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Dear Sean,



**Water Research  
Laboratory**

## **Coastal Engineer's Estuarine Risk Management Report for Boat House, 1742 Pittwater Road, Bayview**

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### **1. Introduction**

The Water Research Laboratory (WRL) of the School of Civil and Environmental Engineering at UNSW Sydney is pleased to provide the following advice regarding the proposed boat house at 1742 Pittwater Road, Bayview.

### **2. Documents**

The following reference documents were considered in assessing the coastal hazards, and/or will be utilised for future calculation of wave forces:

- Australian Standard AS 4997-2005 "Guidelines for the Design of Maritime Structures";
- FEMA (2000, 2011), "Coastal Construction Manual";
- AUS 2004 Bathymetric chart for Broken Bay;
- AWACS (1991), "Design Guidelines for Water Level and Wave Climate at Pittwater";
- Coastal Engineering Manual (2011);
- NSW Government (2011) "Coastal Risk Management Guide: Incorporating sea level rise benchmarks in coastal risk assessments";
- Pittwater Council P21 DCP Part B (18 November 2013);
- Pittwater Council P21 DCP Part D (18 November 2013);
- Cardno (2015), "Pittwater Estuary Mapping of Sea Level Rise Impacts"; and
- Shore Protection Manual (1984).

The following documents supplied by the Client were utilised by WRL as input in the calculations:

- Ian Linton Surveying Services Drawing NC BAYVIEW1 002 PLAN OF LEVEL & DETAIL SURVEY
- Gartner Trovato Architects Drawing 1920 A-01 (29/07/19);
- Gartner Trovato Architects Drawing 1920 A-02 (29/07/19);
- Gartner Trovato Architects Drawing 1920 A-03 (29/07/19);
- Gartner Trovato Architects Drawing 1920 A-04 (29/07/19);
- Gartner Trovato Architects Drawing 1920 A-05 (29/07/19); and
- Gartner Trovato Architects Drawing 1920 A-01 (29/07/19).



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### 3. Site conditions and proposed development

The site faces approximately 60° relative to true north (east-north-east) on the southern shore of Pittwater. This application is for a boat house with a proposed floor level of 2.2 m AHD (Australian Height Datum). The existing house on the site has a floor level of 8.4 m AHD and is well set back from the foreshore, so is well above the estuarine planning level (EPL – see below) for the site. This assessment excludes any assessment of the stability of the existing or future seawalls for the site and is applicable to the proposed boat house only.

A ramp with a seaward slope of approximately 1V:4H and a maximum elevation of about 2 m AHD is proposed seaward of the proposed boat house. Provided this remains intact, it would provide some protection from storm waves to the boat house.

As the foreshore seaward of the existing seawall is sand, any long term change to the sand level may alter the depth limited wave height able to reach the proposed structure.

### 4. Estuarine Planning Level (EPL)

Pittwater DCP21 Part B (2013) states that new boat sheds should have a floor level above the “Estuarine Planning Level” (EPL), or if below the EPL, should be designed to withstand the wave forces.

The parameters shown in Table 1 were considered and utilised for the calculations.

For the geometry of the site, the reference **EPL is 2.76 m AHD** (Cardno, 2015).

Even excluding freeboard, the EPL is 2.46 m AHD, which exceeds the proposed boat house floor level. Therefore, the proposed new boat house structure needs to be designed for wave forces.

**Table 1: Design and Input Parameters**

Parameter	Value	Source
Location/Site	Southern Shores (S2) Bayview foreshore (18)	AWACS (1991) Cardno (2015)
Design life	50 years	AS 4997-2005 for normal structure
Design event	100 year ARI	Pittwater P21 DCP
100 year ARI design SWL	1.53 m AHD	Cardno (2015)
Sea level rise	0.4 m	Cardno (2015)
Foreshore type	Type 2 (seawall) Crest 2 m AHD	Cardno (2015), Gartner Trovato Architects Drawing 1920 A-04 (29/07/19)
Setback from seawall	3 m	Gartner Trovato Architects Drawing 1920 A-04
Reference Estuarine Planning Level	2.76 m AHD	Appendix C – Components Used in Calculation of Estuarine Planning Levels Cardno (2015)
Estuarine Planning Level (without 0.3 m freeboard)	2.46 m AHD	Appendix C – Components Used in Calculation of Estuarine Planning Levels Cardno (2015)
Proposed boat house floor	2.2 m AHD	Gartner Trovato Architects Drawing 1920 A-06

## **5. Wave Forces**

Since the proposed floor level for the boat house is below the EPL, estimation of wave forces and appropriate structural design will need to be undertaken prior to detailed design.

Electrical services and storage of any hazardous materials should be located higher than the applicable EPL for the boat house (2.76 m AHD if including a 0.3 m freeboard).

## **6. Summary**

For the geometry of the site, the reference Estuarine Planning Level (EPL) is **2.76 m AHD**.

Since the proposed floor level for the boat house is below the EPL, estimation of wave forces and appropriate structural design will need to be undertaken prior to detailed design.

Please contact James Carley on (02) 8071 9863 should you require further information.

Yours sincerely,

**Duncan Rayner**  
Acting Manager