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Sydney Superyacht Marina

Noise Impact Assessment

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1 INTRODUCTION

In this report we will assess potential noise emissions associated with proposed Sydney Superyacht Marina, Rozelle. The report has been undertaken for the proposed Section 75W changes to the proposed development and has been undertaken in conjunction with the previously conducted 'Noise Impact Assessment' conducted by Benbow Environmental (Ref: 121017_Rep_Final) which includes the relevant acoustic criteria for the development which are not reported to be changed.

In this report we will:

- Identify appropriate noise emission assessment criteria.
- Identify potential noise sources caused by proposed development.
- Assesses the predicted impacts against the criteria.
- Discusses the appropriate management and noise control measures that should be adopted to ensure that adverse impacts are not produced during the operation of the proposed facility.

The report has been conducted in conjunction with the following architectural drawings provided to this office and including:

- DA04- Site Plan
- DA05- Ground Floor Plan
- DA06- First Floor Plan
- DA06.1- Second Floor Plan
- DA07- Roof Plan
- DA19 – Outdoor seating areas to the list of plans received

2 SITE DESCRIPTION / PROPOSED DEVELOPMENT

The proposed development is located at the Sydney Superyacht Marina at Rozelle Bay, Sydney.

The approved development includes a yacht club, marine commercial offices, a provedore and ancillary restaurants, bars and cafes. The upper level of the western building will be a yacht club and assessment has included the use of this space for gatherings and amplified music.

The proposed development also includes a carpark to the north of the site of which the proposed numbers of carparking have been increased as part of the Section 75W submission.

The existing areas surrounding the site include retail and commercial properties to the north, east and west of the site with the potentially worst affected residential receivers located to the south of the site on Glebe Point Road.

The approved hours of operation of the site include the following which are not proposed to be changed;

Use	Hours of operation
Commercial maritime (offices and dormitory accommodation)	24-hours-a-day, Monday to Sunday
Commercial maritime (chandlery, provisioning, workshops and retail)	7am – 7pm, Monday to Friday 7am – 8pm, Saturday and Sunday
Yacht Club	7am – 12 midnight, Monday to Sunday (From 10pm everyday balconies must not be used and doors and windows must be closed).
Ancillary uses (restaurants, bars etc)	7am – 11pm, Sunday to Wednesday 7am – 12 midnight, Thursday to Saturday (From 10pm everyday balconies must not be used and doors and windows must be closed).

The approved and proposed uses are as follows:

Building	**Approved**		**Proposed**	
	m^2	**% use**	**m^2**	**% use**
A Marine	2851	45.9	3718	54.0
B Yacht Club	1932	31.2	1745	25.4
C Ancillary/ Restaurants	966	15.6	952	13.8
D Provedore	451	7.3	465	6.8
TOTAL:	6200	100	6880	100.0%

As previously identified within the Benbow Environmental 'Noise Impact Assessment' the nearest potentially affected residential properties are the residential premises located directly to the south of the site on Glebe Point Road (see aerial photo below). Compliance at this location represents compliance at all other potentially affected residential receivers.

Figure 1 below details the location of the proposed development including potentially affected receivers.

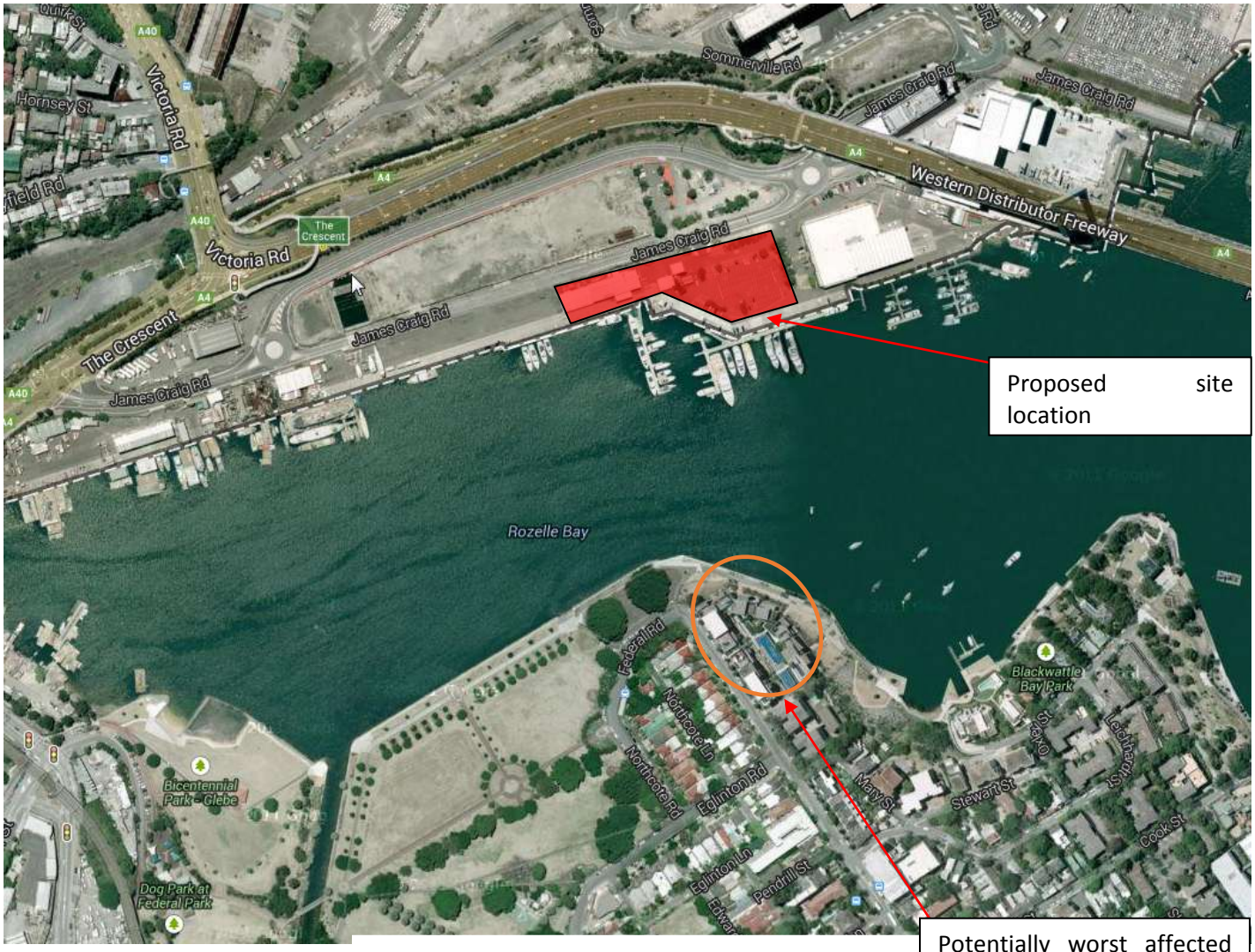

Figure 1 – Site Location

3 NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including road traffic. Accordingly, a 15 minute measurement interval is normally utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source depends on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

4 EXISTING ACOUSTIC ENVIRONMENT

The acoustic environment surrounding the proposed development is characterised by high background noise levels associated with latent traffic noise from the Anzac Bridge, City West Link and other surrounding roadways which carry high volumes of vehicle movements.

Noise measurements including unattended noise logging and attended measurements have previously been conducted by Benbow Environmental in their report 'Environmental Noise Impact Assessment, Urban Perspectives, Proposed Superyachts Marina Rozelle Bay, NSW' (Ref: 110056_Rep_Rev1) dated April 2012.

The Benbow report also formulates suitable acoustic criteria for the assessment of the proposed development which form part of the Conditions of Consent and are not reported to be changed as part of the Section 75W Assessment.

5 NOISE EMISSION CRITERIA

Based on the previously undertaken Benbow Environmental in their report 'Environmental Noise Impact Assessment, Urban Perspectives, Proposed Superyachts Marina Rozelle Bay, NSW' (Ref: 110056_Rep_Rev1) dated April 2012, which formed part of the previous submission of the project the relevant noise level criteria for the projects noise emissions are summarised below:

Urban Perspectives
Noise Impact Assessment for Sydney Super Yacht Marina – Rozelle Bay

Table 4-1: Project-Specific Noise Limits (PSNL), dB(A)

Receivers	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1-R8 1st floor	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58
	$Night_1$	26	35	37	40	48	52	47	36	23	54
	$Night_2$	18	29	31	35	41	45	41	31	18	48
R1-R8 5th floor	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57
	$Night_1$	17	31	38	42	47	51	45	37	28	54
	$Night_2$	14	27	35	37	42	45	40	34	27	48

Note: Day indicates time period between 7:00 am to 6:00 pm
Evening indicates time period between 6:00 pm to 10:00 pm
$Night_1$ indicates time period between 10:00 pm to 00:00 am
$Night_2$ indicates time period between 00:00 am to 7:00 am

Reference: Benbow Environmental in their report 'Environmental Noise Impact Assessment, Urban Perspectives, Proposed Superyachts Marina Rozelle Bay, NSW' (Ref: 110056_Rep_Rev1) dated April 2012.

6 ASSESSMENT OF NOISE EMISSIONS

Potential noise emissions from the future development including the proposed S75W modification to a Part 3A alterations have be predicted to the potentially worst affected residential receivers located to the south of the project on Glebe Point Road and the relevant noise level criteria as detailed above and previously submitted as part of the DA approval process.

Predicted noise emissions will be assessed against the criteria nominated in section 5. The additional noises which need to be assessed arising from the s75W will be:

- Vocal noise from additional patrons using the outdoor seating areas to those previously considered in the assessment and is now proposed to include the following:

  The Consent includes condition A11(d) which requires separate development consent for outdoor seating areas. It is proposed to seek consent to use all of the decks and balconies for outdoor seating, and part of the wharf level forecourt, whilst maintaining the area set aside for the public access walkway along the foreshore. Consent is sought for seating over a larger area than originally envisaged so as to allow for maximum flexibility of usage over time to the operators of the Site. It is not envisaged that all of the areas will be used simultaneously for restaurant seating.

  Plan DA19C illustrates the areas for outdoor seating for restaurant/bar/ancillary uses and the yacht club, being approximately 1322m$_2$ on decks and balconies and 850m$_2$ on terrace level, totalling 2172m$_2$:

  - 295m$_2$ for use by the yacht club on the western building balconies and part of the western deck.
  - 152m$_2$ for the western building decks (excluding the yacht club).
  - 573m2 for the eastern building decks.
  - 302m2 for the eastern building balconies.
  - 850m2 for the wharf level seating in front of the eastern building. Additionally an area of 545m2 on the level 2 of the eastern building is sought for uses associated with marine uses. This area would not be utilised for restaurant seating.

- A suggested condition will be that the outdoor seating area on level 2 of the eastern building is restricted to being associated with the marine uses.
- Additional traffic noise from the additional 18 dedicated car spaces and additional height of the car park building and use of an up ramp rather than car lifts.
- Boat noise from the use of the marina.
- Additional use of area on the new roof top level of the eastern building.
- Use of the ground floor marine facilities in the car park building

6.1 ANCILLARY AREAS NOISE IMPACT ASSESSMENT

The proposed development includes a number of ancillary areas within the future Superyachts Marina. The proposed project layout is detailed in Figure 2 below.

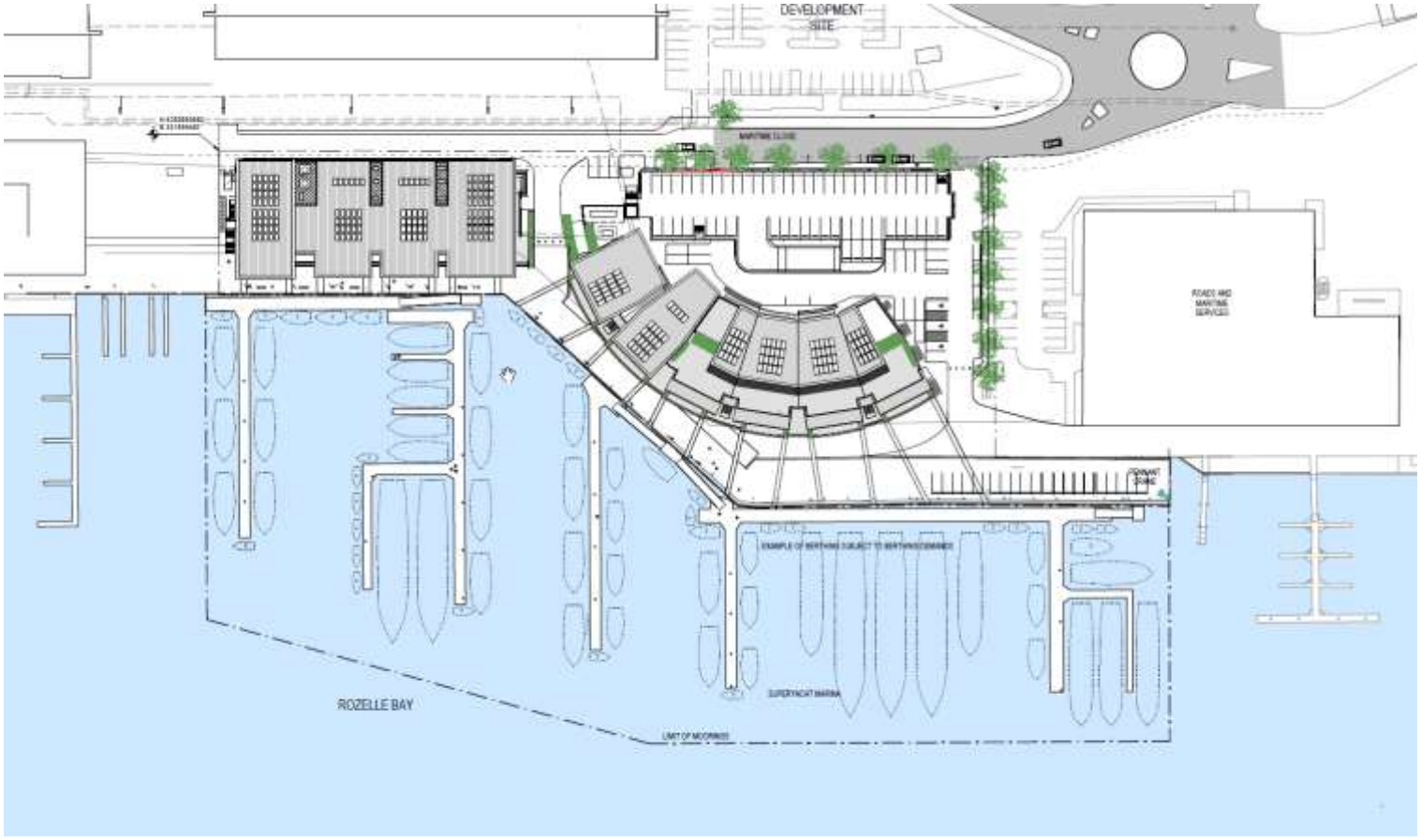

Figure 2- Proposed project

The predicted noise level will be based on the following assumptions:

- Patron noise internally - Average noise level generated by patron speech internally is 77dB(A)$_{L10}$ (one in three talking at any one time). The internal sound pressure level used for the assessment is 83 dB(A) based on measurements at a similar establishment.

- Noise from amplified music/speech will be played on the site in accordance on the project in conjunction with the required conditions of consent. Noise generated from the amplified speech and music will be 105 dB(A) SPL within the proposed facility which has been used as the source noise from the purpose of this assessment.

All predicted levels have been determined on the assumption that the acoustic treatments set out in section 7 have been adopted. Predictions take into account the number of patrons using the internal and external areas of the propose development, the size of the proposed retail/commercial areas, the distance to the receivers and the screening affects to receivers.

Table 1 - Before 10pm Assessment – To Affected Residential Receivers (A-Weighted)

Noise Level	Noise level dB – Frequency (Hz)									
	31.5	63	125	250	500	1k	2k	4k	8k	**A-wt**
Predicted Noise Level at Residences - dBL$_{10}$	**20**	**30**	**38**	**39**	**36**	**3**	**35**	**35**	**28**	**47**
Criteria	20	34	41	45	50	53	50	44	37	**57**
Complies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Table 2 - After 10pm Assessment – To Affected Residential Receivers (A-Weighted)

Noise Level	Noise level dB – Frequency (Hz)									
	31.5	63	125	250	500	1k	2k	4k	8k	**A-wt**
Combined Noise Level (at residences) – dBL$_{10}$	**2**	**12**	**14**	**9**	**5**	**3**	**1**	**-4**	**-10**	**18**
Criteria	14	27	35	37	42	45	40	34	27	**48**
Complies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Noise from the proposed activities on the suite comply with acoustic criteria at all times and all potentially affected residential properties.

6.2 TRAFFIC NOISE

An acoustic assessment for the potential of additional traffic noise from the proposed carparking associated with the development has been assessed.

The proposed modifications include between 237 to 307 car parking spaces (increased from the approved 219) both internally and externally to the proposed building structure. The car parking areas are located to the north of the site between the future building structure and the City West Link.

The existing environment is predominantly affected by existing traffic noise using the Anzac Bridge and the City West Link which carry large numbers of traffic movements, including a large proportion of heavy vehicles traveling at speeds of upto 70 km/h.

As a result the proposed additional traffic noise associated with movements to and from the site and within the proposed carparking area will not generate an additional noise level to any surrounding residential receivers and will be acoustically acceptable.

The previously conducted Noise Impact Assessment undertaken by Benbow Environmental concludes that the proposed carparking numbers within the submitted DA assessment (which include upto 187 car parking spaces) would not general an acoustic impact. The proposed additional spaces as part of the S75W modification to a Part 3A submission (including carparking as detailed in section 6 of this report) is an acoustically small increase and would not impact on any surrounding residential receivers.

6.3 BOAT NOISE FROM THE USE OF THE MARINA

As part of this assessment the potential for additional noise generation from the additional number of boat berths proposed within the S75W modification to a Part 3A submission has been considered.

Based on information provided from the operator of the facility it has been identified that currently no more than 5 or 6 superyachts can enter or exit the facility during any given 15 minute period. As a result the proposed change in number of the proposed superyachts will not result in an increase in noise levels above those levels currently experienced within any give 15 minute assessment period.

A 15 minute period has been identified as the suitable assessment period based on the requirements of the Environmental Protection Authorities (EPA) Industrial Noise Policy (INP).

In addition to the fact that noise levels will not be increased during a worst case 15 min period the following operational conditions exist which will limit the potential noise impact to surrounding receivers:

1. The superyachts using the marina are designed to operate at speeds of upto 30 knots. The speed limit within the marina areas is 4 knots and as a result the superyachts engines will be operating at a very low capacity. Thus limiting noise impact to surrounding receivers.

2. During normal periods there will be one superyacht entering or exiting the facility. The times of the year when multiple superyachts would use the facility at the same time is limited to restricted events such as New Year's Eve, Australia Day, Boxing Day and the like. During these special events there will also be other noise sources generating an elevated background noise hence limiting the impact of any superyacht movements.

3. Use of the harbour area within the vicinity of the marina is a public area and is regularly used by other marine vessels some of which include machinery which generate a greater noise level than a well maintained superyachts.

Based on the discussions above the proposed alterations to the proposed numbers of berths within the Sydney Superyacht Marina will not generate a noise level which increases noise levels during an assessment period of 15 minutes above existing noise levels and therefore there will be no negative acoustic impact on surrounding residential receivers.

6.4 GROUND FLOOR FACILITIES

The proposed Section 75W modification includes a number of marine use facilities in the ground floor of the car park building. These will be used for mixed marine businesses at the marina. They will be glazed on the northern side and during operation will be open to the car park building. Some noise is anticipated from these uses as is normal for mixed marine businesses, however the generated noise sources within the proposed areas will be acoustically screened from the sensitive residential receivers by the eastern building such that noise levels at these locations will generally be inaudible.

7 DISCUSSION

7.1 RECOMMENDED TREATMENTS

The following is the recommended acoustic treatments for the building to control noise associated with the proposed development.

- Any penetrations through the façade of the building such as ventilation should be acoustically treated or sealed within the external façade.

- Any external glazing should be a minimum of 10.38mm laminated glass with a minimum STC/Rw performance of 35. All external windows to be fitted with acoustic seals.

- Ceiling with the top level of the retail/commercial area is required should be constructed from eith a concrete construction or 1x13mm plasterboard with insulation (similar to 75mm thick, 14kg/m^3) installed within the cavity and a metal deck roof. All penetration within the ceiling should be acoustically treated.

7.2 RECOMMENDED MANAGEMENT CONTROLS

Management controls are required to control emissions from the proposed development:

- No music to be played externally after 10pm.

- All external windows and doors are to be closed after 10pm or during events which high noise amplified voice or music with amplified music.

- Management controls should be utilised to manage patron departure particularly at night and at closing times to ensure that patrons leaving the facility do so in a prompt and orderly manner.

- Prominent notices shall be placed to remind patrons that a minimum amount of noise is to be generated when leaving the premises.

- All garbage shall be retained within the premises and removed after 7am on the following day.

8 BUILDING SERVICES NOISE

As detailed plant selections for the proposed development are not available at this stage it is not possible to carry out a detailed examination of the ameliorative measures that may be required to achieve the noise targets.

Plant will be acoustically treated to prevent noise emissions from adversely impacting the surrounding properties in conjunction with the criteria detailed in Section 5 of this report. This may include selecting the quietest plant practicable, or treating the plant with enclosures, barriers, duct lining and silencers, etc as required to comply with the sound level recommendations.

Experience with similar projects indicates that it would be possible to achieve the requirement with appropriate treatment of the plant. General requirements for a number of potential plant items on the site are expanded on below.

8.1 SUPPLY AND EXHAUST FANS

Supply and exhaust fans may be located within the roof top plant rooms or on the rooftop. These units typically emit high noise levels and require acoustic treatment such as silencers and internal lined ductwork. Silencer requirements would be determined once fan selections have been completed.

8.2 CONDENSER UNITS

Condensing units typically emit relatively low noise levels and with careful selection, it is possible that no further acoustic treatment would be necessary.

9 CONCLUSION

In this report we have identified the primary noise sources which will be generated as a result of proposed Sydney Superyacht Marina, Rozelle S75W modification to a Part 3A consent.

Noise emissions have been assessed against the noise emission requirements of the previously submitted acoustic report and noise level criteria as detailed within the Benbow Environmental 'Environmental Noise Impact Assessment, Urban Perspectives, Proposed Superyachts Marina Rozelle Bay, NSW' (Ref: 110056_Rep_Rev1) dated April 2012.

Noise emissions from the operation of the development will comply with the relevant noise emission criteria provided that the building and management controls recommended in section 7 and 8 of this report.

Yours faithfully,

ACOUSTIC LOGIC CONSULTANCY PTY LTD
Ben White