



Proposed Marine Industry
D'Albora East Coast Marina
570 Royal Esplanade
Manly

ACOUSTIC REPORT



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MA East Coast Sub Trust

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1. Introduction

This report is in response to a request by MA Marina Fund TT Pty Limited atf the MA East Coast Sub Trust for an environmental noise assessment of a proposed marine industry development to be located at 570 Royal Esplanade, Manly. To facilitate the assessment, unattended noise monitoring was conducted to determine the criteria for onsite activities to sensitive receivers. Based on the outcomes of the assessment, recommendations for acoustic treatments and management controls are specified in this report.

An information request was previously requested from Brisbane City Council on the 6 March 2026. The report version 2026110 R01C was issued in response to the items raised by Council.

Since then a further advice notice was provided on the 14 August 2026. This report has been revised in response to the items raised by Council.

2. Site Description

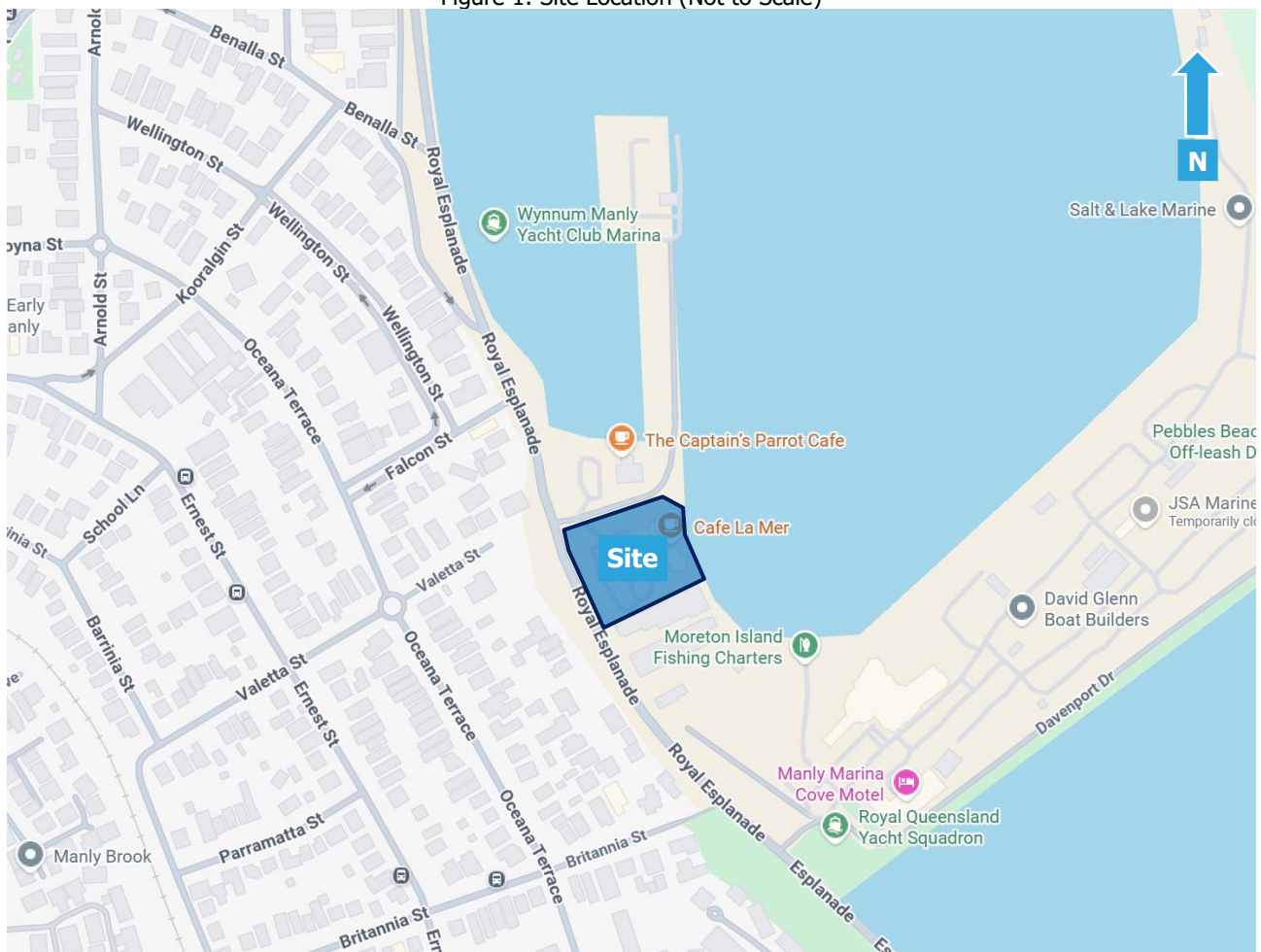
2.1 Site Location

The site is described by the following:

570 Royal Esplanade, Manly
Lot 686 on SP172860

Refer to Figure 1 for site location.

Figure 1: Site Location (Not to Scale)



A site survey was conducted on 23 March 2026 and identified the following:

- a) The site is currently occupied by existing café, carpark and marine industry buildings.
- b) East Coast Marina is located to the north, east and south of the site.
- c) Royal Esplanade bounds the site to the west separating the development from residential dwellings.

2.2 Proposal

The proposal is to construct a marina comprised of the following:

- Total site area of 43.03ha.
- Food and drink outlet consisting of 5 shops, office, marine lounge on ground floor.
- Food and drink outlet located on first floor.
- Hardstand and 5 Marine industry tenancies.
- 148 carparking spaces and a parking deck.
- Site access via Royal Esplanade.

Refer to the Appendix for proposed development plans.

The operating hours of the development have been assessed as follows;

- Food and drink outlet (café) on ground floor to operate from 6am to 3pm Monday to Sunday.
- Food and drink outlet on first floor proposed operations are 12pm to 10pm Sunday to Wednesday and 12pm to 12am Thursday to Saturday.
- The operating hours have been assessed as 6:30am to 7pm for marine industry facilities uses.
- Shops tenancies on ground floor to operate Friday 7am to 6pm Monday and 7am to 5pm on Saturday & Sunday.
- Offices on ground floor 7am - 6pm Monday and Friday and 8am to 5pm Saturday & Sunday
- Club Lounge on ground floor to operate 7am to 6pm Monday to Sunday.

2.3 Zoning

Review of the Brisbane City Council (BCC) interactive mapping indicates that the area of the proposed development is zoned Specialised centre (Marina). The nearest receivers located to the west are zoned as Low Density Residential.

Based on this information, the applicable criteria for onsite activities is specified in Section 8.

2.4 Acoustic Environment

The site is primarily affected by local road traffic noise from Royal Esplanade and noise from the Marina.

3. Equipment

The following equipment was used to facilitate the ambient noise monitoring:

- 1x Rion NL42 Environmental Noise Monitor
- Pulsar Model 105 Sound Calibrator

The Rion NL42 Environmental Noise Monitor holds current NATA Laboratory Certification and are field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Noise Monitoring

4.1 Receiver Locations

The nearest sensitive receiver locations were identified as follows;

1. Residential dwellings are located to the west of the site at 545 and 573 Royal Esplanade, zoned as Low Density Residential.
2. A residential dwelling is located to the northwest of the site at 541 Royal Esplanade, zoned as Low Density Residential.

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

Figure 2: Noise Monitoring and receiver locations



4.2 Unattended Ambient Noise Monitoring

Construction noise was found to be audible at the EM Tooth Residential Aged Care Home, along Ocean Terrace, Falcon Street and Ernest Street. To reduce noise impacts from construction noise a Rion NL42 noise monitor was placed at 47 Arnold Street to measure ambient noise levels. The noise levels from the monitor are considered conservative when compared to sensitive receivers located along Royal Esplanade.

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 23 March and 30 March 2026.

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 AS1055:2018 *Acoustics – Description and measurement of environmental noise*.

For the unattended noise monitoring location refer to Figure 2.

5. Measured Noise Levels

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

5.1 Meteorological Conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (<http://www.bom.gov.au/climate/data>), shown in Table 1 below.

Table 1: Meteorological Conditions – Brisbane Airport

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Direction	Speed (km/h)	Direction	Speed (km/h)
Monday	23/03/26	5.2	SE	15	ESE	20
Tuesday	24/03/26	4.6	SSW	13	SE	17
Wednesday	25/03/26	0.2	SSW	17	ENE	17
Thursday	26/03/26	0	NW	20	NNE	28
Friday	27/03/26	0.2	W	31	W	31
Saturday	28/03/26	0	SSW	17	ENE	20
Sunday	29/03/26	0	S	15	ESE	20
Monday	30/03/26	0	S	17	SE	24

5.2 Environmental Noise Levels

The environmental noise levels measured at the monitoring location are as follows;

Table 2: Measured ambient noise levels – all time periods

Day	Date	RBL L90 dB(A)		
		Day	Eve	Night
Monday	23/03/26	39	35	32
Tuesday	24/03/26	40	36	32
Wednesday	25/03/26	37	35	30
Thursday	26/03/26	37	40	34
Friday	27/03/26	42	37	34
Saturday	28/03/26	35	36	31
Sunday	29/03/26	36	34	29
Monday	30/03/26	44*	-	28
Overall value		38	36	31

^Note rainfall on 23 and 24 March was not found to have affect the measurements, therefore the data was utilized.

*Extraneous noise was found to affected the measurements on 30 March, therefore the data has been removed for the affect time period.

Refer to the appendix for a graphical representation of the noise monitoring.

6. Noise Criteria

6.1 BCC - Environmental Noise Criteria

To ensure a reasonable acoustic amenity is maintained, Brisbane City Council (BCC) requires environmental noise be assessed in accordance with Noise Impact Assessment PSP (2014). To accurately assess environmental noise, the noise must first be classified as to the type and its duration. Section 6.2.1 outlines the noise criteria based on the applicable zoning and overlay codes for the site.

6.1.1 Onsite Activities

To ensure a reasonable amenity is maintained, the following criteria shall be applied for the assessment of onsite activities to sensitive receivers. The noise criteria as applied by Brisbane City Council in accordance with the industry code of the Brisbane City Plan 2014 are as follows;

Table 3: Noise (Planning) Criteria – (Table 9.3.25.3.B)

Criteria Location	Intrusive Noise Criteria Day, evening and night $L_{Aeq,adj,T}$ are not greater than the RBL plus the value in this column for the relevant criteria location, where T equals: - Day - 11hr - Evening - 4hr - Night - 9hr	Acoustic Amenity Criteria		
		Day	Evening	Night
Receiver 1-2 Low density residential zone boundary	3 dB(A)	55 dB(A)	45 dB(A)	40 dB(A)

Based upon the measured noise levels presented in Section 5.2, the intrusive noise criteria applicable to this development is provided in Table 4.

Table 4: Applicable Intrusive noise criteria

Time Period	Measured RBL $L_{A90,T}$	Receiver 1 & 2
		Intrusive Criteria dB(A) (RBL $L_{90} + 3$ dB(A))
Day (7am-6pm)	39	41
Evening (6pm-10pm)	36	39
Night (10pm-7am)	31	34

The low frequency noise criteria as applied by Brisbane City Council in accordance the Brisbane City Plan 2014 are as follows;

Table 5: Night-time Noise Criteria (Table 9.3.25.3.C)

Criteria Location	Day (7am–6pm) $L_{Ceq,adj,11hr}$ is not greater than the following values at the relevant criteria location:	Evening (6pm–10pm) $L_{Ceq,adj,4hr}$ is not greater than the following values at the relevant criteria location:	Night (10pm–7am) $L_{Ceq,adj,9hr}$ is not greater than the following values at the relevant criteria location:
At a zone boundary of a: Low density residential zone (Receivers 1 to 2)	65dB(C)	65dB(C)	60dB(C)

The night time noise criteria as applied by Brisbane City Council in accordance the Brisbane City Plan 2014 are as follows;

Table 6: Night-time Noise Criteria (Table 9.3.25.3.D)

Criteria Location	Where the existing $L_{Aeq,9hr\ night}$ at the criteria location is:	Average of the highest 15 single L_{Amax} events over a given night (10pm–7pm) period is not greater than the following values at the relevant criteria location	The absolute highest single L_{Amax} event over a given night (10pm–7am) period is not greater than the following values at the relevant criteria location
At a zone boundary of a: Low density residential zone (Receivers 1 to 2)	< 45dB(A)	50dB(A)	55dB(A)
	45 to 60dB(A)	$L_{eq,9hr\ night} + 5dB(A)$	$L_{eq,9hr\ night} + 10dB(A)$
	> 60dB(A)	65dB(A)	70dB(A)

Based on the measured noise levels in Section 5 the intrusive noise criteria and night-time noise criteria applicable to this development is as follows:

Table 7: Applicable Night-time Noise Criteria

Criteria Location	Time Period	Average highest 15 events L_{Amax} dB(A)	Highest single event L_{Amax} dB(A)
At a zone boundary of a: Low density residential zone (Receiver 1 & 2)	Night 10pm – 7am	51	56

6.1.2 Mechanical Plant

Development that included mechanical plant (including air-conditioning plant, heat pumps and swimming pool pumps) ensures it is located, designed and attenuated to achieve the following criteria:

$L_{Aeq,adj,T}$ emitted from mechanical plant is not greater than the rating background level plus 3 at a sensitive use not associated with the development.

Where T is:

- (7am to 6pm): 11hr
- (6pm to 10pm): 4hr
- (10pm to 7am): 9hr

Where $L_{Aeq,adj,T}$ is the A-weighted equivalent continuous sound pressure level during measurement time T , adjusted for tonal and impulsive noise characteristics, determined in accordance with the methodology described in the Noise impact assessment planning scheme policy.

The noise criteria applicable to this development are as follows:

Table 8: Applicable Noise Criteria

Time Period	Criteria dB(A) (RBL L_{90} + 3 dB(A))
Day 7am – 6pm	41
Evening 6pm – 10pm	39
Night 10pm – 7am	34

7. Environmental Assessment

Noise impacts were determined using SoundPLAN 8.2 noise modelling software, which uses the calculation method outlined in international standard *ISO 9613-2: 1996 Attenuation of sound during propagation outdoors*. This calculation methodology incorporates distance, terrain, meteorological conditions and screening features such as buildings.

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 ($L_{Aeq, T}$) of a small-medium crowd could be predicted by the following equation:

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

The L_{max} value is predicted by the following equation:

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

Both formulae only apply for a maximum of 100 patrons. Therefore, in areas where more than 100 patrons are assessed, a simple logarithmic increase is used for the additional patrons.

I.e. where $N > 100$,

$$L_{WAeq} = 15 \log (100) + 64 \text{ dBA} + 10 \log (N/100)$$

$$L_{WMax} = 11 \log (100) + 81 \text{ dBA} + 10 \log (N/100)$$

Using the above formula, the predicted overall patron sound power level is presented in Table 9.

Table 9: Predicted sound power levels of patrons

Location	Number of Patrons Assessed	Predicted L_{Aeq} Sound Power Level dBA	Predicted L_{Amax} Sound Power Level dBA
Uncovered deck	30	86	97
Outdoor covered deck	70	92	101

Based on omnidirectional radiation into free space, the equivalent source sound pressure levels when measured at 1m are taken to be 8dB(A) lower than the sound power levels presented. This has been calculated using the methodology contained in Chapter 6 of Engineering Noise Control Theory and Practice (Fourth Edition) by David A. Bies and Colin H. Hansen. The sound power levels are presented in Table 9.

7.2 Onsite Activities

Noise associated with the development was assessed based on previous measurements of similar activities. Any relevant shielding, building transmission loss or recommended acoustic screens are taken into account for these activities.

7.2.1 Source Sound Noise Levels

The sound power levels of each noise source used in the modelling are presented in Table 10.

Table 10: Source Sound Power Levels

Activity	Description	Source Height Above Ground Level (m)	Sound Power Level, T LAeq dB(A)	Sound Power Level, T LAeq dB(C)	Sound Power Level, LAmax dB(A)	Number of Events			Duration of Event, T (s)
						Day (7am to 6pm) 11hr	Eve (6pm to 10pm) 4hr	Night (10pm to 7am) 9hr	
Car Activity	Carpark	0.5	67 per bay^	70 per bay^	89	165	50	25	900s
Car multi storey	Carpark	3.6	67 per bay^	70 per bay^	89	155	50	25	900s
Uncovered deck Patrons	Point Source	1.6	86	87	97	6	4	1	3600s
Outdoor covered deck Patrons	Point Source	1.6	92	93	101	6	4	1	3600s
Café outdoor	Point Source	1.6	78	79	86	8	0	1	3600s
Amplified music outdoor deck	Point Source	1.8	86	101	86	6	4	1	3600s
Truck door closure	Point Source	1.8	88	93	95	176	64	8	2s
Truck Start	Point Source	1.8	98	100	102	88	32	2	2s
Truck Passby(15km/hr)	Moving Point Source	1.8	90	91	94	88	32	2	450s
Truck Reverse	Point Source	1.0	103**	105	106**	88	32	24	15s
Cutting	Point Source	1.2	106	106	110	308	112	28	60s
Grinding	Point Source	1.2	98	98	104	308	112	28	60s
Welding	Point Source	1.2	100	100	102	308	112	28	60s
Electric Sander	Point Source	1.2	93	96	95	220	80	20	120s
Drills	Point Source	1.2	96	97	102	6600	2400	120	5s
Hammering	Point Source	1.2	105	105	112	6600	2400	120	5s
Forklift Reverse	Point Source	1.0	102	104	106**	220	80	20	10s
Forklift Activity	Point Source	1.0	90	96	97	11	4	1	3600s
High pressure wash	Point Source	1.0	96	96	104	44	0	0	450s
Low to Medium Impact Warehouses	Industrial Building	13.5	53/m ² or 73*	77	103	11	4	1	3600s

Activity	Description	Source Height Above Ground Level (m)	Sound Power Level, T LAeq dB(A)	Sound Power Level, T LAeq dB(C)	Sound Power Level, LAmax dB(A)	Number of Events			Duration of Event, T (s)
						Day (7am to 6pm) 11hr	Eve (6pm to 10pm) 4hr	Night (10pm to 7am) 9hr	
Café voice conversation	Point Source	1.6	77	78	86	8	0	1	3600s
Amplified Music and Patron Noise	Industrial Building	1.6	74*	91	92	6	4	1	3600s

*Lp internal reverberant. Refer to Table 11 for further information

**5dBA tonality correction applied

^Calculated using LFU Bayern 2007

Based on omnidirectional radiation into free space, the equivalent source sound pressure levels when measured at 1m are taken to be 8dB(A) lower than the sound power levels presented. This has been calculated using the methodology contained in Chapter 6 of Engineering Noise Control Theory and Practice (Fourth Edition) by David A. Bies and Colin H. Hansen.

We have been advised by InDev Consulting that proposed marine industry activities may include general power tools such as drills, grinders and saws. Based on previous measurements conducted in medium impact industrial buildings, the reverberant sound pressure level is typically 77dBA Leq just inside the facade. Therefore the following spectrum has been utilised as part of the assessment;

Table 11: Maximum reverberant sound pressure level

Description	Lp dB(A)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Reverberant sound pressure level in room	73	73	71	70	68	67	66	63	60

Based on previous measurements of amplified music and patron noise measured in taverns bars, the reverberant sound pressure level is typically 85dBA. The following spectrum has been utilised in the assessment;

Table 12: Maximum Internal Reverberant Sound Pressure Level

Description	Lp dB(A)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Reverberant sound pressure level in room of patron and amplified music	74	95	87	72	65	53	53	54	54

Amplified music has been assessed based on noise spectrum from an EV ETX15P 2000W Loudspeaker.

Table 13: Amplified Music Spectrum

Description	Lw dB(A)	Octave Band Centre Frequency (Hz)					
		63	125	250	500	1k	2k
Amplified music spectrum	86	99	98	86	78	77	77

7.3 Composite Transmission Loss

To determine the composite transmission loss associated with the warehouse façade including openings, a calculation was conducted using the following formula:

$$TL_{composite} = 10 \log \left(\frac{\sum_{i=1}^q S_i}{\sum_{i=1}^q S_i \left(10^{\frac{-\tau_i}{10}} \right)} \right)$$

Where:

S_i = The surface area (one side only) of the i^{th} façade element (e.g. glazing, doors, walls)

τ_i = The transmission loss of the i^{th} façade element

q = the total number of different façade elements

Based on the architectural plans the marine industry warehouses will be comprised of pre-cast concrete panel and metal cladding walls with a metal roof. The bistro is proposed to have a plasterboard ceiling and metal roof. We have been advised that the proposed glazing will be 10mm float.

Based on the wall and roof construction, the sound transmission loss (STL) of the proposed buildings are as follows;

Table 14: Transmission Loss

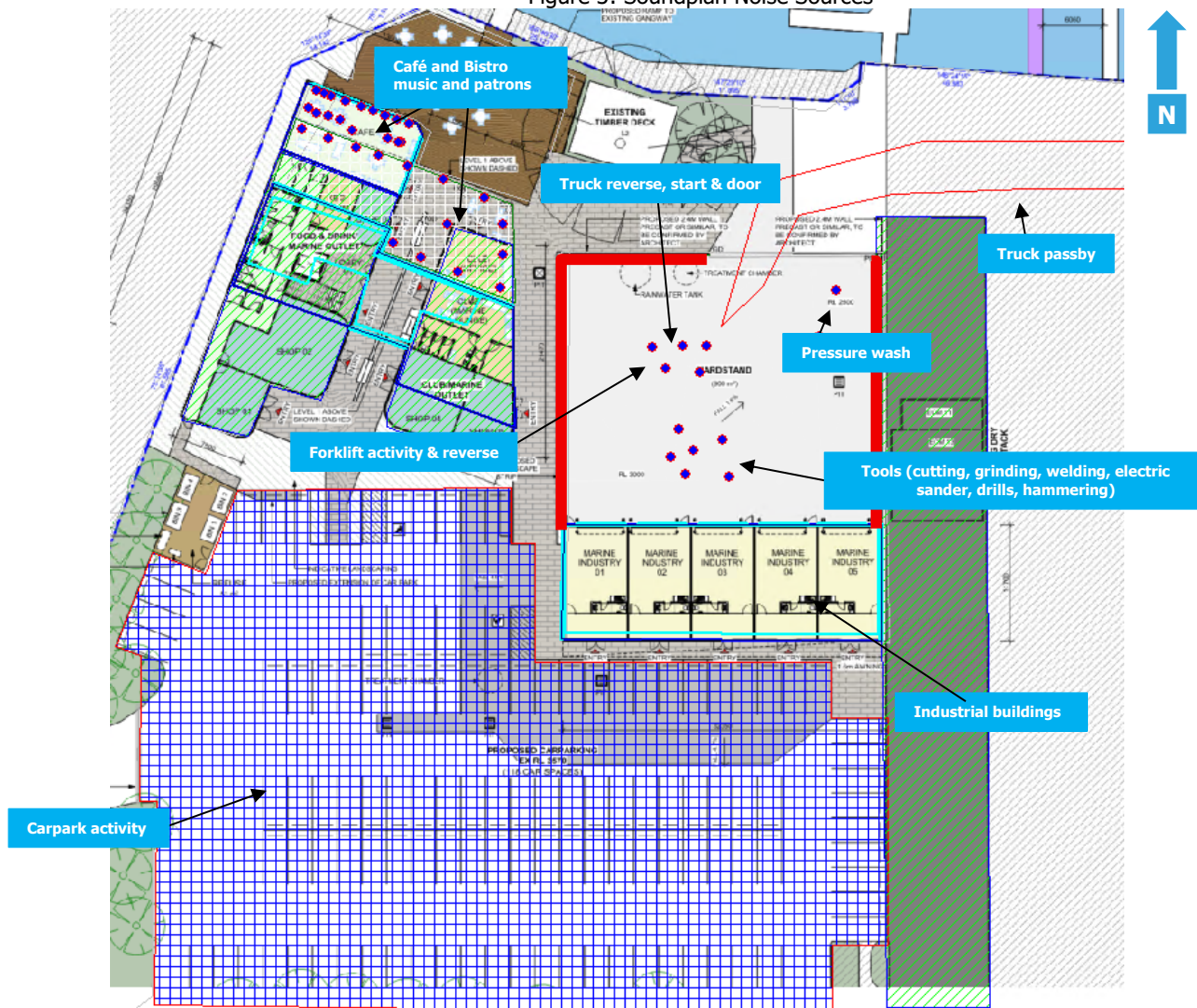
Building composite sound transmission loss	Rw	Octave band centre frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Food and drink Outlet	29	14	18	23	28	29	27	30	31
Marine Industry	14	7	10	11	12	14	14	15	15

7.3.1 Noise Source Locations

Noise source locations in the Soundplan model are based on the current set of plans by Reid Campbell, dated 22 April 2026. These locations are labelled in Figure 3 below.

- The uncovered deck point sources represent 2 patrons per source
- The covered deck point sources represent 5 patrons per source
- Bifold and entry doors have been assumed open

Figure 3: Soundplan Noise Sources



7.3.2 Fences

As per the Architectural plans a 2.4m acoustic barrier has been included within the model as shown in green as seen in Figure 3 above.

7.3 Predicted Noise Levels

At the request of Brisbane City Council, existing and vacant lots have been assessed to determine potential noise impacts. Based on the applied zoning, residential dwellings may be constructed up to 2 storeys in height. Therefore, based on the allowable use of the lots, receiver points have been assessed at the property boundary at two-storeys high.

7.3.1 Intrusive and Acoustic Amenity Criteria

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

Table 15: Predicted External Noise Impacts to Sensitive Offsite Receivers – Intrusive and Acoustic Amenity Criteria

Receiver	Level	Predicted External Noise Impacts at Residential Boundary dBA			Intrusive Criteria			Acoustic Amenity Criteria			Complies with Acoustic Amenity Yes/No
		LAeq, 11hr Day	LAeq, 4hr Eve	LAeq, 9hr Night	LAeq, 11hr Day	LAeq, 4hr Eve	LAeq, 9hr Night	LAeq, 11hr Day	LAeq, 4hr Eve	LAeq, 9hr Night	
Receiver 1: 545-573 Royal Esplanade	GF	40	39	34	42	39	34	55	45	40	Yes
	L1	41	39	34	42	39	34	55	45	40	Yes
Receiver 2: 541 Royal Esplanade	GF	39	37	32	42	39	34	55	45	40	Yes
	L1	40	38	33	42	39	34	55	45	40	Yes

The 3D SoundPLAN CoRTN noise model predicts L_{Aeq} levels as shown Figure 4 to Figure 9.

Figure 4: Noise Impact Modelling: LAeq,T 11hr (Day Time Period) – Ground Level – Intrusive & Acoustic Amenity

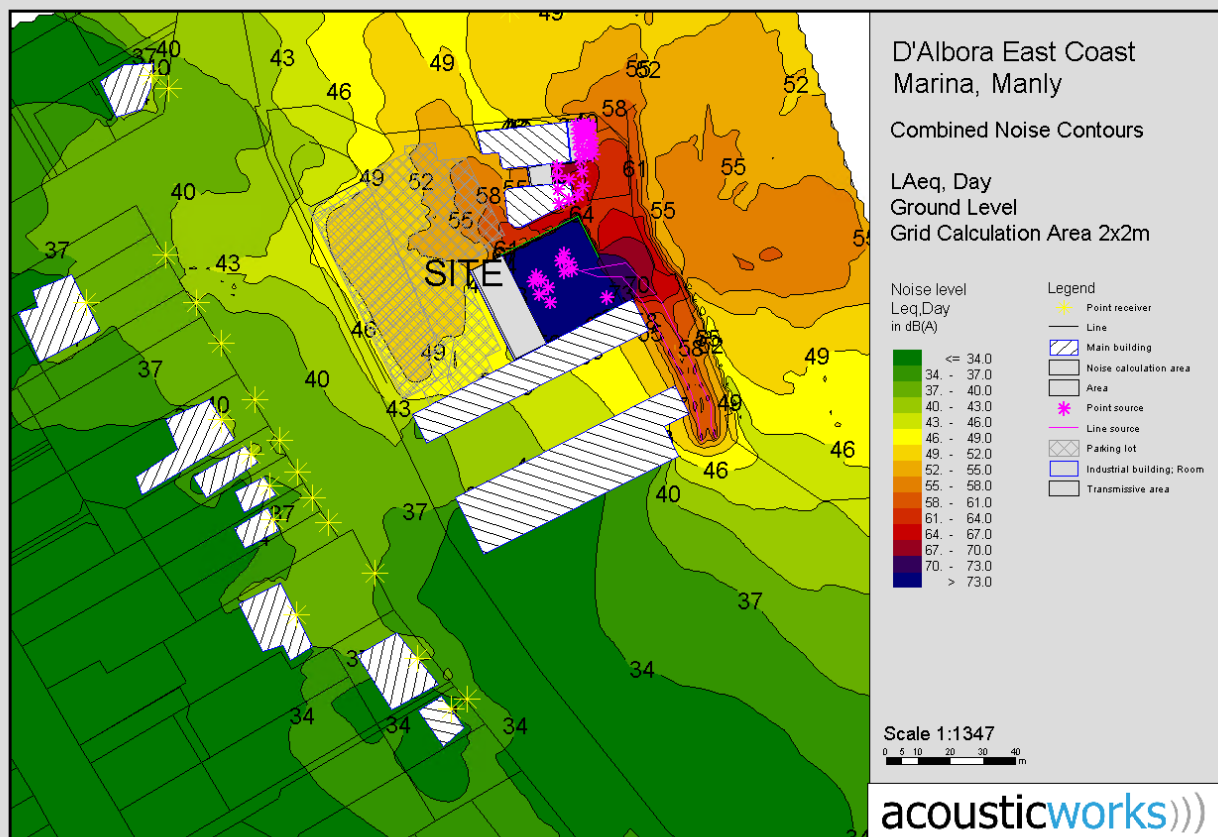


Figure 5: Noise Impact Modelling: LAeq,T 11hr (Day Time Period) – Level 1 – Intrusive & Acoustic Amenity

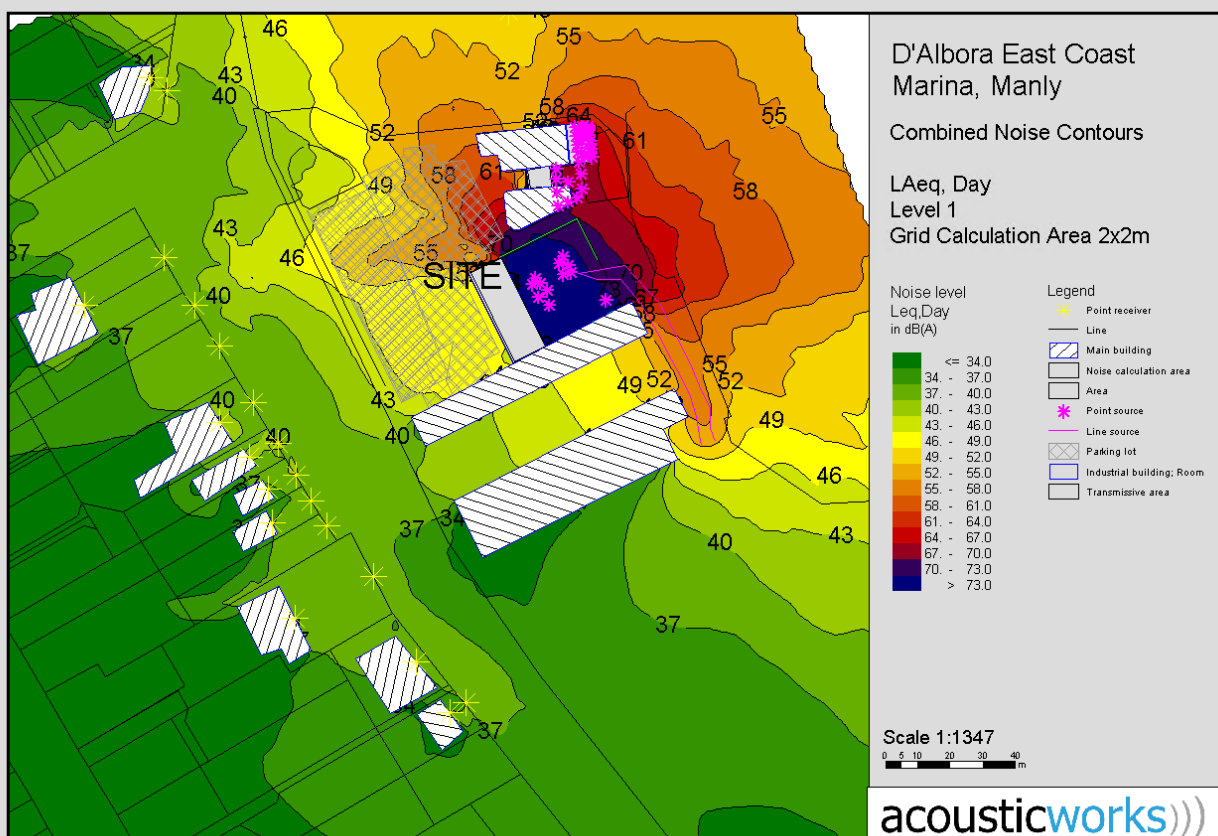


Figure 6: Noise Impact Modelling: LAeq, 4hr (Evening Time Period) – Ground Level – Intrusive & Acoustic Amenity

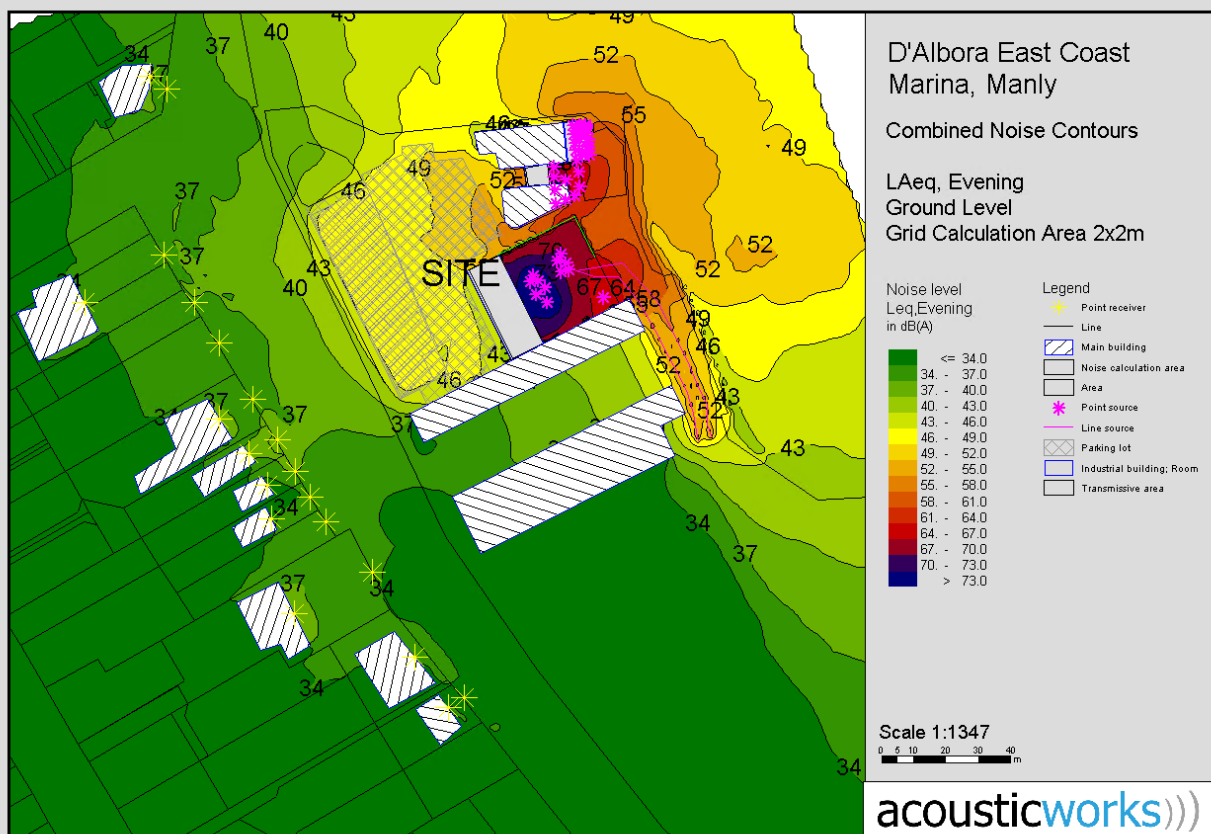


Figure 7: Noise Impact Modelling: LAeq, 4hr (Evening Time Period) – Level 1 – Intrusive & Acoustic Amenity

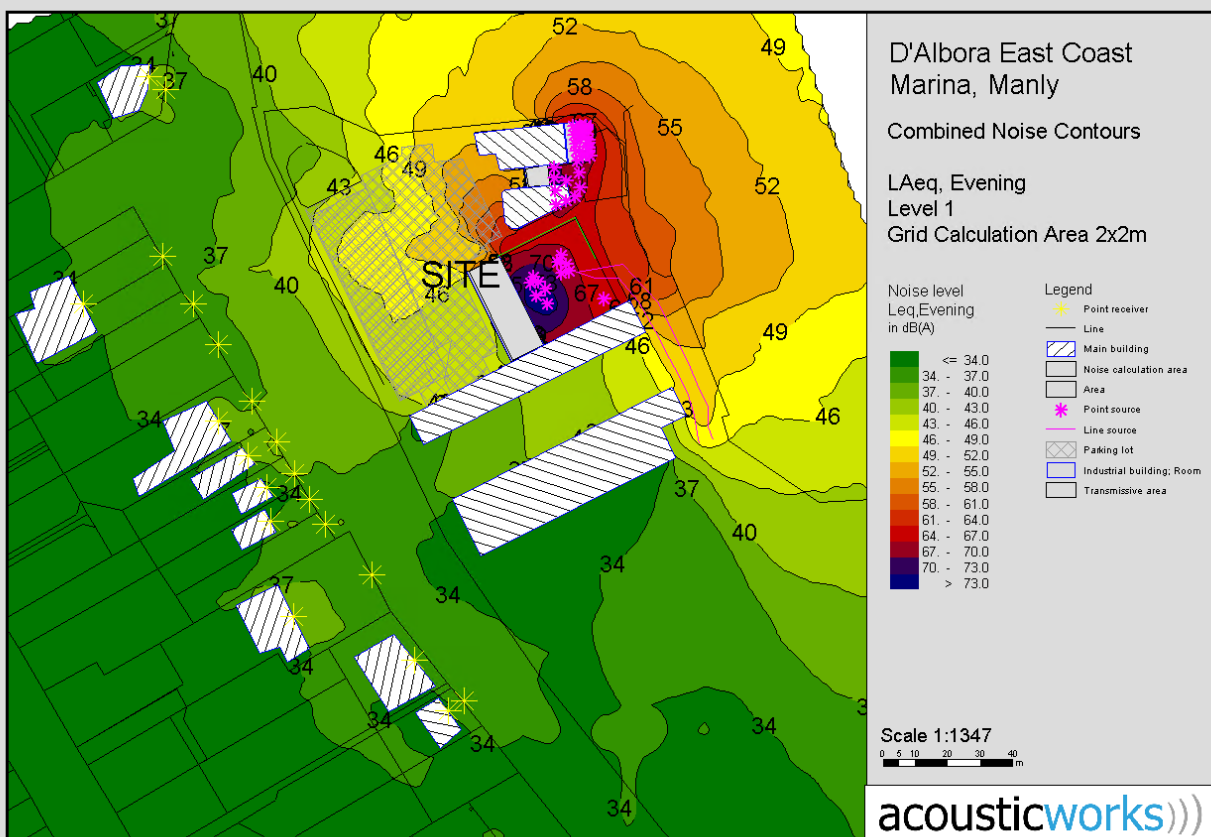


Figure 8: Noise Impact Modelling: LAeq, 9hr (Night Time Period) – Ground Level – Intrusive & Acoustic Amenity

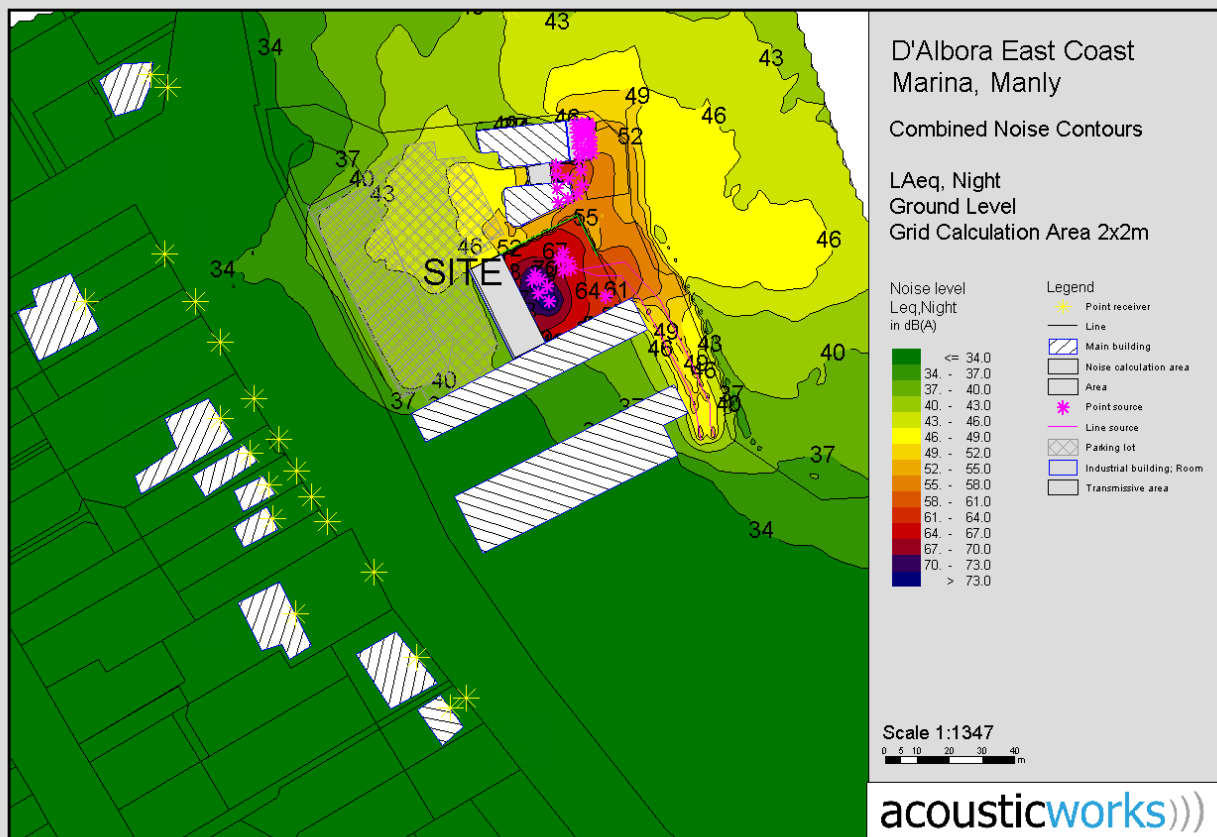
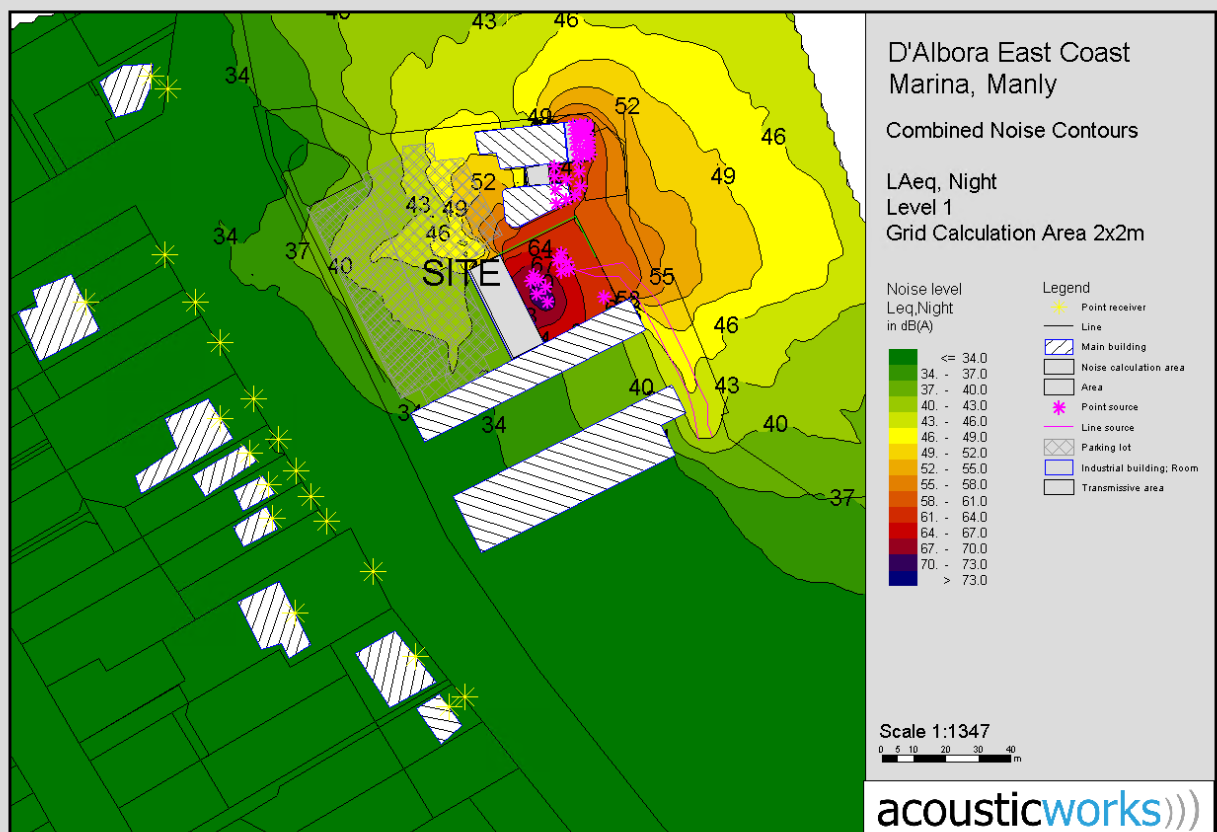


Figure 9: Noise Impact Modelling: LAeq, 9hr (Night Time Period) – Level 1 – Intrusive & Acoustic Amenity



7.3.1 Low Frequency Criteria

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

Table 16: Predicted External Noise Impacts to Sensitive Offsite Receivers – Low Frequency Criteria

Receiver		Predicted Noise Level at Residential Boundary LCeq			Low Frequency Noise Criteria dB(C)			Complies with Low Frequency Noise Criteria Yes/No
		External			Day	Eve	Night	
		Day	Eve	Night				
Receiver 1: 545-573 Royal Esplanade	GF	52	53	47	65	65	60	Yes
	L1	53	53	48	65	65	60	Yes
Receiver 2: 541 Royal Esplanade	GF	52	52	46	65	65	60	Yes
	L1	52	53	47	65	65	60	Yes

The 3D SoundPLAN CoRTN noise model predicts L_{Aeq} levels as shown Figure 10 to Figure 15.

Figure 10: Noise Impact Modelling: LAeq,T 11hr (Day Time Period) – Ground Level – Low Frequency Criteria

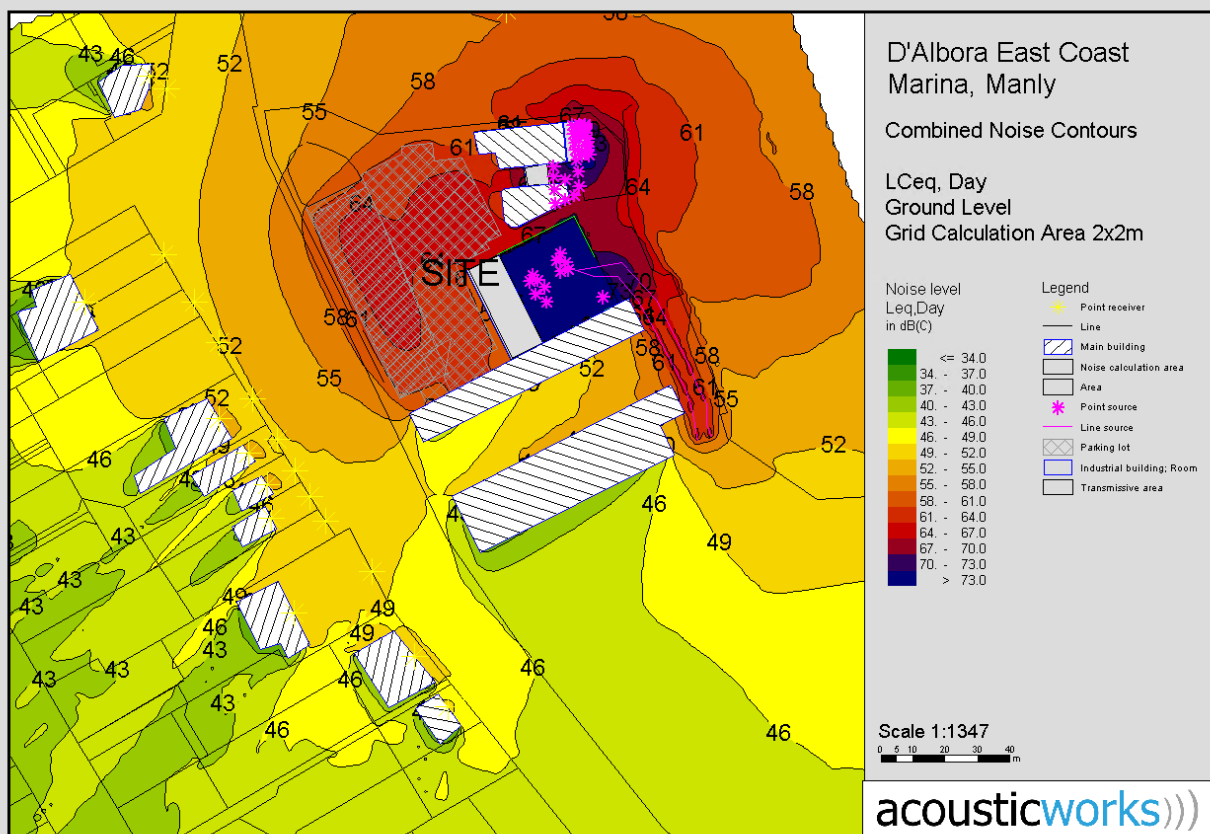


Figure 11: Noise Impact Modelling: LAeq,T 11hr (Day Time Period) – Level 1 – Low Frequency Criteria

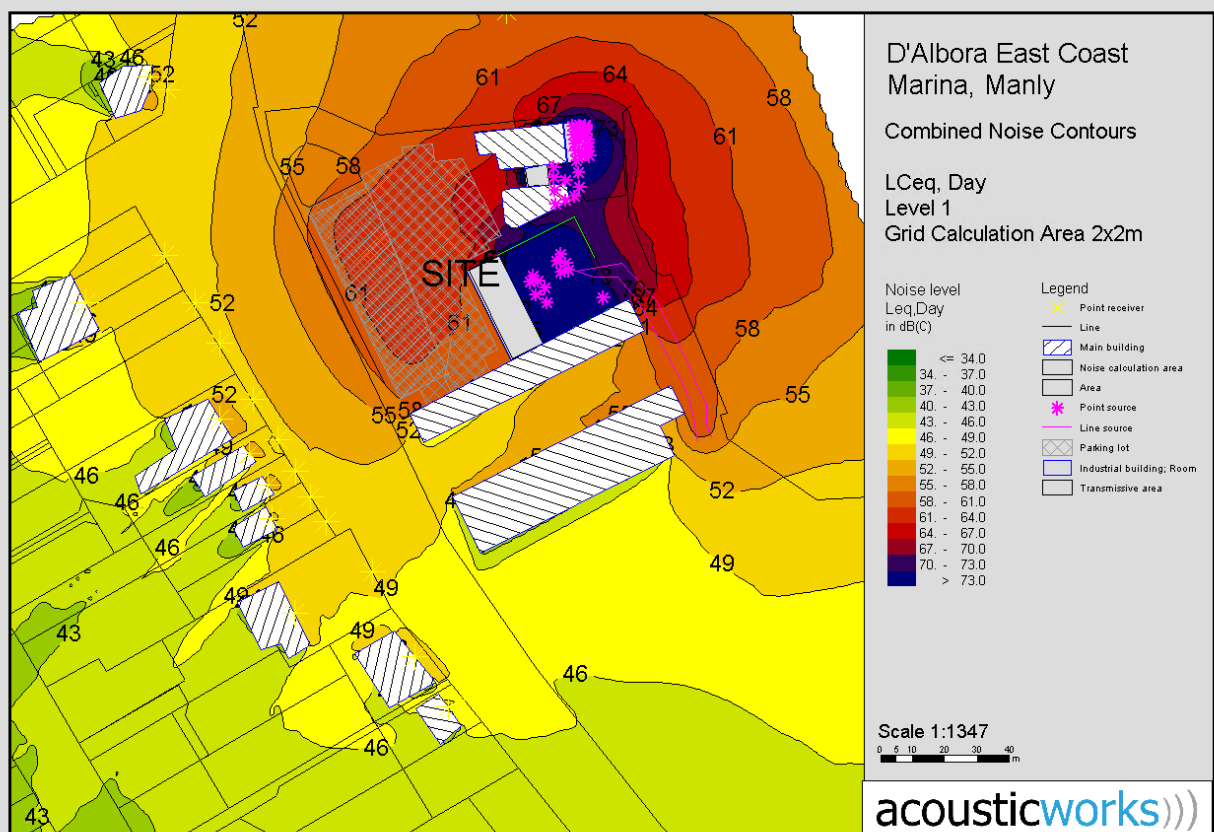


Figure 12: Noise Impact Modelling: LAeq, 4hr (Evening Time Period) – Ground Level – Low Frequency Criteria

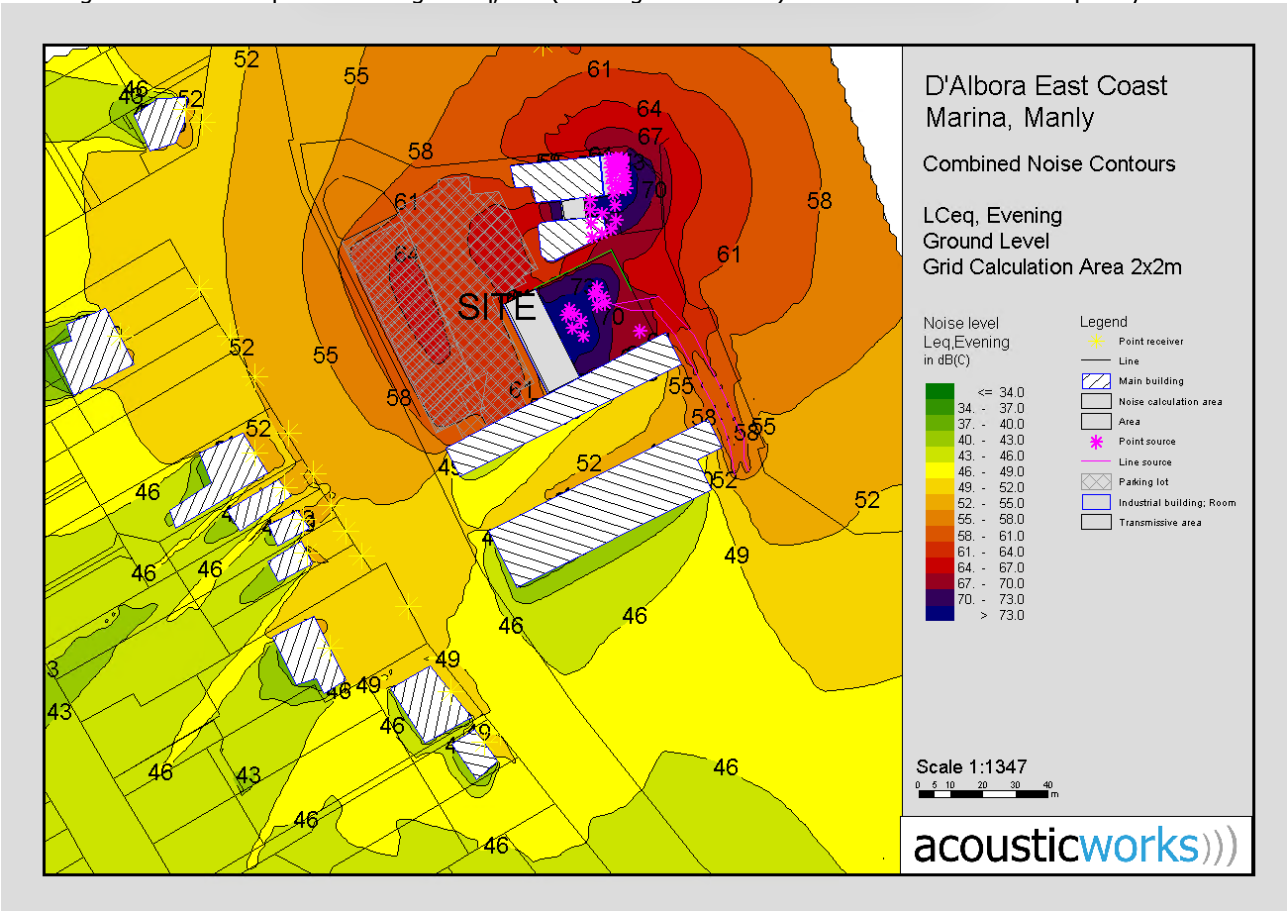


Figure 13: Noise Impact Modelling: LAeq, 4hr (Evening Time Period) – Level 1 – Low Frequency Criteria

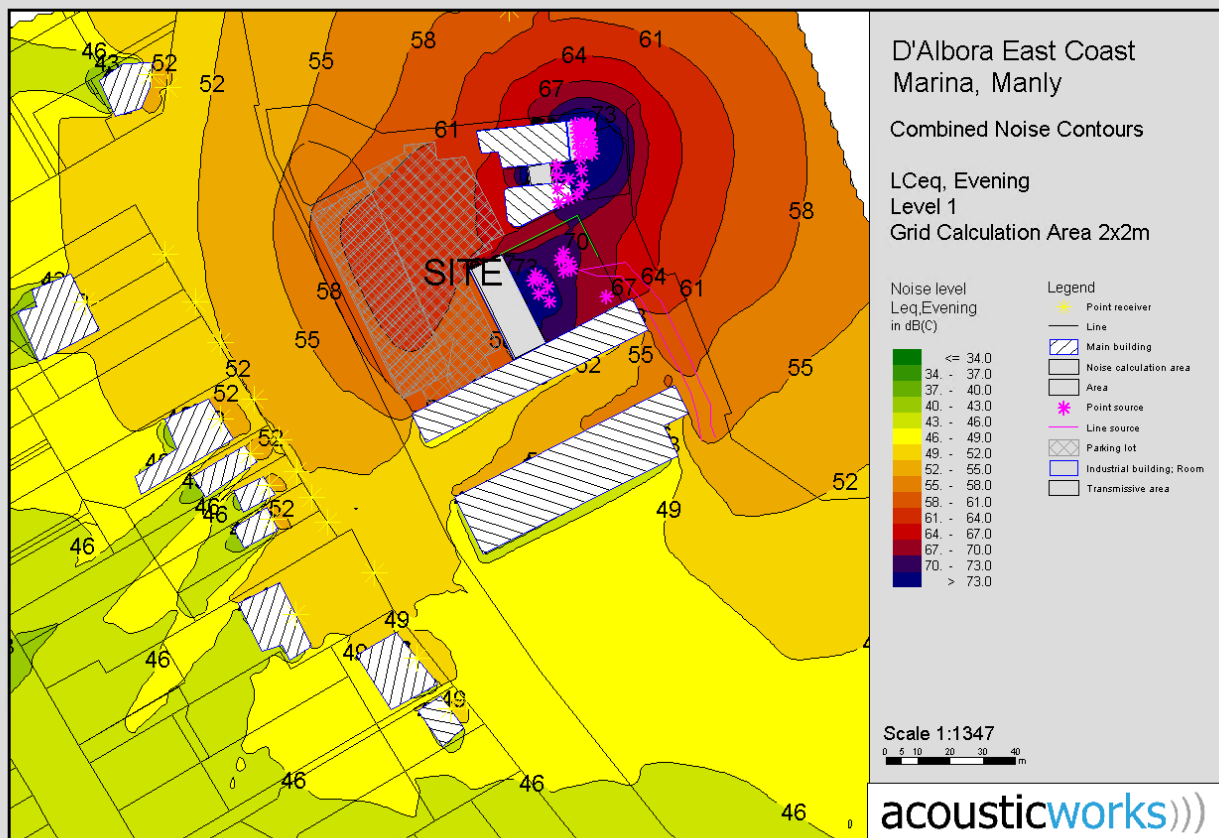


Figure 14: Noise Impact Modelling: LAeq, 9hr (Night Time Period) – Ground Level – Low Frequency Criteria

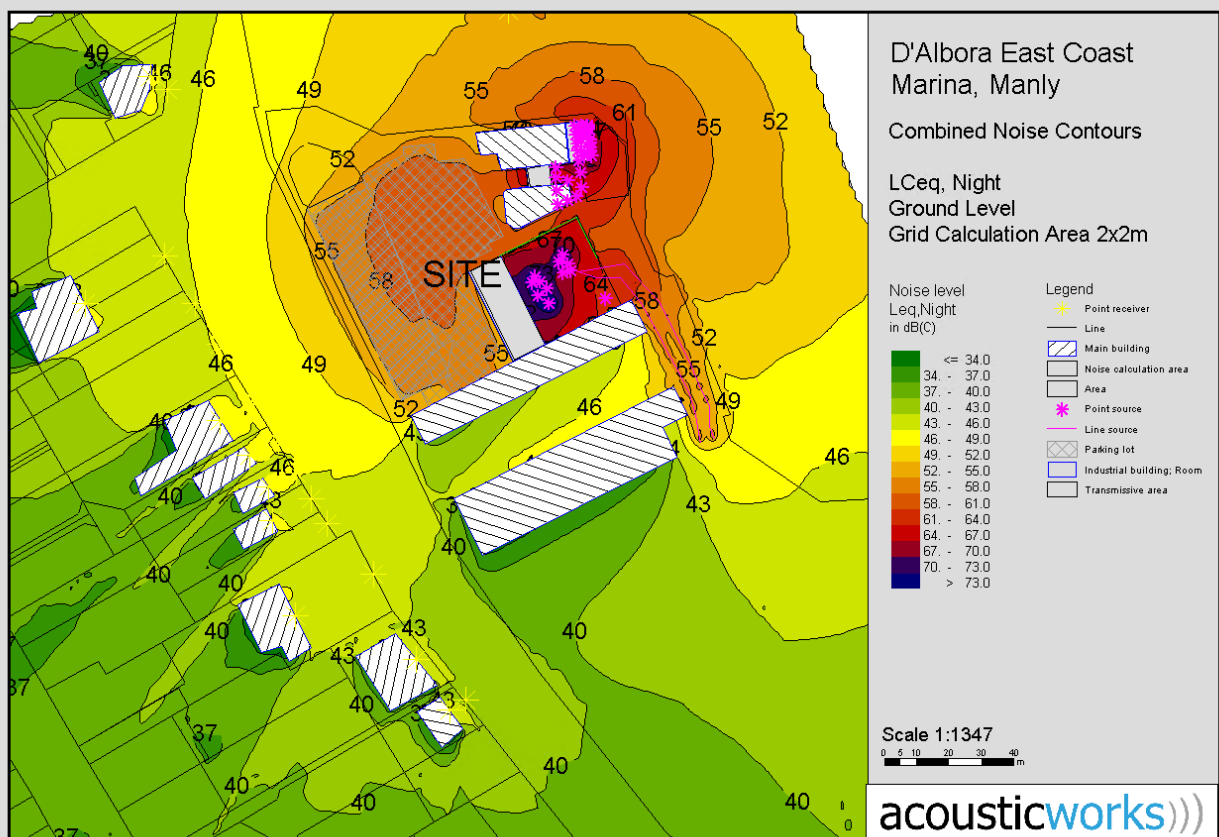
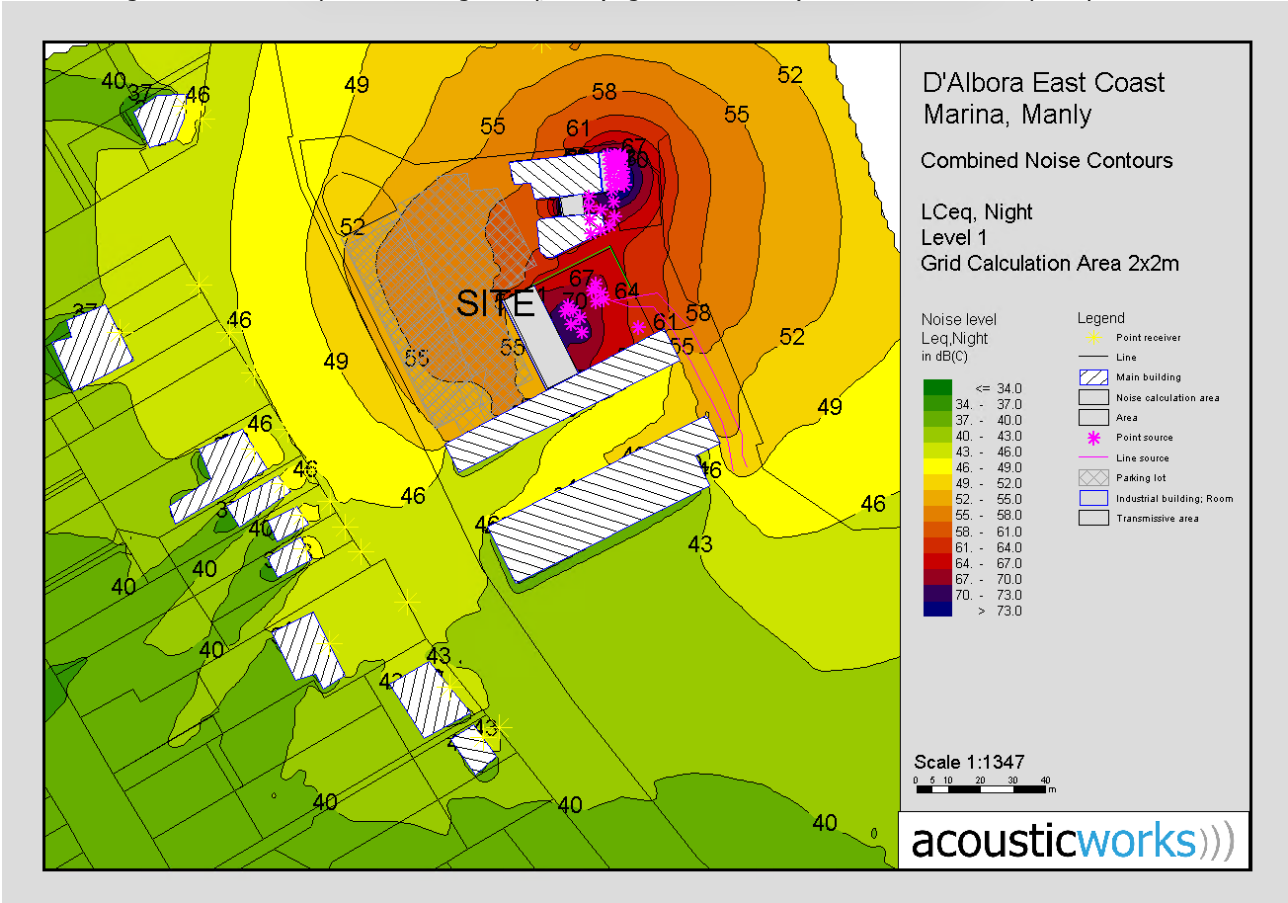


Figure 15: Noise Impact Modelling: LAeq, 9hr (Night Time Period) – Level 1 – Low Frequency Criteria



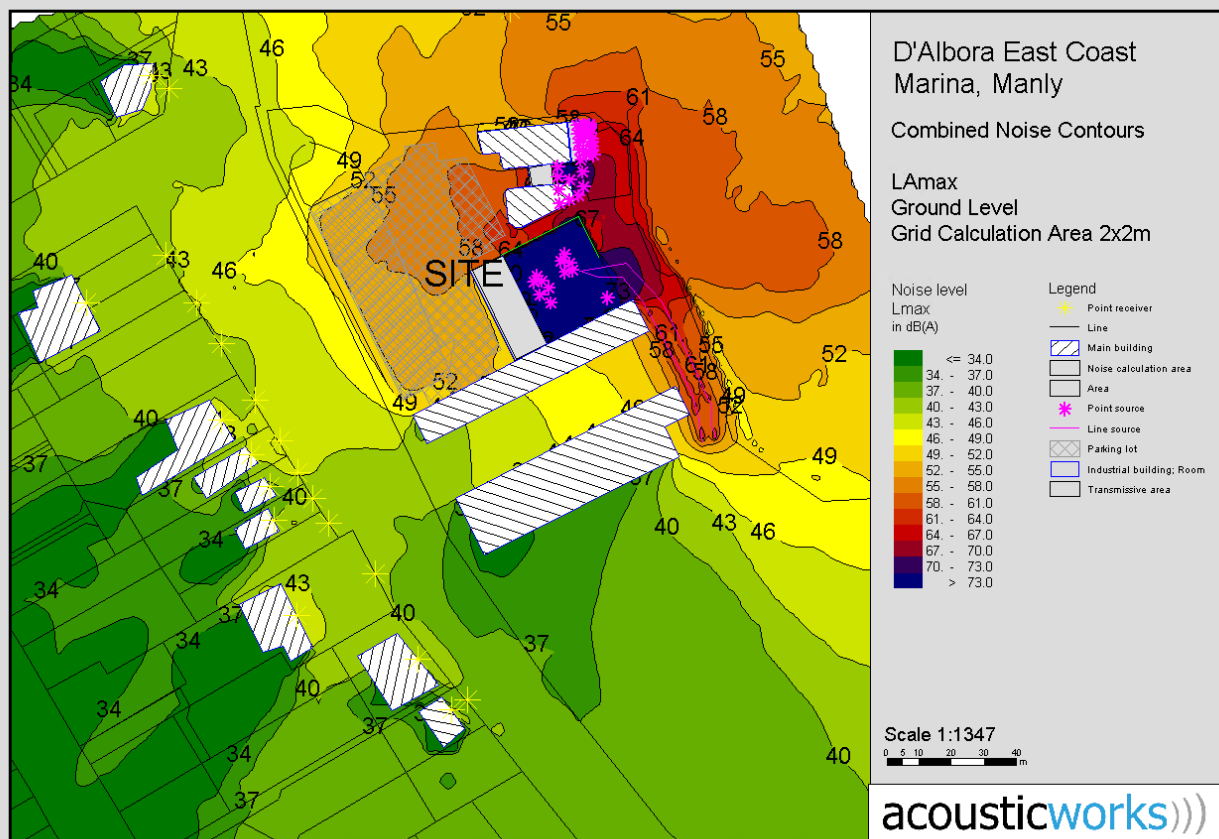
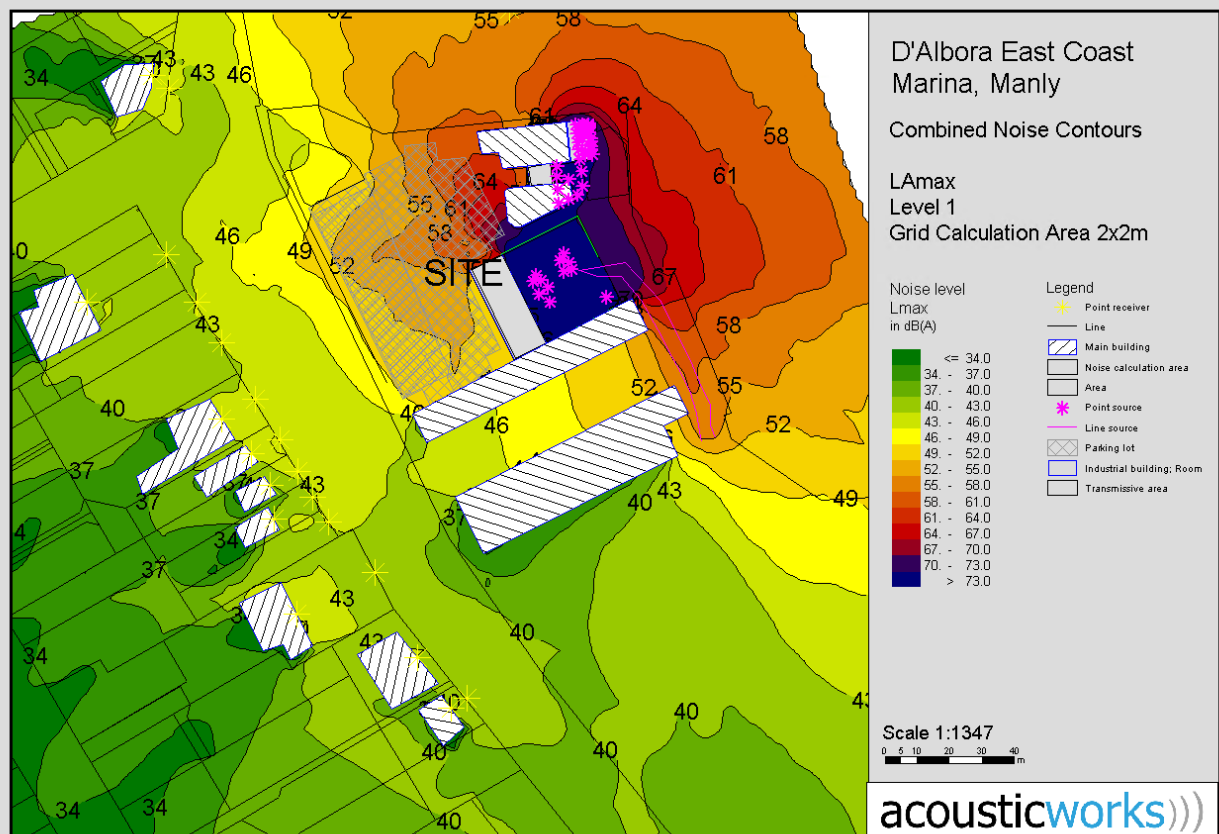
7.3.2 Nighttime Criteria

The predicted night time LA_{max} impacts at the receiver locations are shown in Table 17 and Figures 16-17 below;

Table 17: Predicted External Noise Impacts to Sensitive Offsite Receivers – Nighttime Criteria

Receiver	Level	Predicted Noise Impacts External Residential Boundary Night dBA (L _{max} dBA)	LA _{max} Noise Criteria	
			Average highest 15 events L _{max} dB(A)	Average highest 15 events L _{max} dB(A)
Receiver 1: 545-573 Royal Esplanade	GF	46	51	56
	L1	46	51	56
Receiver 2: 541 Royal Esplanade	GF	44	51	56
	L1	45	51	56

Compliance is generally predicted with the LA_{max} criteria on the condition the recommendations detailed in Section 8 are implemented.

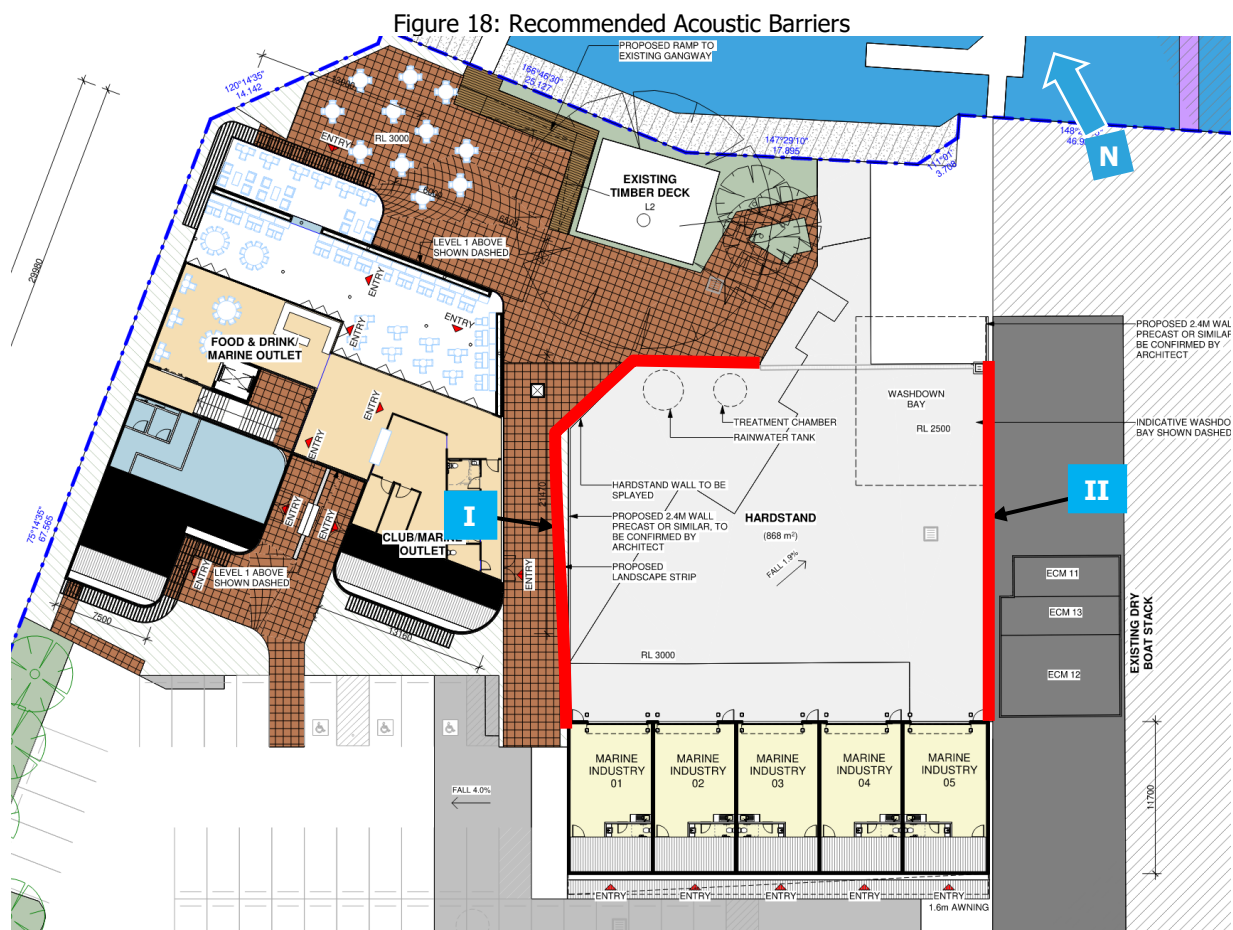
Figure 16: Noise Impact Modelling: L_{max} External (Night Time Period) – Ground Level – Nighttime CriteriaFigure 17: Noise Impact Modelling: L_{max} External (Night Time Period) – Level 1 – Nighttime Criteria

8. Recommendations

8.1 Acoustic Barriers

Acoustic barriers are recommended to be constructed along the hardstand boundary as shown in the architectural plans provided by Reid Campbell and provided in Figure 18. The barriers are recommended to be built to the heights as shown in Table 18 above the finished ground level or boundary level (whichever is higher).

The acoustic barriers shall be constructed using materials that achieve a minimum surface density of at least 11kg/m^2 . 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.



Acoustic barrier 2.4m high above finished ground level or boundary level (whichever is higher)

Table 18: Recommended Acoustic Barrier Height

Reference Point	Approximate Finished Level RL	Recommended Barrier Height (m)	Approximate Finished Top Barrier Level RL
I	3.0	2.4	5.4
II	2.5	2.4	4.9

8.2 Onsite Activities

Based on the predicted noise levels of the site and surrounds for all time periods, noise impacts at the residential receiver locations are predicted to comply on the condition the following acoustic treatments are implemented:

- Construct acoustic barriers as recommended in Figure 18.
- It is recommended to replace existing traditional pure tone reversing beepers on forklifts onsite with broadband reversing beepers. Trucks delivering the site during evening and nighttime periods are also recommended to have broadband reversing beepers. Suitable broadband reversing systems are available from Narva, Brigade BBS-TEK and other manufacturers.
- Operating hours are recommended to be as follows:
 - Food and drink outlet (café) on ground: 6am to 3pm
 - Food and drink outlet on first floor: 12pm to 12am
 - Marine industry, truck activities and outside tools: 6am to 7pm
 - High Pressure Washer: 6:30am to 7pm

8.3 Music Noise Limits

Based on the background creep criteria, ambient noise levels measured at the nearest sensitive receiver and separation distances, the amplified music would require a total sound power level that does not exceed 78dBA SPL @ 1m from the speakers for the outdoor areas. Further improvement of the total sound power of the speakers is possible with the same noise outcomes at nearby receivers. This noise level can be improved by directivity, type of speaker, speaker position, height and location. If the speakers are directional the allowable noise level would be up to 94dBA total sound power.

If a liquor licence is required, a full assessment should be conducted in accordance with the OLGR criteria.

8.4 Waste Collection

We recommend waste collection be conducted in accordance with existing site's collections in the area to reduce the potential for disturbance.

8.5 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 criteria stated and an assessment by qualified acoustic consultant to be conducted prior to installation.

9. Conclusion

An environmental noise assessment was conducted for the proposed marine industry development to be located at 570 Royal Esplanade, Manly. On the condition the recommendations detailed in Section 8 are implemented, compliance is predicted with Brisbane City Council assessment criteria.

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

Report Prepared By



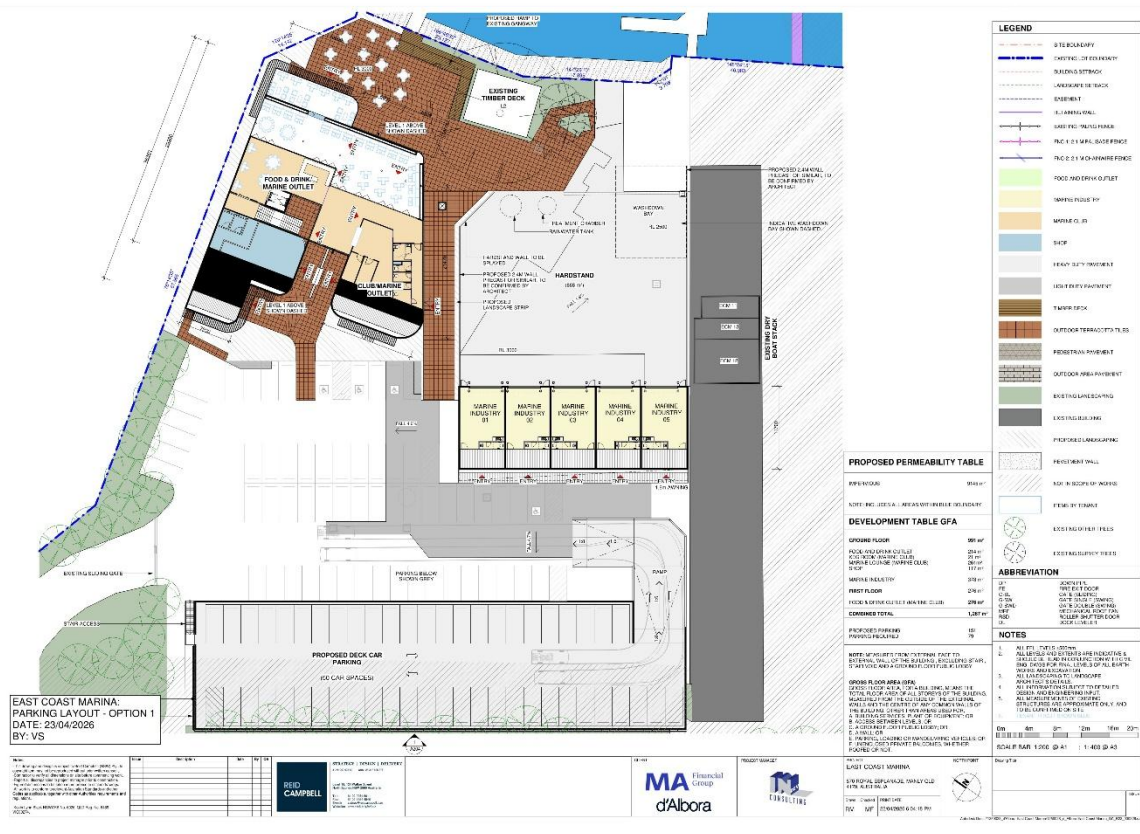
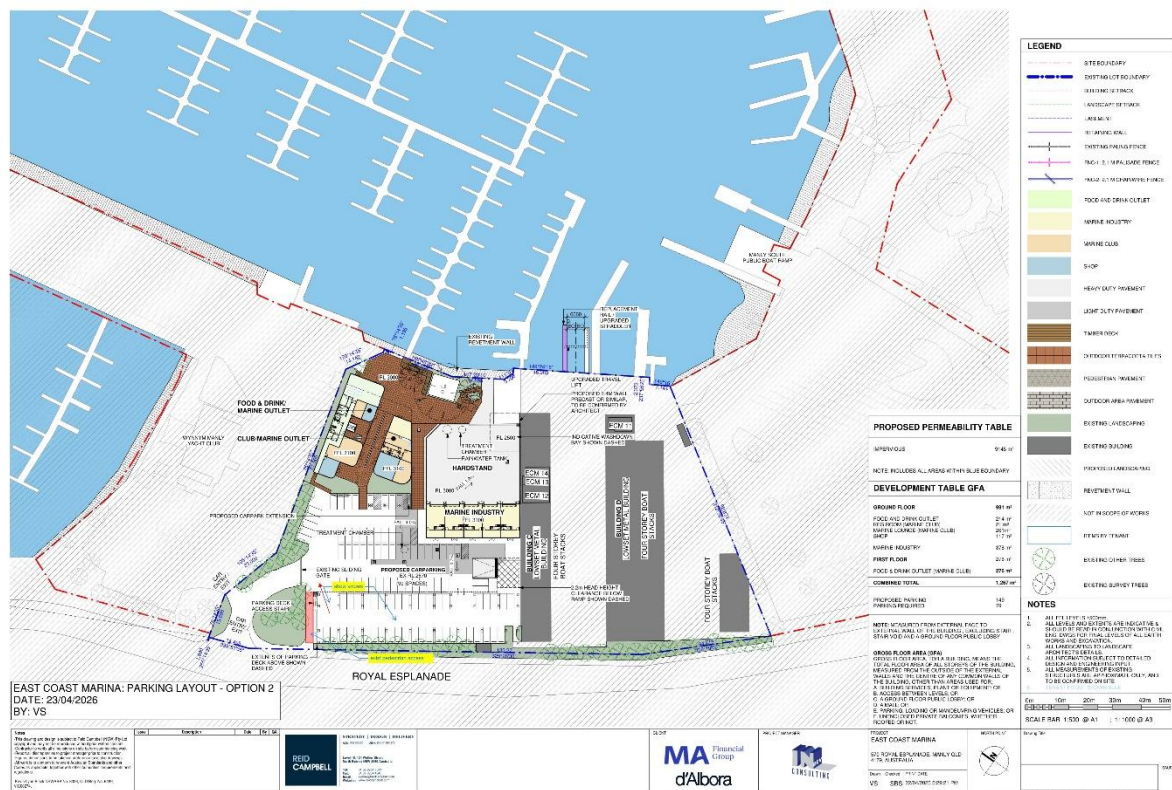
Kaitlyn Dawn

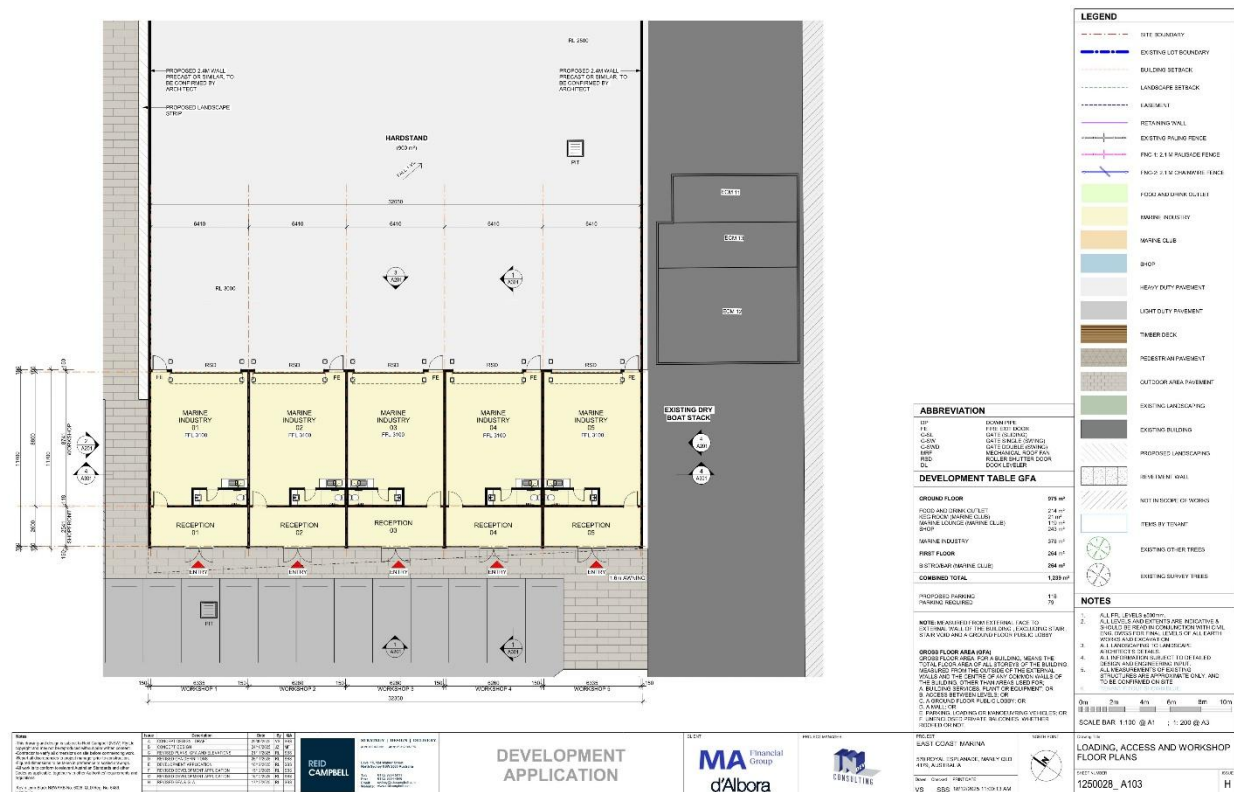
Acoustic Consultant

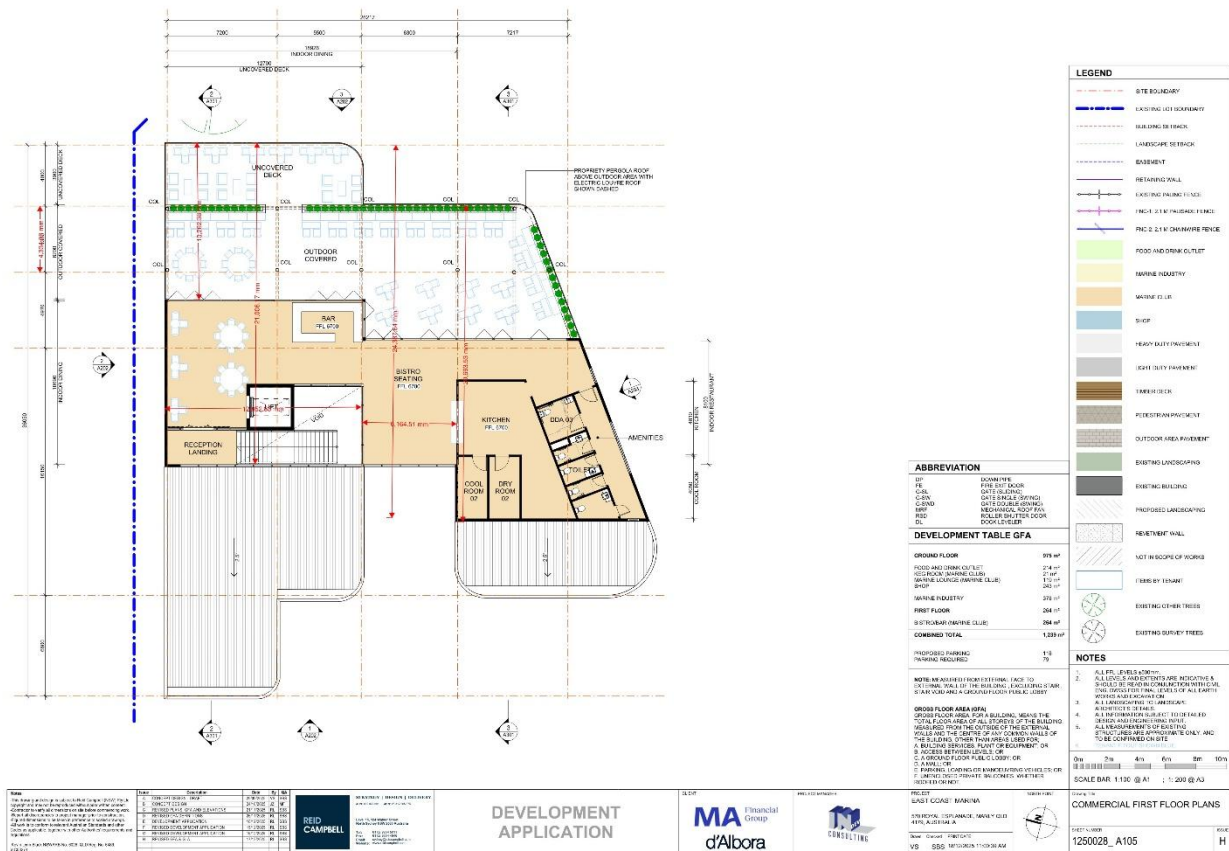
acousticworks)))

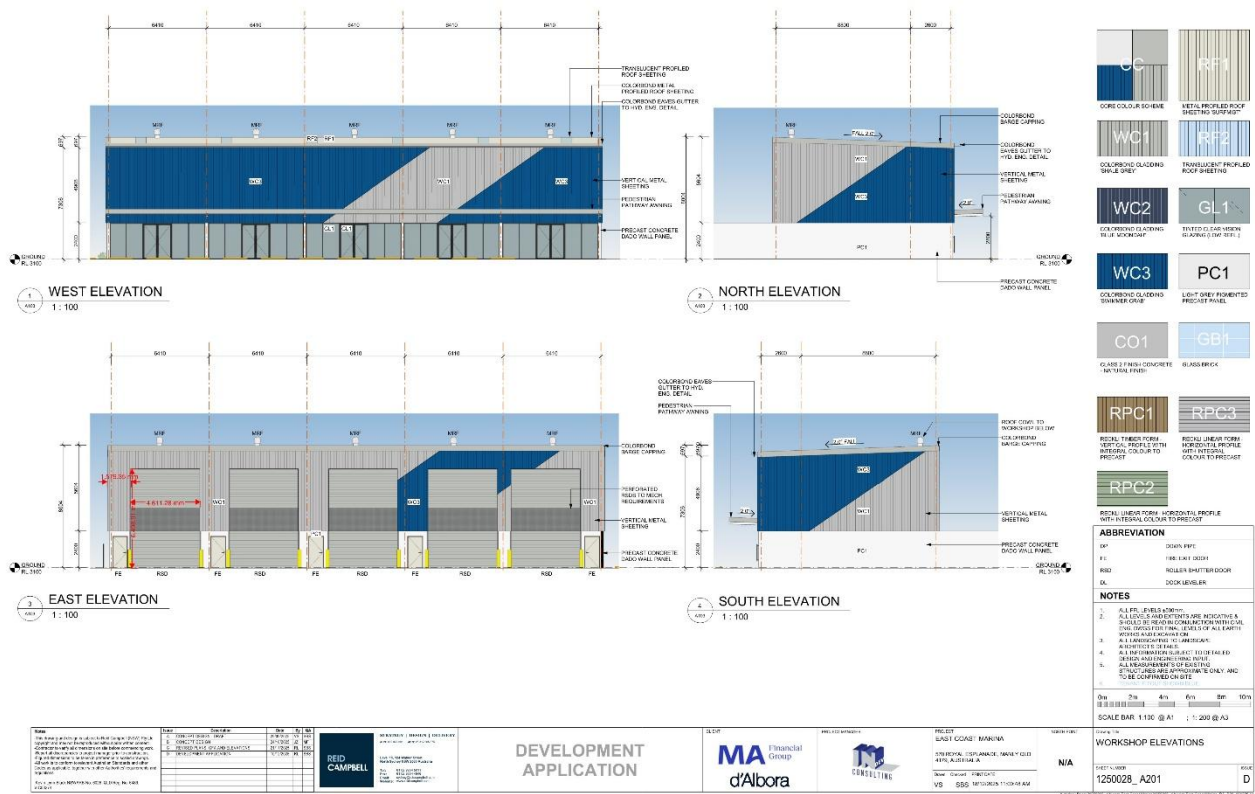
10. Appendices

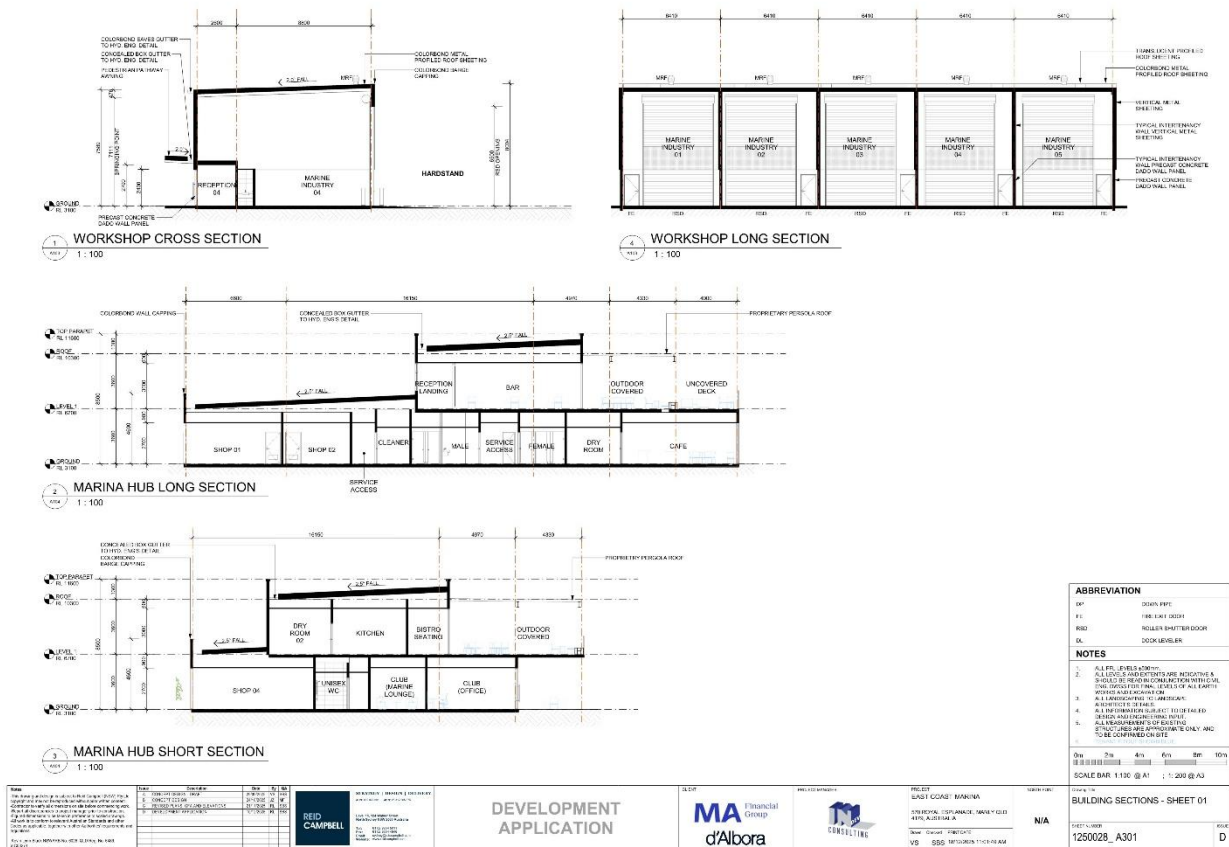
10.1 Development Plans

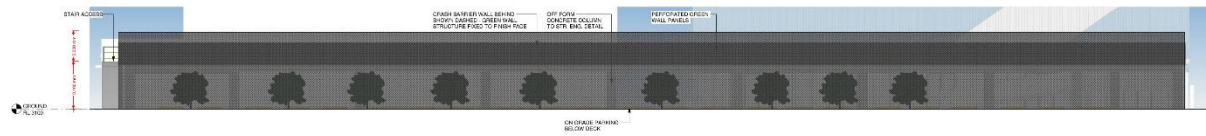




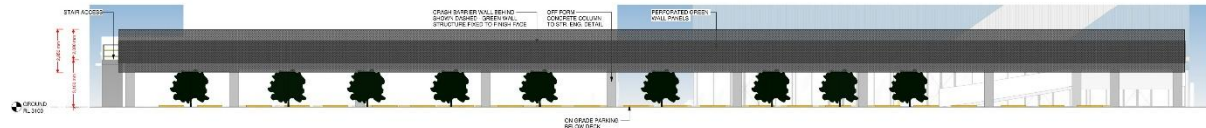








PERFORATED GREEN WALL - OPTION 1



PERFORATED GREEN WALL - OPTION 2

EAST COAST MARINA - PERFORATED GREEN WALL
DATE: 23/04/2026
BY: VS

[illegible]

**REID
CAMPBELL**

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MA Financial Group
d'Albora



PROJECT
EAST COAST MARINA
579 ROYAL ESPRANADE, MANLY QLD
4170, AUSTRALIA
Drawn: Created: 7/18/2010
VS SSS 22/04/2010 8:04:54 PM

10/11/2017	Sheet 1 of 1	PARKING DECK ELEVATION	
N/A			REV. 1

ABBREVIATION	
DP	DOWN PIPE
FE	FIRE EXIT DOOR
PSD	ROLLER SHUTTER DOOR
DL	DOCK LEVELER

NOTES	
1.	A. ALL PER. ITEMS COMMON
2.	A. ALL ITEMS ARE IDENTIFIED AND INDICATIVE & SHOULD BE READ IN CONJUNCTION WITH ITEM LEVEL AND SURVEYED FOR THE SCALE OF ALL EARTH WORK AND EXCAVATION
3.	A. ALL LANDSCAPING TO INCLUDE ARCHITECT'S DETAILS
4.	A. ALL INFORMATION SUBJECT TO DETAILED SURVEY AND ENGINEERING INPUT
5.	A. ALL MEASUREMENTS OF EXISTING STRUCTURES ARE APPROXIMATE ONLY AND TO BE CONFIRMED ON SITE

0m 2m 4m 6m 8m 10m
SCALE BAR 1:100 @ A1 : 1:200 @ A3

PARKING DECK ELEVATION

10.2 Noise Monitoring Charts

