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19 October 2023

Coastline Risk Management Report for 15 Ocean Road Palm Beach

1. INTRODUCTION AND BACKGROUND

It is proposed to demolish and rebuild a dwelling at 15 Ocean Road Palm Beach, hereafter denoted as the 'site', for which a Development Application is to be submitted to Northern Beaches Council. The site is located within a "wave inundation" area designated on the Coastal Risk Planning Map (Sheet CHZ_015) that is referenced in *Pittwater Local Environmental Plan 2014*. The site is also mapped as being subject to erosion/recession and coastal inundation hazards in the *Pittwater Coastline Hazard Definition and Climate Change Vulnerability Study*, and identified as a "beach management" area on the *Pittwater 21 Development Control Plan* (DCP)[1] Map MDCP016.

Therefore, the site is subject to Chapter B3.3 of the DCP, and the *Coastline Risk Management Policy for Development in Pittwater* (denoted as the "Coastline Policy" herein, which is Appendix 6 of the DCP), and a Coastline Risk Management Report must be submitted as part of the DA. Horton Coastal Engineering was engaged to prepare the required Coastline Risk Management Report, as set out herein. As required, completed Forms 1 and 1(a) as given in the Coastline Policy are attached.

The report author, Peter Horton [BE (Hons 1) MEngSc MIEAust CPEng NER], is a professional Coastal Engineer with 31 years of coastal engineering experience. He has postgraduate qualifications in coastal engineering, and is a Member of Engineers Australia (MIEAust) and Chartered Professional Engineer (CPEng) registered on the National Engineering Register (NER). He is also a member of the National Committee on Coastal and Ocean Engineering (NCCOE) and NSW Coastal, Ocean and Port Engineering Panel (COPEP) of Engineers Australia. Peter has prepared Coastline Risk Management Reports for numerous properties along Ocean Road at Palm Beach in recent years, and has inspected the area in the vicinity of the site on several occasions in the last few decades, including a specific recent inspection of the site on 23 June 2023.

All levels given herein are to Australian Height Datum (AHD). Zero metres AHD is approximately equal to mean sea level at present in the ocean immediately adjacent to the NSW mainland.

[1] The Pittwater 21 DCP up to Amendment No. 27, which came into effect on 18 January 2021, was considered herein.

2. INFORMATION PROVIDED

Horton Coastal Engineering was provided with 35 drawings (Drawing Nos A1000, 1001, 1011-1015, 1021-1023, 1101-1105, 1201-1204, 1301-1306, 1401, 1402, 1501-1503, 1601, and 2001-2004) of the proposed development prepared by BJB Architects, dated 29 September 2023 and Revision E. A site survey completed by Total Surveying Solutions was also provided, Plan No 230118-1 and dated 8 March 2023.

3. EXISTING SITE DESCRIPTION

The sandy Palm Beach is about 2.3km long, formed between the rocky Barrenjoey Head in the north and Little Head in the south. The site is located on the landward (western) side of Ocean Road towards the southern third of the beach, with vertical and oblique aerial images provided in Figure 1 and Figure 2 respectively. Offshore of the site, the shoreline is sheltered (by Little Head) to some degree from the dominant south to south-east storm swell waves that occur offshore of Sydney, but is fully exposed to waves from the east and north-east. Photographs of the site are provided in Figure 3 and Figure 4.

Figure 1: Aerial view of site (red outline) on 7 March 2023

Figure 2: Oblique aerial view of site (at arrow) on 1 May 2023

Figure 3: View of site (at arrow) from Ocean Road on 23 June 2023, facing WNW

Figure 4: View of site (at arrow) from Palm Beach on 23 June 2023, facing WNW

Based on the survey provided, ground elevations seaward of the site at the centreline of Ocean Road are between about 4.5m and 4.8 AHD (increasing moving north), increasing to about 5.0m AHD at the seaward edge of the existing dwelling. The finished Ground Floor level of the dwelling is 5.07m AHD. Ground levels on the landward side of the dwelling increase to about 8.1m AHD, and increase further to over 20m AHD at the landward property boundary.

Seaward of the site and Ocean Road, there is a car park and grassy reserve (containing a public pathway), then levels fall to the sandy beach. The sand/vegetation interface is typically located about 30m to 40m seaward of the site, increasing moving south. Based on review of the NSW Beach Profile Database (which has beach profiles near the site from 1941 to 2022), sand levels at the base of the sand/vegetation interface are typically at about 4.5m AHD, and the adjacent dune crest is typically at about 5.3m AHD. The distance to the shoreline at mean sea level, seaward of the site, is typically about 70m to 110m (varying with erosion and accretion cycles).

4. PROPOSED DEVELOPMENT

It is proposed to demolish the existing dwelling and construct a new dwelling over four levels. The lowest level (Lower Ground) and garage finished floor level is proposed to be 5.17m AHD.

5. SUBSURFACE CONDITIONS

A geotechnical investigation of the site has been undertaken by Geotechnical Consultants Australia (2023). Based on three boreholes immediately seaward of the dwelling, sandstone bedrock was found at 1.0m AHD (southern end), 0.9m AHD (centre) and 1.5m AHD (northern end).

Geotechnical Consultants Australia (2023) advised that foundations for the proposed development shall be embedded into consistent and competent strength bedrock underlying the site.

6. DESIGN LIFE

In the Coastline Policy, it is noted that a planning period (design project life) of 100 years should be adopted unless otherwise justified. A 60-year design life (that is, at 2083) has been adopted for the proposed development herein. This is the same design life as adopted in the *Coastal Zone Management Plan [CZMP] for Bilgola Beach (Bilgola) and Basin Beach (Mona Vale)* that was prepared by the author for Council and gazetted on 14 July 2017. Although this CZMP does not geographically apply at the site, it is the only gazetted CZMP in the former Pittwater Council area, and hence is relevant to consider in the selection of design life at a similar open coast beach.

As justified in the CZMP, a 60 year life is considered to be appropriate for infill residential development as it is consistent with the design life used in various Australian Standards (eg *AS 3600 – Concrete structures* and *AS 4678 – Earth-retaining structures*), tax legislation, and community expectations.

7. EROSION/RECESSION COASTAL HAZARDS

In the *Coastline Hazard Definition and Climate Change Vulnerability Study* prepared for Pittwater Council and dated 4 May 2015 (denoted as the "Hazard Study" herein), coastal hazard lines in the vicinity of the site were derived assuming an entirely sandy erodible subsurface above -1m AHD. However, due to bedrock at around 0.9m to 1.5m AHD seaward of the site (ie 1.9m to 2.5m above -1m AHD), these hazard lines are overly conservative and have not been depicted herein.

That stated, it can be noted that the 2100 (Zone of Slope Adjustment) Coastal Hazard Line determined assuming an entirely sandy erodible subsurface is located seaward of the proposed dwelling. Adjusting for the bedrock in the profile, the 2100 Zone of Slope Adjustment would be well seaward of the site. Therefore, it can be stated that the proposed development is not expected to be directly impacted by erosion/recession to 2100, which is beyond the 60 year design life. This means that geotechnical constraints rather than traditional coastal hazard lines apply at the site.

Based on the Coastline Policy, it is theoretically required to define a Coastline Hazard Line (CHL) and Coastline Management Line (CML)[2], but these lines are located seaward of the site due to the elevated bedrock, so are not applicable.

As noted in Section 5, the proposed development is to be founded on underlying bedrock, which would give additional redundancy in the highly unlikely event that the dwelling was undermined by erosion/recession over the design life. There are no particular foundation requirements from a coastal engineering perspective.

[2] In the Coastline Policy it is recommended that the CML be defined to be 10m landward of the CHL, unless otherwise justified.

8. COASTAL INUNDATION AND WAVE RUNUP

Wave runup levels at Palm Beach in a severe storm may exceed 8m AHD, particularly taking sea level rise into account over the next 60 years, and assuming an infinite height foreshore. In reality, any waves that overtopped the foreshore seaward of the site (at a level of about 5m AHD) would 'fold over' the crest and travel as a sheet flow at shallow depth, spreading out and infiltrating over landward areas[3]. There is the expectation of a significant reduction in the velocity and depth of the runup within the order of 10m from the foreshore crest.

To reduce the risk of wave runup impacting the proposed development, the only location where inundation could enter the lower ground floor is at the southern end, flowing west along the driveway to the south of the solid boundary fence and then entering the garage door. The garage itself falls to the door, and the floor is to be concrete which is tolerant of inundation.

The following measures should also be adopted to further reduce the risk of inundation impacting on the dwelling:

- the door from the garage to the remainder of the lower ground floor shall be designed to be watertight and resist hydrostatic forces as advised by a coastal engineer in detailed design;
- the walls of the garage shall be designed to withstand inundation to 0.5m above the floor;
- any electrical equipment, wiring, and any other service pipes and connections in the garage that could be damaged by inundation shall be located at least 0.5m above the floor, or waterproofed if below this;
- only items that can withstand periodic inundation shall be stored or placed in the garage within 0.5m above the floor level; and
- potentially polluting or buoyant materials shall be stored at least 0.5m above the garage floor.

For the purpose of the report herein, a Coastline Planning Level of 5.67m AHD has been adopted in the garage, which is 0.5m above the garage floor level. Note that a freeboard does not need to be added to this, as the garage is at the landward limit of shallow depth wave runup.

9. MERIT ASSESSMENT

9.1 *State Environmental Planning Policy (Resilience and Hazards) 2021*

9.1.1 Preamble

Based on *State Environmental Planning Policy (Resilience and Hazards) 2021* (SEPP Resilience) and its associated mapping, the site is within a "coastal environment area" (see Section 9.1.2) and a "coastal use area" (see Section 9.1.3).

9.1.2 Clause 2.10

Based on Clause 2.10(1) of SEPP Resilience, "development consent must not be granted to development on land that is within the coastal environment area unless the consent authority

[3] Although there would be limited infiltration into the Ocean Road surface, but note that there are drainage pits in the road with pipes leading back to the beach.

has considered whether the proposed development is likely to cause an adverse impact on the following:

(a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,
(b) coastal environmental values and natural coastal processes,
(c) the water quality of the marine estate (within the meaning of the *Marine Estate Management Act 2014*), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,
(e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,
(f) Aboriginal cultural heritage, practices and places,
(g) the use of the surf zone".

This is not a coastal engineering matter, but it can be noted that with regard to (a), the proposed works are in a developed residential area. The works would not be expected to adversely affect the biophysical and hydrological (surface and groundwater) environments. Existing stormwater drainage pathways to Ocean Road are not to be significantly altered, with conventional stormwater management and BASIX requirements such as a 6,500L rainwater tank to be installed. The proposed works would not be a source of pollution as long as appropriate construction environmental controls are applied. The works would not be expected to adversely affect the ecological environment based on a Flora and Fauna Assessment Report by Narla Environmental submitted with the DA, as long as the recommendations in that report are followed.

With regard to (b), the proposed development would not be expected to adversely affect coastal environmental values or natural coastal processes any differently to the existing dwelling.

With regard to (c), the proposed works would not adversely impact on water quality as long as appropriate construction environmental controls are applied, given the residential land use. No sensitive coastal lakes are located in the vicinity of the proposed development.

With regard to (d), this is not a coastal engineering matter so is not definitively considered herein. That stated, there are no undeveloped headlands or rock platforms, nor marine vegetation, in proximity to the proposed development. No significant impacts on marine fauna and flora would be expected as a result of the proposed development, as the proposed development would generally not be expected to interact with subaqueous areas over its design life. Consideration of native vegetation and fauna and their habitats has been made in the Flora and Fauna Assessment Report submitted with the DA, in which it was concluded that the proposed development should have minimal ecological impact if their recommendations are followed.

With regard to (e), it can be noted that the proposed development is entirely within the site boundary, and will not alter existing public access arrangements seaward of the site.

With regard to (f), a search of the Heritage NSW "Aboriginal Heritage Information Management System" (AHIMS) was undertaken on 19 October 2023. This resulted in no Aboriginal sites nor Aboriginal places being recorded or declared within at least 200m of the site.

With regard to (g), the proposed development would not be expected to interact with the surf zone (where waves break) over its design life.

Based on Clause 2.10(2) of SEPP Resilience, "development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

(a) the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1), or
(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or
(c) if that impact cannot be minimised—the development will be managed to mitigate that impact".

The proposed development has been designed and sited to avoid the adverse impacts referred to in Clause 2.10(1).

9.1.3 Clause 2.11

Based on Clause 2.11(1) of SEPP Resilience, "development consent must not be granted to development on land that is within the coastal use area unless the consent authority:

(a) has considered whether the proposed development is likely to cause an adverse impact on the following:
    (i) existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,
    (ii) overshadowing, wind funnelling and the loss of views from public places to foreshores,
    (iii) the visual amenity and scenic qualities of the coast, including coastal headlands,
    (iv) Aboriginal cultural heritage, practices and places,
    (v) cultural and built environment heritage, and
(b) is satisfied that:
    (i) the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or
    (ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or
    (iii) if that impact cannot be minimised—the development will be managed to mitigate that impact, and
(c) has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development".

With regard to (a)(i), the proposed development is entirely on private property and will not affect public foreshore, beach, headland or rock platform access.

Clauses (a)(ii) and a(iii) are not coastal engineering matters so are not considered herein.

With regard to (a)(iv), as noted in Section 9.1.2, there are no particular Aboriginal sites recorded nor Aboriginal Places declared within at least 200m of the site.

With regard to (a)(v), the nearest environmental heritage items to the site listed in Schedule 5 of *Pittwater Local Environmental Plan 2014* are a house at 2 Palm Beach Road (about 30m from the site) and a change room and toilets at 1 Ocean Road (Ocean Beach Reserve) about 90m

south of the site. The proposed development would not be expected to impact on these or more distant heritage items.

With regard to (b), the proposed development has been designed and sited to avoid any potential adverse impacts referred to in Clause 2.11(1).

Clause (c) is not a coastal engineering matter so is not considered herein.

9.1.4 Clause 2.12

Based on Clause 2.12 of SEPP Resilience, "development consent must not be granted to development on land within the coastal zone unless the consent authority is satisfied that the proposed development is not likely to cause increased risk of coastal hazards on that land or other land".

The proposed development, being founded on bedrock and highly unlikely to be undermined by erosion/recession up to 2100, would not be expected to increase the risk of coastal hazards at the site or adjacent properties over the design life.

9.1.5 Clause 2.13

Based on Clause 2.13 of SEPP Resilience, "development consent must not be granted to development on land within the coastal zone unless the consent authority has taken into consideration the relevant provisions of any certified coastal management program that applies to the land".

No certified coastal management program applies at the site.

9.1.6 Synthesis

The proposed development satisfies the requirements of SEPP Resilience for the matters considered herein.

9.2 *Pittwater Local Environmental Plan 2014*

Clause 7.5 of *Pittwater Local Environmental Plan 2014* (LEP 2014) applies at the site, as the site is identified as a "wave inundation" area on the Coastal Risk Planning Map (Sheet CHZ_015). Based on Clause 7.5(3) of LEP 2014, "development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:

(a) is not likely to cause detrimental increases in coastal risks to other development or properties, and
(b) is not likely to alter coastal processes and the impacts of coastal hazards to the detriment of the environment, and
(c) incorporates appropriate measures to manage risk to life from coastal risks, and
(d) is likely to avoid or minimise adverse effects from the impact of coastal processes and the exposure to coastal hazards, particularly if the development is located seaward of the immediate hazard line, and
(e) provides for the relocation, modification or removal of the development to adapt to the impact of coastal processes and coastal hazards, and
(f) has regard to the impacts of sea level rise, and

(g) will have an acceptable level of risk to both property and life, in relation to all identifiable coastline hazards".

With regard to (a) and (b), the proposed development would not increase coastal risks nor alter coastal processes and the impacts of coastal hazards over its design life. This is because it is to be founded on bedrock, is highly unlikely to be undermined by erosion/recession up to 2100, and has measures incorporated to reduce the risk of coastal inundation damage (see Section 8).

With regard to (c) and (g), the site is sufficiently landward to not be at significant risk of erosion/recession over the design life, with the proposed dwelling being founded on bedrock reducing the risk further. In addition, with the measures adopted as described in Section 8, there is an acceptably low risk to property and life from inundation. Therefore, there is an acceptably low risk to property and life from coastal risks (that stated, risk to life from coastal risks is inherently insignificant at the site over the design life).

With regard to (d), the site is sufficiently landward, and has appropriate measures to deal with inundation risks, to not have an unacceptable exposure to coastal hazards over the design life. Given that the proposed development is at an acceptably low risk of damage for an acceptably long life, (e) is not necessary.

With regard to (f), sea level rise has been considered herein, with the coastal hazard lines and wave runup levels considered incorporating sea level rise projections.

9.3 *Pittwater 21 DCP*

Based on Chapter B3.3 of the DCP:

- "development must be designed and constructed to ensure that every reasonable and practical means available is used to remove risk to an acceptable level for the life of the development; and,
- the development must not adversely affect or be adversely affected by coastal processes nor must it increase the level of risk for any people, assets and infrastructure in the vicinity due to coastal processes".

The proposed development is at an acceptably low risk of being damaged or adversely affected by coastal processes for a 60 year design life (for both erosion/recession and wave runup), and would not adversely affect or increase the level of risk to any people, assets or infrastructure in its vicinity.

Based on Chapter 8.1(i) of the Coastline Policy:

a) "all structures below the Coastline Planning Level shall be constructed from flood compatible materials;
b) all development must be designed and constructed so that it will have a low risk of damage and instability due to wave action and/or oceanic inundation hazards;
c) all development and/or activities must be designed and constructed so that they will not adversely impact on surrounding properties, coastal processes or the amenity of public foreshore lands;
d) all uncontaminated dune sand excavated during construction operations shall be returned to the active beach zone as approved and as directed by Council;

e) wherever present, remnant foredune systems shall be appropriately rehabilitated and maintained for the life of the development to stabilise an adequate supply of sand (as determined by a coastal engineer) that is available to buffer erosion processes and/or minimise the likelihood of oceanic inundation;
f) all vegetated dunes, whether existing or created as part of coastal protection measures shall be managed and maintained so as to protect the dune system from damage both during construction of the development and as a result of subsequent use during the life of the development;
g) all electrical equipment, wiring, fuel lines or any other service pipes and connections must be waterproofed to the Coastline Planning Level;
h) the storage of toxic or potentially polluting goods, materials or other products, which may be hazardous or pollute waters during property inundation, will not be permitted below the Coastline Planning Level;
i) for existing structures, a tolerance of up to minus 100mm may be applied to the Coastline Planning Level in respect of compliance with these controls;
j) building heights must not exceed 8.0 metres above the Coastline Planning Level or 8.5 metres above existing ground level, whichever is higher; and,
k) where land is also subject to the provisions of the Flood Risk Management Policy for Development around Pittwater, the higher of the Coastline Planning Level and Flood Planning Level shall apply".

For Item (a), this has been recommended for within 0.5m of the garage floor (see Section 8), that is, below the Coastline Planning Level of 5.67m AHD (but only within the garage).

For Item (b), it has been noted previously that the proposed development has an acceptably low risk of damage and instability due to wave action (erosion/recession) and oceanic inundation (wave runup) hazards over an acceptably long design life.

For Item (c), it has been noted previously that the proposed development would not be expected to adversely impact on surrounding properties or coastal processes.

For Item (d), any excess suitable excavated sand (if any) can be placed on the active beach as may be required by Council, if directed by Council.

For Item (e), this requirement is noted, but is not applicable at the site.

For Item (f), no vegetated dunes would be impacted by the proposed development.

For Items (g) and (h), this was noted in Section 8 in relation to the garage.

Item (i) is not applicable.

Item (j) is not a coastal engineering matter.

For Item (k), the site is not mapped as being significantly affected by rainfall-runoff flooding.

In conclusion, the proposed development is consistent with the Coastline Policy matters considered above.

10. CONCLUSIONS

The proposed development is at an acceptably low risk of damage (over a reasonable 60 year design life) from:

- from erosion/recession, as it is landward of an overconservative 2100 Zone of Slope Adjustment and also to be founded on bedrock, and
- from coastal inundation and wave runup with the measures outlined in Section 8 adopted.

The proposed development satisfies the requirements of *State Environmental Planning Policy (Resilience and Hazards) 2021*, Clause 7.5 of *Pittwater Local Environmental Plan 2014*, Chapter B3.3 of the *Pittwater 21 DCP* and the *Coastline Risk Management Policy for Development in Pittwater* for the matters considered herein.

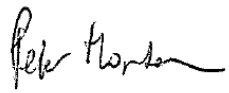
11. REFERENCES

Geotechnical Consultants Australia (2023), *Geotechnical Investigation Report, Proposed Development at 15 Ocean Road Palm Beach NSW 2108,* GCA Report No.: G23285-1, 6 September

12. 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 +61 407 012 538.

Yours faithfully
HORTON COASTAL ENGINEERING PTY LTD



Peter Horton
Director and Principal Coastal Engineer

Coastline Risk Management Policy for Pittwater Form No. 1 and Form No. 1(a) are attached overleaf

COASTLINE RISK MANAGEMENT POLICY FOR PITTWATER

FORM NO. 1 – To be submitted with Development Application

Development Application for Avik & Avedis Kalloghlian
Name of Applicant

Address of site 15 Ocean Road Palm Beach

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

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

on this the 19 October 2023 (date)

certify that I am a Coastal Engineer as defined by the Coastline Risk Management Policy for 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.

I have:

Please mark appropriate box

☑ Prepared the detailed Coastal Risk Management Report referenced below in accordance with the Pittwater Council Coastline Risk Management Policy

☐ Am willing to technically verify that the detailed Coastal Risk Management Report referenced below has been prepared in accordance with the Pittwater Council Coastline Risk Management Policy

☐ 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 coastal hazard analysis or risk assessment is not required.

☐ Provided the coastal hazard analysis for inclusion in the Coastal Risk Management Report

Coastal Risk Management Report Details:

Report Title: Coastline Risk Management Report for 15 Ocean Road Palm Beach

Report Date: 19 October 2023

Author: Horton Coastal Engineering Pty Ltd

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

See Section 2 and Section 11 of report

I am aware that the above Coastal 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 Pittwater Council as the basis for ensuring that the coastal 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 reasonable and practical measures have been identified to remove foreseeable risk.

Signature ……

Name Peter Horton

Chartered Professional Status MIEAust CPEng NER

Membership No. 452980

COASTLINE RISK MANAGEMENT POLICY FOR PITTWATER

FORM NO. 1(a) - Checklist of Requirements for Coastal Risk Management Report for Development Application or Part 5 Assessment

Development Application for Avik & Avedis Kalloghlian
Name of Applicant

Address of site 15 Ocean Road Palm Beach

The following checklist covers the minimum requirements to be addressed in a Coastal Risk Management Report. This checklist is to accompany the Coastal Risk Management Report and its certification (Form No. 1).

Coastal Risk Management Report Details:

Report Title: Coastline Risk Management Report for 15 Ocean Road Palm Beach

Report Date: 19 October 2023

Author: Horton Coastal Engineering Pty Ltd

Please mark appropriate box

☑ Comprehensive site mapping conducted Survey provided as per Section 2
(date)

☐ Mapping details presented on contoured site plan to a minimum scale of 1:200 (as appropriate)
Not applicable, as site not subject to traditional coastal hazard lines

☐ Subsurface investigation required

☐ No Justification .....

☑ Yes Date conducted Refer to Geotechical Consultants Australia (2023)

☑ Impact by and upon coastal processes identified

☑ Coastal hazards identified

☑ Coastal hazards described and reported

☑ Risk assessment conducted in accordance with Council's Policy

☐ Adequacy of existing coastal protection measures assessed and certified (not applicable)

☑ Opinion has been provided that the design can achieve the risk management criteria in accordance with Council's Policy provided that the specified conditions are achieved.

☑ Design Life Adopted:

☐ 100 years

☑ Other 60 years (as justified)

specify

☑ Development Controls as described in the Pittwater Coastline Risk Management Policy have been specified

☑ Additional actions to remove risk where reasonable and practical have been identified and included in the Coastal Risk Management Report.

I am aware that Pittwater Council will rely on the Coastal Risk Management Report, to which this checklist applies, as the basis for ensuring that the coastal risk management aspects of the proposal 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 specified, and justified in the Report and that reasonable and practical measures have been identified to remove foreseeable risk.

Signature .....

Name ..... Peter Horton .....

Chartered Professional Status..... MIEAust CPEng NER .....

Membership No. ..... 452980 .....