

Temporary Coastal Protection Works, Clarkes Beach

Environmental Impact Statement



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Cover photo: Temporary coastal protection works in front of café, Clarkes Beach, February 2021

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**21-018 - BYRON BAY COASTAL WORKS DEVELOPMENT APPLICATION
ENVIRONMENTAL IMPACT STATEMENT - CLARKES BEACH COASTAL PROTECTION WORKS**

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I hereby certify that I have prepared the content of this Environmental Impact Statement (EIS) and to the best of my knowledge it is in accordance with the *Environmental Planning and Assessment Act, 1979* and Regulations, contains all available information that is relevant to the environmental assessment of the development and the information contained in the statement is neither false nor misleading.

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Date: 29 September 2021

EXECUTIVE SUMMARY

NSW Department of Planning, Industry & Environment – Crown Lands (DPIE - Crown Lands) constructed a temporary geobag seawall and associated dune nourishment works at Clarkes Beach, Byron Bay in late 2020. The works were designed to mitigate, over the short term, coastal erosion risks to the Beach Byron Café (the café), the adjacent Crown reserve and a Crown road.

Previous coastal erosion fronting Clarkes Beach Holiday Park to the east of the café was managed by the construction of temporary geobag seawalls in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks). The Crown Lands geobag seawall ties-in to the western end of the geobag seawall installed by Reflections Holiday Park. The geobag seawalls now comprise a near contiguous structure of about 250 m length.

DPIE - Crown Lands is applying for development consent to retain and maintain the temporary works (Crown Lands geobag seawall and associated dune nourishment works) for an estimated five-year period to provide time for the reconfiguration and/or relocation of the café to reduce the risks from coastal erosion. The Reflections works are the subject of a separate development application by Reflections Holiday Parks.

The DPIE - Crown Lands proposal includes dune stabilisation, revegetation and dune fencing, regular monitoring of the works and maintenance of the geobag seawall and upslope dune. Maintenance activities may include the importation of additional sand to nourish the dune if required following coastal erosion events or other damage, the repair or replacement of geobags and recontouring and revegetation of the erosion scarp. The works will be removed opportunistically after the five-year period, when they are exposed and beach conditions are appropriate. When the works are removed, the site will be decommissioned and the beach will be restored through a combination of dune regrading, beach nourishment and/or revegetation works. These works will be undertaken with due consideration of coastal processes, tides and public safety risks. Decommissioning of the site will be undertaken in consultation with Byron Shire Council, the Bundjalung of Byron Bay Aboriginal Corporation and other key stakeholders.

This Environmental Impact Statement (EIS) has been prepared by Hydrosphere Consulting on behalf of DPIE - Crown Lands. It has been undertaken in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The EIS assesses and provides details on the potential impacts associated with the proposal on coastal processes, terrestrial and marine biodiversity, heritage, traffic and access, noise, vibration, amenity, waste and socio-economic outcomes, and outlines measures to mitigate these impacts.

An investigation was undertaken by UNSW Water Research Laboratory (UNSW WRL) to assess the impact of the proposal on coastal processes over the life of the works and to provide advice on appropriate monitoring, maintenance and impact mitigation measures. The investigation concluded that the quantity of sand retained by the works is minor compared to other processes and that observed end effects to date were minor. Theoretical end effects were also assessed, considering a number of scenarios, including the retention of both the café works and the Reflections works. Over the five-year design life of the works, observed and theoretical end effects from the combined works are not expected to impact on built assets such as roads or car parks, but may impact the Crown reserve and the Council-managed pedestrian beach access located 50 m to the west of the café. UNSW WRL examined likely impacts from the works on coastal

processes and recommended a range of measures to mitigate these impacts which have been included in this proposal.

The site is of cultural and social significance to the local Aboriginal community and is of high archaeological and scientific significance. There are three recorded middens in the vicinity of the works. An Aboriginal Cultural Heritage Assessment Report prepared for the proposal by Everick Heritage Consultants concluded that harm to the closest midden site, with salvage and repatriation on site, is the most appropriate management response for the midden material. The report recommended that an Aboriginal Heritage Impact Permit should be sought for revegetation activities, the decommissioning of the coastal protection works (removal of the geobags) and salvage of the midden material.

An assessment of impacts on terrestrial and marine biodiversity was undertaken by Biodiversity Assessments and Solutions. The assessment found that the proposal footprint is not considered to be of significant biodiversity value in the local context, nor is it considered to have any significant ecological value or to provide any significant wildlife habitat. Potential impacts of occupation and maintenance phases of the proposal would be negligible and can be mitigated sufficiently to ensure that direct and indirect impacts on biodiversity values would be avoided and minimised.

The proposal has been considered in the context of the broader, longer term strategic planning processes that will be occurring over the lifetime of the works. The proposal is considered to be the most appropriate approach to the management of public safety and environmental risks in this area while strategic and longer-term options are developed and implemented. This EIS has identified both direct and indirect impacts on the surrounding environment and has identified control measures to address general risks as well as specific issues related to coastal processes, biodiversity and Aboriginal heritage. These are well-established and standard strategies which if properly implemented will result in low residual risk. Detailed management plans addressing monitoring and maintenance activities and environmental management measures required during maintenance and decommissioning phases will be prepared. If the proposed mitigation measures and management plans are implemented, it is concluded that any impacts of the proposal will be sufficiently mitigated. The proposal provides the appropriate balance between the management of public safety, risks to the natural environment and existing infrastructure and adaptive planning required to address coastal erosion and recession.

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1. INTRODUCTION

Clarkes Beach has been subject to significant coastal erosion in recent years, increasing from mid-July 2019 when an east coast low event occurred coincident with spring high tides. Since this event there has been significant landward movement of the coastal erosion escarpment. In October 2020 coastal and structural/geotechnical engineers determined that the café building was at imminent risk of collapse.

NSW Department of Planning, Industry & Environment – Crown Lands (DPIE - Crown Lands) constructed a temporary geotextile sand container (herein geobag) seawall and associated dune nourishment works at Clarkes Beach in November and December 2020. The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and Beach Byron Bay (the café). The works were authorised under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in accordance with section 19(2)(a) of the *State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP) which allows for the placing of sandbags by a public authority for a period of not more than 90 days for the purposes of temporary protection from coastal erosion.

DPIE - Crown Lands is applying for development consent to retain and maintain the works for an estimated five-year period. The works will be removed opportunistically after the five-year period when they are exposed and beach conditions are appropriate. The proposal includes dune stabilisation, revegetation and dune fencing, regular monitoring of the works, maintenance of the geobag seawall and upslope dune and beach nourishment (the importation of sand). This proposal is the subject of a development application (DA) and this Environmental Impact Statement (EIS).

This EIS has been prepared by Hydrosphere Consulting on behalf of DPIE - Crown Lands. The environmental assessment has been undertaken in accordance with Part 4 of the EP&A Act and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). This EIS provides details on the potential environmental impacts associated with the proposal and recommends mitigation strategies in accordance with local, State and Federal legislation and regulations.

2. SITE DESCRIPTION

The temporary coastal protection works were constructed at Clarkes Beach on Lot 18, DP 1269368 (former Lot 10, DP 1049827) and Lot 410 DP 729062 shown on Figure 1. The café is located on Lot 9, DP 1049827, between Clarkes Beach and the public reserve off Massinger Street, Byron Bay. The site is part of Crown Reserve 82000 (R82000), managed by Byron Shire Council (Council) as Crown Land Manager. Lot 18, DP 1269368 is also a Crown public road. Lot 9, DP 1049827 is within Crown Lease LX 566595 for the café. The eastern portion of Lot 18 DP 1269368 is bounded to the south by Lawson Street, with Lot 410 DP 729062 encompassing Reflections Holiday Park. The development footprint for the proposed works covers an area of approximately 1,500 m².

The subject Crown land is subject to Indigenous Land Use Agreement NI2006/004 between the State and Bundjalung People of Byron Bay (ILUA 2) registered 22 April 2008. The proposed works may proceed in accordance with the ILUA.

Clarkes Beach is a north facing beach within the Byron Bay embayment. The area surrounding the works consists of ocean beach, dunes, foreshore, open public space, public dining premises, amenities block and showers, tourism operations and vehicle parking. The site is generally low-lying, with two distinct tiers (i.e. beach and elevated foreshore) with elevation below the 10 m Australian Height Datum (AHD) contour.

Rainfall on the reserve bushland to the west and east of the café drains north to the ocean. Vegetation on the dunes consists of young age class littoral rainforest. The vegetation to the east of the café is mapped as littoral rainforest under the Coastal Management SEPP (Figure 1). Littoral rainforest is also mapped as occurring within the works area, however is no longer present due to coastal erosion.

Previous coastal erosion fronting Clarkes Beach Holiday Park to the east of the café was managed by the construction of temporary coastal protection works (geobag seawalls) in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks). The Reflections works are the subject of a separate DA by Reflections Holiday Parks. The Crown Lands geobag seawall ties-in to the western end of the geobag seawall installed by Reflections Holiday Park. The geobag seawalls now comprise a near contiguous structure of about 250 m length (Figure 1). Although the two DAs have been prepared and submitted separately, an assessment of the impact of the combined works on coastal processes was undertaken by the UNSW Water Research Laboratory (UNSW WRL, 2021), acknowledging that the structures are contiguous. Future monitoring activities, impact mitigation measures and decommissioning of the works will be coordinated with Reflections Holiday Parks.

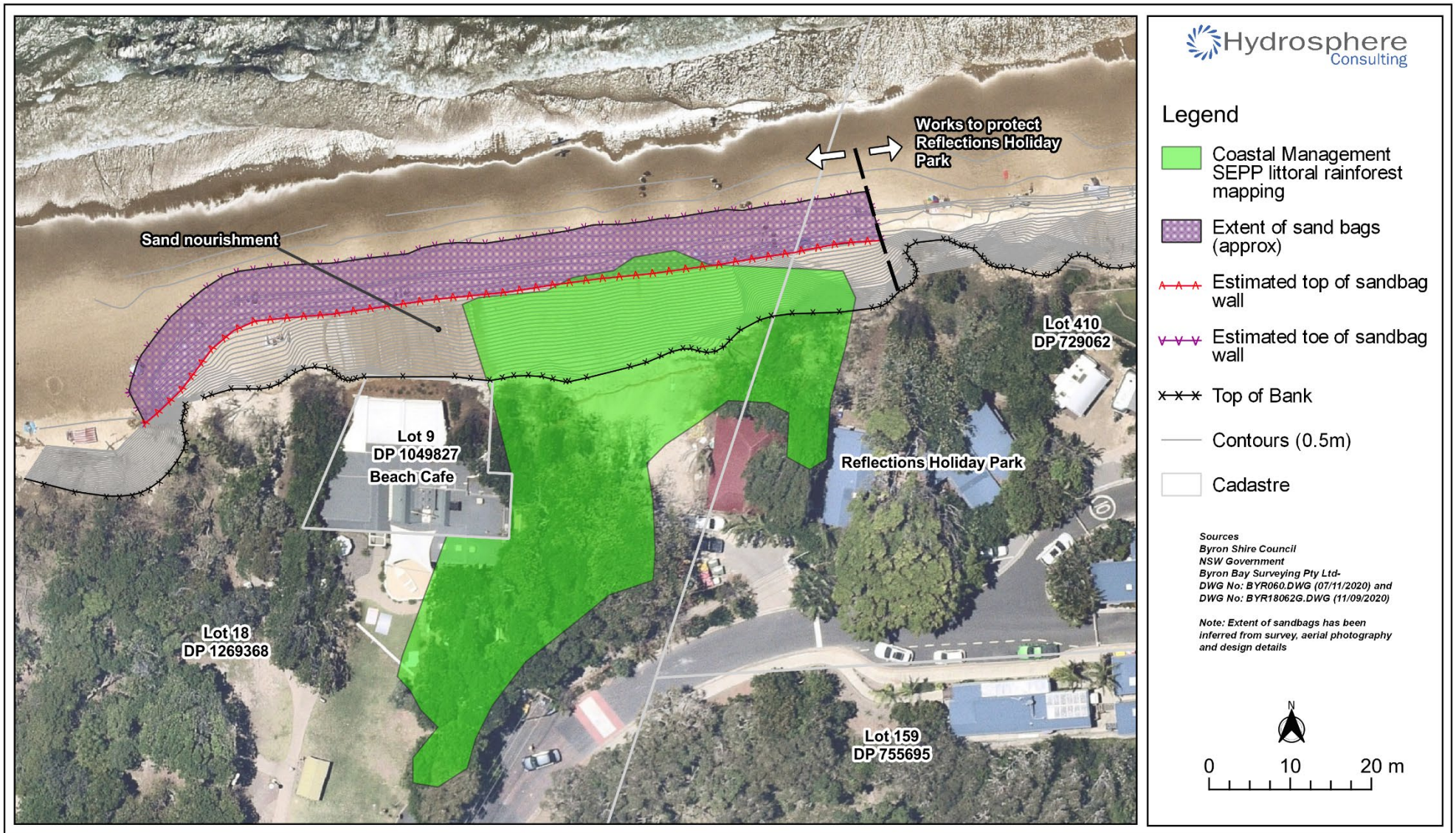


Figure 1: Location of Clarkes Beach temporary coastal protection works

3. DESCRIPTION OF THE PROPOSAL

DPIE - Crown Lands constructed a geobag seawall and undertook dune rebuilding and beach nourishment works at Clarkes Beach in late 2020. The works were designed to provide temporary protection to the café from coastal erosion. The works were authorised under Part 5 of the EP&A Act, in accordance with s.19(2)(a) of the Coastal Management SEPP for a period of 90 days.

The proposal being assessed in this EIS is the retention of the existing coastal protection works for an estimated five-year period and associated activities (monitoring, maintenance, impact mitigation measures, decommissioning and restoration of the site) as described in the following sections.

3.1 Constructed Works

The temporary coastal protection works were installed in response to significant coastal erosion and recession along Clarkes Beach following an East Coast Low event in July 2020, to mitigate the risk of the collapse of all or part of the café on to the beach (Plate 1).



Plate 1: Coastal erosion in front of the café on Clarkes Beach (16 October 2020) prior to installation of coastal protection works

Source: DPIE- Crown Lands

Geotechnical investigations documented in Ardill Payne & Partners (2021) assessed the risk of collapse of the café in October 2020. The geotechnical investigations included a slope stability assessment for the café and surrounding land, with and without a geobag seawall. This information informed the development of preliminary options for the design of the works, involving toe protection and/or reconstruction of the dune in front of the café. The works constructed in October/November 2020, included a geobag seawall with loose density fill above the geobag crest height at a slope of 28° to maintain stability (Ardill Payne, 2021).

The works consisted of approximately 650 geobags (0.75 m³ volume each) forming a tiered geobag seawall approximately 90 m long and 7 m deep, constructed upon the naturally occurring clay/rock layer with a geotextile underlayer. The geobags formed a stepped retaining wall structure to a height of four geobags. The bags were filled with locally quarried sand before being placed on the beach. Following the construction of the geobag seawall, over 3,000 tonnes (1,900 m³) of clean beach sand was imported to the site to re-build the frontal dune behind the geobag seawall.

Due to wave overtopping in December 2020, another row of geobags was placed on the crest of the seawall, raising its overall height. The height of the geobag seawall crest (five courses) ranges between 2.4 - 2.7 m from the base. Approximately 1,300 tonnes (800 m³) of additional sand were also placed on the dune behind the geobags in December 2020. Design drawings, surveyed site plan and cross-sections of the constructed works are shown in the following figures.

Jute mesh was placed over the repaired dune face in December 2020 to minimise the movement of windblown sand. The constructed works are shown in Plate 2. By February 2021, sand had accreted in front of the geobags, partially burying most of the geobag seawall. Additional accretion has occurred since February 2021, as shown in Plate 2.



Plate 2: Temporary coastal protection works in front of café, Clarkes Beach (left: February 2021 and right: June 2021)

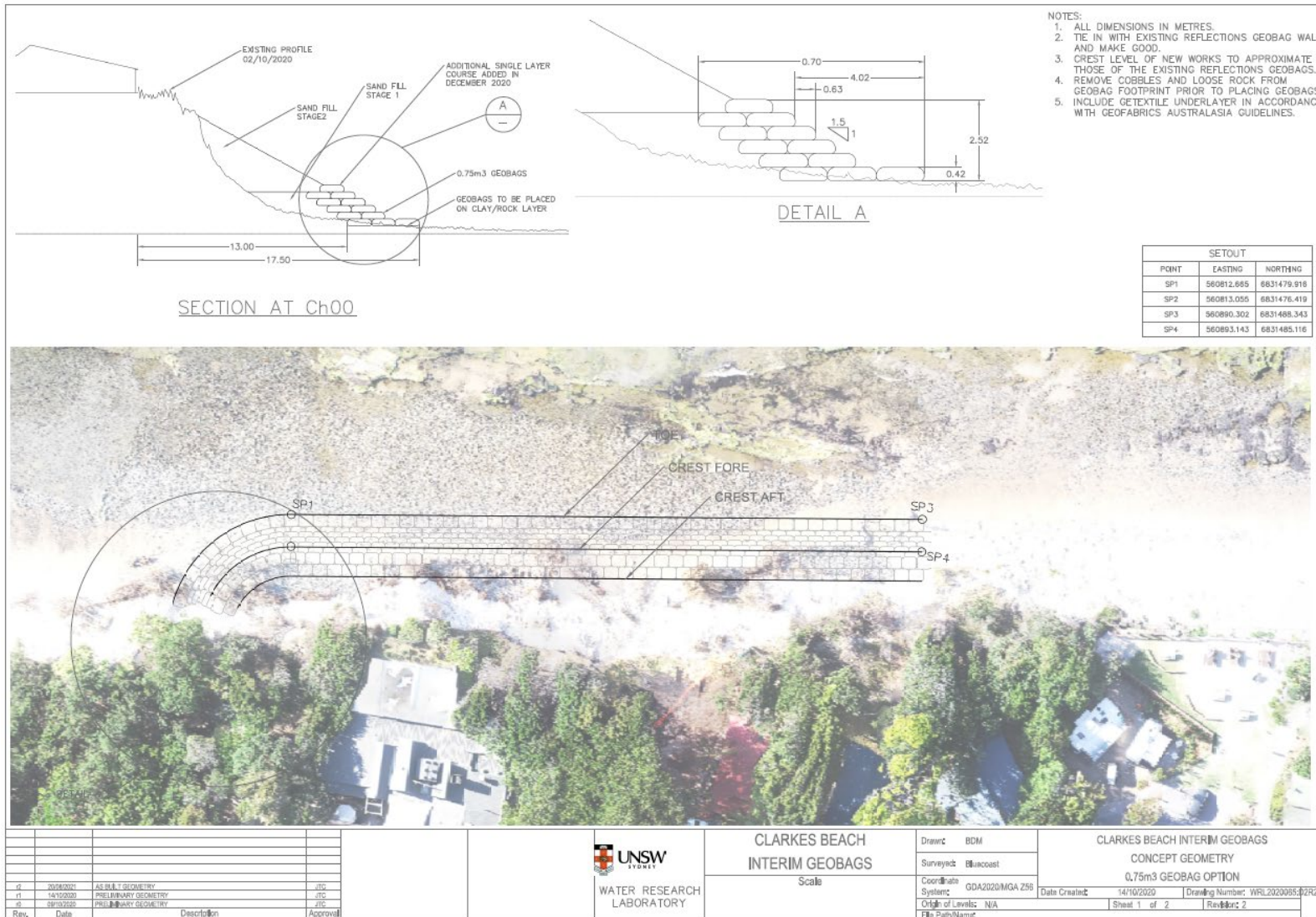


Figure 2: Concept geometry, section and detail

Source: WRL (2021)

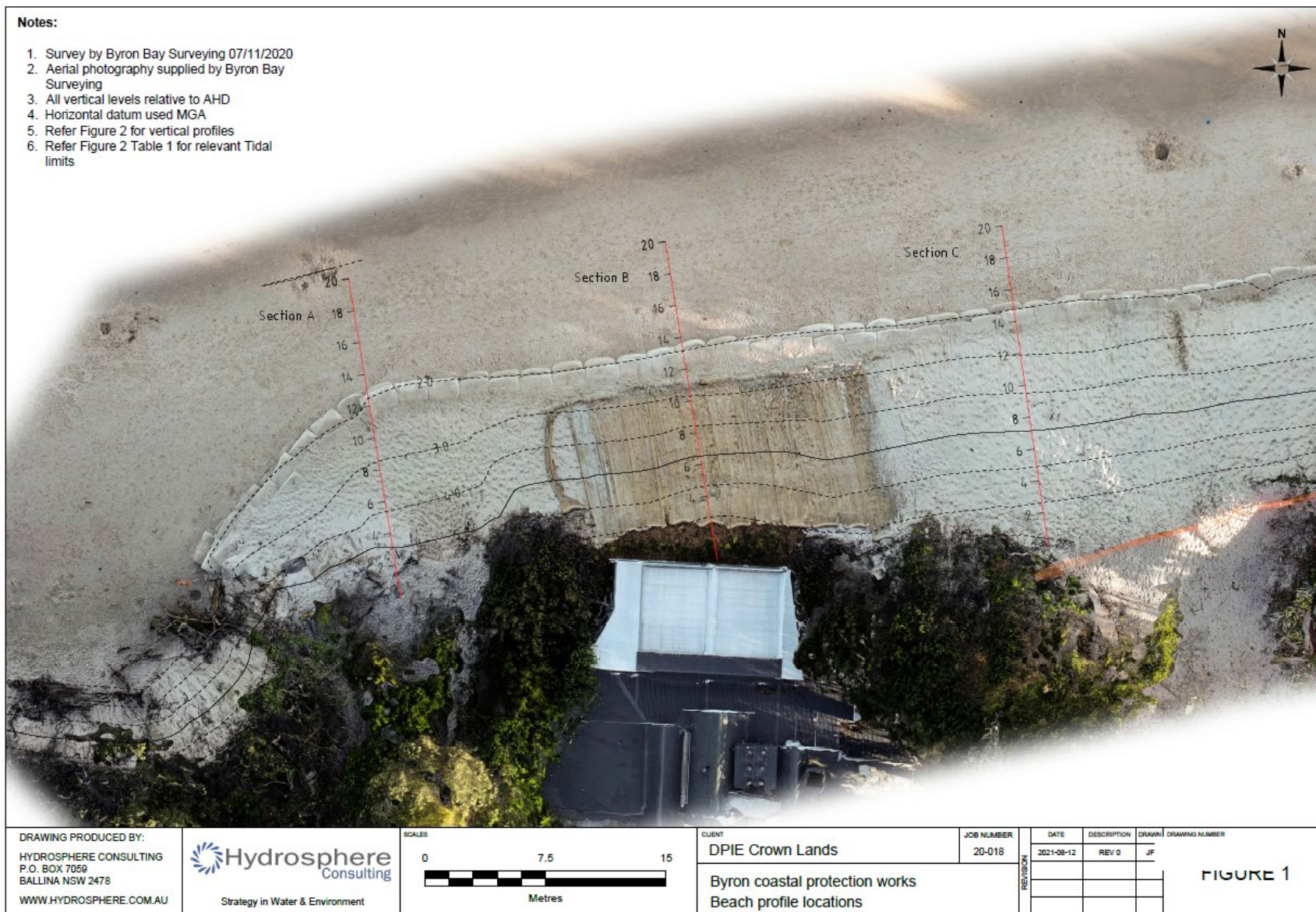


Figure 3: Survey plan of constructed works

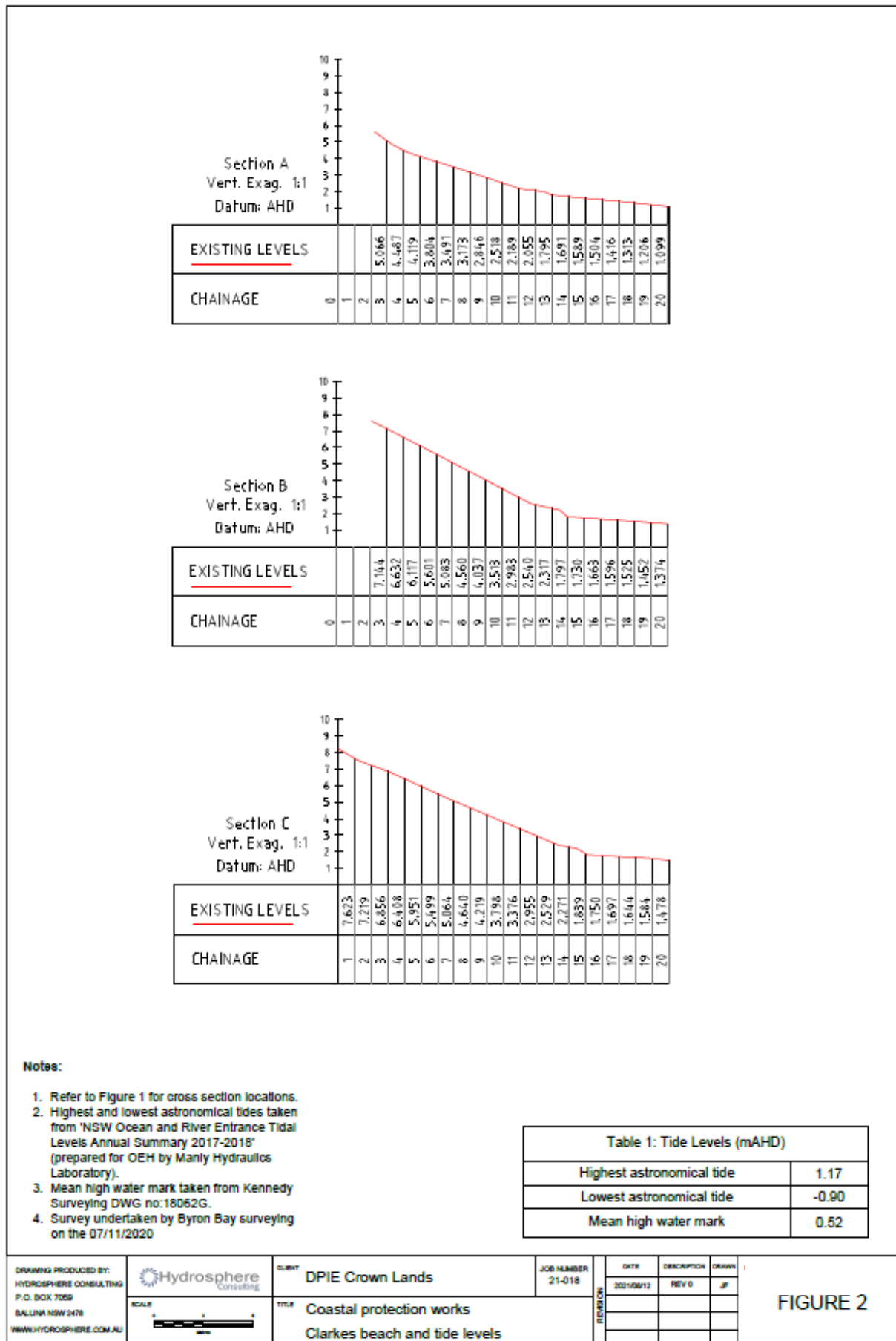


Figure 4: Cross-sections of constructed works

3.2 Objectives

The objectives of the temporary coastal protection works (geobag seawall and dune nourishment) and this proposal are:

1. To provide a degree of temporary protection to the Beach Byron Bay café site from coastal erosion.
2. To provide sufficient time to achieve the reconfiguration and/or relocation of the Beach Byron Bay café.
3. To ensure that risks from coastal erosion to public safety and beach access are mitigated over the period the temporary works are in place.

To achieve these objectives, the temporary works need to remain in place for an estimated five-year period.

3.3 Dune Stabilisation

As part of the proposal to retain the works for 5 years, the upslope dune will be stabilised through the provision of dune forming fencing and vegetation. The area to be stabilised and vegetated is approximately 1,800 m² and is currently devoid of vegetation. Fencing with cloth material will be installed along the top and mid-section of the dune to promote the trapping of wind-blown sand. The fencing will also discourage informal pedestrian access which causes erosion of the dune face, which could compromise the geotechnical stability of the dune. Signage will be installed to discourage informal access and trampling of vegetation and the dune (Figure 5).

Revegetation will trap windborne sand and stabilise the surface of the dune. Revegetation will be undertaken using suitable locally endemic native dune vegetation species including sand-binding grasses and succulent creepers. These species are highly tolerant to salt, wind and smothering and can grow in unstable sand on exposed bare sites (groundcover species such as *Spinifex hirsutus*, (Beach spinifex), *Ipomoea pes-caprae* (Goatsfoot), *Canavalia rosea* (Beach bean), *Carpobrotus glaucescens* (Pigface) and *Ficinia nodosa* (Knobby club rush). Plantings will be undertaken by direct seeding and translocation of local cuttings. The vegetation will be monitored, maintained and weed control will be implemented while the works are in place.

Revegetation works are not proposed within the Council-managed Crown reserve above the dune, as Council is developing vegetation management strategies for this reserve. DPIE – Crown Lands will liaise with Council regarding any future revegetation of this area as part of related dune stabilisation proposals.

Dune fencing was installed along the top of the dune to the east of the café to discourage pedestrian access. This is relatively temporary and will be formalised, in consultation with Reflections Holiday Park.

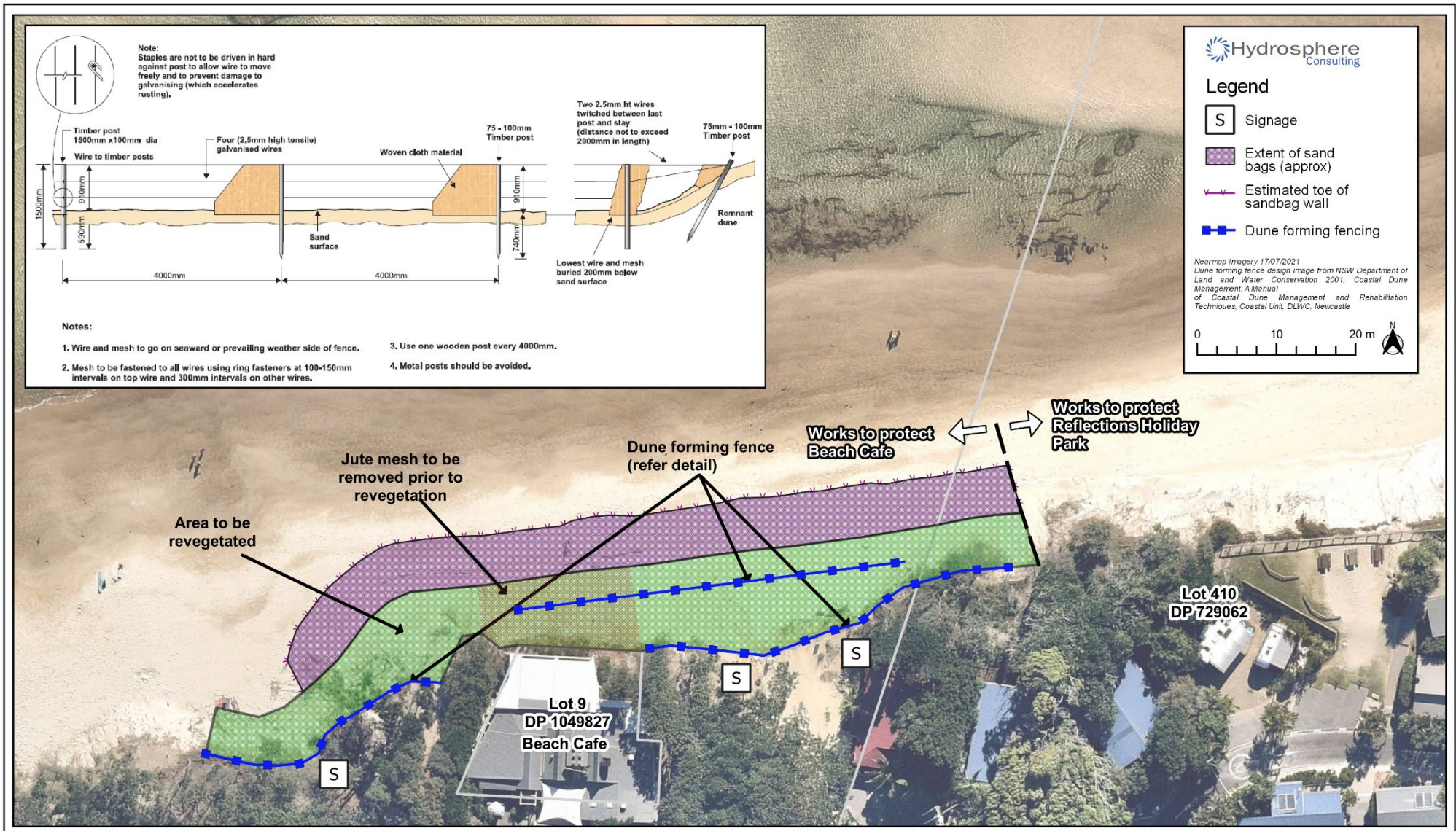


Figure 5: Dune vegetation, fencing and signage concept

3.4 Monitoring, Maintenance and Mitigation Measures

A monitoring and maintenance plan will be developed for the works. An outline of the proposed monitoring and maintenance measures is provided in the following sections.

3.4.1 Monitoring of the works

The condition of the works will be monitored on a regular basis, to ensure risks to public safety and structural integrity are identified. The monitoring and maintenance program will be based around the following principles, as recommended by UNSW WRL (2021):

- A weekly photo from the CoastSnap station or closer reference location with analysis of changes over time. If two or less courses of geobags are visible and those courses are not substantially displaced, no additional monitoring is required for that week.
- If more than two geobag courses are exposed, or warnings for dangerous surf, damaging surf or abnormally high tides are issued, additional daily high and low tide photos will be taken.
- If the photos reveal substantially exposed geobags or displaced geobags, the works should be inspected as soon as practicable by a coastal engineer or competent person to assess for damage and/or hazardous geobags. Subject to an assessment of the beach state, a UAV LiDAR/optical survey of the site will be initiated to assess sand and geobag change.
- Should the sand behind the geobags become eroded, a geotechnical/structural engineer will be consulted for advice.
- The loss of more than 2% of geobags from the wall (which equates to approximately 14 geobags over the 90 m length of the café wall), displacement or loss of crest bags such that their ability to resist wave runup is reduced, or loss of the sand slope will be rectified as soon as practicable. The sand slope above the geobags is unlikely to accrete naturally over the estimated 5-year project life, so any erosion of the sand slope will need to be managed through the placement of imported sand.

3.4.2 Monitoring of beach and geobag impacts

The following activities will be undertaken to monitor beach and geobag impacts:

- An initial UAV LiDAR/optical survey of the site undertaken at low tide, extending at least 500 m to the east and west the geobags.
- Three monthly assessments of the evolution of the geobag end effects using the following hierarchy of data sources, as they become available with a minimum data frequency of once per month:
 - UAV LiDAR/optical survey of the site.
 - High resolution aerial or satellite photos.
 - Shoreline or vegetation mapping through a CoastSnap station or similar.
 - Low resolution aerial or satellite photos.

In addition to the above, the condition of fencing, signage and dune stabilising vegetation will be inspected on a regular basis. Maintenance and repair measures will be implemented to ensure these works are maintained in a functional condition.

3.4.3 Maintenance of the works

DPIE - Crown Lands will be responsible for repairs and maintenance of the works, if and when required, following coastal erosion events or other unforeseeable events (e.g. damage caused by vandalism). Maintenance activities for the geobag seawall and dune, will be similar to those undertaken for the works in December 2020. These activities are described in the Review of Environmental Factors (REF; SCS, 2020). Key elements are outlined below and shown on Figure 6:

- Importation of sand to nourish the dune:
 - Additional imported sand will be placed behind the geobags (and at the toe of bags where required) to replace eroded sand and restore the dune profile as required to maintain structural stability. Based on the geotechnical investigations (Ardill Payne & Partners, 2021), the geobags are required to be maintained as toe protection elements to prevent undermining of the dune and subsequent steepening of the backslope leading to destabilisation. In addition, the dune backslope is required to be maintained to provide ongoing stability to the café seawall. Additional sand nourishment will be required if the local backslopes exceed 35° with the toe protection in place. This may require supplementing the dune with additional sand. The maintenance frequency will be affected by the severity of beach scour events experienced over the life of the works.
 - Plastic bridging mats will be used to form a temporary haul route from Massinger Street to the edge of the eroded dune (east of the café). Sand will be unloaded at the top of the erosion scarp/dune and moved into place using excavators.
 - If sand cannot be unloaded from this location it will be hauled onto the beach via the access track to the west of the café. The size/type and number of excavators or other suitable tracked machinery will depend on the volume of sand to be imported and urgency of repair works required. Earthworks may be required at the existing beach access track to improve the access point and facilitate safe access for machinery.
 - Any additional sand will be imported from Dunloe quarry (or other suitable source) by truck. Sand used will match the existing sand properties at Clarkes Beach as far as possible. The Dunloe quarry sand has previously been confirmed as suitable and was used for the construction of the works (SCS, 2020) as discussed in Section 7.1. Preliminary discussions with the quarry operators have confirmed that the required quantity of sand of similar quality to that previously supplied will be available.
 - The volume of sand and amount of truck movements required will depend on the extent of damage and sand loss and volume of sand required for repair. As an indication, the sand imported after the December 2020 erosion event (800 m³) required 130 truck movements along Massinger Street over a 3-day period (SCS, 2020).

- Repair or replacement of geobags:
 - Where practicable, dislodged bags will be repaired and reinstated as necessary. If bags are damaged and unserviceable, new bags will be imported and installed. Any unserviceable bags will be removed from the beach and disposed of at a suitable waste facility.
 - Where possible, replacement geobags will be filled offsite and brought onto the beach via the existing access track to the west of the café. If offsite geobag filling is not possible a temporary sand stockpile site and geobag filling station will be established in the site compound area to the west of the café.



Figure 6: Proposal components, construction access for maintenance works and geobag removal

Source: Aerial (21/4/21) metromap

3.4.4 Impact mitigation measures and beach restoration

The beach area adjacent and to the west of the works, including the beach access managed by Byron Shire Council, will be monitored on a regular basis and after events. The monitoring will determine whether the works are causing increased erosion adjacent to and west of the works (end effects). If significant impacts are identified, then the affected area will be restored in the following manner:

- Trees that are at risk of falling on to the beach due to coastal erosion in this area will be removed to ensure the safety of beach goers. The dune in this location will be re-graded if required to ensure that it is stable and presents a minimal risk to the public (to a maximum gradient of 1V:1.5H, 34°).
- Vegetation that is lost due to erosion/recession within this area will be replaced within the newly profiled dune in consultation with Council.

- If increased end effects are observed and Byron Shire Council's beach access 50 m to the west of the café is compromised, restoration measures will be developed in consultation with Council. This may include the importation of additional sand, as available through the beach restoration sand budget discussed in Section 3.5 (Table 1). The measures will aim to restore the beach access track, and/or to reduce the risk of further erosion or dune slumping occurring as a result of the works.

Both DPIE - Crown Lands and Reflections Holiday Parks will be responsible for monitoring the impact of the works and the implementation of impact mitigation measures including beach restoration. These measures will be implemented in consultation with Byron Shire Council, Bundjalung of Byron Bay Aboriginal Corporation (BoBBAC) and other key stakeholders.

3.5 Decommissioning of the works and restoration of the site

The works were originally installed as a temporary measure. The current proposal is to leave the existing works in place for an estimated five-year period after which the works will be removed and the site will be decommissioned and restored.

Under historic observed beach conditions, the geobag seawall has been predominantly buried since early 2021. Removal of buried geobags is not proposed, as this will require substantial excavation and contribute to additional dune erosion, dune disturbance and disruption to beach users. The geobags will be removed opportunistically after the five-year period has lapsed, if/when they are exposed. The decommissioning works will be subject to the concurrence of a geotechnical and/or structural engineer, noting that removal of geobags may cause the instability and collapse of the dune above. Timing of the removal will depend on several variables including:

- The volume of sand in the beach profile and the exposure and accessibility of the geobags.
- The geotechnical stability of any structures within the area.
- Meteorological, tidal and oceanic conditions.
- Public safety risks and expected beach visitation. School holidays and the peak tourist season will be avoided where possible.

It is envisaged that removal of the geobags would be undertaken by cutting one end of the geobag, emptying the sand onto the beach and disposing of the empty bag at a suitable waste facility. Opportunities for beneficial reuse of the filled geobags will be considered at the time of removal. Machinery will access the beach via the access track to the west of the café (as proposed for maintenance activities discussed in Section 3.4).

Following removal of the geobags, debris (vegetation fallen onto the beach, litter, construction materials etc.) will be removed from the site and the dune in front of the café will be re-shaped, if required, to ensure that it is stable (maximum gradient 1V:1.5H, 34°). Additional sand will be imported to the site, to restore the beach and compensate for the sand locked up by the geobags over the life of the works (refer Section 7.3). The total volume of sand to be imported to the site is based on calculations provided by UNSW WRL (2021) as shown in Table 1. The total volume of 1,500 m³ for DPIE-Crown Lands, includes an additional 20% contingency to account for any uncertainties in the estimates. The volume of sand imported on decommissioning of the works will take into account any sand imported to the site for restoration activities, as discussed in Section 3.4.4.

Table 1: Beach restoration sand budget (volume of sand to be imported to the site over the life of the works)

Component	Quantity
Sand imported and placed behind sandbags - October/November 2020 ¹	1,900 m ³
Sandbag fill - original structure October/November 2020 ¹	488 m ³
Additional sand imported to replace sand lost to wave overtopping - December 2020 ¹	800 m ³
Sandbag fill - additional layer December 2020 ¹	40 m ³
Sand imported to fill section of dune eroded by stormwater - June 2021 ¹	16 m ³
<i>Total sand imported (September 2021)</i>	<i>3,244 m³</i>
Sand locked up by recession acting on café geobags ²	208 m ³ /year
Estimated life of works (post development approval ~ December 2021)	5 years
Estimated installed life (pre development approval since December 2020)	1 year
Total sand locked up by recession acting on café geobags	1,248 m ³
Total sand to be imported (120% of sand locked up)	1,500 m ³

1. The restoration budget does not include sand imported to the site as part of the original works

2. Source: UNSW WRL (2021)

3.6 Ancillary Works

3.6.1 Stormwater controls

Stormwater erosion (caused by runoff from the pathways surrounding the café, other impervious areas and roof drainage) occurred to the west and east of the café in early 2021 and caused scour of the dune face, compromising the integrity of the coastal protection works. DPIE - Crown Lands installed stormwater management works in June 2021, to slow the flow of water and promote infiltration prior to the discharge of stormwater over the dune. An additional 25 tonnes (16 m³) of sand were brought to the site, to repair the eroded section of the dune. As part of the works, the trees that were at risk of falling on to the beach due to the erosion of the dune scarp in this area, were removed to mitigate public safety risks. The dune escarpment was also re-shaped to ensure it was stable. These works were subject to a separate Part 5 approval process.

3.6.2 Reconstruction of access path

The coastal erosion occurring at Clarkes Beach damaged the pedestrian beach access to the immediate west of the café prior to the installation of the works. This beach access was formerly managed by Byron Shire Council as the manager of Crown Reserve 82000 and has been closed for over 12 months. DPIE - Crown Lands has investigated various options for reinstatement of the beach access in consultation with Council. Subsequently Council has advised that its preference is to decommission this beach access as there is an access path approximately 50 m to the west. DPIE - Crown Lands will work with Council to decommission the damaged beach access and will support the formalisation of the beach access further

west. Any works relating to Council's beach access will be subject to a separate planning and approval process.

3.6.3 Café works

The operators of the café are investigating options to reconfigure and or relocate the café building. Any modification to the café will be subject to a separate planning and approval process.

4. PROJECT JUSTIFICATION AND ALTERNATIVES

4.1 Coastal Management Strategy for the Byron Bay embayment

Coastal Management Programs prepared under the *Coastal Management Act 2016* set long term strategies for managing the coastal zone and issues such as coastal erosion. There is no certified Coastal Management Program (CMP) in place for Byron Bay or Clarkes Beach. Council is currently in the process of preparing a CMP for the Byron Shire coastline to define the long-term strategy for management of the open coast in Byron Shire including the Clarkes Beach precinct. DPIE - Crown Lands has and will continue to be engaged in the development of the CMP through the Clarkes Beach Working Group (Section 6.9), a multi-agency group established by DPIE - Crown Lands in July 2021, as well as other groups and committees convened by Council.

Prior to the current CMP development process, Council prepared the *Draft Coastal Zone Management Plan for the Eastern Precincts of the Byron Bay Embayment* (BSC, 2018) however the plan was not certified. The *Coastal Management Program Scoping Study for Cape Byron to South Golden Beach* (CMP Scoping Study; BMT, 2020) has been prepared for Cape Byron to South Golden Beach under the NSW Coastal Management Framework in accordance with the *Coastal Management Act 2016* and the *Coastal Management Manual* (OEH, 2018). The Scoping Study identified the hazard of beach erosion as a high risk with Clarkes Beach considered to be an erosion hot spot. Coastal hazard studies were recommended for Stage 2 of the CMP development including update of the beach erosion and shoreline recession hazards assessment using a probabilistic approach for the entire Byron Shire coastline. Stage 3 of the CMP development will include identification and evaluation of potential management options.

4.2 Need for the Project

Coastal processes have been investigated in a separate report (UNSW WRL, 2021) and are summarised in Section 7.3.

DPIE - Crown Lands is working with Reflections, the café owner, Council and other stakeholders to develop a precinct-based, strategic approach to address coastal hazards in the area. The geobags are required to remain in place while strategies for the relocation and/or reconfiguration of the café are developed. In parallel, Council will develop the CMP and adopt coastal management strategies for this precinct and the wider Byron Bay embayment. The proposal allows for a considered long-term plan and orderly implementation to achieve the most appropriate long-term outcome.

4.3 Alternative Options

4.3.1 Alternative designs

Prior to construction of the hybrid structure (geobags and sand nourishment), Crown Lands considered advice from coastal and geotechnical engineers on alternative designs based on sand nourishment-only protection, position of the geobag seawall toe, sand compaction and sand slope. A sand-only option involves higher risk due to the sand not remaining where it is needed, high cost due to the need for monitoring and replenishment and high levels of disruption from trucks and machinery if/when replenishment is required.

The global stability of the sand slope with the installed hybrid option meets geotechnical engineering standards provided the geobags and sand remain intact. Global stability refers to the entire dune collapsing from behind the dune crest to seaward of the dune toe. As the hybrid option provides lower overall risk, this was the option preferred by DPIE - Crown Lands.

4.3.2 Immediate removal of temporary coastal protection works

This option would consist of immediately removing the existing geobag seawall using the methodology described in Section 3.5. Immediate removal of the geobags is likely to expose the area to coastal erosion causing significant environmental, economic and social impact including:

- The café is an important hospitality venue for the region, hosting weddings and other important events, generating local employment and income. This social and economic activity is important for the community, visitors and the Byron Bay economy which has and continues to be heavily impacted by the COVID-19 pandemic. The reconfiguration or relocation of the café will require significant resources and planning, given the highly constrained nature of the site. In a worst-case scenario, erosion of the dune and collapse of the café could result in waste and building debris falling on to the beach, into the ocean and Cape Byron Marine Park, resulting in public safety risks and harm to marine life.
- Reduced scenic amenity, beach access and risks to public safety. This section of Clarkes Beach is frequently used by large numbers of beach goers and provides pedestrian access to The Pass. Further erosion of the dune and damage to vegetation is likely to restrict safe access along this part of the beach to periods of very low tides.
- Loss of vegetation including littoral rainforest. Remaining areas of littoral rainforest are present on the dune surrounding the café. The erosion and recession expected to occur after the removal of the geobag seawall would result in continued loss of this vegetation (refer Section 7.4).
- Recession of the dune and reserve – the reserve between Reflections Holiday Park and Main Beach includes popular community recreation areas and public infrastructure (amenities block, car park and pathways) which would be at risk if the dune was allowed to recede further.

4.3.3 Beach scraping

Beach scraping can be a useful and cost-effective technique for rebuilding dunes or restoring beaches. Scraping accelerates the natural process of dune re-building by moving sand from the intertidal area of the beach and placing it on the dunes. It does not add sand reserves to the beach but provides for existing sand reserves to be retained as an erosion buffer. In 2010 Council conducted a pilot study to understand if beach scraping could be used as an effective management strategy at New Brighton beach. The study was deemed a success and subsequent beach scraping has been conducted in 2013 and 2017 (BMT, 2020). Beach scraping may be considered in the CMP as a management strategy for the Byron Bay embayment in addition to other longer-term options.

The viability of a sand scraping proposal would depend on whether sand is available downslope or in the immediate vicinity. Any sand scraping undertaken for this precinct would also require toe protection to mitigate the coastal erosion risk to the café.

4.3.4 Permanent coastal protection options

The construction of permanent protection structures, such as a rock revetment seawall, would provide longer term protection of the site. Permanent coastal protection works are unfavourable for the following reasons:

- There is no certified CMP in place to set the longer-term direction for coastal management at this location. The installation of permanent coastal protection works would pre-empt the CMP process and this is not considered appropriate by DPIE - Crown Lands.
- The location experiences long term recession and the impact of permanent seawalls on coastal processes would be difficult to mitigate without an agreed, longer-term strategy in place, as determined through a CMP.
- Local planning provisions including the requirements of Part J of the *Byron Development Control Plan 2010* (DCP 2010), preclude the construction of hard engineered coastal protection works in this area. In addition, the *Byron Local Environmental Plan 1988* (BLEP 1988) requires that development approved in the coastal zone be temporary and/or relocatable, based on triggers pertaining to coastal hazards and the position of the erosion escarpment.

4.3.5 Dune vegetation management

Dune revegetation works are undertaken in the Clarkes Beach reserve by dune care groups and Council to revegetate and stabilise some areas of the dune system. While dune revegetation works may encourage sand deposition and provide a buffer against coastal processes, this vegetation is likely to be lost once the geobags are removed and the area is subject to coastal processes and erosion. Therefore dune revegetation works alone are not sufficient to mitigate the risk of coastal erosion.

5. REGULATORY REQUIREMENTS AND CONSIDERATIONS

5.1 Byron LEP

The proposal is located within the Byron Shire Council Local Government Area (LGA). Land use in the LGA is governed by the *Byron Local Environmental Plan 2014* (BLEP 2014) and BLEP 1988. The proposed works site is zoned Deferred Matter under the BLEP 2014 and is therefore subject to BLEP 1988. The site is zoned as 7(f1) Coastal Lands under the BLEP 1988. Under the BLEP 1988 coastal restoration works are permitted only with development consent. The objectives of zone 7(f1) are:

- (a) to identify and protect environmentally sensitive coastal land,*
- (b) to enable development for certain purposes where such development does not have a detrimental effect on the habitat, landscape or scenic quality of the locality,*
- (c) to prevent development which would adversely affect, or be adversely affected by, coastal processes, and*
- (d) to enable the careful control of noxious plants and weeds by means not likely to be significantly detrimental to the native ecosystem.*

Under Section 33 (Development within Zone No 7 (f1) (Coastal Lands Zone)) of BLEP 1988:

- (2) A person shall not carry out development for any purpose on land to which this clause applies except with the consent of the council.*

...

- (4) The Council, in deciding whether to grant consent to development referred to in subclause (2), shall take into consideration -*

- (a) the likelihood of the proposed development adversely affecting, or being adversely affected by, coastal processes,*
- (b) the likelihood of the proposed development adversely affecting any dune or beach of the shoreline or foreshore,*
- (c) the likelihood of the proposed development adversely affecting the landscape, scenic or environmental quality of the locality of the land, and*
- (d) whether adequate safeguards and rehabilitation measures have been, or will be, made to protect the environment.*

The proposal is consistent with BLEP 1988. The above considerations have been addressed in the coastal processes study *Geobag Walls at Clarkes Beach, Byron Bay* (UNSW WRL, 2021) and this EIS.

5.2 Legislation

5.2.1 *Environmental Planning and Assessment Act 1979 and Regulation*

The proposed works require development consent under Part 4 of the EP&A Act (Crown DA) and will be assessed by Byron Shire Council and then determined by the Northern Regional Planning Panel as the proposal is regionally significant development (Section 5.3.2).

The proposal is integrated development under Section 4.46 of the EP&A Act, as approval is required under the *Roads Act 1993* (Section 5.2.7) and the *National Parks and Wildlife Act 1974* (Section 5.2.6). The proposal is designated development as it is located in land mapped as littoral rainforest in the *Coastal Management SEPP 2018* (Section 5.3.1).

A consent authority is required to take into consideration the matters listed in Section 4.15 of the EP&A Act (Table 2).

Table 2: Matters for consideration - evaluation of development applications (Section 4.15 of the EP&A Act)

Matters for consideration	Application to this proposal	Response
(1) Matters for consideration - general: In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:		
(a) the provisions of:		
(i) any environmental planning instrument, and	BLEP 1988, Coastal Management SEPP, Koala SEPP, State and Regional Development SEPP	Sections 5.1 and 5.2.9 of this EIS
(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and	Not applicable.	-
(iii) any development control plan, and	Byron DCP 2010: Chapter 1(E) Waste Minimisation and Management. Chapter 1(J) Coastal Erosion Lands. Chapter 21 Social Impact Assessment.	Section 5.4

Matters for consideration	Application to this proposal	Response
(iia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and	Not applicable.	-
(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),	EP&A Regulation: Part 6, Division 3: Development Applications for Integrated Development. Schedule 2: Environmental Impact Statements.	DPIE has provided the Secretary's Environmental Assessment Requirements (SEARs, Section 6.1 of this EIS). The form and content of the EIS complies with Part 3 of Schedule 2.
(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,	Addressed in this EIS.	Section 7
(c) the suitability of the site for the development,		
(d) any submissions made in accordance with this Act or the regulations,	Stakeholder consultation has been undertaken and feedback has been addressed in this EIS. Additional feedback may be provided during the exhibition phase.	Section 6
(e) the public interest.	Addressed in this EIS.	Section 7

5.2.2 Coastal Management Act 2016

The *Coastal Management Act 2016* aims to manage the coastal environment of NSW in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State. There is no relevant certified Coastal Management Program in place for the location, prepared under Part 3 of the Act.

The proposed works site includes land mapped as littoral rainforest under Section 6 of the Act (Figure 1). The management objectives for the coastal wetlands and littoral rainforests area are as follows (Section 6(2) of the Act):

(a) to protect coastal wetlands and littoral rainforests in their natural state, including their biological diversity and ecosystem integrity,

(b) to promote the rehabilitation and restoration of degraded coastal wetlands and littoral rainforests,

- (c) to improve the resilience of coastal wetlands and littoral rainforests to the impacts of climate change, including opportunities for migration,*
- (d) to support the social and cultural values of coastal wetlands and littoral rainforests,*
- (e) to promote the objectives of State policies and programs for wetlands or littoral rainforest management.*

The proposed works provide temporary protection for the remaining littoral rainforest in the surrounding area (refer Section 7.4).

The proposed works are on land identified as coastal environmental area under Section 8 of the Act. The management objectives for the coastal environment area are as follows (Section 8(2) of the Act):

- (a) to protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons, and enhance natural character, scenic value, biological diversity and ecosystem integrity,*
- (b) to reduce threats to and improve the resilience of coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change,*
- (c) to maintain and improve water quality and estuary health,*
- (d) to support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons,*
- (e) to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place,*
- (f) to maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms.*

Coastal environment area objectives (a), (d), (e) and (f) are relevant to the proposal. The proposed works will support those objectives while they remain in place.

The proposed works are on land identified as coastal use area under Section 9 of the Act. The management objectives for the coastal use area are as follows (Section 9(2) of the Act):

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

The proposed works will support those objectives while they remain in place.

Clause 27 of the Act provides requirements for development consent for coastal protection works:

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.

The above considerations have been addressed in the coastal processes study *Geobag Walls at Clarkes Beach, Byron Bay* (UNSW WRL, 2021) and this EIS. Public access arrangements and public safety are discussed in Sections 7.9 and 7.10. Ongoing maintenance activities are discussed in Section 3.4. DPIE – Crown Lands will be responsible for ongoing restoration and maintenance for the period that the temporary coastal protection works are in place.

5.2.3 Biodiversity Conservation Act 2016 and Regulation 2017

The NSW Government *Biodiversity Conservation Act 2016* (BC Act) came into effect in August 2017 replacing the repealed *Threatened Species Conservation Act 1995*, *Native Vegetation Act 2003* and *National Parks and Wildlife Act 1974* (animal and plant provisions only). The purpose of this Act is to maintain a

healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The Act provides provisions for the protection of threatened or protected animal and plant species, threatened ecological communities and areas of outstanding biodiversity value.

Section 7.2 of the BC Act provides that development under the EP&A Act is likely to significantly affect threatened species if:

- (a) It is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in Section 7.3, or*
- (b) The development exceeds the biodiversity offsets scheme (BOS) threshold if the BOS applies to the impacts of the development on biodiversity values, or*
- (c) It is carried out in a declared Area of Outstanding Biodiversity Value (AOBV).*

Impacts on biodiversity are discussed in a separate report included with the DA (Biodiversity Assessments & Solutions Pty Ltd, 2021) and summarised in Section 7.4. No threatened flora species listed under the BC Act were recorded at the subject land or in the immediate vicinity. Therefore, it is considered that no threatened flora species would be likely to be impacted by the proposal. Vegetation on the subject land contains tree species commonly found within the vegetation community listed in Schedule 2 of the BC Act as a threatened ecological community (TEC), namely the endangered ecological community (EEC) *Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*. It is considered that despite a sparse understorey or mid-storey vegetation in this location, the vegetation is analogous with the EEC as described in the final Scientific Committee determination (Biodiversity Assessments & Solutions Pty Ltd, 2021).

No threatened fauna species were recorded by Biodiversity Assessments & Solutions Pty Ltd, although extensive targeted surveys for all fauna classes were not undertaken. The subject land contains little valuable habitat for threatened fauna species listed under the BC Act, however, valuable habitat does occur proximal to the site to the east and south particularly, which would not be impacted by the proposal. A subject land suitability assessment was undertaken for those species recorded within 1.5 km of the development footprint. This identified eight species as having some potential to occur at the subject land and to be impacted by the proposal which were further assessed by way of a Test of Significance (ToS). The ToS concluded that the proposal is not likely to result in any direct or indirect impacts to threatened species, populations, ecological communities, or their habitats either on the subject land or beyond (Biodiversity Assessments & Solutions Pty Ltd, 2021).

Part 7 of the *Biodiversity Conservation Regulation 2017* (BC Regulation) prescribes the biodiversity assessment and approvals under the EP&A Act and details when an activity exceeds a threshold and therefore requires assessment under the BOS. The following three main threshold triggers apply:

- 1) The area clearing threshold depends on the minimum lot size under the relevant LEP – this threshold is not exceeded and does not apply.
- 2) Biodiversity Values Map threshold – this threshold is not exceeded and does not apply.
- 3) A threatened species ToS – The ToS concluded that the proposal is not likely to result in any direct or indirect impacts to threatened species, populations, ecological communities or their habitats.

The BOS thresholds have not been exceeded and the BOS does not apply (Biodiversity Assessments & Solutions Pty Ltd, 2021).

5.2.4 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the EPBC Act as matters of national environmental significance. The Act lists threatened species or ecological communities that are recognised as a matter of national environmental significance.

No flora or fauna species listed under the EPBC Act were recorded at the subject land during site surveys and a habitat suitability assessment concluded that no fauna species listed under the EPBC Act would likely be impacted by the proposal. Therefore, the proposal would not impact on any Matters of National Environmental Significance and assessment under the EPBC Act is not required (Biodiversity Assessments & Solutions Pty Ltd, 2021).

5.2.5 Marine Estate Management Act 2014

The *Coastal Management Act 2016* (section 3(m)) supports the objects of the *Marine Estate Management Act 2014*, with the coastal zone forming part of the marine estate. The *Marine Estate Management Act 2014* provides for strategic and integrated management of the whole marine estate – marine waters, coasts and estuaries. The Act does this by:

- Providing for the management of the marine estate consistent with the principles of ecologically sustainable development.
- Establishing two advisory committees, a Marine Estate Management Authority (MEMA) and Marine Estate Expert Knowledge Panel.
- Requiring the development of a Marine Estate Management Strategy to address priority threats identified through the threat and risk assessment (TARA).
- Facilitating the maintenance of ecological integrity, and economic, social, cultural and scientific opportunities.
- Promoting the coordination of government programs.
- Providing for a comprehensive system of marine parks and aquatic reserves.

The *Marine Estate Management Strategy 2018 - 2028* (MEMS) (MEMA, 2018) provides an overarching strategic approach to the coordinated management of the NSW marine estate, i.e. the coastal waters, estuaries, lakes, lagoons and coastal wetlands. The Strategy considers the ten MEMA management principles as well as priority threats for the marine estate as identified in the TARA (BMT WBM, 2017). The TARA identifies and assesses threats and risks to environmental assets and natural attributes and social, cultural and economic benefits (community benefits). Threats and their associated risks were assessed at a state and regional scale. The proposed works are located within the North Region (from Tweed Heads to

Stockton). The high priority threats to the coastline area (state-wide and the North Region) were identified as (BMT WBM, 2017):

- Climate change (20 years).
- Foreshore development.
- Beach nourishment and grooming.

In NSW, marine parks are declared and managed under the *Marine Estate Management Act 2014* (MEM Act) by NSW Department of Primary Industries (DPI). Cape Byron Marine Park extends approximately 37 km along the coastline from the Brunswick River northern training wall to Lennox Head. The ocean to the north of the proposed works site is part of the Broken Head Sanctuary Zone and Habitat Protection Zone. A Marine Parks permit is required for any works or activities conducted below mean high water. In addition to this requirement, sections 55 and 56 of the MEM Act require that determining authorities do not carry out or grant approval to carry out activities that are likely to have an effect on the marine park unless the consent authority has consulted with DPI. Consultation with DPI – Cape Byron Marine Park is discussed in Section 6.5.

DPI - Cape Byron Marine Park provided a Marine Parks permit (MEAA20/264, expires 16 October 2021) as part of the temporary coastal protection works for the removal of debris, installation of geofabric bags at the dune toe (in accordance with DPIE Coastal Management team advice), reconfiguration of compromised infrastructure, management of unstable sand cliffs and strategic placement of geofabric bags. Any future or additional works below mean high water will require a further marine park permit.

5.2.6 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) regulates the control and management of all national parks, historic sites, nature reserves and Aboriginal areas. The main aim of the Act is to conserve the natural and cultural heritage of NSW. The Cape Byron State Conservation Area is located approximately 200 m to the east of the proposed works site and Arakwal National Park is approximately 280 m to the south-east. National parks and reserves will not be impacted by the proposal. Impacts on cultural heritage are discussed in a separate report included with the DA (Hill *et al.*, 2021) and summarised in Section 7.5.

The requirement for an Aboriginal Heritage Impact Permit (AHIP) is outlined under Part 6, Division 2, Section 90 of the NPW Act. An AHIP is required to knowingly destroy, deface or damage a relic or aboriginal place. Under section 4.46 (2) of the EP&A Act, the development is classified as “integrated development” as an Aboriginal heritage impact permit is required under Part 6 of the NPW Act.

5.2.7 Roads Act, 1993

The *Roads Act 1993* regulates the carrying out of various activities on public roads. The objectives of the Act relevant to this proposal are (section 3 of the Act):

(a) to set out the rights of members of the public to pass along public roads, and

(b) to set out the rights of persons who own land adjoining a public road to have access to the public road, and

...

(h) to regulate the carrying out of various activities on public roads.

The proposal will not inhibit passage along or adjoining public roads or access to a public road.

Consent under Section 138 of the Act is required for any works or activities in a public reserve, public roadway or footpath. Approval will be required from Council for the use of machinery at the compound within the reserve adjacent to the café which is proposed to be used for the maintenance activities that require machinery access to the beach and the decommissioning of the works.

As Lot 18, DP 1269368 is also a Crown public road (unformed), consent from DPIE – Crown Lands as the roads authority is also required.

Under section 4.46 (1) of the EP&A Act, the development is classified as integrated development as consent is required under section 138 of the *Roads Act 1993*.

5.2.8 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act 1994* (FM Act) are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. Under Section 199 of the FM Act 'A public authority (other than a local government authority) must, before it carries out or authorises the carrying out of dredging work or reclamation work -

- a) *give the Minister written notice of the proposed work, and*
- b) *consider any matters concerning the proposed work that are raised by the Minister within 21 days after the giving of the notice (or such other period as is agreed between the Minister and the public authority).'*

Dredging or reclamation refers to dredging or reclamation of 'water land' which is defined under the FM Act as land submerged by water either permanently or intermittently. Under the FM Act dredging work means:

- a) *"any work that involves excavating water land, or*
- b) *any work that involves moving material on water land or removing material from water land that is prescribed by the regulations as being dredging work."*

Reclamation work means any work that involves:

- a) *using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or*
- b) *depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or*
- c) *draining water from water land for the purpose of its reclamation."*

The location of the geobags is considered to be waterland and the placement, maintenance and removal of the geobags, including nourishment, is considered to constitute dredging and reclamation works for the purposes of the FM Act. Consultation with the Department of Primary Industries – Fisheries (DPI – Fisheries) is discussed in Section 6.

5.2.9 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act, 1997* (POEO Act) provides a legal framework to protect and enhance the quality of the environment in NSW and promote ecologically sustainable development. The Act also aims to prevent the degradation of the environment by the implementation of mechanisms that promote issues such as the re-use and recovery of materials and the elimination of harmful waste.

The POEO Act is administered by the EPA and establishes a licensing regime for waste, air, water and pollution. Relevant sections of the Act are Part 5.3 Water Pollution, Part 5.4 Air Pollution, Part 5.5 Noise Pollution and Part 5.6 Land Pollution and Waste. Any work potentially resulting in pollution must comply with the POEO Act. Relevant licences must be obtained if required. No licences are required under the Act.

5.2.10 Water Management Act 2000

The main objective of the *Water Management Act 2000* (WM Act) is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. Section 91E of the Act establishes an approval regime for controlled activities within waterfront land. However clause 41 of the *Water Management (General) Regulation 2018* provides an exemption for public authorities in relation to all controlled activities on waterfront land. Although formal approval under the WM Act is not required, the proposed activity is within 40m of a waterway (ocean). Impacts on waterways are discussed in Section 7.2.

No water licensing under the WM Act is required for the proposed works. No water sharing plan or water source embargo is relevant to the proposed works.

5.2.11 Heritage Act 1977

All non-Aboriginal archaeological relics across NSW (including NPWS estate) over 50 years old are managed under the *Heritage Act 1977*. The proposed works do not involve an item or place listed on the NSW State Heritage Register or the subject of an interim heritage order or listing and is therefore not a controlled activity. Approval of works on the site is therefore not required under Part 4 of the *Heritage Act 1977*.

5.3 State Environmental Planning Policies

5.3.1 SEPP Coastal Management 2018

Under clause 19(2)(a) of the Coastal Management SEPP:

Development for the purpose of coastal protection works may be carried out on land to which this Policy applies by or on behalf of a public authority -

(a) without development consent - if the coastal protection works are -

- (i) identified in the relevant certified coastal management program, or*
- (ii) beach nourishment, or*
- (iii) the placing of geobags for a period of not more than 90 days, or*

(iv) routine maintenance works or repairs to any existing coastal protection works, or

(b) with development consent - in any other case.

The proposed works are being undertaken by a public authority (DPIE - Crown Lands), however the works are not identified in a certified CMP and consist of the placement of geobags for longer than 90 days.

The geobag seawall and beach nourishment works are (partially) located on land mapped as littoral rainforest under the Coastal Management SEPP. Under Clause 10(1) of the Coastal Management SEPP (Development on certain land within coastal wetlands and littoral rainforests area):

(1) The following may be carried out on land identified as "coastal wetlands" or "littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map only with development consent -

(a) the clearing of native vegetation within the meaning of Part 5A of the Local Land Services Act 2013,

(b) the harm of marine vegetation within the meaning of Division 4 of Part 7 of the Fisheries Management Act 1994,

(c) the carrying out of any of the following -

(i) earthworks (including the depositing of material on land),

(ii) constructing a levee,

(iii) draining the land,

(iv) environmental protection works,

(d) any other development.

(2) Development for which consent is required by subclause (1), other than development for the purpose of environmental protection works, is declared to be designated development for the purposes of the Act.

The works require development consent under Clause 10(1) and are considered to be designated development under Clause 10(2).

The Coastal Management SEPP identifies coastal wetlands and littoral rainforest areas, coastal vulnerability areas, coastal environment areas and coastal use areas. The proposed works are located on mapped littoral rainforest and littoral rainforest proximity area, coastal environment and coastal use areas. The coastal vulnerability areas are not currently mapped. The Coastal Management SEPP outlines consent considerations for each management area which have been addressed in this EIS (Table 3).

Table 3: Coastal Management SEPP considerations for coastal management areas

Consideration	Comment	Section
<i>Littoral rainforest</i>		
A consent authority must not grant consent unless the consent authority is satisfied that sufficient measures have been, or will be, taken to protect, and where possible enhance, the biophysical, hydrological and ecological integrity of the coastal wetland or littoral rainforest.	The geobag seawall is located on land mapped as littoral rainforest, however, littoral rainforest is not currently present within the footprint of the works as previous coastal erosion resulted in the loss of littoral rainforest from this area. The remaining mapped littoral rainforest is present to the east and south-east of the café. The geobag seawall is expected to provide temporary protection from beach erosion to the remaining littoral rainforest located to the east and south-east of the café. Once the geobags are removed it is expected that the remaining littoral rainforest will be vulnerable to future coastal erosion and shoreline recession.	Section 7.4
Development consent must not be granted to development on land identified as “proximity area for coastal wetlands” or “proximity area for littoral rainforest” on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on -		
(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or	The proposed works will provide protection to the remaining areas of mapped littoral rainforest while they are in place. Once the geobags are removed it is expected that the remaining littoral rainforest will be vulnerable to future coastal erosion and shoreline recession.	Sections 7.2 and 7.4
(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.	No impacts identified.	Sections 7.2 and 7.4
<i>Coastal environment area</i>		
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,	No impacts identified. The proposal will provide temporary protection to a small length of hind dune.	Sections 7.1, 7.2, 7.3, 7.4

EIS: Temporary coastal protection works, Clarkes Beach

Consideration	Comment	Section
(b) coastal environmental values and natural coastal processes,	The proposal will increase erosion in a small area to the west of the works although this is a minor contribution to shoreline change compared to the impacts of waves, storms, sea level rise and coastal recession (UNSW WRL, 2021).	Sections 7.3, 7.4, 7.5, 7.9 and 7.10
(c) the water quality of the marine estate (within the meaning of the <i>Marine Estate Management Act 2014</i>)	No impacts identified.	Section 7.2
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,	Potential impacts of the of the proposal can be mitigated sufficiently to ensure that direct and indirect impacts on biodiversity values would be avoided and minimised.	Section 7.4
(e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,	The geobags may impact alongshore pedestrian access when the beach is in an eroded state. When the beach is accreted, especially at low tide, the works do not affect beach access. While in place the seawall will also stabilise the beach, minimising the impact of further beach erosion and its associated impacts on public access and use of the beach (e.g. high steep escarpments, falling trees, narrow beach).	Sections 7.9 and 7.10
(f) Aboriginal cultural heritage, practices and places,	The site is located near a recorded midden site and is of cultural significance to the local Aboriginal community. While the works are in place, they provide temporary protection to any areas of midden remaining in the dune above the geobag seawall.	Section 7.5
(g) the use of the surf zone.	No impacts identified when the beach is accreted. During times of an eroded beach state and high tides, the works may impact entry and egress to the water.	Section 7.10

Consideration	Comment	Section
<i>Coastal use area</i>		
Development consent must not be granted to development on land that is within the coastal use area unless the consent authority -		
(a) has considered whether the proposed development is likely to cause an adverse impact on the following -		
(i) existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,	The geobags may impact alongshore pedestrian access when the beach is in an eroded state. When the beach is accreted, especially at low tide, the works do not affect beach access. While in place the seawall will also stabilise the beach, minimising the impact of further beach erosion and its associated impacts on public access and use of the beach (e.g. high steep escarpments, falling trees, narrow beach).	Sections 7.9 and 7.10
(ii) overshadowing, wind funnelling and the loss of views from public places to foreshores,	No impacts identified.	Section 7.9
(iii) the visual amenity and scenic qualities of the coast, including coastal headlands,	No impacts identified.	Section 7.9
(iv) Aboriginal cultural heritage, practices and places,	The site is located near a recorded midden site and is of cultural significance to the local Aboriginal community. While the works are in place, they provide temporary protection to any areas of midden remaining in the dune above the geobag seawall.	Section 7.5
(v) cultural and built environment heritage,	No impacts identified.	Section 7.5
(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	With the application of the identified environmental management measures the proposed works are not expected to have any adverse environmental impact.	Sections 9 and 10
(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.	The proposed works are considered to be suitable for the proposed location.	-

5.3.2 SEPP State and Regional Development 2011

Under Clause 8A, Schedule 7 of the State and Regional Development SEPP the following works are considered to be regionally significant development:

The following development on land within the coastal zone that is directly adjacent to, or is under the waters of, the open ocean, the entrance to an estuary or the entrance to a coastal lake that is open to the ocean -

(a) development for the purpose of coastal protection works carried out by a person other than a public authority, other than coastal protection works identified in the relevant certified coastal management program,

(b) development for the purpose of coastal protection works carried out by or on behalf of a public authority (other than development that may be carried out without development consent under clause 19(2)(a) of State Environmental Planning Policy (Coastal Management) 2018).

The proposed works are located within the coastal zone directly adjacent to (and potentially under) the waters of the open ocean, are being undertaken by a public authority (DPIE - Crown Lands) and require development consent. Therefore, the proposal is considered to be regionally significant development. The proposed development will be assessed by Byron Shire Council and then determined by the Northern Regional Planning Panel.

The proposed development is not considered to be state significant development as outlined in Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979*, and Part 2, Clause 8 and Schedule 1, 2 of the *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional Development SEPP).

5.3.3 SEPP Koala Habitat Protection 2021

The SEPP Koala Habitat Protection 2021 (Koala SEPP) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koala (*Phascolarctos cinereus*) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline.

The Koala SEPP applies to development under part 4 of the EP&A Act. The *Byron Coast Comprehensive Koala Plan of Management* (KPoM) was approved under the Koala SEPP in March 2021. Clause 10 (2) states that “*The council’s determination of the development application must be consistent with the approved koala plan of management that applies to the land*”. The KPoM applies to the land as the subject land is > 1 hectare in size and is within the Koala planning area.

No Koala habitat has been mapped on the subject land and the adjacent dune vegetation contains one tree listed in Schedule 2 of the Koala SEPP (Section 7.4). This tree would not be impacted by the proposal. Therefore, neither the Koala SEPP nor the KPoM prevent granting consent to the development application.

5.3.4 SEPP No 55 - Remediation of Land

Under Clause 7 of SEPP No 55 - Remediation of Land, a consent authority must not give consent to a proposal unless it has considered whether the land within the proposal is contaminated. The land

subject to the proposal is not considered to be contaminated and is considered suitable for the use of the proposed works.

5.4 Development Control Plan

As the temporary coastal protection works are on land identified as Deferred Matter, DCP 2010 applies. DCP 2010 provides planning strategies and controls for various types of development permissible in accordance with BLEP 1988. Relevant chapters of DCP 2010 are:

- Chapter 1: Part A General, Part F Waste Minimisation and Management – waste management is addressed in Section 7.12.
- Chapter 1: Part A General, Part J Coastal Erosion Lands:
 - The temporary coastal protection works are located seaward of the immediate impact line (Element 1 - Precinct 1). The objective of this element is to ensure the impact of coastal processes on potential development is minimised by limiting development and ensuring any development is only temporary. The prescriptive measures primarily relate to buildings/dwellings. The proposal is consistent with the objective of this element as it is temporary and has been proposed to allow for future reconfiguration or relocation of the café.
 - The DCP element – Beach Protection is also relevant to the proposal with the objective of this element to ensure that works proposed by property owners to protect land from coastal processes will not have adverse effects on other land or on coastal processes. The proposed works comply with the objective and performance criteria for this element. Rock, concrete and hard materials are not proposed for the temporary protection works. Impacts on other land and coastal processes are discussed in Section 7.3.
 - Monitoring of the temporary protection works is proposed as discussed in Section 3.
- Chapter 21: Social Impact Assessment – Council has confirmed that a Social Impact Assessment as described in the DCP is not required. Socio-economic considerations are addressed in Section 7.5 (Aboriginal Cultural Heritage), Section 7.10 (Traffic and Vehicular Access), Section 7.9 (Amenity) and Section 7.11 (Socio-Economic Considerations).

5.5 Community Participation Plan

The *Byron Shire Council Community Participation Plan* (Byron Shire Council, 2019) describes the consultation requirements for development applications including pre-lodgement community consultation. In accordance with the Plan, the proposal is Community Significant Development as it will be referred to the Northern Regional Planning Panel for determination. DPIE - Crown Lands has undertaken the pre-lodgement consultation activities as specified by the Plan. A summary of the pre-lodgement consultation undertaken is provided in Section 6.10 and detailed in a separate report included with the development application.

5.6 Approvals Required

The following approvals will be required for the proposal:

- Development consent – the proposed development will be assessed by Byron Shire Council and then determined by the Northern Regional Planning Panel.
- An AHIP will be sought for the following activities:
 - Decommissioning of the coastal protection works.
 - Revegetation works to provide medium to long-term stability to the dune face, including the use of fabric or plastic material to support the establishment of root structures.
 - As a mitigation measure it is further recommended that salvage of midden material is undertaken by BoBBAC that has:
 - i. Slumped down the dune face and retained around the temporary coastal protection works.
 - ii. Is at imminent risk of loss from storm surge and high tides.
 - Dune fencing to encourage the formation of dunes and to support the establishment of vegetation.
- A Traffic Management Plan will be prepared in accordance with the *RMS Traffic Control at Work Sites Manual RTA* (2010) and *QA Specification G10 Control of Traffic* (RTA, 2008) for the approval of Council.
- Consent from DPIE – Crown Lands as the roads authority for the Crown road is also required.
- Extension of the existing Marine Parks permit (MEAA20/264, expires 16 October 2021) for works below mean high water.

6. CONSULTATION

6.1 Secretary's Environmental Assessment Requirements

DPIE has provided the SEARs for the proposed works (Appendix 1). DPIE – Biodiversity Conservation Division of the Biodiversity, Conservation and Science Directorate in the Environment, Energy and Science Group has also provided input into the SEARs. The SEARS have been addressed in this EIS as shown in the following table.

Table 4: Summary of Secretary's Environmental Assessment Requirements

Recommendation (paraphrased)	Reference
<i>DPIE</i>	
No specific requirements, except that the EIS must address the provisions of the <i>State Environmental Planning Policy (Coastal Management) 2018</i> .	Section 5.3.1
The minimum form and content requirements outlined in Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i> .	This EIS
EIS is prepared in consultation with Byron Shire Council, Tweed Byron Local Aboriginal Land Council and any other relevant local, State and Commonwealth government authorities, service providers, community groups and surrounding landowners, and address any issues they raise in the EIS.	Section 6
<i>DPIE - Biodiversity Conservation Division</i>	
Timeframe for geotextile bags remaining in place - the EIS should explore several options, including the immediate removal of the geotextile bags.	Section 3.6
Risk Management Strategy - the EIS should be informed by a long-term strategy for managing the coastal hazard risks at the site as the land is within a coastal hazard line.	Section 4.1
Aboriginal cultural heritage - there is an Aboriginal midden that became exposed on the adjoining Reflections Holiday Park site as a result of coastal erosion. There is potential for ACH impacts as a result of future coastal erosion and exposure and these should be considered. Advice on this matter should be obtained from Heritage NSW.	Sections 6.4 and 7.5
Biodiversity and dune restoration - the EIS should consider how the proposed works will protect remaining native vegetation and how the future removal of the geotextile bags will be undertaken to limit any further impacts, as well as what dune restoration will be undertaken and within what timeframe. The EIS should detail how a natural dune system will be re-established at the site following removal of the temporary coastal protection works.	Section 3
The EIS should consider the biodiversity impacts on marine turtles and shorebirds.	Section 7.4

Recommendation (paraphrased)	Reference
The Environmental Impact Statement (EIS) should fully and clearly describe the proposed development, including any environmental impact mitigation measures, and identify all the processes and activities intended for the site during the life of the proposed development. The description of the proposed development in the EIS should, where relevant, include:	
1. the location of the proposal and details of the surrounding environment;	Section 2
2. appropriate land use zoning;	Section 5.1
3. the size and type of the proposal and its operation;	Sections 3 and 9
4. the proposed layout of the site;	
5. the staging and timing of the proposal;	
6. the proposal's relationship to any other proposal;	
7. all equipment proposed for use at the site;	
8. chemicals, including fuel, used on the site and proposed methods for the transportation, storage, use and emergency management;	Section 7.10
9. waste generation, storage and disposal;	This EIS
10. the anticipated environment impacts of the proposal, both direct and indirect;	Section 7.4
11. a plan showing the distribution of any threatened flora or fauna species and the vegetation communities on or adjacent to the subject site, and the extent of vegetation proposed to be cleared;	Section 2
12. ownership details of any residence and/or land likely to be affected by the proposal;	Section 2
13. maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc. in the locality that may be affected by the proposal;	Section 9
14. methods to mitigate any expected environmental impacts of the proposal; and	Section 10
15. the anticipated level of performance in meeting required environmental standards.	

Recommendation (paraphrased)	Reference
Biodiversity: 1. The EIS must assess the impacts of the proposed development on biodiversity values to determine if the proposed development is “likely to significantly affect threatened species” for the purposes of Section 7.2 of the <i>Biodiversity Conservation Act 2016</i> (BC Act) as follows:	
A. The EIS must demonstrate whether the proposed development is to be carried out in a declared area of outstanding biodiversity value.	Sections 5.2.3 and 7.4
B. If the proposed development is not carried out in a declared area of outstanding biodiversity value, then the EIS must demonstrate and document whether the proposed development exceeds the biodiversity offset scheme threshold, as set out in section 7.4 of the BC Act and clause 7.1 of the <i>Biodiversity Conservation Regulation 2017</i> (BC Regulation).	
C. If the biodiversity offset scheme threshold is not exceeded, then the EIS must document the test for determining whether proposed development is likely to significantly affect threatened species or ecological communities as outlined in Section 7.3 of the BC Act, by preparing an ecological assessment.	
2. If the EIS determines under 1 above that the proposed development is likely to significantly affect threatened species, then in accordance with Section 7.7 of the BC Act the EIS must be accompanied by a Biodiversity Development Assessment Report prepared in accordance with Part 6, Division 3 of the BC Act..	
3. If the EIS determines under 1 above that the proposed development is unlikely to significantly affect threatened species, then the proposed development should: a. be designed to avoid and minimise impacts on biodiversity values to the fullest extent possible, and b. include a biodiversity offset package to offset remaining direct and indirect impacts on biodiversity values, prepared in accordance with the Department's 13 offsetting principles	
For the <i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>, the EIS should identify any relevant Matters of National Environmental Significance and whether the proposal has been referred to the Commonwealth or already determined to be a controlled action.	Sections 5.2.4 and 7.4
NPWS Estate: The EIS should address the following with respect to land reserved under the <i>National Parks and Wildlife Act 1974</i>. 1. Where appropriate, likely impacts (both direct and indirect) of the proposed development on any adjoining and/or nearby NPWS estate reserved under the <i>National Parks and Wildlife Act 1974</i> should be considered, with reference to the <i>Developments adjacent to National Parks and Wildlife Service lands Guidelines for consent and planning authorities</i> (DPIE, 2020).	Section 5.2.6
Proposed development which may impact marine protected areas should be referred to the Regions, Industry, Agriculture and Resources Group in the Department of Planning, Industry and Environment to determine the assessment and approval requirements.	Section 6.5

Recommendation (paraphrased)	Reference
Acid Sulfate Soils	Section 7.1
Flooding, Stormwater, Coastal Processes and Associated Hazards: the EIS should include an assessment of the following referring to the relevant guidelines:	
1. The potential effect of coastal processes and coastal hazards including potential impacts of sea level rise: a. on the proposed development; and b. arising from the proposed development including whether the proposed development will unreasonably limit or be likely to unreasonably limit public access to or the use of a beach or headland, or pose or be likely to pose a threat to public safety, and whether any increased erosion of the beach or adjacent land is expected to be caused by the presence of the works.	Section 7.3
2. Whether the proposed development is consistent with any coastal zone management plans.	Section 4.1
3. Whether the proposed development is consistent with any floodplain risk management plans.	The land is not identified as being flood prone.
4. Whether the proposed development is compatible with the flood hazard of the land.	
5. Whether the proposed development will significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties.	
6. Whether the proposed development will significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	Sections 7.1, 7.4
7. Whether the proposed development incorporates appropriate measures to manage risk to life from flood.	The land is not identified as being flood prone.
8. Whether the proposed development is likely to result in unsustainable social and economic costs to the community as a consequence of flooding.	
9. The implications of flooding over the full range of potential flooding, including the probable maximum flood, should be considered as set out in the NSW Government Floodplain Development Manual.	
10. All site drainage, stormwater quality devices and erosion / sedimentation control measures should be identified and the onsite treatment of stormwater and effluent runoff and predicted stormwater discharge quality from the proposed development should be detailed.	Section 9

Recommendation (paraphrased)	Reference
Cumulative Impacts: the EIS should include an assessment of the following: 1. The cumulative impacts, including both construction and operational impacts, from all clearing activities and operations, associated edge effects and other indirect impacts on cultural heritage, biodiversity and NPWS Estate in accordance with the <i>Environmental Planning and Assessment Act 1979</i>. 2. The cumulative impacts, including both construction and operational impacts, of the proponent's existing proposals and other proposals and associated infrastructure (such as access tracks etc.) as well as the cumulative impact of the proposed development in the context of other proposals located in the vicinity.	Section 7.13
<i>DPIE - Biodiversity Conservation Division Project Specific Recommendations:</i>	
1. Given the potential for the proposal to have unreasonable impacts to the coastal environment, the EIS should consider the option to remove the geotextile bags immediately as an alternative to leaving them in place, including the relative impacts and benefits of this option.	Section 3.6
2. The EIS should consider time limited options for leaving the geotextile bags in place for a further temporary period, (such as for a two-year timeframe and for a maximum five-year timeframe) including the relative impacts and benefits of these options, noting the requirements of section 27 of the <i>Coastal Management Act 2016</i>.	
3. In considering the above options, the EIS must: a. be informed by the advice of suitably qualified persons with expertise in coastal processes and hazards to enable unambiguous assessment of all direct and indirect, as well as short and long-term impacts, of the proposed development. b. describe the potential impact of the development over the life of the works including whether the proposed development will cause impacts to coastal process and coastal hazards including (but not limited to) whether erosion of the beach or adjacent land is expected to be caused by the presence of the works and to what extent this could occur over the life of the works. c. describe satisfactory arrangements 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, and ii. the maintenance of the works. d. consider the impacts of the proposed development on marine turtles and shorebirds, particularly for turtle nesting. e. consider the impacts the works could have on adjacent coastal lands including the Cape Byron State Conservation Area.	Sections 3, 7.3 and 7.4.

Recommendation (paraphrased)	Reference
4. In presenting and assessing the final preferred option, the EIS should demonstrate: a. that the development will not unreasonably limit, or be likely to unreasonably limit, public access to, or the use of a beach or headland, or pose or be likely to pose a threat to public safety. b. how public access to the beach will be managed to ensure that further erosional impacts do not occur as a result of unregulated public access. c. how removal of geotextile bags will occur that will limit impacts on native vegetation at the site. d. what arrangements will be made to restore the dune areas once the geotextile bags are removed, including, but not limited to, the preparation of a Dune Restoration and Management Plan.	Sections 3 and 7.9
5. The EIS should include a long-term strategy for managing the risks of coastal hazards and how these risks will be addressed in terms of future use and management of the site.	Section 4.1

6.2 Byron Shire Council

Correspondence with Council is included in Appendix 1. A pre-lodgement meeting was held with Council on 31 May 2021. At this meeting the proposal was discussed and broad development assessment requirements were provided. An additional meeting was held on 15 September 2021 to discuss detailed aspects of the proposal including the coastal hazard assessment and integration with the DA submitted by NSW Crown Holiday Parks Land Manager for the adjacent geobag seawall.

6.3 Aboriginal Community

An Aboriginal Cultural Heritage Assessment Report (ACHAR) (Hill *et al.*, 2021) was prepared in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010).

Consultation with the Aboriginal community was undertaken with BoBBAC under the provisions of the Arakwal ILUA which provides for exclusive rights to consultation with regard to Aboriginal cultural heritage. Consultation activities included correspondence and phone calls and a site meeting (29 April 2021) to discuss this proposal and other related proposals. BoBBAC representatives provided feedback on the draft *Aboriginal Cultural Heritage Assessment Report* (ACHAR, Hill *et al.*, 2021) prepared for this proposal.

6.4 Heritage NSW

A representative from Heritage NSW attended the site visit undertaken as part of the preparation of the ACHAR. Based on the recommendations of the ACHAR (AHIP is required), Heritage NSW approval is required as part of the Integrated Development Application and the proposed application for the AHIP. A letter was sent to Heritage NSW on 16 July 2021 advising of the ACHAR recommendation, the intention to submit the proposal as integrated development and requesting any additional requirements. Heritage NSW advised that it had no additional requirements on 6 August 2021. Correspondence with Heritage NSW is included in Appendix 1.

6.5 DPI – Cape Byron Marine Park

Correspondence with DPI – Cape Byron Marine Park is included in Appendix 1. DPI – Cape Byron Marine Park provided the following feedback:

- Advice should be obtained from DPIE (Environment, Energy and Science Group – Biodiversity Conservation Division) – refer Section 6.1.
- Every possible effort must be made to avoid any adverse impacts on the values of Cape Byron Marine Park including impacts to the beach, the marine environment and water quality of the marine park – refer Sections 7.2, 7.3 and 7.4.
- Any planning or works executed at this site should consider short- and long-term effects to the values of the marine park, such as local scouring, down drift erosion, the entry of pollutants, pests, disease or other unnatural material to the marine park and loss of public access or amenity – refer Section 7.
- Threats to the marine estate should be considered and managed – refer Section 5.2.5.
- The locality of the works is culturally significant – refer Section 7.5.
- Given that the works are contiguous with a similar adjacent seawall it is expected that future arrangements are planned and coordinated appropriately. A DA for the Reflections geobag proposal has been submitted by Reflections Holiday parks. Although the two proposals are separate, an assessment of the impact of the two proposals on coastal processes has been undertaken (UNSW WRL, 2021), acknowledging that the structures are contiguous. Future monitoring activities and removal of the geobags will be coordinated with Reflections Holiday Parks.

6.6 DPI – Fisheries

Correspondence with DPI – Fisheries is included in Appendix 1. DPI – Fisheries advised that the works are unlikely to pose significant impacts on key fish habitat. Standard minimum information requirements for environmental assessment are detailed in *Policy and Guidelines for fish habitat conservation and management* (DPI, 2013). Relevant information requirements are:

- General site information – refer Sections 2 and 3.
- Aquatic habitat and fauna assessment – refer Section 7.4.
- Beach nourishment and foreshore stabilisation - coastal processes are discussed in Section 7.3. Clean sand with similar particle size to that on the beach has been used for beach nourishment (refer Section 7.1). Surveyed cross-sections of the beach and protection works are provided in Section 3.1.

6.7 Adjoining Property Owners

DPIE - Crown Lands has consulted with the commercial operators (Byron Beach Café and Reflections Holiday Park) adjacent to the site as part of project planning. Adjoining property owners were also invited to the pre-lodgement consultation meeting (refer Section 5.5).

6.8 Dune Care

Green & Green Dunecare was invited to provide feedback on the proposal (Appendix 1). Concerns were raised about the erosion adjacent to the geobags and impacts on beach access (refer Sections 7.3 and 7.9).

Dunecare representatives were also invited to the pre-lodgement consultation meeting (refer Section 5.5).

6.9 Working Group

DPIE – Crown Lands has convened a Working Group to assist with managing the complex coastal erosion and management issues at Clarkes Beach. The objectives of the working group are to:

- Provide guidance regarding the development applications for coastal protection works at Clarkes Beach, being prepared and submitted by Reflections Holiday Parks and Crown Lands in 2021.
- Provide a forum for regular and constructive communication between the authorities who have technical experience, legislative and/or management responsibilities for public land and assets at Clarkes Beach.
- Ensure briefings, communications and messaging is aligned and consistent, where appropriate, in relation to managing coastal erosion at Clarkes Beach.
- Support the development and implementation of a holistic and longer-term solution to managing coastal erosion impacts on Crown land managed by DPIE - Crown Lands and Reflections Holiday Parks at Clarkes Beach, including the 'planned retreat' of the cafe.
- Working together to support Council in the development of the CMP for the Clarkes Beach precinct and to align and integrate, where appropriate, the outcomes of the working group with and into the CMP.

The Working Group includes DPIE – Crown Lands, Reflections Holiday Parks, Byron Shire Council, DPI – Marine Parks, DPIE Biodiversity Conservation Division (Coast and Estuaries) and BoBBAC. This process will integrate with the CMP being developed by Council. The group has met three times during the preparation of the DA (May, July and September 2021) and will continue to meet during the preparation of the CMP.

6.10 Pre-Lodgement Community Consultation

A facilitated on-line community meeting was held on 9 July 2021. An outline of the proposal was presented, included an overview of coastal processes and impacts. Meeting attendees asked questions during the forum. Feedback on the proposal was also provided via email from various respondents prior to and after the meeting. The issues raised have been considered in the DA and supporting materials.

The feedback confirmed the importance of the EIS process and the need for a robust analysis of coastal processes and the impacts of the proposal on the embayment and the immediate coastal environment. It also confirmed the importance of considering the impact of both the Reflections works and the DPIE - Crown Lands works in a combined assessment. In addition, there should be consideration of the proposals in the context of the broader, longer term strategic planning processes that will be occurring over the proposed lifetime of the works i.e. the development of a Plan of Management for the Holiday Park and the development of the CMP.

7. IMPACT ASSESSMENT

7.1 Topography, Geology, Soils

The soil landscapes at Clarkes Beach are mainland and barrier beaches and associated foredunes and hind dunes on Quaternary (Holocene) sands (Angels Beach landscape), beach plains with relief up to 5 m, slopes <3%, foredunes with relief to 15 m and slopes 20–50% and hind dunes that have been disturbed. This section of the seaward face of the dune is steep (approximately 1V:1.5H or 34°). The soils are predominantly deep (>300 cm) rapidly drained Siliceous Sands on the foredunes. The soils are non-cohesive, highly permeable soils of very low fertility and low available water-holding capacity with extreme wind and wave erosion hazard and localised steep slopes (NSW Department of Planning, Industry and Environment, 2020).

The Clarkes Beach area was subject to historic sand mining extending to the west of the café and the dune profile comprises the graduated grey sands consistent with adjacent dune and overlaid by yellowish sands inferred to be spoil from sand mining activities (Hill *et. al.*, 2021, refer Section 7.5).

The area has no known occurrence of acid sulfate soils (NSW Department of Planning, Industry and Environment, 2020). There are no known contaminated sites listed on the NSW EPA Public Register of Contaminated Land or the Contaminated Sites Register (NSW EPA, 2020). The REF prepared for the emergency coastal protection works (SCS, 2020) identified that there have been anecdotal occurrences of pieces of asbestos being exposed from the eroding sand dunes.

The geobags are fronted/founded on a weathered bedrock/reef layer which has lower erodibility than beach sand (Plate 3, UNSW WRL, 2021).



Plate 3: Weathered bedrock and reef offshore from the café

Source: UNSW WRL (2021)

The placement of the geobags and sand for dune nourishment stabilised the dune in front of the café following a period of significant coastal erosion (Section 3.1). The sand imported for nourishment was selected to be free of contaminants and of an appropriate composition, granulometry and colour to be

consistent with the receiving environment and meet project objectives. The sand characteristics were based on the original design report by UNSW WRL (2020) as follows:

- Concentration of clay and silt of not greater than 2%, a concentration of shell not greater than 10%, a colour similar to existing beach material and a composition principally of quartzose material.
- A median grain size (D50) of 0.18 to 0.35 mm and ideally 0.20 to 0.30 mm.

A Particle Size Distribution (PSD) assessment and a petrographic assessment of the imported quarry sand (SCS, 2020) confirmed that the imported sand material from Dunloe Quarry met the above sand specifications. The sand was also classified as free from potential acid sulfate soils.

Coastal processes and impacts on the beach and surrounding land use are discussed in Section 7.3.

7.2 Surface and Groundwater

Clarkes Beach is located in the Byron Bay embayment which is a part of the broader Cape Byron Marine Park and Pacific Ocean. Tides within the Byron Bay embayment typically range from 1.17 m AHD (highest astronomical tide) to -0.90 m AHD (lowest astronomical tide) with a mean sea level of 0.02 m AHD (MHL, 2018). At the time of survey, the crest of the geobag seawall was typically ~2 m AHD and the sand level directly abutting the bags was typically at 1.79 m AHD. As such, with the current beach profile the geobags are above the tidal zone. Other coastal processes are discussed in detail in Section 7.3.

Oceanic waters of the Byron Bay region are in a zone of convergence of warmer northern waters and cooler southern waters (BSC, 2018). Upwelling of cooler nutrient rich waters is reported to occur in the region as a result of local geomorphology supporting high biodiversity (BMT WBM, 2020). Water quality data are scarce however Clarkes Beach and other nearby locations were included in the Beachwatch monitoring program over the period of 2009 to 2013. The sites consistently scored good to very good across this period (BMT WBM, 2020).

The land is not identified as being flood prone but is subject to coastal processes as discussed in Section 7.3. The majority of overland flow from the café and surrounding paved areas flows to the west of the café via the constructed stormwater works (Section 3.6) which have been installed to minimise any impact that stormwater may have had on the geobag seawall. No waterways, except for the ocean, are located within the vicinity of the proposal.

The groundwater table is likely to fluctuate with highest levels occurring after periods of heavy rainfall. Locally infiltrated groundwater is expected to flow towards the beach and seep from the base of dunes after periods of rainfall. Groundwater discharge and exchange is likely to be occurring deeper in the beach profile.

7.3 Coastal Processes

A coastal processes investigation was undertaken by the UNSW WRL (2021) for this proposal. The study also considers the adjacent Reflections coastal protection works and the cumulative impact of both proposals. A summary of the coastal processes relevant to the café works is provided below, extracted from UNSW WRL (2021).

The eastern precinct of the Byron Bay embayment, including Clarkes Beach, has endured a long history of large coastal storms and coastal erosion and has been identified as an area that is undergoing long-term

coastal recession. Numerous qualitative and quantitative coastal process studies and/or models have been undertaken or developed for Byron Bay. While the quantitative studies differ in their adopted magnitude of cross embayment transport, all studies conclude that the Byron Bay embayment, including Clarkes Beach is receding due to a sand deficit.

Pulses or slugs of sand can enter the embayment from the east, causing substantial widening of the beach for extended periods of time. Conversely, extended periods of erosion can occur and due to the complex headland bypassing mechanisms, the erosion may not be directly attributable to large waves and/or elevated water levels. While the passage of slugs of sand can predominate for extended periods of time, the net long-term trend is recession.

Erosion of the Clarkes Beach dune face appears to have accelerated from 2013, however, episodic sand slugs have periodically accreted the intertidal beach, including during 2021. Increased erosion has been evident immediately west of the front of the sand slug.

The recent erosion is likely to be caused by the following factors:

- Several recent large storm wave events (east coast lows and tropical cyclones) between 2013 and 2020 causing waves from the east to north-east, such as Tropical Cyclone Uesi, which caused littoral drift transport away from Cape Byron in both directions (southward to Tallow Beach and north-west into Byron Bay).
- This likely reduced the available volume of sand close to Cape Byron for headland bypassing and therefore the available supply to Clarkes and Main Beach.
- A sand slug had filled Wategos and The Pass in late 2020 - it had not yet reached Clarkes Beach in 2020 but propagated to the west of the café geobags during 2021.
- Average losses of 50,000 m³/year to the south of Cape Byron (PWD, 1978) due to the East Australian Current (EAC) have likely continued, noting that no updates on this estimate have yet been undertaken since 1978 and no readily available studies quantifying the EAC in the vicinity of Cape Byron with regard to sediment transport potential are known.
- Sea level rise, sea level rise induced recession and ongoing underlying recession have continued.

Seawall end effects may occur only at the downdrift side of seawalls (Figure 7) where the waves almost always approach from one side, which is the case for Clarkes Beach (a drift aligned beach).

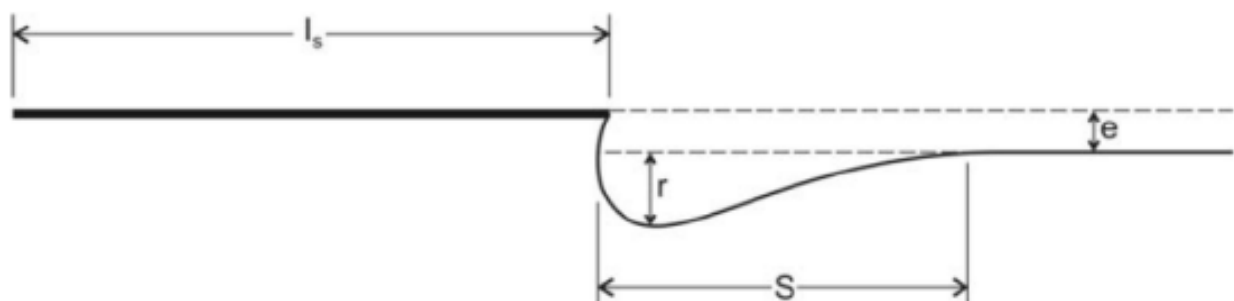


Figure 7: Seawall end effect variables

Source: UNSW WRL (2021)

Measurements were made by UNSW WRL (2021) of end effects of the Reflections geobags plus the combined Reflections and café geobags using photogrammetry/LiDAR. Observed end effects were quantified by mapping the vegetation line, the embayment-wide erosion and the local erosion associated with the seawall. End effects observed to date are presented in Table 5 and illustrated as in Figure 8 and in context of the broader embayment in Figure 9.

Table 5: Observed end effects

Geobag seawall	r - distance of end effect erosion shoreward (m) ¹	S - distance of end effect erosion along length of beach (m) ¹
Reflections seawall only	4	20
Reflections and Café seawall	5	35

1. Refer Figure 7.

Source: UNSW WRL (2021)

With Clarkes Beach generally appearing to be accreting during 2021, the recent observations may be the maximum extent of end effects, however, this trend cannot be extrapolated for the next 5 years. Theoretical end effects were also calculated by UNSW WRL (2021) to estimate the potential extent of end effects. Several scenarios were calculated using two methods and results typically indicated that the theoretical end effect is larger than currently observed at the site. UNSW WRL (2021) noted that actual end effects are likely to be less than theory because:

- The project life is an estimated 5 years.
- The present beach state is eroded and is presently in a recovery/accretion phase.
- There will likely be a substantial sand buffer fronting the geobags.
- Wave overtopping of the geobags will deliver sand to the end effect area.
- Should an extreme event occur, the geobags are likely to be damaged and may be outflanked on their western side, delivering sand to the end effect area and therefore will not have an increased end effect.

Over the estimated 5-year design life, observed and calculated theoretical end effects are not indicated to impact on built assets such as roads or car parks, but may impact the Crown reserve and two pedestrian beach accesses to the west of the café. The beach access closest to the café has been decommissioned. If the observed end effect increases and the existing sand access track located 50 m to the west of the café is compromised, restoration measures will be developed in consultation with Council. Once the geobags are removed, there will be no increased erosion caused by the geobag seawall.

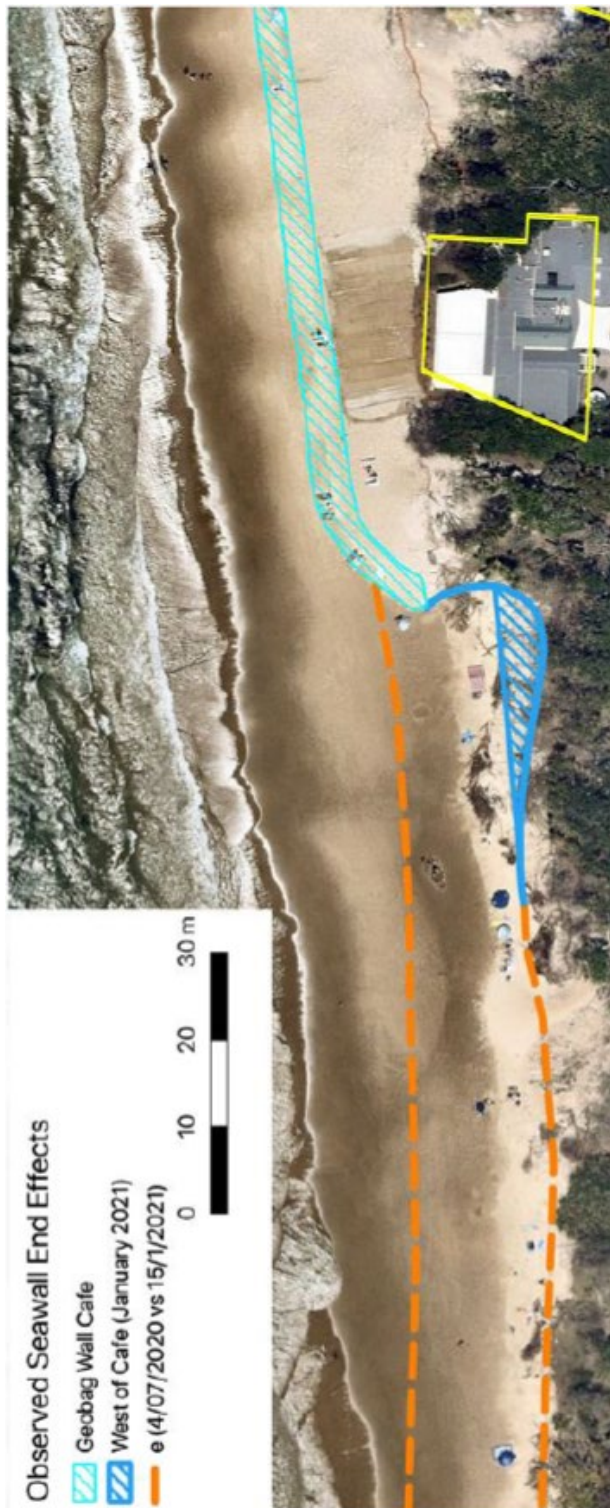


Figure 8: Observed end effect - Reflections plus café geobags

Source: UNSW WRL (2021)



Figure 9: Observed end effect - embayment view

Source: UNSW WRL (2021)

Restoration of the beach and land adjacent to the works is proposed including revegetation and grading of the scarp to a safe angle (Section 3.4). Should the beach continue on its present trajectory towards an average/accreted state, there will not be further erosion/recession over the life of the works (UNSW WRL, 2021). If a new trend of erosion/recession establishes at the site, restoration of the beach will be undertaken

by through beach nourishment with small scale imported sand sufficient to restore beach access and replace sand locked up by the works.

Structures built on open coast sandy beaches have the potential to impact sand movement processes by holding back sand from the littoral system. UNSW WRL (2021) estimated the volume of sand that may be locked up by the café geobags (based on the 2.5 m high geobag seawall withholding sand above it to an active height of 5 m) for the case where the beach remains eroded (208 m³/year). DPIE – Crown Lands proposes additional beach nourishment with imported sand to offset this locked up sand (refer Section 3.5). Once the geobags are removed, there will be no impact on volumes of sand available to the littoral system due to the proposal.

For the parts of Clarkes and Main Beach without protection, the contribution of dune sand to the lower beach is insufficient to cover the exposed rock/reefs and involves the collapse of vegetation and formation of potentially dangerous scarps. The constructed works prevent this occurring over their alongshore extent for storm wave conditions up to approximately 5-year ARI (UNSW WRL, 2021).

7.4 Terrestrial and Marine Biodiversity

An assessment of impacts on biodiversity was undertaken by Biodiversity Assessments & Solutions Pty Ltd (2021). The assessment has taken into consideration any potential impacts of the proposal on threatened species or ecological communities in accordance with the BC Act and identifies any provisions within the BC Regulation that may apply to the proposal. The assessment also considers the requirements of the Coastal Management SEPP and the Koala SEPP and how they relate to the proposal.

The biodiversity impact assessment covers two associated components, with potential direct and indirect impacts assessed both individually and in combination due to the proximity and association of works required, the distinction between habitat types within the footprint and to assess any sum of impacts as a result. This assessment was undertaken to accompany the Part 5 REF for the stormwater works (Section 3.6.1, subject to a separate approval) and the lodgement of a Part 4 DA for temporary coastal protection works on the subject land (the proposal which is the subject of this EIS). A summary of the impact assessment relating to this development proposal from Biodiversity Assessments & Solutions Pty Ltd (2021) is provided below.

The site of the geobag seawall, dune face and intertidal beach is currently devoid of terrestrial and marine vegetation. Upslope of the dune there is a small area of fragmented littoral rainforest vegetation surrounding the café within the reserve. As a result of significant historical land use impacts (e.g. sand mining followed by urban expansion), the dynamic nature of the foreshore and the high public use of the subject land in general, the site represents limited potential habitat for native fauna, particularly for threatened species with the potential to occur in the locality. The development footprint includes an area of Clarkes Beach which represents potential habitat for a small suite of threatened species, particularly marine species such as marine turtles and shorebirds. The development footprint also contains a small area of fragmented littoral rainforest vegetation currently impacted by coastal erosion and land use pressures.

The development footprint for the proposed works is the upper tidal extent and north facing dune of Clarkes Beach, an area significantly eroded by storms in recent years. The area is a heavily trafficked and dynamic stretch of beach in Byron Bay. It offers habitat potential for predominantly marine and coastal species,

however, the specific value provided is variable in that location, depending on the position of the foreshore and dune system in relation to the development footprint at any given time.

A search of the BioNet Atlas of NSW Wildlife was conducted, based on an area within 1.5 km of the development footprint. This search returned a record of 48 threatened species listed under Schedule 1 of the BC Act (Figure 3). The value of habitat within the development footprint, with respect to threatened species with the potential to occur, is of most relevance to shorebirds and marine turtles. The beach and dune system provides potential nesting habitat for marine turtles and provides potential foraging and temporary resting habitat for shorebirds.

Vegetation on the terrestrial component of subject land in the proximity to the proposal is analogous with the vegetation community listed in Schedule 2 of the BC Act as threatened ecological communities (TEC), namely the endangered ecological community (EEC) *Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*. Extensive high-quality habitat for native fauna occurs in the wider locality, particularly to the south-east and south-west of the subject land, including within protected areas such as Arakwal National Park and Cumbebin Nature Reserve. Cape Byron Marine Park also provides protected marine habitat within the 1.5 km assessment circle and beyond. The suitability of the subject land for threatened flora and fauna species previously recorded within a 1.5 km assessment circle of the development footprint and their likelihood of occurrence was assessed following a desktop spatial analysis, subject land habitat assessment and review of the Office of Environment and Heritage (OEH) Threatened Species Profiles.

Potential direct and indirect impacts have been assessed for the EEC by way of the ToS for those threatened fauna species with the potential to occur within the development footprint and/or considered to have some potential to be impacted by the proposal. The following eight fauna species were identified for further assessment:

- Sooty Oystercatcher (*Haematopus fuliginosus*).
- Pied Oystercatcher (*Haematopus longirostris*).
- Little Tern (*Sternula albifrons*).
- Great Knot (*Calidris tenuirostris*).
- Koala (*Phascolarctos cinereus*).
- Common Blossom-bat (*Syconycteris australis*).
- Loggerhead Turtle (*Caretta caretta*).
- Green Turtle (*Chelonia mydas*).



Figure 10: Threatened flora species within 1.5 km, vegetation mapping and protected areas

Source: Biodiversity Assessments & Solutions (2021)

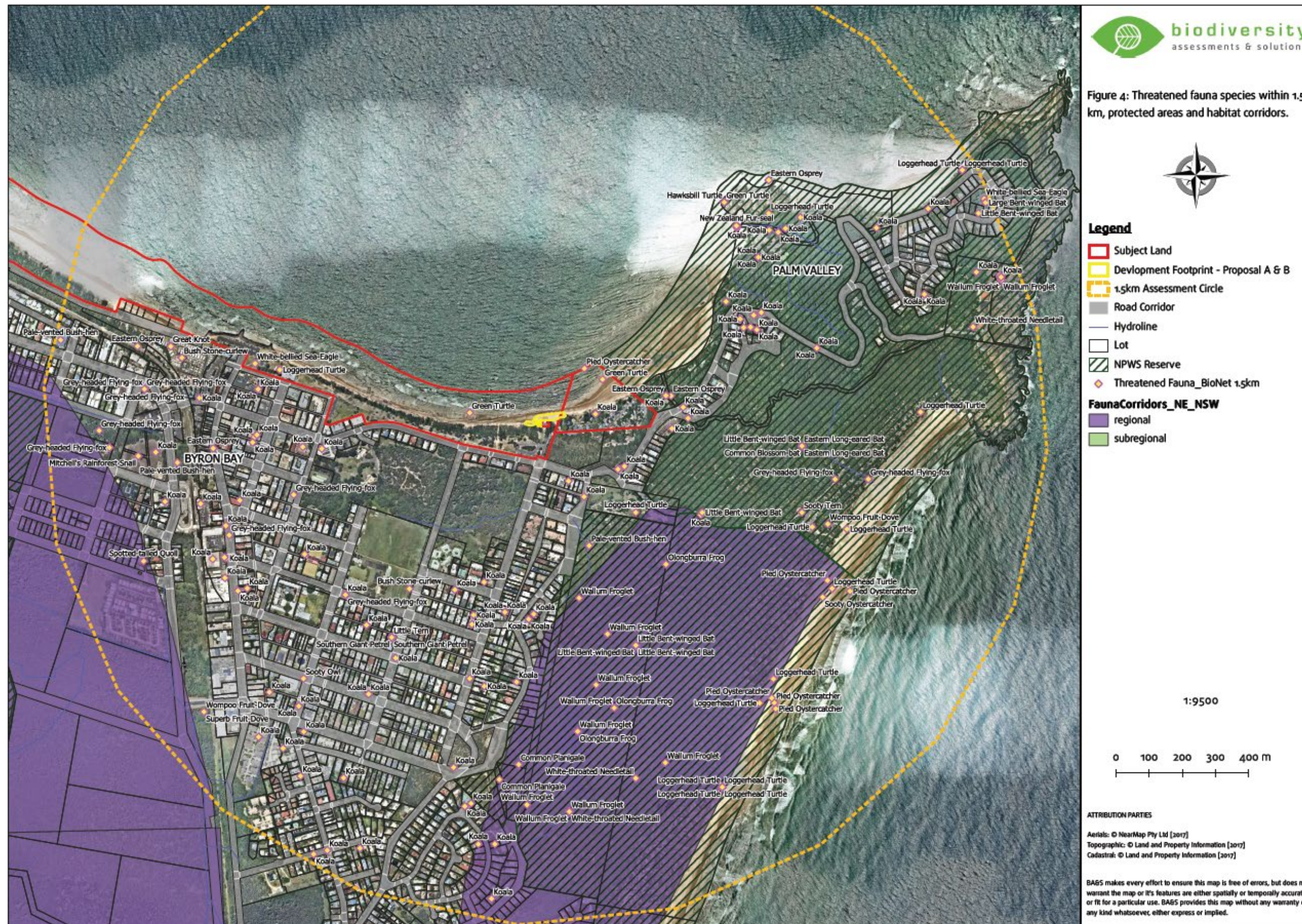


Figure 11: Threatened fauna species within 1.5 km, protected areas and habitat corridors

Source: Biodiversity Assessments & Solutions (2021)

The ToS concluded that the proposal would not result in a significant impact. The abundance of high-quality habitat in the surrounding areas is likely to further mitigate any potential indirect impacts that may occur from this development proposal by providing significant alternative resources for threatened species with a likelihood of occurring on the subject land.

The geobag seawall was almost entirely covered by sand at the time of the assessment (May 2021), with only a small portion exposed. Habitat loss from the placement of geobags is likely of most relevance whilst geobags are exposed, with beach replenishment covering the geobag seawall and allowing for some beach infauna to begin recolonizing the upper sand column. The total area of the geobag seawall is estimated to be approximately 600 m², which is unlikely to represent a significant loss of habitat in the local context.

Habitat loss has also been considered in the context of the geobag seawall acting as a barrier to fauna movement, of most relevance when considering the importance of the beach habitat for nesting marine turtles. Again, this is likely to result in more pronounced impacts whilst the geobag seawall is exposed, with minimal impact likely with ensuing beach replenishment. The geobag seawall covers a length of 80 m (on the subject land assessed for this proposal) and even in the instance of sufficient exposure of the geobag seawall to a level which would constitute a barrier to movement, the small scale of the temporary seawall is unlikely to represent significant loss of habitat in the local context.

Habitat loss because of potential additional sand nourishment that may be required to maintain the dune between the geobag seawall and café, is also highly unlikely to represent a significant loss of habitat, with little significant habitat currently present at the time of the assessment. This is unlikely to represent a significant loss in the local context.

The level of potential disturbance attributed to the proposal because of activities within the identified development footprint are considered relatively minor. This is attributed to the small footprint, minimal vegetation clearing or disturbance and in the context of existing land use and activity at the site. The potential disturbance from the geobag seawall currently in place is considered a potential risk for marine turtles for the reason that the geobag seawall, when exposed, poses a potential barrier for marine turtles coming ashore to nest in the dunes on Clarkes Beach. The level of disturbance attributed to the geobag seawall barrier is likely to vary substantially with the level of exposure at the time (i.e. the geobag seawall is likely to represent a potential barrier when the geobag seawall is exposed) and there is potential that nesting marine turtles may abort attempts to come ashore at that location if unable to traverse the location of the geobag seawall. The level of threat is significantly reduced and potentially removed, if sand has been redeposited on the beach and covered the geobag seawall. At the time of the assessment the geobag seawall was only partially visible, with the majority situated below the current beach surface.

Disturbance to shorebirds is likely more attributable to activities undertaken within the development footprint to accommodate the proposal, which is likely to represent minor short-term impacts and in the context of the regular disturbances at the site due to the busyness of the area, it is unlikely that these disturbance events would be significant, as shorebirds are likely to generally favour more isolated and less trafficked beaches and sandflats within the local area over busy locations.

Following assessment of all available ecological information, threatened species records, habitat assessment of the subject land and potential impacts, as well as key relevant legislation, Biodiversity Assessments & Solutions (2021) provided the following conclusions:

- The proposal has environmental benefits by way of protecting mapped Coastal Management SEPP littoral rainforest and other areas of coastal habitat from further loss, as well as reducing damage to the coastal vegetation, mapped by Byron Shire Council as littoral rainforest while the geobags are in place.
- The proposal footprint is not considered to be of significant biodiversity value in the local context, nor is it considered to have any significant ecological value or to provide any significant wildlife habitat.
- Potential impacts of occupation and maintenance phases of the proposal would be negligible and be able to be mitigated sufficiently to ensure that direct and indirect impacts on biodiversity values would be avoided and minimised.
- The proposal would not cause significant impacts to species or ecological communities listed in the BC Act or the EPBC Act, nor would the development proposal be likely to result in a significant impact for any threatened fauna listed under these Acts.

It is considered that the subject land and identified proposal footprint is suitable for the proposal and subsequent activities and that the proposal has, within all reasonable expectations, avoided and minimised impacts to the biodiversity values of the subject land.

7.4.1 Beach Infauna

Clarkes Beach provides habitat for beach infauna (fauna living in the sand). Beach infauna typical of sandy beaches include bivalves such as pipis (*Donax deltoides*), polychaete beach worms (e.g. *Australonuphis* spp.), amphipods, gastropods and crustaceans such as ghost crabs (*Ocypode cordimana*). The abundance and distribution of beach infauna generally change according to the tide with different fauna preferring specific areas of the intertidal zone, although generally a higher number is found lower in the tidal zone closer to the low water spring tide mark (Hacking, 1996; Schlacher & Thompson, 2007). Air breathing crabs (Decapods), Isopods and insects tend to inhabit the upper tidal zone and shoreline while the water dependent polychaete worms, crustaceans and molluscs inhabit the lower tidal zone (Hacking, 1996). Many species also move throughout the tidal cycle to occupy preferred zones of depth, water movement and sediment composition. As a result the lateral distribution of beach infauna across a beach profile will vary according to a variety of factors such as tide state, wave energy and beach slope characteristics.

The geobag seawall displaces a relatively small area of potential infauna habitat. However, the area occupied is insignificant in the context of the broader beach. Further, when the beach is in an accreted state infauna are able to occupy the sand accreted around and over the geobags. The use of heavy machinery on the beach will disturb infauna within the direct vicinity of the works and will impact fauna by direct impact (i.e. crushing). The area of potential impact will be restricted to locations used by machinery and trucks to traverse the beach. The largest area that may potentially be impacted is from the access track approximately 100 m to the west of the geobags. Direct impacts are expected to be temporary and the area impacted relatively small in comparison to the size of the beach.

Directly offshore of the proposed works are intertidal and subtidal sandy and rocky habitats. Offshore habitats are not expected to be impacted by the proposal.

7.5 Aboriginal Cultural Heritage

The cultural heritage assessment was undertaken by Everick Heritage Consultants (Hill *et. al*, 2021) in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW, 2010a) and application of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010b). The assessment was undertaken to accompany the Part 5 REF for the stormwater works (subject to a separate approval) and the lodgement of a Part 4 DA for temporary coastal protection works on the subject land (the proposal which is the subject of this EIS). A summary of the impact assessment (Hill *et. al.*, 2021) relating to this development proposal is provided below.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) was conducted on 27 April 2021 of Lot 9 DP1049827 with a 1,000 m buffer. The search returned seven sites within the search area (Table 6 and Figure 12), the nearest sites being Clarkes Beach Park Midden (#04-5-0199), Clarkes Beach Holiday Park 1 (#04-5-0358) and Clarkes Beach Holiday Park 2 (#04-5-0359). The intent of the assessment was to understand the potential impacts of the proposed works on the cultural values of the closest midden site (Clarkes Beach Holiday Park. 1, AHIMS #04-5-0358). The dune profile in this area is consistent with adjacent dune and comprises the graduated grey sands overlaid by yellowish sands inferred to be spoil from sand mining. The dune profile to the west of the geobags was substantially different in that it was lower in overall height and did not appear to have the distinctive grey soil layer. As such the dune to the west is inferred to contain mostly spoil from sand mining activities.

The dune profile is inferred to be consistent with the dune adjacent to Reflections Holiday Park that contains midden that has been assessed in previous studies as documented in Hill *et al.* (2021). For the purposes of this assessment, the three middens in the vicinity of the works are considered to comprise a single cultural unit.

Table 6: Summary of AHIMS site information

SITE ID	Site name	Easting	Northing	Features
04-5-0199	Clarkes Beach Park Midden	561100	6831540	Shell
04-5-0358	Clarkes Beach Holiday Park.1	560918	6831486	Shell: 1
04-5-0359	Clarkes Beach Holiday Park.2	561010	6831506	Shell: 1
04-5-0146	HR1;Palm Valley;	561420	6831830	Artefact : -
04-5-0117	HR4;	561500	6831600	Artefact : -
04-5-0118	HR3	561450	6831780	Artefact : -
04-5-0061	Palm Valley;	561350	6831850	Artefact : -, Shell : -



Figure 12: AHIMS search results and proposal site

As a result of the Aboriginal Cultural Heritage Assessment, the following is concluded:

- The Clarkes Beach Holiday Park 1 midden comprises predominately Eugarie shell which exists at the interface of the old sand dune profile (identifiable by the grey sand layer) which has been buried by a more recent yellow sand deposit within the historic period.
- Eugarie middens typically result from the consumption of locally available shellfish and typically have a narrow species diversity. The middens are more commonly referred to as 'Dinner Time Camps' and typically were discarded by small family groups. However, over time these small sites accumulate into extensive midden deposits which cover a large portion of the fore and hind dune systems.
- Based on the results of radiocarbon dating undertaken for the midden material, it is reasonable to proceed on the basis that the midden lens within the area dates to the period of early contact (approximately 170 years BP or 1850s) and is not older than 260 years BP.
- The Clarkes Holiday Park 1 midden is similar to Eugarie middens along the Tyagarah Beach, but different to the midden at The Pass. The Eugarie middens were very common along the dune systems, however most of the midden sites have now been lost as a result of historic sand mining and more recently coastal erosion.

- The dune system at Clarkes Beach has suffered massive losses of sand since the 1990s and it is expected that a large part of the midden complex has been lost as a result. As such, the conservation status of the remaining midden is increased.
- It is likely that the midden originally extended along Clarkes Beach, however is now only partially retained in the sand dune section that was not subject to intensive sand mining.

In terms of rarity, the midden site is of high archaeological and scientific significance. The representativeness of the site is bound with it being a physical example of traditional beach gathering of food resources that continues to the present day. Early European observers emphasise the important role of fish and shellfish in the Aboriginal diet between the Richmond, Brunswick and Tweed Rivers. The site was associated with the seasonal movements of fish along north coast beaches. The site is relatively simple, with one shell species and one terrestrial fauna species identified. Nevertheless, a range of activities may be reflected primarily around marine resources exploitation. In terms of integrity, the site is of moderate archaeological significance. Intact midden material was unable to be detected behind the dune face and it is likely that most of the midden exists as a single shell lens eroding from the sides of the dune. The physical connectedness of the site to other sites in the locality has been broken to a large extent by the loss of middens caused by sand mining. The closest other recorded midden is located at The Pass to the east. The nearest fore-dune middens are north at Belongil. Based on the site inspections and subsurface investigations, the Clarkes Beach Park Midden Site is determined to be of cultural or social significance to the local Aboriginal community. The site does not have significant inherent aesthetic values.

The potential harm from the proposed works include:

- The retention and subsequent removal of the existing temporary geobag seawall.
- Revegetation and dune stabilisation works.
- Salvage of midden by BoBBAC Aboriginal sites officers.

The following management and mitigation options were considered for the Clarkes Beach Holiday Park 1 (#04-5-0358) midden by Hill *et al.*, (2021):

- a) Complete avoidance.
- b) Partial avoidance.
- c) Harm with salvage and repatriation on-site.
- d) Harm without salvage.

Hill *et al.*, (2021) concluded that (c) harm with salvage and repatriation on-site is the most appropriate management response for the Clarkes Beach Holiday Park 1 (#04-5-0358) midden. The assessment acknowledged the following:

- The views of the Aboriginal community representatives who have participated in the ACHAR.
- The degree to which the midden has already been disturbed by coastal erosion and the potential for additional impacts to the midden in the immediate future.
- The proximity to the Clarkes Caravan Park Midden (#04-5-0199) which has been subject to archaeological investigation and radiocarbon dating.

- The potential to retain midden material with the dune system and actively manage the midden as a cultural resource.
- The potential for more permanent engineering solutions to protect the sand dune and midden complex.

The following recommendations are provided by Hill *et al.* (2021) to ameliorate the likely impacts to Aboriginal cultural heritage values of the Clarkes Holiday Park 1 midden site:

Recommendation 1: Aboriginal Heritage Impact Permit:

- It is recommended that an AHIP is sought for the following activities:
 - Decommissioning of the coastal protection works.
 - Revegetation works to provide medium to long-term stability to the dune face, including the use of fabric or plastic material to support the establishment of root structures.
 - As a mitigation measure it is further recommended that salvage of midden material is undertaken by BoBBAC that has:
 - iii. Slumped down the dune face and retained around the temporary coastal protection works.
 - iv. Is at imminent risk of loss from storm surge and high tides.

It is recommended that the salvaged midden material is temporally stored within a secure area within the office of BOBBAC until such time as a permanent storage area is identified between BoBBAC and the Proponent. Permanent storage should be in compliance with Requirement 26 of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW, 2010) or in accordance with instructions from BoBBAC. It is noted that the permanent reburial area must be recorded as a new AHIMS site and managed as an Aboriginal site.

Recommendation 2: Unexpected Find Procedure: Works which are located on spoil from the sand mining are not likely to impact on Aboriginal shell midden. As a precautionary measure the following unexpected finds procedure should be applied for works in these areas:

- Work in the surrounding area is to stop immediately.
- A temporary fence is to be erected around the site, with a buffer zone of at least 10 metres around the known edge of the site.
- In consultation with the BoBBAC, an appropriately qualified archaeological consultant is to be engaged to identify the material.
- Should the material be confirmed as an Aboriginal object or archaeological site and works cannot be redesigned to avoid the site the ACHAR should be updated to support an application to vary the AHIP.

Given the potential that the *in-situ* dune exists under the sand mining spoil it is recommended that the BoBBAC are engaged as 'spotters' during any construction works. All works should be subject to reassessment if the indicative grey sands of the *in-situ* dune are identified during construction.

Recommendation 3: Reporting:

- It is recommended that a field log is maintained to record basic data from the archaeological salvage program. This would include dates of salvage, species, volume of material and particulars of the event which resulted in the salvage. Should scientific analysis be undertaken this should also be included within the field log. It is recommended that the field log be attached to the AHIMS Site Recording Form or the AHIMS Site Impact Recording Form periodically.

7.6 European Cultural Heritage

Whites Cottage (constructed in 1953) is located to the east of the café on land managed by Reflections Holiday Park. The site was recommended for local heritage significance in a NSW State Heritage Inventory Report (SCS, 2020) but is not included in the NSW Heritage Register or BLEP 1988. There are no other items on European Heritage significance in the vicinity of the proposed works.

There would be no impact on European heritage as a result of the proposed works.

7.7 Air Quality

Local air quality is influenced by the sub-tropical climatic conditions of the region, primarily associated with high average rainfall predominantly in summer/autumn and seasonal changes in dominant wind directions. The air quality at the Clarkes Beach precinct is typical of urban coastal areas with occasional wind-blown sand and vehicle emissions from traffic along Lawson Street, access roads and parking areas. Windborne sand dislodged and transported from the dune face during high winds, from a northerly direction, may potentially create a nuisance for beach goers and the cafe. Jute netting has been placed in the dune in front of the cafe to minimise windblown sand. Dune revegetation and barrier fencing will further reduce windblown sand.

The potential for minor air quality impacts may arise during maintenance or decommissioning works from generation of exhaust from trucks and plant infrastructure and airborne sand during placement of sand. Any impacts are expected to be localised and temporary.

7.8 Noise and Vibration

While the dominant noise is from the ocean, residential areas, café and general public noise (including traffic on Lawson Street, access roads and parking areas) are also local noise sources. Heavy truck movements occur on Lawson Street intermittently and are likely to be the only source of vibration which is expected to be minor.

The operation of construction machinery during maintenance works and decommissioning of the works would generate noise that is likely to temporarily exceed typical background noise but would be localised and temporary.

7.9 Amenity and Public Safety

Clarkes Beach Park is an urban parkland which has a moderate to high visual quality. Clarkes Beach and the adjacent reserve is an important and popular public space, used mainly for passive recreational beach

activities, including swimming, walking, surfing and related commercial operations such as sea kayaking tours. The surrounding area is used for walking, picnicking, BBQs, monthly markets and amenities include ablution blocks, picnic chairs and tables, barbecues, waste bins and footpaths. Clarkes Beach provides an important alongshore pedestrian access to The Pass. Similarly, significant foot traffic occurs within the areas adjacent to the café, holiday park and the walking track to The Pass, Wategos and the Byron Bay lighthouse. The top of the dune is currently fenced to prevent pedestrian access to the beach at this location and protect the sand dune. The nearest alternative beach access paths are located 50 m to the west and 170 m to the east (access to and from Reflections Holiday Park).

The presence of construction machinery and plant and associated site compounds and fencing are likely to temporarily impact the amenity of the immediate locality. Traffic and pedestrian control would be implemented when vehicle movements associated with the maintenance and decommissioning of the works are occurring to manage public safety (Section 7.10).

The lower, seaward portion of the works may be damaged by wave runup during times of large waves and/or eroded beach states. The dune will be reinstated as required to maintain structural stability with the placement of additional sand. Any fences or dune vegetation would also be reinstated if damaged due to coastal erosion occurring while the temporary coastal protection works are in place. The need for repair of the infrastructure will be informed by monitoring of areas subject to ongoing coastal erosion and following significant coastal erosion events (Section 3.4).

The lower-mid beach profile appears to have accumulated sand since placement with only the top bags visible above the sand surface in mid- 2021. The works will impact alongshore pedestrian access when the beach is in an eroded state, such as it was in November and December 2020 (UNSW WRL (2021), Plate 4), especially at high tide. This intermittent impact on alongshore access will be limited to the estimated five-year life of the works. When the beach is accreted, especially at low tide, the works do not affect beach access. The works have improved the beach for recreational use within the works area creating a more user-friendly beach environment than the steep eroded sections of dune. Further, the bags appear to be utilised by beach goers for sitting/sunbathing and placement of accessories. Given that impacts to alongshore public access are limited to times when the beach is in an eroded state and that the seawall is intended to be retained for the estimated 5-year life, the overall impact to public access is not considered to be unreasonable (UNSW WRL, 2021).



Plate 4: Alongshore public access when beach is eroded (18 December 2020)

Source: UNSW WRL (2021), photos: J. Carley

The works have no impact on surfing and swimming when the beach is accreted. During times of an eroded beach state and high tides, the works may impact entry and egress to the water. Geobags are softer than rock or concrete but may become slippery if they are frequently in the splash zone. The works are distant from the main surfing areas of Byron Bay (The Pass, Main Beach, The Wreck) and the patrolled swimming area of Main Beach. Whatever the beach state the works will not adversely impact the predominant open water swimming route which runs from The Pass to Main Beach. Impacts to beach use are not considered to be unreasonable (UNSW WRL, 2021).

The main potential risks to public safety are (UNSW WRL, 2021):

- The instability of the geobag seawall.
- The collapse of trees or steep erosion scarps.
- The collapse of the café building onto the beach.

Provided that the monitoring and maintenance program is completed and followed, the threat to public safety arising from the above risks is low (UNSW WRL, 2021).

Materials and structures on the beach and dune such as the geobags, fencing, revegetation materials etc. have the potential to degrade or be damaged over time. Presence of such materials on the dune and beach is likely to detract from the amenity of the area. All structures will be regularly monitored for any signs of damage, degradation or failure (Section 3.4). Any fault will be remedied as soon as possible and all disused material removed from the beach and disposed of at an appropriate waste facility. With the proposed monitoring and maintenance program, the threat to public safety arising from the above risks is low.

7.10 Traffic and Vehicular Access

Massinger Street north of the Lawson Street roundabout is a no through road that services the Clarkes Beach car park, the café and Reflections Holiday Park. Traffic fluctuates according to beach usage and park patronage. Traffic levels are likely to be higher during the warmer months and holiday periods. There is constant traffic along Lawson Street as this is a main road in Byron Bay connecting the central business district, popular recreational spots and residential areas (e.g. Wategos Beach, The Pass, Tallows Beach and the Byron lighthouse). A public parking area is available between Lawson Street and the café.

Construction equipment will access the works site from Lawson Street and Massinger Street when required for maintenance of the seawall and to remove the geobags (refer Section 3.4 and 3.5). There will be a short-term increase in traffic in the area during those times. Traffic movements and property access would be maintained during the works. Any disturbance would be minimised to prevent unnecessary traffic delays.

A Traffic Management Plan will be prepared in accordance with the *RMS Traffic Control at Work Sites Manual RTA (2010)* and *QA Specification G10 Control of Traffic (RTA 2008)* for the approval of Council. DPIE - Crown Lands will comply with Council requirements regarding traffic control, access and road/pedestrian access.

7.11 Socio-Economic Considerations

The café is an important hospitality venue for the region, hosting weddings and other events, generating local employment and income. Similarly, the Holiday Park is also an important facility for the community, visitors and the Byron Bay economy. The works will allow for adaptive planning required to address coastal erosion and recession risks that would impact on these businesses while longer term options are developed and implemented. There will be a beneficial impact on local businesses while the works are in place due to the protection provided to the café and reserve.

There is a commercial tourist operation located in Clarkes Beach Park that specialises in kayak tours into the Cape Byron Marine Park. There are also regular community markets within the parklands. A site compound in the reserve to the west of the café and car park will temporarily occupy a section of the park and the beach access typically utilised by the kayak business. The compound would be required during maintenance activities that require machinery access on the beach as well as during the decommissioning of the works (Section 3.4). Although the businesses are expected to be able to remain operational, they may be exposed to temporary construction impacts (noise, traffic) while the access tracks are used for construction access.

All maintenance and decommissioning works would be contained within designated work areas. There is expected to be a minor and temporary impact on businesses during decommissioning and maintenance works.

7.12 Waste Management

Waste generated by the decommissioning of the works would include the geobags if they are not beneficially reused. Fencing materials that are at risk of damage due to future coastal erosion would also be removed. Typical construction personnel waste is to be expected. No other waste materials are expected as a result of maintenance or decommissioning works.

If the geobags are appropriately monitored and maintained, there will be minimal release of geotextile material into the environment. The geobag seawall will be regularly monitored for any signs of damage, degradation or failure. Any fault will be remedied and all disused material removed from the beach and disposed of at an appropriate waste facility.

7.13 Cumulative Impacts

The proposed works are the provision of temporary coastal protection works at Clarkes Beach, to provide sufficient time to achieve the reconfiguration and/or relocation of the café. Other related works include the stormwater management works and removal of unsafe trees to ensure public safety and reduce impacts of the coastal erosion on adjacent lands. These works are complementary to the temporary coastal protection works and are intended to improve the integrity of the works. There will be no cumulative impacts due to these works.

The geobag seawall in front of the café ties in with the geobag seawall constructed to protect Reflections Holiday Park. Cumulative impacts on coastal processes were considered in Section 7.3 and have been mitigated through beach restoration activities in both DAs. Ongoing monitoring, maintenance and restoration activities will be coordinated with the manager of the holiday park.

8. PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The principles of ecologically sustainable development are as follows (Schedule 2, clause 7(4) of the EP&A Regulation) -

(a) the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by -

(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) an assessment of the risk-weighted consequences of various options,

The proposed works are temporary and are required to remain in place to allow longer term, strategic planning for the café and Holiday park precinct. The works will result in the temporary protection of the remaining littoral rainforest upslope of the dune and the midden in this area while the works are in place. Long-term options for coastal management will be considered in the development of the CMP.

(b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

Long-term options for coastal management will be considered in the development of the CMP.

(c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

The proposal will not have a significant impact on biological diversity or ecological integrity. The works will result in the protection of the remaining littoral rainforest upslope of the dune while the works are in place.

(d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as -

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

DPIE – Crown Lands as landowner is funding the full cost of the works and any future monitoring, maintenance or restoration works.

9. ENVIRONMENTAL MANAGEMENT MEASURES

Mitigation measures have been identified to address general risks as well as specific issues related to soil erosion, water quality, biodiversity, Aboriginal heritage, noise, air quality, waste and traffic management. These are well-established and standard strategies which if properly implemented will result in low residual risk. The environmental safeguards and mitigation measures in Table 7 will be undertaken as part of the proposed works.

Table 7: Environmental management measures

Management Measure	Timing
<i>General</i>	
A detailed monitoring and maintenance plan will be prepared in consultation with Council BoBBAC and managers of the holiday park addressing all requirements for the life of the works.	Following development approval
An Environment Management Plan (EMP) is to be prepared prior to any maintenance or decommissioning works commencing. The EMP should include all relevant environmental safeguards and mitigation measures identified in this EIS.	Following development approval
All key stakeholders including businesses and residents with the potential to be affected by the activity are to be notified at least five business days prior to the start of maintenance works or decommissioning including identification of alternative operating arrangements.	Prior to any maintenance works or decommissioning
All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. Site specific training is to include areas of high sensitivity including Aboriginal values, threatened species habitat and EECs. Records of site induction training are to be kept by the project manager.	Prior to any maintenance works or decommissioning
All maintenance and decommissioning work areas, including on beach areas, storage, laydown and compound areas will be fenced to prevent unauthorised access.	Prior to any maintenance works or decommissioning
Works will be limited to Monday to Friday 7:00 am to 6:00 pm with no work on weekends or public holidays.	During any maintenance works or decommissioning
Suitable signage is to be erected at the site notifying the public of the nature, extent and expected duration of works.	During maintenance and decommissioning works
<i>Flora and Fauna</i>	
All machinery/vehicles/personnel will enter and exit along main entry routes so additional impacts or disturbance do not occur to native vegetation or marine habitat.	Prior to/during maintenance and decommissioning works
The number of truck/machinery movements and footprint of disturbance on the beach will be minimised.	Maintenance and decommissioning works

Management Measure	Timing
All truck and machinery movements are to avoid the lower beach where infauna is typically concentrated by travelling on the upper levels of compacted sand, as close as practical to the dry sand and avoiding the water's edge.	Maintenance and decommissioning works
If present, fallen logs and large woody debris in the off-beach proposal areas (i.e. site compound, access tracks etc.) are to be relocated into adjacent areas to provide similar habitat value.	Maintenance and decommissioning works
Machinery is to be cleaned prior to entering the subject land to ensure that weed seeds and propagules are not imported.	Maintenance and decommissioning works
If unexpected protected or threatened fauna are encountered, then work is to stop immediately, and a qualified ecologist or wildlife carer is to be contacted for advice.	Maintenance and decommissioning works
Contingencies to address the risk of bushfire, including spark arrestors and suspending works in high bushfire danger periods are to be implemented.	Maintenance and decommissioning works
Revegetation will be undertaken using suitable locally endemic native dune vegetation species including sand-binding grasses and succulent creepers which are highly tolerant to salt, wind and smothering and can grow in unstable sand on exposed bare sites (groundcover species such as <i>Spinifex hirsutus</i> , (Beach spinifex), <i>Ipomoea pes-caprae</i> (Goatsfoot), <i>Canavalia rosea</i> (Beach bean), <i>Carpobrotus glaucescens</i> (Pigface) and <i>Ficinia nodosa</i> (Knobby club rush)). Plantings will be undertaken by direct seeding and translocation of local cuttings.	Maintenance and decommissioning works
Tree protection zones (TPZs) are to be established and maintained around trees to be retained which are immediately adjacent to the proposal where excavation and/or construction are required.	Prior to maintenance and decommissioning works
Trees/debris to be removed off the beach is to be moved to the site compound to be chipped, rather than on the beach.	Construction
<i>Soils and Water</i>	
Any sand imported is to be tested and verified as being suitable for use at the site.	Prior to maintenance works
No soil, rock, aggregate etc. other than verified sand is to be placed on the beach, including the access track. If the access track requires improvement, earthworks or imported verified sand and/or plastic bridging mats are to be used and removed following the works.	Prior to/during maintenance and decommissioning works
Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book" on erosion and sediment control.	Prior to and during maintenance and decommissioning works

Management Measure	Timing
The rehabilitation of disturbed off-beach works areas (i.e. site compound, access tracks etc.) will be carried out progressively as construction stages are completed. The beach access track and on beach machinery/truck route are to be returned to at least pre-works condition. This includes profiling of sand to remove wheel ruts (as far as possible).	During maintenance and decommissioning works
No fuels, oils or other fluids are to be stored on the beach. Fuels, oils and other fluids are to be appropriately stored and banded more than 40 m away from the beach and drainage lines where practical.	During maintenance and decommissioning works
Refuelling and maintenance of machinery is not to be undertaken on the beach. Refuelling and maintenance are to be undertaken at least 40 m away from the beach and drainage lines where practical	During maintenance and decommissioning works
Suitable spill kits are to be appropriately maintained and kept onsite. Spill kits are to be suitable for hydrocarbon and hydraulic fluids and are to include a marine boom in the case of a spill on the beach.	During maintenance and decommissioning works
All plant and machinery to be used on the beach is to be checked for leaks, thoroughly maintained and washed down daily at the site compound prior to the commencement of works each day to ensure contaminants are not taken onto the beach.	Prior to and during maintenance and decommissioning works
Erosion and sediment controls are to be monitored for effectiveness and maintained until the site is remediated.	Prior to, during and post maintenance and decommissioning works
<i>Aboriginal heritage</i>	
All personnel working on site will receive training to ensure awareness of the location of existing Aboriginal objects within the study area and immediate surrounds and relevant statutory responsibilities.	Prior to and during maintenance and decommissioning works
Representatives from BoBBAC will be engaged as 'spotters' during the construction works. All works will be subject to reassessment if the indicative grey sands of the in-situ dune are identified during construction.	Prior to and during maintenance and decommissioning works
The following unexpected finds procedure will be applied for the proposed works: • Work in the surrounding area is to stop immediately. • A temporary fence is to be erected around the site, with a buffer zone of at least 10 m around the known edge of the site. • In consultation with the BoBBAC, an appropriately qualified archaeological consultant is to be engaged to identify the material. • Should the material be confirmed as an Aboriginal object or archaeological site and works cannot be redesigned to avoid the site the ACHAR should be updated to support an application to vary the AHIP.	Prior to and during maintenance and decommissioning works

Management Measure	Timing
<i>Air Quality</i>	
The works area and site compound will be as small as possible to minimise ground disturbance.	During maintenance and decommissioning works
Stockpiles and vehicles transporting materials will be appropriately covered to prevent dust emissions.	During maintenance and decommissioning works
If sand is to be stockpiled at the compound the sand is to be piled no more than 2 m high.	During maintenance and decommissioning works
Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.	During maintenance and decommissioning works
Screens will be included on site fencing where required to prevent dust impacting on café customers and members of the public in the vicinity of the works.	During maintenance and decommissioning works
<i>Traffic</i>	
All work will comply with Council requirements regarding traffic control, access and road/pedestrian access.	During maintenance and decommissioning works
The capacity of loads will be maximised, where practicable, to minimise the number of loads required.	During maintenance and decommissioning works
<i>Noise</i>	
All plant and machinery will be turned off when not in use.	Construction
All plant and machinery are to be suitably maintained and complying with relevant manufacturers noise specification.	Pre- construction/ Construction
Works are to conform with NSW EPA construction noise guidelines.	Construction
<i>Waste</i>	
If contaminated areas are encountered during construction (including asbestos), appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area would cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions are identified in consultation with relevant government agencies.	During maintenance and decommissioning works
Waste destined for recycling or reuse will be stored separately and in a suitable location to avoid mixing with other materials/wastes.	During maintenance and decommissioning works
All residual waste material will be disposed of at a suitably licensed landfill or waste management facility.	During maintenance and decommissioning works
All working areas will be monitored to ensure they are kept free of rubbish and cleaned at the end of each working shift.	During maintenance and decommissioning works

Management Measure	Timing
Storage and handling of any dangerous goods will be undertaken in accordance with <i>The Storage and Handling of Dangerous Goods Code of Practice 2005</i> .	During maintenance and decommissioning works
Any excavated natural material will be treated in accordance with the requirements of the POEO Act.	During maintenance and decommissioning works
When the seawall is no longer required, all geobags (geotextile material) are to be completely removed from the beach and appropriately reused or disposed of at a suitable waste facility.	Decommissioning
<i>Coastal Processes</i>	
Public safety will be managed through regular inspection of the beach and dune, removal of vegetation at risk of imminent collapse and grading of the erosion scarp.	While the geobags are in place.
Revegetation will be undertaken to replace the vegetation lost due to erosion/recession within the end effect area.	While the geobags are in place.
Restoration or consolidation of neighbouring beach accesses will be undertaken in consultation with Byron Shire Council.	While the geobags are in place.
The mitigation of end effects through importation of sand will be undertaken in consultation with Byron Shire Council.	While the geobags are in place.
Additional sand will be imported to the site to restore the beach and compensate for the sand locked up by the geobags over the life of the works.	Decommissioning

10. CONCLUSION

This documentation was developed to support a DA for temporary coastal protection works at Clarkes Beach, Byron Bay, New South Wales. The proposed works are partially located on land mapped as littoral rainforest under the Coastal Management SEPP and therefore an EIS is required.

Pursuant to the provisions of the *EP&A Act, 1979*, an environmental impact assessment of the proposed works has been completed. The proposal has been considered in the context of the broader, longer term strategic planning processes that will be occurring over the proposed lifetime of the works. Consideration has been given to the likely impact of the activity on the environment, having regard to all relevant factors. This EIS has identified both direct and indirect impacts on the surrounding environment and has identified control measures to address general risks as well as specific issues related to coastal processes, biodiversity and Aboriginal heritage. These are well-established and standard strategies which if properly implemented will result in low residual risk.

Detailed management plans addressing monitoring and maintenance activities and environmental management measures required during maintenance and decommissioning phases will be prepared. If the proposed mitigation measures and management plans are implemented it is concluded that any impacts of the proposal will be sufficiently mitigated. The proposal provides the appropriate balance between the management of public safety, risks to the natural environment and existing infrastructure and adaptive planning required to address coastal erosion and recession and is considered to be the most appropriate approach to the management of public safety and environmental risks in this area, while longer term options are developed and implemented.

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GLOSSARY AND ABBREVIATIONS

AHD	Australian height datum
AHIMS	Aboriginal heritage information management system
AHIP	Aboriginal heritage impact permit
AOBV	Area of Outstanding Biodiversity Value
BC	Biodiversity Conservation (Act or Regulation)
BLEP	Byron Local Environmental Plan
BoBBAC	Bundjalung of Byron Bay Aboriginal Corporation
BOS	Biodiversity Offset Scheme
BP	Before present
CM	Coastal Management (Act or SEPP)
CMP	Coastal Management Program
Council	Byron Shire Council
CZMP	Coastal Zone Management Program
DA	Development application
DCP	Development Control Plan
DP	Deposited plan
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry & Environment
EAC	East Australian Current
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EP&A	Environmental Planning and Assessment (Act or Regulation)
EPBC	Environment Protection and Biodiversity Conservation (Act)
FM	Fisheries Management (Act)
H	Horizontal
ILUA	Indigenous land use agreement
KPoM	Koala Plan of Management
LGA	Local government area
m	metres
m ²	Square metres
m ³	Cubic metres

MEMA	Marine Estate Management Authority
MEMS	Marine Estate Management Strategy
NPW	National Parks and Wildlife (Act)
NPWS	National Parks and Wildlife Service
POEO	Protection of the Environment Operations (Act)
REF	Review of Environmental Factors
SEARs	(NSW Department of Planning) Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
TARA	Threat and risk assessment
TEC	Threatened ecological community
ToS	Test of significance
V	Vertical
WM	Water Management (Act)

APPENDIX 1 STAKEHOLDER FEEDBACK

Ref: 21-018

Date: 8/4/2021

The Executive Director, Key Sites and Industry Assessments
Department of Planning, Industry & Environment
GPO Box 39
SYDNEY NSW 2001
By email: information@planning.nsw.gov.au

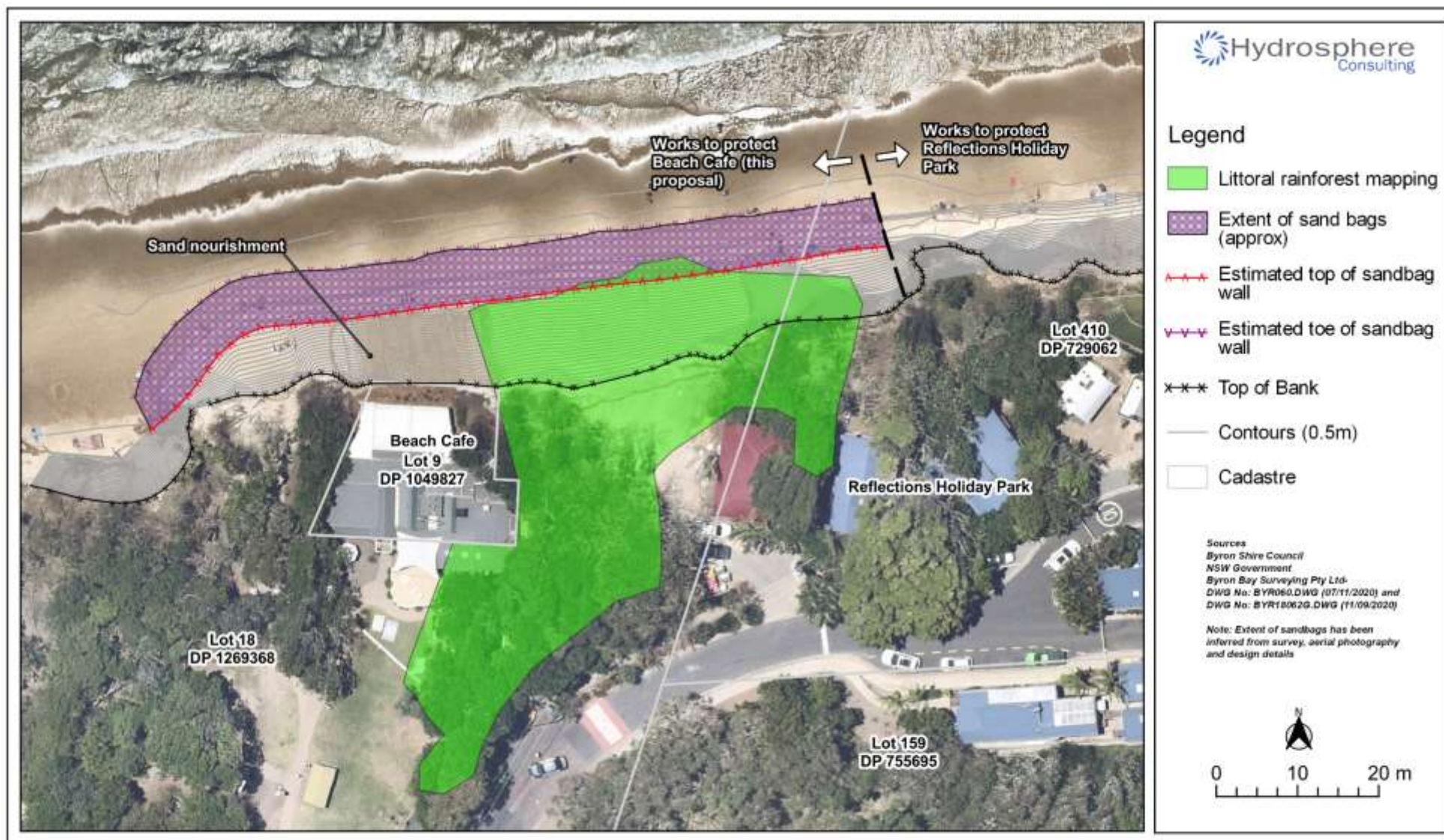
Attention: Director, Industry Assessments

RE: Request for Planning Secretary's Requirements

The NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) has engaged Hydrosphere Consulting to provide planning and project management services for its development application for coastal protection works at Clarkes Beach, Byron Bay. We are requesting the Planning Secretary's requirements for preparation of an Environmental Impact Statement for the works. The completed Form A and plan showing the proposed works are attached.

Clarkes Beach has been subject to significant coastal erosion and recession impacts which has increased since mid-July 2019 when an east coast low event coincident with high spring tides caused significant landward movement of the coastal erosion escarpment at Clarkes Beach. Crown Lands constructed a temporary sandbag seawall and associated beach nourishment works at Clarkes Beach in November 2020 (works to protect the café shown on the attached plan). The works were authorised under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in accordance with s.19(2)(a) of the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP).

The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and 'Beach Byron Café'. Crown Lands is seeking development consent for the works, so they can remain in place until arrangements for retreat of the café are implemented (expected to take between two to five years). The coastal protection works are considered to be designated development and regionally significant development. Although a section of the area is mapped as littoral rainforest, this vegetation was removed by the coastal erosion. The disturbance or removal of any existing littoral rainforest vegetation will not be required as part of this proposal. As part of the works or as part of separate Part 5 approvals, Crown Lands will restore pedestrian access to the beach adjacent to the café, improve stormwater controls and install fencing on the dune along with revegetation works.



Previous coastal erosion fronting Clarkes Beach Holiday Park (refer attached plan) to the east of the café has been managed by the construction of temporary sandbag walls in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks, works to protect Clarkes Beach Holiday Park, your reference: SEAR 1530). The Crown Lands sandbag seawall ties in with the western extent of the sandbag seawall installed by Reflections Holiday Parks as shown in the attached plan.

Please contact me on 02 6686 0084, 0421 145 027 or robyn@hydrosphere.com.au if you require any additional information for the provision of the environmental assessment requirements.

Yours sincerely,



Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting

Attachments:

1 - Form A

Form A

Request for the Planning Secretary's Requirements for the preparation of an Environmental Impact Statement

Please provide the following information so that we can advise you promptly.

1. Provide details of the applicant

Applicant name	NSW DPIE - Crown Lands		
Postal Address	PO Box 624 Ballina		
	State	NSW	Postcode 2478
Contact name	Catherine Knight		
Contact number	0423 611 248	Email	catherine.knight@crownland.nsw.gov.au
ABN	72 189 919 072		

2. Describe the subject site

Street address	Clarkes Beach, Lawson Street
Suburb, town or locality	Byron Bay
Local government area	Byron
Real property description (eg. lot, DP/ MPS, vol/ fol, parish, portion)	
Part lot 410, DP729062 and part lot 18, DP1269368	

As part of your completed Form A, you must attach a **locality map** which clearly highlights the location and boundary of the site, as well as any key identifying features in the locality (eg. roads, towns, waterbodies, etc.).

3. Briefly describe the proposal

Purpose	Coastal protection works - retention of temporary emergency coastal protection works installed in 2020 to stabilise the dune.
Components	Sandbags, beach nourishment, beach access and stormwater controls, dune fencing and revegetation
Size	90 m long, 10 - 20 m wide
Employment	
Capital Investment Value	estimated \$1 million
Other Details	Temporary works were constructed in November 2020 (under Part 5). DPIE is seeking development consent to retain the works at the site. Refer attached figure.

4. The proposed development is (please tick one):

- | | |
|--|--|
| ☒ Permissible with development consent | Go to Question 5 |
| ☐ Permissible without development consent | Go to Question 8 |
| ☐ Prohibited development | Go to Question 8 |
| ☐ State significant development | This form <u>SHOULD NOT</u> be used and you should contact the Department |
- Refer to Schedule 1 and 2 of State Environmental Planning Policy (State and Regional Development) 2011*

DEVELOPMENT WITH CONSENT

5. a) Which environmental planning instrument(s) apply to the proposal?

(ie. Council local environmental plan, regional environmental plan, State environmental planning policy, etc.)

SEPP (Coastal Management) 2018, SEPP (State and Regional Development) 2011

b) Who is the consent authority?

(ie. the local council, the Joint Regional Planning Panel, etc.)

Regional Planning Panel

c) Is the proposal 'designated development'?

☐ No

*This form **SHOULD NOT** be used and you should contact the local council*

☒ Yes

If yes, what is the basis for designation?

(Refer to Schedule 3 of the Environmental Planning and Assessment Regulation 2000, or the relevant environmental planning instrument)

Div. 1, Clause 10, Part 1 and 2 - SEPP (Coastal Management) - Coastal wetlands and littoral rainforest

What is the category of designated development?

(eg. concrete works, waste management facilities or works, etc.)

Earthworks (on land identified as littoral rainforest)

You should check this with the local council.

6. Is the proposal 'Crown development'?

☐ No

Go to [Question 7](#)

☒ Yes

Go to [Question 8](#)

If yes, the proposal is not integrated development.

7. Tick the relevant boxes next to the approvals which may be required to carry out the proposal.

If any box is ticked, the proposal would also be considered 'integrated development'.

☐ Roads Act 1993 s. 138 (Council, Land & Property Information or Roads and Maritime Services (RMS))	Consent to: a) erect a structure or carry out a work in, on or over a public road b) dig up or disturb the surface of a public road c) remove or interfere with a structure, work or tree on a public road d) pump water into a public road from any land adjoining the road e) connect a road (whether public or private) to a classified road	☐ Protection of the Environment Operations Act 1997 s. 43, 47, 48, 55, 122 (NSW Environment Protection Authority)	Environment Protection Licence to: a) authorise the carrying out of scheduled development work at any premises (scheduled development work is listed in Schedule 1 of the <i>POEO Act 1997</i>) b) authorise the carrying out of scheduled activities at any premises (excluding an activity described as a 'waste activity' but including any activity described as 'waste facility') c) control carrying out of non-scheduled activities for the purposes of regulating water pollution from the activity
Tick the relevant approval body for the Roads Act: ☐ the road works affect a freeway or tollway = RMS ☐ the road works affect a Crown road = Lands Department ☐ other road works = Council ☐ the road works affect a classified road = Council with RMS concurrence <i>Note: If an approval is required from the Council under the Roads Act, the proposal is not considered 'integrated development' if Council is also the consent authority.</i>		☐ Rural Fires Act 1997 s. 100B (NSW Rural Fire Service)	Bushfire Safety Authority for the: a) subdivision of bushfire prone land* that could lawfully be used for residential or rural residential purposes b) development of bushfire prone land* for a special fire protection purpose as defined in s. 100B of the <i>Rural Fires Act 1997</i> <i>* bushfire prone land is identified by a 'Bushfire Prone Land Map' prepared under s.146 of the Environmental Planning and Assessment Act 1979.</i>
☐ Water Management Act 2000 s. 89, 90, 91 (Department of Primary Industries (DPI) Water)	Water use approval, water management work approval or activity approval under Part 3 of Chapter 3	☐ Fisheries Management Act 1994 s. 144 (DPI Fisheries NSW)	Aquaculture permit
☐ Heritage Act 1977 s. 58 (Office of Environment and Heritage)	Approval in respect of the doing or carrying out of an act, matter or thing referred to in s.57(1) of the <i>Heritage Act 1977</i>	☐ Fisheries Management Act 1994 s. 201 (DPI Fisheries NSW)	Permit to carry out dredging or reclamation work
☐ Coal Mine Subsidence Compensation Act 2017 s. 21 (Mine Subsidence Board)	Approval to alter or erect improvements or to subdivide land within a Mine Subsidence District	☐ Fisheries Management Act 1994 s. 205 (DPI Fisheries NSW)	Permit to cut, remove, damage or destroy marine vegetation on public water, land, an aquaculture lease, or on the foreshore of any such land or lease
☐ Mining Act 1992 s. 63, 64 (Department of Planning and Environment (DPE) Resources & Geoscience)	Grant of mining lease	☐ Fisheries Management Act 1994 s. 219 (DPI Fisheries NSW)	Permit to: a) set a net, netting or other material b) construct or alter a dam, floodgate, causeway or weir c) otherwise create an obstruction, across or within a bay, inlet, river or creek, or across or around a flat
☐ National Parks and Wildlife Act 1974 s. 90 (Office of Environment and Heritage)	Grant of Aboriginal heritage impact permit	☐ Petroleum (Onshore) Act 1991 s. 9, 42 (DPE Resources & Geoscience)	Grant of production lease

8. In your opinion, is the proposed development a 'potentially hazardous industry' or a 'potentially offensive industry'?

(Refer to the Department's guideline Applying SEPP 33)

☐ Yes ☒ No

DEVELOPMENT WITHOUT CONSENT

Only answer the following question if you answered 'permissible WITHOUT development consent' to Question 4.

9. Does the proposal include an 'activity' (as defined under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act))?

☐ Yes ☒ No

If yes, what is the basis of this proposal being an 'activity'?

Name all determining authorities, as defined under section 110B of the EP&A Act.

ALL DEVELOPMENT - Provide the following information for all proposals.

10. Provide details of the person requesting the Planning Secretary's requirements, if it is not the applicant.

Name	Hydrosphere Consulting		
Postal Address	PO Box 7059, Ballina		
	State	NSW	Postcode 2478
Contact name	Robyn Campbell		
Contact number	02 6686 0084	Email	robyn@hydrosphere.com.au
ABN	74 162 782 428		

11. Signature of person requesting the Planning Secretary's requirements

Name	Robyn Campbell		
Signature		Date	8/4/21

12. Submitting your completed Form A

All enquiries should be directed to 1300 305 695.

BY EMAIL

Please email a scanned copy of the completed form to:
information@planning.nsw.gov.au

Attention: Director, Industry Assessments

BY POST

The Executive Director, Key Sites and Industry Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Director, Industry Assessments

21 May 2021

Ms Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting
Suite 6, 26-54 River Street
Ballina NSW 2478

SEAR 1567

Dear Ms Campbell,

**Coastal Protection Works in a Littoral Rainforest Area
Clarkes Beach Lawson Street, Byron Bay (Part Lot 410 DP729062 & Part Lot 18 DP1269368) –
Byron Shire Council LGA
Planning Secretary's Environmental Assessment Requirements (SEAR) 1567**

I refer to your email of 8 April 2021, seeking the Planning Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) for the above development proposal. I note your proposal would seek development consent for the retention of emergency sandbags, restoration of pedestrian access to the beach, improvement of stormwater controls, fencing along the dune, and revegetation works.

The Department of Planning, Industry and Environment (the Department) has reviewed the documentation submitted and confirms it has no specific requirements, except that the EIS must address the provisions of the *State Environmental Planning Policy (Coastal Management) 2018*. You should ensure your EIS meets the minimum form and content requirements outlined in Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*.

In preparing the SEARs, the Department of Planning, Industry and Environment (the Department) has consulted with the Biodiversity and Conservation Division. A copy of their requirements is attached.

In addition, you should ensure your EIS is prepared in consultation with Byron Shire Council, Tweed Byron Local Aboriginal Land Council and any other relevant local, State and Commonwealth government authorities, service providers, community groups and surrounding landowners, and address any issues they raise in the EIS.

If you do not lodge a development application under section 4.12(8) of the *Environmental Planning and Assessment Act 1979* within 2 years of the date of this letter, you must consult with the Planning Secretary in relation to any further requirements for lodgement.

Should you have any further enquiries, please contact Kathryn Moreira, Planning and Assessment, at the Department on 02 9274 6086.

Yours sincerely



Chris Ritchie
Director
Industry Assessments
as delegate of the Planning Secretary



Our Ref: DOC21/282510
Your Ref: SEAR 1567

Industry Assessments
Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Attention: Ms Kathryn Moreira

Dear Ms Moreira

**Re: Request for Biodiversity and Conservation Division's Environmental Impact Statement
Environmental Assessment Requirements – Coastal Protection Works– Clarkes Beach
Lawson Street, Byron Bay (Part Lot 410 DP729062 & Part Lot 18 DP 1269368) (SEAR 1567)**

Thank you for your e-mail dated 9 April 2021 about the proposed coastal protection works (sandbags, beach nourishment), beach access and stormwater controls, dune fencing and revegetation at Clarkes Beach, Lawson Street, Byron Bay, seeking Environmental Assessment Requirements (EARs) from the Biodiversity and Conservation Division (BCD) of the Biodiversity, Conservation and Science Directorate in the Environment, Energy and Science Group of the Department of Planning, Industry and Environment. I appreciate the opportunity to provide input.

We note that the project will be assessed in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Environmental Impact Statement (EIS) EARs provided by the Biodiversity and Conservation Division are limited to biodiversity, NPWS estate, acid sulphate soils, flooding, stormwater and coastal processes.

The BCD advises that in providing these comments, it should not be assumed or implied that BCD condone the retention of the geotextile bags on Clarkes Beach, as these currently have no legal status. We note that there is currently no approval for the works to remain in place.

We have identified several issues in relation to the proposed works and coastal processes and hazards, National Parks and Wildlife Service (NPWS) estate (including Aboriginal cultural heritage on park estate) and biodiversity. The following comments are provided on these matters.

1. Timeframe for geotextile bags remaining in place

In providing this response, the BCD notes the geotextile bags have been in place since November 2020. Approval for the temporary works expired in February 2021.

Reference is made in the cover letter from Hydrosphere Consulting dated 8 April 2021 to a proposed timeframe between two to five years for the existing coastal protection works to remain in place until arrangements for retreat of the café are implemented.

The EIS should explore several options, including the immediate removal of the geotextile bags cognisant of the fact that they currently have no legal status to remain on the beach. In exploring the options to retain the geotextile bags, the proponent should define the time that the geotextile bags would be required to remain in place and the justifications for this action.

2. Risk Management Strategy

The EIS should be informed by a long-term strategy for managing the coastal hazard risks at the site as the land is within a coastal hazard line.

3. Aboriginal cultural heritage

While Aboriginal cultural heritage (ACH) functions have been transferred from the BCD to Heritage NSW in the Department of Premier and Cabinet we note there is an Aboriginal midden that became exposed on the adjoining Reflections Holiday Park site as a result of coastal erosion. There is potential for ACH impacts as a result of future coastal erosion and exposure and these should be considered. Advice on this matter should be obtained from Heritage NSW at heritagemailbox@environment.nsw.gov.au.

4. Biodiversity and dune restoration

Protecting biodiversity at the site including the Littoral Rainforest and Wallum Sand Heath vegetation is important, and the best way to achieve this is to enable the establishment of a natural dune system with appropriate regeneration.

The EIS should consider how the proposed works will protect remaining native vegetation and how the future removal of the geotextile bags will be undertaken to limit any further impacts, as well as what dune restoration will be undertaken and within what timeframe. We note the reference to dune fencing and revegetation. The EIS should detail how a natural dune system will be re-established at the site following removal of the temporary coastal protection works.

The EIS should consider the biodiversity impacts on marine turtles and shorebirds. For example, in early 2021 a threatened Green Turtle (*Chelonia mydas*) left the ocean in a nesting attempt on Clarkes Beach in front of the geotextile bags adjacent to the Reflections Holiday Park.

Photographic evidence suggests that the presence of the geotextile bags prevented the turtle from accessing the incipient dune above the mean high-water mark, where marine turtles nest, and she returned to sea without nesting. While there is no guarantee every time a female turtle emerges from the ocean that she will lay eggs, a more suitable environment increases the probability of a successful nesting event.

In conclusion, we understand the approval for the temporary works has expired and there is no approval in place for their retention. Our preferred outcome for the site in terms of biodiversity is that the emergency coastal protection works be removed as soon as possible, and dune revegetation works be undertaken with the aim of re-establishing the dunes with native vegetation to facilitate natural coastal processes.

The full list of our requirements that may need to be addressed in the EIS is provided in **Attachment 1**. In preparing the EIS, the proponent should refer to the relevant guidance material listed in **Attachment 2**.

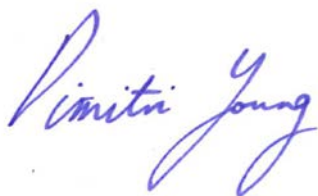
Our project specific requirements that must be addressed in the EIS are provided in **Attachment 3**. These include a requirement that, given the potential for the proposal to have unreasonable impacts to the coastal environment, the EIS should consider the option to remove the geotextile bags immediately as an alternative to leaving them in place.

We consider that this information is necessary for a comprehensive EIS for the proposed development.

The BCD requests the opportunity to review the EIS when it is placed on public exhibition and to provide comment on it as part of a co-ordinated DPIE response.

If you have any questions about this advice, please do not hesitate to contact Ms Rachel Lonie, Senior Conservation Planning Officer, at rachel.lonie@environment.nsw.gov.au or 6650 7130.

Yours sincerely



23 April 2021

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

Enclosures:

Attachment 1 - BCD Recommended EARs – BCD Recommended EARs – EIS – Coastal Protection Works– Clarkes Beach Lawson Street, Byron Bay (Part Lot 410 DP729062 & Part Lot 18 DP 1269368) (SEAR 1567)

Attachment 2 - EIS Guidance Material

Attachment 3 – BCD Project Specific Requirements

Attachment 1

Biodiversity and Conservation Division's Recommended Secretary's Environmental Assessment Requirements (SEARs) for Preparation of an Environmental Impact Statement

for the

**Coastal Protection Works– Clarkes Beach
Lawson Street, Byron Bay (Part Lot 410
DP729062 & Part Lot 18 DP 1269368)**

SEAR 1567

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A. The Proposed Development

The Environmental Impact Statement (EIS) should fully and clearly describe the proposed development, including any environmental impact mitigation measures, and identify all the processes and activities intended for the site during the life of the proposed development.

The description of the proposed development in the EIS should, where relevant, include:

1. the location of the proposal and details of the surrounding environment;
2. appropriate land use zoning;
3. the size and type of the proposal and its operation;
4. the proposed layout of the site;
5. the staging and timing of the proposal;
6. the proposal's relationship to any other proposal;
7. all equipment proposed for use at the site;
8. chemicals, including fuel, used on the site and proposed methods for the transportation, storage, use and emergency management;
9. waste generation, storage and disposal;
10. the anticipated environment impacts of the proposal, both direct and indirect;
11. a plan showing the distribution of any threatened flora or fauna species and the vegetation communities on or adjacent to the subject site, and the extent of vegetation proposed to be cleared;
12. ownership details of any residence and/or land likely to be affected by the proposal;
13. maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc. in the locality that may be affected by the proposal;
14. methods to mitigate any expected environmental impacts of the proposal; and
15. the anticipated level of performance in meeting required environmental standards.

B. Environmental Impacts of the Proposed Development

Impacts related to the following environmental issues should be assessed (by suitably qualified persons in the specific area of impact), quantified and reported on:

- Biodiversity
- NPWS Estate (land reserved or acquired under the *National Parks and Wildlife Act 1974*)
- Acid Sulfate Soils
- Flooding, Stormwater, Coastal Processes and Associated Hazards
- Cumulative Impacts

The EIS should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is at **Attachment 2**.

C. Biodiversity

1. The EIS must assess the impacts of the proposed development on biodiversity values to determine if the proposed development is “likely to significantly affect threatened species” for the purposes of Section 7.2 of the *Biodiversity Conservation Act 2016* (BC Act) as follows:
 - A. The EIS must demonstrate whether the proposed development is to be carried out in a declared area of outstanding biodiversity value.
 - B. If the proposed development is not carried out in a declared area of outstanding biodiversity value, then the EIS must demonstrate and document whether the proposed development exceeds the biodiversity offset scheme threshold, as set out in section 7.4 of the BC Act and clause 7.1 of the *Biodiversity Conservation Regulation 2017* (BC Regulation), by determining whether the proposed development involves:
 - I. The clearing of native vegetation of an area declared by clause 7.23 of the BC Regulation as exceeding the threshold, or
 - II. The clearing of native vegetation, or other action prescribed by clause 6.1 of the BC Regulation, on land included on the Biodiversity Values Map published under clause 7.3 of the BC Regulation.
 - C. If the biodiversity offset scheme threshold is not exceeded, then the EIS must document *the test for determining whether proposed development is likely to significantly affect threatened species or ecological communities* as outlined in Section 7.3 of the BC Act, by preparing an ecological assessment that should include:
 - I. A field survey of the site conducted and documented in accordance with relevant guidelines, including:
 - a. *Field survey methods for environmental consultants and surveyors when assessing proposed developments or other activities on sites containing threatened species* <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/field-survey-method-guidelines.pdf>
 - b. *Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna -Amphibians* (DECC, 2009) <http://www.environment.nsw.gov.au/resources/threatenedspecies/09213a/amphibians.pdf>
 - c. *NSW Guide to Surveying Threatened Plants* (OEH 2016) <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/guide-surveying-threatened-plants-160129.pdf>
 - d. “*Species credit*” *threatened bats and their habitats* <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/species-credit-threatened-bats-survey-guide-180466.pdf>

- e. *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004), <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/draft-threatened-biodiversity-survey-guide.pdf>.

If a proposed field survey methodology is likely to vary significantly from the methods in the guidelines above, then the proponent should discuss the proposed methodology with the Biodiversity and Conservation Division prior to undertaking surveys for the EIS, to determine whether the Biodiversity and Conservation Division considers the proposed methodology appropriate.

The results of recent (less than five years old) field surveys may be used. However, the results of previous field surveys should not be used if they have:

- been undertaken in seasons, weather conditions or following extensive disturbance events when the subject species are unlikely to be detected or present, or
- utilised methodologies, survey sampling intensities, timeframes or baits that are not the most appropriate for detecting the target subject species,

unless these differences can be clearly demonstrated to have had an insignificant impact upon the outcomes of the field surveys.

If the results of previous field surveys are used, then field surveys for any additional threatened entities listed under the BC Act since the previous field surveys took place, must be undertaken and documented.

The list of potential threatened species, populations, ecological communities, or their habitats for the site should be determined in accordance with:

- the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004), and
- the Department's Threatened Species website <http://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species>, and
- the *Bionet Atlas of NSW* <http://www.environment.nsw.gov.au/wildlifeatlas/about.htm>, and
- the Vegetation Information System (BioNet Vegetation Classification) <http://www.environment.nsw.gov.au/research/Visclassification.htm>, and
- other data sources (e.g. PlantNET, Online Zoological Collections of Australian Museums (<http://www.ozcam.org/>), previous or nearby surveys etc.) may also be used to compile the list.

II. The following information as a minimum:

- a. A description, spatial data files, and geo-referenced mapping of the study area, (overlays on topographic maps, satellite images and /or aerial photos, including details of map datum, projection and zone), showing all field survey locations, vegetation communities classified in accordance with the BioNet Vegetation Classification (<http://www.environment.nsw.gov.au/research/Visclassification.htm>), key

habitat features and reported locations of threatened species and ecological communities present in the subject site and study area.

- b. A description of survey methodologies used, including timing, location and weather conditions.
 - c. Details, including qualifications and experience, of all staff undertaking the surveys, mapping and assessment of impacts as part of the EIS.
 - d. Identification of national and state listed threatened biota known or likely to occur in the study area and their conservation status.
 - e. A description of the likely impacts of the proposed development on biodiversity values, including direct and indirect impacts and construction and operation impacts, with impacts quantified, wherever possible, such as the amount of each vegetation community or species habitat to be cleared or impacted, and/or the degree of fragmentation of a habitat connectivity.
 - f. Identification of the avoidance, mitigation and management measures that will be put in place as part of the proposed development to avoid or minimise biodiversity impacts, including details about alternative options considered and how long-term management arrangements will be guaranteed.
 - g. A description of the residual impacts of the proposed development.
- III. The *'test for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats'* as outlined in Section 7.3 of the BC Act undertaken in accordance with the gazetted *Threatened Species Test of Significance Guidelines* (OEH 2018) available at: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/threatened-species-test-significance-guidelines-170634.pdf>
2. If the EIS determines under 1 above that the proposed development is likely to significantly affect threatened species, then in accordance with Section 7.7 of the BC Act the EIS must be accompanied by a Biodiversity Development Assessment Report prepared in accordance with Part 6, Division 3 of the BC Act.
 3. If the EIS determines under 1 above that the proposed development is unlikely to significantly affect threatened species, then the proposed development should:
 - a. be designed to avoid and minimise impacts on biodiversity values to the fullest extent possible, and
 - b. include a biodiversity offset package to offset remaining direct and indirect impacts on biodiversity values, prepared in accordance with the Department's 13 offsetting principles available at <http://www.environment.nsw.gov.au/biodivoffsets/oehoffsetprincip.htm>:

Note:

For the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*, the EIS should identify any relevant Matters of National Environmental Significance and whether the proposal has been referred to the Commonwealth or already determined to be a controlled action.

D. NPWS Estate

The EIS should address the following with respect to land reserved under the *National Parks and Wildlife Act 1974*.

1. Where appropriate, likely impacts (both direct and indirect) of the proposed development on any adjoining and/or nearby NPWS estate reserved under the National Parks and Wildlife Act 1974 should be considered, with reference to the *Developments adjacent to National Parks and Wildlife Service lands Guidelines for consent and planning authorities* (DPIE 2020) available at:

<https://www.environment.nsw.gov.au/research-and-publications/publications-search/developments-adjacent-to-national-parks-and-wildlife-service-lands>

Note: Proposed development which may impact marine protected areas should be referred to the Regions, Industry, Agriculture and Resources Group in the Department of Planning, Industry and Environment to determine the assessment and approval requirements.

E. Acid Sulfate Soils

The EIS should address the following:

1. The potential impacts of the proposed development on acid sulfate soils must be assessed in accordance with the relevant guidelines in the Acid Sulfate Soils Manual (Stone et al. 1998) and the Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004).
2. The mitigation and management options that will be used to prevent, control, abate or minimise potential impacts from the disturbance of acid sulfate soils associated with the proposed development and to reduce risks to human health and prevent the degradation of the environment must be described, including include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

F. Flooding, Stormwater, Coastal Processes and Associated Hazards

The EIS should include an assessment of the following referring to the relevant guidelines in Attachment 2:

1. The potential effect of coastal processes and coastal hazards including potential impacts of sea level rise:
 - a. on the proposed development; and
 - b. arising from the proposed development including whether the proposed development will unreasonably limit or be likely to unreasonably limit public access to or the use of a beach or headland, or pose or be likely to pose a threat to public safety, and whether any increased erosion of the beach or adjacent land is expected to be caused by the presence of the works.
2. Whether the proposed development is consistent with any coastal zone management plans.
3. Whether the proposed development is consistent with any floodplain risk management plans.
4. Whether the proposed development is compatible with the flood hazard of the land.
5. Whether the proposed development will significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties.
6. Whether the proposed development will significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
7. Whether the proposed development incorporates appropriate measures to manage risk to life from flood.
8. Whether the proposed development is likely to result in unsustainable social and economic costs to the community as a consequence of flooding.
9. The implications of flooding over the full range of potential flooding, including the probable maximum flood, should be considered as set out in the NSW Government Floodplain Development Manual. This should include the provision of:
 - a. Full details of the flood assessment and modelling undertaken in determining any design flood levels (if applicable), including the 1 in 100 year flood levels.
 - b. A sensitivity assessment of the potential impacts of an increase in rainfall intensity and runoff (10%, 20% and 30%) and sea level rise on the flood behaviour for the 1 in 100 year design flood if applicable.
10. All site drainage, stormwater quality devices and erosion / sedimentation control measures should be identified and the onsite treatment of stormwater and effluent runoff and predicted stormwater discharge quality from the proposed development should be detailed.

G. Cumulative Impacts

The EIS should include an assessment of the following:

1. The cumulative impacts, including both construction and operational impacts, from all clearing activities and operations, associated edge effects and other indirect impacts on cultural heritage, biodiversity and NPWS Estate in accordance with the *Environmental Planning and Assessment Act 1979*.
2. The cumulative impacts, including both construction and operational impacts, of the proponent's existing proposals and other proposals and associated infrastructure (such as access tracks etc.) as well as the cumulative impact of the proposed development in the context of other proposals located in the vicinity.

Attachment 2 – EIS Guidance Material

Title	Web address
<u>Relevant Legislation</u>	
<i>Biodiversity Conservation Act 2016</i>	https://www.legislation.nsw.gov.au/#/view/act/2016/63/full
<i>Coastal Management Act 2016</i>	https://www.legislation.nsw.gov.au/#/view/act/2016/20/full
<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
<i>Environmental Planning and Assessment Act 1979</i>	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
<i>Fisheries Management Act 1994</i>	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+1994+cd+0+N
<i>Marine Parks Act 1997</i>	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+64+1997+cd+0+N
<i>National Parks and Wildlife Act 1974</i>	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+1974+cd+0+N
<i>Protection of the Environment Operations Act 1997</i>	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
<i>Water Management Act 2000</i>	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
<i>Wilderness Act 1987</i>	http://www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+FIRST+0+N
<u>Biodiversity</u>	
Biodiversity Assessment Method (OEH, 2017)	http://www.environment.nsw.gov.au/resources/bcact/biodiversity-assessment-method-170206.pdf
Biodiversity Development Assessment Report	https://www.legislation.nsw.gov.au/#/view/act/2016/63/part6/div3/sec6.12
Guidance and Criteria to assist a decision maker to determine a serious and irreversible impact (OEH, 2017)	http://www.environment.nsw.gov.au/resources/bcact/guidance-decision-makers-determine-serious-irreversible-impact-170204.pdf
Accreditation Scheme for Application of the Biodiversity Assessment Method Order 2017	https://www.legislation.nsw.gov.au/regulations/2017-471.pdf

Title	Web address
Biodiversity conservation actions	www.environment.nsw.gov.au/resources/bcact/ancillary-rules-biodiversity-actions-170496.pdf
Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules	www.environment.nsw.gov.au/resources/bcact/ancillary-rules-reasonable-steps-170498.pdf
Threatened Species Website	www.environment.nsw.gov.au/threatenedspecies/
NSW BioNet (Atlas of NSW Wildlife)	www.bionet.nsw.gov.au/
NSW guide to surveying threatened plants (OEH 2016)	www.environment.nsw.gov.au/resources/threatenedspecies/160129-threatened-plants-survey-guide.pdf
Threatened species survey and assessment guideline information	www.environment.nsw.gov.au/threatenedspecies/surveyassessmentguidelines.htm
BioNet Vegetation Classification - NSW Plant Community Type (PCT) database	www.environment.nsw.gov.au/research/Vegetationinformationssystem.htm
Data Portal (access to online spatial data)	http://data.environment.nsw.gov.au/
Fisheries NSW policies and guidelines	http://www.dpi.nsw.gov.au/fisheries/habitat/publications/policies-guidelines-and-manuals/fish-habitat-conservation
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx
Revocation, recategorisation and road adjustment policy (OEH, 2012)	http://www.environment.nsw.gov.au/policies/RevocationOfLandPolicy.htm
Developments adjacent to National Parks and Wildlife Service lands Guidelines for consent and planning authorities (DPIE 2020)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Development-guidelines/developments-adjacent-npws-lands-200362.pdf
<u>Water and Soils</u>	
Acid sulphate soils	
Acid Sulfate Soils Planning Maps via Data.NSW	http://data.nsw.gov.au/data/
Acid Sulfate Soils Manual (Stone et al. 1998)	http://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf

Title	Web address
Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004)	http://www.environment.nsw.gov.au/resources/soils/acid-sulfate-soils-laboratory-methods-guidelines.pdf This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Flooding and Coastal Erosion	
Reforms to coastal erosion management	http://www.environment.nsw.gov.au/coasts/coastalerosionmgmt.htm
Floodplain development manual	http://www.environment.nsw.gov.au/floodplains/manual.htm
Guidelines for Preparing Coastal Zone Management Plans	http://www.environment.nsw.gov.au/resources/coasts/130224CZMPGuide.pdf
NSW Climate Impact Profile	http://climatechange.environment.nsw.gov.au/
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	www.environment.gov.au/water/publications/quality/australian-and-new-zealand-guidelines-fresh-marine-water-quality-volume-1
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	http://deccnet/water/resources/AWQGuidance7.pdf
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

Attachment 3. BCD Project Specific Recommendations

1. Given the potential for the proposal to have unreasonable impacts to the coastal environment, the EIS should consider the option to remove the geotextile bags immediately as an alternative to leaving them in place, including the relative impacts and benefits of this option.
2. The EIS should consider time limited options for leaving the geotextile bags in place for a further temporary period, (such as for a two-year timeframe and for a maximum five-year timeframe) including the relative impacts and benefits of these options, noting the requirements of section 27 of the *Coastal Management Act 2016*.
3. In considering the above options, the EIS must:
 - a. be informed by the advice of suitably qualified persons with expertise in coastal processes and hazards to enable unambiguous assessment of all direct and indirect, as well as short and long-term impacts, of the proposed development.
 - b. describe the potential impact of the development over the life of the works including whether the proposed development will cause impacts to coastal process and coastal hazards including (but not limited to) whether erosion of the beach or adjacent land is expected to be caused by the presence of the works and to what extent this could occur over the life of the works.
 - c. describe satisfactory arrangements 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, and
 - ii. the maintenance of the works.
 - d. consider the impacts of the proposed development on marine turtles and shorebirds, particularly for turtle nesting.
 - e. consider the impacts the works could have on adjacent coastal lands including the Cape Byron State Conservation Area.
4. In presenting and assessing the final preferred option, the EIS should demonstrate:
 - a. that the development will not unreasonably limit, or be likely to unreasonably limit, public access to, or the use of a beach or headland, or pose or be likely to pose a threat to public safety.
 - b. how public access to the beach will be managed to ensure that further erosional impacts do not occur as a result of unregulated public access.
 - c. how removal of geotextile bags will occur that will limit impacts on native vegetation at the site.
 - d. what arrangements will be made to restore the dune areas once the geotextile bags are removed, including, but not limited to, the preparation of a Dune Restoration and Management Plan.
5. The EIS should include a long term strategy for managing the risks of coastal hazards and how these risks will be addressed in terms of future use and management of the site.

Ref: 21-018

Date: 17/05/21

Attn: General Manager
Byron Shire Council
70 Station Street
Mullumbimby, NSW 2482

council@byron.nsw.gov.au

Dear Sir,

RE: Consultation with Byron Shire Council regarding Part 5 activity at Clarkes Beach, Byron Bay - stormwater erosion controls and restoration of beach access

I am writing to you regarding proposals by NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) to undertake works at Clarkes Beach, Byron Bay and consultation requirements under Division 1, clauses 13 and 15A of the *State Environmental Planning Policy (Infrastructure) 2007*. Hydrosphere Consulting is providing project management and environmental assessment services to Crown Lands for this project.

Part 4 Temporary Coastal Protection Works

Clarkes Beach has been subject to significant coastal erosion and recession impacts which increased from mid-July 2019 when an east coast low event coincident with high spring tides caused significant landward movement of the coastal erosion escarpment. Crown Lands constructed a temporary sandbag seawall and associated beach nourishment works at Clarkes Beach in November 2020. The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and 'Beach Byron Café' (the café). The works were authorised under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in accordance with s.19(2)(a) of the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP).

Crown Lands intends to apply for development consent for the sandbag works (as well as fencing on the dune and revegetation works). These coastal protection works are designated development and regionally significant development. Hydrosphere Consulting is preparing a development application and Environmental Impact Statement for these works on behalf of Crown Lands. Separate correspondence will be provided to Council in relation to the development application and Environmental Impact Statement for the coastal protection works.

Previous coastal erosion fronting Clarkes Beach Holiday Park to the east of the café has been managed by the construction of temporary sandbag walls in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks). The Crown Lands sandbag seawall ties in with the western extent of the sandbag seawall installed by Reflections Holiday Parks. The Reflections seawall is the subject of a separate development application by Reflections Holiday Parks.

Part 5 Stormwater Controls and Access Path Reconstruction

The coastal erosion occurring at Clarkes Beach has damaged the pedestrian access stairs to the beach to the west of the café. In addition, stormwater erosion (caused by runoff from the surrounding pathways, other impervious areas and roof drainage) has occurred to the west of the café, scouring the dune face and compromising the integrity of the coastal protection works.

Crown Lands proposes to construct stormwater control works and restore the public access to the beach. The works will be constructed on Lot 18, DP 1269368 (former Lot 10, DP 1049827) to the west of the café, between Clarkes Beach and the public car park along Lawson Street, Byron Bay (Crown Reserve 82000). The location of the works and preliminary designs for the access path and stormwater works are attached to this letter. As part of the works, trees that are at risk of falling onto the beach due to the erosion of the dune scarp in this area will be removed to ensure safety for beach goers.

The proposed stormwater works are designed to slow the flow of water and provide infiltration prior to discharge of stormwater over the dune. Overland stormwater flows will be diverted to a kerb inlet pit. This pit will discharge into a disposal area within the dune (filled with 20 - 50 mm blue metal wrapped in geotextile) via a 300 mm diameter PVC pipe. During large rainfall events, flows will overtop the inlet pit and flow along a swale (0.75 – 3.0 m wide) with Atlantis (infiltration) cells wrapped in geotextile fabric installed along the V-drain centre (depth 240 mm below drain invert). Coconut rolls will be used to slow the flow through the swale and the scoured flow path will be filled with rock and vegetation on sandy topsoil. Roof water from the western section of the café roof will also be discharged into the swale. The swale infill will be located within the existing scoured extents between trees.

Roof water from the eastern section of the café roof currently drains to the north of the café, through the dune onto the beach. Roof runoff will be redirected to the south-east via a 150 mm diameter ag-line pipe.

The current access path is not usable due to coastal erosion. Due to the steepness (approximately 1V:1.5H, 34°) of the dune behind the sandbags, considerable effort is required to provide an access track at the required gradient. It is proposed to construct the portion landward of the vegetation line with board and chain, while the portion seaward of the vegetation line would be a sand ramp with fence posts and guide wire on the seaward side. The lower, seaward portion of the ramp may be damaged by wave runup during times of large waves and/or eroded beach states. This would be reinstated with the placement of additional sand as required.

The proposed works are permissible without consent and will be assessed under Part 5 of the EP&A Act. Crown Lands is both a public authority proponent (EP&A Act Section 5.3) and the determining authority (EP&A Act Section 5.1) for these works.

Request for Input

Please advise any requirements for the environmental assessment for the Review of Environmental Factors for stormwater controls and access path reconstruction.

Please provide your feedback by 7 June 2021.

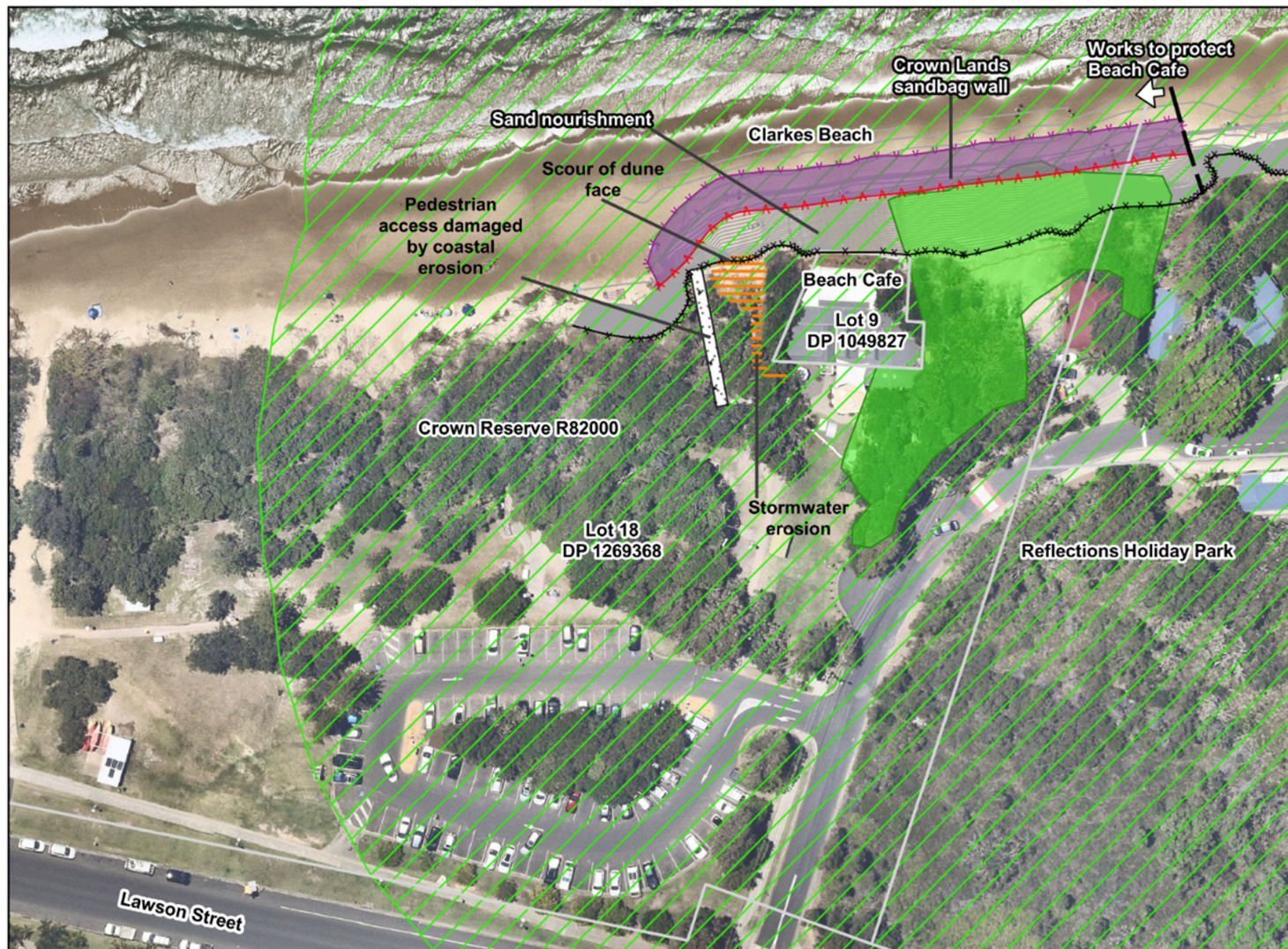
Please contact me on 6686 0084, 0421 145 027 or email robyn@hydrosphere.com.au if you would like to discuss this further.

Yours sincerely,



Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting

Att. Location of works and design drawings



Legend

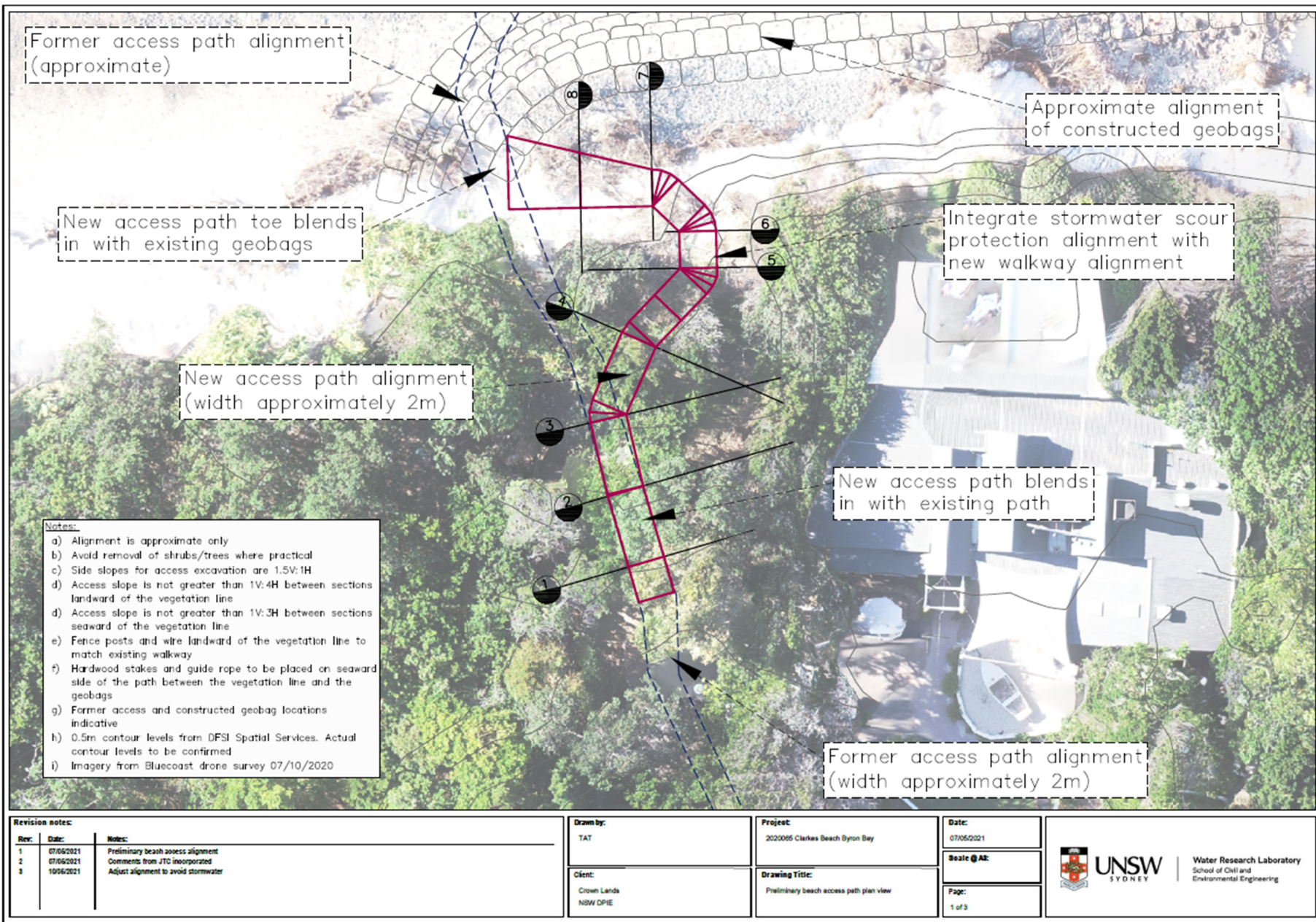
- Littoral rainforest mapping
- Littoral Rainforest Proximity Area
- Extent of sand bags (approx)
- Stormwater erosion
- Pedestrian access damaged by coastal erosion
- Estimated top of sandbag wall
- Estimated toe of sandbag wall
- Top of Bank
- Contours (0.5m)
- Cadastre

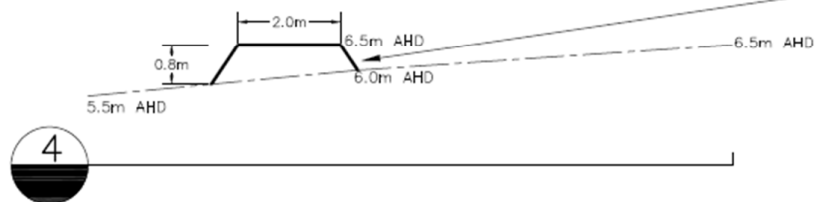
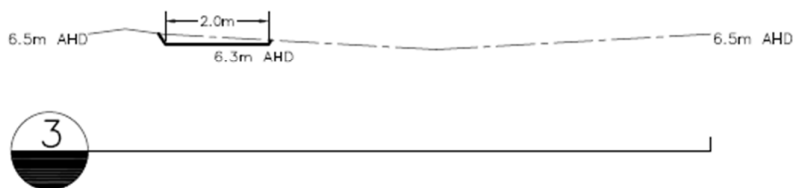
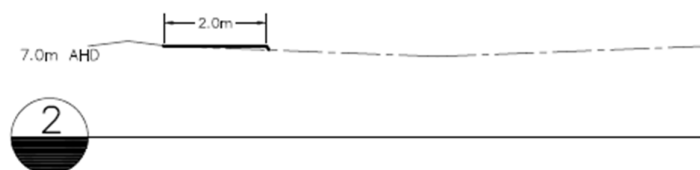
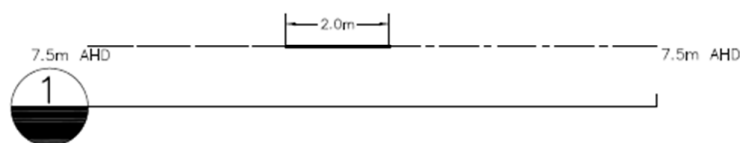
Sources
Byron Shire Council
NSW Government
Byron Bay Surveying Pty Ltd-
DWG No: BYR060.DWG (07/11/2020) and
DWG No: BYR18062G.DWG (11/09/2020)

Note: Extent of sandbags has been
inferred from survey, aerial photography
and design details



0 10 20 30 m





Notes:

- Alignment is approximate only
- Avoid removal of shrubs/trees where practical
- Side slopes for access excavation are 1.5V:1H
- Access slope is not greater than 1V:4H between sections landward of the vegetation line
- Access slope is not greater than 1V:3H between sections seaward of the vegetation line
- Fence posts and wire landward of the vegetation line to match existing walkway
- Hardwood stakes and guide rope to be placed on seaward side of the path between the vegetation line and the geobags
- 0.5m contour levels from DFSI Spatial Services. Actual contour levels to be confirmed

Revision notes:

Rev:	Date:	Notes:
1	07/05/2021	Preliminary beach access alignment
2	07/05/2021	Comments from JTC incorporated
3	10/05/2021	Adjust alignment to avoid stormwater

Drawn by:

TAT

Project:

2020065 Clarkes Beach Byron Bay

Date:

07/05/2021

Scale @ A1:

Page:

2 of 3

Client:

Crown Lands
NSW DPIE

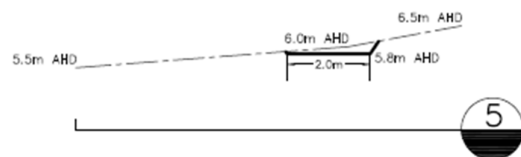
Drawing Title:

Preliminary beach access path cross-sections 1

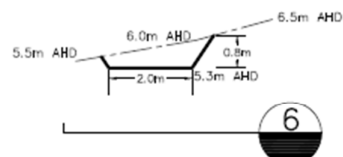


UNSW
SYDNEY

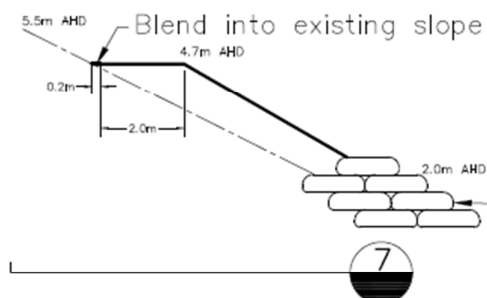
Water Research Laboratory
School of Civil and
Environmental Engineering



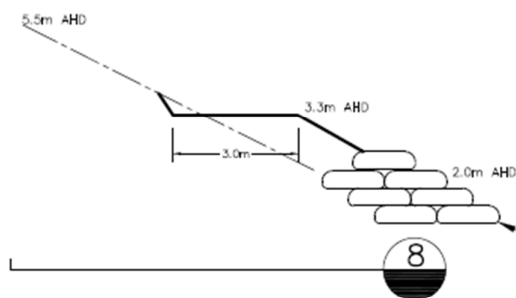
Integrate stormwater scour protection alignment with walkway alignment



Integrate stormwater scour protection alignment with walkway alignment



Approximate location of geobags



Approximate location of geobags

Notes:

- Alignment is approximate only
- Avoid removal of shrubs/trees where practical
- Side slopes for access excavation are 1.5V:1H
- Access slope is not greater than 1V:4H between sections landward of the vegetation line
- Access slope is not greater than 1V:3H between sections seaward of the vegetation line
- Fence posts and wire landward of the vegetation line to match existing walkway
- Hardwood stakes and guide rope to be placed on seaward side of the path between the vegetation line and the geobags
- 0.5m contour levels from DFSI Spatial Services. Actual contour levels to be confirmed

Revision notes:

Rev:	Date:	Notes:
1	07/06/2021	Preliminary beach access alignment
2	07/06/2021	Comments from JTC incorporated
3	10/06/2021	Adjust alignment to avoid stormwater

Drawn by:

TAT

Client:

Crown Lands
NSW DPIE

Project:

2020065 Clarks Beach Byron Bay

Drawing Title:

Preliminary beach access path cross-sections 2

Date:

07/06/2021

Scale @ A3:

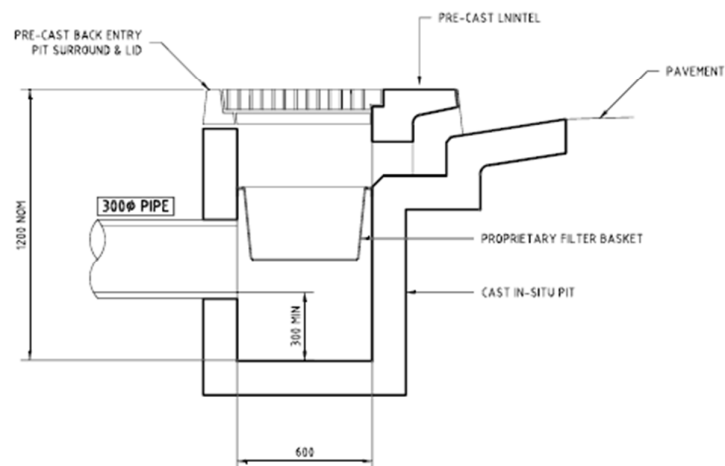
Page:

3 of 3

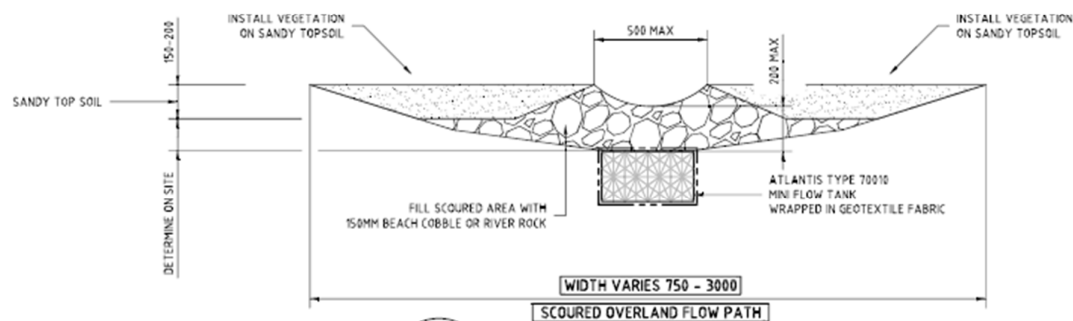


UNSW
SYDNEY

Water Research Laboratory
School of Civil and
Environmental Engineering



B
C101
SECTION
INLET PIT GENERAL ARRANGEMENT
SCALE 1:20



A
C101
SECTION
SCoured OVERLAND FLOW PATH REHABILITATION DETAILS
SCALE 1:20

0		10		20		30		40		50		60		70		80		90		100		110		120		130		140		150		160		170		180		190		200		210		220		230		240		250		260		270		280		290		300		310		320		330		340		350		360		370		380		390		400		410		420		430		440		450		460		470		480		490		500		510		520		530		540		550		560		570		580		590		600		610		620		630		640		650		660		670		680		690		700		710		720		730		740		750		760		770		780		790		800		810		820		830		840		850		860		870		880		890		900		910		920		930		940		950		960		970		980		990		1000	
CROWN LANDS DPI										PROJECT										SCOUR PROTECTION & INFILTRATION DEVICES BEACH CAFE CLARKES BEACH BYRON BAY NSW										TITLE										DETAIL SHEET 1																				CONSTRUCTION CERTIFICATE ISSUE																																																																																																																																													
B 30/06/2021 REVISED LAYOUTS & DETAILS AC										B 30/06/2021 CONSTRUCTION CERTIFICATE ISSUE AC										DO NOT SCALE DRAWING, USE ONLY FOR DIMENSIONS ONLY INFO PLAN IS COPYRIGHTED MATERIAL, ALL RIGHTS RESERVED.										DESIGNED: PLANNERS & SURVEYORS DEVELOPMENTAL PROJECT MANAGEMENT 8/15/61/1/3/																																																																																																																																																																											

Ref: 21-018

Date: 16/07/21

Attn: Rosalie Neve
Department of Premier & Cabinet
Locked Bag 5020
Paramatta, NSW 2124

rosalie.neve@environment.nsw.gov.au

Dear Rosalie,

RE: Consultation with Heritage NSW regarding Part 4 temporary coastal protection works at Clarkes Beach, Byron Bay

I am writing to you regarding the proposal by NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) to undertake works at Clarkes Beach, Byron Bay. Hydrosphere Consulting is providing project management and environmental assessment services to Crown Lands for this project. Thank you for your input at the site meeting on 29 April 2021 and consultation with Bundjalung of Byron Bay Aboriginal Corporation (BoBBAC) undertaken as part of the Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared by Everick Heritage.

Part 4 Temporary Coastal Protection Works

Clarkes Beach has been subject to significant coastal erosion and recession impacts which increased from mid-July 2019 when an east coast low event coincident with high spring tides caused significant landward movement of the coastal erosion escarpment. Crown Lands constructed a temporary sandbag seawall and associated beach nourishment works at Clarkes Beach in November 2020. The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and 'Beach Byron Café' (the café). The works were authorised under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in accordance with s.19(2)(a) of the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP).

Crown Lands intends to apply for development consent for the sandbag works as well as dune revegetation works, to achieve the following objectives of the works:

1. To provide a degree of temporary protection to the Beach Byron Bay café site from coastal erosion.
2. To provide sufficient time to achieve the reconfiguration and/or 'planned retreat' of the Beach Byron Bay café.
3. To ensure that risks from coastal erosion to public safety and beach access, are mitigated over the period the temporary works are in place.

These coastal protection works are designated development and regionally significant development. Hydrosphere Consulting is preparing a development application and Environmental Impact Statement for these works on behalf of Crown Lands.

Previous coastal erosion fronting Clarkes Beach Holiday Park to the east of the café has been managed by the construction of temporary sandbag walls in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks). The Crown Lands sandbag seawall ties in with the western extent of the sandbag seawall installed by Reflections Holiday Parks. The Reflections seawall is the subject of a separate development application by Reflections Holiday Parks.

Aboriginal Cultural Heritage Impact Assessment

The ACHAR prepared by Everick Heritage recommends the following to ameliorate the likely impacts to Aboriginal cultural heritage values of the Clarkes Holiday Park 1 midden site:

Recommendation 1: Aboriginal Heritage Impact Permit

It is recommended that an AHIP is sought for the following activities:

- *Decommission of the coastal protection works at the end of the agreed license period.*
- *Revegetation works to provide medium to long-term stability to the dune face, including the use of fabric or plastic material to support the establishment of root structures.*
- *As a mitigation measure it is further recommended that salvage of midden material is undertaken by BoBBAC that has*
 - i. Slumped down the dune face and retained around the temporary geobag system; and*
 - ii. Is at imminent risk of loss from storm surge and high tides.*

It is recommended that the salvaged midden material be temporally stored within a secure area within the office of either BoBBAC until such time as a permanent storage area is identified between BoBBAC and the Proponent. Permanent storage should be in compliance with Requirement 26 of the CoPAI or in accordance with instructions from BoBBAC. It is noted that the permanent reburial area must be recorded as a new AHIMS site and managed as an Aboriginal site.

Crown Lands intends to apply for the AHIP as recommended in the ACHAR. The proposed works are integrated development and the development application will be referred to Heritage NSW.

Please advise any additional requirements for the environmental assessment and approval for the development application and Environmental Impact Statement for the temporary coastal protection works.

Please provide your feedback by 6 August 2021.

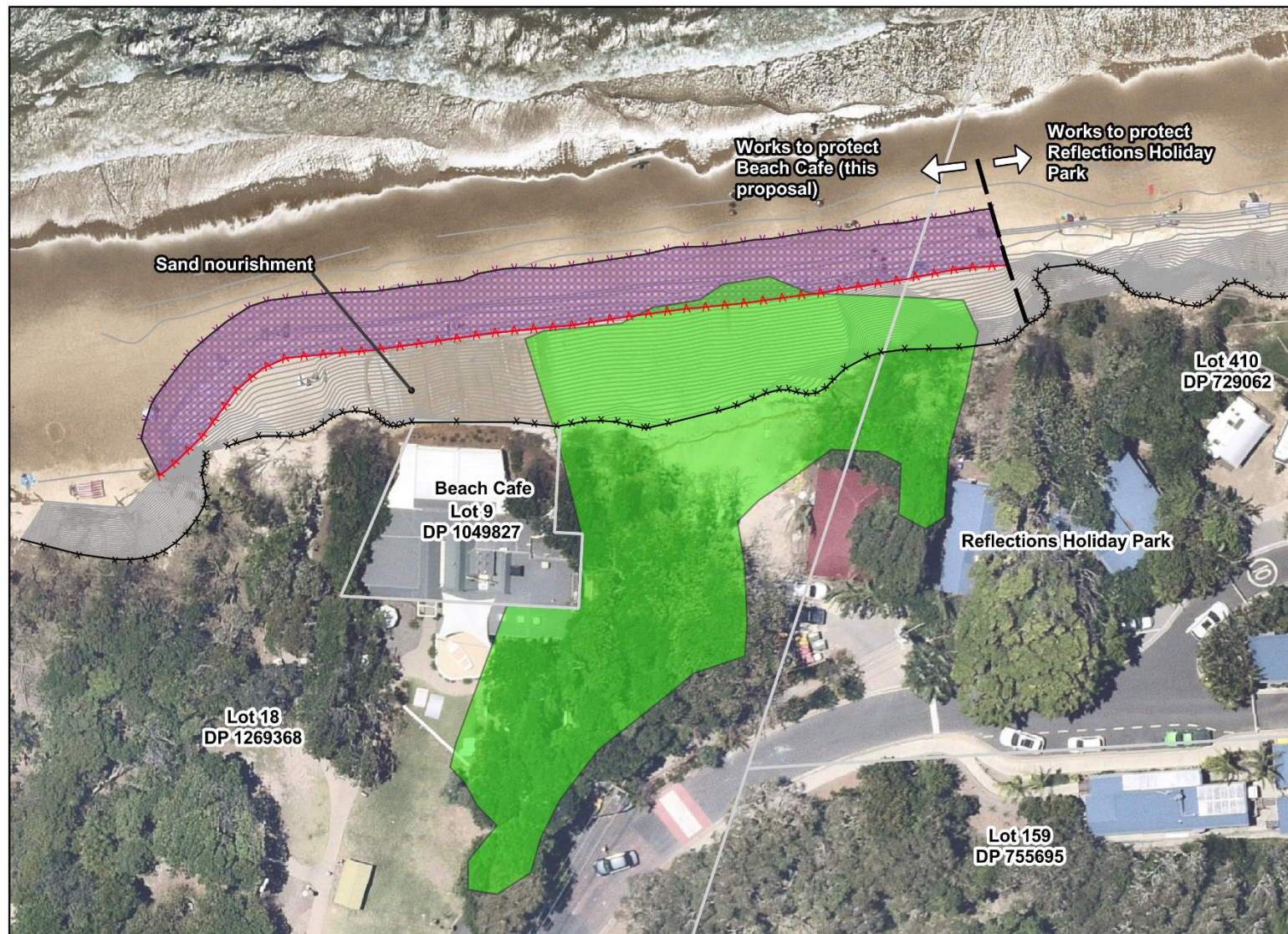
Please contact me on 6686 0084, 0421 145 027 or email robyn@hydrosphere.com.au if you would like to discuss this further.

Yours sincerely,



Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting

Att. Location of works



Legend

- Littoral rainforest mapping
- Extent of sand bags (approx)
- Estimated top of sandbag wall
- Estimated toe of sandbag wall
- Top of Bank
- Contours (0.5m)
- Cadastre

Sources
Byron Shire Council
NSW Government
Byron Bay Surveying Pty Ltd-
DWG No: BYR060.DWG (07/11/2020) and
DWG No: BYR18062G.DWG (11/09/2020)

Note: Extent of sandbags has been
inferred from survey, aerial photography
and design details



Robyn Campbell

From: Rosalie Neve <Rosalie.Neve@environment.nsw.gov.au>
Sent: Friday, 6 August 2021 1:37 PM
To: Robyn Campbell
Subject: RE: Clarkes Beach temporary coastal protection works - integrated development application

Good afternoon Robyn

Based on the process outlined below and your intention to submit the proposal as integrated development we have no additional requirements in relation to the Aboriginal cultural heritage.

Rosalie Neve | Aboriginal Heritage Planning Officer
Heritage NSW, Community Engagement, Department of Premier and Cabinet
T: 0472 828 864 | rosalie.neve@environment.nsw.gov.au



**Premier
& Cabinet**

From: Robyn Campbell [mailto:robyn@hydrosphere.com.au]
Sent: Friday, 16 July 2021 10:20 AM
To: Rosalie Neve <Rosalie.Neve@environment.nsw.gov.au>
Subject: Clarkes Beach temporary coastal protection works - integrated development application

Rosalie

Please find attached a letter regarding the proposed integrated development application by NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) to undertake works at Clarkes Beach, Byron Bay.

Thank you for your input at the site meeting on 29 April 2021 and consultation with Bundjalung of Byron Bay Aboriginal Corporation (BoBBAC) undertaken as part of the Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared by Everick Heritage.

Please advise any additional requirements for the environmental assessment and approval for the development application and Environmental Impact Statement for the temporary coastal protection works.
Please provide your feedback by 6 August 2021.

Regards

Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting
Suite 6, 26-54 River Street
PO Box 7059
Ballina NSW 2478
Tel: +61 2 6686 0084
Mob: 0421 145 027
www.hydrosphere.com.au

Ref: 21-018

Date: 17/05/21

Attn: Andrew Page
Manager, Cape Byron Marine Park
PO Box 127
Byron Bay, NSW 2481

cape.byron@dpi.nsw.gov.au

Dear Andrew,

RE: Consultation with Department of Primary Industries – Cape Byron Marine Park regarding Part 4 temporary coastal protection works and Part 5 stormwater erosion controls and restoration of beach access at Clarkes Beach, Byron Bay

I am writing to you regarding proposals by NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) to undertake works at Clarkes Beach, Byron Bay and consultation requirements under Sections 55 and 56 of the *Marine Estate Management Act 2014* (MEM Act) and Division 1, clause 16 of the *State Environmental Planning Policy (Infrastructure) 2007*. Hydrosphere Consulting is providing project management and environmental assessment services to Crown Lands for this project.

Part 4 Temporary Coastal Protection Works

Clarkes Beach has been subject to significant coastal erosion and recession impacts which increased from mid-July 2019 when an east coast low event coincident with high spring tides caused significant landward movement of the coastal erosion escarpment. Crown Lands constructed a temporary sandbag seawall and associated beach nourishment works at Clarkes Beach in November 2020. The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and 'Beach Byron Café' (the café). The works were authorised under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in accordance with s.19(2)(a) of the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP).

Crown Lands intends to apply for development consent for the sandbag works as well as fencing on the dune and revegetation works, to achieve the following objectives:

1. To provide a degree of temporary protection to the Beach Byron Bay café site from coastal erosion.
2. To provide sufficient time to achieve the reconfiguration and/or 'planned retreat' of the Beach Byron Bay café.
3. To ensure that risks from coastal erosion to public safety and beach access, are mitigated over the period the temporary works are in place.

These coastal protection works are designated development and regionally significant development. Hydrosphere Consulting is preparing a development application and Environmental Impact Statement for these works on behalf of Crown Lands.

DPI (Cape Byron Marine Park) provided a Marine Parks permit in relation to the coastal protection works (MEAA20/264, expires 16 October 2021) for the removal of debris, installation of geofabric bags at the dune toe (in accordance with DPIE Coastal Management team advice), reconfiguration of compromised infrastructure, management of unstable sand cliffs and strategic placement of geofabric bags. We understand that any future or additional works below mean high water will require a further marine park permit under s.55(1)(b) of the MEM Act and that any future or additional works above mean high water will require additional advice under s.56 of the MEM Act.

Previous coastal erosion fronting Clarkes Beach Holiday Park to the east of the café has been managed by the construction of temporary sandbag walls in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks). The Crown Lands sandbag seawall ties in with the western extent of the sandbag seawall installed by Reflections Holiday Parks. The Reflections seawall is the subject of a separate development application by Reflections Holiday Parks.

Part 5 Stormwater Controls and Access Path Reconstruction

The coastal erosion occurring at Clarkes Beach has damaged the pedestrian access stairs to the beach to the west of the café. In addition, stormwater erosion (caused by runoff from the surrounding pathways, other impervious areas and roof drainage) has occurred to the west of the café, scouring the dune face and compromising the integrity of the coastal protection works.

Crown Lands proposes to construct stormwater control works and restore the public access to the beach. The works will be constructed on Lot 18, DP 1269368 (former Lot 10, DP 1049827) to the west of the café, between Clarkes Beach and the public car park along Lawson Street, Byron Bay (Crown Reserve 82000). The location of the works and preliminary designs for the access path and stormwater works are attached to this letter. As part of the works, trees that are at risk of falling onto the beach due to the erosion of the dune scarp will be removed to ensure safety for beach goers.

The proposed stormwater works are designed to slow the flow of water and provide infiltration prior to discharge of stormwater over the dune. Overland stormwater flows will be diverted to a kerb inlet pit. This pit will discharge into a disposal area within the dune (filled with 20 - 50 mm blue metal wrapped in geotextile) via a 300 mm diameter PVC pipe. During large rainfall events, flows will overtop the inlet pit and flow along a swale (0.75 – 3.0 m wide) with Atlantis (infiltration) cells wrapped in geotextile fabric installed along the V-drain centre (depth 240 mm below drain invert). Coconut rolls will be used to slow the flow through the swale and the scoured flow path will be filled with rock and vegetation on sandy topsoil. Roof water from the western section of the café roof will also be discharged into the swale. The swale infill will be located within the existing scoured extents between trees.

Roof water from the eastern section of the café roof currently drains to the north of the café, through the dune onto the beach. Roof runoff will be redirected to the south-east via a 150 mm diameter ag-line pipe.

The current access path is not usable due to coastal erosion. Due to the steepness (approximately 1V:1.5H, 34°) of the dune behind the sandbags, considerable effort is required to provide an access track at the required gradient. It is proposed to construct the portion landward of the vegetation line with board and chain, while the portion seaward of the vegetation line would be a sand ramp with fence posts and guide wire on the seaward side. The lower, seaward portion of the ramp may be damaged by wave runup during times of large waves and/or eroded beach states. This would be reinstated with the placement of additional sand as required.

The proposed works are permissible without consent and will be assessed under Part 5 of the EP&A Act. Crown Lands is both a public authority proponent (EP&A Act Section 5.3) and the determining authority (EP&A Act Section 5.1) for these works.

Request for Input

Please advise any requirements for the environmental assessment and approval for these projects:

1. Development application and Environmental Impact Statement for the temporary coastal protection works.
2. Review of Environmental Factors for stormwater controls and access path reconstruction.

Please provide your feedback by 7 June 2021.

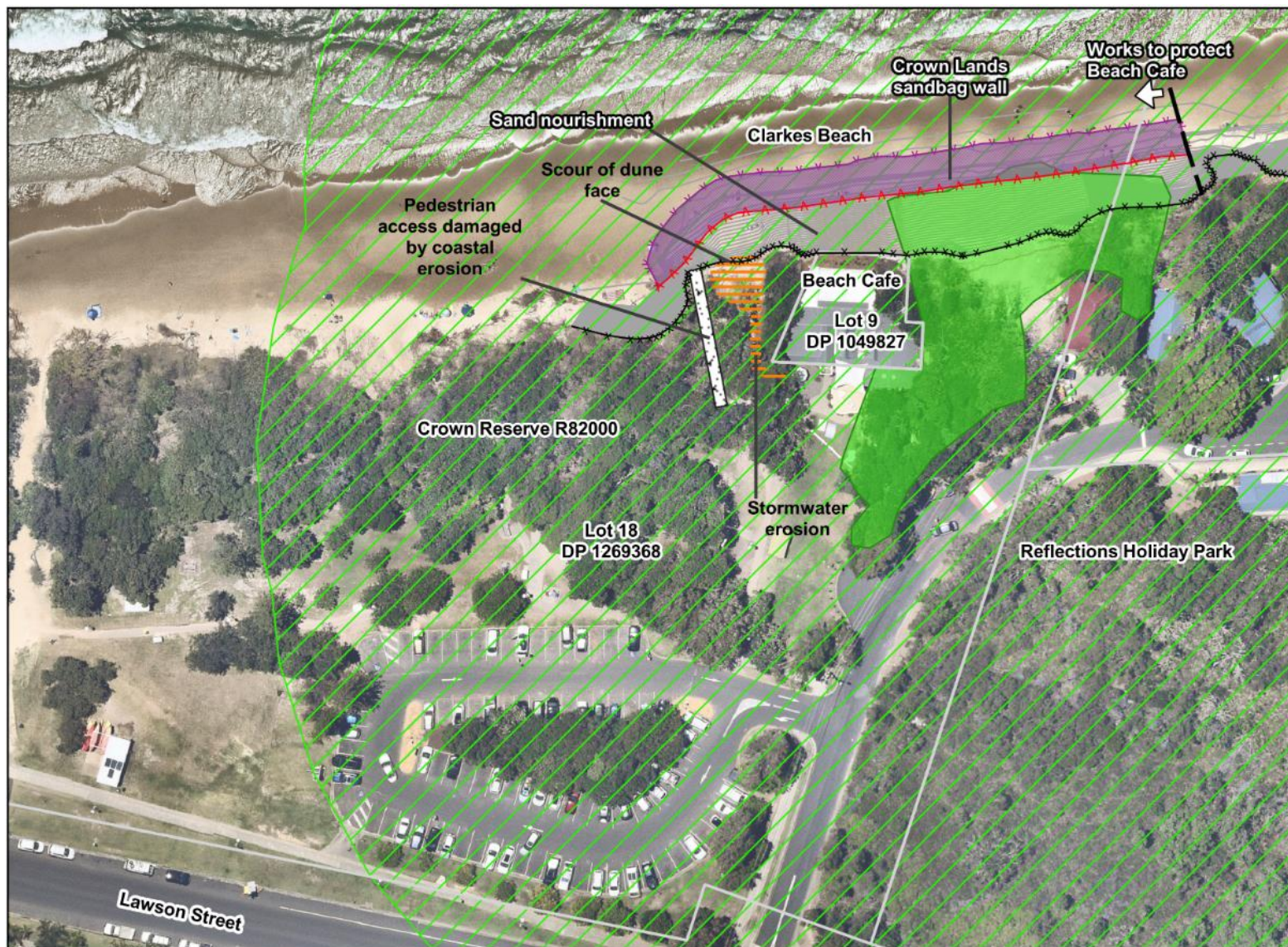
Please contact me on 6686 0084, 0421 145 027 or email robyn@hydrosphere.com.au if you would like to discuss this further.

Yours sincerely,



Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting

Att. Location of works and design drawings



Legend

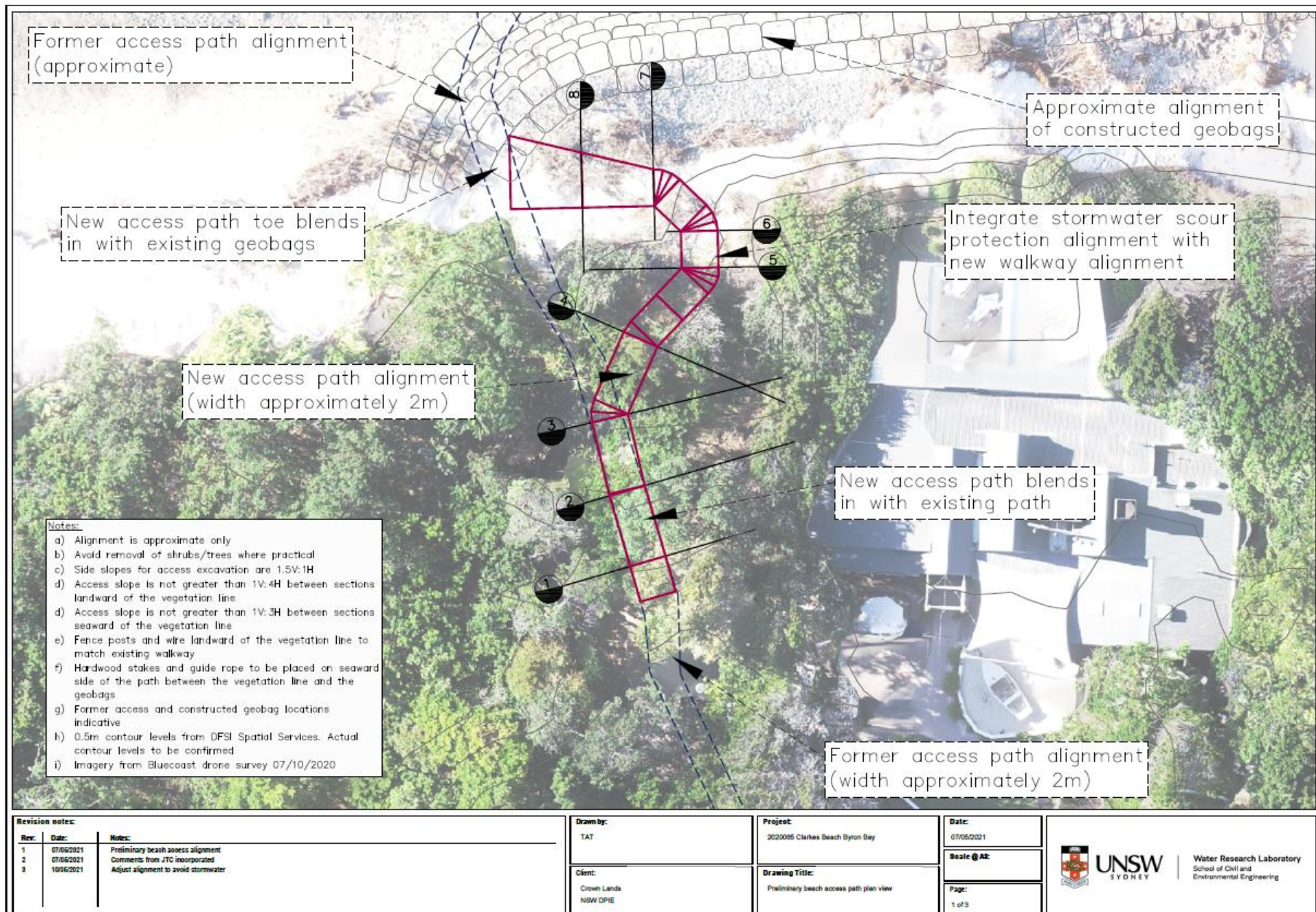
- Littoral rainforest mapping
- Littoral Rainforest Proximity Area
- Extent of sand bags (approx)
- Stormwater erosion
- Pedestrian access damaged by coastal erosion
- Estimated top of sandbag wall
- Estimated toe of sandbag wall
- Top of Bank
- Contours (0.5m)
- Cadastre

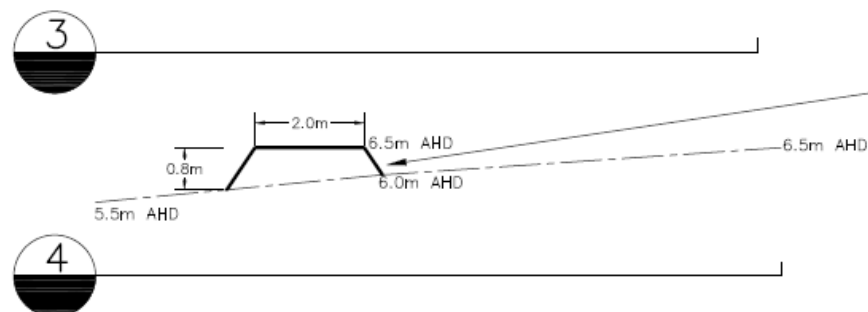
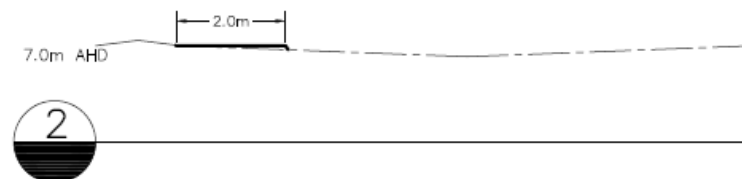
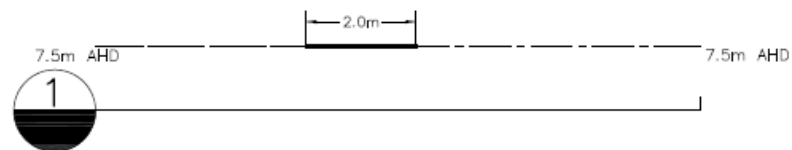
Sources
Byron Shire Council
NSW Government
Byron Bay Surveying Pty Ltd-
DWG No: BYR060.DWG (07/11/2020) and
DWG No: BYR18062G.DWG (11/09/2020)

Note: Extent of sandbags has been inferred from survey, aerial photography and design details



0 10 20 30 m





Notes:

- a) Alignment is approximate only
- b) Avoid removal of shrubs/trees where practical
- c) Side slopes for access excavation are 1.5V:1H
- d) Access slope is not greater than 1V:4H between sections landward of the vegetation line
- d) Access slope is not greater than 1V:3H between sections seaward of the vegetation line
- e) Fence posts and wire landward of the vegetation line to match existing walkway
- f) Hardwood stakes and guide rope to be placed on seaward side of the path between the vegetation line and the geobags
- g) 0.5m contour levels from DFSI Spatial Services. Actual contour levels to be confirmed

Revision notes:

Rev.	Date:	Notes:
1	07/06/2021	Preliminary beach access alignment
2	07/06/2021	Comments from JTC incorporated
3	10/06/2021	Adjust alignment to avoid stormwater

Drawn by:

TAT

Client:

Crown Lands
NSW DPIE

Project:

2020065 Clarkes Beach Byron Bay

Drawing Title:

Preliminary beach access path cross-sections 1

Date:

07/05/2021

Scale @ A3:

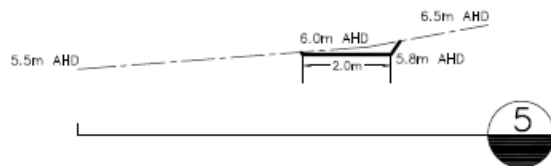
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2 of 3

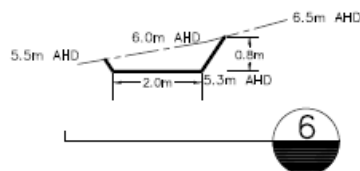


UNSW
SYDNEY

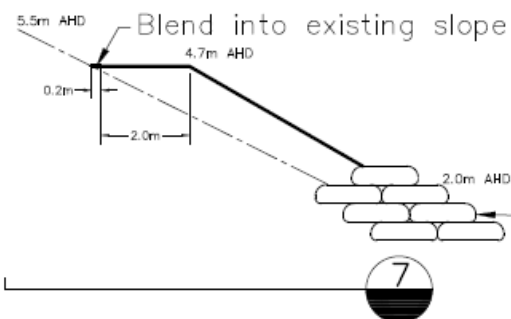
Water Research Laboratory
School of Civil and
Environmental Engineering



Integrate stormwater scour protection alignment with walkway alignment

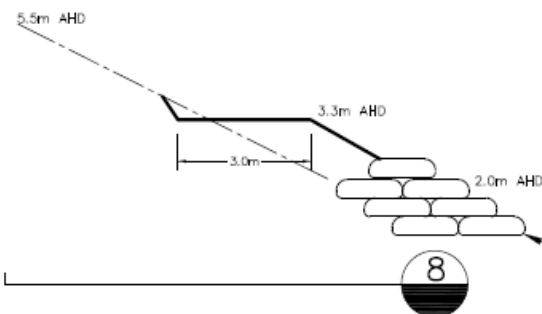


Integrate stormwater scour protection alignment with walkway alignment



Blend into existing slope

Approximate location of geobags



Approximate location of geobags

Notes:

- Alignment is approximate only
- Avoid removal of shrubs/trees where practical
- Side slopes for access excavation are 1.5V:1H
- Access slope is not greater than 1V:4H between sections landward of the vegetation line
- Access slope is not greater than 1V:3H between sections seaward of the vegetation line
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Revision notes:

Rev:	Date:	Notes:
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Drawn by:

TAT

Client:

Crown Lands
NSW DPI

Project:

2020065 Clarks Beach Byron Bay

Drawing Title:

Preliminary beach access path cross-sections 2

Date:

07/06/2021

Scale @ A3:

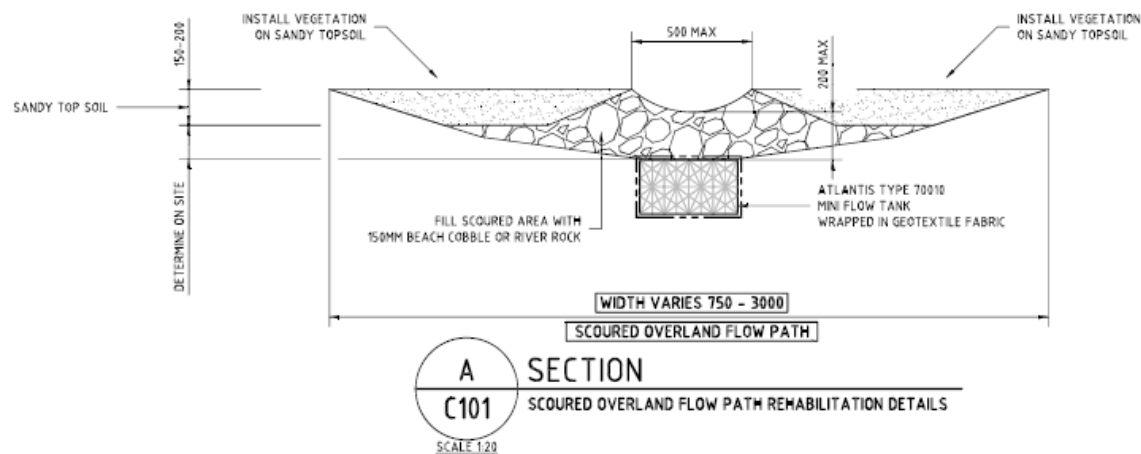
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SYDNEY

Water Research Laboratory
School of Civil and
Environmental Engineering

9

Ref: OUT21/7672

Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting P/L
Suite 6, 26-54 River Street
BALLINA NSW 2478

Via email: robyn@hydrosphere.com.au

Dear Robyn

Consultation with Department of Primary Industries – Cape Byron Marine Park regarding Part 4 temporary coastal protection works and part 5 stormwater erosion controls and restoration of beach access at Clarkes Beach Byron Bay.

I refer to your letter dated 17 May 2021. In summary, it is understood that comment is sought regarding the following proposals:

- 1 Crown Lands is seeking Development Consent for temporary coastal protection works installed in 2020 to remain in place for up to 5 years; and
- 2 Preparation of a REF to guide access path reconstruction and the construction of new stormwater control and management works.

With regard to the first proposal listed above, Sections 55 and 56 of the *Marine Estate Management Act 2014* (MEM Act) require that determining authorities do not carry out or grant approval to carry out activities within or affecting a marine park unless the consent authority has consulted with DPI Fisheries.

The advice of Department of Planning Industry and Environment (DPIE) (Environment, Energy and Science Group – Biodiversity and Conservation Division) coastal management experts and engineers is seen as an appropriate and efficient option for advice about management or intervention and is a key source of guidance for protection works of this nature. Every possible effort must be made to avoid any adverse impacts on the values of Cape Byron Marine Park including impacts to the beach, the marine environment and water quality of the marine park.

DPI has advised previously that any planning or works executed at this site should consider short and long term effects to the values of the marine park, such as local scouring, down drift erosion, the entry of pollutants, pests, disease or other unnatural material to the marine park, and loss of public access or amenity. (Noting Section 27 of the Coastal Management Act (2016) <https://legislation.nsw.gov.au/view/html/inforce/current/act-2016-020#sec.27>).

In 2016, the NSW Government undertook a statewide Threat and Risk Assessment (TARA) to assess and prioritise the threats to social, economic and environmental values of the marine estate. The TARA includes identification of threats to marine estate values, risk assessment of those threats, and identification of available evidence to support the assessment. It can be accessed at https://www.marine.nsw.gov.au/key-initiatives/threat-and-risk-assessment?SQ_VARIATION_679441=0.

Beach nourishment and grooming has been identified as a priority threat for the north region of NSW, including Byron Bay. It is essential that these threats are carefully considered and managed.

I am advised by the Bundjalung of Byron Bay Aboriginal Corporation RNTBC (Arakwal) that the locality of the works is culturally significant. DPI expects that any advice provided by the Corporation, including the need for monitoring of the site during any works, is adhered to.

Please note that the boundary of the Cape Byron Marine Park at this location is generally to the Mean High Water Mark. Any access arrangements or activities taking place above that may require approvals from other agencies or land owners/managers.

Note that the comments provided here under section 56 of the MEM Act relate to the proposal to preserve the existing geobag wall as it exists at the date of this letter. I confirm that any future or additional works above mean high water will require additional advice under section 56 of the MEM Act, and any future or additional works below mean high water will require a marine park permit. These considerations may include discharge of the contents of geofabric bags.

Given that the works are contiguous with a similar adjacent structure it is expected that future arrangements are planned and coordinated appropriately.

With regard to the second proposal — Preparation of an REF to guide access path reconstruction and the construction of new stormwater control and management works on the foredunes at Clarkes Beach, adjacent to the tidal waters of the Cape Byron Marine Park (CBMP). It is my expectation that any proposed activities will be planned and executed in accordance with the intent of Marine Estate Management legislation and the level of protection afforded adjacent waters.

The New South Wales Marine Estate Threat and Risk Assessment Final Report 2017 identifies urban stormwater discharge as a priority threat to the environmental assets of the Marine Estate (Table ES 1-2). The proposed work site is adjacent to a popular surfing beach and close to a Marine Park Sanctuary Zone. CBMP consistently advises that any new or replacement stormwater infrastructure draining to the marine park should include litter traps or similar gross pollutant traps. It is considered that the installation and maintenance of pollutant traps would also meet local community expectations for this popular area.

The waters of the marine park must be protected from any impacts associated with construction works - for example, inputs of foreign materials such as building debris, silt run off, plastic litter, contaminated or potential acid sulphate soils, or other contaminants including those associated with fill material.

In addition, any works must be undertaken in accordance with or exceeding the recommendation of "Managing Urban Stormwater - Soils and Construction Vol 14th Edition March 2004" Published by the NSW Government ("the Blue Book")

<http://www.environment.nsw.gov.au/stormwater/publications.htm>

If you have any queries concerning the above, please do not hesitate to contact me by telephone 02 6620 9305 / 0439 485 266 or email cape.byron@dpi.nsw.gov.au

Yours sincerely



Andrew Page

Manager, Cape Byron Marine Park

10 June 2021

Ref: 21-018

Date: 17/05/21

Attn: Jonathan Yantsch
Department of Primary Industries - Fisheries
1243 Bruxner Highway
Wollongbar, NSW 2477

jonathan.yantsch@dpi.nsw.gov.au

Dear Jonathan,

RE: Consultation with Department of Primary Industries – Fisheries regarding Part 4 temporary coastal protection works at Clarkes Beach, Byron Bay

I am writing to you regarding a proposal by NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) to undertake works at Clarkes Beach, Byron Bay and consultation requirements under Section 199 of the *Fisheries Management Act 1994* (dredging and reclamation works). Hydrosphere Consulting is providing project management and environmental assessment services to Crown Lands for this project.

Part 4 Temporary Coastal Protection Works

Clarkes Beach has been subject to significant coastal erosion and recession impacts which increased from mid-July 2019 when an east coast low event coincident with high spring tides caused significant landward movement of the coastal erosion escarpment. Crown Lands constructed a temporary sandbag seawall and associated beach nourishment works at Clarkes Beach in November 2020. The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and 'Beach Byron Café' (the café). The works were authorised under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in accordance with s.19(2)(a) of the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP).

Crown Lands intends to apply for development consent for the sandbag works as well as fencing on the dune and revegetation works, to achieve the following objectives of the works:

1. To provide a degree of temporary protection to the Beach Byron Bay café site from coastal erosion.
2. To provide sufficient time to achieve the reconfiguration and/or 'planned retreat' of the Beach Byron Bay café.
3. To ensure that risks from coastal erosion to public safety and beach access, are mitigated over the period the temporary works are in place.

These coastal protection works are designated development and regionally significant development. Hydrosphere Consulting is preparing a development application and Environmental Impact Statement for these works on behalf of Crown Lands.

Previous coastal erosion fronting Clarkes Beach Holiday Park to the east of the café has been managed by the construction of temporary sandbag walls in July 2019 by NSW Crown Holiday Parks Land Manager (trading as Reflections Holiday Parks). The Crown Lands sandbag seawall ties in with the western extent of the sandbag seawall installed by Reflections Holiday Parks. The Reflections seawall is the subject of a separate development application by Reflections Holiday Parks.

Referral under s199 of the Fisheries Management Act

Please advise any requirements for the environmental assessment and approval for the development application and Environmental Impact Statement for the temporary coastal protection works.

Please provide your feedback by 7 June 2021.

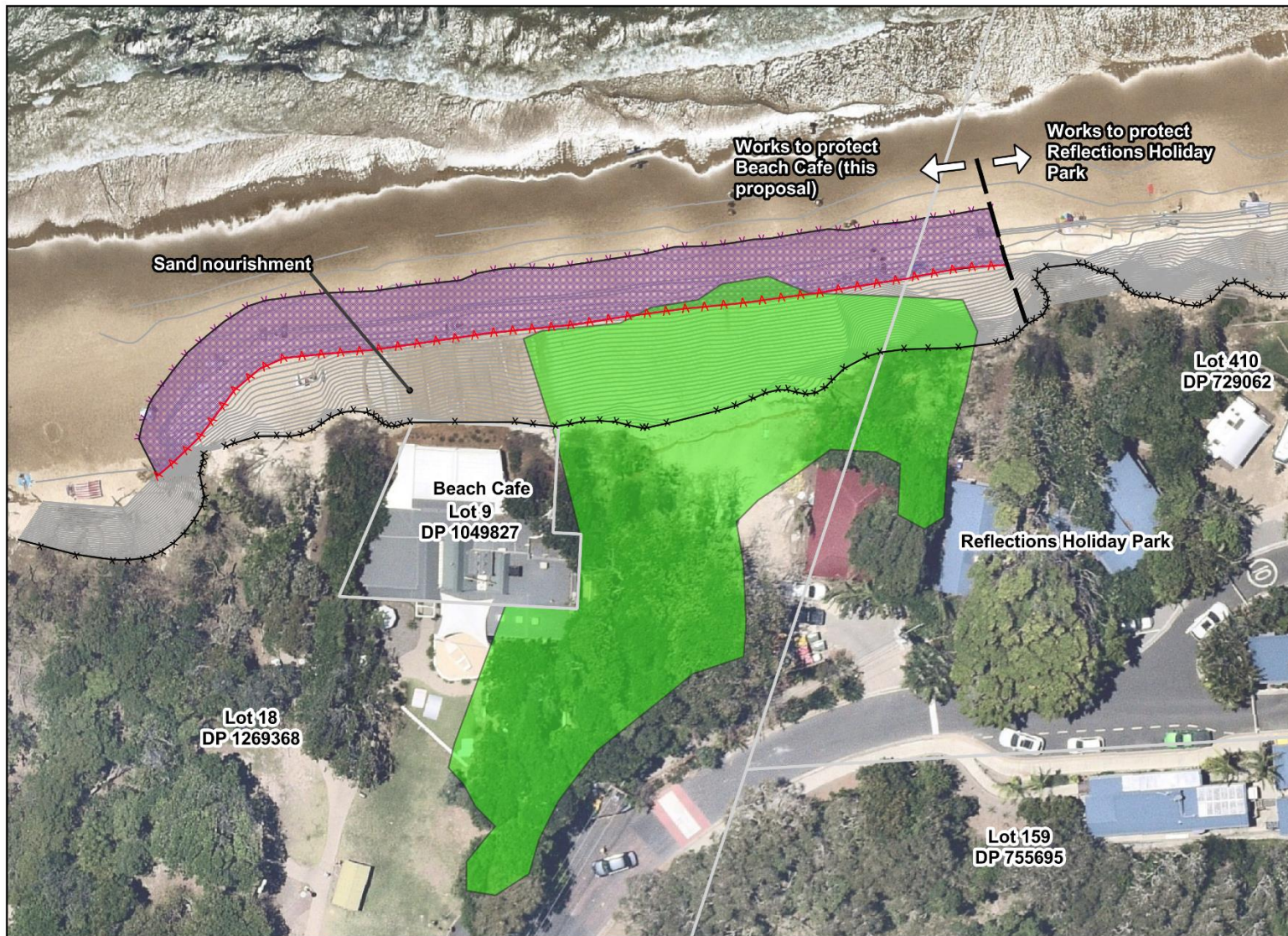
Please contact me on 6686 0084, 0421 145 027 or email robyn@hydrosphere.com.au if you would like to discuss this further.

Yours sincerely,



Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting

Att. Location of works



Legend

- Littoral rainforest mapping
- Extent of sand bags (approx)
- Estimated top of sandbag wall
- Estimated toe of sandbag wall
- Top of Bank
- Contours (0.5m)
- Cadastre

Sources
Byron Shire Council
NSW Government
Byron Bay Surveying Pty Ltd-
DWG No: BYR060.DWG (07/11/2020) and
DWG No: BYR18062G.DWG (11/09/2020)

Note: Extent of sandbags has been
inferred from survey, aerial photography
and design details



Robyn Campbell

From: Jonathan Yantsch <jonathan.yantsch@dpi.nsw.gov.au>
Sent: Monday, 7 June 2021 8:10 PM
To: Robyn Campbell
Cc: Andrew Page
Subject: RE: Consultation with Department of Primary Industries – Fisheries regarding Part 4 temporary coastal protection works at Clarkes Beach, Byron Bay

Hi Robyn

Thank you for your email.

Given that the location of the sand bag works will be high up in the intertidal zone and are unlikely to pose significant impacts on key fish habitat, DPI Fisheries have no specific requirements with regard to information that should be contained within the environmental impact statement for the proposed works. DPI Fisheries' standard minimum information requirements for environmental assessment are clearly detailed in section 3.3 of the DPI Fisheries [Policy and guidelines for fish habitat conservation and management \(Update 2013\)](#).

I have CC'd Andrew Page, Cape Byron Marine Park Manager into this response given components of the works will be located within the Cape Byron Marine Park.

Regards

Jonathan

Jonathan Yantsch | Senior Fisheries Manager - Coastal Systems (North Coast)
Aboriginal Fishing & Marine and Coastal Environments
NSW Department of Primary Industries | Fisheries
1243 Bruxner Hwy | Wollongbar | NSW 2477
T: 02 6626 1375 | **M:** 0447 537 168 | **E:** jonathan.yantsch@dpi.nsw.gov.au

PERMIT APPLICATION FORMS & FISH HABITAT POLICIES:

www.dpi.nsw.gov.au/fishing/habitat/protecting-habitats/toolkit
Submit permit applications via email to ahp.central@dpi.nsw.gov.au

NB: From date of receipt of application, please allow:

- 21 days for s199 Consultations
- 28 days for Permits, Consultations and Land Owner's Consent responses
- 40 days for Integrated Development Applications

KNOWN & EXPECTED DISTRIBUTION OF THREATENED FISH SPECIES:

www.dpi.nsw.gov.au/fishing/threatened-species/threatened-species-distributions-in-nsw

DPI Fisheries acknowledges that it stands on Country which always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative approaches to our work.

From: Robyn Campbell <robyn@hydrosphere.com.au>
Sent: Monday, 17 May 2021 4:20 PM
To: Jonathan Yantsch <jonathan.yantsch@dpi.nsw.gov.au>
Subject: Consultation with Department of Primary Industries – Fisheries regarding Part 4 temporary coastal protection works at Clarkes Beach, Byron Bay

Hi Jonathan

Please find attached correspondence regarding this project.

Robyn Campbell

Senior Environmental Engineer

Hydrosphere Consulting

Suite 6, 26-54 River Street

PO Box 7059

Ballina NSW 2478

Tel: +61 2 6686 0084

Mob: 0421 145 027

www.hydrosphere.com.au

Ref: 21-018

Date: 1/6/21

Attn: Veda Turner
Brunswick Catchment Dunecare – Green and Clean Awareness Team
vedaturner@gmail.com

Dear Veda,

RE: Consultation with Dune Care regarding works at Clarkes Beach, Byron Bay - stormwater erosion controls and restoration of beach access

I am writing to you regarding proposals by NSW Department of Planning, Industry & Environment – Crown Lands (Crown Lands) to undertake works at Clarkes Beach, Byron Bay. Hydrosphere Consulting is providing project management and environmental assessment services to Crown Lands for this project.

Part 4 Temporary Coastal Protection Works

Clarkes Beach has been subject to significant coastal erosion and recession impacts which increased from mid-July 2019 when an east coast low event coincident with high spring tides caused significant landward movement of the coastal erosion escarpment. Crown Lands constructed a temporary sandbag seawall and associated beach nourishment works at Clarkes Beach in November 2020. The coastal protection works were designed to mitigate, over the short term, coastal erosion risks to the adjacent Crown reserve, Crown road and 'Beach Byron Café' (the café). Crown Lands intends to apply for development consent for the sandbag works to remain in place for a nominal 5-year period (as well as dune revegetation works).

Part 5 Stormwater Controls and Access Path Reconstruction

The coastal erosion occurring at Clarkes Beach has damaged the pedestrian access stairs to the beach to the west of the café. In addition, stormwater erosion (caused by runoff from the surrounding pathways, other impervious areas and roof drainage) has occurred to the west of the café, scouring the dune face and compromising the integrity of the coastal protection works.

Crown Lands proposes to construct stormwater control works and restore the public access to the beach. The works will be constructed on Lot 18, DP 1269368 (former Lot 10, DP 1049827) to the west of the café, between Clarkes Beach and the public car park along Lawson Street, Byron Bay (Crown Reserve 82000). The location of the works and preliminary designs for the access path and stormwater works are attached to this letter. As part of the works, trees that are at risk of falling onto the beach due to the erosion of the dune scarp in this area will be removed to ensure safety for beach goers.

The proposed stormwater works are designed to slow the flow of water and provide infiltration prior to discharge of stormwater over the dune. Overland stormwater flows will be diverted to a kerb inlet pit. This pit will discharge into a disposal area within the dune (filled with 20 - 50 mm blue metal wrapped in geotextile) via a 300 mm diameter PVC pipe. During large rainfall events, flows will overtop the inlet

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Roof water from the eastern section of the café roof currently drains to the north of the café, through the dune onto the beach. Roof runoff will be redirected to the south-east via a 150 mm diameter ag-line pipe.

The current access path is not usable due to coastal erosion. Due to the steepness (approximately 1V:1.5H, 34°) of the dune behind the sandbags, considerable effort is required to provide an access track at the required gradient. It is proposed to construct the portion landward of the vegetation line with boardwalk, while the portion seaward of the vegetation line would be a sand ramp with fence posts and guide wire on the seaward side.

Request for Input

We are aware that dune restoration works are conducted in this area. Please advise any feedback on the proposed stormwater controls and access path reconstruction by 11 June 2021.

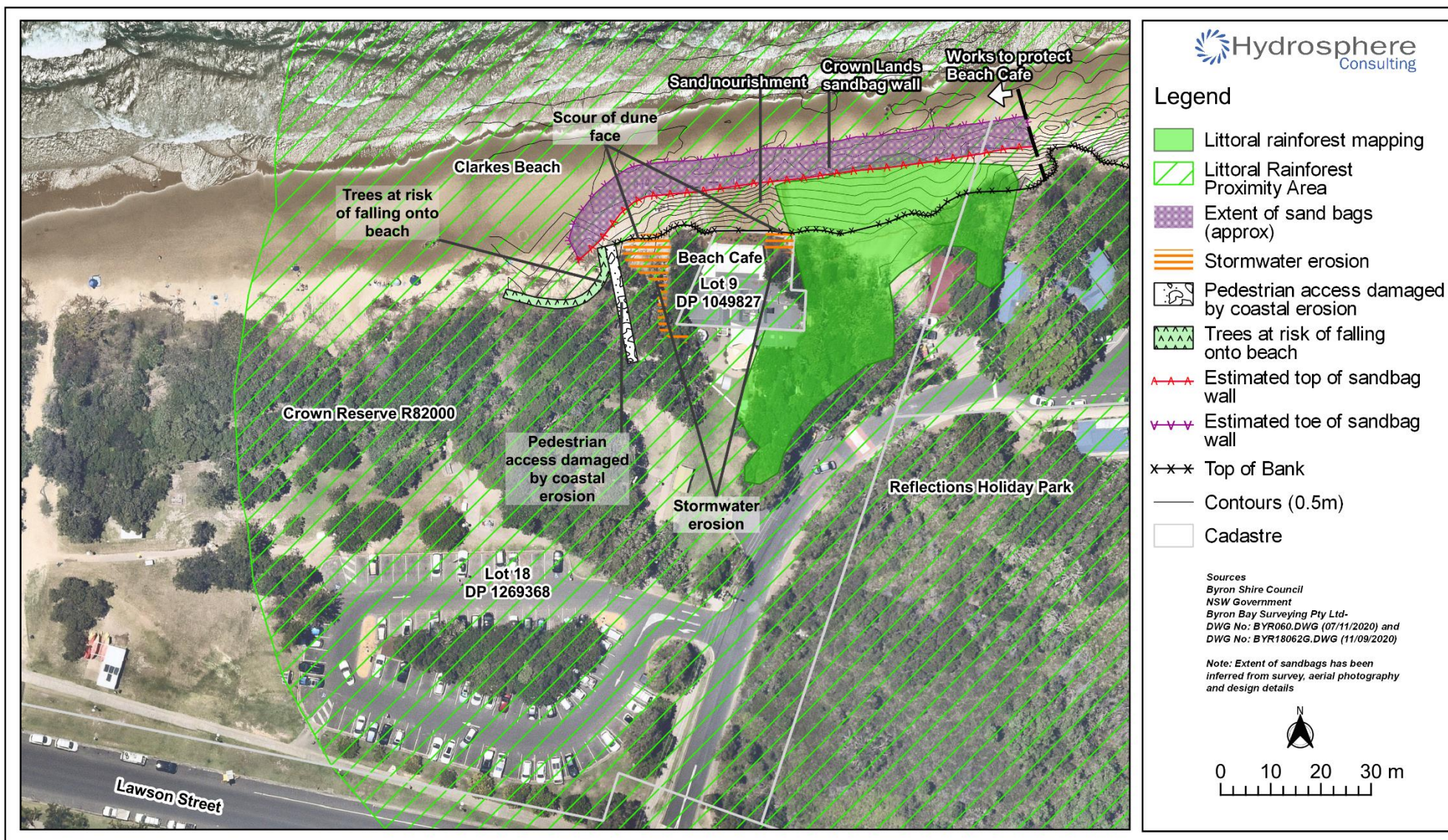
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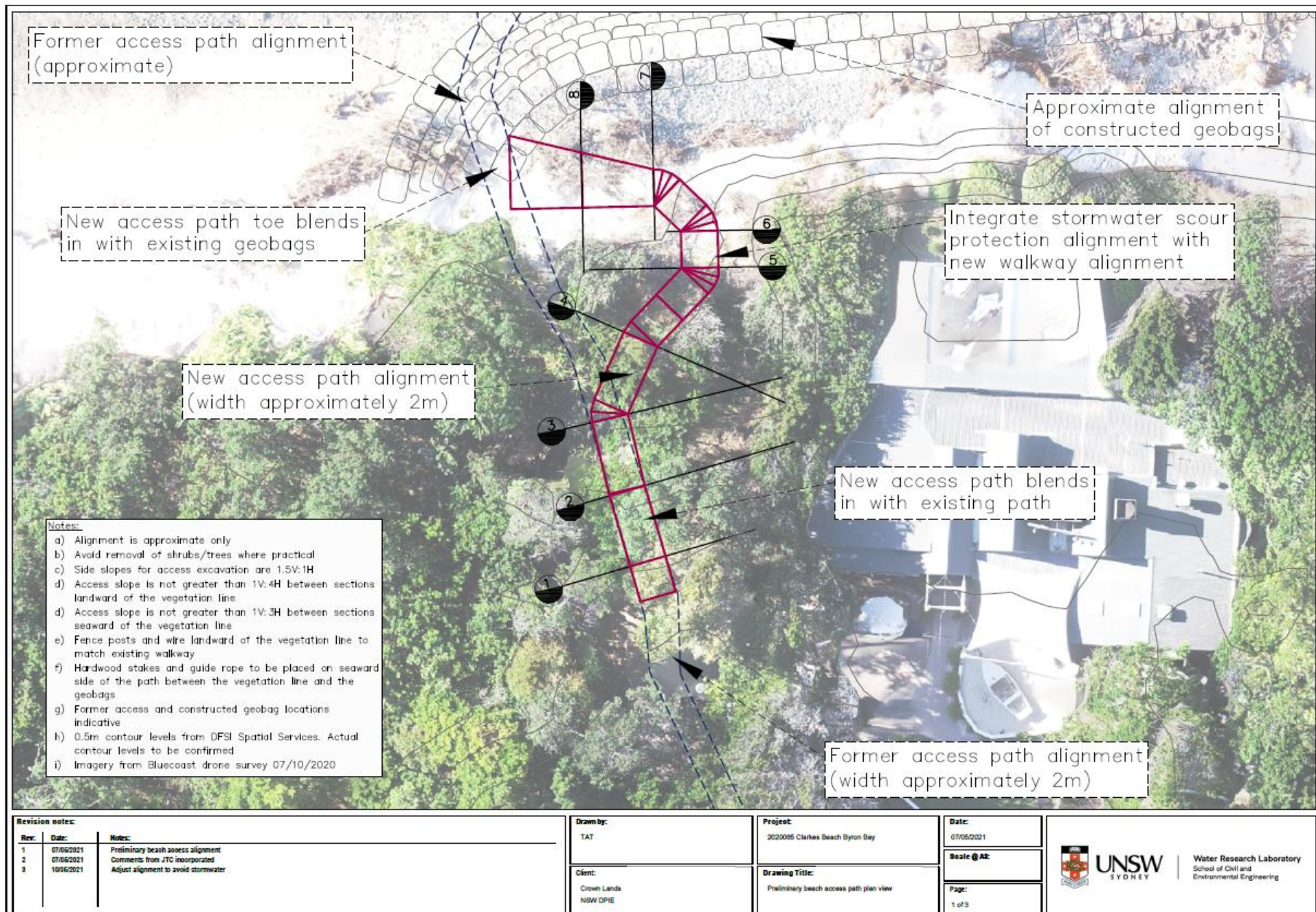
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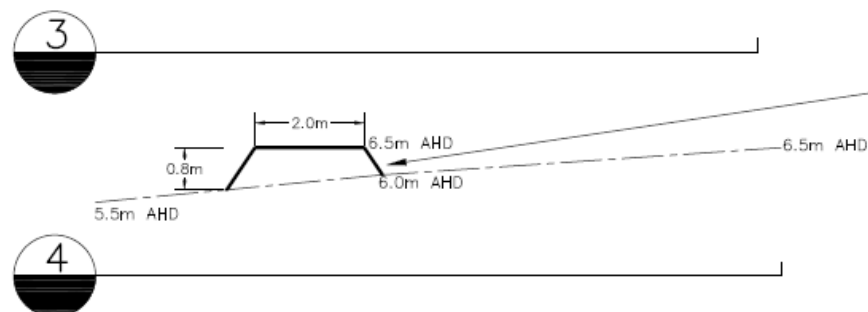
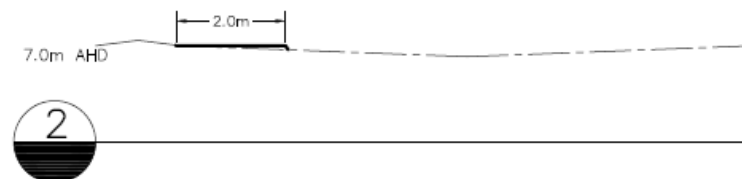
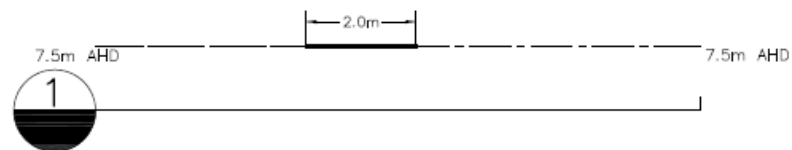


Robyn Campbell
Senior Environmental Engineer
Hydrosphere Consulting

Att. Location of works and design drawings







Notes:

- a) Alignment is approximate only
- b) Avoid removal of shrubs/trees where practical
- c) Side slopes for access excavation are 1.5V:1H
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Crown Lands
NSW DPIE

Project:

2020065 Clarkes Beach Byron Bay

Drawing Title:

Preliminary beach access path cross-sections 1

Date:

07/05/2021

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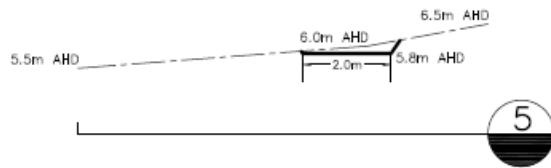
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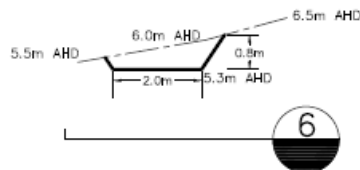


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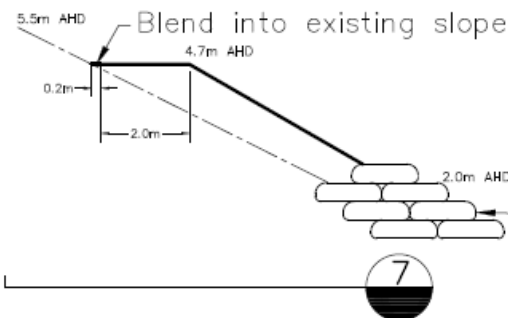
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Integrate stormwater scour protection alignment with walkway alignment

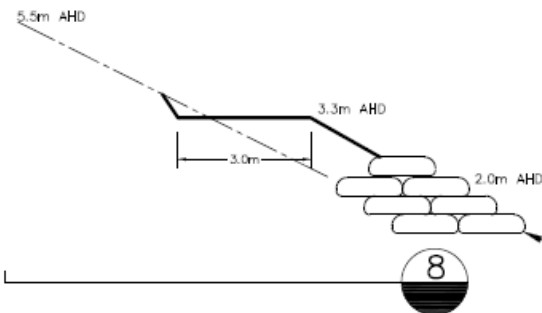


Integrate stormwater scour protection alignment with walkway alignment



Blend into existing slope

Approximate location of geobags



Approximate location of geobags

Notes:

- Alignment is approximate only
- Avoid removal of shrubs/trees where practical
- Side slopes for access excavation are 1.5V:1H
- Access slope is not greater than 1V:4H between sections landward of the vegetation line
- Access slope is not greater than 1V:3H between sections seaward of the vegetation line
- Fence posts and wire landward of the vegetation line to match existing walkway
- Hardwood stakes and guide rope to be placed on seaward side of the path between the vegetation line and the geobags
- 0.5m contour levels from DFSI Spatial Services. Actual contour levels to be confirmed

Revision notes:

Rev:	Date:	Notes:
1	07/06/2021	Preliminary beach access alignment
2	07/06/2021	Comments from JTC incorporated
3	10/06/2021	Adjust alignment to avoid stormwater

Drawn by:

TAT

Client:

Crown Lands
NSW DPIE

Project:

2020065 Clarkes Beach Byron Bay

Drawing Title:

Preliminary beach access path cross-sections 2

Date:

07/06/2021

Scale @ A3:

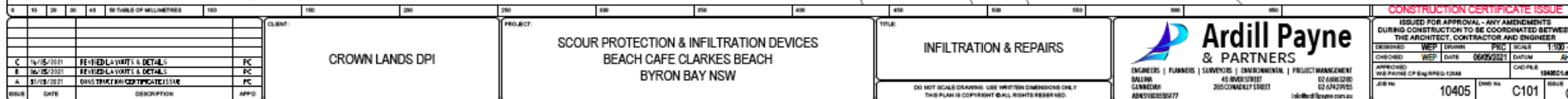
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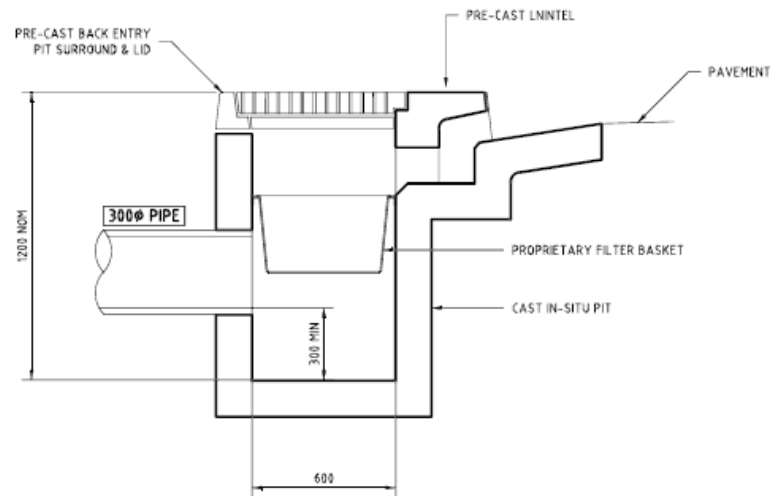
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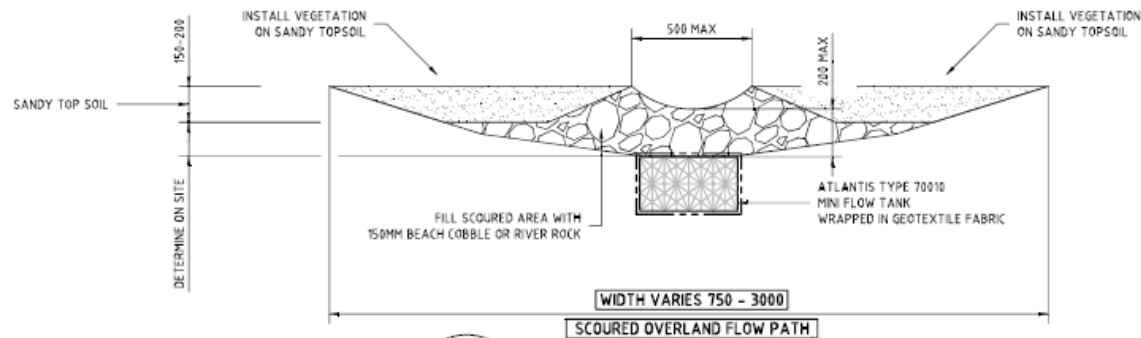
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B
C101
SECTION
INLET PIT GENERAL ARRANGEMENT
SCALE 1:20



A
C101
SECTION
SCoured OVERLAND FLOW PATH REHABILITATION DETAILS
SCALE 1:20

0 10 20 30 40 50 TABLE OF METRES 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000										CONSTRUCTION CERTIFICATE ISSUE									
CLIENT: CROWN LANDS DPI										PROJECT: SCOUR PROTECTION & INFILTRATION DEVICES BEACH CAFE CLARKES BEACH BYRON BAY NSW									
TITLE: DETAIL SHEET 1										 Ardill Payne & PARTNERS ENGINEERS PLANNERS SURVEYORS ENVIRONMENTAL PROJECT MANAGEMENT 43 RIVER STREET 285 CONNELL STREET 4005 BODILLY STREET									
B 04/05/2021 REVISED LAYOUTS & DETAILS JC A 01/08/2021 CONSTRUCTION CERTIFICATE ISSUE JC										DURING CONSTRUCTION TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR AND ENGINEER DESIGNED: WEP DRAWN: PNC SCALE: 1:20 L&S CHECKED: WEP DATE: 06/05/2021 DATE: JND APPROVED: INFILTRATION OF SOIL SPDS 100M DATE: 10/05/2021 JOB No: 10405 DWG No: C201 ISSUE: B									

Robyn Campbell

From: Veda Turner <vedaturner@gmail.com>
Sent: Tuesday, 8 June 2021 12:06 PM
To: Robyn Campbell
Cc: Miles Shorten; Erskine, Andy; Cate Coorey
Subject: Re: Temporary Coastal Protection Works - Clarkes Beach

Follow Up Flag: Follow up
Flag Status: Completed

Hello Robyn,

Thank you for the opportunity to comment on the proposed works.

I have discussed the plan with members of our group.
We have serious concerns that the works proposed will add to the current erosion issues to the north of the current sandbag placement at the Cafe.

Our group feel that for any erosion controls at Clarkes Beach to have a lasting positive effect, sandbags will need to be continued, possibly to the Main Beach groyne.

It is widely accepted, and very evident at Clarkes and Cavvanbah Beach, that immediately north of fixed erosion controls, there is a greatly increased risk of erosion.

The Disabled Access path and the Vehicular Access onto Clarkes Beach are clearly impacted. The rate of erosion along the beach will soon have taken all dune vegetation in some areas, and will be putting Denning Park, the footpath and eventually Lawson St at risk.

We believe the time to act is immediate. Council and Crown Lands must put a plan in place and act together to protect this vital asset of our community and the local tourism industry.

I am now away until Friday, but am contactable on the mobile number below

Best Regards,

Veda Turner
Byron Kinesiology Centre
Co-ord. Green & Clean Dunecare
0427 857991

On Tue, 1 Jun 2021 at 10:18, Robyn Campbell <robyn@hydrosphere.com.au> wrote:

Dear Dune Care representative

DPIE – Crown Lands is planning to construct rehabilitation works associated with the temporary coastal protection works in front of the café on Clarkes Beach (stormwater controls and beach access path). Please find attached a letter regarding the proposed works. Please provide any feedback by return email by 11 June or contact me if you require further information.