Adriano Pupilli Architects Pty Ltd

Newport SLSC

Acoustic report

May 2022

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1. Introduction

1.1 Introduction

GHD has prepared an acoustic assessment for the existing Newport Surf Life Saving Club (SLSC) located at Newport Beach, Newport. The objective of this assessment is to assess noise emission from the use and operation of the proposed facilities, and where required, provide noise mitigation measures to achieve the relevant requirements of the Northern Beaches Council.

1.2 Purpose of this report

This report has been prepared to support the Development Application (DA) for the propose additions and alterations of the Newport SLSC. The DA will be lodged with Northern Beaches Council.

The scope of this assessment includes:

- Undertake background noise monitoring to establish noise criteria in accordance with the requirements of North Beaches Council
- Assessment of the operational noise emission from the use and operation of the facilities in accordance with the requirements of the Northern Beaches Council
- Provide mitigation measures, where required, to reduce noise emission to acceptable levels.

This report has been prepared with consideration of the following documents:

- Pittwater 21 Development Control Plan
- Architectural Drawings provided by Adriano Pupilli Architects (dated 02/09/2020)

1.3 Proposal description

The proposal can be summarised as additions and alterations to the existing Newport SLSC, as well as changes to the use of the facilities. These include the following:

- Internal refurbishment of SLSC
- Additions and alterations to top floor external balconies
- Additional training and assessment rooms on top of expanded boat storage area
- Operational hours – 5:00 am to 12:00 am
  - Licenced bar operational hours
    - Monday to Thursday: 12:00 pm to 9:00 pm
    - Friday and Saturday: 10:00 am to 12:00 am
    - Sunday: 10:00 am to 10:00 pm
- Live music played internally on the top floor. Live music could occur at any time within the Licenced Bar operating hours listed above.

Architectural drawings for the proposal are presented below in Appendix A.

1.4 Scope and limitations

This report has been prepared by GHD for Adriano Pupilli Architects Pty Ltd and may only be used and relied on by Adriano Pupilli Architects Pty Ltd for the purpose agreed between GHD and the Adriano Pupilli Architects Pty Ltd as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Adriano Pupilli Architects Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Adriano Pupilli Architects Pty Ltd and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

2. Site surrounding

The proposal is situated on the existing Newport SLSC on Newport Beach. It is situated within an area zoned “RE1 – Public Recreation”, and is bordered by:

- Residential premises and apartment blocks to the north, west and south; primarily on Barrenjoey Road
- Newport beach to the east
- Commercial businesses to the south-west; primarily based on Barrenjoey Road

Existing environmental noise levels for receivers fronting Barrenjoey Road is primarily dominated by road traffic. All other receivers set back from the road would experience environmental noise levels dominated by noise from Newport Beach as waves crashing on the shore.

The subject site, noise monitoring location and identified noise sensitive receivers are presented below in Figure 2-1.

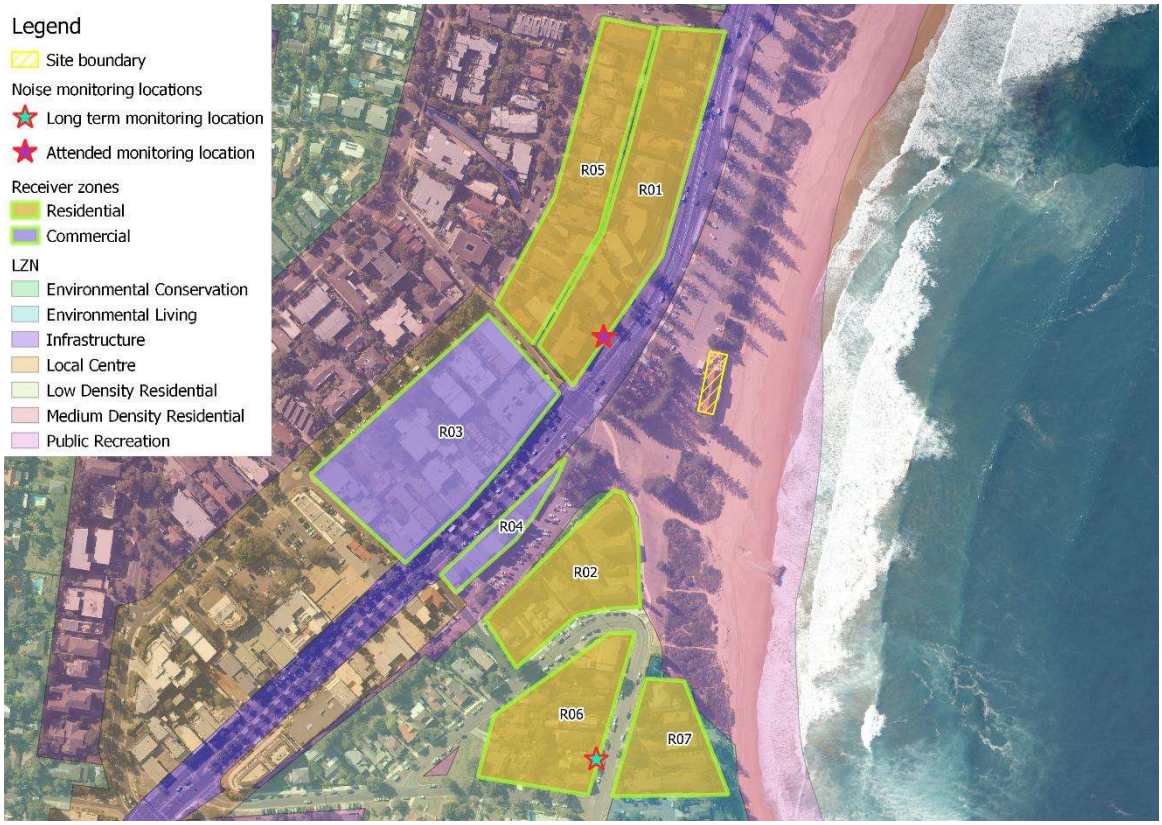

Figure 2-1 Subject site, nearby sensitive receivers and noise monitoring location

3. Noise monitoring

3.1 Unattended noise monitoring

The methodology for the noise monitoring program includes the following:

- Identification of sensitive receivers including residences and other sensitive land uses in the vicinity of the proposal
- Noise logging was conducted from Thursday 24 September to Friday 2 October, 2020 at a location representative of the nearest sensitive receiver to the proposal, being 14 Myola Road, Newport
- A calibration check was performed on the noise monitoring equipment using a sound level calibrator with a sound pressure level of 94 dB(A) at 1 kHz. At completion of the measurements, the meter's calibration was re-checked to ensure the sensitivity of the noise monitoring equipment had not varied. The noise loggers were found to be within the acceptable tolerance of ± 0.5 dB(A).
- Noise monitoring was undertaken using a Rion NL-52 environmental noise logger. The noise logger was programmed to accumulate L_{A90}, L_{A10}, and L_{Aeq} noise descriptors continuously over the entire monitoring period.
- The data collected by the loggers was downloaded and analysed, and any invalid data removed. Invalid data generally refers to periods of time where average wind speeds were greater than 5 m/s, or when rainfall occurred. Meteorological data was sourced from the Bureau of Meteorology's Terrey Hills AWS (SN 066059).
- All noise monitoring activities were undertaken and processed in accordance with the Noise Policy for Industry (NPfI, 2017) long term monitoring method. All noise logger settings and descriptors used were based on this method.

3.2 Summary of noise monitoring results

Details of the noise monitoring equipment and location are provided in Table 3-1. Noise logger data results are summarised in Table 3-2. Noise monitoring charts are presented in Appendix B.

Table 3-1 Background noise monitoring details

Location	Equipment Details	Equipment settings	Logger photo
Front garden 14 Myola Road, Newport	Rion NL-52 SN: 00131629	A-weighted Fast time response 15 minute intervals Pre/post calibration variance: -0.3 dB	

Table 3-2 Summary of noise monitoring results

Location	Background noise level $L_{A90(15min)}$, dB(A)			Ambient noise level $L_{Aeq(15min)}$, dB(A)		
	Day	Evening	Night	Day	Evening	Night
14 Myola Road, Newport	40	39	38	56	48	49

3.3 International Standard ISO 226: 2003

The ISO 226 :2003 – Normal Equal-Loudness-Level contours presents values for the threshold of human hearing in third octave bands, denoted as *Tf*. The *Tf* corresponding to each octave band centre frequency is presented in Table 3-3 below.

Table 3-3 Threshold of human hearing (ISO 226:2003 Table 1)

Weighting	dB in octave bands [Hz]								
	31.5	63	125	250	500	1000	2000	4000	8000
Z - weighted	59.5	37.5	22.1	11.4	4.4	2.4	-1.3	-5.4	12.6
A - weighted	20.1	11.3	6	2.8	1.2	2.4	-0.1	-4.4	11.5

Where background noise levels are below the threshold of human hearing, the A-weighted threshold of human hearing will be used.

3.4 Octave band noise monitoring results

The criteria presented in Section 4 requires the assessment of noise emission in octave bands. Octave band background noise levels are presented in Table 3-4.

Table 3-4 Octave band background noise levels

Time period	RBL L_{A90} in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day	20(10)[1]	22	25	29	34	35	33	28	18
Evening	20(10)[1]	22	25	28	33	34	31	25	16
Night	20(8)[1]	21	23	27	32	33	31	25	17

Note 1: The human threshold of hearing has been used over the reported RBL (see Section 3.3). Numbers in brackets are the measured noise level

3.5 Attended noise monitoring

GHD attended site on Thursday 24 September 2020 between 11:00 am to 12:00 pm to conduct noise measurements of the noise environment for the properties fronting Barrenjoey Road. This was conducted to quantify the difference in noise levels between the long term unattended noise monitor, which was situated away from Barrenjoey Road, and the residences fronting Barrenjoey Road. The equipment details of the attended noise monitoring and results are

presented in Table 3-5. The results of the attended noise monitor is compared against the long term noise monitoring results for that period to determine the difference in background noise level for the two locations, and is presented in Table 3-6 and Table 3-7. These attended monitoring results will be used in the operational noise assessment to provide an appropriate criteria for the residential receivers fronting Barrenjoey Road where the ambient noise level is higher due to the nearby road traffic.

Table 3-5 Attended noise monitor details

Parameter	Value
Date	Thursday 24 September 2020
Time of measurement	11:15 am to 11:45 am
Location	391 Barrenjoey Road, Newport 10 metres from roadside kerb
Equipment details	Svan 977 Sound level meter SN: 36874
Equipment settings	A-weighted Fast time response 15 minute intervals
Pre/post calibration variance	-0.1 dB

Table 3-6 Attended and long term noise monitoring results and comparison

Measurement period	Location	Average $L_{A90(15min)}$, dB(A)	Average $L_{Aeq(15min)}$, dB(A)
11:15 am to 11:45 am	14 Myola Road Long term noise monitor	45	56
	391 Barrenjoey Road Attended noise monitor	54	65
Difference – long term to attended noise monitor		*+ 9 dB*	*+ 9 dB*

Table 3-7 Attended and long term noise monitoring results and comparison in octave bands

Location	Descriptor	Noise level in octave bands [Hz], dB(A)								
		31.5	63	125	250	500	1000	2000	4000	8000
Long term noise monitor	$L_{A90(15min)}$	12	24	27	29	33	35	33	28	18
	$L_{Aeq(15min)}$	32	38	41	44	47	48	50	51	42
Attended noise monitor (difference)	$L_{A90(15min)}$	25 (+13)	34 (+10)	40 (+13)	43 (+14)	46 (+13)	50 (+15)	48 (+15)	40 (+12)	29 (+11)
	$L_{Aeq(15min)}$	34 (+2)	47 (+9)	53 (+12)	55 (+11)	56 (+9)	62 (+14)	59 (+9)	51 (+0)	42 (+0)

4. Noise criteria

4.1 Pittwater 21 Development Control Plan

The Pittwater 21 Development Control Plan provides the following requirements for noise emission associated with the use and operation of a business development:

C2.10 Pollution Control

Outcomes

Development does not adversely impact public health, the environment or other lands. (S, E)

Controls

All developments must be designed, constructed, maintained, and operated in a proper and efficient manner to prevent air, water, noise or land pollution.

Development and business operation must comply with the Protection of the Environment Operations Act 1997, and any relevant legislation.

Compliance with the NSW Environment Protection Authority Industrial Noise Policy (January 2000).

Note that the *NSW Industrial Noise Policy* has since been superseded by the *Noise Policy for Industry* (2017). The criteria for such pertaining to mechanical plant, as well as other sources of noise, is presented below in Section 4.3.

4.2 Protection of the Environment Operations Act 1997

Under the POEO Act 1997, the subject premises should not emit “offensive noise”. Under the POEO Act “offensive noise” means noise that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

1. Is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
2. Interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.

In lieu of any numerical noise emission criteria within the POEO Act 1997, compliance with the NPfI criteria should ensure the acoustic amenity of the sensitive receivers within the study area is adequately protected.

4.3 Noise Policy for Industry, 2017 (NPfI)

In addition to the requirements above the NSW Environment Protection Authority’s *Noise Policy for Industry* (NPfI) (which supersedes the Industrial Noise Policy) provides a suitable framework for the assessment of noise emission from the licensed venue to nearby residential and commercial receivers.

The NPfI provides amenity criteria that are designed to limit the total noise level from all sources near a receiver. The NPfI noise criteria are planning levels and are not mandatory limits required by legislation however the noise criteria will assist the determining authority to assess operational noise impacts. Where noise criteria are predicted to be exceeded, feasible and reasonable noise mitigation strategies should be considered. Feasible and reasonable noise mitigation measures should consider the economic, social and environmental costs and benefits of the development against the noise impacts.

The NPfI reports the following with regards to proposal intrusiveness noise levels:

2.3 Proposal intrusiveness noise level

The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold. This intrusiveness noise level seeks to limit the degree of change a new noise source introduces to an existing environment.

The NPfI proposal intrusiveness criteria is presented in Table 4-1.

Table 4-1 Proposal intrusiveness criteria (NPfI), dB(A)

Receiver type	Time of day	RBL, $L_{A90(15min)}$, dB(A)	Proposal intrusiveness noise criteria $L_{Aeq(15min)}$, dB(A)
Residential	Day (R01) (7:00 am to 6:00 pm)	49	54
	Day (7:00 am to 6:00 pm)	40	45
	Evening (6:00 pm to 10:00 pm)	39	44
	Night (10:00 pm to 7:00 am)	38	43

The NPfI also presents criteria for proposal amenity noise levels for residential and non-residential receivers, which is defined as the recommended amenity noise level minus 5 dB. Table 4-2 presents proposal amenity noise criteria from the NPfI.

Table 4-2 NPfI amenity criteria

Type of receiver	Time of day	Recommended amenity noise level $L_{Aeq(period}$, dB(A)	Proposal amenity noise criteria $L_{Aeq(15min)}$, dB(A)[1]
Residential (Suburban)	Day	55	53
	Evening	45	43
	Night	40	38
Commercial	When in use	65	63
Notes 1: A – 3 dB correction has been applied to convert the noise descriptor from $L_{Aeq(period)}$ to $L_{Aeq(15min)}$			

The NPfI provides guidance for the assessment of sleep disturbance for short-term noise events. The NPfI defines the sleep disturbance criteria during the night time at a residential location as L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, which is greater. The proposal criteria for sleep disturbance is presented below in Table 4-3.

Table 4-3 NPfI sleep disturbance criteria

Time period	Prevailing RBL $L_{A90(15min)}$, dB(A)	Sleep disturbance criteria L_{AFmax}, dB(A)
Night time	38	53

The proposal specific criteria for the NPfI is presented below in Table 4-3.

Table 4-4 NPfI proposal specific criteria

Type of receiver	Time of day	Noise descriptor	Noise criteria, dB(A)		
			Intrusiveness	Amenity	Proposal[1]
Residential	Day (R01)	$L_{Aeq(15min)}$	54	***53***	53
	Day	$L_{Aeq(15min)}$	***45***	53	45
	Evening	$L_{Aeq(15min)}$	44	***43***	43
	Night	$L_{Aeq(15min)}$	43	***38***	38
	Night	L_{AFmax}	53		
Commercial	When in use	$L_{Aeq(15min)}$	63		
Note 1: The most stringent between the intrusiveness and amenity criteria is selected					

4.4 Liquor and Gaming New South Wales (LGNSW)

The SLSC is currently licenced for the sale of alcohol, and will need to be compliant with the requirements of Liquor and Gaming New South Wales (LGNSW). As such, an assessment against the standard conditions imposed on licensed venues by LGNSW has been undertaken.

The standard conditions imposed on licensed venues by LGNSW are presented below.

The L_{A10} noise emitted from the licensed premises shall not exceed the background noise level in any octave band frequency (31.5 Hz to 8 kHz inclusive) by more than 5 dB(A) between 7.00am and midnight at the boundary at any affected residence.

The L_{A10} noise level emitted from the licensed premises shall not exceed the background noise in any octave band centre frequency (31.5 Hz to 8 kHz inclusive) between midnight and 7.00am at the boundary of any affected residence.

Notwithstanding compliance of the above, noise from the licensed premises shall not be audible in any habitable room in any residential premises between the hours of midnight and 7.00am.

The LGNSW octave band noise criteria is presented below in Table 4-5. Note that the venue does not propose to operate beyond midnight, therefore the night-time criteria has been set at $L_{A10} \leq L_{A90} + 5$ dB.

Table 4-5 LGNSW octave band noise criteria for residential receivers

Time of day	RBL L_{A90} in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day (R01) (7 am to 6 pm)	25	34	40	43	46	50	48	40	29
Day (7 am to 6 pm)	20	22	25	29	34	35	33	28	18
Evening (6 pm to 10 pm)	20	22	25	28	33	34	31	25	16
Night (10 pm to 12 am)	20	21	23	27	32	33	31	25	17
Time of day	LGNSW $L_{A10(15min)}$ criteria is octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day (R01) (7 am to 6 pm)	30	39	45	48	51	55	53	45	34
Day (7 am to 6 pm)	25	27	30	34	39	40	38	33	23
Evening (6 pm to 10 pm)	25	27	30	33	38	39	36	30	21
Night (10 pm to 12 am)	25	26	28	32	37	38	36	30	22

4.5 Emergency operations

There is no guidance for the assessment of noise from emergency operations from a SLSC. The *Interim Construction Noise Guideline* (EPA, 2009), whilst intended for construction activities, it allows “emergency works” to be conducted at any time to avoid the loss of life without requiring assessment. As such noise emission from emergency surf life-saving operations, including the deployment of water vessels or alarms in an emergency situation, are not required to be assessed, and not expected to occur frequently enough to significantly impact sensitive receivers.

5. Assessment of impacts

5.1 Modelling methodology and scenario

Noise modelling was undertaken using CadnaA 2020. CadnaA is a computer program for the calculation, assessment and prognosis of noise exposure. Environmental noise propagation in CadnaA was calculated using the ISO 9713-2 algorithm.

The following noise modelling assumptions were made to establish site specific conditions:

- The residential area was modelled assuming a mix of 75% soft and 25% hard ground, with a ground absorption coefficient of 0.75
- The residential area was modelled assuming
- Receivers were modelled at a height of 1.5 m (ground floor)

The following meteorological conditions used in the model:

- Atmospheric air absorption was based on an average temperature of 10°C and an average humidity of 75 % (conservative)
- Atmospheric propagation conditions were modelled with moderate inversions from source to receiver (ISO 9613)

The assessment of noise emission from the SLSC has been assessed against the relevant noise emission criteria. The resulting scenarios and assumptions for the assessment are as follows and have been designed to result in compliance with the relevant noise criteria. There are various operable doors on the 1st floor of the SLSC which are referred in the modelling assumptions, the naming conventions for which are presented below in Figure 5-1. Source data can be found in Appendix C.

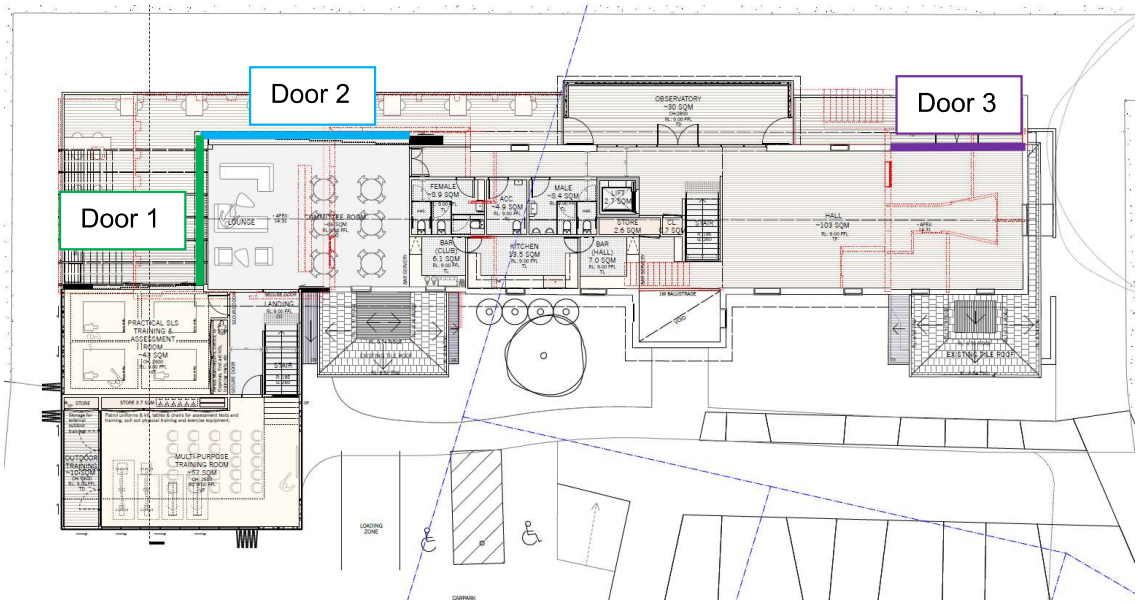

Figure 5-1 Door naming designation

Scenario 1: Venue at 100 % capacity – 7:00 am to 12:00 am

This scenario represents the SLSC at full capacity of 320 patrons distributed evenly around the top floor with background music being played throughout. This scenario represents the venue at maximum noise emission, and would eventuate on rare occasions. The assumptions for this scenario are as follows:

- 320 patrons distributed evenly throughout top floor. Based on floor area, the distribution is as follows
  - Inside spaces – 60 %
  - Large northern balcony, named “TERRACE” in architectural drawings – 30 %
  - Small southern balcony, named “BALCONY” in architectural drawings – 10 %
  - 50 % of patrons speaking at any one time
- Patron noise levels
  - 70 % patrons speaking with normal voices – sound power level (SWL) 68 dB(A)
  - 20 % patrons speaking with raised voices – sound power level (SWL) 76 dB(A)
  - 10 % patrons speaking with loud voices – sound power level (SWL) 83 dB(A)
- Internal background music – internal reverberant sound pressure level (SPL) 77 dB(A)
  - This may also include acoustic or small live music performance which is at a similar noise level to background music
- Outdoor background music
  - 10 speakers on the large northern balcony distributed evenly along SLSC building façade, all directed east – SWL 80 dB(A) each
  - 4 speakers on the small southern balcony distributed evenly along SLSC building façade, all directed east – SWL 80 dB(A) each
  - This may also include acoustic or small live music performance which is at a similar noise level to background music
- Doors 1, 2 and 3 located on large and small balconies assumed to be glazing of minimum thickness 8.38 mm in heavy frames – minimum sound reduction of Rw 32
- Between 7:00 am to 10:00 pm
  - Doors 1, 2 and 3 are assumed to be open
- Between 10:00 pm to 12:00 am
  - Doors 1 and 3 are assumed to be closed
  - Door 2 is assumed to be open

Scenario 2: Venue at 75 % capacity – 7:00 am to 12:00 am

This scenario represents the venue is at a capacity of 240 patrons distributed evenly around the top floor with background music being played throughout. This scenario represents the venue at a typical “busy” level of trade and would likely eventuate on occasion such as Friday and Saturday evenings/nights. The assumptions for this scenario are as follows:

- 240 patrons distributed evenly throughout top floor. Based on floor area, the distribution is as follows
  - Inside spaces – 60 %
  - Large northern balcony, named “TERRACE” in architectural drawings – 30 %
  - Small southern balcony, named “BALCONY” in architectural drawings – 10 %
  - 50 % of patrons speaking at any one time
- Patron noise levels
  - 70 % patrons speaking with normal voices – sound power level (SWL) 68 dB(A)
  - 25 % patrons speaking with raised voices – sound power level (SWL) 76 dB(A)
  - 5 % patrons speaking with loud voices – sound power level (SWL) 83 dB(A)

- Internal background music – internal reverberant sound pressure level (SPL) 75 dB(A)
  - This may also include acoustic or small live music performance which is at a similar noise level to background music
- Outdoor background music
  - 10 speakers on the large northern balcony distributed evenly along SLSC building façade, all directed east – SWL 80 dB(A) each
  - 4 speakers on the small southern balcony distributed evenly along SLSC building façade, all directed east – SWL 80 dB(A) each
  - This may also include acoustic or small live music performance which is at a similar noise level to background music
- Between 7:00 am to 12:00 am
  - Doors 1, 2 and 3 are assumed to be open

Scenario 3: Venue at 50 % capacity – 7:00 am to 12:00 am

This scenario represents the venue is at a capacity of 160 patrons distributed evenly around the top floor with background music being played throughout. This scenario represents the venue at a typical level of trade, and would likely eventuate frequently throughout a standard week. The assumptions for this scenario are as follows:

- 160 patrons distributed evenly throughout top floor. Based on floor area, the distribution is as follows
  - Inside spaces – 60 %
  - Large northern balcony, named “TERRACE” in architectural drawings – 30 %
  - Small southern balcony, named “BALCONY” in architectural drawings – 10 %
  - 50 % of patrons speaking at any one time
- Patron noise levels
  - 75 % patrons speaking with normal voices – sound power level (SWL) 68 dB(A)
  - 25 % patrons speaking with raised voices – sound power level (SWL) 76 dB(A)
- Internal background music – internal reverberant sound pressure level (SPL) 74 dB(A)
  - This may also include acoustic or small live music performance which is at a similar noise level to background music
- Outdoor background music
  - 10 speakers on the large northern balcony distributed evenly along SLSC building façade, all directed east – SWL 80 dB(A) each
  - 4 speakers on the small southern balcony distributed evenly along SLSC building façade, all directed east – SWL 80 dB(A) each
  - This may also include acoustic or small live music performance which is at a similar noise level to background music
- Between 7:00 am to 12:00 am
  - Doors 1, 2 and 3 are assumed to be open

Scenario 4: Live music – 7:00 am to 12:00 am

This scenario represents the SLSC at maximum noise emission. The venue is at full capacity of 320 patrons distributed evenly around the top floor and live music performance taking place internally on the top floor. The assumptions for this scenario are as follows:

- 320 patrons distributed evenly throughout top floor. Based on floor area, the distribution is as follows
  - Inside spaces – 60 %
  - Large northern balcony, named “TERRACE” in architectural drawings – 30 %
  - Small southern balcony, named “BALCONY” in architectural drawings – 10 %
  - 50 % of patrons speaking at any one time
- Patron noise levels
  - 70 % patrons speaking with normal voices – sound power level (SWL) 68 dB(A)
  - 20 % patrons speaking with raised voices – sound power level (SWL) 76 dB(A)
  - 10 % patrons speaking with loud voices – sound power level (SWL) 83 dB(A)
- Internal live music – internal reverberant sound pressure level (SPL) 90 dB(A)
- No outdoor background music
- Between 7:00 am to 6:00 pm
  - Doors 1, 2 and 3 are assumed to be open
- Between 6:00 pm to 12:00 am
  - Doors 1 and 3 are assumed to be closed
  - Door 2 is assumed to be open

Mechanical plant and equipment

It must be noted that at the time of the assessment, mechanical plant for the development is yet to be determined as it is subject to detailed design. It is likely that mechanical plant will be required as following, and are based off the additions and alterations for the development:

- Toilet and wet area extraction fans for the ground floor amenities
- Air conditioning condenser units for internal areas and fresh air intakes
- Lift shaft motors
- Kitchen exhaust extraction fans

Based on the surrounding locality and topography of the SLSC, and typical noise levels for these pieces of equipment, it is unlikely that mechanical plant should lead to any acoustic impacts. This does not mean that no assessment on mechanical plant noise emission is required, and it is recommended that once preliminary mechanical plant drawings for the development are available, a suitably qualified acoustic engineer be engaged to assess mechanical plant noise levels on nearby sensitive receivers (see Section 6).

No acoustic impacts are anticipated for any other scenarios outside of what is described above. Other uses of the SLSC will primarily involve the use of the boat storage facilities on the ground floor. Whilst these facilities are accessible beginning from 5:00 am, noise levels from these activities are anticipated not to cause noise impacts under the assumption that patrons using facilities during this time behave in an orderly manner. Recommendations to ensure this are provided in Section 6. This does not however exclude car door slams from patrons arriving at the SLSC during early morning hours, and is assessed below in Section 0.

5.2 Noise assessment

5.2.1 NPfl noise assessment

Results of the NPfl noise assessment for the 4 operational scenarios are presented below in Table 5-1.

Table 5-1 NPfl noise assessment results

Receiver ID	Receiver type	Criteria	Operational noise level $L_{Aeq(15min)}$, dB(A)			
			S1	S2	S3	S4
R01	Residential	Day: 53 Evening: 43 Night: 38	37	36	31	36
R02		Day: 45 Evening: 43 Night: 38	32	32	27	31
R03	Commercial	When in use: 63	30	31	26	29
R04			29	31	25	29
R05	Residential	Day: 45 Evening: 43 Night: 38	32	31	25	31
R06			29	30	25	27
R07			31	34	29	28

5.2.2 LGNSW noise assessment

Results from the LGNSW octave band noise assessment is presented below in Table 5-2 to Table 5-7.

Based on previous measurements of music within entertainment venues, the typical relationship between the L_{Aeq} and L_{A10} has been observed to be + 3 dB. As such, a +3 dB correction has been applied to the L_{Aeq} noise levels to predict the L_{A10} noise levels at the receivers.

Table 5-2 LGNSW octave band noise assessment – Scenario 1 7:00 am to 10:00 pm

Time of day	LGNSW octave band $L_{A10(15min)}$ noise criteria in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day (R01)	30	39	45	48	51	55	53	45	34
Day	25	27	30	34	39	40	38	33	23
Evening	25	27	30	33	38	39	36	30	21
Receiver ID	Predicted $L_{A10(15min)}$ in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
R01	0	6	25	33	38	39	32	22	4
R02	0	6	23	31	32	31	22	10	9
R05	0	0	18	27	32	34	26	13	0
R06	0	1	19	28	31	30	22	8	0
R07	0	0	19	29	33	34	26	12	0

Table 5-3 LGNSW octave band noise assessment – Scenario 1 10:00 pm to 12:00 am

Time of day	LGNSW octave band $L_{A10(15min)}$ noise criteria in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Night	25	26	28	32	37	38	36	30	22
Receiver ID	Predicted $L_{A10(15min)}$ in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
R01	0	6	24	32	35	36	30	21	5
R02	0	5	22	29	30	29	20	9	9
R05	0	0	18	27	30	31	25	14	0
R06	0	0	17	26	28	28	20	7	0
R07	0	0	18	27	29	30	23	10	0

Table 5-4 LGNSW octave band noise assessment – Scenario 2 7:00 am to 12:00 am

Time of day	LGNSW octave band $L_{A10(15min)}$ noise criteria in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day (R01)	30	39	45	48	51	55	53	45	34
Day	25	27	30	34	39	40	38	33	23
Evening	25	27	30	33	38	39	36	30	21
Night	25	26	28	32	37	38	36	30	22
Receiver ID	Predicted $L_{A10(15min)}$ in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
R01	0	2	22	32	35	35	27	15	0
R02	0	5	22	30	31	29	20	8	7
R05	0	0	18	28	30	29	20	7	0
R06	0	0	18	27	29	28	19	5	0
R07	0	0	19	29	32	32	24	10	0

Table 5-5 LGNSW octave band noise assessment – Scenario 3 7:00 am to 12:00 am

Time of day	LGNSW octave band $L_{A10(15min)}$ noise criteria in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day (R01)	30	39	45	48	51	55	53	45	34
Day	25	27	30	34	39	40	38	33	23
Evening	25	27	30	33	38	39	36	30	21
Night	25	26	28	32	37	38	36	30	22
Receiver ID	Predicted $L_{A10(15min)}$ in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
R01	0	2	22	31	33	32	24	12	0
R02	0	4	21	29	29	26	17	5	5
R05	0	3	20	28	27	24	16	3	2
R06	0	2	20	28	27	24	15	3	1
R07	0	0	18	27	28	26	17	4	0

Table 5-6 LGNSW octave band noise assessment – Scenario 4 7:00 am to 6:00 pm

Time of day	LGNSW octave band $L_{A10(15min)}$ noise criteria in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Day (R01)	30	39	45	48	51	55	53	45	34
Day	25	27	30	34	39	40	38	33	23
Receiver ID	Predicted $L_{A10(15min)}$ in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
R01	0	11	29	39	40	41	35	24	9
R02	0	15	24	31	31	29	23	12	19
R05	0	4	23	33	34	36	29	18	0
R06	0	9	18	25	27	27	19	7	3
R07	0	4	17	24	27	28	20	7	0

Table 5-7 LGNSW octave band noise assessment – Scenario 4 6:00 pm to 12:00 am

Time of day	LGNSW octave band $L_{A10(15min)}$ noise criteria in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
Evening	25	27	30	33	38	39	36	30	21
Night	25	26	28	32	37	38	36	30	22
Receiver ID	Predicted $L_{A10(15min)}$ in octave bands [Hz], dB(A)								
	31.5	63	125	250	500	1000	2000	4000	8000
R01	0	11	17	25	34	35	30	21	13
R02	0	15	19	26	29	27	21	11	19
R05	0	6	12	20	29	31	24	14	3
R06	0	9	13	21	26	26	18	6	3
R07	0	2	10	18	26	27	19	6	0

5.2.3 Sleep disturbance assessment

The assessment of sleep disturbance from the use and operation of the SLSC is based on the following scenarios that represent maximum noise level events, and is assessed against the NPfI sleep disturbance criteria

- SD1: Car door slam in the car park - SWL 85 dB(A)
- SD2: Patron shouting in outdoor deck area – SWL 90 dB(A)

It is expected that maximum noise event from within the SLSC would be similar to this or less. The results of the sleep disturbance noise assessment are presented in Table 5-8.

Table 5-8 Sleep disturbance assessment

Receiver ID	Receiver type	Criteria L_{AFmax}, dB(A)	Predicted max noise level at receiver L_{AFmax}, dB(A)		Compliance
			SD1	SD2	
R01	Residential	53	48	23	Yes
R02			34	20	Yes
R05			33	17	Yes
R06			25	15	Yes
R07			23	16	Yes

5.3 Discussion

The results of the NPfI, LGNSW and sleep disturbance noise assessments indicate the following:

- The proposed operational scenarios are compliant with both the NPI and LGNSW criteria
- The maximum noise emission from the SLSC is below the sleep disturbance screening assessment criteria.

Mitigation measures are presented in Section 6 to ensure compliance with the relevant noise criteria.

6. Recommendations

The results of the noise assessment presented in Section 5 indicate the noise levels are predicted to comply with the relevant noise criteria. Nevertheless, to reduce the impact on the surrounding sensitive receivers and to remain compliant with the noise emission criteria presented in Section 4, the following operational procedure presented in Table 6-1 will should be put in place for operation of the SLSC.

Table 6-1 Operational procedure

Operational status	Operational requirements during given time of day[1]		
	Day period (7:00 am to 6:00 pm)	Evening period (6:00 pm to 10:00 pm)	Night period (10:00 pm to 12:00 am)
Live music (Scenario 4)	No restrictions on doors being closed Patron noise management measures implemented No outdoor music	Doors 1 and 3 closed Patron noise management measures implemented No outdoor music	Doors 1 and 3 closed Patron noise management measures implemented No outdoor music
Capacity greater than 75 % (Scenario 1)[2]	No restrictions on doors being closed Patron noise management measures implemented May have outdoor music	No restrictions on doors being closed Patron noise management measures implemented May have outdoor music	Doors 1 and 3 closed Patron noise management measures implemented May have outdoor music
Capacity at or lower than 75 % (Scenarios 2 and 3)[2]	No restrictions on doors being closed Patron noise management measures implemented May have outdoor music	No restrictions on doors being closed Patron noise management measures implemented May have outdoor music	No restrictions on doors being closed Patron noise management measures implemented May have outdoor music

Note 1: When any doors are required to be closed, they may be opened briefly for the ingress and egress of patrons from one area to another.

Note 2: Any acoustic or small live music performance which is at a similar noise level to background music is considered encapsulated in these scenarios, and may take place during these operational scenarios.

The following additional mitigation measures are provided to ensure compliance with the relevant acoustic criteria is maintained, and the acoustic amenity of the nearby receivers is adequately protected:

- Glazing on the northern façade of the indoor function space is to be minimum 8.38 mm thick laminated glass.

- The erection of clear signage at the entry/exit of the venue advising patrons that they must not generate excessive noise and leave the premises in a quiet and sensible manor to minimise any potential impacts on the surrounding amenity.
- For all speakers located in the outdoor courtyard area:
  - All outdoor speakers will be placed along the façade of the SLSC building, directed east towards the ocean
  - The volume of the speakers should be set at SWL of $L_{Aeq(15min)}$ 80 dB(A) or a sound pressure level of $L_{Aeq(15min)}$ 72 dB(A) at 1 metre
- Emptying glass bottles in bins is to be conducted during the day time hours only (7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and Public Holidays). Glass bottles should be crushed prior to disposal, if possible
- Mechanical plant should be maintained correctly and in proper working order so as to minimise excessive noise
- A suitably qualified acoustic engineer should be engaged to assess mechanical plant noise levels on nearby sensitive receivers once a preliminary design for the mechanical plant specifications of the development are available.
- Patrons and staff are to be reminded to keep extremely aware of noise levels when using SLSC facilities between the times of 5:00 am to 7:00 am, so as to not cause any sleep disturbance impacts on nearby residential receivers.

7. Conclusion

Based on the noise modelling assumptions and assessment of the operation of the proposed Newport SLSC, GHD considers the development should achieve the relevant noise emission criteria presented in Section 4. With the mitigation measures presented in Section 6 implemented, the proposed SLSC should not adversely affect the acoustic amenity of the surrounding residential area.

Appendices

Appendix A – Architectural drawings

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Site Analysis

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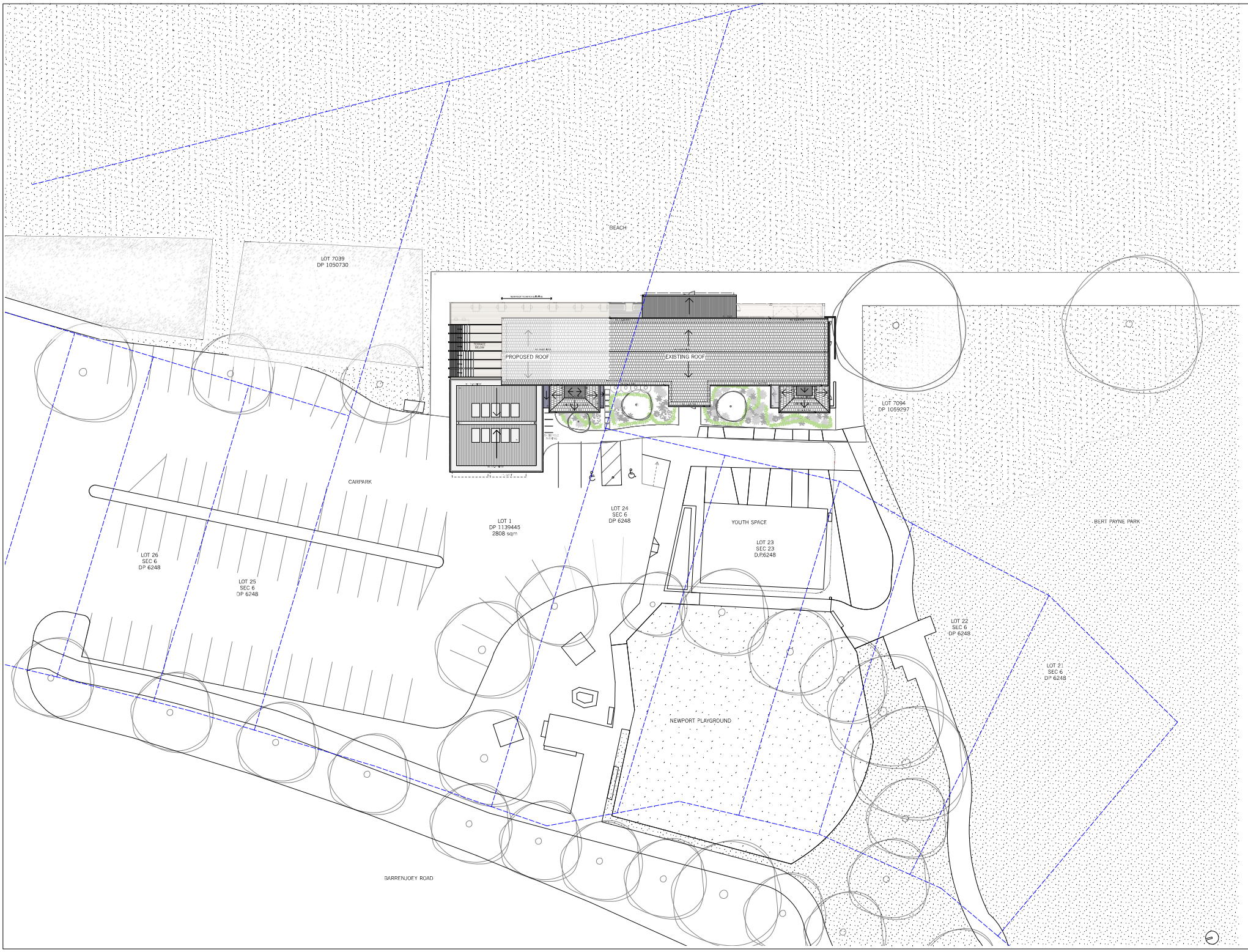

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Site Plan

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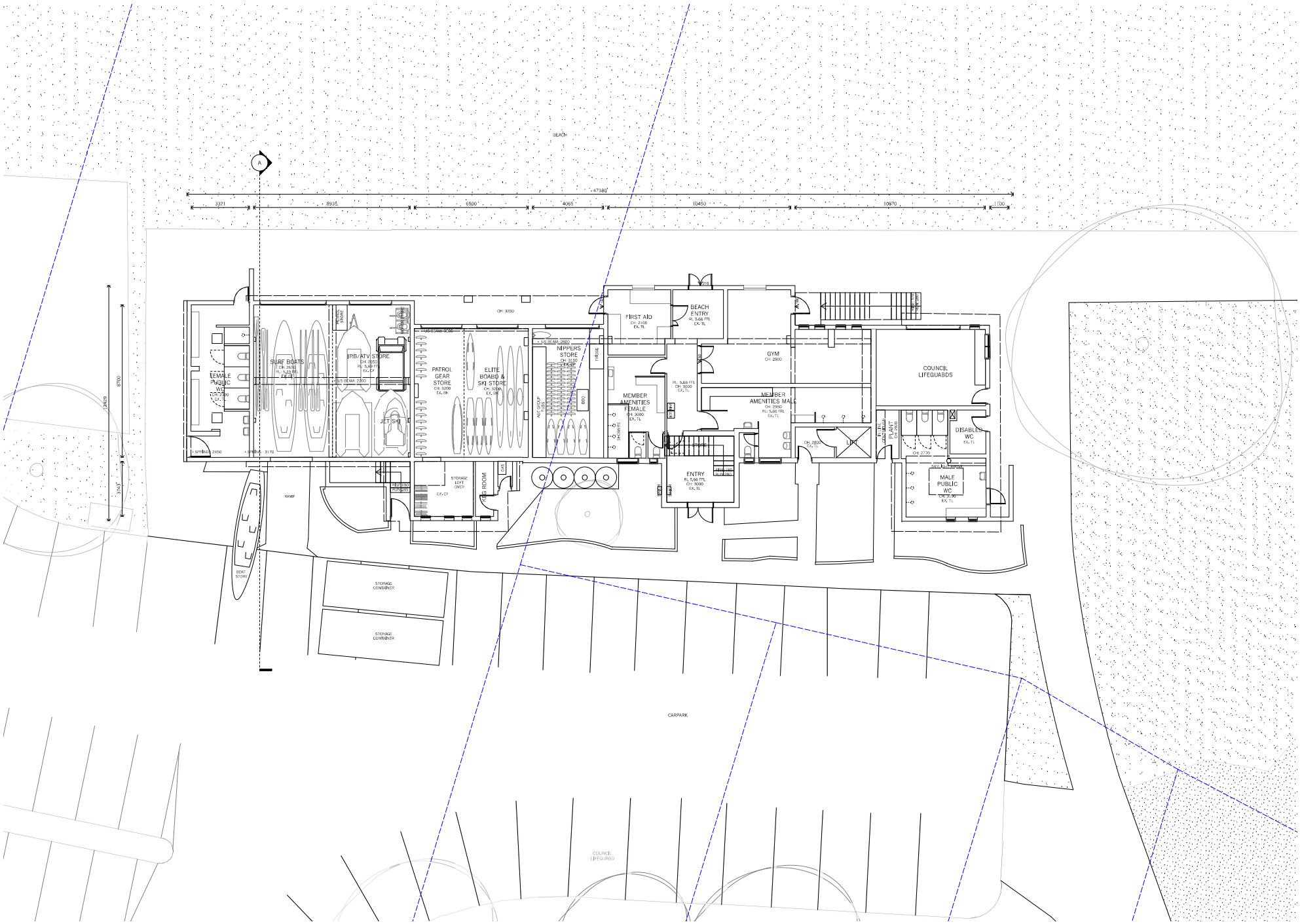

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Existing Ground Floor Plan

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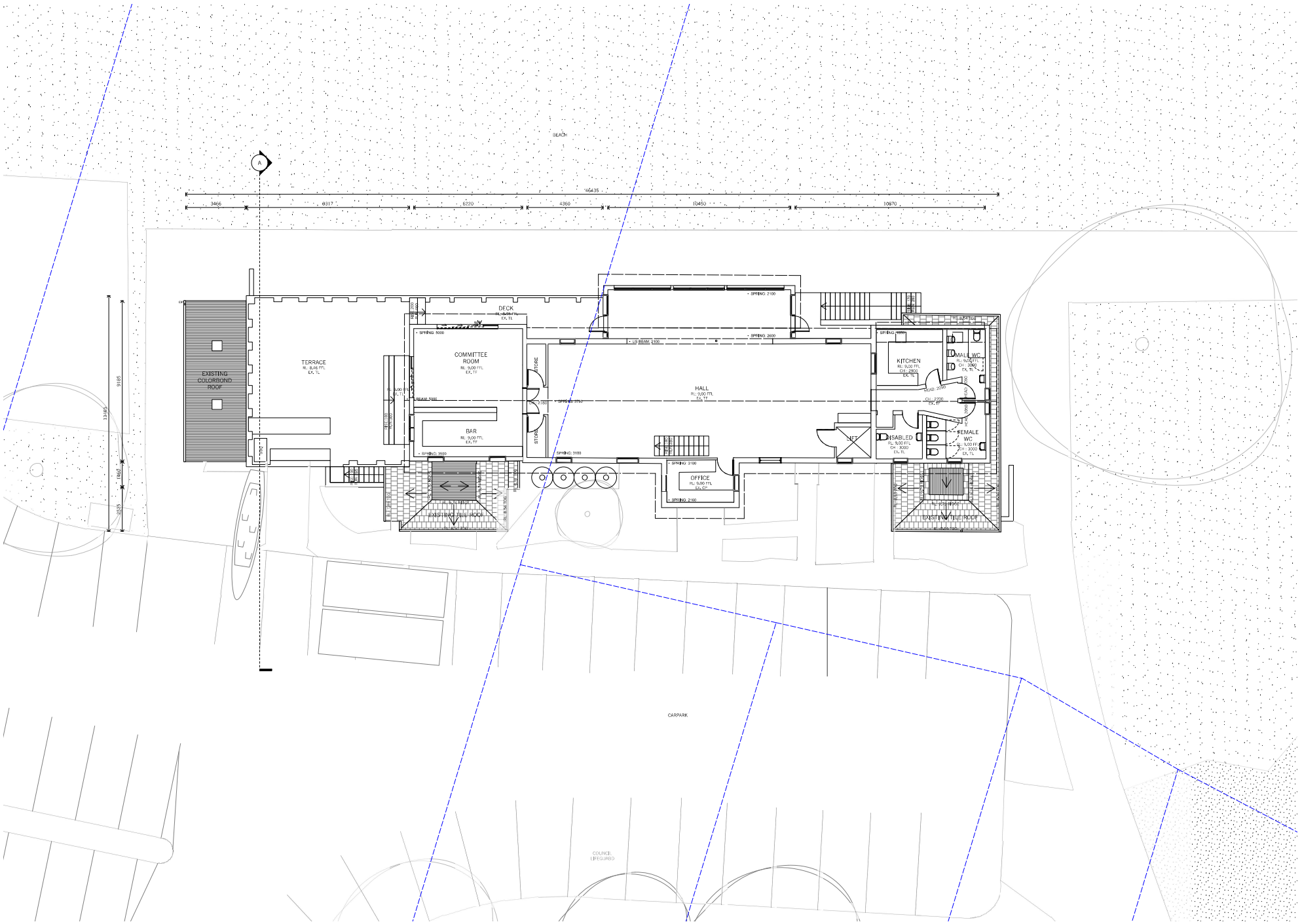

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Existing First Floor Plan

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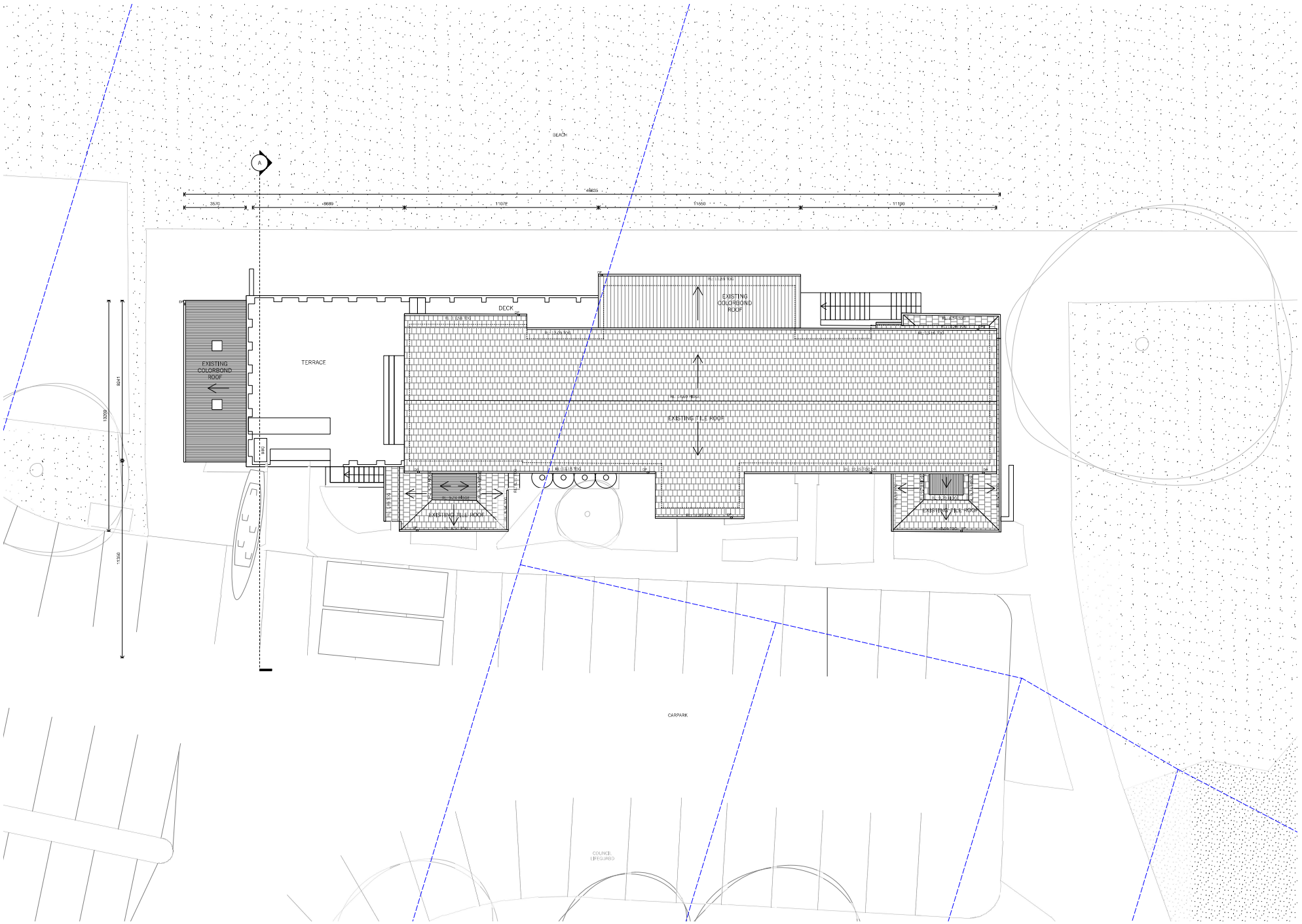

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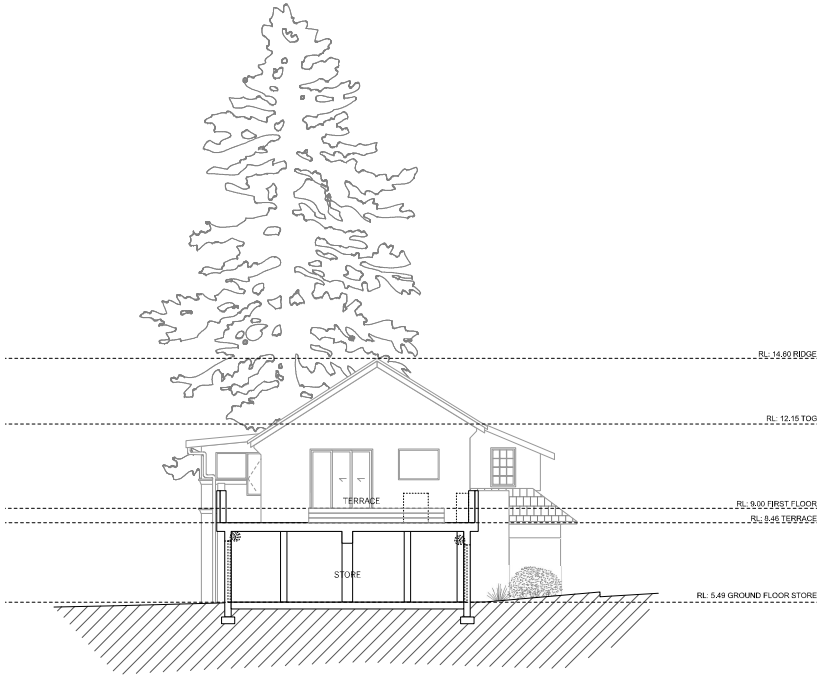

1 EXISTING SECTION
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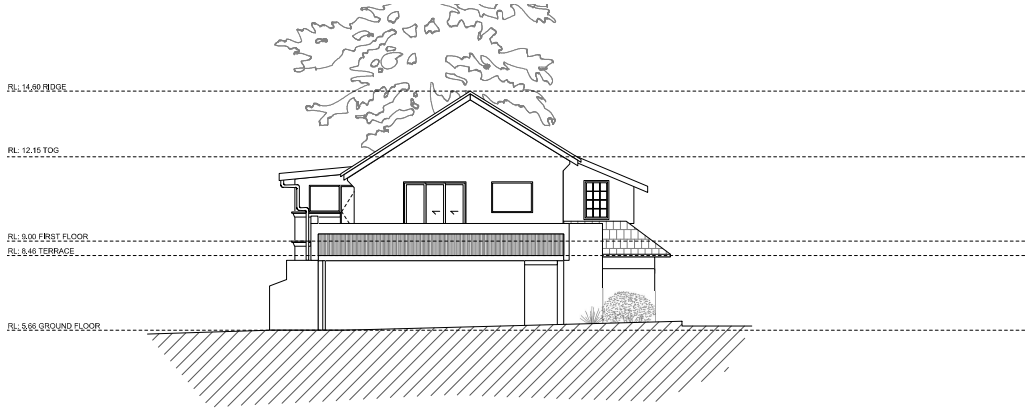

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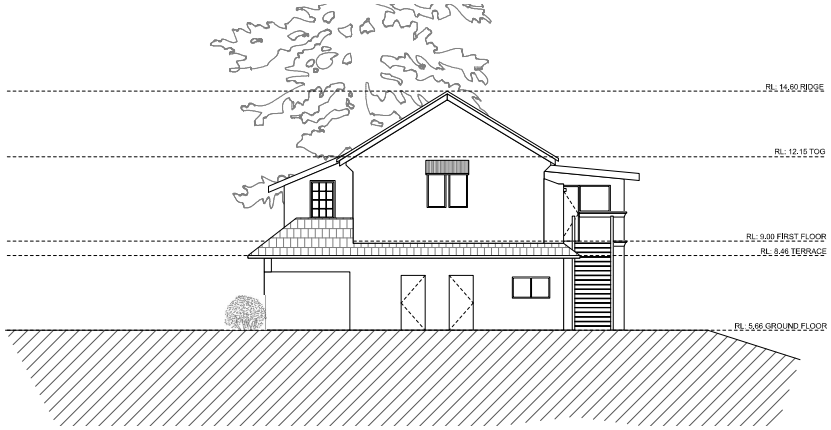

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3 EXISTING EAST ELEVATION
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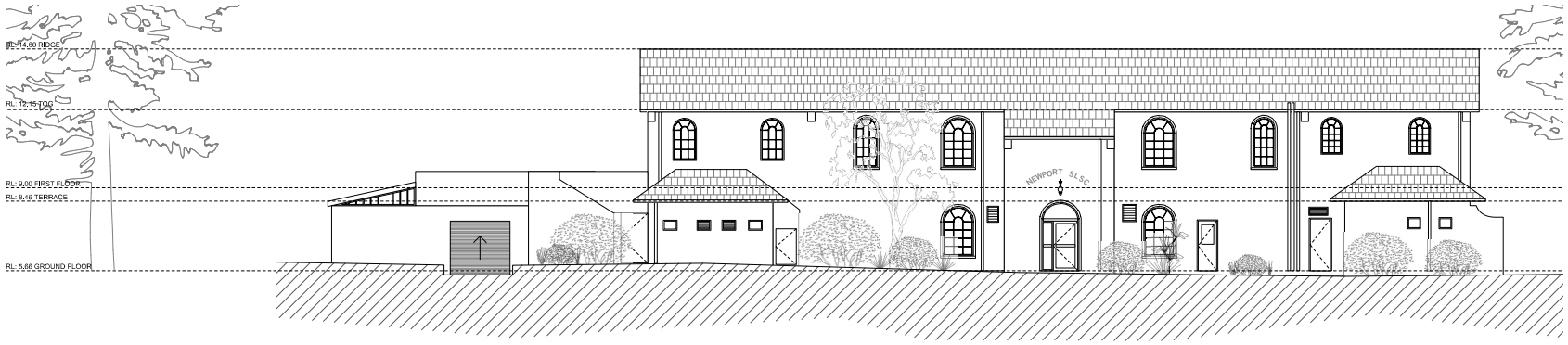

4 EXISTING WEST ELEVATION
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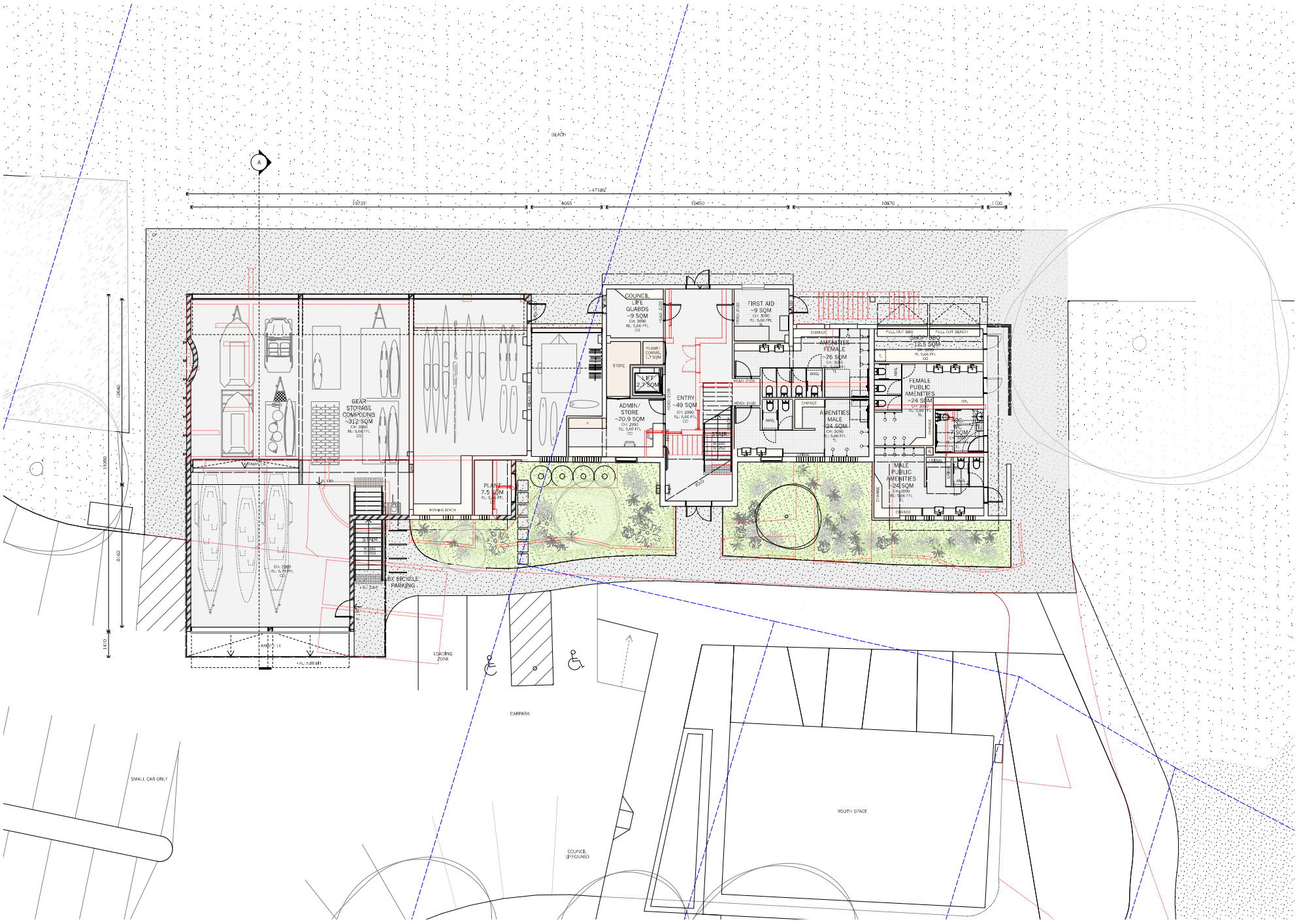

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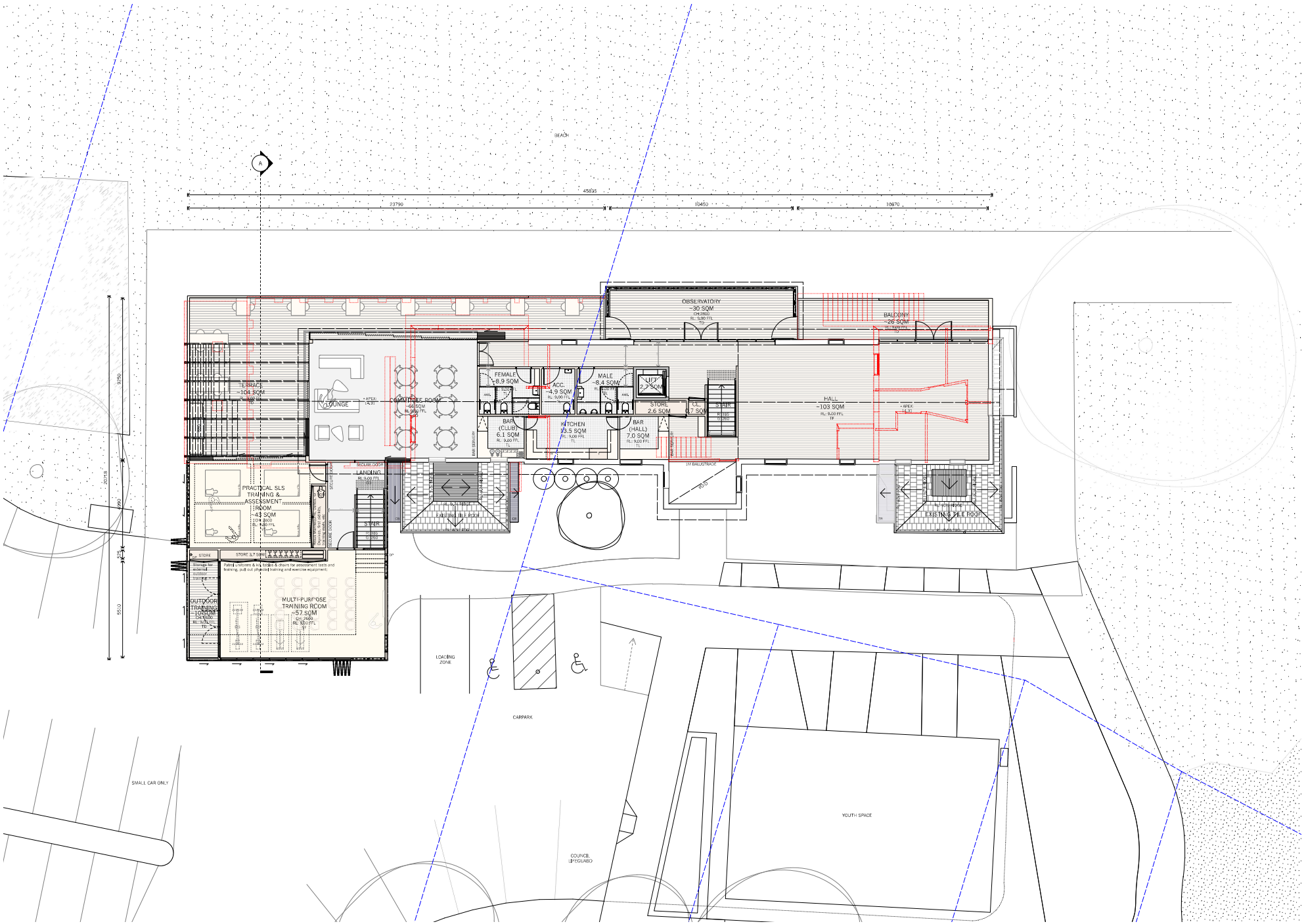

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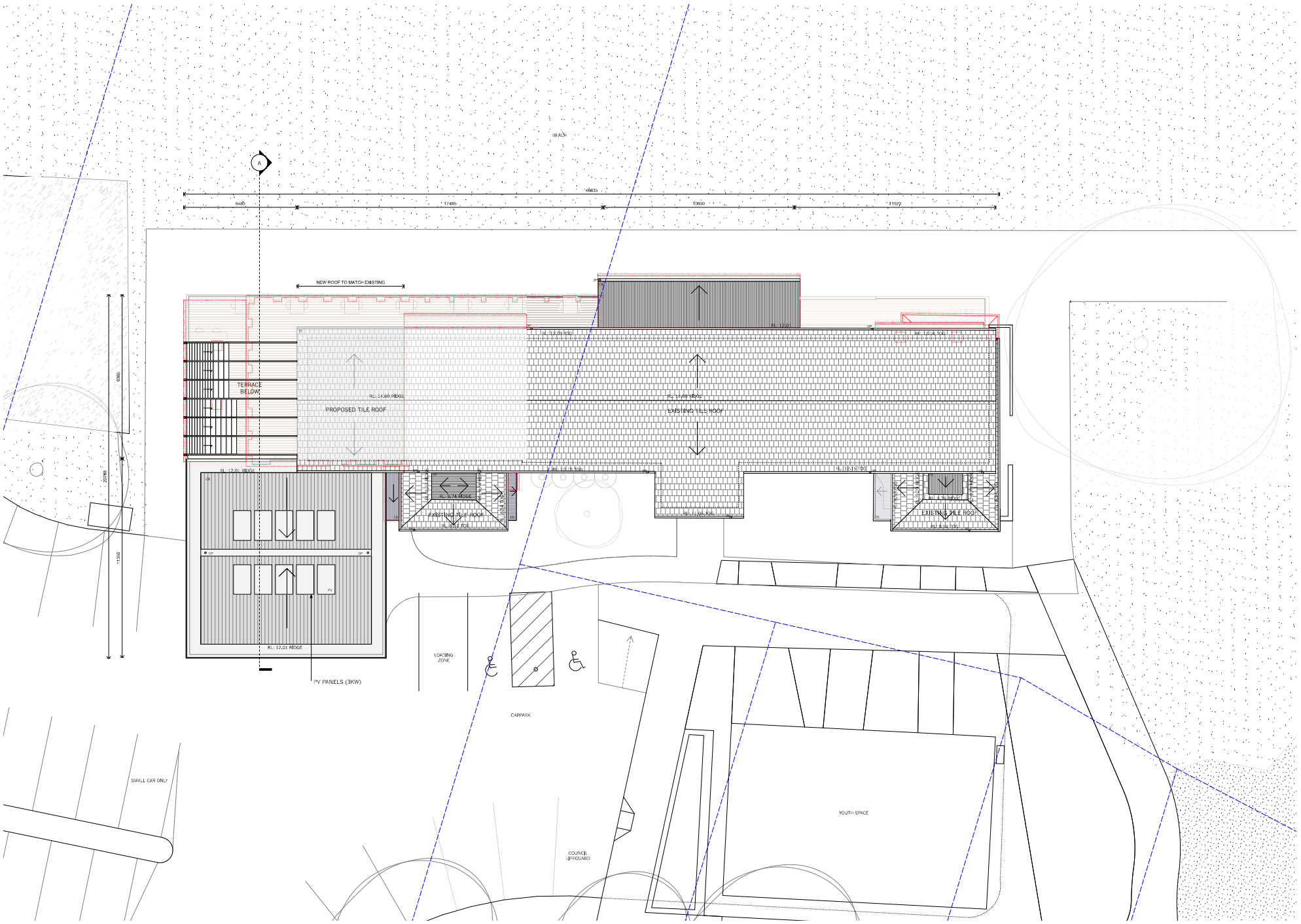

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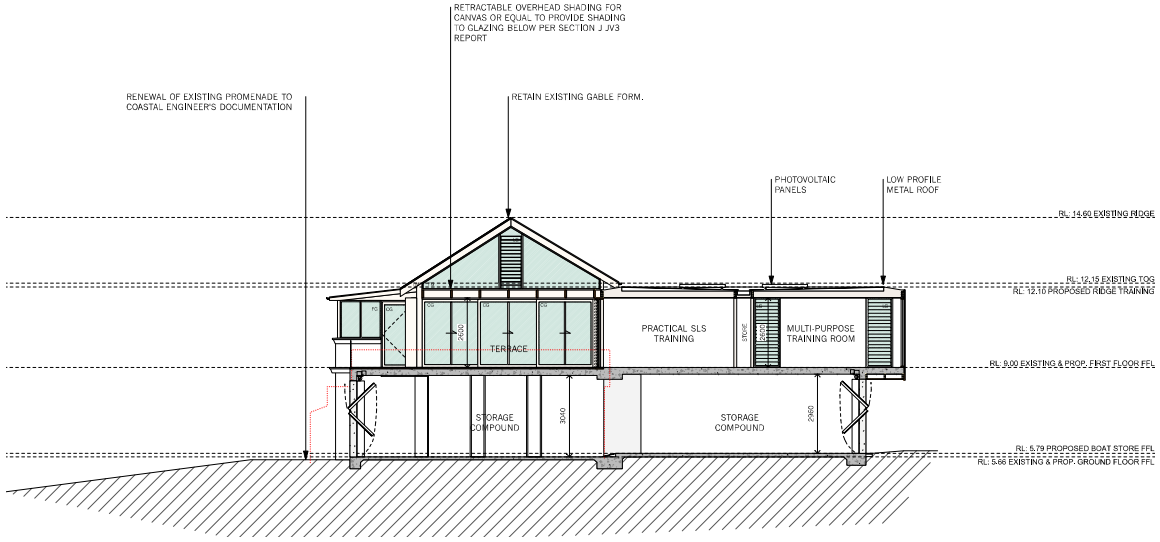

1 PROPOSED SECTION
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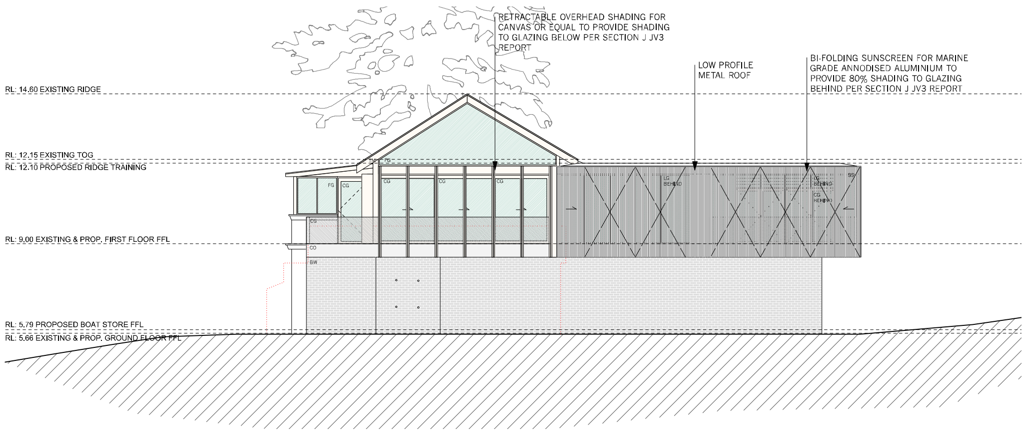
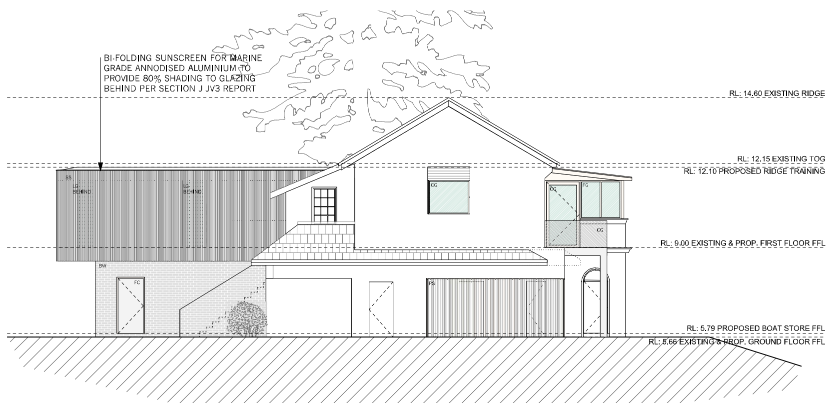
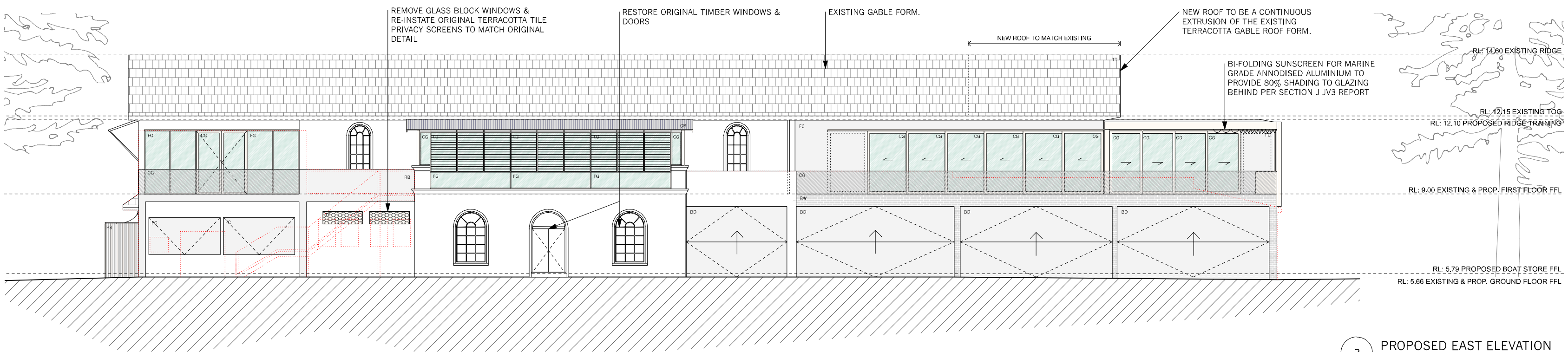

RETRACTABLE OVERHEAD SHADING FOR CANVAS OR EQUAL TO PROVIDE SHADING TO GLAZING BELOW PER SECTION J JV3 REPORT
LOW PROFILE METAL ROOF
BI-FOLDING SUNSCREEN FOR MARINE GRADE ANNODISED ALUMINIUM TO PROVIDE 80% SHADING TO GLAZING BEHIND PER SECTION J JV3 REPORT
RL: 14.60 EXISTING RIDGE
RL: 12.15 EXISTING TOG
RL: 12.10 PROPOSED RIDGE TRAINING
RL: 9.00 EXISTING & PROP. FIRST FLOOR FFL
RL: 5.79 PROPOSED BOAT STORE FFL
RL: 5.66 EXISTING & PROP. GROUND FLOOR FFL

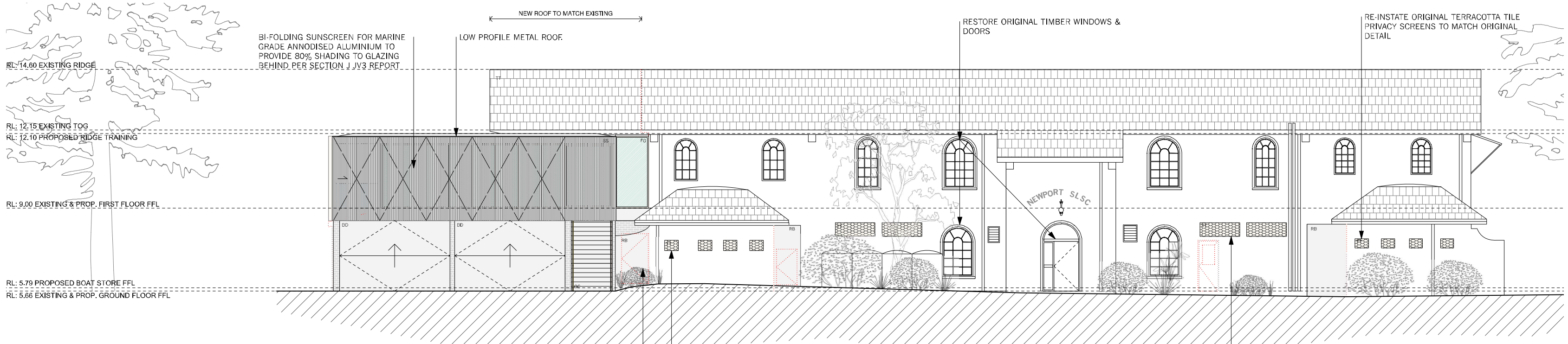
1 PROPOSED NORTH ELEVATION
1:100 @ A1


BI-FOLDING SUNSCREEN FOR MARINE GRADE ANNODISED ALUMINIUM TO PROVIDE 80% SHADING TO GLAZING BEHIND PER SECTION J JV3 REPORT
RL: 14.60 EXISTING RIDGE
RL: 12.15 EXISTING TOG
RL: 12.10 PROPOSED RIDGE TRAINING
RL: 9.00 EXISTING & PROP. FIRST FLOOR FFL
RL: 5.79 PROPOSED BOAT STORE FFL
RL: 5.66 EXISTING & PROP. GROUND FLOOR FFL

2 PROPOSED SOUTH ELEVATION
1:100 @ A1


REMOVE GLASS BLOCK WINDOWS & RE-INSTATE ORIGINAL TERRACOTTA TILE PRIVACY SCREENS TO MATCH ORIGINAL DETAIL
RESTORE ORIGINAL TIMBER WINDOWS & DOORS
EXISTING GABLE FORM.
NEW ROOF TO MATCH EXISTING
NEW ROOF TO BE A CONTINUOUS EXTRUSION OF THE EXISTING TERRACOTTA GABLE ROOF FORM.
BI-FOLDING SUNSCREEN FOR MARINE GRADE ANNODISED ALUMINIUM TO PROVIDE 80% SHADING TO GLAZING BEHIND PER SECTION J JV3 REPORT
RL: 14.60 EXISTING RIDGE
RL: 12.15 EXISTING TOG
RL: 12.10 PROPOSED RIDGE TRAINING
RL: 9.00 EXISTING & PROP. FIRST FLOOR FFL
RL: 5.79 PROPOSED BOAT STORE FFL
RL: 5.66 EXISTING & PROP. GROUND FLOOR FFL

3 PROPOSED EAST ELEVATION
1:100 @ A1


NEW ROOF TO MATCH EXISTING
BI-FOLDING SUNSCREEN FOR MARINE GRADE ANNODISED ALUMINIUM TO PROVIDE 80% SHADING TO GLAZING BEHIND PER SECTION J JV3 REPORT
LOW PROFILE METAL ROOF
RESTORE ORIGINAL TIMBER WINDOWS & DOORS
RE-INSTATE ORIGINAL TERRACOTTA TILE PRIVACY SCREENS TO MATCH ORIGINAL DETAIL
NEWPORT SLSC
RL: 14.60 EXISTING RIDGE
RL: 12.15 EXISTING TOG
RL: 12.10 PROPOSED RIDGE TRAINING
RL: 9.00 EXISTING & PROP. FIRST FLOOR FFL
RL: 5.79 PROPOSED BOAT STORE FFL
RL: 5.66 EXISTING & PROP. GROUND FLOOR FFL
RE-INSTATE ORIGINAL TERRACOTTA TILE PRIVACY SCREENS TO MATCH ORIGINAL DETAIL
REMOVE STORE ROOM DOOR & RE-INSTATE ORIGINAL FIN WALL TO MATCH OPPOSITE SIDE
REMOVE LIFT DOOR & RE-INSTATE ORIGINAL TERRACOTTA TILE PRIVACY SCREENS TO MATCH ORIGINAL DETAIL

4 PROPOSED WEST ELEVATION
1:100 @ A1

MATERIALS SCHEDULE

ITEM	DESCRIPTION
CG	CLEAR GLASS - TO SECTION J JV3 REPORT
FG	FIXED GLASS - TO SECTION J JV3 REPORT
OG	OPAQUE GLASS - TO SECTION J JV3 REPORT
LG	LOUVRE GLASS - TO SECTION J JV3 REPORT
CB	COLORBOND ROOF "STAINLESS STEEL" GRADE - COLOUR TO SECTION J JV3 REPORT
TR	TRANSLUCENT ROOF - DANPAL OR EQUAL
TT	TERRACOTTA TILE TO MATCH EXISTING
BW	BRICKWORK - FACE BRICK FOR MOTLED GREY FINISH
RB	RENDERED BRICK FOR PAINT FINISH TO MATCH EXISTING
BD	AUSTRAL MONSOON AB100 BI-FOLD UP DOOR FOR GREY FC FINISH
PS	PRIVACY SCREEN - SPOTTED GUM OR EQUAL FOR CLEAR SEALER
SS	SUNSCREEN MARINE GRADE ANNODISED ALUMINIUM - 80% SHADING PER JV3 REPORT
FC	COMPRESSED FIBRE CEMENT - N211 GREY EQUITONE "NATURA" OR EQUAL
TF	TIMBER FLOOR - T&G SPOTTED GUM OR EQUAL FOR CLEAR FINISH
VF	VINYL FLOORING - COMMERCIAL GRADE
TD	TIMBER DECKING - SPOTTED GUM OR EQUAL FOR CLEAR FINISH
TL	TILE FINISH - NON-SLIP TO AS & BCA
CO	CONCRETE FOR BURNISHED OR HONED FINISH
CP	CONCRETE PAVEMENT FOR BRUSHED NON-SLIP FINISH TO AS & BCA
TM	SPOTTED GUM HABDWOOD OR EQUAL FOR CLEAR SEALER
DP	DOWNPIPE - CONNECT TO EXISTING SW SYSTEM PER CIVIL ENG. DRAWINGS

NOTES:

ISSUE	DATE	REVISION
A	2/9/20	FOR DEVELOPMENT APPLICATION

PROJECT
Alterations and Additions to Newport Surf Life Saving Club

LOT, DP
Lot 7094, DP 1059297 & Lot 1, DP 1139445

CLIENT
Northern Beaches Council

DWG
Proposed Elevations

PROJECT #	NSC	DWG #	014
SCALE @ A1	1:100	REVISION	A
SCALE @ A3	1:200		
DRAWN	AS	DATE	2/9/20
CHKD	MR		

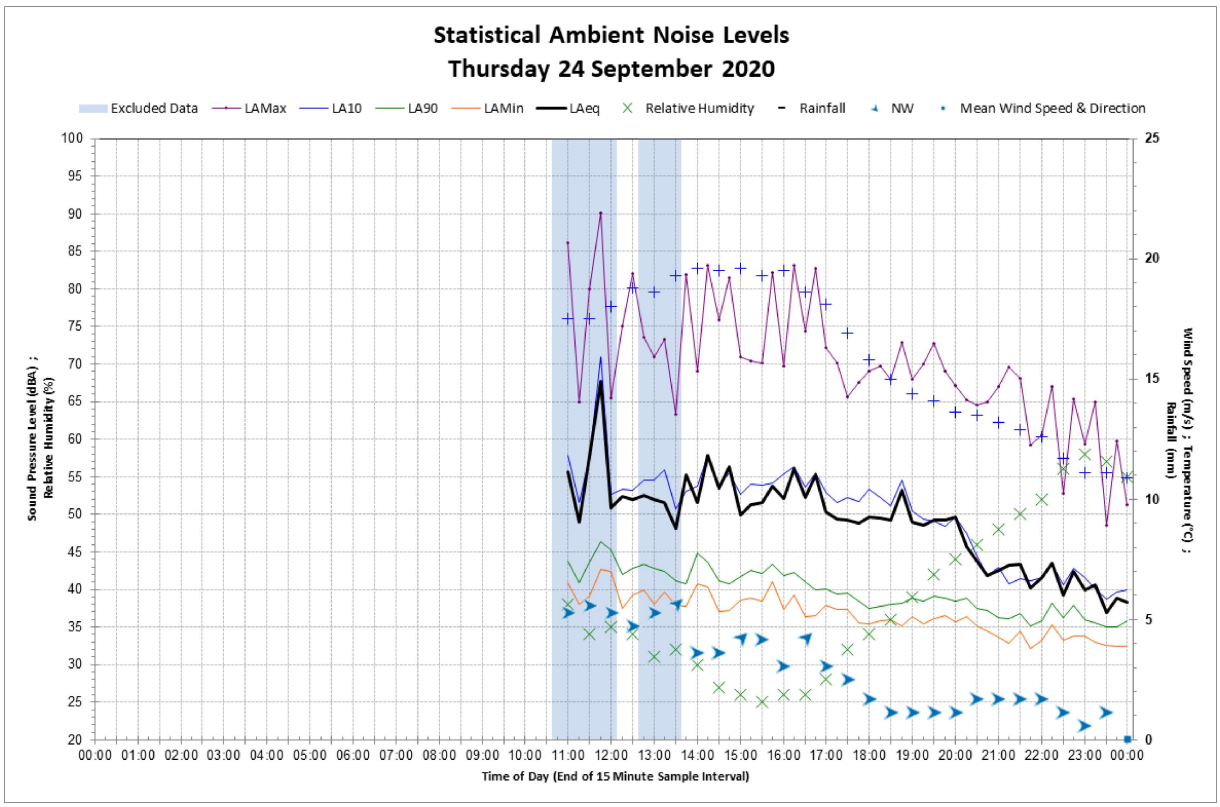
northern beaches council
NORTHERN BEACHES COUNCIL
W: www.northernbeaches.nsw.gov.au
P: 725 Pittwater Rd, Dee Why NSW 2099
T: (02) 9942 2111

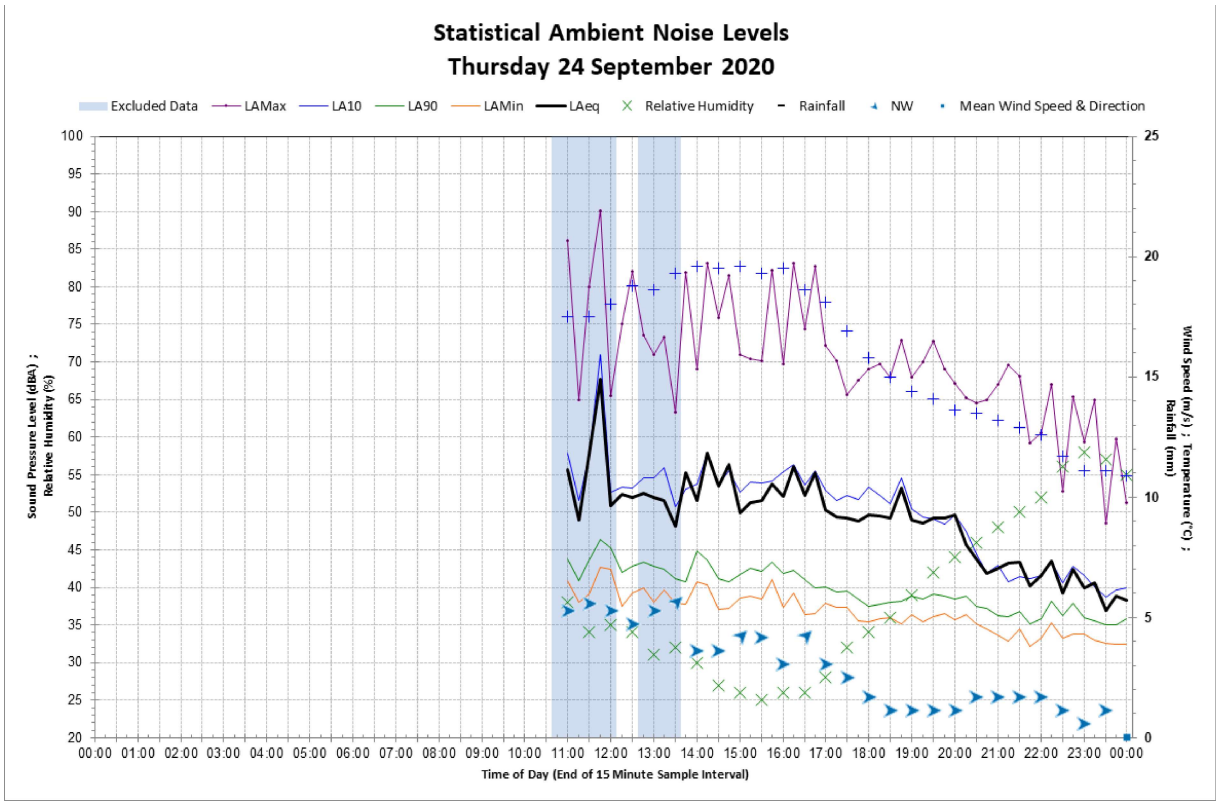
AA
ADRIANO PUPILLI ARCHITECTS
W: www.adrianopupilli.com.au
E: info@adrianopupilli.com.au
P: PO Box 770 Manly NSW 2095
T: (02) 9114 6300

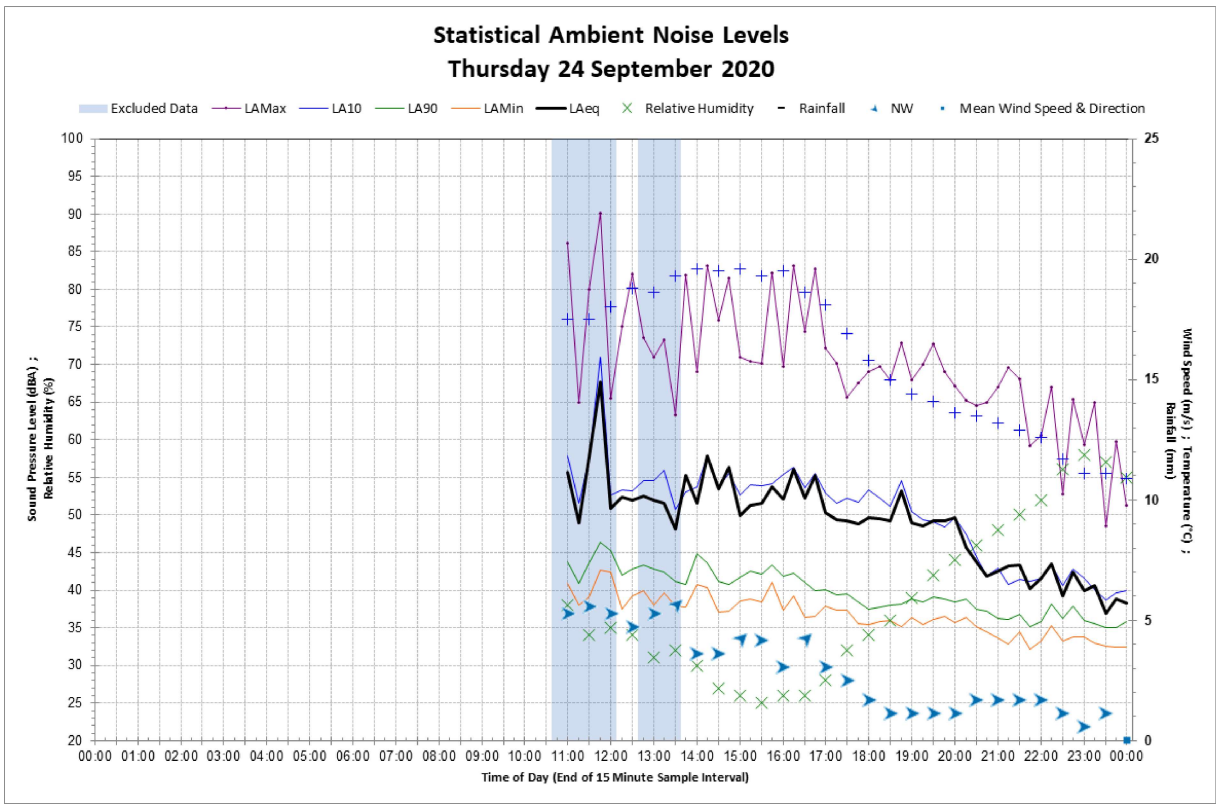
FOR DEVELOPMENT APPLICATION

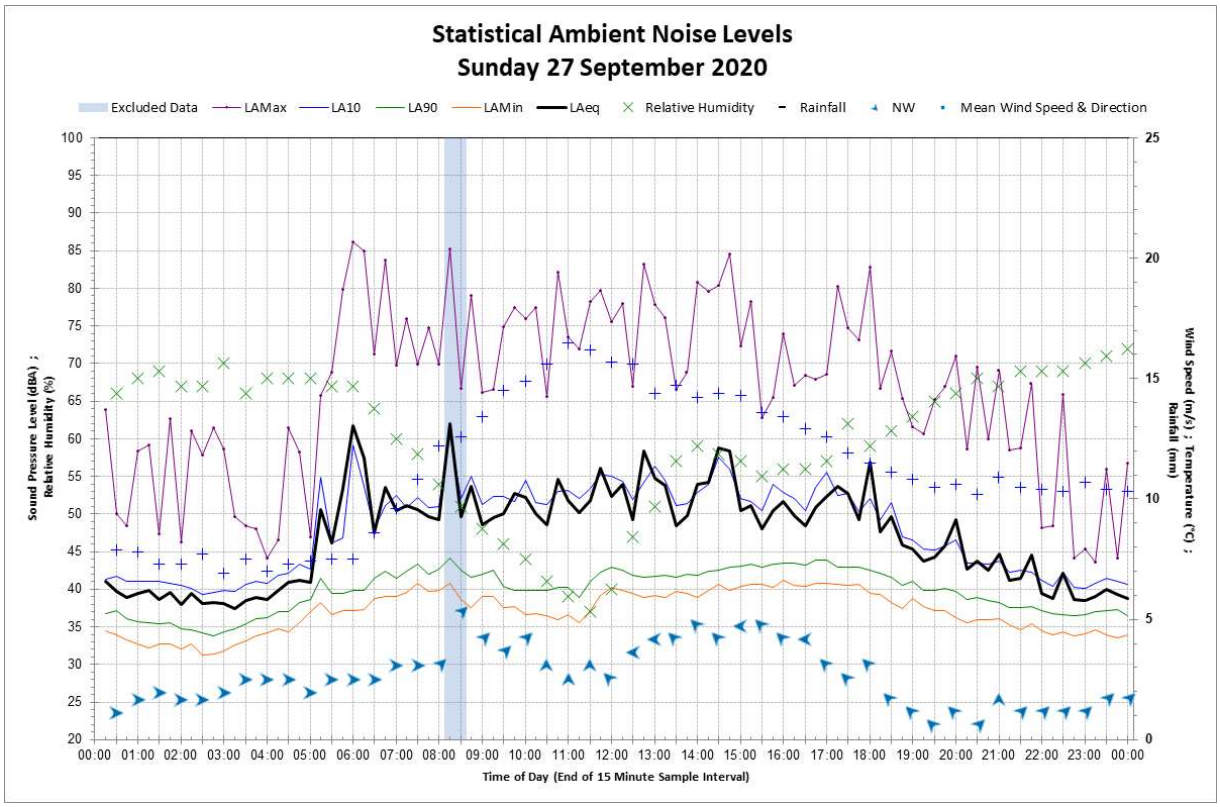
NOTES:
DO NOT SCALE OFF DRAWINGS. USE DIMENSIONS.
A SURVEY IS REQUIRED TO ENSURE CORRECT RELATIONSHIP TO SITE BOUNDARIES.

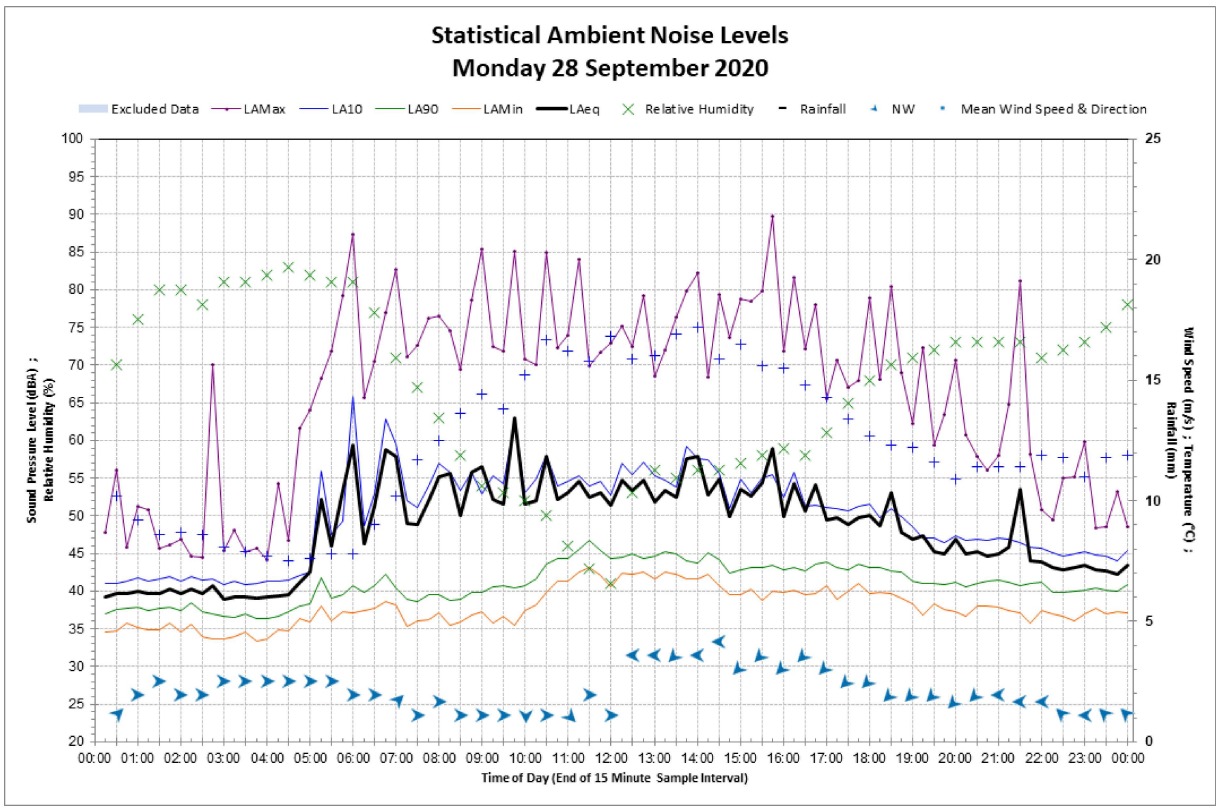
Appendix B – Daily noise monitoring charts

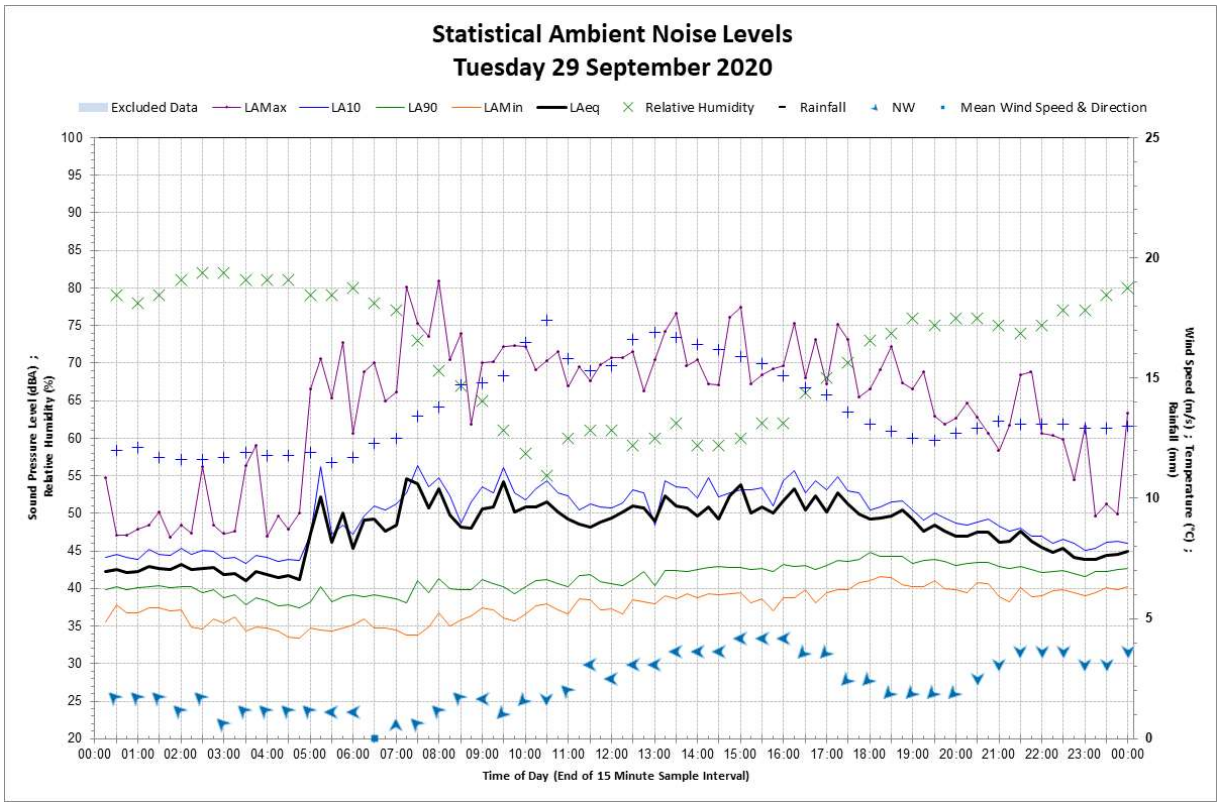


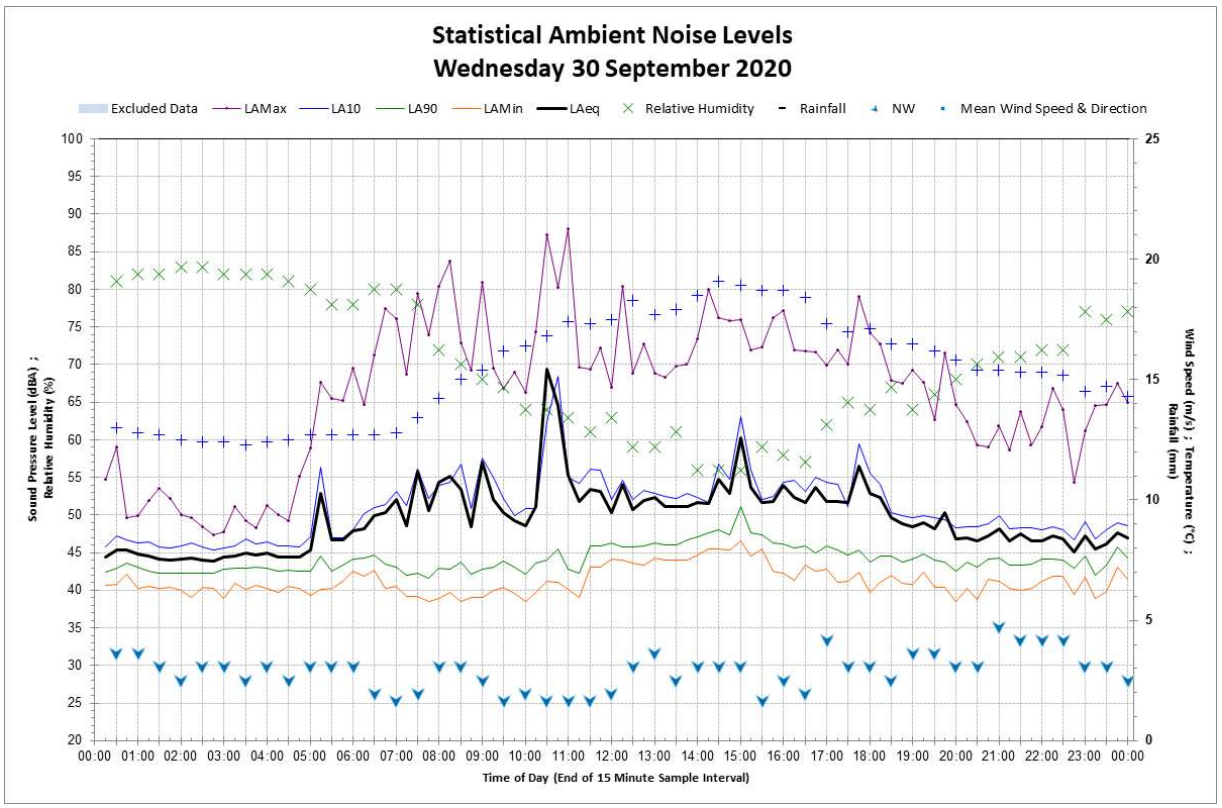


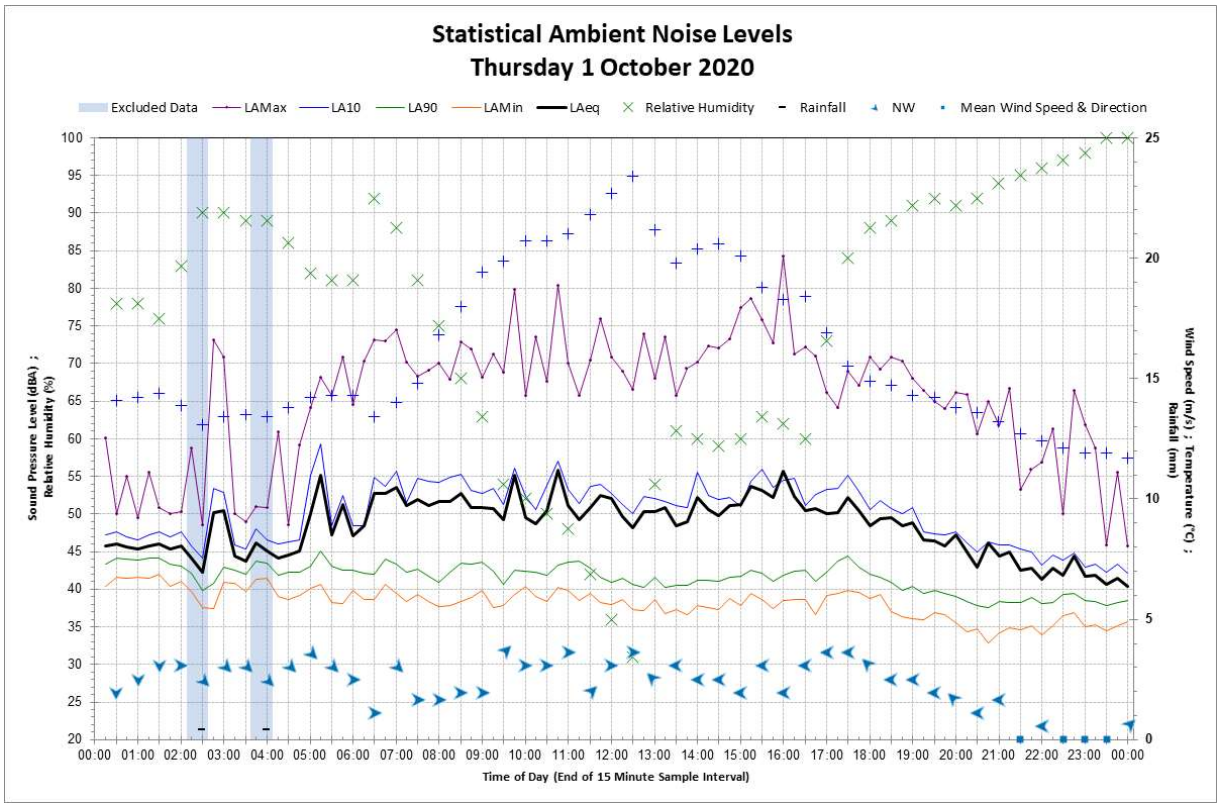

Statistical Ambient Noise Levels
Thursday 24 September 2020
Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)

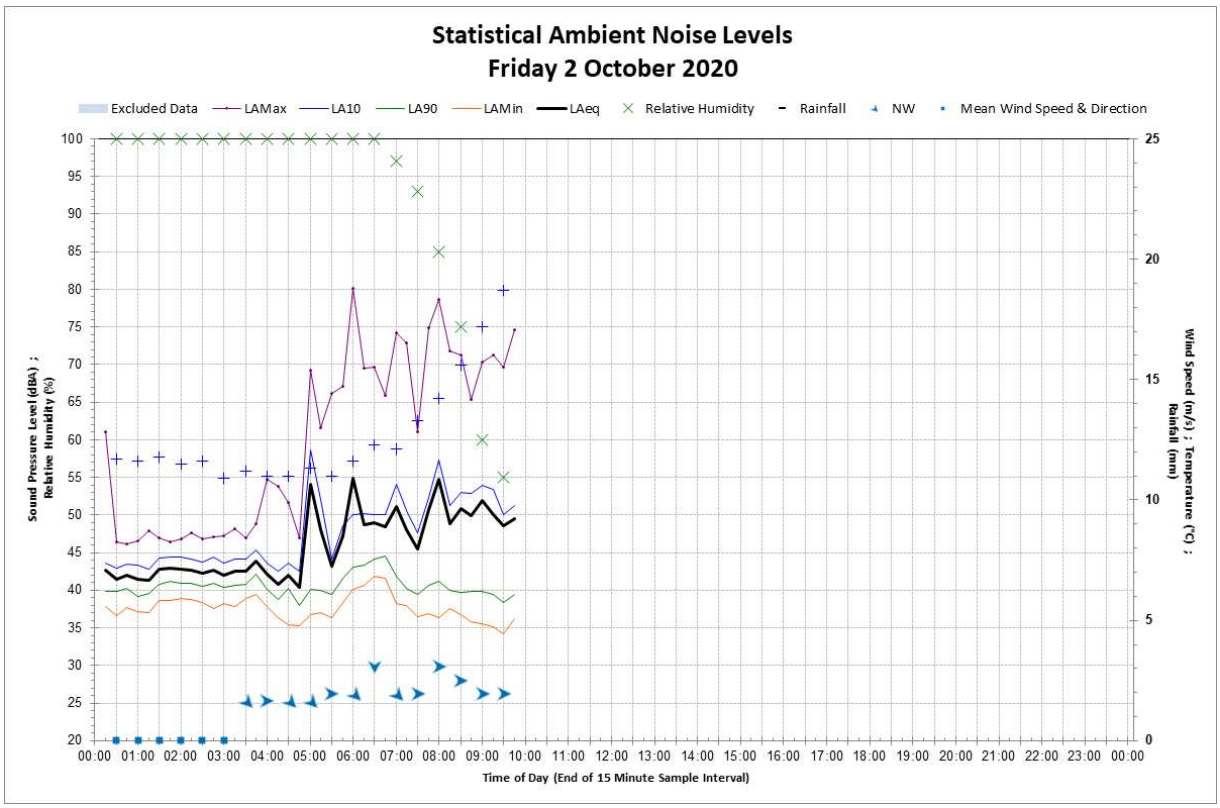

Statistical Ambient Noise Levels
Sunday 27 September 2020
Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Monday 28 September 2020
Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Tuesday 29 September 2020
Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Wednesday 30 September 2020
Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Thursday 1 October 2020
Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
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Excluded Data
LAMax
LA10
LA90
LAMin
LAeq
Relative Humidity
Rainfall
NW
Mean Wind Speed & Direction
Sound Pressure Level (dBA) ; Relative Humidity (%)
Wind Speed (m/s) ; Temperature (°C) ; Rainfall (mm)
Time of Day (End of 15 Minute Sample Interval)

Appendix C – Source data

Source noise data

Source description	Descriptor[1]	Noise level in octave bands [Hz], dB(A)									
		31.5	63	125	250	500	1k	2k	4k	8k	OA
Patron - normal voice[2]	SWL	1	19	39	56	66	63	57	51	45	68
Patron – raised voice[2]	SWL	4	22	43	61	72	72	65	58	47	76
Patron – loud voice[2]	SWL	8	26	47	63	77	80	74	67	54	83
Speaker[3]	SWL	27	43	66	76	75	78	73	65	62	82
Internal music – 77 dB(A)	IR SPL	22	38	61	71	70	73	68	60	57	77
Internal music – 75 dB(A)	IR SPL	20	36	59	69	68	71	66	58	55	75
Internal music – 74 dB(A)	IR SPL	19	35	58	68	67	70	65	57	54	74
Internal music – 90 dB(A) (live music)	IR SPL	35	51	74	84	83	86	81	73	70	90

Note 1:

SWL – Sound power level
IR SPL – Internal reverberant sound pressure level

Note 2: Source *Association of Australasian Acoustical Consultants Licenced Premises Noise Assessment Technical Guideline* (AAAC)

Note 3: Source – GHD measurement database of typical licenced venue music amplification systems

Note 4: Calculation based on venue geometry, internal surface finishes and number of sources within space

Source sound reduction indices Rw

Source description	Descriptor	Sound reduction indices per octave band [Hz]									
		31.5	63	125	250	500	1k	2k	4k	8k	OA
8.38 mm glazing[1]	Rw	16	18	22	26	31	30	32	39	43	32

Note 1: *Bies & Hansen – Engineering Noise Control*

GHD

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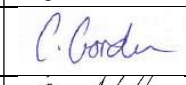
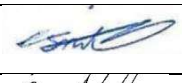
12537693-46344-1/https://projectsportal.ghd.com/sites/pp15_01/newportslscacousticr/ProjectDocs/12537693-REP_Newport SLSC acoustic report.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	A.Bagby	C.Gordon		E.Smith		16/12/2020
1	A.Bagby	E Milton		E Milton		30/5/22

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