

**NOISE IMPACT ASSESSMENT
FOR PROPOSED SYDNEY SUPERYACHT MARINA
MODIFICATION
ROZELLE BAY, NSW**

Prepared for: Sydney Superyacht Marina
Urban Perspectives

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Attachment 1: Glossary of Environmental Noise Terminology

Attachment 2: Site Landscape Plans



1. INTRODUCTION

Benbow Environmental (BE) have been engaged by Urban Perspectives on behalf of Sydney Superyacht Marina to prepare a noise impact assessment for the proposed Section 75W modifications to the proposed development and has been undertaken in conjunction with the previously completed 'Noise Impact Assessment (NIA)' by Benbow Environmental (121017_Rep_Final) which outlines the relevant criteria for the proposed development.

The following noise assessment will document all the proposed modifications, results and recommendations. The report has been completed in conjunction with the 'SSM Landscape Plan' provided by the proponent (Attachment 2).

1.1 SCOPE

The noise impact assessment has been limited to the following:

- a) Review of proposed site modifications;
- b) Determine all potential noise sources associated with the approved development application and proposed modifications;
- c) Predict potential noise impacts from the development at the nearest potentially affected residential receivers;
- d) Assessment of potential noise impacts against relevant legislation and guidelines;
- e) Investigate ameliorative measures/control solutions (where required); and
- f) The compilation of this report containing concise statements of potential noise impact.

2. PROJECT INFORMATION

2.1 CURRENT APPROVAL

The current approval for the proposed development consists of marine commercial offices, a yacht club, a provedore and ancillary restaurants, bars and cafes.

A car parking facility consisting of four levels and a total of 140 car spaces has been approved to the north of the eastern building.

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
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 every day, 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 every day, balconies must not be used and doors and windows must be closed).

2.2 PROPOSED MODIFICATIONS

The proposed Section 75W modifications to the proposed development includes the following:

- To upgrade the berthing arrangements, reconfigure the pontoons and increase the approved number of vessels from 24 superyachts of varying sizes to 43 vessels not less than 15 metres in length, together with the right to store a tender for each berthed vessel (limited to a maximum of 36 tenders on water). The berthing will allow for at least 24 vessels of at least 24 metres each to be berthed at any one time;
- Remove the car park car lifts and replace with a two way ramp, and include a passenger lift;
- Remove the 13 car spaces on the northern side of the western building (already approved under MOD 2 in May 2015);
- To add a small area of a gross floor area (GFA) of 540m² as an additional second level on the eastern building (as per Attachment 2);
- To increase the number of car parks on the Site – to be achieved by lengthening the car park building and adding another level onto the car park building;
- Use of outdoor areas for seating and use; and
- Enable some of the car parks in the car park building to be used as storage and some as commercial maritime use.

Refer to Attachment 2 for the Site Landscape plan for a detailed visual of the proposed outdoor seating areas and additional level on the eastern building.

2.3 SITE LOCALITY AND SURROUNDING RECEIVERS

A site locality plan below and the nearest identified receiver locations considered in this assessment have been provided in Figure 2-1 and Table 2-1.

Figure 2-1: Site Locality

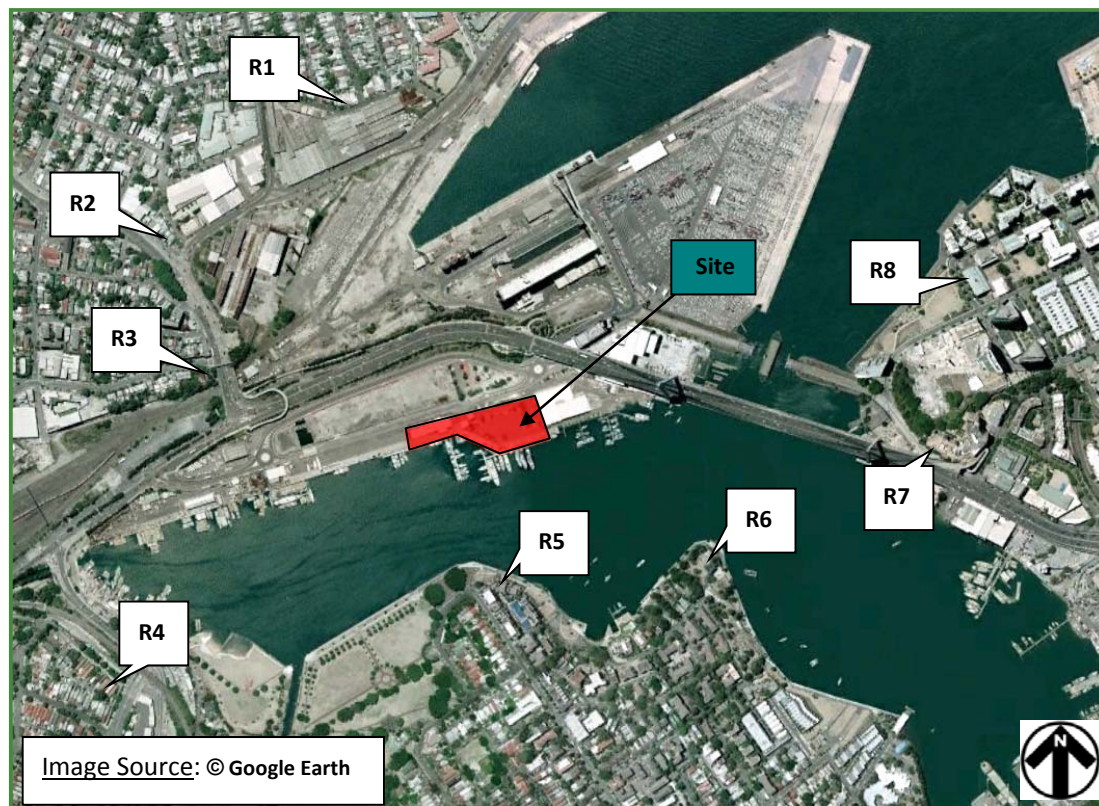


Table 2-1: Residential Receiver Locations Considered

Receiver	Location	Approx. Separation Distance†	Bearing	Indicative Noise Amenity Area
R1	Mansfield Street	515 m	N	Urban
R2	Victoria Road	480 m	NW	Urban
R3	Lilyfield Road	330 m	W	Urban
R4	Bayview Crescent	620 m	SW	Urban
R5	Glebe Point Road	210 m	S	Urban
R6	Leichhardt Street	330 m	SE	Urban
R7	Bank Street	620 m	E	Urban
R8	Tambua Street	720 m	NE	Urban

Note: † denotes assessed from proposed site.

3. EXISTING AMBIENT NOISE ENVIRONMENT

As per the NIA completed in 2012 by Benbow Environmental, it should be reiterated that the proposed development is situated in a location comprised of marine and industrial uses. The surrounding environment is characterised by high background noise levels associated with major roads which carry high volumes of traffic.

In order to establish appropriate project noise criteria for all surrounding sensitive receives, BE conducted attended and unattended noise monitoring to understand the existing ambient and background noise environment.

The results were utilised in the 2012 NIA to formulate suitable acoustic criteria for the assessment of the proposed development which now forms part of the Conditions of Consent and are to remain consistent as part of the Section 75W assessment.

4. CURRENT LEGISLATION AND GUIDELINES

4.1 NSW OFFICE OF LIQUOR, GAMING AND RACING NOISE CRITERIA

The NSW Office of Liquor, Gaming and Racing noise criteria was developed in order to assess licensed premises that may generate noise impacts at particular residential areas. As required by the NSW Department of Planning and Infrastructure, this guideline was utilized for assessing the potential noise impact from the Sydney Superyacht Marina development.

This noise criteria states:

“The L_{A10} noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8k Hz inclusive) by more than 5 dB between 07:00 am and 12:00 midnight at the boundary of any affected residence. The L_{A10} noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8k Hz inclusive) between 12:00 midnight and 07:00 am at the boundary of any affected residence. Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00 am.

Where L_{A10} is the average maximum deflection of the noise emission from the licensed premises.”

4.2 PROJECT-SPECIFIC NOISE LEVELS

Noise limits for the development have been established in accordance with the measured background noise levels and the NSW Office of Liquor, Gaming and Racing noise criteria.

The selected Project-Specific Noise Levels for all the receiver locations are presented in Table 4-1.

As stated in Section 3, the measured results along with the NSW Office of Liquor, Gaming and Racing noise criteria were utilised in the 2012 NIA to formulate suitable acoustic criteria for the assessment of the proposed development which now forms part of the Conditions of Consent and are to remain consistent as part of the Section 75W assessment.

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

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

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 Indicates time period between 10:00 pm to 7:00 am

5. PREDICTIVE NOISE MODELLING

An outline of the predictive noise modelling methodology and operating scenarios has been provided below.

5.1 PREVIOUS NOISE MODEL

Based on the previously completed NIA by Benbow Environmental in 2012, the predictive noise modelling software version of SoundPLAN was 7.1. The current version of SoundPLAN utilised for the current modifications is 7.3.

The noise sources as well as the topographical features of the subject area and receiver locations, were all input into the noise model to determine the noise emissions of the proposed development at the nearest potentially affected residences. On-site structures were included in the model to conservatively account for shielding provided by the building walls.

Based on the proposed Section 75W modifications, the current 2012 noise model has been utilised and amended according to the proposed modifications. The primary noise sources associated with the 2012 noise model include:

- Outdoor seating areas on the balconies and terraces (Western building: 271 people, Eastern building: 310);
- Outdoor Live Band
- Function facilities within the buildings;
- Café, restaurant, takeaway and bars;
- Air conditioning plant and Fan units on the roof; and
- A four level car park.

The following section will outline the modifications and assumptions adopted in the current noise model.

5.2 MODIFICATIONS AND ASSUMPTIONS

All assumptions and noise controls outlined in the initial NIA completed by Benbow Environmental in 2012 will remain consistent in the Section 75W modification.

As stated in Section 2.2, the current proposed Section 75W modifications which need to be assessed include the following:

- To add a small area of a gross floor area (GFA) of 540m² as an additional second level on the eastern building (as per Attachment 2);
- Additional car park noise associated with the increase of the number of car parks on the Site – adding another level on the car park building;
- Amend the assessed number of people in the outdoor dining areas to 891 people from 581 (western building 271 and eastern building increased to 620);
- Additional boat noise from the use of the marina;
- Additional ground floor uses of the car park which could include maritime workshops, chandlery, maritime retail, provisioning, maritime operations; and

- Amend the yacht club glass to remove the airlocks and apply new laminated glass with acoustic seals.

It should be noted that the relevant assessment period for this noise impact assessment was considered to be 15 minutes; therefore noise source durations detailed throughout the following assumptions section should be considered per 15 minute period in view of potential noise impacts under worst-case scenarios.

Modelling scenarios have been carried out using the LA10 descriptor. Using this descriptor, noise emission levels were predicted at the receiver locations to determine potential noise impacts against the relevant noise criteria in accordance with the Office of Liquor, Gaming and Racing.

5.2.1 Scenarios

Model scenarios were configured to provide a realistic assessment of potential site-related noise emissions. Each model configuration was used to calculate noise levels at the nearest potentially affected receivers under the proposed maximum operations.

Three (3) operating scenarios were established for the modelling of on-site noise generation so as to provide an accurate estimation of the potential noise impacts at different times of the day, evening and night time periods.

Each scenario was modelled considering the maximum attendance of guest. Table 5-1 shows the number of people and PA system utilized within the different buildings and areas of the site.

Each scenario is further detailed in Table 5-2.

Table 5-1: People and PA System Considered in the Model

Level	Building	Area	Source
Ground Level	Western	Indoor	8 PA system 159 people moderate level
		Terrace	141 moderate level
	Eastern	Indoor	16 PA system 58 people moderate level
		Terrace	444 people moderate level
Level 1	Western	Indoor	16 PA system 569 people elevated level
		Level 1 Balcony	130 people moderate level
	Eastern	Indoor	16 PA system 58 people moderate level
		Balcony	96 people moderate level
Level 2	Eastern	Balcony	80 people moderate level

It should be noted that according to Table 5-1, there are a total of 271 people modelled outdoors at the Western Building and 620 people modelled outdoors at the Eastern Building.

Ground level carpark will also facilitate for storage space following the conclusion of all maritime operations.

Table 5-2: Modelled Noise Scenarios

Scenario	Description	Sources Included	Source Locations
1	Indoor Moderate Rock/Jazz Band	Sources Table 5.2	Refer Table 5.2
		72 cars manoeuvring	Car park
		96 cars ignition	Car park
		Maritime workshops, chandlery, maritime retail, provisioning, maritime operations and storage	Carpark (Ground level)
		7 fan units	4 fans roof western building 3 fans roof eastern building
		Indoor rock/jazz band	Within level 1 western building
2	Outdoor Moderate Jazz Band	Sources Table 5.2	Refer Table 5.2
		72 cars manoeuvring	Car park
		96 cars ignition	Car park
		Maritime workshops, chandlery, maritime retail, provisioning, maritime operations and storage	Carpark (Ground level)
		7 fan units	4 fans roof western building 3 fans roof eastern building
		Outdoor jazz band	South eastern end of eastern building
3	Outdoor Moderate Rock Band	Sources Table 5.2	Refer Table 5.2
		72 cars manoeuvring	Car park
		96 cars ignition	Car park
		Maritime workshops, chandlery, maritime retail, provisioning, maritime operations and storage	Carpark (Ground level)
		7 fan units	4 fans roof western building 3 fans roof eastern building
		Outdoor rock band	South eastern end of eastern building

Each scenario was run with noise enhancing meteorological conditions. The following conditions were considered:

- Condition A: neutral weather conditions;
- Condition B: 3 m/s wind from source to receiver; and
- Condition C: 3 °C/100m temperature inversion with 2m/s wind from source to receiver.

These meteorological conditions have been displayed in detail in Table 5-3.

Table 5-3: Meteorological Conditions Assessed in Noise Propagation Modelling

Condition	Classification	Ambient Temp.	Ambient Humidity	Wind Speed	Wind Direction	Temperature Inversion	Affected Receiver	Applicability
A	Neutral	10 °C	70%	–	–	–	All	All periods
B	Gradient Flow	10 °C	70%	3m/s	Receiver	–	All	All periods
C	Inversion	10 °C	70%	2m/s	Receiver	3 °C/100m	All	All periods

5.3 PREDICTED NOISE LEVELS

Results of the predictive noise modelling have been displayed from Table 5-4 to Table 5-15. The exact same results were obtained for conditions B and C consequently the results of these weather conditions have been presented in the same tables.

Scenario 1: Table 5-4 to Table 5-7

The predicted results for this scenario indicated that compliance is achievable for all considered residential receivers under neutral weather conditions. However, minor noise exceedances up to 1 dB were observed at receiver R5 during the day and evening time periods. This exceedance is considered to be negligible as the human hearing cannot distinguish an increase of 1 dB for a particular frequency band.

Scenario 2: Table 5-8 to Table 5-11

The predicted results for this scenario indicated that compliance is not achievable for receiver R5 and R6 under neutral and adverse weather conditions. However, minor noise exceedances up to 2 dB were observed at receiver R4 and R7 during the day and evening time periods under adverse weather conditions. Therefore, control measures are strictly necessary in order to comply with the noise limits at all the considered octave bands.

Scenario 3: Table 5-12 to Table 5-15

The predicted results for this scenario indicated that compliance is not achievable for receiver R5 and R6 under neutral and adverse weather conditions. However, minor noise exceedances up to 2 dB were observed at receiver R4 and R7 during the day and evening time periods under adverse weather conditions. Therefore, control measures are strictly necessary in order to comply with the noise limits at all the considered octave bands.

Table 5-4: Noise Modelling Results – Scenario 1, Receivers 1st floor dB(A) – Condition A

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	7	10	18	26	30	22	17	10	-14	
	Evening	7	10	18	26	30	22	17	10	-14	
	Night	7	9	17	23	24	18	13	10	-15	
R2	Day	8	10	17	25	26	19	13	10	-14	
	Evening	8	10	17	25	26	19	13	10	-14	
	Night	7	10	17	23	24	18	12	10	-14	
R3	Day	11	13	21	28	30	23	18	17	-4	
	Evening	11	13	21	28	30	23	18	17	-4	
	Night	10	13	20	26	27	21	16	16	-4	
R4	Day	6	9	18	28	34	26	20	8	-20	
	Evening	6	9	18	28	34	26	20	8	-20	
	Night	5	8	16	20	24	18	13	6	-22	
R5	Day	15	19	29	41	48	41	37	31	15	
	Evening	15	19	29	41	48	41	37	31	15	
	Night	13	17	27	37	44	39	34	29	13	
R6	Day	10	14	24	34	41	34	29	21	0	
	Evening	10	14	24	34	41	34	29	21	0	
	Night	8	12	22	29	35	31	25	18	-3	
R7	Day	5	8	17	27	32	25	18	6	-22	
	Evening	5	8	17	27	32	25	18	6	-22	
	Night	3	6	16	19	22	16	10	4	-25	
R8	Day	3	6	15	24	29	21	14	2	-30	
	Evening	3	6	15	24	29	21	14	2	-30	
	Night	1	5	13	17	21	15	7	-1	0	
Criteria	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58
	Night	26	35	37	40	48	52	47	36	23	54

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-5: Noise Modelling Results – Scenario 1, Receivers 5th floor dB(A) – Condition A

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	7	10	18	27	30	23	17	10	-14	
	Evening	7	10	18	27	30	23	17	10	-14	
	Night	7	10	17	24	24	18	13	10	-15	
R2	Day	8	10	18	25	27	19	14	10	-14	
	Evening	8	10	18	25	27	19	14	10	-14	
	Night	7	10	18	24	24	18	12	10	-14	
R3	Day	11	13	21	29	31	23	18	17	-4	
	Evening	11	13	21	29	31	23	18	17	-4	
	Night	11	13	21	27	28	21	16	17	-4	
R4	Day	6	9	18	28	34	26	19	8	-21	
	Evening	6	9	18	28	34	26	19	8	-21	
	Night	5	8	16	20	23	17	10	5	-23	
R5	Day	15	19	30	41	48	41	37	31	15	
	Evening	15	19	30	41	48	41	37	31	15	
	Night	13	17	28	37	44	39	34	29	13	
R6	Day	10	14	24	34	41	34	29	21	0	
	Evening	10	14	24	34	41	34	29	21	0	
	Night	8	12	22	29	35	31	25	18	-3	
R7	Day	5	8	18	27	33	25	18	6	-22	
	Evening	5	8	18	27	33	25	18	6	-22	
	Night	3	6	16	20	22	16	10	4	-25	
R8	Day	4	7	16	25	30	22	15	2	-30	
	Evening	4	7	16	25	30	22	15	2	-30	
	Night	2	6	14	20	24	16	8	0	0	
Criteria	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57
	Night	17	31	38	42	47	51	45	37	28	54

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-6: Noise Modelling Results – Scenario 1, Receivers 1st floor dB(A) - Condition B & C

Receiver	Time Period	Frequency (Hz)									Overall
		31.5	63	125	250	500	1000	2000	4000	8000	
R1	Day	10	12	21	31	35	27	21	17	-8	
	Evening	10	12	21	31	35	27	21	17	-8	
	Night	9	12	20	28	29	23	17	16	-9	
R2	Day	10	13	21	29	31	24	18	16	-8	
	Evening	10	13	21	29	31	24	18	16	-8	
	Night	10	12	20	28	29	22	17	16	-8	
R3	Day	13	16	23	32	35	27	22	22	2	
	Evening	13	16	23	32	35	27	22	22	2	
	Night	13	16	23	30	31	25	21	22	1	
R4	Day	9	12	22	34	40	31	24	15	-13	
	Evening	9	12	22	34	40	31	24	15	-13	
	Night	7	10	20	26	30	23	17	13	-15	
R5	Day	18	21	32	44	51	45	41	36	20	
	Evening	18	21	32	44	51	45	41	36	20	
	Night	15	19	30	40	48	43	38	34	18	
R6	Day	13	16	27	39	45	39	33	27	6	
	Evening	13	16	27	39	45	39	33	27	6	
	Night	10	14	25	33	40	35	29	24	3	
R7	Day	7	10	21	33	39	30	23	13	-15	
	Evening	7	10	21	33	39	30	23	13	-15	
	Night	5	9	19	25	28	21	14	11	-18	
R8	Day	5	8	18	30	35	26	19	9	-23	
	Evening	5	8	18	30	35	26	19	9	-23	
	Night	4	7	17	23	27	19	12	6	-25	
Criteria	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58
	Night	26	35	37	40	48	52	47	36	23	54

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-7: Noise Modelling Results – Scenario 1, Receivers 5th floor dB(A) – Condition B & C

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	10	13	21	31	35	27	21	17	-8	
	Evening	10	13	21	31	35	27	21	17	-8	
	Night	9	12	20	28	29	23	17	16	-9	
R2	Day	10	13	21	29	32	24	18	16	-8	
	Evening	10	13	21	29	32	24	18	16	-8	
	Night	10	13	21	28	29	23	17	16	-8	
R3	Day	13	16	24	32	35	28	22	22	2	
	Evening	13	16	24	32	35	28	22	22	2	
	Night	13	16	23	31	32	26	21	22	1	
R4	Day	9	12	22	34	40	31	24	14	-14	
	Evening	9	12	22	34	40	31	24	14	-14	
	Night	7	10	20	26	29	22	15	12	-16	
R5	Day	18	22	32	44	51	45	41	36	20	
	Evening	18	22	32	44	51	45	41	36	20	
	Night	15	19	30	40	47	43	38	34	18	
R6	Day	13	16	27	39	45	38	33	26	6	
	Evening	13	16	27	39	45	38	33	26	6	
	Night	10	14	25	33	40	34	27	24	3	
R7	Day	7	10	21	33	39	30	23	13	-15	
	Evening	7	10	21	33	39	30	23	13	-15	
	Night	5	9	20	25	28	21	14	11	-18	
R8	Day	6	9	19	30	36	27	19	9	-23	
	Evening	6	9	19	30	36	27	19	9	-23	
	Night	5	8	18	25	30	21	12	6	-25	
Criteria	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57
	Night	17	31	38	42	47	51	45	37	28	54

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-8: Noise Modelling Results – Scenario 2, Receivers 1st floor dB(A) - Condition A

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	10	29	34	33	37	34	28	18	-5	
	Evening	10	29	34	33	37	34	28	18	-5	
R2	Day	8	22	25	26	28	22	17	11	-13	
	Evening	8	22	25	26	28	22	17	11	-13	
R3	Day	11	22	26	29	31	25	20	17	-3	
	Evening	11	22	26	29	31	25	20	17	-3	
R4	Day	11	32	37	37	41	38	32	20	-6	
	Evening	11	32	37	37	41	38	32	20	-6	
R5	Day	21	42	47	47	53	50	47	43	33	
	Evening	21	42	47	47	53	50	47	43	33	
R6	Day	17	38	43	42	48	46	42	36	22	
	Evening	17	38	43	42	48	46	42	36	22	
R7	Day	12	33	38	38	42	40	34	24	2	
	Evening	12	33	38	38	42	40	34	24	2	
R8	Day	10	31	36	35	40	37	31	20	-6	
	Evening	10	31	36	35	40	37	31	20	-6	
Criteria	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-9: Noise Modelling Results – Scenario 2, Receivers 5th floor dB(A) – Condition A

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	11	29	34	33	37	34	27	17	-5	
	Evening	11	29	34	33	37	34	27	17	-5	
R2	Day	8	22	25	26	28	23	17	11	-12	
	Evening	8	22	25	26	28	23	17	11	-12	
R3	Day	12	25	28	30	32	26	21	17	-3	
	Evening	12	25	28	30	32	26	21	17	-3	
R4	Day	11	32	37	37	41	38	32	20	-6	
	Evening	11	32	37	37	41	38	32	20	-6	
R5	Day	21	42	47	47	53	50	47	43	33	
	Evening	21	42	47	47	53	50	47	43	33	
R6	Day	17	38	43	43	48	46	42	36	22	
	Evening	17	38	43	43	48	46	42	36	22	
R7	Day	12	33	38	38	42	40	34	24	2	
	Evening	12	33	38	38	42	40	34	24	2	
R8	Day	10	32	36	35	40	37	31	20	-6	
	Evening	10	32	36	35	40	37	31	20	-6	
Criteria	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-10: Noise Modelling Results – Scenario 2, Receivers 1st floor dB(A) - Condition B & C

Receiver	Time Period	Frequency (Hz)									Overall
		31.5	63	125	250	500	1000	2000	4000	8000	
R1	Day	12	32	37	38	43	39	32	25	2	
	Evening	12	32	37	38	43	39	32	25	2	
R2	Day	11	24	28	31	33	27	21	18	-6	
	Evening	11	24	28	31	33	27	21	18	-6	
R3	Day	14	25	29	33	36	30	25	23	3	
	Evening	14	25	29	33	36	30	25	23	3	
R4	Day	13	34	41	42	48	43	36	27	1	
	Evening	13	34	41	42	48	43	36	27	1	
R5	Day	23	44	50	51	56	54	52	48	38	
	Evening	23	44	50	51	56	54	52	48	38	
R6	Day	19	41	46	47	53	50	47	42	28	
	Evening	19	41	46	47	53	50	47	42	28	
R7	Day	14	36	42	43	48	45	39	31	9	
	Evening	14	36	42	43	48	45	39	31	9	
R8	Day	12	34	40	41	46	43	36	27	2	
	Evening	12	34	40	41	46	43	36	27	2	
Criteria	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-11: Noise Modelling Results – Scenario 2, Receivers 5th floor dB(A) - Condition B & C

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	13	32	37	38	43	39	32	24	2	
	Evening	13	32	37	38	43	39	32	24	2	
R2	Day	11	25	29	31	33	27	21	18	-6	
	Evening	11	25	29	31	33	27	21	18	-6	
R3	Day	14	27	31	34	37	30	25	23	3	
	Evening	14	27	31	34	37	30	25	23	3	
R4	Day	13	34	41	42	48	43	36	27	1	
	Evening	13	34	41	42	48	43	36	27	1	
R5	Day	23	44	50	51	56	54	52	48	38	
	Evening	23	44	50	51	56	54	52	48	38	
R6	Day	19	41	46	47	53	50	47	42	28	
	Evening	19	41	46	47	53	50	47	42	28	
R7	Day	14	36	42	43	48	45	38	31	9	
	Evening	14	36	42	43	48	45	38	31	9	
R8	Day	13	34	40	41	46	43	36	27	2	
	Evening	13	34	40	41	46	43	36	27	2	
Criteria	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-12: Noise Modelling Results – Scenario 3, Receivers 1st floor dB(A) – Condition A

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	10	29	34	33	35	33	28	18	-5	
	Evening	10	29	34	33	35	33	28	18	-5	
R2	Day	8	22	25	26	27	22	17	11	-13	
	Evening	8	22	25	26	27	22	17	11	-13	
R3	Day	11	22	26	28	31	25	20	17	-3	
	Evening	11	22	26	28	31	25	20	17	-3	
R4	Day	11	32	37	36	40	37	31	20	-6	
	Evening	11	32	37	36	40	37	31	20	-6	
R5	Day	21	42	47	47	51	49	47	43	32	
	Evening	21	42	47	47	51	49	47	43	32	
R6	Day	17	38	43	42	46	44	42	36	22	
	Evening	17	38	43	42	46	44	42	36	22	
R7	Day	11	33	38	37	40	39	34	24	2	
	Evening	11	33	38	37	40	39	34	24	2	
R8	Day	10	31	36	35	38	36	31	20	-6	
	Evening	10	31	36	35	38	36	31	20	-6	
Criteria	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-13: Noise Modelling Results – Scenario 3, Receivers 5th floor dB(A) - Condition A

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	10	29	33	33	35	33	27	17	-5	
	Evening	10	29	33	33	35	33	27	17	-5	
R2	Day	8	22	25	26	28	22	17	11	-13	
	Evening	8	22	25	26	28	22	17	11	-13	
R3	Day	11	25	28	30	31	25	20	17	-3	
	Evening	11	25	28	30	31	25	20	17	-3	
R4	Day	11	32	37	36	40	37	31	20	-6	
	Evening	11	32	37	36	40	37	31	20	-6	
R5	Day	21	42	47	47	51	49	47	43	32	
	Evening	21	42	47	47	51	49	47	43	32	
R6	Day	17	38	43	42	46	44	42	36	22	
	Evening	17	38	43	42	46	44	42	36	22	
R7	Day	11	33	38	37	40	38	34	24	2	
	Evening	11	33	38	37	40	38	34	24	2	
R8	Day	10	32	36	35	38	36	31	20	-6	
	Evening	10	32	36	35	38	36	31	20	-6	
Criteria	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-14: Noise Modelling Results – Scenario 3, Receivers 1st floor dB(A) – Condition B & C

Receiver	Time Period	Frequency (Hz)									
		31.5	63	125	250	500	1000	2000	4000	8000	Overall
R1	Day	12	32	37	38	41	38	32	25	2	
	Evening	12	32	37	38	41	38	32	25	2	
R2	Day	11	24	28	31	32	27	21	17	-6	
	Evening	11	24	28	31	32	27	21	17	-6	
R3	Day	14	25	29	33	35	30	25	23	3	
	Evening	14	25	29	33	35	30	25	23	3	
R4	Day	13	34	41	42	46	42	36	27	1	
	Evening	13	34	41	42	46	42	36	27	1	
R5	Day	23	44	50	51	55	53	51	48	37	
	Evening	23	44	50	51	55	53	51	48	37	
R6	Day	19	41	46	47	51	49	46	42	28	
	Evening	19	41	46	47	51	49	46	42	28	
R7	Day	14	36	42	43	47	44	38	31	9	
	Evening	14	36	42	43	47	44	38	31	9	
R8	Day	12	34	40	40	44	41	35	27	1	
	Evening	12	34	40	40	44	41	35	27	1	
Criteria	Day	30	40	41	45	50	53	49	39	26	57
	Evening	29	38	40	44	50	53	54	41	26	58

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

Table 5-15: Noise Modelling Results – Scenario 3, Receivers 5th floor dB(A) – Condition B & C

Receiver	Time Period	Frequency (Hz)									Overall
		31.5	63	125	250	500	1000	2000	4000	8000	
R1	Day	13	32	37	38	41	38	32	24	1	
	Evening	13	32	37	38	41	38	32	24	1	
R2	Day	11	25	29	31	33	27	21	17	-6	
	Evening	11	25	29	31	33	27	21	17	-6	
R3	Day	14	27	31	34	36	30	25	23	3	
	Evening	14	27	31	34	36	30	25	23	3	
R4	Day	13	34	41	42	46	42	36	27	1	
	Evening	13	34	41	42	46	42	36	27	1	
R5	Day	23	44	50	51	55	53	51	48	37	
	Evening	23	44	50	51	55	53	51	48	37	
R6	Day	19	41	46	47	51	49	46	42	28	
	Evening	19	41	46	47	51	49	46	42	28	
R7	Day	14	36	42	43	47	43	38	31	8	
	Evening	14	36	42	43	47	43	38	31	8	
R8	Day	12	34	40	40	44	41	35	27	1	
	Evening	12	34	40	40	44	41	35	27	1	
Criteria	Day	24	37	43	47	51	54	50	45	38	58
	Evening	20	34	41	45	50	53	50	44	37	57

Note: Shaded cells indicate that the predicted noise exceeds the Project Specific Noise Level

5.4 NOISE CONTROLS FOR PROPOSED MODIFICATIONS TO OUTDOOR SEATING AREAS

It should be noted that the noise controls outlined in the NIA completed by Benbow Environmental in 2012 and set out in the current consent, have been applied to the current modification.

No additional noise controls have been implemented as part of the Section 75W modification.

It should be noted that the predicted noise complies in Scenario 1. Condition F2 of the 2012 Consent makes Scenario 2 and 3 subject to a trial period. Noise measurements along with a separate and subsequent modification application will need to be submitted during which real time monitoring of outdoor bands can be used to assess the noise impact of bands.

5.5 BOAT NOISE FROM USE OF MARINA

The noise emissions from the boats would need to comply with the noise criteria established in accordance with the NSW Industrial Noise Policy. This is equal to the rating background level plus 5 dB. As shown in Table 4-1, the “total” noise limits apply to the boat noise.

According to the information supplied by the marina operators, a maximum of 5 to 6 super yachts can enter or exit a facility at any given 15 minute period.

According to the EPA’s NSW Industrial Noise Policy, a 15 minute period has been identified as the suitable assessment period. As a result, any increase in the number of proposed super yachts will not result in the increase of the number of boats currently operating within a 15 minute period as the marina is operating to its maximum capacity of boats per 15 minutes.

In addition to the marina operating at its maximum 15 minute capacity, boats are required to operate at very low speeds (4 knots as opposed to 30 knots) within the Marina area. This will provide additional reduction in noise within the Marina area.

Noise associated with the boat operations is expected to be consistent with the current operations as there is no change to the amount of boats operating over a 15 minute assessment period. Further assessment of the noise associated with the boats has not been considered necessary.

6. CONCLUSIONS

A detailed noise impact assessment of the proposed Section 75W modifications has been completed for the Sydney Superyacht Marina located at Rozelle Bay, NSW 2029.

This report has been completed in conjunction with the noise impact assessment by Benbow Environmental in 2012.

All assumptions within the 2012 NIA and noise controls outlined in the MOD 2 consent have been implemented into the current assessment along with the Section 75W modifications.

The predicted noise results for the proposed Section 75W modifications indicate that the criteria is met at all receivers in Scenario 1. Condition F2 of the 2012 Consent makes Scenario 2 and 3 subject to a trial period. Noise measurements along with a separate and subsequent modification application will need to be submitted during which real time monitoring of outdoor bands can be used to assess the noise impact of bands.

Noise associated with the boat operations is expected to be consistent with the current operations as there is no change to the amount of boats operating in a 15 minute period. Current yacht movements at the marina are operating at maximum capacity of movements per 15 minutes. Further assessment of the noise associated with the boats has not been considered necessary.

This concludes the report.

Prepared by:



David Sallak
Acoustic Engineer



R T Benbow
Principal Consultant



7. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Urban Perspectives, as per our agreement for providing environmental services. Only Urban Perspectives is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Urban Perspectives for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

ATTACHMENTS

Attachment 1: Glossary of Environmental Noise Terminology

Glossary of Noise Terminology

Acceptable Noise Level: The acceptable L_{Aeq} noise level from industrial sources, recommended by the NSW EPA (Table 2.1, INP). Note that this noise level refers to all industrial sources at the receiver location, and not only noise due to a specific project under consideration.

Acoustic Barrier: Solid walls or partitions, solid fences, earth mounds, earth berms, buildings, etc used to reduce noise, without eliminating it.

Adverse Weather: Weather conditions that affect noise (wind and temperature inversions) that occur at a particular site for a significant period of time. The previous conditions are for wind occurring more than 30% of the time in any assessment period in any season and/or for temperature inversions occurring more than 30% of the nights in winter.

Ambient Noise: The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.

Assessment Period: The period in a day over which assessments are made.

Assessment Point A: position at which noise measurements are undertaken or estimated.

Background Noise: Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{A90} noise level.

Decibel [dB] : The units of sound pressure level.

dB(A): A-weighted decibels. Noise measured using the A filter.

Free field: An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5m from any acoustic reflecting structures other than the ground.

Frequency: Frequency is synonymous to pitch. Frequency or pitch can be measured on a scale in units of Hertz (Hz).

Impulsive noise: Noise having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.

Intermittent noise: Level that drops to the background noise level several times during the period of observation.

L_{Amax} The maximum sound pressure level measured over a period.

L_{Amin} The minimum sound pressure level measured over a period.

L_{A1} The sound pressure level that is exceeded for 1% of the time for which the sound is measured.

L_{A10} The sound pressure level that is exceeded for 10% of the time for which the sound is measured.

L_{A90} The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{A90} noise level expressed in units of dB(A).

L_{Aeq} The “equivalent noise level” is the summation of noise events and integrated over a selected period of time.

Reflection: Sound wave changed in direction of propagation due to a solid object meeting on its path.

R-w: The Sound Insulation Rating R-w is a measure of the noise reduction performance of the partition.

SEL: Sound Exposure Level is the constant sound level which, if maintained for a period of 1 second, would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L_{Aeq} sound levels over any period of time and can be used for predicting noise at various locations.

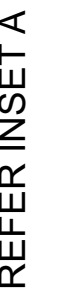
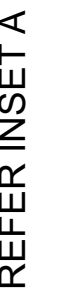
Sound Absorption: The ability of a material to absorb sound energy through its conversion into thermal energy.

Sound Level Meter: An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.

Sound Pressure Level: The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.

Sound Power Level: Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.

Tonal noise: Containing a prominent frequency and characterised by a definite pitch.

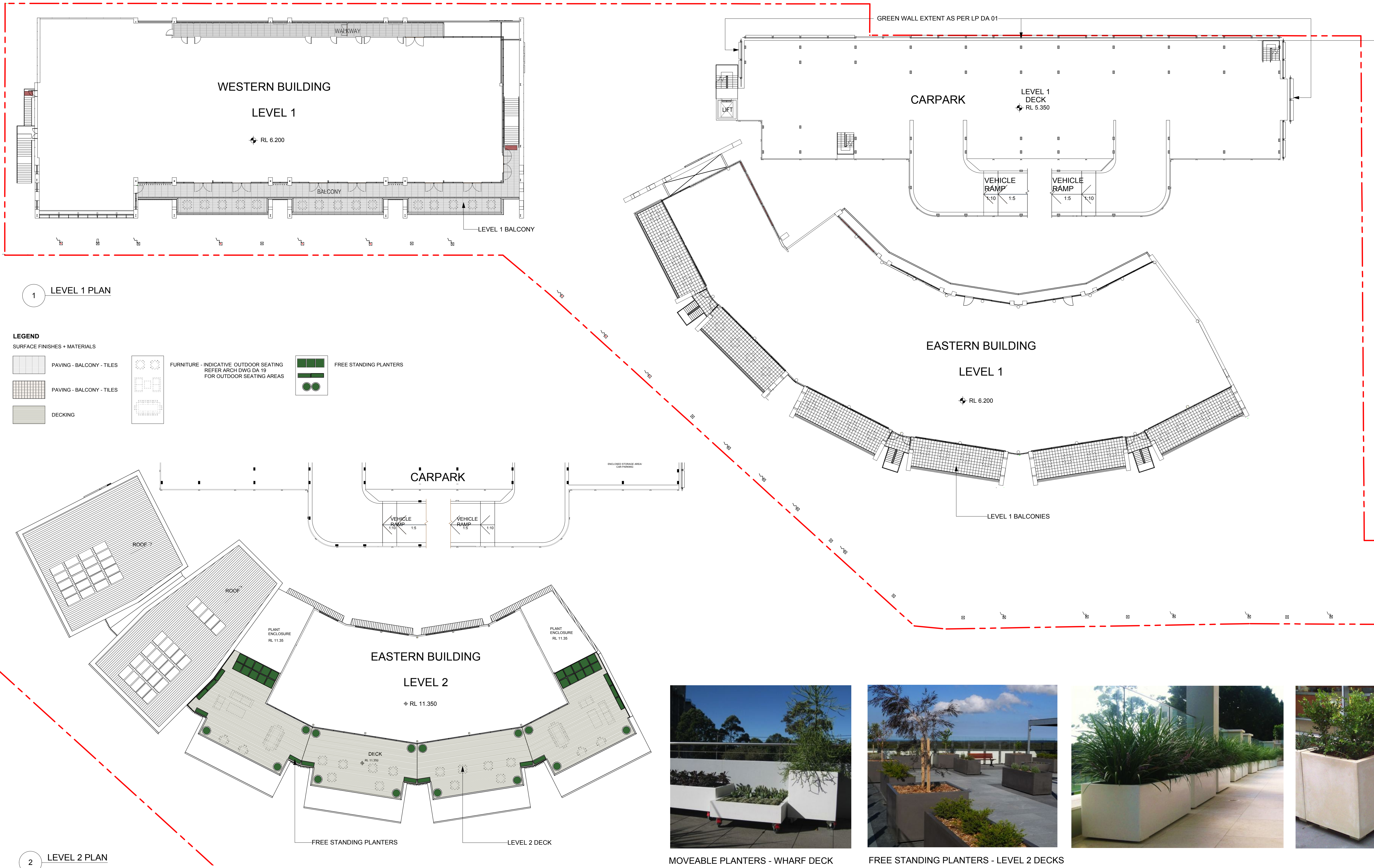


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MOVEABLE PLANTERS - WHARF DECK



FREE STANDING PLANTERS - LEVEL 2 DECKS



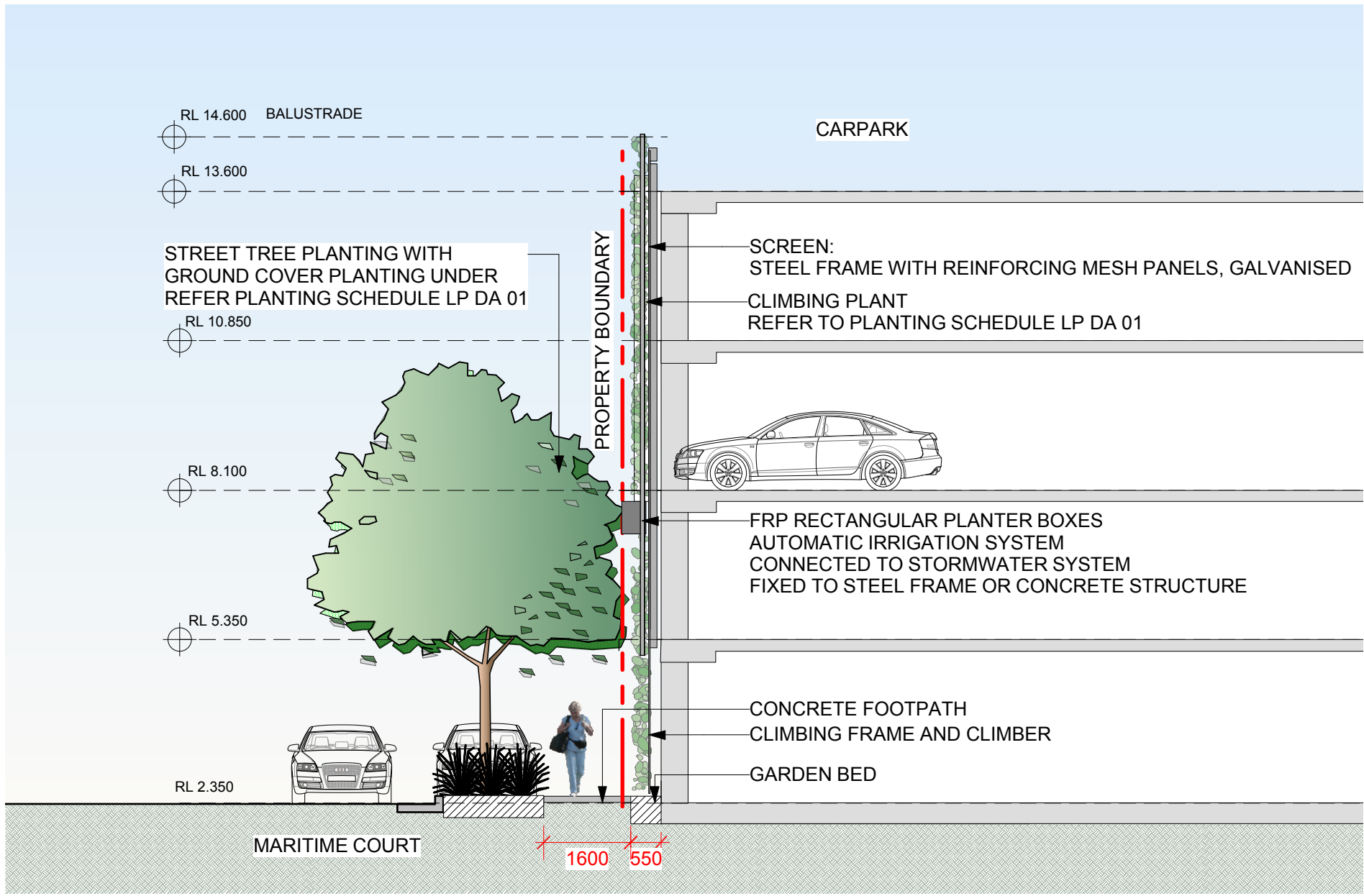
OUTDOOR SEATING AREAS - PLANTERS BOXES

FOR APPROVAL

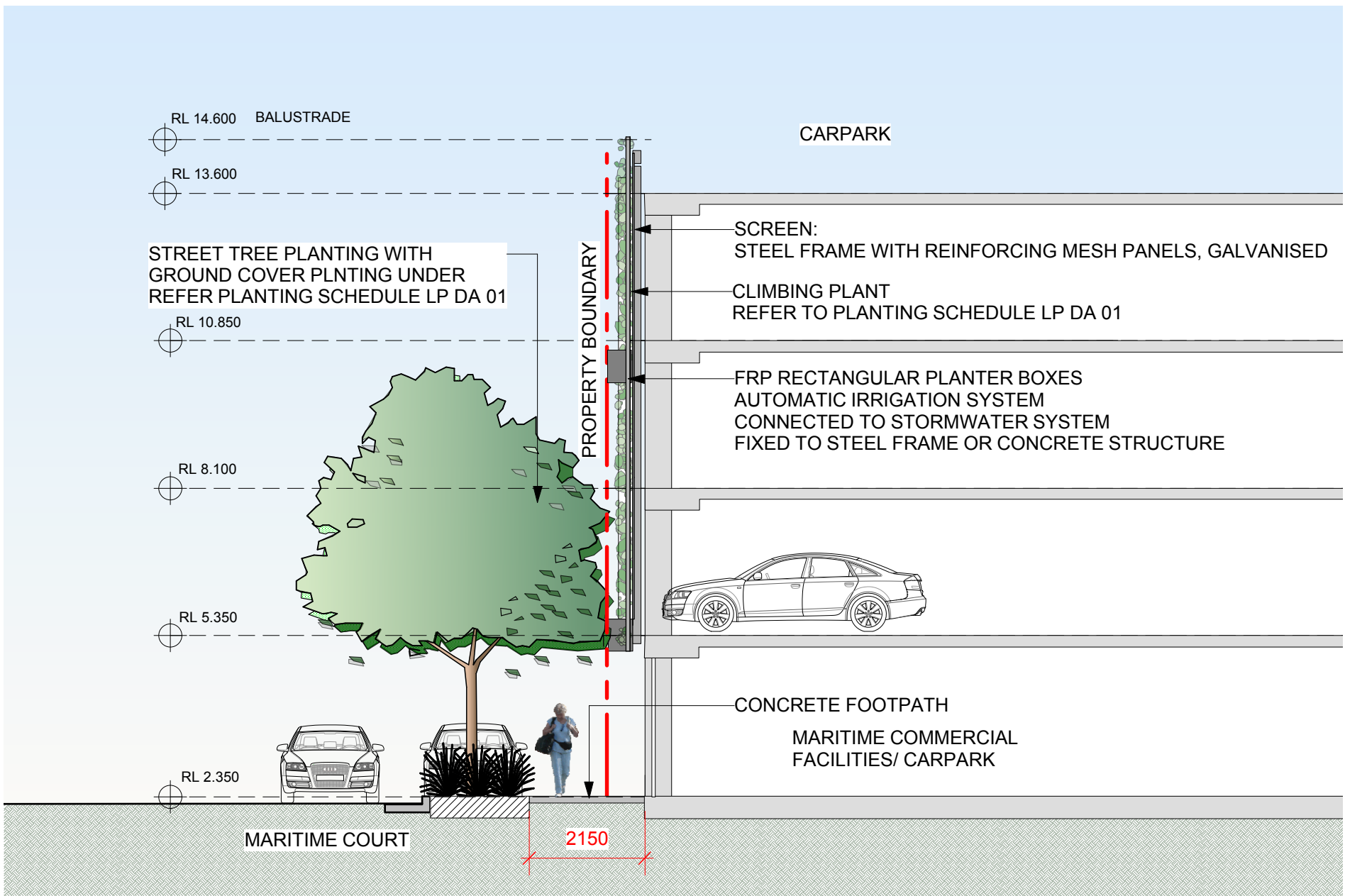
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A	DEVELOPMENT APPLICATION	16.09.15	FY	<div>PO BOX 887 ST IVES CENTRE NSW 2075 M: 0414 446 730 E: fyeates@fyc.net.au</div> <div>© 2015 FIONA YEATES CONSULTING PTY LTD</div> <div>This work is not to be copied or reproduced in any form without the prior written permission of the author.</div>		MARITIME COURT, ROZELLE BAY NSW		JOB NUMBER:	DRAWING NO:	REV:
P2	FOR REVIEW	01.09.15	FY					1515	LP DA 02	A
P1	FOR REVIEW	24.08.15	FY							
REVISION	DESCRIPTION	DATE	BY							



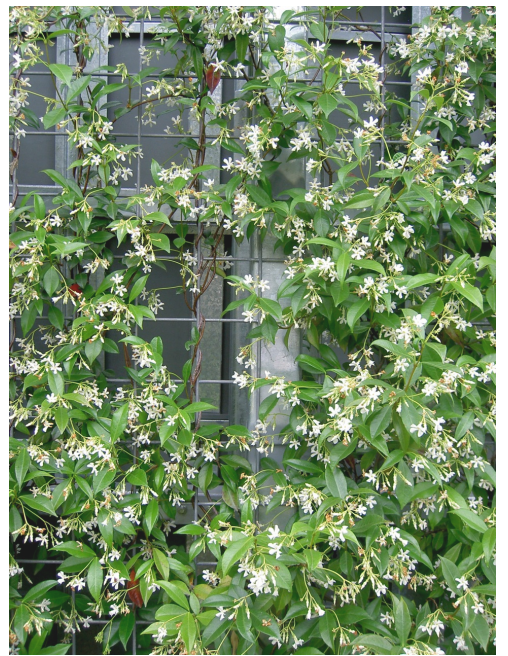
1 NORTH ELEVATION CARPARK
Scale: 1:100



2 MARITIME COURT/ CARPARK
Scale: 1:100



3 MARITIME COURT/ CARPARK
Scale: 1:100



GREEN SCREEN FACADES
INDICATIVE IMAGES

GREEN SCREEN CLIMBERS
STAR JASMINE
WONGA WONGA VINE

				LANDSCAPE ARCHITECT: FIONA YEATES Consulting				PROJECT: SYDNEY SUPERYACHT MARINA MARITIME COURT, ROZELLE BAY				CLIENT: SYDNEY SUPERYACHT MARINA PTY LTD MARITIME COURT, ROZELLE BAY NSW				SCALE: AS SHOWN @A1				FOR APPROVAL			
				PO BOX 887 ST IVES CENTRE NSW 2075 M: 0414 446 730 E: fyeates@fyc.net.au																DRAWING TITLE: CARPARK FACADE ELEVATION/ SECTION			
A				DEVELOPMENT APPLICATION				16.09.15				FY								JOB NUMBER:			
P1				FOR REVIEW				24.08.15				FY								DRAWING NO:			
REVISION				DESCRIPTION				DATE				BY								1515			
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