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Northern Beaches Council
Attention: Mr Donald Gibson
c/- Mr Geoff Bonus
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Date:	31 January 2023	Contact name:	Greg Britton
Your reference:		Telephone:	02 8854 5002
Our reference:	PA3341_CA report for DA	Email:	greg.britton@rhdhv.com
Classification:	Project related		

Dear Geoff

FRESHWATER SLSC ALTERATIONS AND ADDITIONS – COASTAL ASSESSMENT REPORT FOR DEVELOPMENT APPLICATION

Further to recent discussions, we are pleased to set out in this letter the Coastal Assessment Report for the proposed alterations and additions to the Freshwater Surf Life Saving Club (SLSC).

1. BACKGROUND

1.1 Outline of Proposed Alterations and Additions

The Freshwater SLSC building complex comprises three sections constructed at different times:

- the 'old' SLSC building located on the seaward side of the building complex, constructed in 1935;
- the SLSC extension located on the landward side of the building complex, constructed in 1986; and
- the Heritage Room situated between the old SLSC building and the extension, constructed in 2009.

The proposed alterations and additions are shown on Bonus & Associates Drawing Nos DA200 to DA218, all Issue P1, dated 9.12.22, and can be described as follows:

- to the 1935 building: Refurbishment of the existing internal and external building fabric and seaward extension of the existing Level 2 decking. The width of the extension seawards is approximately 2.5m. The level of the deck is 7.324m AHD to match the existing Level 2 floor level. The extended deck would be covered by a retractable fabric awning;
- to the 1986 extension: Extension of the existing basement storage area at Level 1, removal of the existing public changerooms and amenities, an increase in size of the recreation hall, provision of a restaurant and café and new toilet facilities for use in conjunction

with the clubhouse accommodation at Level 2, new training rooms, gymnasium and refurbished Caretaker's Apartment at Level 3, installation of a new roof, a passenger lift servicing all three levels, and other alterations to provide equitable access; and

- to the 2009 Heritage Room: Demolition of the room and the existing clubhouse entry, construction of a new wing to provide entry, multi-purpose hall, double height space to be used for functions and exhibitions, including as a Museum of Surf in the northern beaches.

The design life of the proposed alterations and additions is a minimum of 60 years.

1.2 Pre-lodgement Meeting

A Pre-lodgement meeting was held with Council staff on 22 April 2016. Meeting notes issued by Council following the meeting included the following comments in relation to a coastal assessment:

> *Matters related to the impact of the development on coastal processes (Clause 5.5 of WLEP 2011 and Part E9 WDCP 2011) and compliance with SEPP71 can be addressed within the Statement of Environmental Effects. It is recommended that the limited impact of the proposal on coastal processes be confirmed by a coastal engineer. A short letter or email will be sufficient. A coastal hazards assessment does not need to be submitted with this proposal[1].*

2. BRIEF OUTLINE OF HISTORIC BEACHFRONT DEVELOPMENT, COASTAL PROCESSES AND COASTAL HAZARDS

2.1 Surf Club Buildings, Seawall and Dune Construction

Freshwater SLSC was formed in 1907. The first clubhouse was washed away in storms, a second clubhouse lasted from 1917 to 1935. The existing older SLSC building was opened in 1935, the newer SLSC extension was constructed in 1986, as noted in Section 1.1.

The older SLSC building had been threatened and damaged by storms in May-June 1974 (refer Figure 2-1 and Figure 2-2) and was intended to be sacrificial when the newer SLSC extension was constructed behind it. The concept was one of 'planned retreat', such that the new structure could stand-alone once the old building was lost.

[1] *WLEP is Warringah Local Environmental Plan. WDCP is Warringah Development Control Plan. SEPP71 is State Environmental Planning Policy No. 71 – Coastal Protection, however this SEPP has now been replaced by State Environmental Planning Policy (Resilience and Hazards) 2021. It is also noted that reference to Clause 5.5 of WLEP 5.5 should probably be to Clause 6.5 as Clause 5.5 has been repealed and Clause 6.5 is titled Coastline Hazards.*

Figure 2-1 Erosion in front of the Freshwater SLSC in 1974 (Source: UNSW Water Research Laboratory)

Figure 2-2 Erosion due to the 1974 storms and damage to the pavement and roller shutters (Source: UNSW Water Research Laboratory)

A vertical sandstone seawall and promenade (similar to Manly Ocean Beach) were constructed north of the SLSC building in 1931 (refer Figure 2-3). These structures were buried by artificial dunes constructed in the period 1979 to 1981 under the NSW Government's Beach Improvement Program (refer Figure 2-4), with the beach being further stabilised by diverting the northern stormwater outlet to the northern rock platform. Supply of sand to the beach for construction of the dunes comprised two quantities of 12,000m^3 sourced from dredging of Narrabeen Lagoon.

Figure 2-3 Freshwater Beach seawall and promenade in 1974 (Source: UNSW Water Research Laboratory)

Figure 2-4 Freshwater Beach following dune construction 1980 (Source: State Library of NSW)

WRL (2016) carried out an analysis of sand volume change utilising aerial photography and surveys from 15 dates between 1951 and 2016 and found that the dunes at Freshwater Beach had been accreting at an average rate of 0.32m/yr, both before and after dune construction in the period 1979 to 1981. This accretion was despite ongoing sea level rise, which would cause shoreline recession, plus a level of incidental/accidental human removal of sand from the beach.

2.2 Coastal Processes

WRL (2016) examined a range of coastal processes at Freshwater Beach including water levels, extreme waves, wave runup, sediment characteristics, beach volume changes and the overall sediment budget. Of most relevance to the current assessment is wave runup and beach volume changes.

WRL (2016) estimated the 100 year Average Recurrence Interval (ARI) wave runup level exceeded by 2% of the waves ($R_{2\%}$) to be 5.9m AHD, for present day conditions (2016)[2].

As noted in Section 2.1, WRL (2016) found that the dunes at Freshwater Beach had been accreting at a rate of 0.32m/yr, both before and after dune construction[3]. It was further noted that in the absence of any significant change to the sediment budget for the beach system (not expected) future sea level rise would have to reach 10mm/yr for Freshwater Beach to switch to long term recession.

[2] *Due to the variability of wave runup levels between individual waves and groups of waves, adoption of the $R_{2\%}$ level is a common approach.*

[3] *When adjustment was made to allow for recession due to a sea level rise of 1.3mm/yr the accretion rate increased to 0.38m/yr.*

2.3 Coastal Hazards

As noted in Section 1.2, Council staff indicated in notes following the Pre-lodgement Meeting that a coastal hazards assessment did not need to be submitted with the development proposal. Nevertheless, for context, some discussion is provided below in regard to the three hazards of interest, namely:

- beach erosion;
- shoreline recession; and
- coastal inundation.

It is convenient to consider the beach erosion and shoreline recession hazard jointly, followed by the coastal inundation hazard.

2.3.1 Beach erosion and shoreline recession hazard

WorleyParsons (2012) estimated the position of the Immediate Hazard Line (2012), and the 2050 Hazard Line due to erosion and recession, based on a number of parameters selected at the time, including:

- pre-storm beach profile at 2004. This would be somewhat conservative on the basis of the accretion identified by WRL (2016), ie. the beach profile could be expected to have accreted further seaward by approximately 3m in the period 2004 to 2012 (8 years times 0.38m/yr), with an associated seaward advancement of the hazard lines;
- design storm erosion demand of 250m^3/m, typical of an open coast value. WorleyParsons acknowledged this value was likely to be conservatively high for adoption at Freshwater Beach due to the indented nature of this beach;
- long term recession due to net sediment loss of 0.0m/yr. This is conservative given the accretion of the dunes of 0.38m/yr determined in WRL (2016);
- sea level rise at 2050 of 0.4m, relative to 1990. Taking into account the actual sea level rise over the period from 1990 to 2012, the actual sea level rise applied in WorleyParsons (2012) was 0.34m; and
- conversion of sea level rise to a shoreline recession due to sea level rise based on a multiplier of 40 (the so-called Bruun factor). A value of 40 was also referred to in WRL (2016) and is considered reasonable.

The Immediate Hazard Line and the 2050 Hazard Line determined by WorleyParsons (2012) are shown in Figure 3-1[4].

The hazard lines indicated that the old SLSC building could be undermined in the immediate term in an event comparable to the 1974 storms, and that at 2050, for the parameters adopted, the erosion escarpment in the design storm would just reach the seaward side of the SLSC extension. The position of the hazard lines in Figure 3-1 would be expected to be conservative due to the conservatism in a

[4] *The hazard lines corresponded to the position of the so-called Zone of Slope Adjustment (ZSA), as defined in Nielsen et al (1992). Physically speaking, this is the position of the crest of the erosion escarpment after the design storm, following slumping of the near-vertical sand face. A further zone extends further landward of the ZSA, termed the Zone of Reduced Foundation Capacity (ZRFC), where a reduced bearing capacity of the sand would exist due to the adjacent erosion escarpment.*

number of the parameters selected to establish the lines, as noted above, and the deterministic methodology adopted[5].

As part of this coastal assessment report a quick but experienced re-appraisal of the hazard lines determined by WorleyParsons (2012) has been carried out. For this re-appraisal a planning period of 60 years has been adopted, nominally from 2025 to 2085.

The following parameters have been considered:

- pre-storm beach profile: A beach profile up to 8m further seaward than that adopted in WorleyParsons (2012), based on an accretion rate of 0.38m/yr determined in WRL (2016) and a time period of 21 years (2004 to 2025);
- design storm erosion demand: A value of 250m^3/m, which is known to be conservative but has been retained in the absence of any further detailed analysis;
- net sediment loss: Actual net sediment gain (accretion), as determined in WRL (2016), of 0.38m/yr;
- sea level rise: Based on the latest Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6), a value to 2085 relative to 2025 of 0.5m, expected to be somewhat conservative; and
- Bruun factor: Value of 40 as per WorleyParsons (2012) and WRL (2016).

Based on the above parameters and again using a deterministic methodology, the Immediate Hazard Line (ZSA) would be up to approximately 8m further seaward than that shown in Figure 3-1, or just seaward of the old SLSC building. By virtue of the accretion of the beach approximately balancing the shoreline recession due to sea level rise, the 2085 Hazard Line would be in a similar position to Immediate Hazard Line.

Accordingly, it would be expected that:

- the old SLSC building could be threatened by erosion over the design life in a design storm similar to the 1974 event, and would be situated within the ZRFC following such an event or lesser events. It should be considered that damage to the old SLSC building could occur within the design life; and
- the structures landward of the old SLSC building are unlikely to be threatened by erosion or be located within the ZRFC during their design life.

[5] *In the deterministic methodology, in addition to selection of single parameters that are typically conservative, the approach constrains the design storm to occur at the end of the planning period at the time of maximum shoreline recession, which is also conservative.*

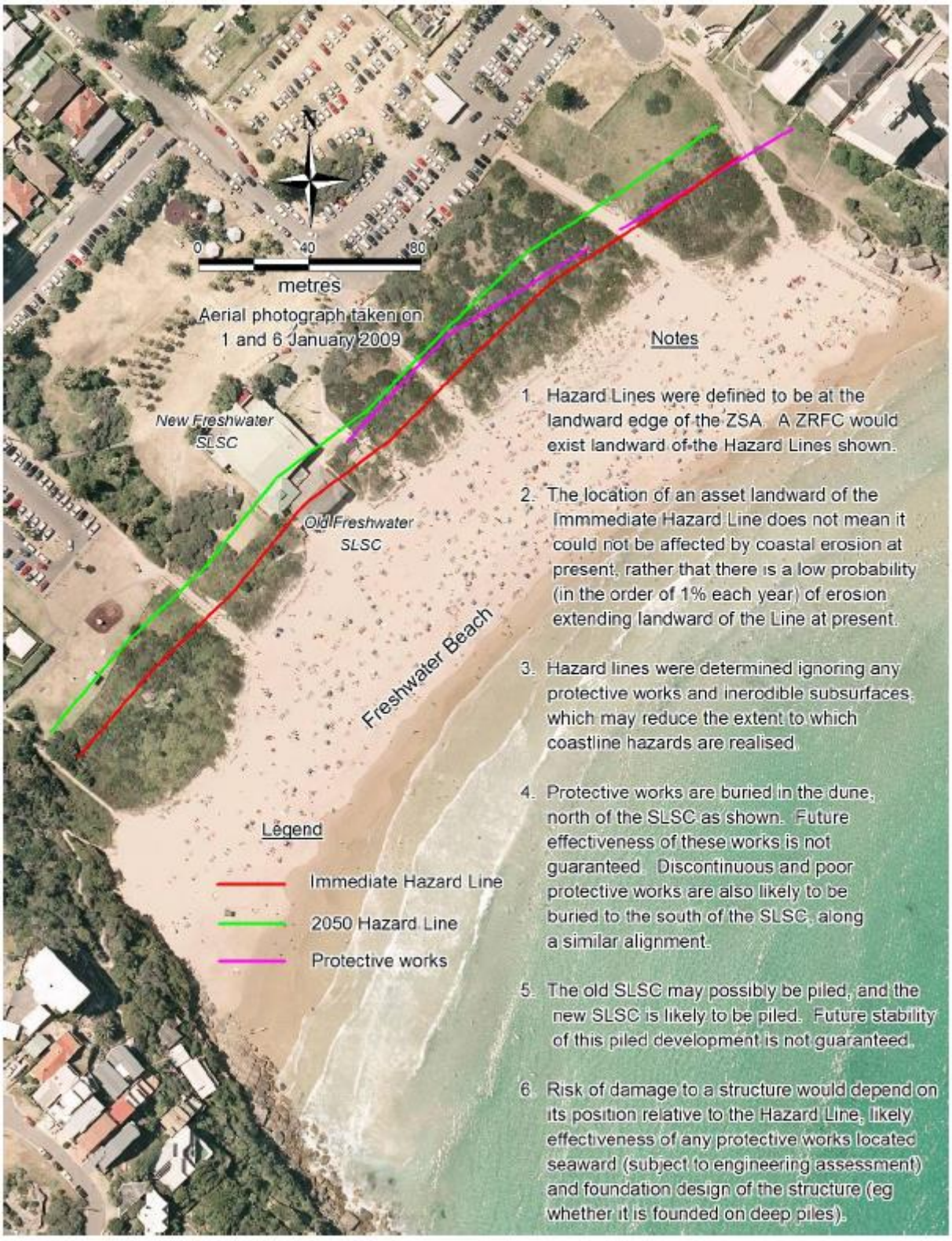

Figure 3-1 Immediate and 2050 Coastal Hazard Lines at Freshwater Beach (ignoring protective works and inerodible surfaces) from WorleyParsons (2012) (Figure 77)

2.3.2 Coastal inundation hazard

As noted in Section 2.2, the estimated present day (2016) wave runup level set out in WRL (2016) is 5.9m AHD. This inundation level would increase with sea level rise, with the increase being approximately equal to the amount of the projected sea level rise. As such, the inundation level at 2085 would be approximately 5.9m AHD + 0.5m = 6.4m AHD. This level is below the proposed level of the seaward extension of the existing Level 2 decking in the old SLSC (7.324m AHD). As such, it is unlikely the deck would be inundated during the design storm over the design life, but it is expected it would be subject to spray and splashing by waves during the design storm.

3. COASTAL ASSESSMENT

This section sets out a review of the proposal in relation to the following:

- State Environmental Planning Policy (Resilience and Hazards) 2021;
- Clause 6.5 of Warringah Local Environmental Plan 2011; and
- Part E9 of Warringah Development Control Plan 2011.

3.1 State Environmental Planning Policy (Resilience and Hazards) 2121

3.1.1 General

The relevant part of the State Environmental Planning Policy (Resilience and Hazards) 2021 is Part 2.2 Development controls for coastal management areas. Within this Part there are four relevant Divisions as follows:

- Division 2 Coastal vulnerability area
- Division 3 Coastal environment area
- Division 4 Coastal use area
- Division 5 General

The following sections consider each of these Divisions in turn.

3.1.2 Division 2 Coastal Vulnerability area

As yet no Coastal Vulnerability Area Map has been prepared and therefore no coastal vulnerability area has been identified. On the one hand it could be considered that due to the absence of a Map the matter of development within a coastal vulnerability area does not apply. However, it is clear that the proposed works would be located within a coastal vulnerability area once mapped, hence consideration is given to this matter below. The relevant Clause 2.9 is reproduced followed by comments and assessment in Table 3-1.

2.9 Development on land within the coastal vulnerability area

> Development consent must not be granted to development on land that is within the area identified as "coastal vulnerability area" on the *Coastal Vulnerability Area Map* unless the consent authority is satisfied that—

(a) if the proposed development comprises the erection of a building or works—the building or works are engineered to withstand current and projected coastal hazards for the design life of the building or works, and

(b) the proposed development—
  (i) is not likely to alter coastal processes to the detriment of the natural environment or other land, and
  (ii) is not likely to reduce the public amenity, access to and use of any beach, foreshore, rock platform or headland adjacent to the proposed development, and
  (iii) incorporates appropriate measures to manage risk to life and public safety from coastal hazards, and

(c) measures are in place to ensure that there are appropriate responses to, and management of, anticipated coastal processes and current and future coastal hazards.

Table 3-1 Coastal Vulnerability Area - Comments and Assessment

SEPP Clause 2.9	Comments/Assessment
Development consent must not be granted to development on land that is within the area identified as "coastal vulnerability area" on the *Coastal Vulnerability Area Map* unless the consent authority is satisfied that:	
(a) if the proposed development comprises the erection of a building or works—the building or works are engineered to withstand current and projected coastal hazards for the design life of the building or works	The proposed development would comprise 'works'. The works situated within building structures landward of the old SLSC building would not be expected to be subject to current and projected coastal hazards for their design life. The works within the old SLSC could be threatened by erosion over their design life and would be situated within the Zone of Reduced Foundation Capacity. This risk has been known and accepted by Council since the 1980s. The proposed seaward extension of the Level 2 decking in the old SLSC is above the predicted coastal inundation level over the design life but is expected to be subject to spray and splashing by waves during the design storm. This should be considered in the selection of building materials.
(b) the proposed development: (i) is not likely to alter coastal processes to the detriment of the natural environment or other land	The proposed works are not likely to alter coastal processes to the detriment of the natural environment or other land as the works are either landward of coastal processes, or are situated within existing building structures, or are at a level above the influence of coastal processes.
(ii) is not likely to reduce the public amenity, access to and use of any beach, foreshore, rock platform or headland adjacent to the proposed development	The proposed works are not likely to reduce the public amenity, access to and use of any beach, foreshore, rock platform or headland adjacent to the proposed works, as the works are situated within existing building structures. The proposed works would enhance public amenity and use of the beach through the upgrading of existing facilities and inclusion of additional facilities.
(iii) incorporates appropriate measures to manage risk to life and public safety from coastal hazards	The proposed works are primarily located within existing building structures and do not increase the risk to life and public safety from coastal hazards. The proposed seaward extension of the Level 2 decking in

SEPP Clause 2.9	Comments/Assessment
	the old SLSC is above the predicted coastal inundation level over the design life.
(c) measures are in place to ensure that there are appropriate responses to, and management of, anticipated coastal processes and current and future coastal hazards	It should not be necessary to manage anticipated coastal processes and current and future coastal hazards in the case of works landward of the old SLSC. In the case of the old SLSC, Council has in place a Coastal Erosion Emergency Action Subplan for Beaches on the Northern Beaches, including Freshwater Beach, to ensure appropriate responses to, and management of, anticipated coastal processes and current and future coastal hazards.

3.1.3 Division 3 coastal environment area

The relevant clause is reproduced below followed by comments and assessment in Table 3-2.

2.10 Development on land within the coastal environment area

(1) 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.

(2) Development consent must not be granted to development on land to which this section 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 subsection (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.

(3) This section does not apply to land within the Foreshores and Waterways Area within the meaning of *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*.

Table 3-2 Coastal Environment Area - Comments and Assessment

SEPP Clause 2.10	Comments/Assessment
(1) 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	Not a coastal engineering consideration. However, it can be stated that the proposed works would not cause an adverse impact to surface and groundwater.
(b) coastal environmental values and natural coastal processes	The proposed works would not be likely to cause an adverse impact on coastal environmental values and natural coastal processes being located primarily within existing building structures and, in the case of the seaward extension of the Level 2 decking in the old SLSC, being located above the predicted coastal inundation level over the design life.
(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	The proposed works would have no adverse impact on water quality of the marine estate or sensitive coastal lakes identified in Schedule 1 of the Marine Estate Management Act 2014 as they would not generate runoff during operation and are remote from these systems. Standard water quality controls should be incorporated during building works, such as those outlined in the 'Blue Book'.
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms	The proposed works would have no adverse impacts on marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms, as they are located within existing building structures and are remote from these features.
(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	The proposed works would have no adverse impacts on 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, as they are located within existing building structures. Equitable access within the existing buildings would be improved.
(f) Aboriginal cultural heritage, practices and places	Not a coastal engineering consideration.
(g) the use of the surf zone	The proposed works would not be likely to cause an adverse effect on use of the surf zone as the proposed works are located primarily within existing building structures located at the back of the beach and, in the case of the seaward extension of the Level 2 decking in the old SLSC, are located above the predicted coastal inundation level over the design life. The works would not be located within the surf zone and would not interact with surf zone processes in normal surfing conditions.
(2) Development consent must not be granted to development on land to which this section applies unless the consent authority is satisfied that:	

SEPP Clause 2.10	Comments/Assessment
(a) the development is designed, sited and will be managed to avoid an adverse impact referred to in subsection (1), or	The proposed works are sited to avoid an adverse impact referred to in subsection (1). Council has an adopted position regarding the management of any erosion risk to the old SLSC. Management of erosion risk generally would be in accordance with Council's adopted Coastal Erosion Emergency Action Subplan for Beaches.
(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or	The impact has been reasonably avoided due to the siting of the proposed works, hence consideration of 2(b) is not necessary.
(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.	The impact has been reasonably avoided due to the siting of the proposed works, hence consideration of 2(c) is not necessary.

3.1.4 Division 4 Coastal use area

The relevant clause is reproduced below followed by comments and assessment in Table 3-3.

2.11 Development on land within the coastal use area

(1) 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.

(2) This section does not apply to land within the Foreshores and Waterways Area within the meaning of *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*.

Table 3-3 Coastal Use Area - Comments and Assessment

SEPP Clause 2.11	Comments/Assessment
(1) 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	The proposed works are not likely to cause an adverse impact, refer to comments/assessment under Clause 2.9 (b)(ii) and Clause 2.10 (1)(e).
(ii) overshadowing, wind funnelling and the loss of views from public places to foreshores,	Not a coastal engineering consideration.
(iii) the visual amenity and scenic qualities of the coast, including coastal headlands	Not a coastal engineering consideration.
(iv) Aboriginal cultural heritage, practices and places	Not a coastal engineering consideration.
(v) cultural and built environment heritage	Not a coastal engineering consideration.
(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	The proposed works are sited such that they are not likely to cause an adverse impact in relation to (1)(a)(i), which is the applicable coastal engineering consideration under (1).
(ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or	The impact has been reasonably avoided due to siting of the proposed works, hence consideration of (1)(b)(ii) is not necessary.
(iii) if that impact cannot be minimised—the development will be managed to mitigate that impact	The impact has been reasonably avoided due to siting of the proposed works, hence consideration of (1)(b)(iii) is not necessary.
(c) has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development	Not a coastal engineering consideration.

3.1.5 Division 5 General

The relevant clause is reproduced below followed by comments and assessment in Table 3-4.

2.12 Development in coastal zone generally—development not to increase risk of coastal hazards

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.

Table 3-4 General – Comments and Assessment

SEPP Clause 2.12	Comments/Assessment
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 works are not likely to cause increased risk of coastal hazards on the subject land or other land as the proposed works are either located landward of coastal processes, or are situated within existing building structures, or are at a level above the influence of coastal processes.

3.2 Clause 6.5 of Warringah Local Environmental Plan 2011

Clause 6.5 is reproduced below. It is evident from (2) when the Coastline Hazard Map is examined that the Clause relates only to Collaroy Beach, Narrabeen Beach and Fishermans Beach. Accordingly, it would not appear relevant to Freshwater Beach. In any case the intent of Clause 6.5 is considered to be addressed in the earlier assessment of the proposed works against State Environmental Planning Policy (Resilience and Hazards) 2021.

6.5 Coastline hazards

(1) The objectives of this clause are as follows -
  (a) to avoid significant adverse impacts from coastal hazards,
  (b) to enable evacuation of coastal risk areas in an emergency,
  (c) to ensure uses are compatible with coastal risks,
  (d) to preserve and protect Collaroy Beach, Narrabeen Beach and Fishermans Beach as national assets for public recreation and amenity.

(2) This clause applies to the land shown on the Coastline Hazard Map as -
  (a) Area of Wave Impact and Slope Adjustment, and
  (b) Area of Reduced Foundation Capacity.

(3) 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) will not significantly adversely affect coastal hazards, and
  (b) will not result in significant detrimental increases in coastal risks to other development or properties, and
  (c) will not significantly alter coastal hazards to the detriment of the environment, and
  (d) incorporates appropriate measures to manage risk to life from coastal risks, and
  (e) avoids or minimises exposure to coastal hazards, and
  (f) makes provision for relocation, modification or removal of the development to adapt to coastal hazards and NSW sea level rise planning benchmarks.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the foundations of the development have been designed to be constructed having regard to coastal risk.

(5) A word or expression used in this clause has the same meaning as it has in the *NSW Coastal Planning Guidelines: Adapting to Sea Level Rise (*ISBN 978-1-74263-035-9*)* published by the NSW Government in August 2010, unless it is otherwise defined in this Plan.

3.3 Part E9 of Warringah Development Control Plan 2011

Part E9 is reproduced below. As in the case of Clause 6.5 of WLEP 2011, Part E9 of WDCP 2011 relates only to Collaroy Beach, Narrabeen Beach and Fishermans Beach. Again, the intent of Part 9 is considered to be addressed in the earlier assessment of the proposed works against State Environmental Planning Policy (Resilience and Hazards) 2021.

E9 Coastline Hazard

Applies to Land

This control applies to land identified on the Warringah LEP Coastline Hazard Map.

Objectives

• To minimise the risk of damage from coastal processes and coastline hazards for proposed buildings and works along Collaroy Beach, Narrabeen Beach and Fisherman's Beach.
• To ensure that development does not have an adverse impact on the scenic quality of Collaroy, Narrabeen and Fisherman's Beaches.
• To ensure that development does not adversely impact on the coastal processes affecting adjacent land.
• To retain the area's regional role for public recreation and amenity.

Requirements

1. The risk of damage from coastal processes is to be reduced through having appropriate setbacks and foundations, as detailed in Criteria for the Siting and Design of Foundations for Residential Development (see Policy volume).
2. For development in the area affected by the certified Coastal Zone Management Plan for Collaroy-Narrabeen Beach and Fishermans Beach (Coastal Zone Management Plan), the applicant must demonstrate compliance with the Northern Beaches Coastal Erosion Policy, the Coastal Zone Management Plan and the Collaroy-Narrabeen Protection Works Design Specifications (as amended from time to time).

4. REFERENCES

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

Water Research Laboratory (WRL) (2016), Sand Dune Management at Freshwater Beach, Sydney, WRL Technical Report 2016/05, prepared for Warringah Council, May 2016

WorleyParsons (2012), Coastal Erosion Emergency Action Subplan for Beaches in Warringah – Reference Document, Project No 301015-02236, prepared for Warringah Council, August 2012

I trust the above meets your requirements. Please contact me should you require any clarification or additional information.

Yours faithfully

Greg Britton

Technical Director
Water