#### Horton Coastal Engineering Coastal & Water Consulting

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Andrew Bursill C/- GartnerTrovato Architects Attention: Sean Gartner Suite 13, L1 Pittwater Place 10 Park Street Mona Vale NSW 2103 (sent by email only to sean@g-t.com.au)

8 September 2022

# Updated Estuarine Risk Management Report for 1772 Pittwater Road Bayview

## **1. INTRODUCTION**

Horton Coastal Engineering prepared a report dated 20 December 2019, as part of Development Application DA2020/0014 for demolishing and rebuilding a dwelling house and swimming pool at 1772 Pittwater Road Bayview. These works were approved by Northern Beaches Council on 11 May 2020.

An application for modification of this development consent, Mod2022/0460, has now been submitted to Council. Council has advised that "as the original Development Application was supported by this report [the Horton Coastal Engineering report dated 20 December 2019], a revised version, or letter provided by the original author/consultant stating the recommendations of the original report remain valid, is required". The report/letter required by Council is set out herein.

The report author is Peter Horton [BE (Hons 1) MEngSc MIEAust CPEng NER]. Peter has postgraduate qualifications in coastal engineering and 30 years of coastal engineering experience, and prepared the 20 December 2019 report of Horton Coastal Engineering.

## 2. INFORMATION PROVIDED

Horton Coastal Engineering was provided with 7 drawings of the proposed Mod2022/0460 works, prepared by GartnerTrovato Architects and dated 12 August 2022 (Revision B). Based on review of these drawings, it is evident that the proposed ground floor level of the dwelling of 3.5m AHD is unchanged from DA2020/0014, and that the other modifications are generally inconsequential to estuarine hazard considerations. It is noted that the pool is no longer to be rebuilt, but retained, and that this is inconsequential to estuarine hazard considerations.

## 3. UPDATED ESTUARINE PLANNING LEVEL

In Cardno (2015), the 100-year Average Recurrence Interval (ARI) present day water level in the region covering the subject property is reported as 1.53m AHD. This value is unchanged from the 2019 report of Horton Coastal Engineering.

However, it is necessary to reassess the Estuarine Planning Level derived in the 2019 report, as the Intergovernmental Panel on Climate Change (IPCC) has issued an updated assessment since that time. Based on the latest IPCC (2021) assessment, which is widely accepted by competent scientific opinion, the sea level rise values presented in Table 1 (at 2082, adopting a 60-year design life) were determined for the five illustrative scenarios (shared socioeconomic pathways, SSP's<sup>1</sup>) considered in IPCC (2021)<sup>2</sup>.

This includes regional sea level rise variations at Sydney as reported by the Physical Oceanography Distributed Active Archive Center (PO.DAAC), a NASA Earth Observing System Data and Information System data centre operated by the Jet Propulsion Laboratory in Pasadena, California. The sea level rise values were determined at 2082, relative to the average sea level from a 1995-2014 baseline (taken to be at 2005).

Emissions Scenario	Exceedance Probability		
(Shared Socioeconomic Pathwav)	95% exceedance	Median	5% exceedance
SSP1-1.9	0.12	0.26	0.52
SSP1-2.6	0.15	0.31	0.59
SSP2-4.5	0.23	0.40	0.70
SSP3-7.0	0.29	0.48	0.80
SSP5-8.5	0.34	0.54	0.90
Average	0.23	0.40	0.70

Table 1: Mean sea level rise (m) at Sydney from a 1995-2014 average level (taken at 2005) to 2083
derived from IPCC (2021) and PO.DAAC

Taking the median exceedance probability and average of the 5 SSP's, a sea level rise value of 0.40m at 2082 (relative to 2005) was derived. Given that Cardno (2015) water levels were derived at 2010, the sea level rise should be determined relative to 2010. Watson (2020) found that the rate of sea level rise from satellite altimetry in the SE Australia region was 3.5mm/year from 1992-2019. Applying this rate from 2005 to 2010, the projected sea level rise from 2010 to 2082 at Sydney is 0.38m.

Therefore, the design 100-year ARI estuarine still water level at 2082 is 1.91m AHD. This is below the equivalent value of 1.96m AHD determined in the 2019 report, and for the sake of simplicity the Estuarine Planning Level adopted in the 2019 report of 3.3m AHD can continue to apply to Mod2022/0460.

On this basis, the 20 December 2019 report of Horton Coastal Engineering generally remains valid to be applied to Mod2022/0460.

# 4. REITERATION OF KEY REQUIREMENTS IN 2019 REPORT OF HORTON COASTAL ENGINEERING

To reiterate the key requirements outlined in the 2019 report of Horton Coastal Engineering, in relation to the Estuarine Planning Level (EPL) of 3.3m AHD:

 any electrical items below the EPL should be waterproofed or tolerant of inundation; and

<sup>&</sup>lt;sup>1</sup> Known as representative concentration pathways in the previous IPCC (2013) assessment.

<sup>&</sup>lt;sup>2</sup> The five illustrative scenarios represent varying projected greenhouse gas emissions, land use changes and air pollutant controls in the future.

• no toxic or potentially polluting items should be stored at the property below the EPL.

If these measures are followed, the risks of the proposed development being adversely affected by estuarine processes would be suitably mitigated.

## 5. MERIT ASSESSMENT

The proposed development in Mod2022/0460 remains consistent with the requirements of Chapter B3.7 of the Pittwater 21 DCP, the *Estuarine Risk Management Policy for Development in Pittwater* (Estuarine Policy), and *State Environmental Planning Policy (Coastal Management) 2018*<sup>3</sup>, as outlined in the 2019 report of Horton Coastal Engineering.

## 6. FORM

Although the current Estuarine Policy does not have a form that is required to be filled in, Council has in the past requested that a form provided in a former Estuarine Policy be filled in, as provided at the end of the document herein.

## 7. CONCLUSIONS

Mod2022/0460 has been submitted to Northern Beaches Council in relation to works at 1772 Pittwater Road Bayview to demolish and rebuild a dwelling house. An Estuarine Planning Level (EPL) of 3.3m AHD has been adopted. This is below the proposed dwelling ground floor level of 3.5m AHD, as required.

As long as the measures outlined in Section 4 are followed, the proposed development satisfies the requirements of Section B3.7 of the Pittwater 21 DCP, the *Estuarine Risk Management Policy for Development in Pittwater*, and *State Environmental Planning Policy (Resilience and Hazards)* 2021, as outlined in the 2019 report of Horton Coastal Engineering submitted as part of DA2020/0014.

## 8. **REFERENCES**

Cardno (2015), *Pittwater Estuary Mapping of Sea Level Rise Impacts*, LJ2882/R2658v7, Revised Draft, for Pittwater Council, February

Intergovernmental Panel on Climate Change [IPCC] (2013), *Climate Change 2013, The Physical Science Basis, Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, [Stocker, TF; Qin, D; Plattner, G-K; Tignor, M; Allen, SK; Boschung, J; Nauels, A; Xia, Y; Bex, V and PM Midgley (editors)], Cambridge University Press, Cambridge, United Kingdom and New York, New York, USA

Intergovernmental Panel on Climate Change [IPCC] (2021), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, [V Masson-Delmotte, P Zhai, A Pirani, SL Connors, C Péan, S Berger, N Caud, Y Chen, L Goldfarb, MI Gomis, M Huang, K Leitzell, E Lonnoy, JBR Matthews, TK Maycock, T Waterfield, O Yelekçi, R Yu and B Zhou (editors)], Cambridge University Press, in press

<sup>&</sup>lt;sup>3</sup> Which has now been superseded verbatim by State Environmental Planning Policy (Resilience and Hazards) 2021.

Watson, Phil J (2020), "Updated Mean Sea-Level Analysis: Australia", *Journal of Coastal Research*, Volume 36, Issue 5, September, pp. 915-931

## 9. SALUTATION

If you have any further queries, please do not hesitate to contact Peter Horton via email at peter@hortoncoastal.com.au or via mobile on 0407 012 538.

Yours faithfully HORTON COASTAL ENGINEERING PTY LTD

Peter Horton Director and Principal Coastal Engineer

This report has been prepared by Horton Coastal Engineering Pty Ltd on behalf of and for the exclusive use of Andrew Bursill and GartnerTrovato Architects (the client), and is subject to and issued in accordance with an agreement between the client and Horton Coastal Engineering Pty Ltd. Horton Coastal Engineering Pty Ltd accepts no liability or responsibility whatsoever for the report in respect of any use of or reliance upon it by any third party. Copying this report without the permission of the client or Horton Coastal Engineering Pty Ltd is not permitted.

Estuarine Risk Management Policy for Pittwater Form No. 1 is provided overleaf

# FORM NO. 1 **To be submitted with Estuarine Risk Management Report**

Development Application for Andrew Bursill and GartnerTrovato Architects (Mod2022/0460)

Name of Applicant

Address of site 1772 Pittwater Road Bayview

#### Declaration made by a Coastal Engineer as part of an Estuarine Risk Management Report

I, Peter Horton on behalf of Horton Coastal Engineering Pty Ltd (Insert Name) (Trading or Company Name)

on this the 8th September 2020 (date)

certify that I am a Coastal Engineer as defined by the Estuarine Risk Management Policy for Development in Pittwater and I am authorised by the above organisation/company to issue this document and to certify that the organisation/company has a current professional indemnity policy of at least \$2 million.

#### Please mark appropriate box

- × I have prepared the detailed Estuarine Risk Management Report referenced below in accordance with the Estuarine Risk Management Policy for Development in Pittwater
- I am willing to technically verify that the detailed Estuarine Risk Management Report referenced below has been prepared in accordance with the Estuarine Risk Management Policy for Development in Pittwater
- □ I have examined the site and the proposed development/alteration in detail and, as detailed in my report, am of the opinion that the Development Application only involves Minor Development/Alterations or is sited such that a detailed Estuarine Risk Management Report is not required.

#### Estuarine Risk Management Report Details:

Report Title:

Updated Estuarine Risk Management Report for 1772 Pittwater Road Bayview

Report Date:

8 September 2022

Author: Horton Coastal Engineering Pty Ltd

#### Documentation which relate to or are relied upon in report preparation:

See Section 2 and Section 8 of report. Also relied on 20 December 2019 report of Horton Coastal Engineering submitted as part of

DA2020/0014

I am aware that the above Estuarine Risk Management Report, prepared for the above mentioned site is to be submitted in support of a Development Application for this site and will be relied on by Northern Beaches Council as the basis for ensuring that the estuarine risk management aspects of the proposed development have been adequately addressed to achieve an acceptable risk management level for the life of the structure, taken as at least 100 years unless otherwise stated and justified in the Report and that all reasonable and practical measures have been identified to remove foreseeable risk.

Signature

Name

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Peter Horton

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Membership No.

Chartered Professional Status

**MIEAust CPEng** 

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