



24th October 2012

NSW Coastal Panel
Office of Environment & Heritage
PO Box A209
Sydney South
NSW 1232

RE: Erosion Protection Works at Old Bar
DP524933 – DP1028979 incl Meridian Resort
Your Ref: DOC12/34287

Dear Sir/Madam,

In response to your letters of 7th & 27th August 2012 requesting further information regarding the above application, the specific concerns identified have been addressed below. Also enclosed is a hard copy and electronic copy of the amended drawings [revision A] and consent of owners of 38 & 40 Lewis St. If an amended Statement of Environmental Effects is required, please advise.

- **Land ownership and consent for the development application from the owners of 38 and 40 Lewis St;**

Please find enclosed proof of ownership and a letter from the new owners of 38 & 40 Lewis St providing consent for the development application.

- **Quantification of 'end effects' to the north and south of the proposed structure when a design erosion volume of 220m³/m is adopted;**

Based on the DECC&W draft guidelines [WRL, 2011] and Carley et al [2010] as outlined in section 7.1.2 of the Statement of Environmental Effects and adopting a design erosion volume of 220m³/m, the following end effects are expected:

The design erosion volume of 220m³/m was adopted by the Hazard Definition Study (Worley Parsons, 2010) to generate the immediate hazard line. If this is increased by 80% (to 396m³/m) in accordance with the guidelines, this equates to maximum additional erosion beyond the immediate hazard line (r) of ~24m. [Figure 1]

The alongshore extent of erosion (S) is estimated as extending up to 70% of the length of the wall or 500m, whichever is the lesser. For the proposed works, the length of the wall is taken as 200m (the length of the wall below 4m AHD) and as such the nominal alongshore extent of erosion on this basis could potentially be up to 140m. [Figure 1]

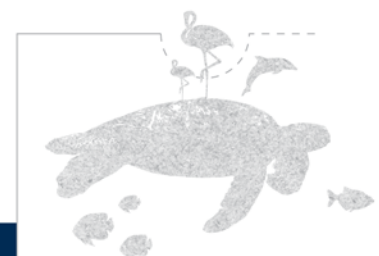




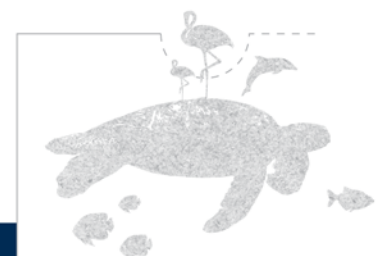
Figure 1 - Area of potential end effects [assuming extension of the wall along preferred alignment]

It is noted that this end effect is relevant to a design event (or series of design events) and even in this case the actual observed end effect could be substantially lower. Given the northerly sediment transport in ambient conditions, some recovery of these areas might also be expected post-storm, although while this might result in greater buffer for future erosion events it is unlikely to result in full regeneration of any lost dune given the height of the scarp.

Without extension of the proposed erosion protection works, the properties at the northern end of the structure will continue to experience long term recession. The fact that the Hazard Definition Study [2010] indicates both net transport and the storm-induced transport is in a southerly direction indicates that any end effects would typically be expected at the southern end of the structure although the potential for northerly transport and associated end effects is conceivable in some conditions, particularly in the longer term.

- How 'end effects' are proposed to be addressed and managed by the proponents in the short and long term (i.e. if erosion impacts on adjoining properties are increased);

As erosion continues (as a result of ongoing natural erosion or as a result of any exacerbated erosion as a result of end effects) additional infrastructure and land will come under threat and the structure will be flanked. To address this threat, it is preferable for the wall to be extended to protect these properties, residences & infrastructure [Figure 2] rather than mitigating this impact through temporary measures (e.g. the placement of sand).

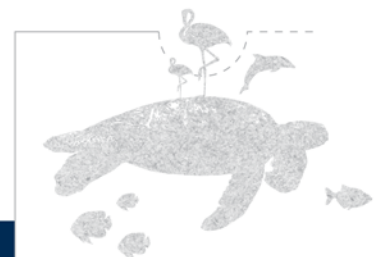




As part of the submissions to the NSW Coastal Panel in response to this application, a number of owners have indicated that they would be supportive of an extended wall alignment (properties of supportive owners marked in green in Figure 3). The remaining owners did not object to the initial proposal (which included allowance for extension of the walls as required).



Figure 2 – Proposed return wall extension [extract from ICM drawing OB-EPW-005]



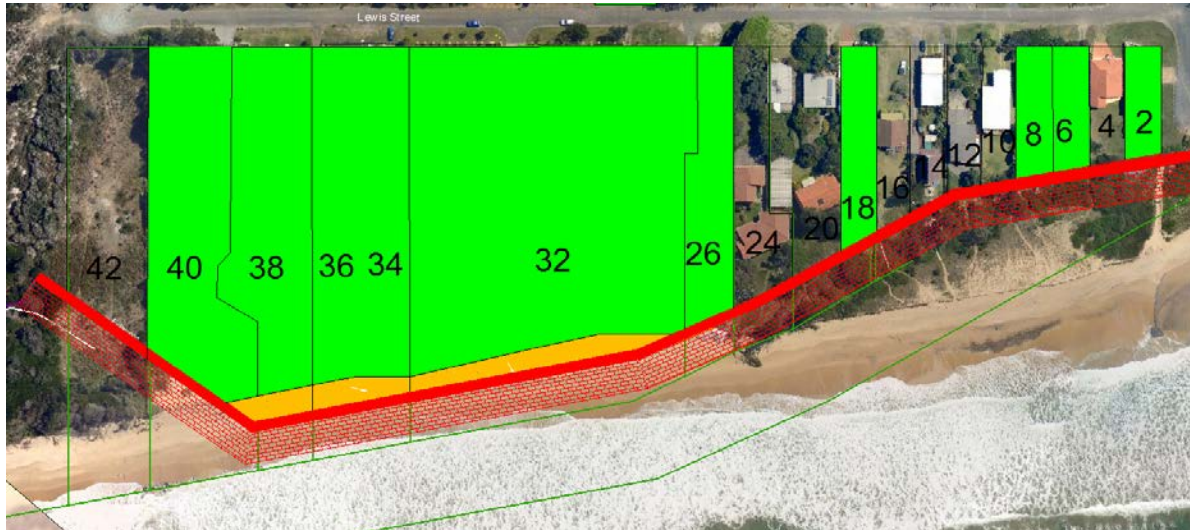


Figure 3 – Sketch identifying [in green] owners who are supportive of an extended wall alignment

In terms of the 'end effects' alone, the property potentially most affected (i.e. 42 Lewis Street) is presently undeveloped. It would be expected that development of this unprotected property would be difficult given that the entire property lies seaward of the Worley Parsons [2010] nominated 2108 erosion hazard line. Extension of the wall along the proposed alignment could be considered to effectively mitigate the risk to this property owner. The owner has not responded to previous attempts to make contact and has not responded to the initial application.

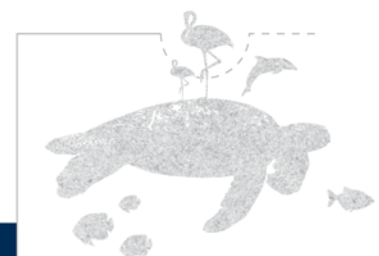
On the larger property further to the south, it is understood that approved [but as yet unconstructed] future development is effectively limited to areas substantially landward of the area which could potentially be affected by end effects. Erosion which affects development is only likely to occur in the much longer term, during which time it is expected that beach management of this area will need to be reassessed.

- If 'end effects' are experienced, how public safety is proposed to be managed by the proponents (e.g. from any increased risk to the walls' structural integrity as a result of flanking);

Given the width of the immediate and 100 year hazard zones, extension of the returns to completely protect against flanking in the short or long term would require significant excavation. As such, it is desirable for the returns to be extended as required. In the event that the location is subject to smaller events, this will likely result in gradual erosion of the scarps adjacent to the return and the walls may be extended without the structure being flanked. In a major event or series of major events, however, a significant level of natural erosion could be anticipated and flanking of the structure at either / both ends could result prior to arrangement of extension of the returns. In the event of the structure being flanked, any damaged sections of wall will require restacking and the wall will need to be extended as required. The potential safety hazard the damaged wall and adjacent erosion presents to the public will be dependent on the extent of the erosion. Management of this risk is addressed in the Seawall Management Plan [enclosed]. It is noted that the narrow beaches and the height of the existing scarps already present a significant safety hazard to beach users during high tides and after storm events.

- Achieving restoration of the beach during and after the life of the works and how this would occur;

While seawalls can result in exacerbated erosion during storm events, they also typically experience heightened accretion subsequent to the storm event. As such, restoration of the beach during the life of the works will be achieved naturally without the need for further intervention by the owners. Any loss of beach width in front of the wall in the longer term would





be the result of landward movement of the natural profile as a result of natural erosion and cannot be effectively remediated on such a short stretch of foreshore. As such, implementation of a broader beach management strategy would be required to provide a wider beach.

Options for beach management have been investigated by Worley Parsons and consideration is presently being given by the community to methods for pursuing active beach management along this vulnerable stretch of coastline, however it is expected that this process may prove to be time-consuming and the proposed works may be required in the interim prior to a beach management strategy being implemented (or in the longer term if no further beach management is undertaken). It is noted that the proposed works are not expected to be inconsistent with any effective beach management strategy that could be implemented in the future (including submerged reef(s) and/or beach nourishment). A wider, managed beach would result in burial of the proposed works, minimise the potential for reflection and end effects while retaining the wall itself for protection in the event of major erosion events.

In terms of restoration of the beach after the life of the works, this is addressed separately in "Long term plans for the decommissioning of the wall" below.

- **Justification for the proposed design in terms of its adequacy for the expected design life and consideration for alternative designs that may improve structural integrity such as a double layer wall with three layers at the toe to a depth of -1m AHD;**

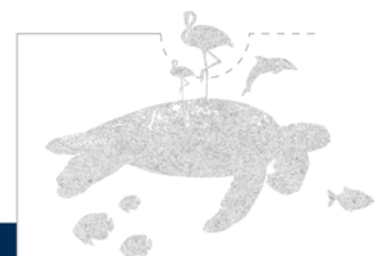
The proposed single layer wall and toe design has been used in many other similar structures in Queensland and New South Wales, many in similarly exposed locations, and is considered to be structurally acceptable. While the cost is much higher for the alternate dual layer design and toe detail, there are also benefits associated. Consideration has been given to adoption of an alternate design and the owners have agreed to modify the proposed design to incorporate a double layer up to +3.0m AHD (with the potential for this to be raised to +6.0m AHD over time in response to actual conditions and sea level rise) and a deeper toe depth of -1m AHD with three layers. Modified drawings to reflect this change are enclosed.

- **Justification for the proposed rock toe placement (if required), including consideration of beach amenity, maintenance of public access and public safety impacts;**

The provision for rock placement at the toe of the structure was nominal only, intended to provide an indication of how structural integrity could be ensured in the long term in the event of ongoing erosion resulting in undermining of the toe of the structure (i.e. beyond that which could be accommodated by the flexible toe). The proposed design has been modified to incorporate a deeper toe depth of -1m AHD (see enclosed modified drawings) while retaining the flexible toe detail which can accommodate erosion to a depth of approximately -2m AHD. As such, the allowance for future rock placement in the event that this is required no longer forms part of the proposed works.

- **Justification and consideration of alternatives for the seawall alignment, including the consideration of a more landward alignment to address beach access issues;**

The modifications to the design outlined above have resulted in a widening of the overall structure and minor changes to the required alignment to ensure that the works remain entirely within private property. Further consideration has been given to alternate seawall alignments (including those more landward). The alignment on the modified drawings attached is the preferred alignment as it maintains access around the most seaward of the existing residences. The proposed alignment still results in the permanent loss of usable land up to 18.6m from the property boundary.





- The potential for impacts on dune vegetation from increased erosion resulting from the seawall and how this is to be managed, especially the *State Environmental Planning Policy No 26 – Littoral Rainforest* area to the north of the site;

The proposed works are located more than 250m south of the 100m buffer zone surrounding the SEPP26 designated littoral rainforest [Figure 4]. As the Worley Parsons [2010] Coastline Management Study indicates a net littoral drift to the south and southerly transport during storm conditions (when the upper beach profile is most likely to be affected), it is expected that the impact of the proposed works would primarily be to the south and the potential for impact on the littoral rainforest some 350m to the north is expected to be fairly limited. It is noted, however, that this area is naturally very vulnerable to erosion and is also affected by the dynamics of Racecourse Creek. This may need to be reassessed in the event of additional erosion making the extension of the wall substantially to the north necessary / desirable.

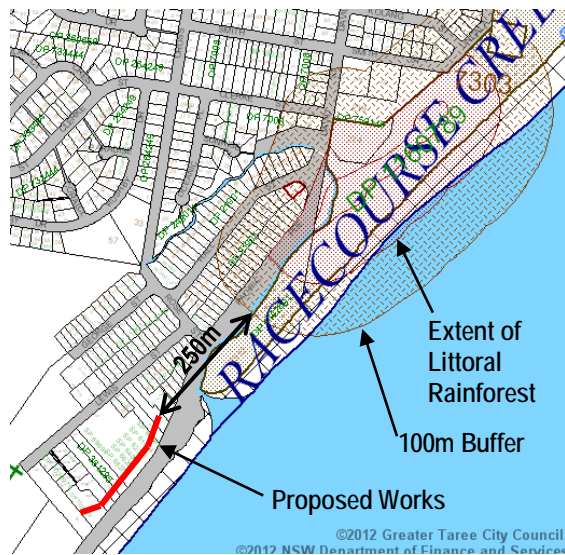
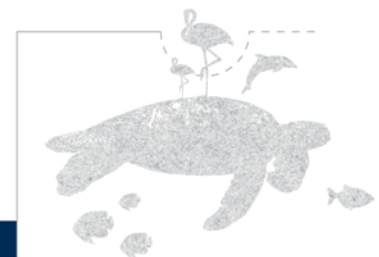


Figure 4 – Area of SEPP26 Littoral Rainforest

- Additional information on staging and construction management. Issues to be addressed include: triggers for the construction of stages (and whether stages are dependent on funding arrangements or commitments of specific landholders); a contingency plan if end effects are evident prior to the completion of specific stages of the proposed structures, worker safety management (e.g. access to the beach in heavy vehicles), a risk assessment of the integrity and effectiveness of the wall should only the first stage/s be constructed for an extended period of time, confirmation of Crown Land access arrangements, and information about the temporary sand stockpiles (e.g. location, maintenance of public beach access, protection from wave/tide erosion);

Prior to lodgment, it was anticipated that construction of the wall for 38 & 40 Lewis St would have necessarily been delayed since the properties were in the possession of receivers. This is, however, no longer the case. Subsequent to recent discussions, owners advise that they will co-ordinate to have the wall constructed as a single project without potential for time delays between sections. As such, there are no triggers for construction of stages and no known funding issues. As works are to be undertaken as a single project, no contingency plans or risk assessments have been developed. Crown Land access arrangements are subject to separate approval. At this stage it is anticipated that stockpiles of imported sand will be located on private property. Material from toe excavation will be temporarily stockpiled on Crown Land as far landward as possible to minimise any impact on beach access and avoid loss of material from waves / tides. Material is to





be reinstated over the constructed toe as soon as practicable. Excavation and construction of the toe is to be undertaken progressively along the structure.

- Ongoing management and maintenance of the structure for its design life, understood to be 25 years. Ideally, this would include the preparation of a Seawall Management Plan as recommended within *the Draft Guidelines for Assessing the Impact of Seawalls* prepared by the former Department of Environment, Climate Change and Water. Issues to be addressed include the arrangements for ongoing Crown Land access; maintenance and cost arrangements / commitments for the life of the seawall (including cost distribution arrangements between landholders) and whether this should include the payment of a bond, and further details of maintenance actions (e.g. commitments of the timely maintenance of damaged bags, inspections after storm events etc.) Please refer to and consider Clause 129A(1) of Stage Environmental Planning Policy (Infrastructure) 2008 and Section 55M of the Coastal Protection Act 1979 which provide important heads of consideration that must be addressed with regard to this proposal ;

Please find enclosed a Seawall Management Plan.

- Long term plans for the decommissioning of the wall and remediation for the site (should this be deemed necessary);

Decommissioning of the wall is not planned at this stage. While the containers have an expected lifetime of 25 years as a result of UV exposure, these can be replaced if and as required to maintain the effectiveness of the structure. This is made simpler through the use of a two layer design as the seaward layer (which is exposed to vandalism and UV) can be easily replaced while the landward unexposed layer remains in place.

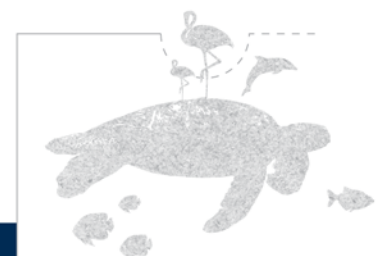
In the event that removal is deemed necessary in the long-term, this can be undertaken very easily and with little expense. Emptying of the sand from the containers and removal of the geotextile fabric will result in effective removal of the structure and placement of sand at the toe of the newly exposed 1V:1.5H scarp. This will reinstate the site to similar to its present condition (with the scarp height dependent on the condition of the beach at the time of removal). In the event of substantial erosion occurring prior to removal, it is likely that the protected areas will be subject to increased levels of erosion immediately after decommissioning and this should be carefully considered prior to removal, including the resulting risk to infrastructure being protected by the wall and any safety implications for the residents and general public.

- Any impacts of the excavation on groundwater;

It is expected that the deeper toe will be located under the groundwater table. While it is possible for containers to be placed underwater, it is more typical for the toe to be excavated in shorter sections and the trench to be at least partially dewatered for the short period of toe construction. This often occurs during lower tides to improve its effectiveness. Regardless of how it is undertaken, groundwater flows in sand are such that groundwater levels are reinstated very quickly after placement of these lower layers and any impact is temporary.

- Any storm water management impacts;

Overlay of these pipeline locations provided by MidCoast Water in their response to the application [Figure 4] indicates that the initial works footprint is clear of existing stormwater, water and sewer pipelines. The worst-case potential for end effects is also initially well clear of the pipelines [Figure 5]. In the medium-term, however, this water pipeline may become affected by erosion which has been exacerbated by the proposed revetment. It is noted, however, that this pipeline is already within the 2058 hazard zone and as such is already vulnerable to erosion. Plans for its eventual protection are unknown, however relocation of this service landward appears to be feasible [Figure 6].



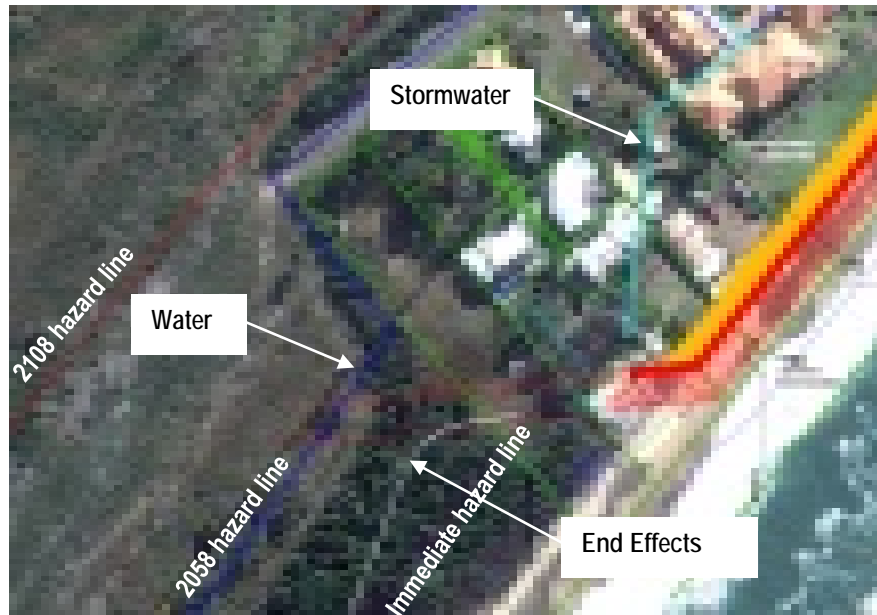


Figure 5 – Overlay of Pipeline with Proposed Works

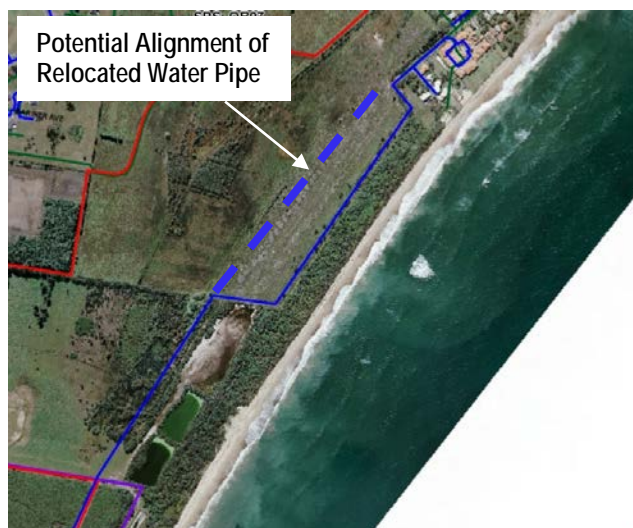
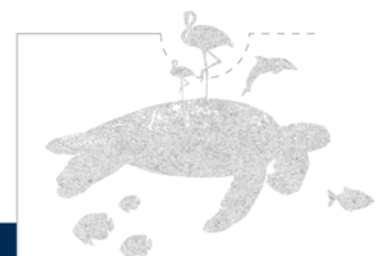


Figure 6 – Potential alignment of relocated water pipeline

In terms of overland flows, the crest of the wall is close to the top height of the scarp and any minor flows which are not directed landward will still be able to be accommodated over the structure without detrimental effect.

- Confirmation of the source of sand, including how issues such as variable grain size and composition would be managed.

The design drawings require imported material to be clean sand, free of organics and with low fines content. The material is to be used as fill for the containers and backfill as required. As such, while it is essential that the material be free-draining





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sand, its specific grain size and composition is not critical as it might be for a beach nourishment exercise since the sand is not intended to form part of the active beach system or have any mechanism by which it could affect local sediment transport processes.

If you have any further queries, please let me know.

Regards,

Bobbie Corbett

