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REPORT

Newport SLSC - Alterations and Additions - DA2021/2173

Supplementary Coastal Engineering Report

Client:	King & Wood Mallesons
Reference:	PA2407-102-105-RP-0001
Status:	Final
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1 INTRODUCTION

1.1 Background

In November 2021 Northern Beaches Council (Council) lodged a Development Application, DA2021/2173, seeking to make alterations and additions to the Newport Surf Life Saving Club (SLSC) building with an extension to the northern end and construction of coastal protection works to protect the building from coastal hazards.

Specifically, the proposed works comprised:

- partial demolition of the building
- construction of a new northern section of the building
- reconfiguration of the internal layout of the building
- upgrade to the club and public amenities
- landscape upgrades, and
- coastal protection works, involving a secant pile wall with reinforced concrete capping beam and high-level beach access steps.

The consent authority for the DA was the Sydney North Planning Panel. The Panel determined the DA on 5 October 2022 by way of refusal. The reasons for refusal included:

- the proposal does not satisfactorily address section 27 of the Coastal Management Act 2016
- the proposal does not satisfy clause 4.3 of the Pittwater Local Environmental Plan (LEP) 2014 (this clause relates to the height of buildings)
- the site is not suitable for the proposed development given its exposure to coastal hazards
- alternative design options for such a valuable but exposed asset were not properly considered due to emphasis on heritage and open space protection
- the use of coastal protection works to protect the current building footprint and heritage fabric is questionable given that wave overtopping and inundation of the building would still occur and collateral damage is likely to be caused to the surrounding beach and park, and
- the long term planning for the location's Coastal Management Program (CMP) is yet to be completed. This would facilitate the appropriate assessment of the impacts on the whole coastal compartment, not just the club site.

In November 2022 Council requested a review of the refusal of the DA by the Panel (REV 2022/0024). A range of additional information was supplied with the review application.

At the request of Council, an independent external assessment of the review application in relation to coastal engineering matters was prepared by the writer dated 14 March 2023 (Ref: PA2407-102-105 external DA assnt).

On 4 April 2023 Council commenced Proceedings against the Panel's refusal of the DA. The First Respondent in the Proceedings is Northern Beaches Council (at the control and direction of the Sydney North Planning Panel). The Second Respondent is the Sydney North Planning Panel. A Statement of Facts and Contentions (SOFAC) was filed by the Sydney North Planning Panel on 26 May 2023. A copy of the SOFAC is included in Appendix A.

Council (as Applicant) and the Panel attended a section 34 conciliation conference on 8 September 2023. Following this conference updated documents were prepared by Council and supplied to the Panel on a without prejudice basis.

The conciliation conference was ultimately terminated by the Commissioner as no in-principle agreement could be reached between the parties. As such, the matter is proceeding to a hearing.

This report has been prepared to support an amendment to the application.

1.2 Scope of the Report

The report considers primarily coastal engineering matters. The report also considers beach access as this matter was raised by the Panel in the SOFAC.

A number of revisions to the design of the coastal protection works and beach access in the original DA are proposed having regard to matters raised within the SOFAC and Royal HaskoningDHV's experience. The revisions to the design have been informed by an extensive program of physical model testing carried out at the University of New South Wales Water Research Laboratory (WRL). The physical model testing has assessed wave overtopping (inundation) and hydraulic wave loading for a range of different Average Recurrence Interval (ARI) storm events, different beach profiles (average profile and eroded profile), and with consideration of sea level rise due to climate change over the design life of the SLSC building.

A separate physical model testing report has been prepared by WRL (WRL TR2024/20, August 2024).

1.3 Structure of the Report

The report is structured in the following way:

- Section 2 provides a summary of key site conditions and coastal hazards
- Section 3 sets out a description of the proposed revised beach access and coastal protection works
- Section 4 provides a discussion of alternative options considered for beach access and the coastal protection works
- Section 5 sets out commentary on the contentions filed by the Sydney North Planning Panel
- Section 6 sets out an assessment of the revised beach access and coastal protection works in relation to relevant legislation and Plans
- Section 7 provides a list of References.

2 SUMMARY OF KEY SITE CONDITIONS AND COASTAL HAZARDS

2.1 Site Conditions

2.1.1 General

A range of site conditions influence the design, construction, and impact assessment of the alterations and additions to the SLSC building and the coastal protection works. Several key site conditions are listed below and discussed in the following sections:

- existing rock protection in front of the SLSC building
- geotechnical conditions
- Norfolk Island Pines
- stormwater outlet on the beach south of the SLSC building

2.1.2 Existing Rock Protection

Rock protection exists seaward along the entire length of the SLSC building placed by the then Warringah Council as an emergency response to the May 1974 storm erosion, as reported in Horton Coastal Engineering (HCE)(2021a). A photograph of the rock being placed is shown in Figure 2-1. The rock protection was encountered in geotechnical investigations carried out at the site in 2019 (refer Section 2.1.3).

As a consequence of the storm erosion, it was reported that there was a drop of 3m to 4m from the promenade to the top of the adjacent sand. That observation would indicate an eroded sand level adjacent to the promenade of approximately 1.5m to 2.5m above Australia Height Datum (AHD) (1.5m AHD to 2.5m AHD).[1]

Based on photographic evidence and results of the geotechnical investigation, the existing rock protection cannot be relied upon to provide protection to the SLSC building at the present time or into the future since it does not meet current coastal engineering design standards, for example:

- the rocks are undersized for the incident wave climate experienced in storms (hence would not be hydraulically stable)
- the rocks demonstrate poor interlocking, further adversely affecting stability
- only a single armour layer is likely to exist (not a double armour layer combined with underlayer as is accepted design practice)
- the toe level is high compared to accepted design practice for rock revetments on an open coast beach (the toe level is at approximately 1.8m AHD compared to a typical design level of -1m AHD, hence almost 3m too high presenting an unacceptable undermining risk)

The existing rock protection, when exposed in storms and subject to being strewn across the beach and possibly into the surf zone, also presents a risk to public safety and detracts from the beach amenity.

The existing rock protection also presents an obstruction for installation of coastal protection works that involve piling, which is the proposed approach, as explained further in Section 3.

[1] *Australian Height Datum is approximately equal to mean sea level at present. It is noted that the sand could have been eroded to a lower level than 1.5m AHD to 2.5m AHD at the height of the storm; it is likely partial beach recovery took place prior to conditions being safe to carry out an inspection of the storm damage.*

Figure 2-1 Rock protection being placed seaward of the SLSC building on 28 May 1974 (source: HCE, 2021a)

2.1.3 Geotechnical Conditions

Geotechnical investigations were carried out at the site in 2019 by JK Geotechnics and comprised excavation test pits, Dynamic Cone Penetrometer (DCP) testing, and drilling of four boreholes (HCE, 2021a; JK Geotechnics, 2021).

The test pits and DCPs assisted in establishing the surface level, extent, and structure, of the existing rock protection. The surface level and extent of the existing rock protection is depicted on the drawings for the proposed coastal protection works, as discussed further in Section 3, as this is relevant to constructability and to the coastal assessment for the proposed works.

The results of the geotechnic3al investigation also confirmed two further relevant matters:

- installation of deep piles is feasible
- temporary excavation batters through the sandy profile at a slope of 1 Vertical (V) to 1.5 Horizonal (H) (1V:1.5H) are generally appropriate as a maximum. Temporary batter slopes are an important consideration when excavating near existing footings and tree roots to avoid undermining and damage, for example.[2]

2.1.4 Norfolk Island Pines

Two significant Norfolk Island Pines exist adjacent to the SLSC building, one to the north and one to the south, as shown in Figure 2-2.

[2] *It was noted that some instability of temporary sand batters at a slope of 1V:1.5H may occur at, or below, the level of groundwater seepage especially after rain periods, and sand bagging may be required to stabilise the lower portion of the batters.*

Council proposes to retain these two significant trees; accordingly, it is necessary to ensure that these trees are not adversely impacted during construction of the proposed works or as a consequence of any impacts due to the works. This requirement has influenced the location and alignment of the coastal protection works, in particular, as discussed further in Section 3. It is also noted that an Arborist has been engaged to provide recommendations regarding protection of the two trees and these recommendations have been taken into account.

Figure 2-2 Oblique aerial view of Newport SLSC showing the two significant Norfolk Island Pine trees (source: HCE, 2021a)

2.1.5 Stormwater Outlet South of the SLSC Building

A stormwater outlet is located on the beach approximately 110m south of the SLSC building (refer Figure 2-3). While it is understood this outlet has limited hydraulic capacity (corresponding to less than a 2-year ARI rainfall event) consideration needs to be given to the possibility that a coastal protection works option could impact adversely on the performance of the outlet.

This would be a consideration for the beach nourishment option whereby the intent would be to make the beach sufficiently wide, through importation of sand, that the building is protected from erosion by virtue of the volume of available sand seaward of it. Such widening of the beach would, however, increase the risk of sand blockage of the outlet, adversely affecting upstream flood behaviour, unless the outlet is increased in length commensurately across the beach.

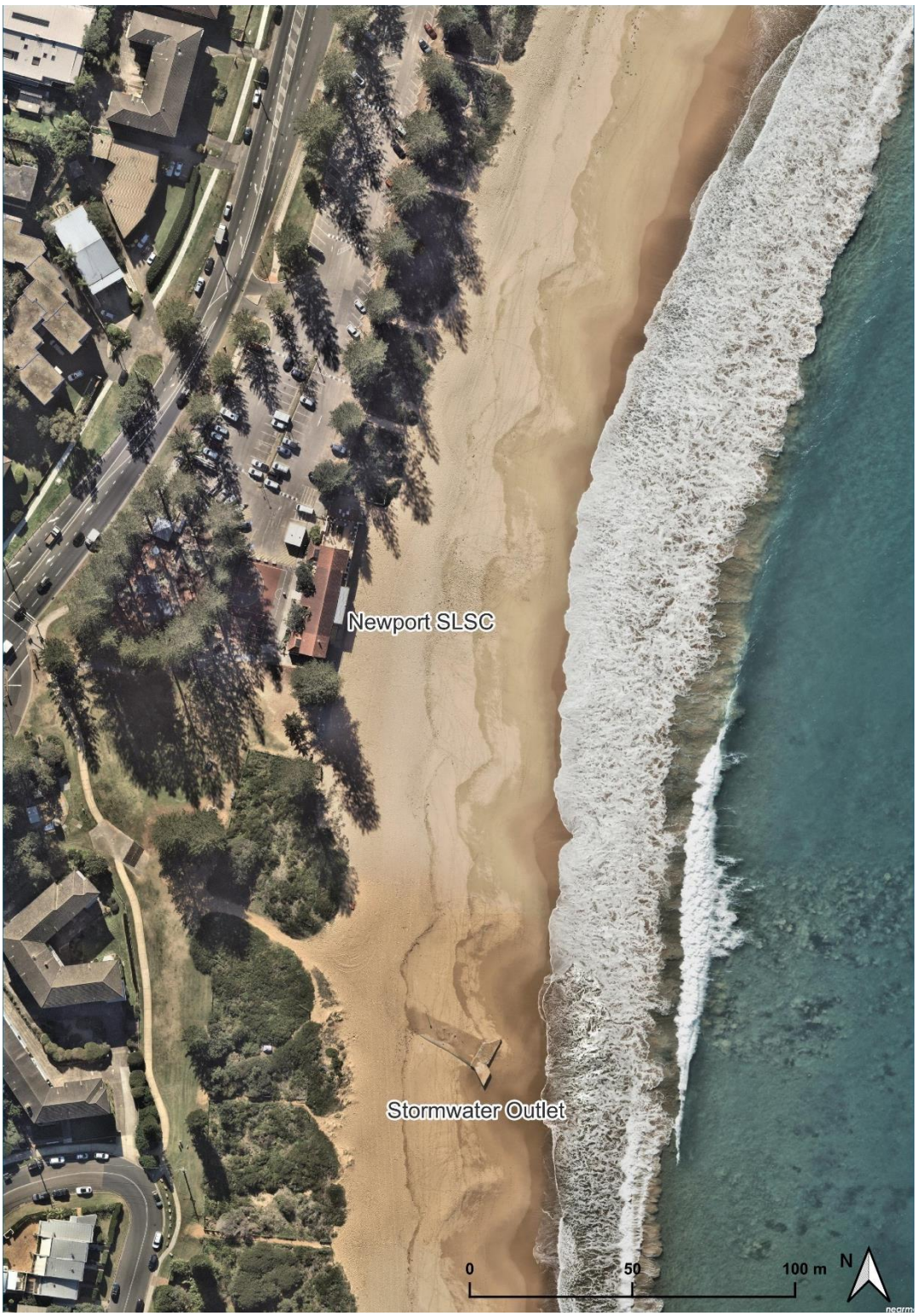


Figure 2-3 Aerial photo of Newport Beach showing the location of the stormwater outlet on the beach south the SLSC building.

2.2 Coastal Hazards

2.2.1 General

The *Coastal Management Act 2016* (CM Act) identifies seven coastal hazards:

- beach erosion
- shoreline recession
- coastal lake or watercourse entrance instability
- coastal inundation
- coastal cliff or slope irritability
- tidal inundation
- erosion and inundation of foreshore caused by tidal waters and the action of waves, including the interaction of those waters with catchment floodwaters.

Of the above seven coastal hazards, the relevant hazards for consideration of the Newport SLSC building are beach erosion, shoreline recession, and coastal inundation. These hazards are briefly summarised below.

2.2.2 Beach Erosion and Shoreline Recession Hazard

It is normal practice to consider the beach erosion hazard and the shoreline recession hazard in combination, and to define the position of the combined hazard for an Immediate (present day) planning time frame and at one or more future planning time frames, having regard to, for example, planning considerations and design life.

The position of the combined hazard at any specific timeframe can be described by reference to three individual zones. These zones are well established and are referred to as follows and depicted in Figure 2-4:

- the Zone of Wave Impact (ZWI)[3]
- the Zone of Slope Adjustment (ZSA)[4]
- the Zone of Reduced Foundation Capacity (ZRFC)[5]

[3] *The Zone of Wave Impact (ZWI) 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.*

[4] *The 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 by wave erosion of the design storm demand. It represents the steepest stable beach profile under the conditions specified.*

[5] *The 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 (i.e., 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 and located within the ZRFC would be considered to have an inadequate factor of safety.*

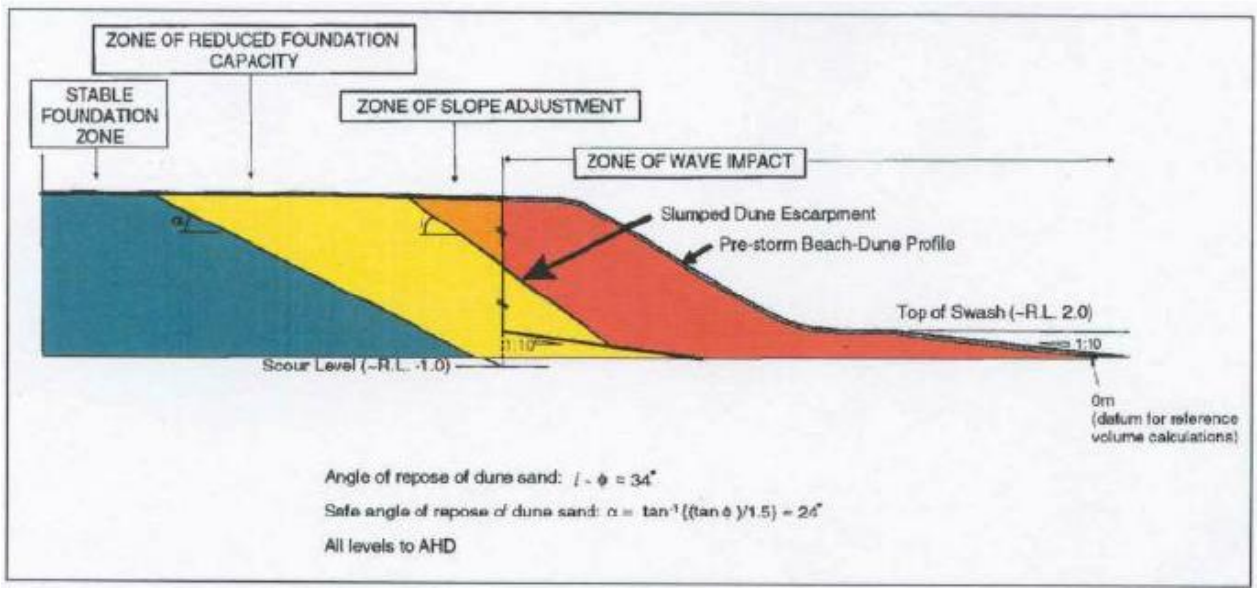


Figure 2-4 Schematic representation of coastal hazard zones (after Nielsen et al, 1992)

It is important to consider the significance of these different zones when developing options for management of the combined beach erosion and shoreline recession hazard for an existing structure on shallow footings, such as the existing SLSC building. For example, in the absence of a terminal structure such as a seawall, it would be necessary to ensure that the building, over its design life, was always situated landward of the ZRFC, otherwise the structure would be considered to have an inadequate factor of safety against foundation failure. This has implications for consideration of a beach nourishment option for management of the beach erosion and shoreline recession hazard, as discussed further in Section 4.

A range of studies have been carried out at Newport Beach over the years to assess the beach erosion and shoreline recession hazard, most recently in HCE (2021a) and WRL (2021) as part of supporting documentation for the DA.

When evaluating the shoreline recession hazard consideration is given to two processes, which are assessed separately:

- shoreline recession due to net sediment loss, sometimes referred to as underlying recession, i.e., more sand is leaving a coastal compartment than is entering the compartment, due to coastal processes
- shoreline recession due to sea level rise as a result of climate change

Underlying recession was assessed to be zero metres per year (0m/year) in HCE (2021a) and WRL (2021), i.e., Newport Beach was considered to be a closed compartment (or closed system). Future shoreline recession was predicted to be solely due to sea level rise.

The estimated position of the combined beach erosion hazard and shoreline recession hazard for the present day, 2050, and 2080, as determined in WRL (2021), is shown in Figure 2-5 (coloured dashed lines). Note that the shoreline depicted is at the landward limit of the ZSA (crest of the slumped erosion assessment). The landward edge of the ZRFC would be approximately a further 12m landward.

Also shown in Figure 2-5 is the ‘end effect’ predicted by WRL for the present day, 2050, and 2080, due to the coastal protection works as proposed in the DA (coloured solid lines). Note that this end effect is shown assuming conservatively that the design storm occurs in the last year of the planning period. It is also shown

for the situation immediately after the storm. Beach recovery would occur naturally after the storm, so that the situation depicted in Figure 2-5 is temporary not permanent.

It is evident from Figure 2-5 and generally accepted that the Immediate ZSA is approximately in line with the seaward edge of the promenade along the seaward side of the SLSC building. As such, the building is currently located within the Immediate ZRFC and has an inadequate factor of safety against foundation failure in a 100-year ARI storm event. Direct undermining of the building is predicted in a 100-year storm event from approximately 2050 onwards.

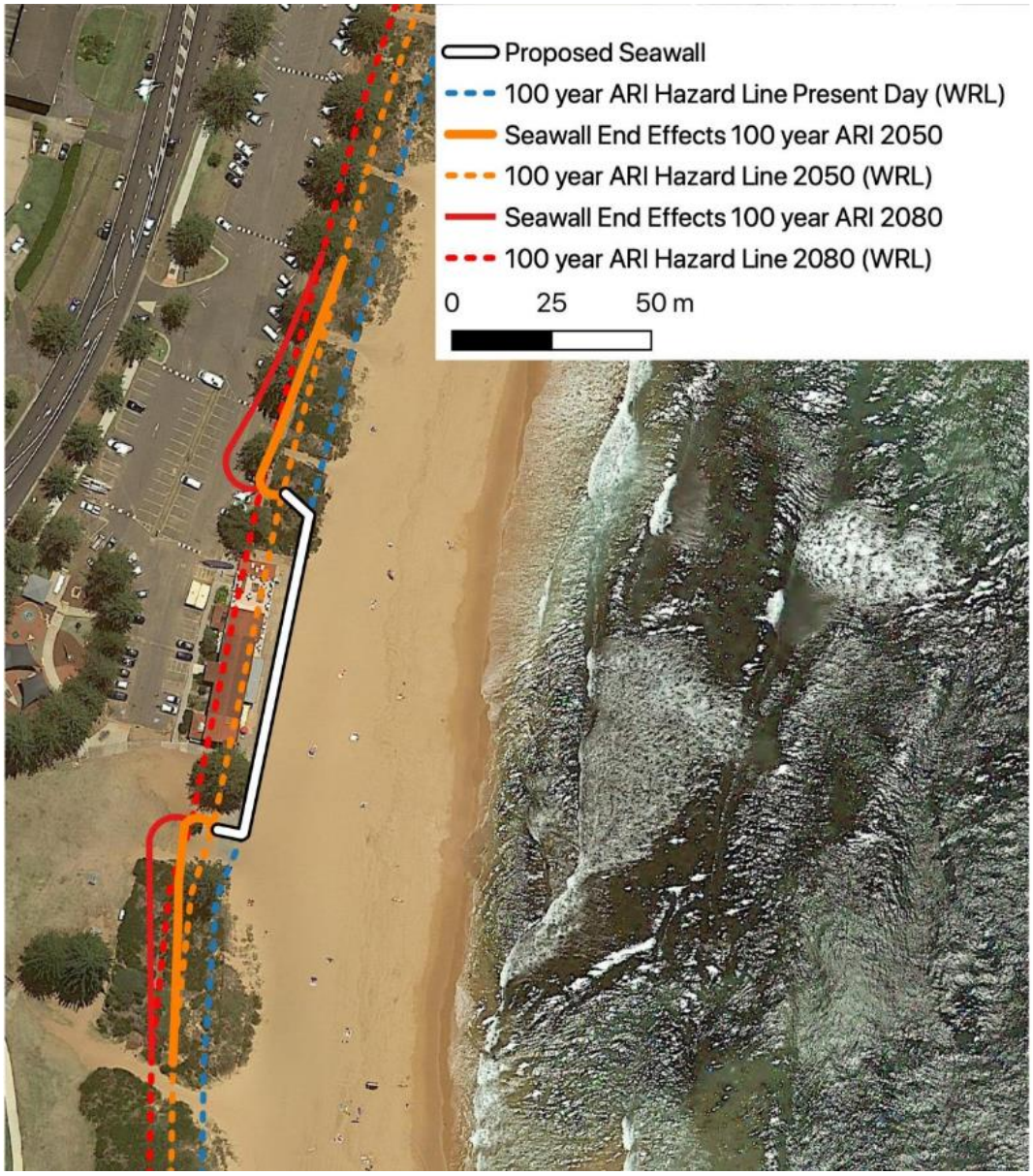


Figure 2-5 Predicted location of the combined beach erosion and shoreline recession hazard (position of ZSA) for present day, 2050, and 2080. Location of coastal protection works is that proposed in the DA. (Source: WRL (2021), Figure 15).

Coastal inundation was considered in HCE (2021a) and WRL (2021) using desktop methods. Wave loading on the SLSC building was also estimated in WRL (2021).

The above studies demonstrated that the present day (Immediate) inundation levels are in the order of 7m AHD for a 100-year ARI storm event and hence, in such an event, wave runup would exceed the level of

the promenade along the seaward side of the SLSC building (level approximately 5.5m AHD) and the level of the ground floor of the SLSC building (level approximately 5.7m AHD). As such, if such an event occurred today the building would be subject to inundation and wave loading, the magnitude of which would increase over time due to projected sea level rise.

It is noted that inundation and wave loading damage to the SLSC building occurred some 50 years ago during the May 1974 storms, as shown in Figure 2-6.

The coastal inundation and wave loading assessments set out in HCE (2021a) and WRL (2021) have now been superseded by the results of the extensive program of physical model testing carried out by WRL and reported in WRL (2024), which have informed the proposed design revisions to the coastal protection works and SLSC building outlined in Section 3.

The physical modelling has quantified the wave overtopping and wave loading for a range of ARI storm events, beach profiles, and with consideration of sea level rise. Example images of wave overtopping from the physical model testing are shown in Figure 2-7 and Figure 2-8. Please see the WRL report for further detail.

Figure 2-6 Damage to Newport SLSC from the coastal storm in May 1974 (source: HCE [2021a]).

Figure 2-7 Peak wave overtopping of the promenade in the 100-year ARI storm for an eroded beach profile under present day water level conditions, with a bleacher profile seaward of the promenade.

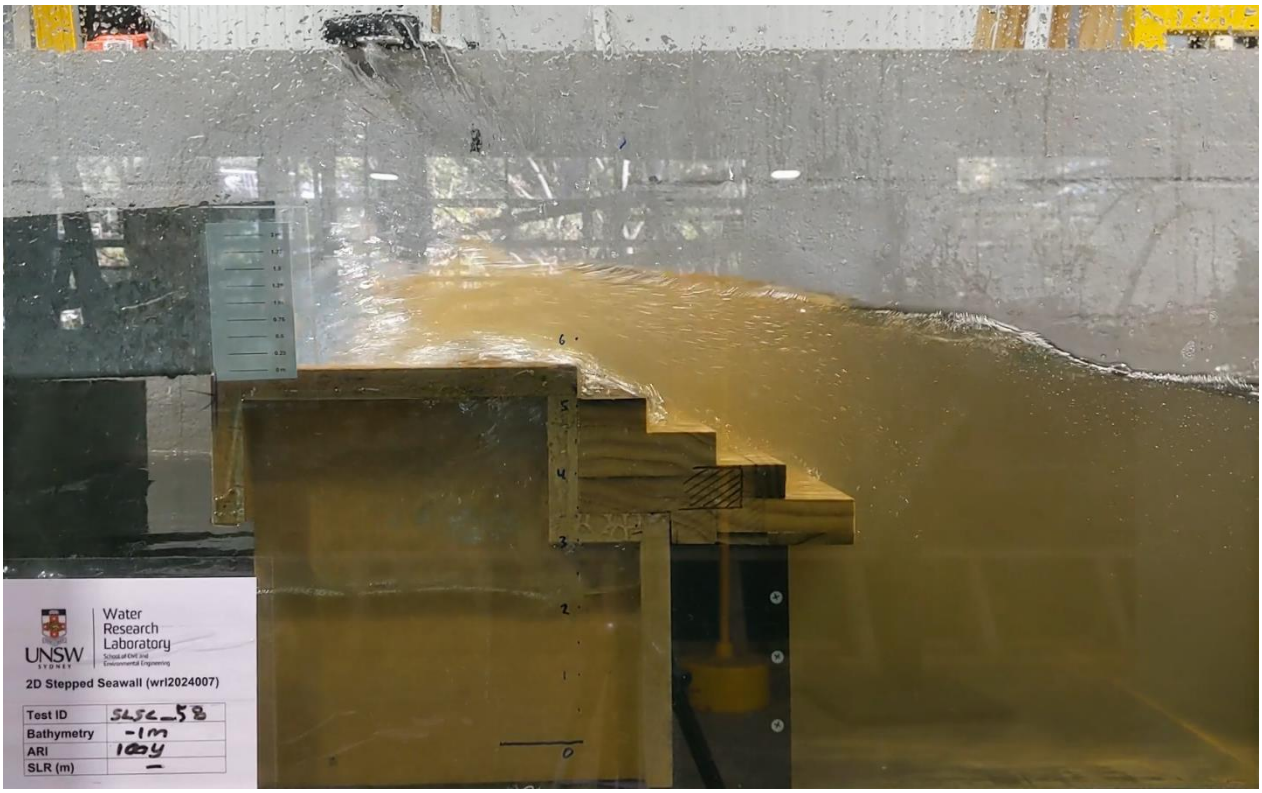


Figure 2-8 Peak wave overtopping of the promenade in the 100-year ARI storm for an eroded beach profile in 2084 after sea level rise, with a bleacher profile seaward of the promenade.

3 DESCRIPTION OF THE PROPOSED REVISED BEACH ACCESS AND COASTAL PROTECTION WORKS

3.1 General

This section sets out a description of the proposed revised design for beach access and the coastal protection works. Prior to this description, a discussion is provided of design life, the design considerations which have influenced the revisions to the design, and the key results from the physical model testing.

3.2 Design Life

3.2.1 General

It is necessary to consider the design life of the proposed works in terms of two components:

- the design life of the asset to be protected, in this case the SLSC building, and
- the design life required for the coastal protection works to ensure an acceptable risk level for the asset to be protected, this is sometimes referred to as the asset owner's 'appetite for risk' (Gordon et al., 2019).

Design life of an asset can be generally defined as the period of time before any major maintenance or refurbishment of the asset is required, it is not necessarily the period of time that the asset may continue to be useful. This period of time can be considered to be the service life of the asset.

The owner of the Newport SLSC building asset to be protected is Northern Beaches Council.

3.2.2 Design Life for Newport SLSC Building Asset

A number of factors can be considered in assessing a reasonable design life to adopt for the Newport SLSC building following the alterations and additions, these include:

- the nature of the alterations and additions
- the value of the alterations and additions
- the design life of SLSC buildings generally, inferred from the history of major maintenance or refurbishment, or demolition and rebuilding, of SLSC buildings on the Northern Beaches
- examples of the design life adopted for other SLSC buildings when rebuilding

Nature of the alterations and additions

The alterations and additions include both reconfiguration of the internal layout of the existing section of the building which is to be retained and demolition and construction of a new northern wing plus other minor new areas. The Architect has advised that the proportion of new build at the ground floor level comprises 53% of the total building area, and on the first floor comprises 61% of the total building area. As such, the works involve a majority new build component. This influences assessment of the design life.

Value of the alterations and additions

An estimate of cost of the alterations and additions was prepared in August 2021 by Donald Cant Watts Corke, Quantity Surveyors. At that time the total building cost estimate, excluding the coastal protection works and GST, was $4.9M.

Advice provided to Council by industry sources is that a reasonable escalation allowance to apply to the August 2021 estimate to arrive at a current cost (August 2024) would be 20-25%. Accordingly, the estimated current building cost estimate, excluding the coastal protection works and GST, would be approximately $6.0M.

Design life inferred from other Northern Beaches SLSC buildings

Table 3-1 sets out, for a number of SLSC buildings on the Northern Beaches, the period of time between their original construction and their demolition and reconstruction, or between their original construction and a major upgrade.

It is apparent from Table 3-1 that the actual life of these SLSC buildings was in the order of 50 to 60 years.

Table 3-1 Examples of actual design life of SLSC buildings on the Northern Beaches

SLSC	Year of Construction	Year of Reconstruction (R) or Major Upgrade (MU)	Period of Time (years)
Avalon	1961	2014 (R)	53
Bilgola	1950	2003 (MU)	53
Long Reef	1956-1965 (date uncertain)	2023 (R)	62
Narrabeen	1950	2009 (MU)	59

Table 3-2 sets out, for a number of additional SLSC buildings on the Northern Beaches, the year of their original construction and the period of elapsed time to date (2024). These SLSC buildings have not been demolished and reconstructed or have not been subject to major upgrading. Some minor upgrades have taken place such as amenities renewals, provision of accessible amenities, kitchen upgrades, flooring upgrades, roofing renewals, balconies, and inclusion of storage rooms.

It is apparent from Table 3-2 that it is not unusual for SLSC buildings, once constructed, to have an actual life of many decades. The average age to date of the SLSC buildings listed in Table 3-2 is approximately 55 years. Their life prior to demolition and reconstruction or major upgrade will be in excess of this figure.

Table 3-2 Examples of SLSC buildings on the Northern Beaches not subject to reconstruction or major upgrades

SLSC	Year of Construction	Period of Time to Present (years)
Bungan Beach	1982	42
Collaroy	1992	32
Dee Why	1960	64
North Curl Curl	1980	44
North Palm Beach	1970	54
North Steyne	1934	90
Queenscliff	1982	42
South Curl Curl	1937	87
South Narrabeen	1976	48
Warriewood	1976	48

Examples of design life adopted for SLSC buildings

For the reconstruction of the Mona Vale SLSC building and the Long Reef SLSC building, Northern Beaches Council adopted a planning period of 100 years for siting of the buildings. The approach taken was to ensure the buildings were at acceptable risk from coastal hazards over this planning time frame, the reasoning being that the buildings would have a life approaching this time span.

For the current approved reconstruction of Bronte SLSC, the asset owner, Waverley Council, specified a design life for the building of 70 years. Again, this reflected Council's position on the period of elapsed time before any major maintenance or refurbishment of the asset should be required. It is also relevant that the existing Bronte SLSC has been in place, with minor upgrades, for approximately 90 years.

Summary

Having regard to the fact that the alterations and additions to the Newport SLSC building involve a majority new build, and that the capital investment in the alterations and additions is substantial at approximately $6.0M, together with the actual life in practice of SLSC buildings and the recent specifications of design life by asset owners of SLSC buildings, the adoption of a design life of 60 years for the Newport SLSC building going forward, as advised in the DA, is considered reasonable.

3.2.3 Design Life for Coastal Protection Structure

As noted earlier, the design life required for the coastal protection structure is that required to ensure an acceptable risk level for the asset to be protected, i.e., the SLSC building, sometimes referred to as the asset owner's 'appetite for risk'.

The appetite for risk is often expressed by way of an acceptable encounter probability for the design storm, related to design life for the asset and the design ARI event for the protective structure. A range of publications provide guidance for selection of the acceptable encounter probability, several of which are summarised in Gordon et al (2019). One of these publications is the Australian Geomechanics Society (AGS) *Practice Note Guidelines for Landslide Risk Management* (AGS, 2007). Significantly, this publication draws distinction between the risk that may be considered for an existing asset versus that for a new asset; namely, that the risk of failure (encounter probability) for an existing asset may be 10 times that for a new asset.

Northern Beaches Council, the asset owner, also has an adopted risk management framework, which includes the following three key documents:

- Council Policy NB-P-05: Enterprise Risk and Opportunity Management
- Risk Appetite Statement (RAS)
- Risk & Opportunity Assessment Guidelines

Council's overall risk appetite is 'open' meaning that Council's appetite is to take a low degree of risk.

Based on industry guidance and practice, and Council's approach to risk, for the design life of the asset to be protected of 60 years, the adopted design ARI event for the structural stability of the coastal protection works is 1,000 years. Physical model testing to assess wave forces on the coastal protection works have included a 1,000-year ARI event occurring at the end of 60 years assuming 2084 water levels which account for sea level rise. The encounter probability of this event over a 60-year design life for the asset is 5 to 6%. Three further factors need to be considered however, which add conservatisms to the approach:

- The 1,000-year ARI is constrained to occur at the end of the design life in 2084 when the full sea level allowance, equal to 0.5m, has been applied to the water level (conservative since the 1,000-

year ARI has an equal chance of occurring in any year, plus noting that wave heights at the structure are depth limited and so have been maximised)
- The 1,000-year design event assumes concurrence of the 1,000-year wave height (1 hour exceedance) and the 1,000-year water level, which is conservative since a significant component of water level is astronomical tide which is independent of storms, although this approach manages the inherent uncertainty in oceanic processes
- The coastal protection works would be designed having a structural factor of safety, i.e., the works would not fail (collapse) in the design 1,000-year ARI event.

To inform decision making on risk to the SLSC building asset, the physical model testing carried out by WRL considered both a 100-year ARI event and a 1,000-year ARI event in the assessment of wave overtopping and wave forces on the seaward face of the building. The 1,000-year ARI event was selected to 'book-end' the design event for the new section of the building. The structural engineer for the building will select the ARI event for design. The 100-year ARI event may be applicable to the design of the section of the existing building to be retained, having regard to approaches in AGS (2007).

3.3 Design Considerations

A range of matters have been considered in developing the proposed design revisions to beach access and the coastal protection works, and to the SLSC building itself, including the following:

- improved pedestrian access to the beach at lower beach levels, achieved through lowering the bottom level of the stairs
- improved access to the beach for watercraft, through provision of a beach access ramp meeting the requirements of SLSC members
- mitigating the impact of coastal inundation (wave overtopping and wave forces) on the SLSC building, informed by the physical modelling
- minimising the encroachment of coastal protection works onto the beach
- mitigating visual impact of the works, including at low beach sand levels and also at high beach levels
- minimising or avoiding the impact of the works on the Norfolk Island Pines immediately north and south of the SLSC building during construction and operation, through avoidance of excavation within the structural root zone (SRZ) and limiting excavation within the tree protection zone (TPZ)
- heritage considerations.

It is relevant that most of the time the coastal protection works would largely be buried under the beach sand. This assists in minimising the visual impact of the works and impacts on beach amenity.

3.4 Physical Model Testing

The physical model testing carried out by WRL is documented in a separate report (WRL, 2024). The key findings, leading from the testing included:

- it would be necessary to incorporate parapet walls seaward of the section of the existing SLSC building which is to be retained to mitigate structural damage due to wave overtopping
- roller shutters originally proposed to be located along the seaward face of the new northern section of the building would be damaged unless protected by wave return walls or relocated from the seaward face
- a solid reinforced concrete wall could be satisfactorily designed for wave forces along the seaward side of the new northern section of the building, without introduction of parapet walls
- management of pedestrians on the promenade would be necessary at times of storms to ensure safety.

3.5 Design Concept

3.5.1 General Arrangement

The general arrangement of the coastal protection works including the promenade and beach access is shown on Drawings PA2407-RHD-00-105-DR-MA-0001, 0011, and 0021 included in Appendix B.

The overall length of the works along the beach is approximately 80m prior to landward returns at the northern and southern ends. The width of the promenade varies from typically 4.0m to 4.5m except for a local widening to 4.85m opposite the main beachside entry to the SLSC building where an upper-level landing provides access to two sets of beach access stairs.

The overall extent of the works seaward from the beachside entry to the SLSC building is 7.6m. This dimension is equivalent to the corresponding dimension on the drawings submitted with the DA, inclusive of the 2m distance referred to on Drawing No. S10 as an extension of the promenade and/or stairs (combined) if required to reduce wave forces on the SLSC building. The opportunity has been taken to extend the works by 2m to introduce features to reduce wave forces on the building; namely, the wave parapets (while maintaining a suitable promenade width for access), and to improve beach access (refer below).

Further details of the design concept are provided in the following sections.

A schedule of the changes between the proposed revised concept design and the concept design submitted with the DA is provided in Section 3.5.6.

3.5.2 Beach Access

Four sets of beach access stairs are proposed; two sets directed parallel to the promenade from an upper-level landing opposite the main beachside entry to the SLSC building and one set near each of the northern and southern ends of the building directed perpendicular to the promenade. The stairs near the northern and southern ends of the building are located adjacent to the paths leading to the beach along the northern and southern sides of the building.

Even though the stairs would largely be buried most of the time, it is proposed that the stairs would extend to a level of 3.22m AHD, approximately 800mm lower than the stairs included in the DA drawings, thereby providing improved beach access at low beach levels.

A ramp for watercraft access to the beach is proposed at the northern end of the promenade close to the watercraft storage area. The width of the ramp (4.5m) and grade of the ramp (1V:4H) have been agreed with SLSC members.

The toe of the ramp would extend approximately 1m below the promenade level and provide improved access when beach levels are lower than the promenade. Sand levels near the ramp would be managed following severe erosion events to avoid a significant drop to the sand below the ramp. SLSC members have also noted that, at such times, watercraft access to and from the beach is typically available further south along the beach, and members accept this alternative situation.

A series of bleachers are proposed between the sets of stairs and at the southern limit of the works. The bleachers extend to the same level as the beach access stairs. Bleachers provide an opportunity for seating and observing the beach and have proven to be a popular inclusion at other beaches adding to beach amenity.

3.5.3 Coastal Protection Works

The proposed coastal protection works comprise a combination of the following structural elements:

- a secant pile wall and reinforced concrete capping beam extending along the full length of the SLSC building and for a distance to the north and south of the building including landward returns to prevent outflanking of the building and to protect the Norfolk Island Pine trees located immediately north and south of the building. The secant wall would be structurally restrained at times of low beach levels by permanent ground anchors. The secant pile wall provides the primary protection to the building (and the Norfolk Island Pine trees) from the beach erosion and shoreline recession hazard
- reinforced concrete stairs and bleachers which protect the building from the beach erosion and shoreline recession hazard above the level of the secant pile wall and capping beam, and which mitigate to a degree the inundation hazard (wave overtopping and wave forces on the building)
- reinforced concrete wave parapets which extend along the seaward edge of the promenade and upper-level landing seaward of the section of the SLSC building to be retained. The wave parapets further mitigate the inundation hazard.

The top of the secant pile wall is at a level 1m below the lowest level of the stairs and bleachers, that is at a level of 2.22m AHD. This level is approximately 1m below the top of the secant pile wall in the drawings submitted with the DA, which assists in mitigating the visual appearance of the works at low beach levels.

The proposed height of the wave parapets above promenade level is 1.05m. The wave parapets would have a recurved profile, or similar, on the seaward side to enhance mitigation of the inundation hazard. Seating is proposed on the landward side of the wave parapets for the amenity of beach users.

The location of the proposed secant pile wall, capping beam, stairs, and bleachers relative to the existing rock protection placed in May 1974 is shown in Figure 3-1. This indicates that the coastal protection works generally follow the profile of the existing rock protection. The alignment of the secant pile wall is approximately 3m landward of the toe of the existing rock protection.

Figure 3-2 shows the location of the proposed secant pile wall, capping beam, stairs, and bleachers (shaded) relative to the coastal protection works submitted in the DA. The proposed secant wall is approximately 2m further seaward than the alignment of the secant wall submitted with the DA.

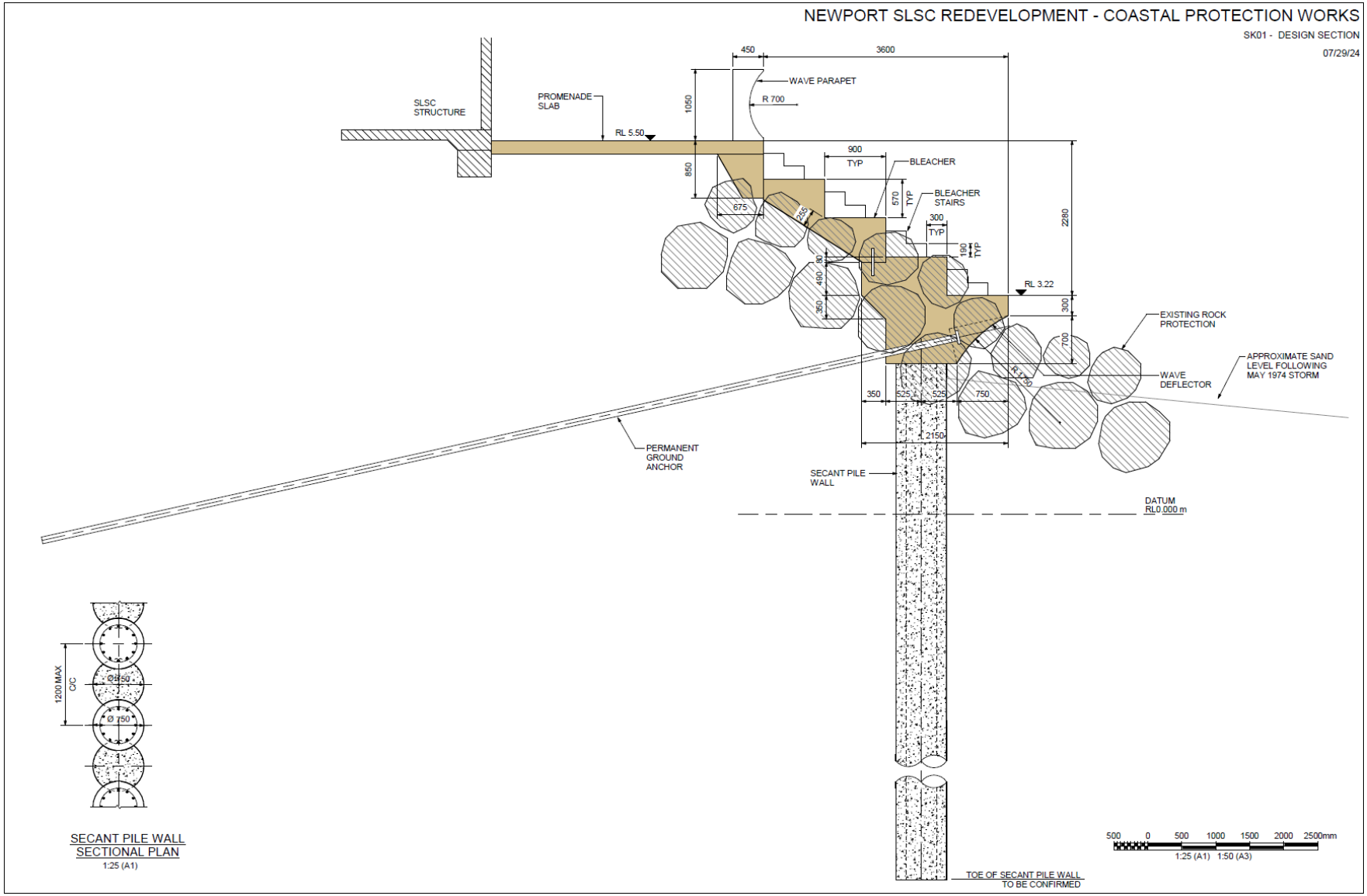


Figure 3-1 Cross-section through the proposed coastal protection works showing the position of the works relative to the existing rock protection

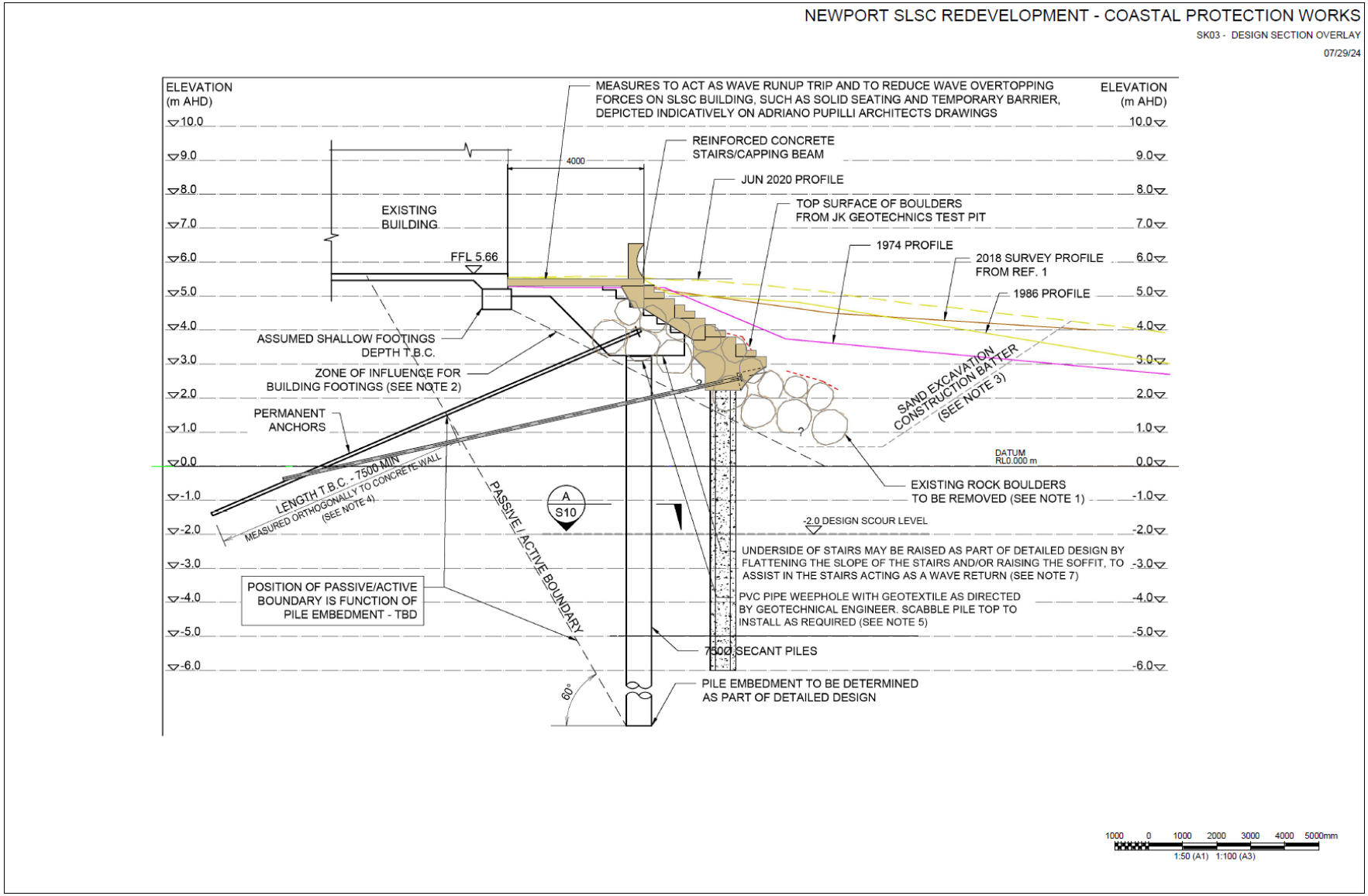


Figure 3-2 Cross-section through the proposed coastal protection works showing the position of the works relative to the works submitted in the DA

3.5.4 Colouring of Concrete

It is proposed to colour the concrete stairs, bleachers, and capping beam to match the colour of the beach sand, to reduce the visual impact of the works.

An example of the colouring of coastal protection works to match beach sand is represented by the Dee Why Beach Seawall project constructed in 1998, as shown in Figure 3-3.

Figure 3-3 Example of colouring coastal protection works to match beach sand colour - Dee Why Beach Seawall

3.5.5 Removal of Existing Rock

Based on the position of the proposed coastal protection works relative to the existing rock protection, as shown in Figure 3-1, it would be necessary to remove a proportion of the existing rock protection to allow unobstructed installation of the coastal protection works.

Full removal of the remaining existing rock protection is proposed as part of the works to address the public safety risk that the existing rock protection presents when exposed, and to improve beach amenity. The rock may be incorporated within the works landward of the secant pile wall providing it does not affect installation of the permanent ground anchors.

3.5.6 Schedule of Changes Between the Proposed Revised Design and DA Design

The main changes between the proposed revised concept design and the concept design submitted with the DA are summarised as follows:

- introduction of wave parapets
- introduction of bleachers
- extending stairs to a lower level (also including the bleachers)
- local widening of the promenade to 4.85m, typical width 4.0 to 4.5m
- overall width of structure 7.6m (the reference to a 2m extension in the DA documents adopted)
- colouring of the concrete

4 CONSIDERATION OF ALTERNATIVE OPTIONS

4.1 Beach Access

Several alternative options were considered for provision of beach access as noted below, including commentary:

- extending stairs and bleachers to a lower level:

  Extending the stairs and bleachers to a lower level than proposed would have involved a greater encroachment of the structures onto the beach. The approach adopted was to minimise the encroachment and not exceed the corresponding dimension on the drawings submitted with the DA. Management of sand levels near the bottom of the stairs following erosion events would be undertaken by means of beach scraping, which is common practice

- extending the beach access ramp for watercraft:

  Similar reasoning as above applied for restricting the length of the ramp. Again, management of sand levels near the bottom of the ramp would be undertaken by means of beach scraping. In addition, as noted earlier, SLSC members advised based on experience that at times of low beach levels watercraft access to and from the beach is available further south along the beach

- provision of all-ability access:

  Provision of all ability access would involve the installation of ramps having a slope of 1V:14H (inclusive of handrails) or 1V:20H (excluding handrails). To reduce the encroachment of such ramps on the beach, alignment parallel to the promenade would be appropriate. Such an arrangement would restrict direct access onto the beach from the section of promenade along the seaward side of the SLSC building, a situation which is fully available at present. Council has developed a 'Disability Inclusion Action Plan 2022 – 2026' and is committed to continually improving access and inclusion, including improving all-ability access to beaches across the Northern Beaches. At Newport Beach it is considered all-ability access to the beach would be achieved in a location and/or by means not directly along the seaward side of the SLSC building. This is the situation for example at Collaroy SLSC and South Curl Curl SLSC.

4.2 Coastal Protection Works

4.2.1 General

Several alternative options to the proposed secant pile wall coastal protection works can be considered, as follows:

- rock revetment, meeting current coastal engineering standards
- offshore artificial reef
- beach nourishment

Each of the above options is considered in the following sections, however for the reasons set out, the proposed secant pile wall (as originally proposed in the DA) is considered to be most appropriate.

4.2.2 Rock Revetment

The following features of a rock revetment have been considered for purposes of assessing this alternative option:

- design event: minimum 100 years ARI
- crest level: matching promenade level
- toe level: -1.0m AHD

- rock type: sandstone preferred
- cross-shore position: as landward as possible while avoiding being located under the promenade (due to foundation issues) and avoiding the risk of undermining the footings of the existing building during excavation for rock placement
- design cross-section: two layers of primary armour rock (median armour mass 5-6t), two layers of underlayer rock (median mass 500-600kg), and geotextile
- parapet walls similar to those proposed for the secant pile wall design to mitigate the inundation hazard
- landward returns at the northern and southern ends of the revetment to prevent outflanking similar to those proposed for the secant pile wall design
- pedestrian beach access to be provided by several suspended sets of steel stairs that 'fly over' the rock revetment.

The approximate outline (envelope) of a rock revetment alternative option meeting current coastal engineering standards is shown in Figure 3-3 superimposed on the proposed secant pile wall design and the existing rock protection. The rock revetment would have a total width across the beach of approximately 15m and extend further seaward from the secant pile wall by 11m to 12m.

The construction cost of a rock revetment would be less than that of the proposed secant pile wall. The difference in cost is likely to be in the order of $10,000 to $12,000/m representing a saving of approximately $1.0 to $1.2M.

Notwithstanding the lower cost, due to the additional encroachment of the rock revetment onto the beach, lesser amenity benefits, and greater visual impact, a rock revetment alternative option is not preferred.

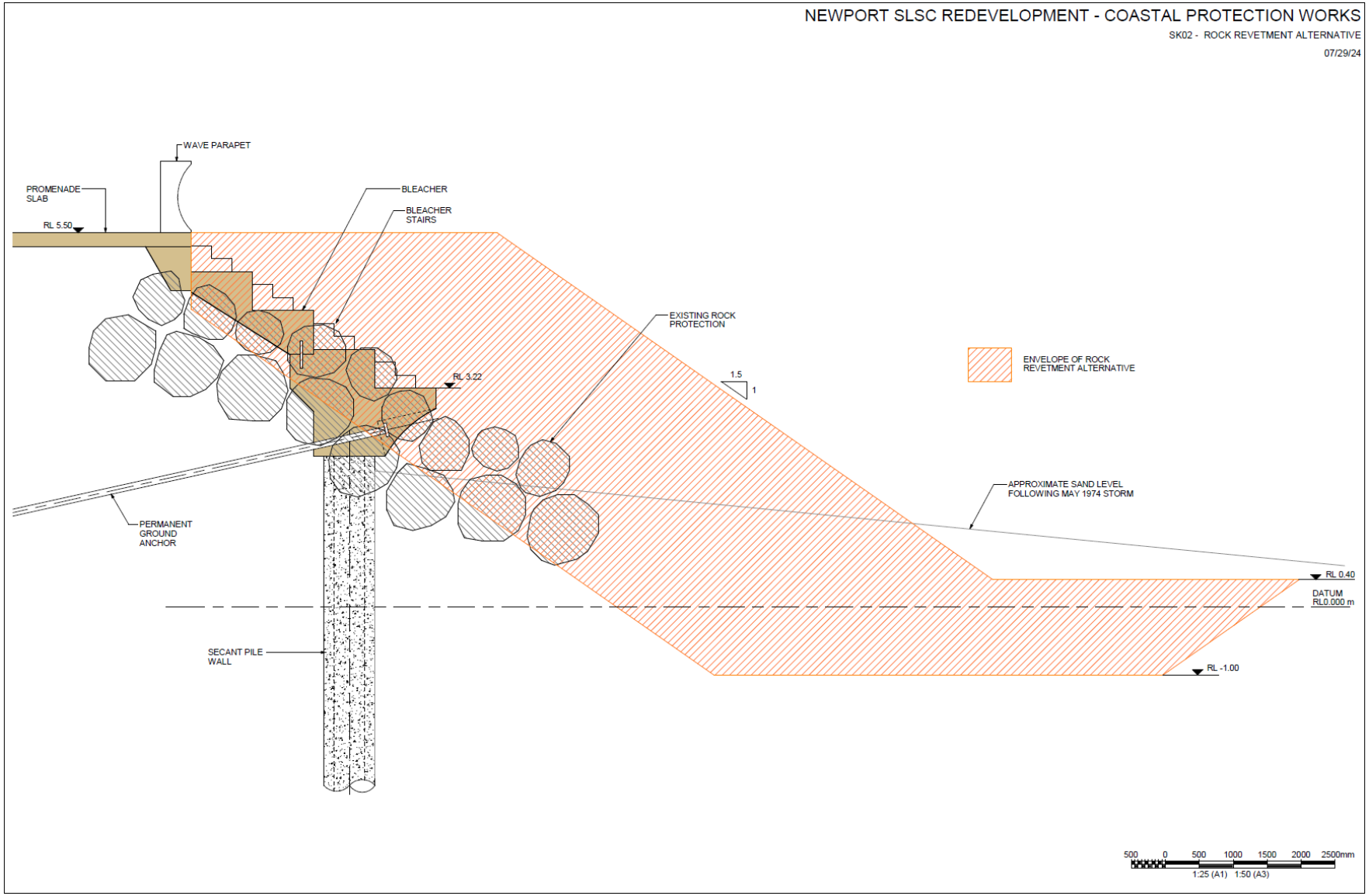


Figure 4-1 Envelope of a rock revetment alternative option for coastal protection works meeting current coastal engineering standards compared to the proposed works and existing rock protection

4.2.3 Offshore Artificial Reef

Construction of an offshore artificial reef could be considered to reduce the wave climate seaward of the SLSC building such that sufficient existing sand is available to meet the (reduced) beach erosion hazard (storm demand) and manage the shoreline recession hazard, with the result that the building is situated landward of the ZRFC over its design life. It is likely this option would need to involve an accompanying program of beach nourishment due to the extent of the existing erosion and recession hazard, but it is sufficient to consider only the artificial reef at this time.

Any offshore artificial reef would need to be sufficiently long in a north-south direction to be effective over a range of offshore wave directions. The required length would be considerably longer than the seaward frontage of the SLSC building which is approximately 50m and likely in excess of several hundred metres. The reef would also need to be sufficiently far offshore so as not to create nearshore currents that could impact beach safety. For an artificial reef constructed recently (2019) off Palm Beach in Queensland as a coastal erosion management measure and to enhance surfing quality, the distance offshore to the reef was around 270m. At Newport Beach this would involve a water depth below mean sea level of approximately 7m.

The construction of offshore reefs is also a costly exercise as quarried rock needs to be loaded out from land onto a barge, towed to site by tug, bottom dumped, and placed/shaped by a barge-mounted crane or possibly a backhoe dredger (BHD) fitted with a rock grab/bucket (the methodology adopted for the Palm Beach artificial reef). Workability of floating equipment is also a factor affecting cost since floating equipment can only operate in certain limiting sea states.

An aerial oblique image of the artificial reef off Palm Beach under construction is shown in Figure 4-2. An image during construction is shown in Figure 4-3.

As a guide to costs, the Palm Beach artificial reef which has dimensions of 160m long and 80m wide and comprised approximately 60,000t of rock, had a construction cost in 2019 of approximately $18M. In 2024 dollars, this would amount to around $22M.

An artificial reef off Newport Beach as an option to protect Newport SLSC would involve at least the above quantity of rock and likely greater, hence would involve an estimated construction cost of $22M or more. This cost is greater than five times the estimated cost of the proposed coastal protection works.

Construction of an offshore artificial reef to protect an individual building structure on a beach, such as Newport SLSC, is not a cost-effective approach, is difficult to justify economically and is not preferred.

Figure 4-2 Aerial oblique view of the Palm Beach offshore artificial reef nearing completion

Figure 4-3 Close up view of the backhoe dredger (BHD) used in construction of the Palm Beach artificial reef

4.2.4 Beach Nourishment

A range of factors are relevant to consideration of beach nourishment as an alternative option for coastal protection works for the Newport SLSC building.

Firstly, a sufficient volume of sand would need to be placed on the beach such that the SLSC building would no longer be situated within the ZRFC at present and for a period of time into the future accounting for storm demand in a nominated ARI storm event and shoreline recession. Expanding on this factor:

- currently the ZRFC is located approximately 12m landward of the seaward edge of the foreshore promenade. If it is considered satisfactory for the promenade to be sacrificial in the design storm, the ZRFC would need to be advanced seaward by around 9m
- the above position of the ZRFC is based on a storm demand of 170m/m, estimated by WRL for a 100-year ARI design event. For a design life of the SLSC building asset of 60 years (refer section 3-2-2), a 100-year ARI design event would not be considered sufficiently rare (encounter probability not sufficiently low) and a 1000-year design event is more appropriate. Based on a log-normal distribution of storm demand versus ARI of the design event (somewhat conservative), a 1000-year ARI storm demand of 250m^3/m is estimated. The net increase in storm demand volume to be incorporated in the beach nourishment is therefore 250-170=80m^3/m
- due to the uncertainty in projected sea level rise (and hence shoreline recession due to sea level rise) it is advisable to place nourishment material to address shoreline recession due to sea level rise in increments, rather than place material for the full design life of 60 years. Following an initial nourishment campaign, sea level rise and beach behaviour can be monitored to assist in planning a subsequent nourishment campaign. Such an approach also limits expenditure and reduces the impact of placing a 'large' quantity of sand on the beach initially, e.g., impact on beach stormwater outlets. A planning period of 15 years is considered reasonable, also influenced by the significant mobilisation and demobilisation cost of dredging equipment involved in placement of the material (refer below). For a 15-year initial planning period the shoreline recession due to sea level rise which would need to be accommodated by the beach nourishment volume would be approximately 4m
- in order to provide beach volume seaward of the SLSC building to protect the asset, it is necessary to widen the entire length of Newport Beach (approximately 1100m) since the nourishment material would be redistributed along the beach by natural coastal processes such that the beach planform remains consistent. The alternative would be to construct structures such as shore-normal groynes to compartmentalise the beach and reduce the required nourishment volume, but such structures would not be expected to be acceptable due to cost, the loss of ‘naturalness’ of the beach, and due to potential impacts on beach safety e.g., introduction of rip currents and the risk of collision with structures by beach users
- sufficient volume of sand needs to be placed below water level as well as above water level to widen the beach, noting that some 70% of the beach profile volume is situated below water level. In effect, an equivalent widening of the beach below water level to that above water level is required from the shoreline out to the ‘inner depth of closure’ (approximately 12m depth at Newport Beach), with tapering to zero widening at the ‘outer depth of closure’ (approximately 24m depth at Newport Beach). Some discount to the estimated volume below water level can be applied in the case of Newport Beach due to the existence of rock reef offshore, amounting to up to a 35% reduction
- it could also be argued that a factor of safety should be applied to assessment of nourishment volumes since reliance for asset protection is being placed on sand (a mobile material) as opposed to a fixed terminal protection structure. In the nourishment volume estimated below however, no factor of safety has been applied
- the calculated nourishment volume is the volume of equivalent ‘native’ beach sand. In those situations where the sand sourced for nourishment (the ‘borrow material’) does not fully match the grain size of the native beach sand, for example if it is finer, a greater volume of borrow material needs to be obtained for the given volume of native material. This is important since the cost of

nourishment is based on the volume of borrow material. For the cost estimate set out below it has been assumed the borrow sand fully matches the native sand, which may be non-conservative, i.e., would underestimate the costs.

The estimated nourishment volume to protect the Newport SLSC building for an initial 15-year planning period based on the above discussion is approximately 500,000m^3 (equivalent native sand).

In terms of the methodology for sourcing and placing the nourishment sand, the following can be stated:

- the preferred source of sand for the nourishment quantity involved would be offshore. The depth of extraction (dredging) at the borrow area would be approximately 40m or greater to mitigate potential impacts to the shoreline due to altered inshore wave climate
- the preferred method of dredging and placement of the nourishment sand would be use of a trailing suction hopper dredger (TSHD). Various size TSHDs could be considered from 2,500m^3 hopper capacity up to 20,000m^3 hopper capacity. The larger TSHDs would have a lower dredging and placement unit cost due to the economy of scale but would have a higher mobilisation and demobilisation cost
- the preferred method of placement of the nourishment sand would be so-called 'profile nourishment' whereby the sand is placed across the beach profile above and below water to replicate the natural beach profile and reduce ant rapid redistribution of the placed sand. For profile nourishment three methods of placement would be employed by the TSHD, each of which would involve a different unit rate: namely bottom dumping (lowest cost), 'rainbowing' over the bow of the vessel (mid cost) and pumping ashore to the beach (highest cost).

Table 4-1 summarises the estimated cost (2024 dollars) for an initial campaign of nourishment (15-year planning period) based on two sizes of TSHD (2,500m^3 and 20,000m^3 hopper capacity) and for several assumed borrow areas located at varying distances from Newport Beach; namely, 2.5 nautical miles (nm), 5nm, and 10nm. The estimated cost is the contract cost, i.e., contractor's operational costs, mobilisation and demobilisation, and the contractor's profit/risk/fixed costs.

It can be seen from Table 4-1 that the larger 20,000m^3 TSHD provides for lower placement costs but has a significantly higher mobilisation/demobilisation cost. Such a vessel would need to be mobilised from Singapore. A 2,500m^3 TSHD could be potentially mobilised from within Australia at a much lower mobilisation/demobilisation cost, but placement costs are relatively high. In practice it would be strategic to share the mobilisation/demobilisation cost between several different beach nourishment projects. Even so, for the assumptions made earlier, the cost of beach nourishment as an option for protecting the Newport SLSC building would be expected to be in the range $7 to $9M.

Other costs would also be incurred as a consequence of the beach nourishment option. Such costs would include an extension of the beach stormwater outlet located to the south of the SLSC building to avoid sand blockage (refer Figure 2-3). The length of this extension would probably not be less than 15 to 20m at a cost in the order of $0.5M. In addition, it is likely that some form of parapet wall to mitigate the inundation hazard would be required over the design life of the building even though the nourishment scheme would be designed to protect the building from the beach erosion and shoreline recession hazard. Further, a second nourishment campaign would be required after 15 years, although this would only be to address the next phase of shoreline recession due to sea level and this future cost would be discounted.

In total, the cost of the beach nourishment option would be expected to approach $10M. This cost is greater than two to three times the estimated cost of the proposed coastal protection works. As for the offshore artificial reef, adoption of beach nourishment to protect to an individual building structure on a beach, such as Newport SLSC, is not a cost-effective approach, is difficult to justify economically and is not preferred.

Beach nourishment is, however, an appropriate option to address future shoreline recession due to sea level rise to maintain beach width for recreational amenity (coupled with terminal protection for the SLSC building). In this case the basis for the required nourishment volume is a significantly lesser 'amenity volume'.

Table 4-1 Estimated cost of initial beach nourishment campaign (15-year planning period)

Size of TSHD (hopper capacity)	Distance to Borrow Area (nm)	Estimated Cost ($M)		
		Mob/Demob	Placement	Total
2,500m^3	2.5	$2.5	$6.9	$9.4
	5.0	$2.5	$7.2	$9.7
	10.0	$2.5	$7.7	$10.2
20,000m^3	2.5	$12.5	$3.0	$15.5
	5.0	$12.5	$3.2	$15.7
	10.0	$12.5	$3.7	$16.2

5 COMMENTARY ON CONTENTIONS FILED BY THE SYDNEY NORTH PLANNING PANEL

Table 5-1 sets out commentary on the contentions filed by the Sydney North Planning Panel.

Table 5-1 Commentary on Contentions filed by the Sydney North Planning Panel

Contention	Commentary
B1: Contentions which warrant refusal of the Application **Coastal** 1. The Application should be refused because the selection of design life is excessive, in particular when applied to the existing building upgrade works. <u>Particulars</u> a. Two documents are provided in the Application which relate to coastal management: i. Coastal Engineering and Flooding Advice for Newport SLSC Clubhouse Redevelopment, Horton Coastal Engineering, 26 August 2021 (Horton, a). ii. Coastal Engineering Report and Statement of Environmental Effects for Buried Coastal Protection Works at Newport SLSC, Horton Coastal Engineering, 26 August 2021 (Horton, b). b. The proposed Surf Life Saving clubhouse building upgrade works consider a 60-year design life (Horton b, section 5.1). The rationale is based on coastal engineering guidelines predominantly applicable to beachfront residential developments. c. The existing clubhouse is a non-habitable building and can operate at a lower design life standard.	The design life for the clubhouse building has been considered in Section 3.2.2 of the report. A 60-year design life is considered reasonable without reference to residential developments, having regard to the majority portion of the redevelopment comprising new build, the magnitude of the investment in the redevelopment (approximately $6M), the actual life in practice of SLSC buildings, and recent specifications of design life for SLSC buildings by the asset owners. The fact that the building is non-habitable is not considered to be the determinant of design life. This

Contention	Commentary
	contention may be inferring that since risk to life for a non-habitable building may be low the design life for the building should be low. In general, the likelihood of risk to life even for beachfront habitable/residential development is low because of the available warning times for severe storms and the existence of coastal erosion emergency action plans. If this contention was to hold, the design life for residential development would also be low.
d. This design life criteria is excessive, considering the nature of the existing building and its use. Consequently, the Proposal has included considerable coastal engineering and structural works to provide an extended design life.	Refer to above commentary. SLSC buildings should be understood to be civic buildings providing important community use. The age of numerous existing SLSC buildings demonstrates in practice their (relatively long) actual design life.
e. A lower design life could provide substantial benefits in the short term, including shorter works programs and more straightforward approval pathways that remain open-ended.	If a shorter design life was adopted, say 20 years, which is at the lower end of the suggested design life for assets such parkland and low value infrastructure (Gordon et al, 2019), and an acceptable encounter probability of 10% was adopted (ibid), the protective structure would need to withstand without failure a 200-year ARI event. This outcome would still lead to substantial coastal protection works.
f. The Proposal does not provide a robust rationale for selecting design life that considers separately the existing clubhouse upgrade works and the proposed clubhouse extensions separately.	Refer to the discussion in Section 3.2. It makes sense to adopt a single design life for the redeveloped existing section of building and the new northern section of the building since the overall completed building functions as an integrated whole. It is however appropriate to consider the existing and new sections of the building differently in terms of

Contention	Commentary
	encounter probability and risk of damage. It would be unreasonable to expect a building structure constructed in 1933 to have the same risk profile for storm damage as a building constructed in 2024.
g. The selection of design life is also a matter of cost-benefit analysis. Such analysis is missing in the Proposal.	Refer to statement by Northern Beaches Council as asset owner. Refer also to options assessment by Rhelm.
2. The development application should be refused because the proposal results in unacceptable coastal impacts. <u>Particulars</u>	
a. The proposed contiguous deep-piled wall foundation with stair access appears to have been selected without considering alternative seawall options. A rock structure could be envisaged in front of the proposed clubhouse to reduce wave actions. The wave overtopping and run-up on a dissipative rock structure are typically lower than on a reflective vertical/stepped structure. This seawall configuration could reduce the hydraulic loads on the proposed upgrade works.	Refer to Section 4 which sets out consideration of alternative options for the coastal protection works, comprising a rock revetment that meets current coastal engineering standards, an offshore artificial reef, and beach nourishment. Figure 4-1 shows the envelope of a rock revetment option compared to the extent of the proposed works. A rock revetment is not preferred due to its significantly greater encroachment on the beach and reduced amenity for beach access and seating. Some reduction in wave overtopping may be possible with a rock revetment, however based on observations in the physical model testing the introduction of parapet walls and relocation of roller shutters would still be necessary.
b. The feasibility of designing the building extension on the deep-piled foundation option was rejected because it was hypothesized that such piling work would be invasive and costly for the existing building (Horton a, Section 4). However, a contiguous deep-piled seawall is proposed only 3.5m from the existing building. This supports that – at least - the	Refer to letter prepared by the Structural Engineer for the building, Partridge. From a coastal engineering perspective, if the new section of building was

Contention	Commentary
extension could be built on deep-piles foundation, which could reduce the length of the proposed seawall. While this would not mitigate coastal hazards on the existing building this would allow for the extension to be resilient to coastal erosion. This option was discussed in the Partridge report (Horton a, Appendix D).	constructed on piles and the coastal protection works were reduced in length: - The secant pile wall would need to be returned landward under the new section of building to prevent undermining of the existing section of building due to outflanking and end effects. - The northern section of promenade and the path alongside the northern side of the building would need to be piled unless undermining and collapse was accepted, noting that these structures provide pedestrian and watercraft access to the beach. - The northern Norfolk Island Pine would be undermined by end effects.
c. The existing rubble rock structure placed in 1974 along the edge of the clubhouse is not of suitable engineering standard. However, this structure could be used to manage some level of beach erosion, as it was over the 1974-1975 period. Scour along the rock rubble structure could trigger sand scraping or sand nourishment works on the beach, particularly between storms. It is not uncommon to carry out beach scraping to maintain beach amenities. This softer coastal management pathway has not been explored in the proposal and is also a matter for the local Coastal Management Plan.	It is agreed that it is not uncommon to carry out beach scraping to maintain beach amenity. It is also agreed that the existing rock on the beach placed in 1974 is not of suitable engineering standard. As noted in Section 2.1.2, this rock is undersized, demonstrates poor interlocking, comprises only a single layer of armour rock, and has an inadequate (very high) toe level. The suggestion in the contention that this rock could manage ‘some level’ of beach erosion is vague and has no certainty as a management approach. The approach suggests beach scraping would be triggered when scour (beach erosion) reaches the rock; this would be during a storm and at such times carrying out beach scraping would be unsafe. Furthermore, sand is unlikely to be available during storm events.

Contention	Commentary
	Beach scraping is a post storm activity, to accelerate natural beach recovery, improve beach access, cover dangerous objects, or the like.
d. Sea level rise and coastal hazards will continue beyond 2080 and are not fully addressed, even by adopting a 60-year design life. Whether the building upgrade works are carried-out or not the existing clubhouse will remain vulnerable to coastal hazards.	It is agreed that sea level rise is projected to continue beyond 2080 (or 2084 for the current proposal) and that coastal hazards will continue. The proposed coastal protection works will address the vulnerability of the clubhouse over its design life. Consideration of sea level rise and coastal hazards beyond the design life is managed by imposing a time limited consent. This has become an accepted approach for managing the uncertainty of sea level rise and future coastal hazards in the assessment of coastal protection works. Adaptation strategies are also a tool for managing future hazards.
e. A 4.9% probability of exceeding the hydraulic loads during the design life of the building is not negligible (Horton b, Section 5.7). As a consequence, it will not be possible to retain the clubhouse at its current location, in perpetuity. Such considerations underpin the 1985 Public Work Department on building relocation (Horton a, Section 8.5). If hydraulic actions damage the existing clubhouse and cannot be repaired, the clubhouse may be relocated landward to an appropriate position.	An encounter probability of approximately 5% (1,000-year ARI design event) is considered reasonable for design of the coastal protection works. As noted in Section 3.2, several other factors contribute to conservatism in the design approach; namely, the application of the design storm in the last year of the design life, the assumed concurrence of the 1,000-year ARI wave height and 1,000-year ARI water level, and given that a structural factor of safety would be included in the design. The hydraulic loads on the SLSC building have been considered in the letter prepared by the Structural Engineer for the building, Partridge, who considers the redevelopment is feasible.

Contention	Commentary
f. It is not uncommon for a Surf Life Saving Club clubhouse to be relocated to manage coastal hazards. This is an efficient risk mitigation strategy in the long-term, which has not been considered.	Relocation of the clubhouse has been considered in reports prepared by Rhelm. There are a number of factors at play, not just coastal protection, such as heritage, amenity, traffic, and beach safety, etc.
3. The Application should be refused because hydraulic loads and structural works have not been investigated sufficiently to confirm the feasibility of the structural reinforcement works and the corresponding heritage impacts on the existing clubhouse. <u>Particulars</u> a. The feasibility of the proposed structural works on the existing clubhouse (solid seating, wall reinforcements, etc.) depends on the hydraulic load associated with wave overtopping and run-up into the clubhouse.	The proposed coastal protection works include wave parapets to mitigate wave overtopping and wave forces on the clubhouse. The wave forces on the clubhouse have been assessed in the physical model testing carried out by WRL. Refer to the WRL report and the letter prepared by the Structural Engineer for the building, Partridge.
b. The Water Research Laboratory (WRL) Report (Horton a, Appendix B) calculated a design hydraulic uniform load along the building for a run-up bore to be 103kN/m for a duration of a wave period (several seconds). On the other hand, the James Taylor engineering report (Horton a, Appendix C) considered that the 103kN/m load would be applied partially and for ultimate limit state design conditions; however, the WRL load is not a peak load. Peak wave hydraulic loads are of brief duration (milliseconds) but significantly affect unreinforced brickworks (fissures, cracking). The Proposal appears to underestimate the ultimate hydraulic load due to wave slamming.	Wave forces on the clubhouse have assessed in more detail in the physical model testing carried out by WRL. Refer to the WRL report and to the letter prepared by the Structural Engineer for the building, Partridge.
c. The feasibility of the proposed building works relies on structural engineering work. The structural engineering works do not provide sufficient detail to provide reasonable confidence in the Proposal's feasibility and likely cost aspects.	The Structural Engineer for the building, Partridge, considers that redevelopment of the building is feasible. Refer to letter prepared by the Structural Engineer.

Contention	Commentary
d. Physical testing is necessary to accurately quantify the hydraulic load and the resulting structural works. Physical testing should be carried-out to investigate the feasibility of the clubhouse upgrade works.	Physical model testing has been carried out by WRL. Refer to WRL report.
e. Solid seating and other systems designed to reduce wave load on the building will need anchoring. The feasibility of such anchors poses similar design challenges to the invasive and costly deep pile foundation option discarded in the brief option selection discussion.	The design of the coastal protection works include wave parapets to reduce wave forces on the building. These walls would be reinforced concrete and would be constructed integrally with the other reinforced concrete structural elements.
f. The addition of reinforced concrete walls, solid seating and bollard will also have a detrimental effect on the Heritage value of the building.	The proposed design arrangement for the wave parapets to reduce wave forces on the building, and the coastal protection works generally, has been developed in consultation with the Heritage Consultant. Refer to heritage report.
g. The structural engineer report has not appraised the pose and effect of ground anchors beneath the existing building and trees despite the WRL recommendation (Horton b, Appendix B). Anchoring could dramatically influence the feasibility of the upgrade works if the anchor installation load and working loads in the soil results in cracks in the existing clubhouse brickworks.	The ground conditions for installation of the permanent ground anchors comprise loose to medium dense sands overlying stiff to very stiff silty sandy clay (JK Geotechnics, 2021). A consideration for installation of the anchors is the possibility of collapse of loose sand into the drill hole, particularly below the water table. Techniques are available to prevent this situation occurring, such as casing the drill hole. Permanent ground anchors have been installed successfully in similar ground conditions, including for the construction of coastal protection works along Collaroy Narrabeen Beach. Installation of the permanent ground anchors would be carried out by a suitably qualified and experienced Contractor and is considered feasible.

Contention	Commentary
B3: Matters involving insufficient information **Access** 11. The Access Report from BCA Logic dated 22/09/2020 does not cover all works included in the Proposal and has not considered beach access issues including beach and all-ability access for the Surf Life Saving Club activities, public access, and beach management works. <u>Particulars</u> a. The Proposal envisages that the beach level will change and may reduce over time. An eroded beach state is likely to persist following a significant storm. This eroded beach state could become permanent, depending on long-term beach stability and sea level rise. b. The stepped seawall structure will compromise the beach access for inflatable rescue boats, jet skis and surfboat craft, through the seaward roller doors. The stepped seawall proposed should consider an all-ability access ramp and/or an access ramp for low-beach positions. A longitudinal ramp could have been included in the Proposal.	The proposed works include stair and bleacher access to the beach to a lower level than in the drawings submitted with the DA to improve beach access following storms. It is not expected that an eroded beach state would become 'permanent' as there will always be a level of beach recovery following storms. Beach access will also be managed by beach scraping carried out by Council. Sea level rise is predicted to cause a narrowing of beach width over time, in common with all beaches. The most appropriate means of managing this future situation would be a universal program of 'amenity beach nourishment'. A ramp is proposed for watercraft access, the position and design of which has been agreed in consultation with Newport SLSC members. Council has developed a 'Disability Inclusion Action Plan 2022 – 2026' and is committed to continually improving access and inclusion, including improving all-ability access to beaches across the Northern Beaches, not only Newport Beach. Refer to Section 4.1 of the report.

6 COASTAL ASSESSMENT

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

- Coastal Management Act 2016;
- State Environmental Planning Policy (Resilience and Hazards) 2021;
- Pittwater Local Environmental Plan 2014; and
- Pittwater 21 Development Control Plan.

6.1 Coastal Management Act 2016

The relevant section of the Coastal Management Act 2016 is Section 27 within Part 5 Miscellaneous. This Section is reproduced below followed by comments and assessment in Table 6-1.

27 Granting of development consent relating to coastal protection works

(1) Development consent must not be granted under the *Environmental Planning and Assessment Act 1979* to development for the purpose of coastal protection works, unless the consent authority is satisfied that—

(a) the works will not, over the life of the works—
(i) unreasonably limit or be likely to unreasonably limit public access to or the use of a beach or headland, or
(ii) pose or be likely to pose a threat to public safety, and

(b) satisfactory arrangements have been made (by conditions imposed on the consent) for the following for the life of the works—
(i) the restoration of a beach, or land adjacent to the beach, if any increased erosion of the beach or adjacent land is caused by the presence of the works,
(ii) the maintenance of the works.

(2) The arrangements referred to in subsection (1) (b) are to secure adequate funding for the carrying out of any such restoration and maintenance, including by either or both of the following—

(a) by legally binding obligations (including by way of financial assurance or bond) of all or any of the following—
(i) the owner or owners from time to time of the land protected by the works,
(ii) if the coastal protection works are constructed by or on behalf of landowners or by landowners jointly with a council or public authority—the council or public authority,

(b) by payment to the relevant council of an annual charge for coastal protection services (within the meaning of the *Local Government Act 1993*).

(3) The funding obligations referred to in subsection (2) (a) are to include the percentage share of the total funding of each landowner, council or public authority concerned.

Note. Section 80A (6) of the *Environmental Planning and Assessment Act 1979* provides that a development consent may be granted subject to a condition, or a consent authority may enter into an agreement with an applicant, that the applicant must provide security for the payment of the cost of making good any damage caused to any property of the consent authority as a consequence of the doing of anything to which the consent relates.

Table 6-1 Coastal Management Act 2016 – Comments and Assessment

Coastal Management Act 2016 Section 27	Comments/Assessment
(1) Development consent must not be granted under the *Environmental Planning and Assessment Act 1979* to development for the purpose of coastal protection works, unless the consent authority is satisfied that:	
(a) the works will not, over the life of the works:	
(i) unreasonably limit or be likely to unreasonably limit public access to or the use of a beach or headland, or	The proposed coastal protection works incorporate public access to the beach by means of four sets of stairs and a series of bleachers along the full length of the seaward side of the SLSC building over a total distance of approximately 70m. The lowest level of the stairs and bleachers is 3.22m AHD, approximately 2.3m below the level of the promenade, accommodating access to the beach at lower beach levels. The access arrangements are an improvement over the existing situation where ad-hoc rock placed in May 1974 currently exists seaward of the promenade. The proposed stairs and bleachers extend a lesser distance onto the beach beyond the promenade than the existing ad-hoc rock. It is not considered the proposed works would unreasonably limit or be likely to unreasonably limit public access to or use of the beach. The proposed works are remote from any headland.
(ii) pose or be likely to pose a threat to public safety.	The proposed works, over the life of the works, would not be expected to pose or be likely to pose a threat to public safety, in respect of the beach erosion/shoreline recession hazard. The proposed coastal protection works comprising a secant pile wall, capping beam, stairs, bleachers, and permanent ground anchors, would be capable of preventing undermining of the SLSC building in the event the building was occupied in a severe storm event. The landward returns of the coastal protection works at the northern and the southern ends are sufficiently long, deep and distant from the SLSC building that the end effects estimated in WRL (2021) and shown on Figure 2-5 would not be expected to reduce the bearing capacity of the existing and proposed footings to the building and otherwise put the building or any occupants at risk. In practice it is unlikely the building would in fact be occupied during a severe storm event having regard to the implementation of coastal erosion emergency action plans and the management of persons at such times. The coastal protection works would be designed to be structurally sound in a 1,000-year ARI event, accordingly damage to the structure which could lead to debris or the like on the beach, presenting a risk to public safety, is not considered a significant risk.

Coastal Management Act 2016 Section 27	Comments/Assessment
	The coastal inundation hazard (wave overtopping) does present a potential risk to public safety. It would be necessary to actively manage the public at times of storm events that lead to overtopping of the promenade. This is feasible and should be incorporated in an Operational Environmental Management Plan (OEMP) or similar. Preparation of such a Plan should be imposed as a condition of consent. Construction of the coastal protection works would include removal of the existing ad-hoc rock protection. This is a positive outcome for public safety due to the risk the existence of this rock poses when exposed in storms and subject to being strewn across the beach and possibly into the surf zone. Based on the above, it is considered the consent authority can be satisfied that the proposed works will not, over the life of the works, pose or be likely to pose a threat to public safety.
(b) satisfactory arrangements have been made (by conditions imposed on the consent) for the following for the life of the works:	
(i) the restoration of a beach, or land adjacent to the beach, if any increased erosion of the beach or adjacent land is caused by the presence of the works,	Firstly, it is necessary to consider whether any increased erosion of the beach or adjacent land would be caused by the presence of the works. This can be considered under several topics: • additional scour/erosion immediately seaward of the works; • end effects on immediately adjacent land; • consequences due to 'locking up' of sand behind the coastal protection works. <u>Additional scour/erosion immediately seaward of the works</u> Research has shown that concerns that seawalls lead to additional scour/erosion immediately seaward and greatly delay post-storm beach recovery are probably false, as there are no known data or physical arguments to support these concerns (US Army Corps of Engineers, 2006). In addition, recent relevant numerical modelling studies of the impact of seawalls on beach behaviour, in particular beach width (MHL et al, 2021; MHL, 2022), have shown that vertical seawalls would not be expected to have a significant impact on beach width behaviour relative to sloping rock protection providing the position of the vertical seawall is sufficiently landward compared to the profile of the sloping rock protection, as would be the case for the proposed coastal protection works and existing rock protection in front of the Newport SLSC building (refer Figure 3-1). As such, the proposed works would not be expected to lead to any increased scour/erosion immediately seaward of the works compared to the existing situation. <u>End effects on immediately adjacent land</u>

Coastal Management Act 2016 Section 27	Comments/Assessment
	Erosion of immediately adjacent land is predicted to occur due to end effects, caused by the presence of the works. The erosion has been estimated by the Water Research Laboratory (2021) and is shown in Figure 2-5. It was found that: • no significant end effect would likely be observed under present day conditions up to the 100 year ARI event, as a sufficient sand buffer would exist seaward of the coastal protection works; and • end effects would be experienced for the 2050 and 2080 planning periods when account is taken of the reduced sand volume seaward of the works due to shoreline recession associated with sea level rise. It can be noted at this point that the end effects depicted at 2050 and 2080 in Figure 2-5, while appropriate for planning purposes, would be expected to be conservative since the design 100 year ARI event has been constrained to occur at the end of the 2050 and 2080 planning periods when the full shoreline recession due to sea level rise has also occurred. The 100 year ARI event has a 1% change of occurring in any one year and may have occurred, for example, earlier in the planning period[6]. The beach would also naturally recover after the design storm event, hence the situation depicted in Figure 2-5 is temporary not permanent. An underlying assumption for determining the extent of the end effect is that the volume of sand 'locked up' behind the coastal protection works and which would otherwise be available to meet the storm erosion demand is offset within the end effect at each end of the works. It is also relevant to assess whether the soil materials within the predicted extent of the end effects are erodible, i.e.. that there are no geological/geotechnical constraints to erodibility. Reference to the geotechnical investigation for the site (JK Geotechnics, 2021) indicates the materials are sand and therefore are erodible[7]. Since end effects would also occur for the existing situation of rock protection in front of the SLSC building, the erosion depicted in Figure 2-5 is not all 'increased erosion' caused by the presence of the proposed works. However, a level of increased erosion can be expected since the north-south length of the proposed coastal protection works is greater than the corresponding length of the existing rock protection, and this length is a factor in assessing the extent of the end effect (e.g. refer Water Research Laboratory (2021), Figure 14). Since some increased erosion would be caused by the presence of the works, in order to meet the requirements of the Coastal Management Act 2016, satisfactory arrangements would need to be made (by conditions

[6] *It is also noted that:*
- *the chance of a 100 year ARI event occurring over the next approximately 30 years (to 2050) is about 25%; conversely there is a 75% change it would not occur;*
- *the chance of a 100 year ARI event occurring over the next approximately 60 years (to 2080) is about 45%; conversely there is a 55% chance it would not occur.*

[7] *It is also assessed that the soils beneath the SLSC building (landward of the proposed coastal protection works and 'locked up') are sand and therefore erodible.*

Coastal Management Act 2016 Section 27	Comments/Assessment
	imposed on the consent) for restoration of the increased erosion for the life of the works. Such a condition should be prepared to ensure compliance by the Applicant with Section 27 (1)(b)(i). <u>Consequences due to 'locking up' of sand</u> There are two potential consequences of the 'locking up' of sand behind the coastal protection works: • additional localised erosion to meet the storm erosion demand. This has been considered in the above discussion of end effects; and • impact on long term shoreline recession. An assessment of the second point has been made by considering that the volume of sand 'locked up' behind the coastal protection works could represent a net loss to the coastal compartment and cause an underlying shoreline recession[8]. The estimated volume of sand 'locked up' behind the coastal protection works over the design life to 2084, measured above 0m AHD, would be approximately 6,000m^3. Distributing this volume over the depth of the active profile and the length of Newport Beach would give an equivalent shoreline recession of approximately 0.4m to 2084. If the length of Bilgola Beach is also included, on the basis that Newport Beach and Bilgola Beach together are considered a single closed system, the equivalent shoreline recession to 2080 would reduce to approximately 0.3m. The above underlying shoreline recession estimates due to a net sediment loss to 2084 may be compared to a predicted shoreline recession to 2084 due to sea level rise of approximately 16m (based on predicted sea level rise 0.5m and Bruun factor of 31) and is therefore less than 3% of the total estimated shoreline recession. This percentage would also be expected to be an overestimate of the 'increased erosion' due to the locking up of sand since such locking up would also occur to a degree for the existing situation due to the existing rock protection even though this protection does not meet current coastal engineering standards. In practice it would be very difficult to differentiate 'on the ground' between the two sources of shoreline recession (locking up of sand and sea level rise). Nevertheless, it is recommended the potential source of increased erosion (recession) due to 'locking up' of sand be recognised in imposing a condition in regard to Section 27 (1)(b)(i).
(ii) the maintenance of the works.	It is understood a draft condition has been prepared to ensure compliance by the Applicant with Section 27 (1)(b)(ii), hence the matter of maintenance of the works over the life of the works has been addressed.
(2) The arrangements referred to in subsection (1) (b) are to secure adequate funding for the carrying out of any such restoration and	A condition should be imposed to satisfactorily address Section 27(2). Funding arrangements are not strictly a coastal engineering matter, although it is noted that

[8] *As noted earlier in the report (Section 2.2.2), underlying recession at Newport Beach is currently assessed to be 0m/yr, with the beach considered to be a closed system.*

Coastal Management Act 2016 Section 27	Comments/Assessment
maintenance, including by either or both of the following:	calculation of the dollar amount to ensure adequate funding may require coastal engineering input.
(a) by legally binding obligations (including by way of financial assurance or bond) of all or any of the following—	Refer above
(i) the owner or owners from time to time of the land protected by the works,	Refer above
(ii) if the coastal protection works are constructed by or on behalf of landowners or by landowners jointly with a council or public authority—the council or public authority.	Refer above
(b) by payment to the relevant council of an annual charge for coastal protection services (within the meaning of the *Local Government Act 1993*).	Refer above
(3) The funding obligations referred to in subsection (2) (a) are to include the percentage share of the total funding of each landowner, council or public authority concerned.	Not applicable

6.2 State Environmental Planning Policy (Resilience and Hazards) 2021

6.2.1 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.

6.2.2 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 6-2.

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 6-2 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 consent authority can be satisfied that the proposed works are engineered to withstand the current and projected beach erosion/shoreline recession hazard and coastal inundation hazard for the design life of the works (60 years). The coastal protection works would be designed for a 1,000-year ARI event, which is considered to constitute an appropriate encounter probability. It is feasible for the existing section of the SLSC building which is to be retained and for the new northern section of the building to be satisfactorily designed to accommodate the wave forces applied to the building (refer to letter prepared by the Structural Engineer for the building, Partridge). It is also noted that roller shutters have been relocated from the seaward face of the SLSC building to the northern side of the building to avoid damage due to wave forces.
(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 likely to alter coastal processes into the future primarily in relation to the creation of additional end effects immediately adjacent to the works, as predicted (conservatively) by the

SEPP Clause 2.9	Comments/Assessment
	Water Research Laboratory (2021). Natural beach recovery would occur following the storms which create the end effects; hence such effects would not be long term. A minor impact on future shoreline recession compared to the existing situation could occur due to 'locking up' of sand behind the coastal protection works. An imposed condition of consent in relation to Section 27 (1)(b)(i) of the Coastal Management Act 2016, as referred to above, would be triggered to restore the land as a result of increased erosion caused by the presence of the works. It is noted here that the wording of sub-clause 2.9 (b)(i) in State Environmental Planning Policy (Resilience and Hazards) 2021 is somewhat at odds with sub-clause 27 (1)(b)(i) in the Coastal Management Act 2016 which specifically anticipates that coastal protection works may increase erosion but that this is only acceptable if conditions can be imposed to restore it. It is understood that if there is any inconsistency between the Policy and the Act, the Act would override the Policy.
(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	Consideration of rock platforms and headlands is not relevant as these features are remote from the proposed works. As noted primarily in response to Section 27 (1)(a)(i) of the Coastal Management Act 2016, the proposed works would improve public access compared to the existing situation, hence the consent authority can be satisfied that the proposed works would not reduce access to the beach. Inclusion of bleachers and seating within the coastal protection works design would improve public amenity. Removal of the existing ad-hoc rock protection would also improve public amenity. The predicted additional end effects due to the proposed works may temporarily reduce use of the beach and foreshore but the combination of natural beach recovery and a condition of consent imposed in relation to Section 27 (1)(b)(i) of the Coastal Management Act 2016 which would require beach restoration due to increased erosion would mean that a reduction in use of the beach and foreshore would not be long term.
(iii) incorporates appropriate measures to manage risk to life and public safety from coastal hazards	The consent authority can be satisfied that appropriate measures are incorporated to manage risk to life and public safety due to the beach erosion/shoreline recession hazard.

SEPP Clause 2.9	Comments/Assessment
	Measures have been proposed to mitigate the risk to life and public safety from the coastal inundation hazard, such as incorporation of wave parapets. However, there is a residual public safety risk due to wave overtopping and a condition of consent should be imposed to manage this risk through preparation of an OEMP or similar.
(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	As noted above, an OEMP or similar should be prepared to ensure there are appropriate responses to, and management of, the coastal inundation hazard. This hazard is well understood following completion of physical model testing by the Water Research Laboratory. It is considered that suitable measures are in place in relation to the beach erosion/shoreline recession hazard to ensure that there are appropriate responses to, and management of, coastal processes and the current and future hazard, in that: • the current and future coastal processes and hazard over the life of the works have been assessed to an acceptable level of understanding; • the design of the proposed works has taken into account the current and future hazard over the life of the works, to accepted practice; and • measures to ensure maintenance and restoration are in place by way of proposed conditions of consent.

6.2.3 Division 3 coastal environment area

The relevant clause is reproduced below followed by comments and assessment in Table 6-3.

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 6-3 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	The relevant coastal engineering consideration is groundwater. The proposed works would not be likely to cause an adverse impact on groundwater since: • free draining material would exist behind the coastal protection works (insitu sand and any crushed reused rock); • weepholes would be provided at the junction of the secant pile wall and capping beam; • the area landward of the coastal protection works is comprised largely of impermeable surfaces thus inhibiting infiltration of overtopping waters; and • any overtopping waters that do enter the groundwater system landward of the works would be able to flow laterally.
(b) coastal environmental values and natural coastal processes	The relevant coastal engineering consideration is natural coastal processes. The proposed works would not be likely to cause an adverse impact on coastal processes directly seaward of the works compared to the existing situation based on the landward position of the secant pile wall relative to the existing sloping rock protection and the results of relevant numerical modelling of beach behaviour

SEPP Clause 2.10	Comments/Assessment
	(beach width) as reported in MHL et al (2021) and MHL (2022). The proposed works would impact on natural coastal processes immediately to the north and south of the proposed works, causing additional end effects compared to the existing situation. The potential for adverse impacts would be mitigated by natural beach recovery following the storm and by restoration works carried out as a condition of consent imposed to address Section 27 (1)(b)(i) of the Coastal Management Act 2016. A potential minor adverse impact on natural coastal processes (possible minor additional shoreline recession) has been identified due to the 'locking up' of sand behind the coastal protection works. To mitigate this potential adverse impact, it is recommended this potential source of recession be recognised in finalising the condition imposed in relation to Section 27 (1)(b)(i).
(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 not be likely to cause an adverse impact on water quality of the marine estate. The proposed coastal protection works are constructed primarily of reinforced concrete which is essentially inert with no risk of leaching contaminants when in contact with surface water, groundwater or ocean waters. The proposed works do not impact on any sensitive coastal lakes listed in Schedule 1.
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms	Not a coastal engineering consideration.
(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	Refer to discussion on public access in earlier responses, e.g. in relation to Section 27 (1)(a)(i) of the CM Act 2016 and Clause 2.9 (b)(ii) of the SEPP (Resilience and Hazards) 2021.
(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 impact on use of the surf zone as the works are located at the back of the beach and would only be expected to interact with the surf in severe storms. Use of the surf by beachgoers would not be expected at such times.
(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	It is considered that the proposed works have been generally designed, sited and managed to avoid, minimise and mitigate the impacts referred to in subsection (1). In particular it is noted that: • the proposed coastal protection works are sited as far landward as practicable with minimal footprint; • a maintenance plan would be prepared as a condition of consent; • a condition of consent would be imposed to ensure satisfactory arrangements are in place, for the life of the works, for restoration of the beach and land adjacent to the beach, if increased erosion of the beach or adjacent land is caused by the presence of the works.
(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or	Refer above
(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.	Refer above

6.2.4 Division 4 Coastal use area

The relevant clause is reproduced below followed by comments and assessment in Table 6-4.

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 6-4 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	Refer to discussion on public access in earlier responses, e.g. in relation to Section 27 (1)(a)(i) of the CM Act 2016 and Clause 2.9 (b)(ii) of the SEPP (Resilience and Hazards) 2021.
(ii) overshadowing, wind funnelling and the loss of views from public places to foreshores,	Not coastal engineering considerations.
(iii) the visual amenity and scenic qualities of the coast, including coastal headlands	The writer acknowledges that he is not an expert in visual impact assessment, however a number of coastal engineering considerations influence the potential for coastal protection works to impact on the visual amenity and scenic qualities of the coast hence it is considered reasonable to provide some commentary below on the visual amenity aspects. In order to satisfy the State Environmental Planning Policy (Resilience and Hazards) 2021 the proposed coastal protection works must be engineered to withstand current and projected coastal hazards over the design life of the works and must incorporate appropriate measures to manage risk to life and public safety from coastal hazards, e.g. refer clauses 2.9(a) and 2.9(b)(iii) of the Policy. The requirement to satisfy the Policy dictates that the proposed works must have a certain structural robustness, e.g. be able to accommodate without failure the design wave conditions, beach scour level, geotechnical conditions, etc. and must have a minimum crest level to mitigate wave overtopping. It is noted that a 1000-year ARI event has been adopted for structural design of the coastal protection works. The outcome of the above process is necessarily a substantial structure.

SEPP Clause 2.11	Comments/Assessment
	The cross-shore position of coastal protection works also influences the potential for the works to impact on visual amenity. The works have been located as far landward as possible, which also benefits other factors such as potential impacts of the works on coastal processes. It is noted that the works would be substantially buried under beach sand most of the time. It is also proposed that the stairs, bleachers, and capping beam would be coloured to match the colour of the beach sand, to reduce visual impact.
(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 coastal protection works have been located as far landward as possible, would be substantially buried most of the time, and the main visual elements would be coloured to match the colour of the beach sand.
(ii) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or	Refer above
(iii) if that impact cannot be minimised—the development will be managed to mitigate that impact	Refer above
(c) has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development	Not coastal engineering considerations.

6.2.5 Division 5 General

The relevant clause 2.12 is reproduced below followed by comments and assessment in Table 6-5. It is noted that clause 2.13 under Division 5 General refers to the need to take into consideration the relevant provisions of any certified coastal management program that applies to the land. A certified coastal management program does not exist for Newport Beach hence this clause is not applicable.

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 6-5 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 likely to cause increased risk of coastal hazards on land to the north and south of the SLSC building primarily due to the expected additional end effects caused by the works. This is a consequence of providing adequate protection to the SLSC building and the two Norfolk Island Pines. It is noted here that the wording of Clause 2.12 in State Environmental Planning Policy (Resilience and Hazards) 2021 is somewhat at odds with sub-clause 27 (1)(b)(i) in the Coastal Management Act 2016 which specifically anticipates that coastal protection works may increase erosion but that this is only acceptable if conditions can be imposed to restore it. It is understood that if there is any inconsistency between the Policy and the Act, the Act would override the Policy.

6.2.6 Pittwater Local Environmental Plan 2014

The relevant clause in Pittwater Local Environmental Plan 2014 is Clause 7.5 Coastal risk planning. However, the SLSC building and adjacent areas are not mapped on the Coastal Risk Planning Map – Sheet CHZ_017 as 'Wave Inundation' or 'Coastal Erosion/Wave Inundation'. The mapping would only appear to apply to private land. In any case, consideration is given to Clause 7.5 below.

Clause 7.5 (3) states the following:

(3) Development consent must not be granted to development 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) incorporate 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".

Most of the matters listed above have been addressed in the previous sections with regard to the Coastal Management Act 2016 and State Environmental Planning Policy (Resilience and Hazards) 2021, and it is not proposed to repeat the comments and assessment here. Reference should be made to these earlier sections. It is noted that Item (e) requires the consent authority to be satisfied that the development

provides for relocation, modification, or removal of the development to adapt to the impact of coastal processes and coastal hazards. Relocation of the development is not under consideration by Council. Removal of the development is not appropriate given the function it serves. Modification of the development would not be expected to be required over the design life, given the basis of design and the proposed conditions, but would be able to be undertaken if necessary.

6.2.7 Pittwater 21 Development Control Plan

The relevant section of the Pittwater 21 Development Control Plan is Section B3.3 Coastline (Beach) Hazard. The following controls apply:

> All development land to which this control applies must comply with the requirements of the *Coastline Risk Management Policy for Development in Pittwater (Part B, Appendix 6 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.
>
> The development must not adversely affect or be adversely affected by coastal processes, nor must it increase the level of risk for any profile, assets and infrastructure in the vicinity due to coastal processes.

While the provisions of Section B3.3 do not apply as the site is not identified as Beach Management Area on the relevant Coastal Risk Planning Map, the Coastline Risk Management Policy for Development in Pittwater does apply as the design and undertaking of the works is by a public authority (Council) and the works would be affected by, and would impact on, coastal processes. Section 8.2 of the Policy and the Controls listed under (i) General (a) to (k), and (ii) Coastal Protection Works (a) to (e), are the relevant considerations.

A number of the Controls under (i) General are matters of construction or operational detail, such as use of flood compatible materials below the Coastal Planning Level, positioning of electrical equipment, return of excavated uncontaminated sand to the active beach, and the means of storage of toxic or potentially polluting materials. These matters have been considered and would be adopted by the Applicant. A number of further Controls relate to maintenance and would be addressed by conditions. The requirement that the development 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, is addressed through the basis of design and by the conditions. The key consideration is the potential for the development to impact on surrounding properties, coastal processes, or the amenity of public foreshore lands. This consideration has been addressed in the review provided in the previous sections. It is considered the Objectives of the Policy and the Controls under (i) General have been or can be met.

In a similar manner to the above, it is considered the Controls under (ii) Coastal Protection Works have been or can be met through inclusion of appropriate conditions, and the wording of conditions. Again, the key consideration has been the potential for the development to impact on surrounding properties or coastal processes (amenity is not referred to under (ii)).

7 REFERENCES

Australian Geomechanics Society (AGS) (2007a), Practice Note Guidelines for Landslide Risk Management 2007, and (2007b), Commentary on Practice Note Guidelines for Landslide Risk Management, Australian Geomechanics Society Landslide Taskforce, Landslide Practice Note Working Group, Australian Geomechanics, Volume 42, No. 1, March, pp. 63-114 and pp. 115 – 158.

Gordon, AD, Carley, JT, and Nielsen, AF (2019), Design Life and Design for Life, Australasian Coasts & Ports 2019 Conference, Hobart, September 2019.

Horton Coastal Engineering (HCE) (2021a), Coastal Engineering and Flooding Advice for Newport SLSC Clubhouse Redevelopment, prepared for Adriano Pupilli Architects, Issue 3, 26 August 2021.

JK Geotechnics (2021), Geotechnical Investigation for Proposed Alterations and Additions at Newport Surf Life Saving Club, 394 Barrenjoey Road, Newport, NSW, prepared for Horton Coastal Engineering, Ref: 32537REpt Rev2, 19 October 2021.

MHL, UNSW WRL and Balmoral Group (2021), Wamberal Terminal Coastal Protection Assessment: Draft Final Stage 2 – Coastal Protection Amenity Assessment, Report Numbers MHL 2779, WRL TR 2021/05, prepared for Central Coastal Council, June 2021

MHL (2022), MHL2877 Collaroy-Narrabeen Beach Seawall: Additional Assessment Items – Stage 1 Review of Development Application for 1190 to 1196 & 1204 Pittwater Road, Narrabeen, 8 June 2022.

Water Research Laboratory (WRL) (2021), Newport SLSC Coastal Engineering Advice, prepared for Northern Beaches Council, WRL Ref: WRL2021004 JTC, 8 July 2021.

Appendix A – Copy of Statement of Facts and Contentions (SOFAC) Filed by the Sydney north Planning Panel of 26 May 2023

Filed: 26 May 2023 9:50 AM

D0001Q3C7E

Statement of Facts and Contentions

COURT DETAILS

Court	Land and Environment Court of NSW
Division	Class 1
Registry	Land and Environment Court Sydney
Case number	2023/00109048

TITLE OF PROCEEDINGS

First Applicant	NORTHERN BEACHES COUNCIL ABN 57284295198
First Respondent	NORTHERN BEACHES COUNCIL (at the control and direction of the Sydney North Planning Panel) ABN 57284295198
Second Respondent	Sydney North Planning Panel

FILING DETAILS

Filed for	Sydney North Planning Panel, Respondent 2
Legal representative	ERIN LEA GAVIN
Legal representative reference	
Telephone	02 8289 6684

ATTACHMENT DETAILS

In accordance with Part 3 of the UCPR, this coversheet confirms that both the Lodge Document, along with any other documents listed below, were filed by the Court.

Statement of Facts and Contentions (Second Respondent's Statement of Facts and Contentions.pdf)

[attach.]

Form A (version 2)

STATEMENT OF FACTS AND CONTENTIONS

COURT DETAILS	
Court	Land and Environment Court of New South Wales
Class	1
Case number	2023/00109048
TITLE OF PROCEEDINGS	
Applicant	**Northern Beaches Council**
First Respondent	**Northern Beaches Council**
Second Respondent	**Sydney North Planning Panel**
FILING DETAILS	
Prepared for	**Sydney North Planning Panel**, Second Respondent
Legal representative	Erin Gavin, Department of Planning and Environment
Legal representative reference	33847
Contact name and telephone	Jessica Mackay, 02 9934 0615 Shahana Karunakaran, 02 8275 1356
Contact email	jessica.mackay@planning.nsw.gov.au shahana.karunakaran@dpie.nsw.gov.au
PART A: FACTS	

The proposal

1. The Applicant submitted Application, DA2021/2173 on 12 November 2021 (the **Application**).
2. The Application sought to make alterations and additions to the Newport Surf Life Saving Club building with an extension to the northern side and coastal protection works in the form of buried seawall along the length of the building. The site is known as the Newport Surf Life Saving Club, and is situated at 394 Barrenjoey Road, Newport and Lot 1 DP 1139445 and Lot 7094 DP 1059297 (**Site**).
3. Specifically, the proposed works are as follows:
    a. Partial demolition of the surf club building;
    b. Construction of a new northern wing made up of a gear storage area, committee room, multi-purpose training room, practical surf life saving training and assessment room, bar and terrace;

c. Reconfiguration of the internal layout of the building;

d. Upgrade to the club and public amenities;

e. Landscape upgrades; and

f. Coastal protection works, involving the building of a secant pile wall with a reinforced concrete capping beam and high-level steps.

4. The Application also relies upon a request for variation to the maximum building height development standard pursuant to clause 4.3 of the *Pittwater Local Environmental Plan 2014 (Pittwater LEP).*

The Site

5. The Site of the proposed development is irregular in shape and stretches from the south of Newport Beach to Myola Road.

6. The Site has an area of approximately 13,620m2.

Figure 1 - The Site

The locality

7. The Site is surrounded by further public open space.

The statutory controls

8. The planning controls applying to the Site are:

- *Environmental Planning and Assessment Act 1979* (**EP&A Act**)
- *Environmental Planning and Assessment Act 2021* (**EP&A Reg**)

- *State Environmental Planning Policy (Resilience and Hazards) 2021* (**Resilience and Hazards SEPP**)
- *State Environmental Planning Policy (Transport and Infrastructure) 2021* (**Transport and Infrastructure SEPP**)
- *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (**BC SEPP)**
- *Pittwater Local Environmental Plan 2014* (**Pittwater LEP**)
- *Pittwater 21 Development Control Plan* (**Pittwater DCP**)

9. The Site is zoned as RE1 Public Recreation under the Pittwater Local Environmental Plan 2014 (**PLEP 2014**).

Actions of the Respondents

10. On 12 November 2021, the Application was lodged with Northern Beaches Council (the **Council**).
11. On 11 May 2022 the Council provided a briefing to the Sydney North Planning Panel (the **Panel**). The Council and the Panel discussed issues pertaining to heritage and coastal impacts.
12. The Application was exhibited between 12 July 2022 and 26 July 2022. A total of 38 written submissions were received.
13. On 20 July 2022, the Council provided a further briefing to the Panel. The Panel raised the issue of coastal risks and requested further information about coastal works.
14. The Site was visited by members of the Panel on 25 August 2022.
15. On 2 September 2022, the Council recommended approval of the Application subject to some conditions.
16. On 21 September 2022, the Panel held a public meeting via teleconference. The Panel considered various submissions from the community. The Panel deferred its determination of the matter for reasons including, that sufficient information had not been provided to justify the project design and its implications for the coastline.
17. The Application was determined by the Panel on 5 October 2022. The Panel unanimously refused the Application. The reasons for refusal include:
    a. The proposal does not satisfactorily address section 27 of the Coastal Management Act;
    b. The proposal does not satisfy clause 4.3 of the Pittwater LEP;

c. The Site is not suitable for the proposed development given its exposure to coastal hazards;

d. Alternative design options for such a valuable but exposed asset were not properly considered due to the emphasis on heritage and open space protection;

e. The use of coastal protections works to protect the current building footprint and heritage fabric is questionable given that over topping and inundation of the building would still occur and collateral erosion damage is likely to be caused to surrounding beach and park; and

f. The long term planning for the location's Coastal Management Program is yet to be completed. This would facilitate the appropriate assessment of the impacts on the whole coastal compartment, not just the surf club site.

18. On 4 April 2023 the Applicant commenced these proceedings by filing the Class 1 Application.

PART B: CONTENTIONS

The Second Respondent says that the contentions relevant to the determination of the Application are as follows:

B1: Contentions which warrant refusal of the Application

Coastal

1. The Application should be refused because the selection of design life is excessive, in particular when applied to the existing building upgrade works.

   Particulars

   a. Two documents are provided in the Application which relate to coastal management:

      i. Coastal Engineering and Flooding Advice for Newport SLSC Clubhouse Redevelopment, Horton Coastal Engineering, 26 August 2021 (Horton, a).

      ii. Coastal Engineering Report and Statement of Environmental Effects for Buried Coastal Protection Works at Newport SLSC, Horton Coastal Engineering, 26 August 2021 (Horton, b).

   b. The proposed Surf Life Saving clubhouse building upgrade works consider a 60-year design life (Horton b, section 5.1). The rationale is based on coastal engineering guidelines predominantly applicable to beachfront residential

developments.

c. The existing clubhouse is a non-habitable building and can operate at a lower design life standard.

d. This design life criteria is excessive, considering the nature of the existing building and its use. Consequently, the Proposal has included considerable coastal engineering and structural works to provide an extended design life.

e. A lower design life could provide substantial benefits in the short term, including shorter works programs and more straightforward approval pathways that remain open-ended.

f. The Proposal does not provide a robust rationale for selecting design life that considers separately the existing clubhouse upgrade works and the proposed clubhouse extensions separately.

g. The selection of design life is also a matter of cost-benefit analysis. Such analysis is missing in the Proposal.

2. The development application should be refused because the proposal results in unacceptable coastal impacts.

Particulars

a. The proposed contiguous deep-piled wall foundation with stair access appears to have been selected without considering alternative seawall options. A rock structure could be envisaged in front of the proposed clubhouse to reduce wave actions. The wave overtopping and run-up on a dissipative rock structure are typically lower than on a reflective vertical/stepped structure. This seawall configuration could reduce the hydraulic loads on the proposed upgrade works.

b. The feasibility of designing the building extension on the deep-piled foundation option was rejected because it was hypothesized that such piling work would be invasive and costly for the existing building (Horton a, Section 4). However, a contiguous deep-piled seawall is proposed only 3.5m from the existing building. This supports that – at least - the extension could be built on deep-piles foundation, which could reduce the length of the proposed seawall. While this would not mitigate coastal hazards on the existing building this would allow for the extension to be resilient to coastal erosion. This option was discussed in the Partridge report (Horton a, Appendix D).

c. The existing rubble rock structure placed in 1974 along the edge of the clubhouse is not of suitable engineering standard. However, this structure could be used to manage some level of beach erosion, as it was over the 1974-1975 period. Scour along the rock rubble structure could trigger sand scrapping or sand nourishment works on the beach,

particularly between storms. It is not uncommon to carry out beach scraping to maintain beach amenities. This softer coastal management pathway has not been explored in the proposal and is also a matter for the local Coastal Management Plan.

d. Sea level rise and coastal hazards will continue beyond 2080 and are not fully addressed, even by adopting a 60-year design life. Whether the building upgrade works are carried-out or not the existing clubhouse will remain vulnerable to coastal hazards.

e. A 4.9% probability of exceeding the hydraulic loads during the design life of the building is not negligible (Horton b, Section 5.7). As a consequence, it will not be possible to retain the clubhouse at its current location, in perpetuity. Such considerations underpin the 1985 Public Work Department on building relocation (Horton a, Section 8.5). If hydraulic actions damage the existing clubhouse and cannot be repaired, the clubhouse may be relocated landward to an appropriate position.

f. It is not uncommon for a Surf Life Saving Club clubhouse to be relocated to manage coastal hazards. This is an efficient risk mitigation strategy in the long-term, which has not been considered.

3. The Application should be refused because hydraulic loads and structural works have not been investigated sufficiently to confirm the feasibility of the structural reinforcement works and the corresponding heritage impacts on the existing clubhouse.

   Particulars

   a. The feasibility of the proposed structural works on the existing clubhouse (solid seating, wall reinforcements, etc.) depends on the hydraulic load associated with wave overtopping and run-up into the clubhouse.

   b. The Water Research Laboratory (WRL) Report (Horton a, Appendix B) calculated a design hydraulic uniform load along the building for a run-up bore to be 103kN/m for a duration of a wave period (several seconds). On the other hand, the James Taylor engineering report (Horton a, Appendix C) considered that the 103kN/m load would be applied partially and for ultimate limit state design conditions; however, the WRL load is not a peak load. Peak wave hydraulic loads are of brief duration (milliseconds) but significantly affect unreinforced brickworks (fissures, cracking). The Proposal appears to underestimate the ultimate hydraulic load due to wave slamming.

   c. The feasibility of the proposed building works relies on structural engineering work. The structural engineering works do not provide sufficient detail to provide reasonable confidence in the Proposal's feasibility and likely cost aspects.

   d. Physical testing is necessary to accurately quantify the hydraulic load and the resulting structural works. Physical testing should be carried-out to investigate the feasibility of

the clubhouse upgrade works.

e. Solid seating and other systems designed to reduce wave load on the building will need anchoring. The feasibility of such anchors poses similar design challenges to the invasive and costly deep pile foundation option discarded in the brief option selection discussion.

f. The addition of reinforced concrete walls, solid seating and bollard will also have a detrimental effect on the Heritage value of the building.

g. The structural engineer report has not appraised the pose and effect of ground anchors beneath the existing building and trees despite the WRL recommendation (Horton b, Appendix B). Anchoring could dramatically influence the feasibility of the upgrade works if the anchor installation load and working loads in the soil results in cracks in the existing clubhouse brickworks.

Planning

4. The Application should be refused because the proposed building height is excessive and does not comply with the objectives or controls in clause 4.3(2) of *Pittwater LEP 2014* in circumstances where the written request made pursuant to clause 4.6 of PLEP 2014 in relation to the contravention of the development standard is inadequate and should not be upheld.

   Particulars

   a. Clause 4.3 of PLEP 2014 states:

      Height of buildings

      (1) The objectives of this clause are as follows—

      a. to ensure that any building, by virtue of its height and scale, is consistent with the desired character of the locality,

      b. to ensure that buildings are compatible with the height and scale of surrounding and nearby development,

      c. to minimise any overshadowing of neighbouring properties,

      d. to allow for the reasonable sharing of views,

      e. to encourage buildings that are designed to respond sensitively to the natural topography,

      f. to minimise the adverse visual impact of development on the natural environment, heritage conservation areas and heritage items.

(2) The height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.

b. The maximum building height permitted for the site pursuant to the Height of Buildings Map is 8.5m. The development proposes a maximum height of 9.11m which exceeds the height of buildings development standard by 610mm (7.2%).

c. The excessive height of the development will result in a visually intrusive building that will appear out of character in the local context, and when viewed from surrounding properties and the public domain.

d. The proposed alterations and additions to the existing building will result in negative impacts on the heritage significance of the local heritage item.

e. The Applicant has submitted a written request pursuant to clause 4.6 of PLEP 2014 seeking to justify the contravention of the height development standard in clause 4.3(2) of PLEP 2014. The Court, having the functions of the consent authority for the purpose of hearing and disposing of this appeal, would not be satisfied that:

   i. The Applicant's written request under clause 4.6 of PLEP 2014 has adequately addressed the following matters required to be demonstrated:

      (1) that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and

      (2) that there are sufficient environmental planning grounds to justify the contravention of the development standard in clause 4.3 of PLEP 2014.

   ii. The proposed development will be in the public interest because it is consistent with the objectives of clause 4.3 of PLEP 2014 and the objectives for development in Zone RE1 Public Recreation pursuant to PLEP 2014.

5. The Application should be refused because the proposed alterations and additions will result in a built form that will cause an adverse impact on the visual amenity and scenic qualities of the coast and is incompatible with the heritage significance of the local item and with the character of the locality.

Particulars

a. The Application does not satisfy Clause 14 (a)(iii) of the Coastal Management SEPP because the proposal will have adverse impacts on the visual amenity and scenic qualities of the coast as a result of siting, height, bulk and scale of the proposed alterations and additions.

b. The subject site is within the Newport Locality, as identified in Section A 'A4.10 Newport

Locality' under Pittwater 21 DCP. The proposal is not consistent with the desired future character identified. In particular, the proposed alterations and additions result in a building footprint, height and scale of development that is inconsistent with the desire to minimise bulk and scale, harmonise with the natural environment and to be designed to be safe from hazards. The proposal is also unacceptable regarding the heritage conservation intent set out in the character statement.

c. The proposal does not satisfy the "outcomes" set out in Section D10.1 of Pittwater 21 DCP as proposed height and architectural design of the built form will not achieve the desired future character of the Locality and does not respond to or reinforce the spatial characteristics of the existing built form and natural environment, nor does it promote a scale and density that is in scale with the height of the natural environment. The visual impact of the built form will not be secondary to landscaping and vegetation and the proposed alterations and additions are not of high quality built for the natural context and any natural hazards.

d. The proposal does not meet Section D10.3 Scenic Protection of Pittwater 21 DCP as the development does not minimise any visual impact on the natural environment when viewed from the adjoining waterway and public reserve.

Heritage

6. The Application should be refused because the heritage significance and potential retention/alteration of the building has not been fully considered in terms of its location within the ongoing Coastal Management program.

   Particulars

   a. The heritage impact statement does not analyse the opportunity for the conservation of the early configuration of the building.

   b. The existing and proposed additions to the original Surf Club design do not complement the building in form, scale, or materials.

   c. There has been no analysis of the alternative location for additions, possibly to the west, that would have less impact on the building's significance and the beach front stability.

   d. The building has been significantly altered and added to and the Application does not provide analysis for the removal of these unsympathetic additions, the potential to relocate the original building fabric or to demolish the building and interpret the structure in a new building that would be located to meet the environmental engineering constraints of the site.

Traffic and Parking

7. The Application should be refused because it did not conduct an analysis of alternative arrangements to the parking layout which would enable the consideration of alternative footprints for the surf club building (for example, moving the bulk of the surf club building away from the ocean).

Public Interest

8. Given the number of objections received during the public notification process, the strong representations made by residents, the inadequacy of the Application and its adverse impacts, the public interest would not be served by granting consent to the Application.

   Particulars

   a. A total of thirty-eight (38) submissions were received in response to the Application. The matters raised by the resident objectors (in so far as those matters coincide with the Contentions above) are matters warranting the refusal of the Application. The submissions received are relevant matters for consideration in the Court's determination of the Application in accordance with section 4.15(1)(d) and (e) of the EP&A Act.

   b. Contentions 1 – 7 are repeated.

B3: Matters involving insufficient information

Traffic and Parking

9. There is insufficient information about the consideration given, if any, to traffic and parking at the Site.

10. The Application documents do not make clear the proposed modifications to the existing car parking layout and circulation within the carpark, to the west and north-west of the surf club building, that will result from the proposed development.

Access

11. The Access Report from BCA Logic dated 22/09/2020 does not cover all works included in the Proposal and has not considered beach access issues including beach and all-ability access for the Surf Life Saving Club activities, public access, and beach management works.

    Particulars

    a. The Proposal envisages that the beach level will change and may reduce over time. An eroded beach state is likely to persist following a significant storm. This eroded beach state could become permanent, depending on long-term beach stability and sea

level rise.

b. The stepped seawall structure will compromise the beach access for inflatable rescue boats, jet skis and surfboat craft, through the seaward roller doors. The stepped seawall proposed should consider an all-ability access ramp and/or an access ramp for low-beach positions. A longitudinal ramp could have been included in the Proposal.

SIGNATURE

Authorised officer of the Second Respondent

Signature of authorised officer of the Second Respondent	
Name in full	Peter Debnam
Capacity	Panel Chair, Sydney North Planning Panel
Date of signature	25 MAY 23

Appendix B – Drawings of Proposed Coastal Protection Works

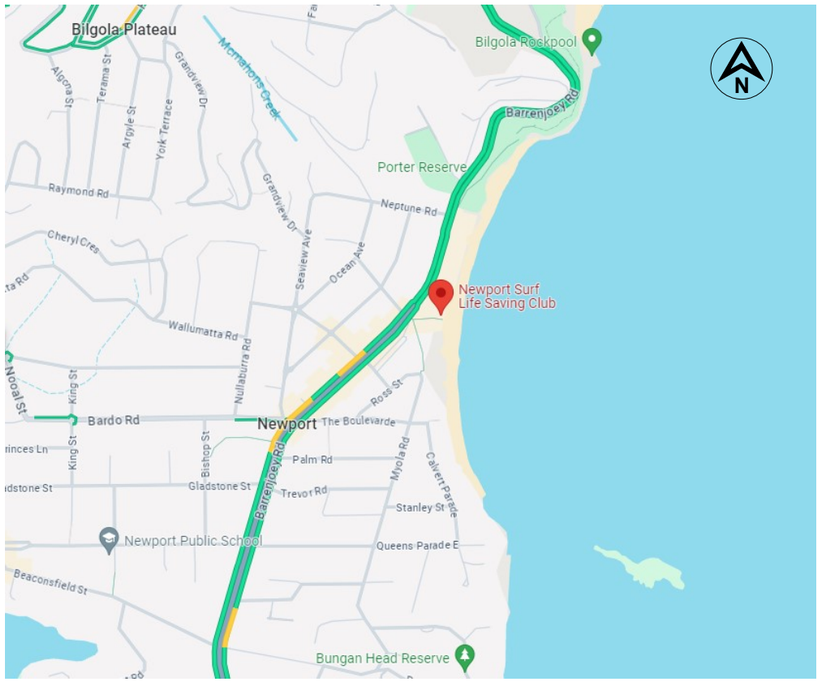
PA2407-RHD-00-105-DR-MA-0001

NEWPORT SLSC REDEVELOPMENT - COASTAL PROTECTION WORKS

FOR

NORTHERN BEACHES COUNCIL

NEWPORT SLSC AERIAL IMAGE



LOCALITY PLAN

DRAWING SHEET SCHEDULE	
DRAWING NUMBER	DRAWING TITLE
PA2407-RHD-00-105-DR-MA-0001	TITLE SHEET, LOCALITY PLAN & DRAWING LIST
PA2407-RHD-00-105-DR-MA-0011	GENERAL ARRANGEMENT PLAN
PA2407-RHD-00-105-DR-MA-0021	GENERAL ARRANGEMENT DETAILS

NOTES:

1. ALL LEVELS ARE IN METRES RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD) AND ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

2. ALL PILING AND CONCRETE STRUCTURES SHALL BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS.

S3 REVIEW & COMMENT

NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK	APP
P01	30.07.2024	DRAFT FOR COMMENT	SH	SC	GB

REVISIONS

CLIENT

northern beaches council

PROJECT

NEWPORT SLSC REDEVELOPMENT - COASTAL PROTECTION WORKS

TITLE

TITLE SHEET, LOCALITY PLAN & DRAWING LIST

Level 15,
99 Mount Street
North Sydney NSW 2060, Australia
Tel +61 2 8854 5000
Email info@rhdhv.com
Website: www.royalhaskoningdhv.com

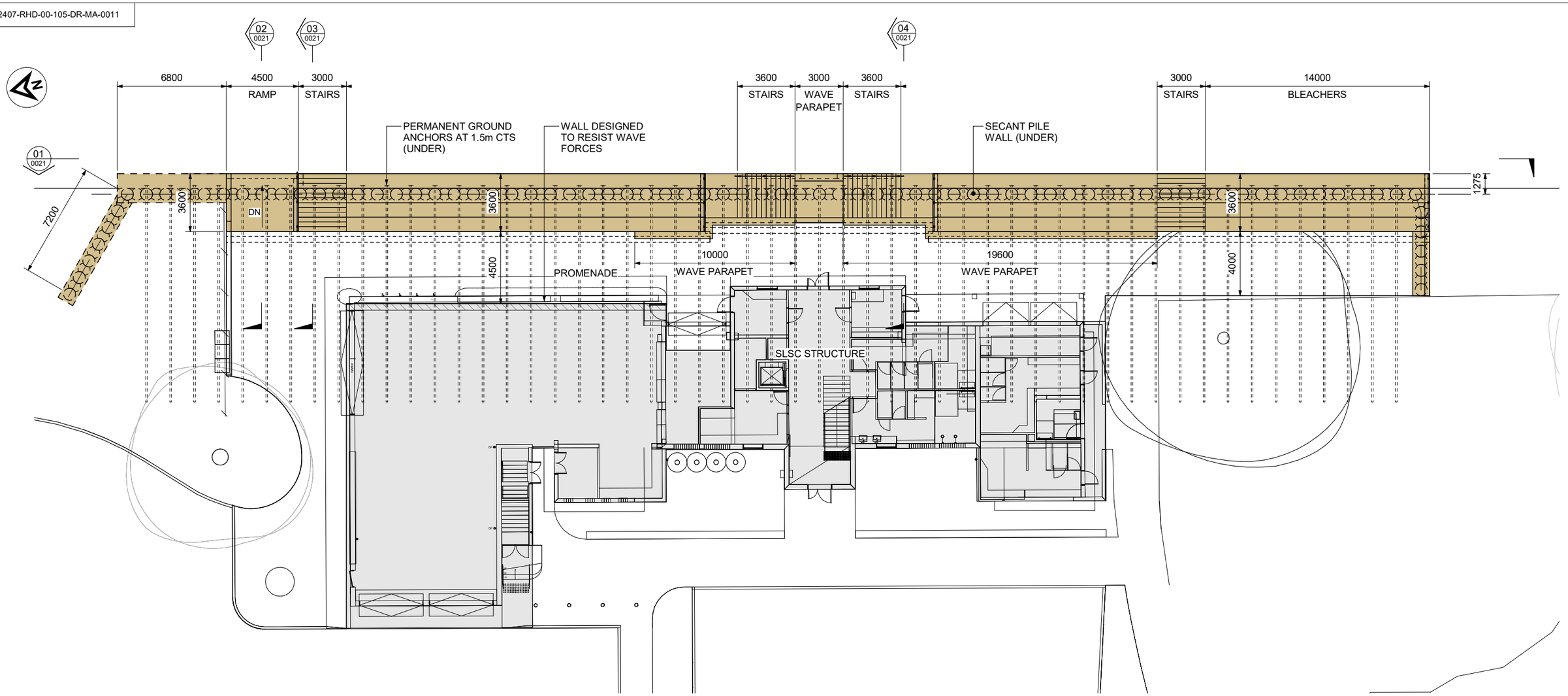
Royal HaskoningDHV
Enhancing Society Together

DRAWN	CHECKED	APPROVED
SC	GB	GB

DATE	SCALE AT A1	REF.
30.07.2024	1 : 1	

DRAWING No.	SUITABILITY	REVISION
PA2407-RHD-00-105-DR-MA-0001	S3	P01

PA2407-RHD-00-105-DR-MA-0011



GENERAL ARRANGEMENT PLAN
1 : 125(A1)

NOTES:

1. ALL LEVELS ARE IN METRES RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD) AND ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

2. CONCEPT DESIGN - SUBJECT TO DETAILED DESIGN.

3. ALTERNATIVE PILING TYPES MAY BE SUBMITTED, SUCH AS CONTIGUOUS PILES COMBINED WITH PILE PLUGS.

S3 REVIEW & COMMENT

NOT FOR CONSTRUCTION

2.5 0 2.5 5 7.5 10 12.5m

1:125 (A1) 1:250 (A3)

REV	DATE	DESCRIPTION	BY	CHK	APP
P01	30.07.2024	DRAFT FOR COMMENT	SH	SC	GB

REVISIONS

CLIENT

northern beaches council

PROJECT

NEWPORT SLSC REDEVELOPMENT - COASTAL PROTECTION WORKS

TITLE

GENERAL ARRANGEMENT PLAN

Royal HaskoningDHV
Enhancing Society Together
Level 15,
99 Mount Street
North Sydney NSW 2060, Australia
Tel +61 2 8854 5000
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Website: www.royalhaskoningdhv.com

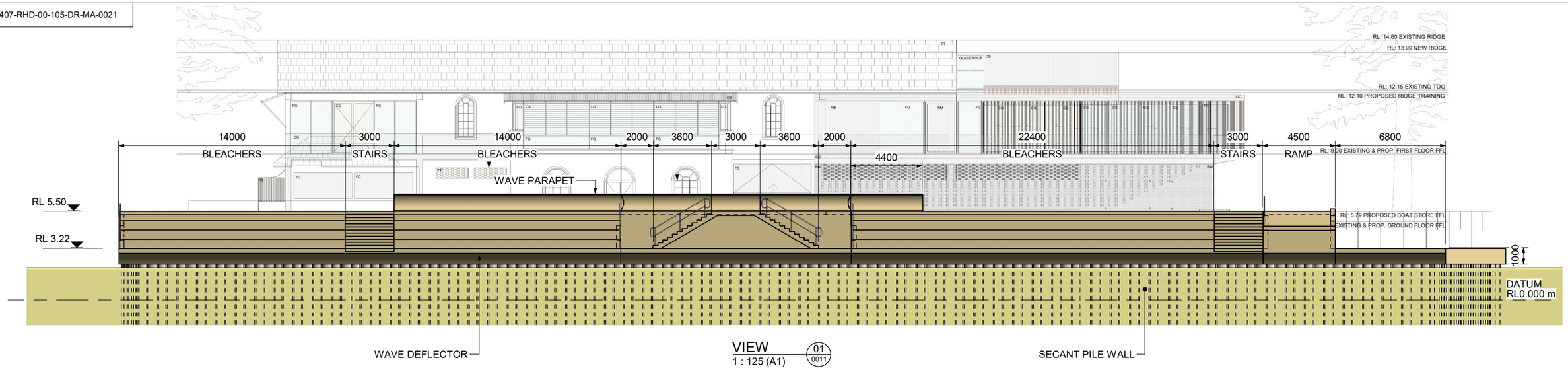
DRAWN	CHECKED	APPROVED
SC	GB	GB

DATE	SCALE AT A1	REF.
30.07.2024	As indicated	

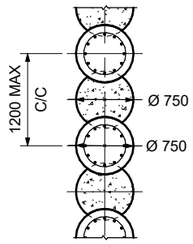
DRAWING No.	SUITABILITY	REVISION
PA2407-RHD-00-105-DR-MA-0011	S3	P01

Autodesk Docs://Newport SLSC/PA2407-Newport.rvt

PA2407-RHD-00-105-DR-MA-0021

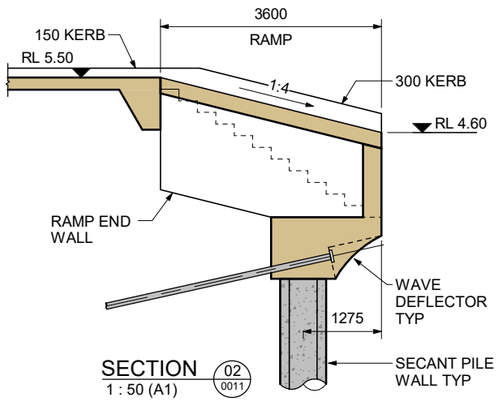


VIEW 01 (0011)
1 : 125 (A1)

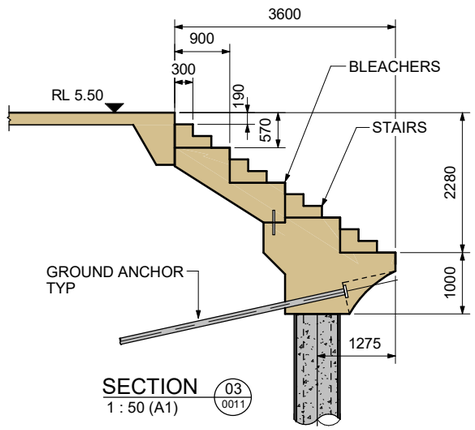


SECANT PILE WALL SECTIONAL PLAN
1:25 (A1)

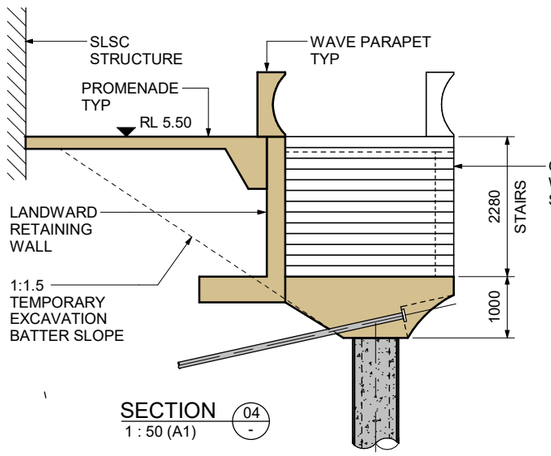
TYPICAL DESIGN SECTION
1 : 40(A1)



SECTION 02 (0011)
1 : 50 (A1)



SECTION 03 (0011)
1 : 50 (A1)



SECTION 04 (-)
1 : 50 (A1)

NOTES:

1. ALL LEVELS ARE IN METRES RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD) AND ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

2. CONCEPT DESIGN - SUBJECT TO DETAILED DESIGN.

3. EXTENT OF EXISTING ROCK IS APPROXIMATE AND BASED ON GEOTECHNICAL INVESTIGATION.

S3 REVIEW & COMMENT

NOT FOR CONSTRUCTION

800 0 800 1600 2400 3200 4000mm
1:40 (A1) 1:80 (A3)

1000 0 1000 2000 3000 4000 5000mm
1:50 (A1) 1:100 (A3)

2.5 0 2.5 5 7.5 10 12.5m
1:125 (A1) 1:250 (A3)

REV	DATE	DESCRIPTION	BY	CHK	APP
P01	30.07.2024	DRAFT FOR COMMENT	SH	SC	GB

REVISIONS

CLIENT

northern beaches council

PROJECT
NEWPORT SLSC
REDEVELOPMENT - COASTAL PROTECTION WORKS

TITLE
GENERAL ARRANGEMENT DETAILS

Royal HaskoningDHV
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Level 15, 99 Mount Street, North Sydney NSW 2060, Australia
Tel +61 2 8854 5000
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Website: www.royalhaskoningdhv.com

DRAWN	CHECKED	APPROVED
SC	GB	GB

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DRAWING No.	SUITABILITY	REVISION
PA2407-RHD-00-105-DR-MA-0021	S3	P01

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Royal HaskoningDHV is an independent consultancy which integrates 140 years of engineering expertise with digital technologies and software solutions. As consulting engineers, we care deeply about our people, our clients and society at large. Through our mission Enhancing Society Together, we take responsibility for having a positive impact on the world. We constantly challenge ourselves and others to develop sustainable solutions to local and global issues related to the built environment and the industry.

Change is happening. And it's happening fast – from climate and digital transformation to customer demands and hybrid working. The speed and extent of these changes create complex challenges which cannot be addressed in isolation. New perspectives are needed to accommodate the broader societal and technological picture and meet the needs of our ever-changing world.

Backed by the expertise of over 6,000 colleagues working from offices in more than 20 countries across the world, we are helping organisations to turn these challenges into opportunities and make the transition to smart and sustainable operations. We do this by seamlessly integrating engineering and design knowledge, consulting skills, software and technology to deliver more added value for our clients and their asset lifecycle.

We act with integrity and transparency, holding ourselves to the highest standards of environmental and social governance. We are diverse and inclusive. We will not compromise the safety or well-being of our team or communities – no matter the circumstances.

We actively collaborate with clients from public and private sectors, partners and stakeholders in projects and initiatives. Our actions, big and small, are driving the positive change the world needs, and are enhancing society now and for the future.

Our head office is in the Netherlands, and we have offices across Europe, Asia, Africa, Australia and the Americas.

EuroCompliance certification ISO37001 EuroCompliance certification ISO37301

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Enhancing Society Together