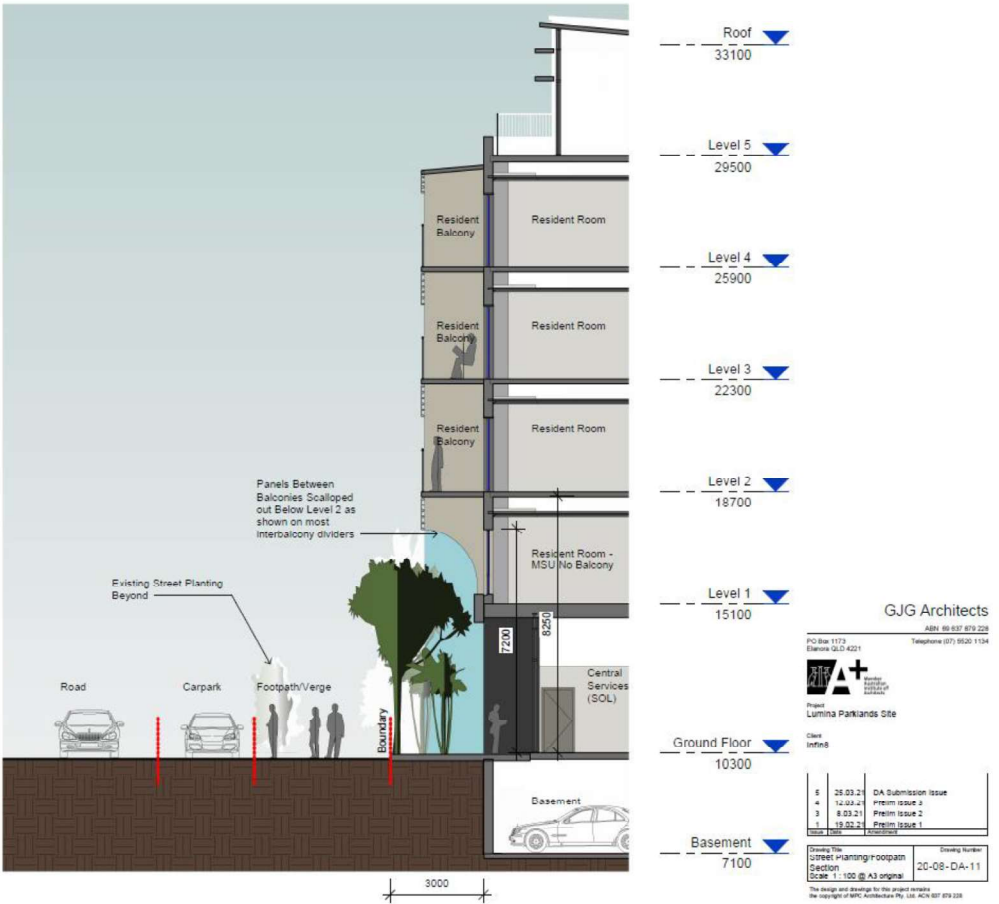
Acoustic Consultant

acousticworks)))

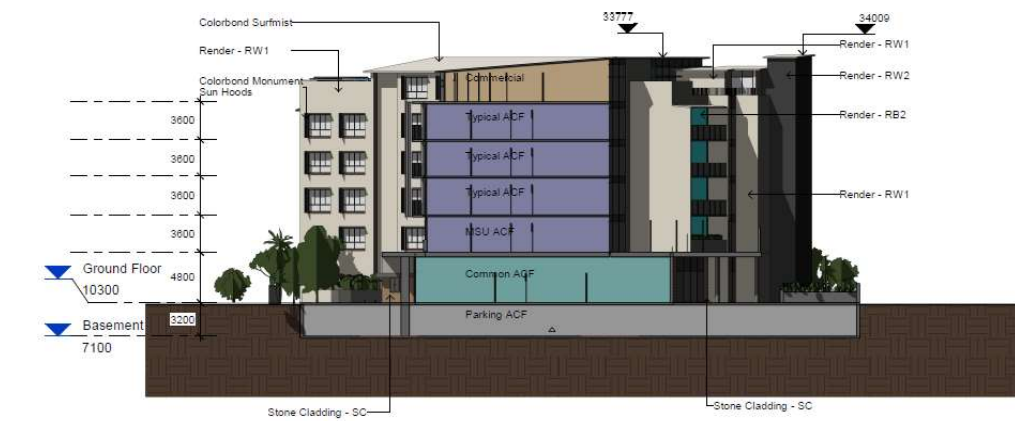
11. Appendices

11.1 Development Plans





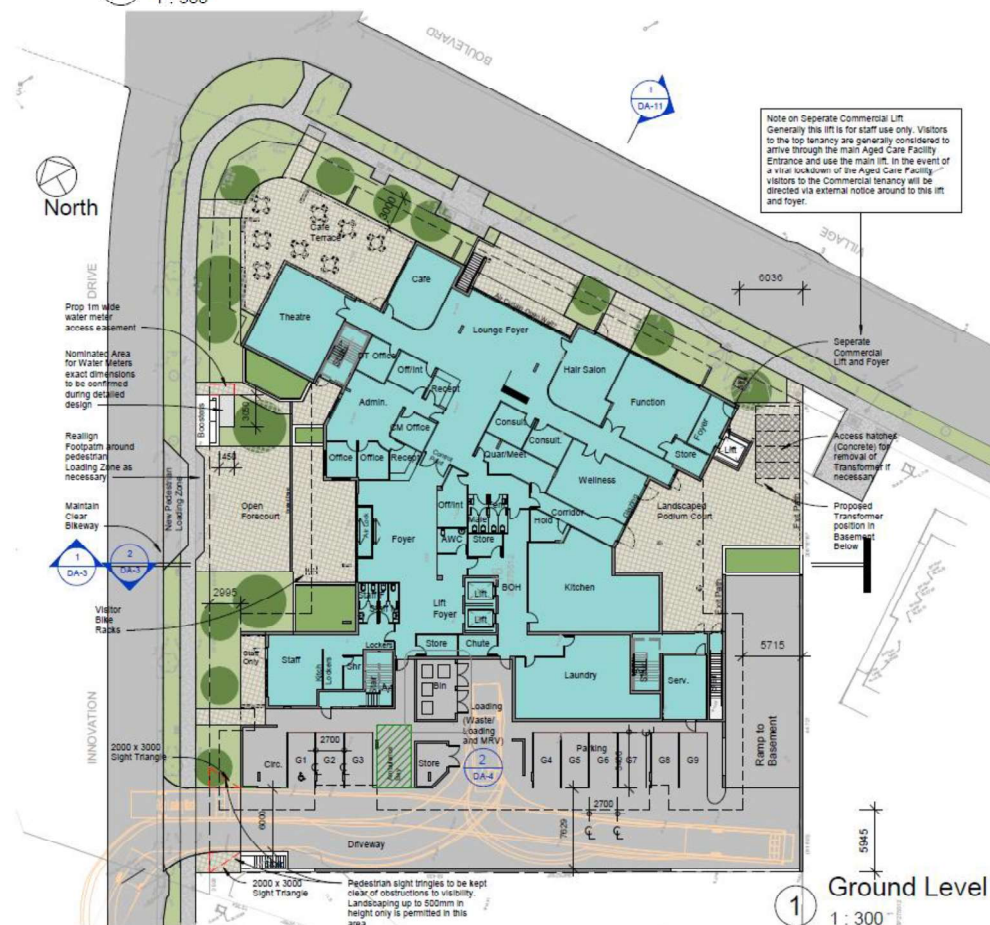
RPD
Lot 16 on SP275512



1 Section 1
1 : 300



2 Section 2
1 : 300



Ground Level
1 : 300

GJG Architects

ABN 69 637 879 228
 telephone (07) 5520 1134

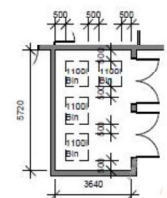
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Lumina Parklands Site

Client
InfiniA

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4	12.03.21	Prelim Issue 3
3	8.03.21	Prelim Issue 2
1	15.02.21	Prelim Issue 1
Issue Title	Approved	

Drawing Title Conceptual Sections	Drawing Number 20-08-DA-3
Scale 1 : 300 (A3 original)	

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② Bin Room
1 : 150

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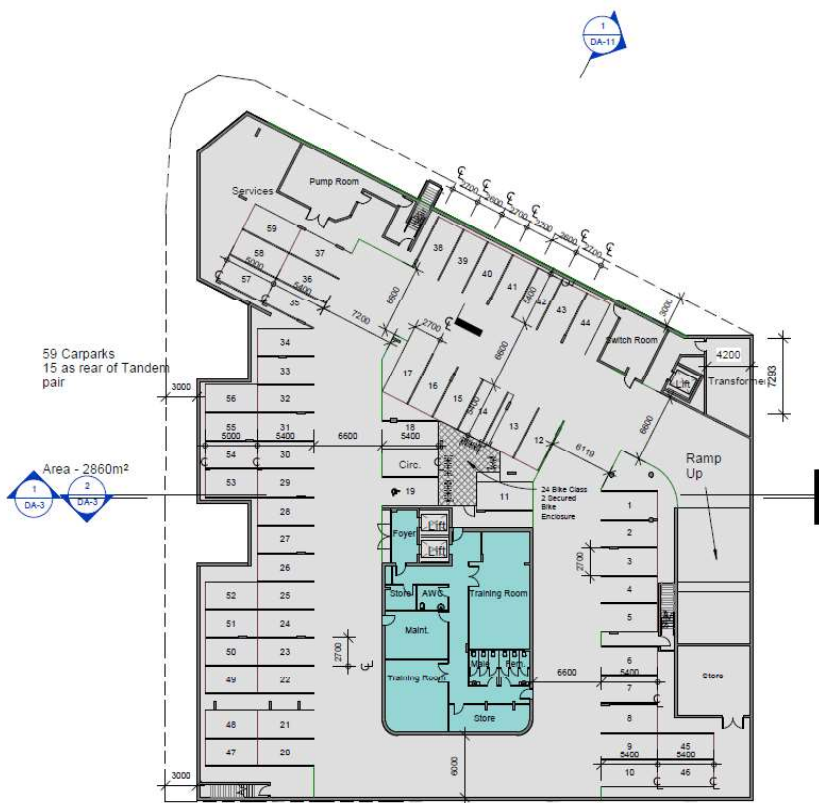
AB94 60 837 870 228
 telephone (07) 5520 1134

Project
Lumina Parklands Site

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2	0.02.21	Prelim Issue 2
2	1.03.21	Booster Pos Shown
1	19.02.21	Prelim Issue 1
Issue	Date	Amendment

Drawing Title	Drawing Number
Ground Floor Plan	00-00-00-1



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5	25.03.21	DA Submission Issue
4	12.03.21	Prelim Issue 3
3	8.03.21	Prelim Issue 2
1	19.02.21	Prelim Issue 1
Issue Date		Revision

Drawing Title Basement Floor Plan	Drawing Number 20-08-DA-5
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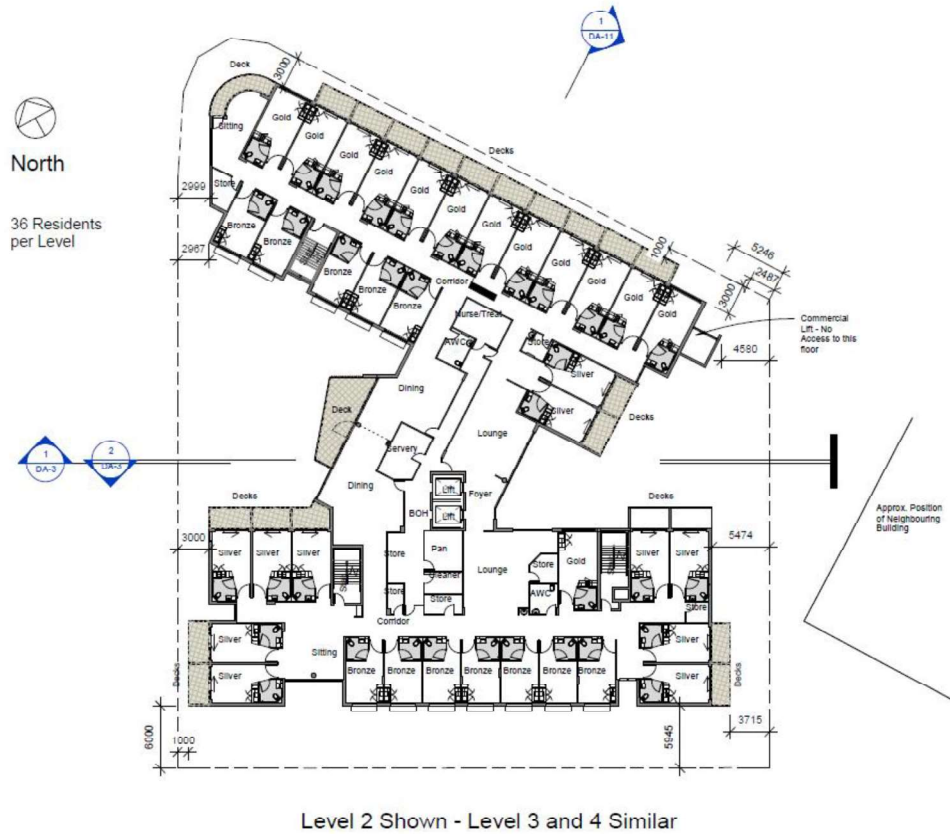


Project
Lumina Parklands Site

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3	8.03.21	Prelim Issue 2
1	19.02.21	Prelim Issue 1
Issue Date		Revision

Drawing Title Level 1 - Floor Plan	Drawing Number 20-08-DA-6
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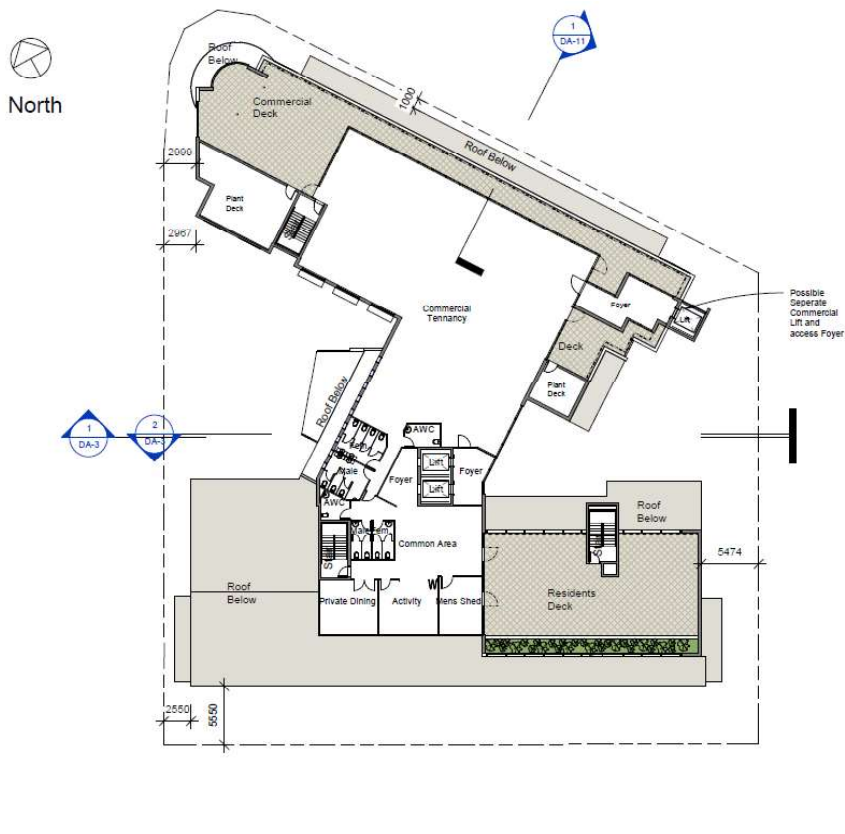
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4	12.03.21	Prelim Issue 3
3	8.03.21	Prelim Issue 2
1	19.02.21	Prelim Issue 1

Issued For:
Typical - L2-L4 Plan
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4	12.03.21	Prelim Issue 3
3	8.03.21	Prelim Issue 2
1	19.02.21	Prelim Issue 1

Issued For:
Level 5 - Floor Plan
Scale 1 : 300 @ A3 original

Issued For:
20-08-DA-8

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11.2 Noise Monitoring Charts

