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20 November 2019

Coastline Risk Management Report for 5 Surfview Road Mona Vale

1. INTRODUCTION AND BACKGROUND

It is proposed to undertake alterations and additions at 5 Surfview Road Mona Vale, for which a Development Application (DA 2018/0565) was submitted to Northern Beaches Council and subsequently withdrawn. A new DA is now to be submitted for the works.

The property is located within a "Coastal erosion / wave inundation" area designated on the Coastal Risk Planning Map (Sheet CHZ_018) 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, which is Part D Appendix 6 of the DCP), and a Coastal Risk Management Report must be submitted as part of the DA. Horton Coastal Engineering was engaged to prepare the required Coastal Risk Management Report, 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.

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 planning period has been considered herein, and this can be justified as this is the same planning period adopted in the *Coastal Zone Management Plan for Bilgola Beach (Bilgola) and Basin Beach (Mona Vale)* (CZMP), which was certified by the Minister for the Environment on 30 June 2016 and gazetted on 14 July 2017².

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

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

² 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 Basin Beach is redeveloped).

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 Basin Beach (Mona Vale) 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 8 September 2019. He was the lead author of the CZMP referred to above.

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

2. INFORMATION PROVIDED

Horton Coastal Engineering was provided with 21 drawings of the proposed development prepared by Rodney Bowry, dated November 2019 and Revision A. A site survey completed by Base Surveying was also provided, Reference 15-110 and dated 3 December 2015.

3. EXISTING SITE DESCRIPTION

Basin Beach is about 300m long, situated between Mona Vale Headland in the north and a rock platform in the south, and facing approximately east-south-east. The subject property is located seaward of Surfview Road towards the southern end of the beach (Figure 1)³. A photograph of the property at the time of the site inspection on 8 September 2019 is provided in Figure 2.

Based on the site survey provided, ground elevations at the seaward property boundary (which is close to the top of the dunal bank) vary from about 8.0m to 8.3m AHD. Moving seaward, levels fall to the sandy beach, with the bottom of bank (sand) level at about 4.3m AHD at the time of the survey. This slope seaward of the property is vegetated with creepers and some low-level shrubs. The distance to mean sea level, seaward of the property, is typically about 50m (reducing after coastal storms that cause erosion of Basin Beach).

Moving landward, ground elevations increase from the top of bank to a tiled patio with a floor level of 9.2m AHD, with the dwelling ground floor level at 9.3m AHD. Elevations reduce moving landward to about 6.8m AHD on the landward side of the dwelling, 6.3m AHD at the landward property boundary, and 6.1m AHD at Surfview Road.

As discussed in the CZMP, in 1980 a rock revetment was constructed along the seaward edge of 3, 5, 7 and 9 Surfview Road, thus including the subject property (see Figure 3). This is expected to comprise approximately 1 tonne sandstone boulders. These works would be expected to provide some protection to the property from coastal erosion/recession, but cannot be relied upon to prevent erosion in a severe storm over the design life.

³ 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) in February 2014



Figure 2: View of subject property (dwelling at arrow) from Basin Beach on 8 September 2019, looking west



Figure 3: Rock revetment visible at 5, 7 and 9 Surfview Road in 1980 (sourced from CZMP)

4. PROPOSED DEVELOPMENT

It is proposed to extend the existing dwelling landward with a basement level (with two new covered car spaces, carport, new bin storage area, entry and replacement of existing access stairs with storage below) at a finished floor level of 6.7m AHD (6.5m AHD for the carport), and a ground level above (with a gym, courtyard, study, bathroom and family room) at a finished floor level of 9.3m AHD. Various internal alterations and additions are also proposed to the existing dwelling.

5. SUBSURFACE CONDITIONS

There are no known geotechnical investigations that have been undertaken at the subject property, but it can be noted that a geotechnical investigation at the adjacent property to the south (3 Surfview Road) by Crozier Geotechnical Consultants (2014) found low strength bedrock at a level of about 1.5m AHD on the seaward side of the dwelling at that property.

6. EROSION/RECESSION COASTLINE HAZARDS

6.1 Acceptable Risk Lines

In the CZMP, 'acceptable risk' setback lines were defined at the subject property for a 60-year planning period, based on consideration of the risk of coastal erosion/recession extending into the property. Two lines were defined (see Figure 4⁴), namely the "acceptable risk line for new development on conventional foundations"⁵ and "acceptable risk line for new development on piled foundations"⁶.

It is evident that part of the proposed extension extends seaward of the "acceptable risk line risk for new development on conventional foundations". Part of the existing development extends seaward of the "acceptable risk line for new development on piled foundations".

The "acceptable risk line for new development on piled foundations" can be adopted as the Coastline Management Line (as per the Coastline Policy) at the subject property. The proposed extension (new portion of the development) is landward of the Coastline Management Line, as required based on Section 8.1(iii) of the Coastline Policy.

An entirely sandy subsurface above -1m AHD was assumed in the derivation of these lines, thus ignoring the presence of bedrock (likely to be at about 1.5m AHD, see Section 5) and existing protection works (see Section 3).

⁴ Note that the property boundary depicted in Figure 4 is not survey accurate, and the positions of the acceptable risk lines should not be scaled relative to this boundary.

⁵ Conventional foundations include slab-on-ground, strip footings or shallow piers.

⁶ Where the piled foundations are deep (generally several metres in length) and are designed to support a structure if undermined by coastal erosion.

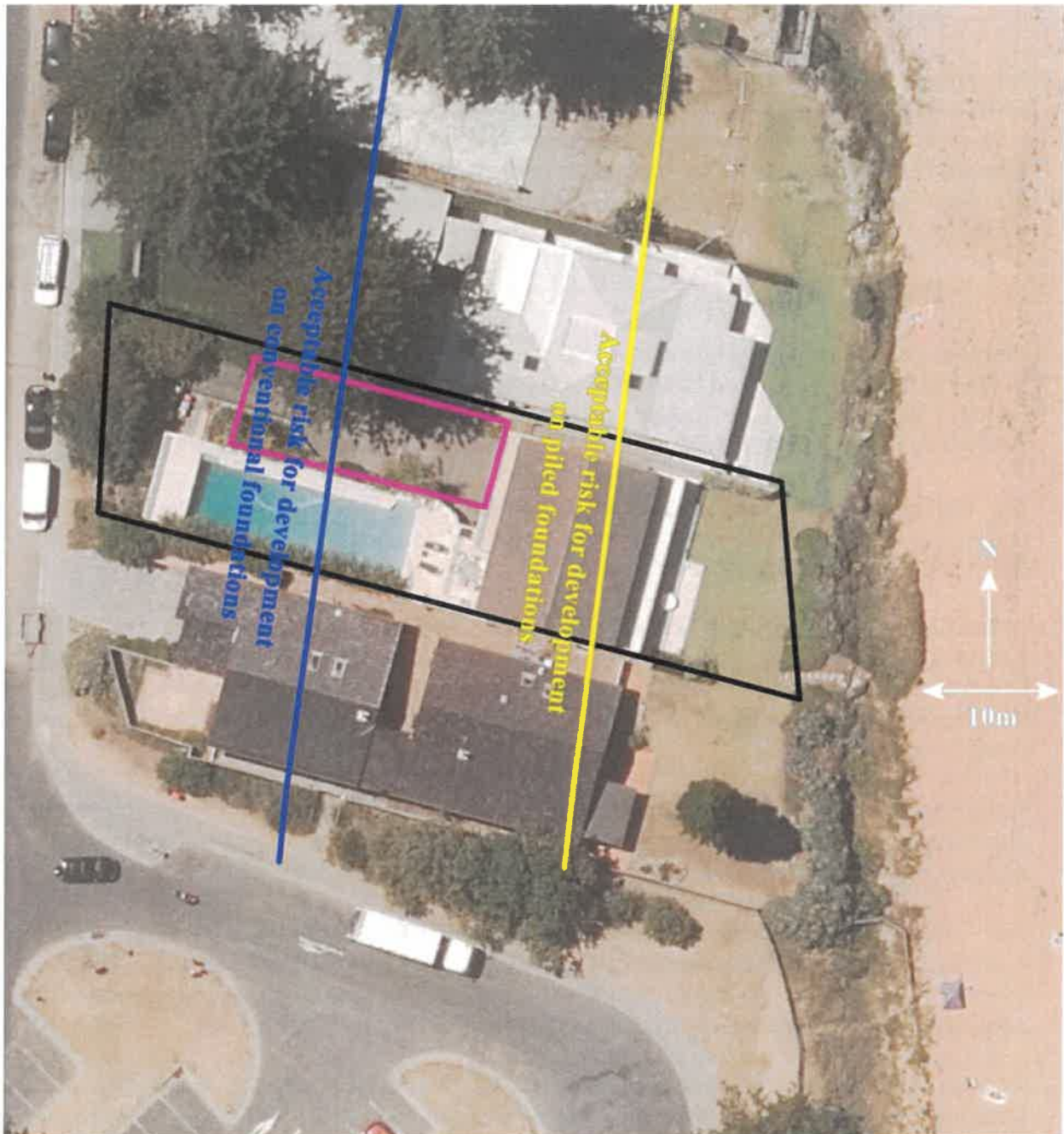


Figure 4: CZMP acceptable risk lines at subject property, with proposed development (roof) outline in magenta (aerial photograph taken February 2014)

6.2 Foundation Requirements

Where practical, it is recommended that the extension is structurally detached from the existing dwelling such that if the existing dwelling was undermined by coastal erosion/erosion in the future, the risk of damage to the extension would be reduced. For the portion of the extension seaward of the “acceptable risk line for new development on conventional foundations”, it is recommended that this is founded on deep foundation piles, although it is recognised that the extension may cease to be a useful structure if the existing dwelling is lost in the future. It is unlikely to be practical to retrofit deep foundation piles to the existing dwelling, as this would be highly invasive to integrate into the structure.

It is recommended that a minimum depth of piling for the extension is adopted based on the distance seaward of the “acceptable risk line for new development on conventional foundations” (with this distance denoted as X herein). Pile depths should be derived ignoring the upper Z metres of soil, where Z is equal to $X \tan(33^\circ)$ based on an angle of repose (Φ) for sand of 33° . That is, the upper 7.8m of soil should be ignored in defining the depth of piles at the seaward edge of the proposed extension, unless bedrock limits that depth⁷.

As part of detailed design, the structural engineer should allow for sand slumping forces in the seaward direction and wave forces in the landward direction on the piles, as advised by a coastal engineer.

No piling is required (from a coastal engineering perspective) landward of the “acceptable risk line for new development on conventional foundations”. That stated, piling may still be desirable landward of this line to minimise the risk of differential settlement, subject to geotechnical and structural engineering advice.

7. COASTAL INUNDATION AND WAVE RUNUP

Wave runup levels at Basin Beach in a severe storm may exceed 8m AHD, particularly taking sea level rise into account over the next 60 years. For the purpose of the report herein, a Coastline Planning Level of 8.5m AHD can be adopted on the seaward side of the development, which does not apply on the landward side of the development. Note that a freeboard does not need to be added to this.

Given that ground levels reach over 9m AHD seaward of the existing development, wave runup is not a significant risk to the proposed development over the design life while the existing dune is in place. However, the dune is projected to be removed in a severe storm event over the design life considering erosion and long-term recession.

To reduce the risk of wave runup impacting the proposed extension, it is recommended that:

- ground levels are contoured to direct any wave runup that could flow landward away from any door or other entries to the dwelling;
- a difference of 0.5m is maintained between natural ground levels and the basement finished floor level (where possible);
- the basement floor and walls up to 0.5m above the floor comprise materials that can tolerate inundation, such as concrete or tiles;
- any electrical equipment, wiring, and any other service pipes and connections in the dwelling that could be damaged by inundation are located at least 0.5m above the basement floor, or waterproofed if below this;
- only items that can withstand periodic inundation are placed within the basement within 0.5m above the floor level; and
- fuels and other chemicals or potentially toxic materials are stored at least 0.5m above the floor or in watertight containers.

⁷ That is, the piles would need to extend below this 7.8m depth, unless limited by bedrock.

8. MERIT ASSESSMENT

8.1 State Environmental Planning Policy (Coastal Management) 2018

8.1.1 Preamble

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

8.1.2 Clause 13

Based on Clause 13(1) of SEPP Coastal, “development consent must not be granted to development on land that is within the coastal environment area unless the consent authority 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 development would not be expected to adversely affect the biophysical, hydrological (surface and groundwater) and ecological environments, being constructed on an already developed property and with stormwater being discharged to the road gutter as at present.

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 development would not be expected to 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), the proposed development would not impact marine vegetation, native vegetation and fauna and their habitats (of significance, which are not known or expected to exist at the property, given its current residential land use), undeveloped headlands and rock platforms, with none of these items in proximity. 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 (or would be supported above wave action in a severe coastal storm).

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

With regard to (f), a search of the Office of Environment and Heritage “Aboriginal Heritage Information Management System” (AHIMS) was undertaken on 7 November 2019. This indicated that there are no particular Aboriginal sites recorded nor Aboriginal Places declared within at least 200m of the subject property.

With regard to (g), the proposed extension would generally not be expected to interact with the surf zone over its design life (or would be supported above wave action in a severe coastal storm).

Based on Clause 13(2) of SEPP Coastal, “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 any potential adverse impacts referred to in Clause 13(1).

8.1.3 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 landward of the existing dwelling, 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 8.1.2, there are no particular Aboriginal sites recorded nor Aboriginal Places declared within at least 200m of the subject property.

With regard to (a)(v), the nearest environmental heritage items to the subject property listed in Schedule 5 of *Pittwater Local Environmental Plan 2014* are the ocean pool at the southern end of Basin Beach (about 190m from the subject property) and the Norfolk Island Pines south of the property and north of Mona Vale SLSC (a minimum of about 40m from the property). The proposed development would not be expected to impact on these locations.

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.

8.1.4 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”.

if the recommendations outlined herein are followed, the proposed development (being founded on deep piles) would not increase the risk of coastal hazards on the subject property or adjacent properties over the design life.

8.1.5 Synthesis

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

8.2 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 8.1.3 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 would not impact on public open space.

With regard to (a)(v), the proposed development would generally not be expected to interact with the surf zone over its design life (or would be supported above wave action in a severe coastal storm), 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.

8.3 *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 “Coastal erosion / wave inundation” area on the Coastal Risk Planning Map (Sheet CHZ_018). 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), if the recommendations outlined herein are followed the proposed development would not increase coastal risks nor alter coastal processes and the impacts of coastal hazards over its design life, as it is to be suspended on piles for an acceptably rare storm over an acceptably long life.

With regard to (c) and (g), founding the proposed development on piles is an appropriate measure to achieve an acceptably low risk to property and life from coastal risks. With regard to (d), founding the proposed development on piles also minimises the adverse effects from the impact of coastal processes and the exposure to coastal hazards for the proposed development,

and it is located landward of the Immediate Hazard Line. 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 acceptable risk lines and wave runup levels adopted incorporating sea level rise projections.

8.4 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 8.2 and 8.3, if the recommendations outlined herein are followed the proposed development would be 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 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 has been recommended for within 0.5m of the basement floor (see Section 7). The Coastline Planning Level does not apply on the landward side of the existing dwelling.

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

For Item (e), this requirement is noted.

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

For Items (g) and (h), this was noted in Section 7 in relation to the basement floor level.

Item (i) is not applicable.

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

For Item (k), the property is not mapped as being affected by catchment flooding.

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

9. CONCLUSIONS

The proposed development would be at an acceptably low risk of damage (over a reasonable 60 year design life) from erosion/recession if founded as outlined in Section 6.2, and from coastal inundation and wave runup if the measures outlined in Section 7 are adopted.

The proposed development satisfies the requirements of *State Environmental Planning Policy (Coastal Management) 2018* (Clauses 13, 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.

10. REFERENCES

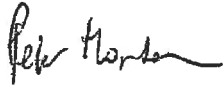
Crozier Geotechnical Consultants (2014), *Report on Geotechnical Investigation for Proposed Sea Wall Structure, 3 Surfview Road, Mona Vale*, Project No. 2014-057.1, 21 October

11. 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

This report has been prepared by Horton Coastal Engineering Pty Ltd on behalf of and for the exclusive use of Lex and Belinda Pedersen and Vaughan Milligan Development Consulting (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.

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 Lex & Belinda Pedersen
Name of Applicant
Address of site 5 Surfview Road Mona Vale

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

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

on this the 20 November 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 5 Surfview Road Mona Vale

Report Date: 20 November 2019

Author: Horton Coastal Engineering Pty Ltd

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

See Section 2 and Section 10 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 Lex & Belinda Pedersen
Name of Applicant
Address of site 5 Surfview Road Mona Vale

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 5 Surfview Road Mona Vale
Report Date: 20 November 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 4 is considered to be sufficient
- ☐ Subsurface investigation required
☒ No Justification Referred to Crozier (2014) - additional investigations not required for DA but for detailed design later
☐ Yes Date conducted
- ☒ 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

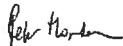


Development Controls as described in the Pittwater Coastline Risk Management Policy have been specified



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

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