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9 August 2019

Coastline Risk Management Report for 235 Whale Beach Road Whale Beach (32 The Strand Whale Beach)

1. INTRODUCTION AND BACKGROUND

A Development Application (DA) for demolition and erection of a new dwelling at 235 Whale Beach Road Whale Beach (also known as 32 The Strand Whale Beach) is to be submitted to Northern Beaches Council. The property 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 property is also mapped as being subject to coastal erosion and coastal inundation hazards in the *Pittwater Coastline Hazard Definition and Climate Change Vulnerability Study* and on the *Pittwater 21 Development Control Plan* (DCP)[1] Map MDCP016. Therefore, the property is subject to Chapter B3.3 of the DCP, and the *Coastline Risk Management Policy for Development in Pittwater* (Coastline Policy), and a Coastal Risk Management Report must be submitted as part of the DA. Horton Coastal Engineering was engaged to prepare a coastal engineering assessment of the works, as set out herein.

In the report herein, all 11 items (namely a to k) listed in Clause 9.3 of the Coastline Policy are addressed where appropriate. As required, completed Forms 1 and 1(a) as given in the Coastline Policy are also attached.

The report author, Peter Horton [BE (Hons 1) MEngSc MIEAust CPEng NER], is a professional Coastal Engineer with 27 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 completed numerous coastal engineering studies in the Whale Beach area, and has inspected the area in the vicinity of the subject property on several occasions in the last few years, including a specific recent inspection on 30 May 2019.

Note that all levels given herein are to Australian Height Datum (AHD). Zero metres AHD is approximately equal to mean sea level at present.

[1] The Pittwater 21 DCP up to Amendment No. 24, which came into effect on 20 October 2018, was considered herein.

2. INFORMATION PROVIDED

Horton Coastal Engineering was provided with 41 drawings of the proposed development prepared by Shaun Lockyer Architects, dated 18 April 2019 (except for Drawings 100.01, 100.10, 210.01, 300.01 & 300.02 dated 26 June 2019, and Drawings 100.08 & 100.09 dated 9 May 2019) and Revision A, B or C. A site survey completed by Stutchbury Jaques was also provided, Reference 10181/18 and dated 25 June 2018.

3. EXISTING SITE DESCRIPTION

The subject property is located adjacent to the central portion of the Whale Beach sandy beach, adjacent to the northern end of the beach car park (The Strand), with the developed area elevated well above and landward of the beach. An aerial view is provided in Figure 1[2]. Photographs of the property at the time of the site inspection on 30 May 2019 are provided in Figure 2 and Figure 3.

Vehicular access to the property is via Whale Beach Road. Based on the site survey, ground elevations vary from about 20m AHD at Whale Beach Road, 17m AHD at the landward edge of the existing dwelling (which has a floor level of 17.2m AHD), and 13m AHD at the seaward edge of the existing dwelling (at a timber retaining wall). Levels then continue to fall towards the beach via three additional retaining walls (down to 9m AHD), then down a grassy slope to the bottom of bank at about 6m AHD. Levels then flatten over the lower portion of the site, reducing to a minimum level of about 5.4m AHD, before rising over the most seaward 5m to 8m of the site to about 7m to 7.5m AHD at the seaward property boundary and 6.9m AHD at the landward edge of The Strand.

Based on 2011 Airborne Laser Scanning data held by Horton Coastal Engineering, The Strand, located seaward of the property, is at a level of about 6.6m AHD at its seaward edge. Levels then generally fall over the sandy beach area to the shoreline at 0m AHD over a typical distance of about 80m at present.

4. PROPOSED DEVELOPMENT

It is proposed to demolish the existing dwelling and erect a new dwelling (over 3 levels), with a pool (with habitable areas under) on the seaward side. The lowest habitable floor level (described as the Lower Ground Floor or Ground Floor on the Drawings) has a finished floor level of 8.5m AHD. At the SE corner of the dwelling, a storage enclosure is proposed with a finished floor level of 6.6m AHD (with a slight fall towards the northern edge to ensure drainage), for the storage of surf craft and the like.

[2] Note that the property boundary depicted in Figure 1 is not survey accurate, being derived from approximate NSW Government GIS cadastral data.

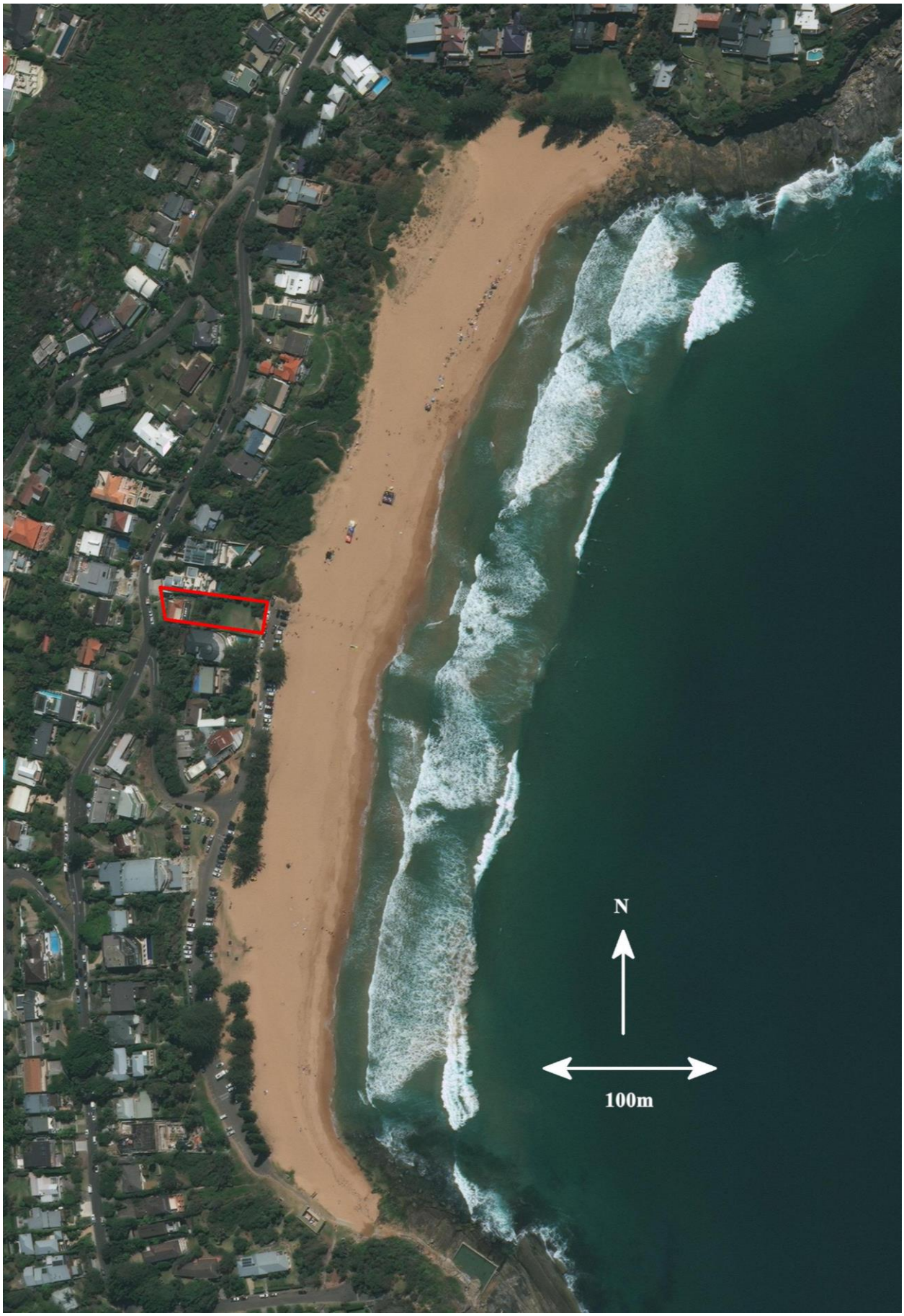


Figure 1: Aerial view of subject property (red outline) at Whale Beach on 29 September 2017

Figure 2: View of subject property (dwelling at arrow) from The Strand, looking west

Figure 3: View of Whale Beach from bottom of slope at subject property, looking ESE

5. DESIGN LIFE

In the Coastline Policy, it is noted that a design project life of 100 years should be adopted, unless otherwise justified. A 60-year design life (that is, at 2079) is considered to be reasonable to adopt for the proposed development. 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 gazetted on 14 July 2017. Although this CZMP does not geographically apply at the subject property, it is the only gazetted CZMP in the former Pittwater Council area and is at another open coast beach, and hence is relevant to consider in the selection of design life and would be expected to have a similar planning paradigm[3].

That stated, as will be outlined in Section 7.2, the proposed development is at an acceptably low risk of damage from coastal erosion/recession to beyond 2100. That is, a design life of over 81 years applies to the erosion/recession hazards. As will be outlined in Section 8, the adopted 60 year design life specifically applies to wave runup considerations.

6. SUBSURFACE CONDITIONS

A geotechnical investigation of the subject property has been completed by White Geotechnical Group (2019). They found that:

- competent medium strength sandstone bedrock outcrops near the toe/base of the slope at the property;
- above the base of the slope, the site is underlain by the Narrabeen Group of rocks (interbedded laminite, shale and quartz to lithic quartz sandstone);
- sand is expected to underlie the property from seaward of the base of the slope and seaward of the property (the depth of the sand was not specified, but based on the plotted Section in the geotechnical report it is expected that bedrock would limit the realisation of erosion/recession coastline hazards seaward of the base of the slope for the order of at least 10m); and
- the proposed house should be supported on a concrete slab and shallow piers taken to low strength rock (with the proposed development extending as far seaward as the toe of the slope, ie immediately above the subsurface rock).

7. EROSION/RECESSION COASTLINE HAZARDS

7.1 Generic Explanation of Hazard Zones

Based on Nielsen et al (1992), a number of coastline hazard zones can be delineated as schematically shown in Figure 4. In this methodology it is assumed that the subsurface in the area of active coastal erosion/recession (above about -1m AHD) is composed entirely of (erodible) sand, which has been assumed to be reasonable over the lower part of the property (seaward of the base of slope), but is likely to be conservative based on the plotted Section in White Geotechnical Group (2019) as discussed in Section 6. An additional geotechnical investigation over the seaward portion of the property could be undertaken to assess bedrock levels in more detail, if required.

[3] A detailed justification of the suitability of a 60-year design life for infill residential development is provided in the CZMP. In summary, a design life of 40 to 60 years is used in numerous Australian Standards relevant to residential construction, and the cost of new residential development is amortised for tax purposes over 40 years based on Subdivision 43-25 of the *Income Tax Assessment Act 1997*, so a 60-year design life is considered to be reasonable and conservative (particularly given the relative frequency at which beachfront property at Whale Beach is redeveloped).

The *Zone of Wave Impact* delineates an area where any structure or its foundations would suffer direct wave attack during a severe coastal storm. It is that part of the beach which is seaward of the beach erosion escarpment.

A *Zone of Slope Adjustment* (ZSA) is delineated to encompass that portion of the seaward face of the beach that would slump to the natural angle of repose of the beach sand following removal of sand by wave erosion.

A *Zone of Reduced Foundation Capacity* (ZRFC) for building foundations is delineated to take account of the reduced bearing capacity of the sand adjacent to the storm erosion escarpment. Nielsen et al (1992) recommended that structural loads should only be transmitted to soil foundations outside of this zone (ie landward or below), as the factor of safety within the zone is less than 1.5 during extreme scour conditions at the face of the escarpment. In general, without the protection of a terminal structure such as a seawall, dwellings/structures not piled (or otherwise founded to an adequate depth) and located within the ZRFC would be considered to have an inadequate factor of safety.

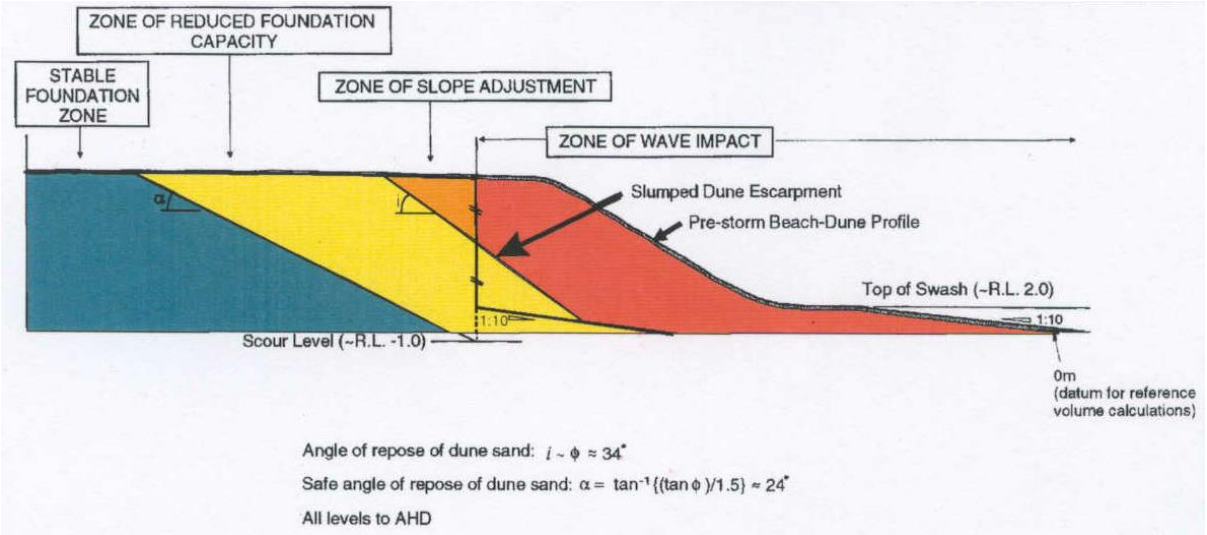


Figure 4: Schematic representation of coastline hazard zones (after Nielsen et al, 1992)

7.2 Hazard Lines at Subject Property

Coastal hazard lines from the draft *Pittwater Council Coastline Hazard Definition and Climate Change Vulnerability Study* (3 July 2012), which is the most recent coastal hazard definition for the study area, are depicted in Figure 5. These were defined assuming an entirely erodible sandy subsurface, which is conservative even seaward of the base of slope (although the depth to bedrock in this location has not been confirmed), except the 2100 ZRFC was positioned at the base of slope[4]. Therefore, if the subsurface is entirely sandy above -1m AHD seaward of the base of slope, erosion in a severe storm (combined with long term recession) may be expected to extend to about 2m to 10m seaward of the base of slope by 2100 (as per the 2100 ZSA in Figure 5). Given this, and that the foundation slope over the upper site is essentially inerodible, and that the proposed development is to be founded on bedrock (see Section 6), coastal erosion/recession is not a credible risk to the proposed development for a planning period beyond 2100.

[4] These two lines do not exactly coincide in Figure 5 due to the broad-brushed nature of the *Pittwater Council Coastline Hazard Definition and Climate Change Vulnerability Study*.

The 2100 ZRFC can be adopted as the Coastline Management Line (as per the Coastline Policy) at the subject property, which is conservative for a 60 year design life (the line applies for an 81 year design life). The proposed development is landward of the Coastline Management Line, as required based on Section 8.1(iii) of the Coastline Policy.

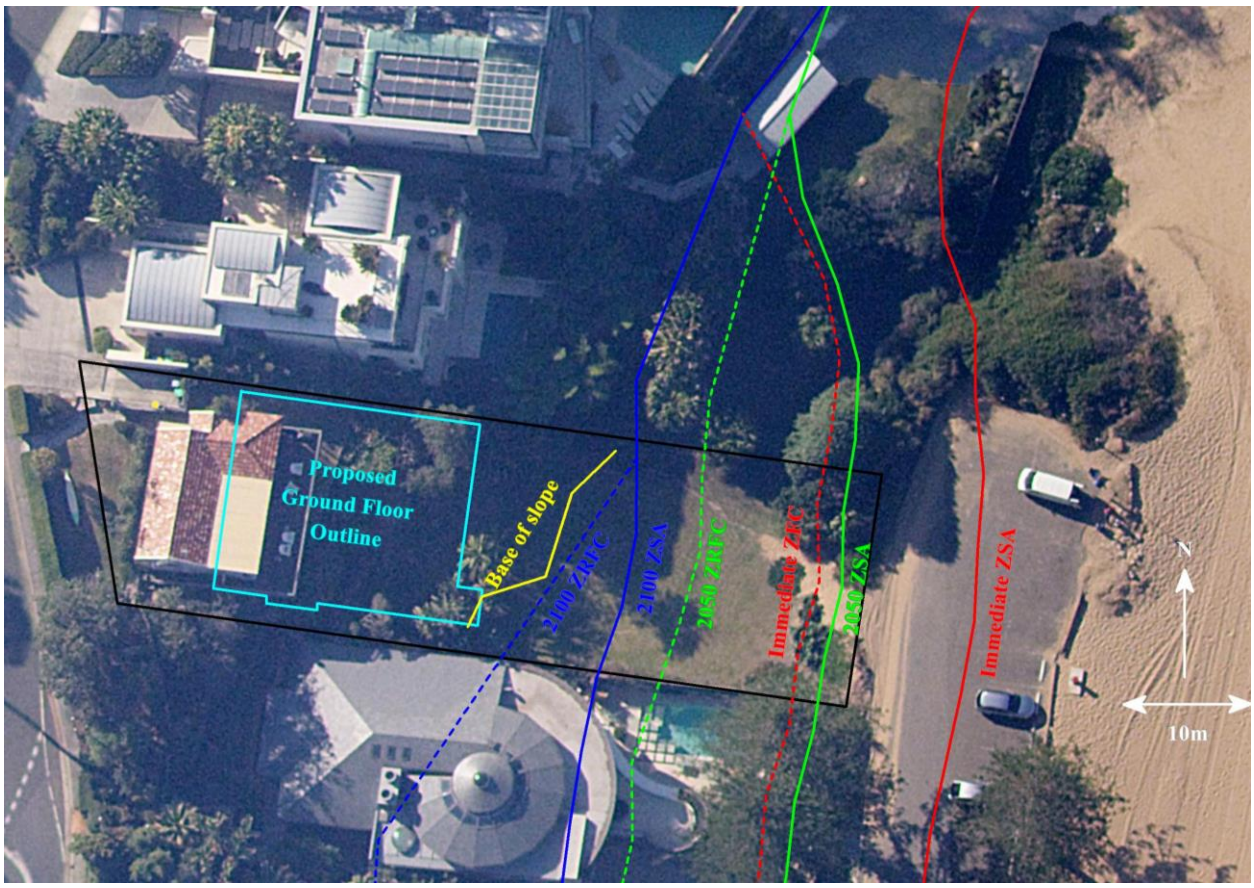


Figure 5: Immediate, 2050 and 2100 coastal hazard lines at subject property from *Pittwater Council Coastline Hazard Definition and Climate Change Vulnerability Study*, with base of slope also shown, landward of which significant erosion would not be expected

8. COASTAL INUNDATION AND WAVE RUNUP

Based on mapping from the *Pittwater Council Coastline Hazard Definition and Climate Change Vulnerability Study*, Immediate, 2050 and 2100 projected extents of wave runup in a severe storm (nominally 1% annual exceedance probability) are depicted in Figure 6. The Immediate and 2050 runup lines are located well seaward of the proposed development, while the 2100 wave runup line extends up to about 13m AHD, which is considered to be unrealistically high (a more realistic, while still conservative wave runup level, is considered to be 9m AHD at 2100).

A conservative wave runup level for a 60 year design life (at 2079) is considered to be 8.5m AHD (a freeboard does not need to be added to this). A Coastline Planning Level of 8.5m AHD can thus be adopted, which is equal to the lowest habitable floor level in the proposed dwelling. Therefore, the risk of inundation impacting habitable floors (the Lower Ground Floor) over the design life would be acceptably low. This assessment is also supported by the proposed Lower Ground Floor terrace floor comprising materials that can tolerate inundation, such as concrete or natural stone. Any electrical equipment, wiring, and any other

service pipes and connections in the dwelling should be placed above 8.5m AHD, or waterproofed if below 8.5m AHD.

It is also recommended that ground levels continue to be contoured to fall to the SE, and the Lower Ground Floor is suspended at least 0.5m above natural ground over most of its length (as depicted in Drawing 50.04[5]), as a relatively simple risk minimisation measure.

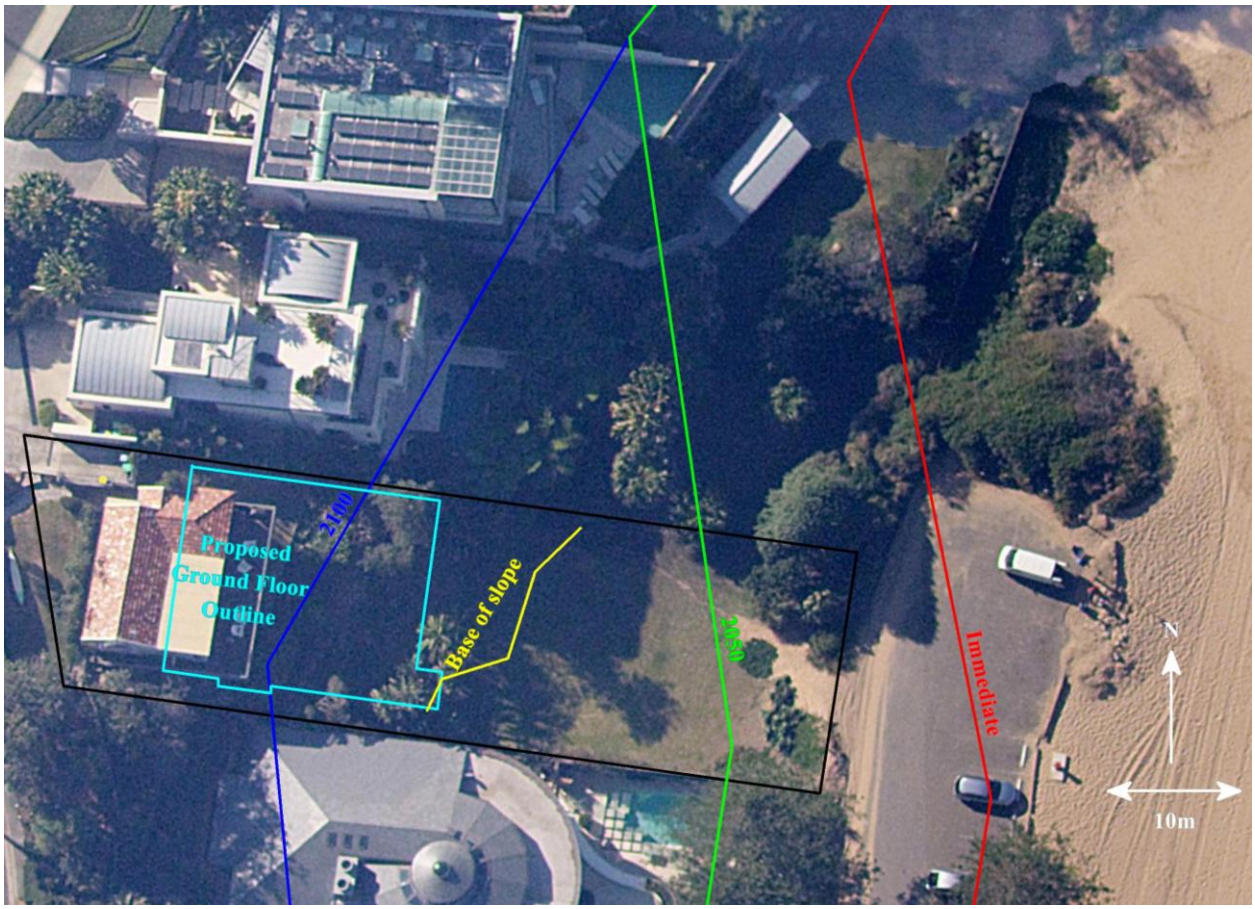


Figure 6: Immediate, 2050 and 2100 wave runup lines at subject property from *Pittwater Council Coastline Hazard Definition and Climate Change Vulnerability Study*

The storage enclosure at the SE corner of the dwelling may be inundated in the design event at 2079, but this is considered to be acceptable if:

- only items that can withstand periodic inundation are placed within the enclosure below 7.6m AHD;
- fuels and other chemicals or potentially toxic materials should be stored above 7.6m AHD or in watertight containers;
- the enclosure floor is constructed of materials that can tolerate inundation, such as concrete or natural stone; and
- all electrical equipment, wiring, and any other service pipes and connections are placed above 7.6m AHD, or waterproofed if below 7.6m AHD.

[5] The Architect advised that the area under the Lower Ground Floor would be enclosed. This is acceptable from a coastal engineering perspective as long as the Lower Ground Floor terrace overhangs the enclosing wall by at least 300mm (to act as a 'wave return'), or the enclosing wall comprises a mesh or openings that allow water flow through it.

It is not considered to be necessary to place the storage enclosure above the Coastline Planning Level, considering the low risk of damage to items in the enclosure with adoption of the measures outlined above.

9. MERIT ASSESSMENT

9.1 State Environmental Planning Policy (Coastal Management) 2018

9.1.1 Preamble

Based on *State Environmental Planning Policy (Coastal Management) 2018* (SEPP Coastal) and its associated mapping, the subject property is within a "coastal use area".

9.1.2 Clause 14

Based on Clause 14(1) of SEPP Coastal, "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 Clause (a)(i), the proposed development is entirely on private property and located on the landward portion of the site, 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), based on a search of the Office of Environment and Heritage "Aboriginal Heritage Information Management System" (AHIMS) that was undertaken on 6 August 2019, there are no particular Aboriginal sites or Aboriginal Places recorded or declared within 200m of the subject property.

With regard to (a)(v), the nearest environmental heritage item to the subject property listed in Schedule 5 of *Pittwater Local Environmental Plan 2014* is the Norfolk Island Pines at Whale Beach Ocean Reserve adjacent to The Strand. The nearest pine tree is about 17m from the

property, on the seaward side of The Strand and opposite the adjacent property to the south. The proposed development would not be expected to impact on this location.

With regard to (b), the proposed development has been designed and sited to avoid any potential adverse impacts referred to in Clause 14(1) for the matters considered herein.

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

9.1.3 Clause 15

Based on Clause 15 of SEPP Coastal, "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 is to be founded on bedrock and is well landward of projected coastal erosion/recession for a planning period to beyond 2100, and is to be located at the limit of projected wave runup in a severe storm in 60 years. The proposed development would thus not even be expected to interact with erosion/recession coastal processes over its design life, and would only be expected to interact with wave runup in a manner that would be inconsequential to surrounding land and development (any reflection of wave runup off the structure would simply direct runup in a seaward direction, in the same direction as the natural rundown pathway). That is, the proposed development is unlikely to cause increased risk of coastal hazards on that land or other land over its design life.

9.1.4 Synthesis

The proposed development satisfies the requirements of *State Environmental Planning Policy (Coastal Management) 2018* for the matters considered herein.

9.2 *Coastal Management Act 2016*

Based on Section 9(2) of the *Coastal Management Act 2016*, "the management objectives for the coastal use area are as follows:

(a) to protect and enhance the scenic, social and cultural values of the coast by ensuring that:
  i) the type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast, and
  ii) adverse impacts of development on cultural and built environment heritage are avoided or mitigated, and
  iii) urban design, including water sensitive urban design, is supported and incorporated into development activities, and
  iv) adequate public open space is provided, including for recreational activities and associated infrastructure, and
  v) the use of the surf zone is considered,
(b) to accommodate both urbanised and natural stretches of coastline".

Section (a)(i) is not a coastal engineering matter so is not considered herein.

With regard to (a)(ii), it has already been noted in Section 9.1.2 that there are no environmental heritage items listed in Schedule 5 of *Pittwater Local Environmental Plan 2014* that would be impacted by the proposed development.

Section (a)(iii) is not a coastal engineering matter so is not considered herein.

With regard to (a)(iv), the proposed development is entirely on private property and located on the landward portion of the site, and would not impact on public open space.

With regard to (a)(v), the proposed development would not be expected to interact with the surf zone over its design life, and would thus not affect the use of the surf zone.

With regard to (b), the proposed development is entirely on private property and would not impact on the natural stretch of coastline seaward of the property.

9.3 *Pittwater Local Environmental Plan 2014*

Clause 7.5 of *Pittwater Local Environmental Plan 2014* (LEP 2014) applies at the subject property, as the property 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, as it would not be expected to interact with erosion/recession over its design life, and would only be expected to interact with wave runup in a manner that would be inconsequential to surrounding land and development.

With regard to (c) and (g), founding the proposed development on piles down to bedrock is an appropriate measure to achieve an acceptably low risk to property and life from coastal risks for the proposed development, along with its setback landward of the 2100 ZRFC. With regard to (d), founding the proposed development on piles down to bedrock also minimises the adverse effects from the impact of coastal processes and the exposure to coastal hazards for the proposed development. The proposed development is located landward of a 2100 ZRFC. White Geotechnical Group (2019) also found that the proposed development was at an acceptably low risk of damage over a 100 year planning period with appropriate measures incorporated in the design and construction (as outlined in Section 12 and Section 13 of their

report), thus meeting (c), (d) and (g). On this basis, (e) should not be necessary, noting that this would be more applicable in a sandy beach environment.

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

9.4 *Pittwater 21 DCP*

Based on Section 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".

As discussed in Section 9.2 and 9.3, the proposed development is at an acceptably low risk of being damaged or adversely affected by coastal processes for a design life to beyond 2100 for erosion/recession and over 60 years for wave runup, and would not adversely affect or increase the level to risk to any people, assets or infrastructure in its vicinity.

Based on Section 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 is noted, and could be achieved with the use of concrete, natural stone or other materials resistant to inundation.

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.

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 can be placed on the active beach as may be required by Council, as directed by Council.

For Item (e), there is not a requirement to maintain a volume of sand seaward of the development, with the proposed development to be founded on bedrock.

For Item (f), no vegetated dunes would be impacted by the proposed development. The limited vegetation at the seaward edge of the property would be maintained and enhanced along the northern boundary seaward of the proposed development, as shown on the Landscape Plan (Drawing 100.10).

For Item (g), this was noted in Section 8.

For Item (h), it is considered that storage of such materials is acceptable above 7.6m AHD in the storage enclosure (as discussed in Section 8), based on the limited potential for wave runup to interact with this area, and anywhere within the dwelling (which has a minimum floor level of 8.5m AHD).

Item (i) is no applicable.

Item (j) is a matter for the architect to confirm.

For Item (k), refer to a separate report by Horton Coastal Engineering on overland flow flooding issues.

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

10. CONCLUSIONS

With the proposed development to be founded on bedrock, coastal erosion/recession is not a credible risk to the proposed development for a planning period beyond 2100 (design life of 81 years). The development would be at an acceptably low risk of damage from coastal inundation and wave runup over a reasonable 60 year design life if the measures outlined in Section 8 are adopted.

The proposed development satisfies the requirements of *State Environmental Planning Policy (Coastal Management) 2018* (Clauses 14 and 15), Section 9(2) of the *Coastal Management Act*

2016, Clause 7.5 of *Pittwater Local Environmental Plan 2014*, Section B3.3 of the *Pittwater 21 DCP* and the *Coastline Risk Management Policy for Development in Pittwater* for the matters considered herein.

11. REFERENCES

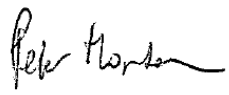
Nielsen, AF; Lord, DB and HG Poulos (1992), "Dune Stability Considerations for Building Foundations", *Australian Civil Engineering Transactions*, Institution of Engineers Australia, Volume CE34, No. 2, June, pp. 167-173

White Geotechnical Group (2019), *Geotechnical Investigation: New House at 32 The Strand Whale Beach*, 17 June

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 Robert & Susie Nugan and BBF Planners
Name of Applicant

Address of site 235 Whale Beach Road Whale 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 9 August 2019 (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 235 Whale Beach Road Whale Beach (32 The Strand Whale Beach)

Report Date: 9 August 2019

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 Robert & Susie Nugan and BBF Planners

Name of Applicant

Address of site 235 Whale Beach Road Whale 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 235 Whale Beach Road Whale Beach (32 The Strand Whale Beach)

Report Date: 9 August 2019

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)
Figure 5 is considered to be sufficient

☐ Subsurface investigation required

☐ No Justification ……...

☑ Yes Date conducted …… Refer to White Geotechnical Group (2019)

☑ 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……