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Date: 8 April 2015

Subject: **CATTLE BAY MARINA – RESPONSE TO SUBMISSIONS ON EIS GEOTECHNICAL INVESTIGATIONS**

Dear Andrew

In Council's response to Eden Resort Hotel Pty Ltd dated 18 February 2015, Council has again raised the matter of geotechnical investigations, stating:

No geotechnical investigation has been carried out to ensure that the location, configuration and structural integrity of the wave attenuator are possible and achievable. This requires appropriate geotechnical investigation and reporting. Until the geotechnical aspects associated with the placement and construction of the wave attenuator have been resolved, potential impacts of wave action, particularly on Cocora Beach and mussel farms to the west are not conclusive.

A number of comments can be made in respect of the statement by Council under the following broad headings:

- location and configuration of the wave attenuator;
- available geotechnical information;
- structural integrity of the wave attenuator.

Location and Configuration of the Wave Attenuator

The location and configuration of the wave attenuator have been dictated by the need to avoid adverse impacts on Cocora Beach due to reflected swell waves off the attenuator. This is the reason why the alignment of the attenuator is 'cranked'.

Avoidance of impacts to Cocora Beach is the paramount objective, other factors are subservient. The geotechnical conditions along the cranked alignment will be what they will be, the alignment of the attenuator cannot be altered based on geotechnical conditions where the outcome of this alteration would create an adverse impact on Cocora Beach.

Available Geotechnical Information

At the time of the EIS

At the time of the preparation of the EIS (2014) there was no geotechnical information in the area of the proposed wave attenuator. An appraisal of the geotechnical conditions in the Eden Harbour area generally was made based on review of the existing available geophysical/geotechnical information and recent, at the time (July 2014), bathymetric and seabed mapping conducted by Marine Solutions on behalf of Ocean Environmental (reported in detail in the Ocean Environmental report [Appendix 5 of the EIS]). The existing available geophysical/geotechnical information comprised:

- geophysical fieldwork carried out by GBG Australia on behalf of the Aurecon Group in December 2013 associated with proposed improvements at Snug Cove for access by ocean cruise vessels;
- borehole and cone penetrometer data contained in the document *Geotechnical investigation for breakwater extension as part of the Eden Port Development* (Longworth & McKenzie Pty Ltd) dated January 1985.

Current available information

The extent of available geotechnical information has recently changed. NSW Trade & Investment Crown Lands completed geotechnical investigations throughout Snug Cove (including Cattle Bay) during January-March 2015 as part of the studies for the Breakwater Wharf Extension Project and the evaluation of options to provide safe boating facilities in Eden Harbour.

The geotechnical investigations included geophysical studies, vibrocoring, vertical boreholes and inclined boreholes. In addition, a sidescan sonar survey and a magnetometer survey were conducted. Reporting on these investigations will include a geotechnical factual report, geotechnical interpretive report and a digital 'ground model', and will be finalised in mid to late April 2015 (pers comm, Mr Andrew Dooley, Project Manager – Eden, Trade & Investment Crown Lands).

Mr Dooley has advised that the geotechnical conditions in the area of the proposed wave attenuator comprise less than 10m of overburden (sands, clayey silts and silty clays) overlying weathered rock[1]. The rock is sandstone and rhyolite (a fine grained volcanic rock).

Structural Integrity of the Wave Attenuator

The wave attenuator would be designed in accordance with Australian Standard AS 4997 'Guidelines for the Design of Maritime Structures'. The design wave conditions are likely to correspond to a 200 year Average Recurrence Interval (ARI) storm.

There is nothing in the available geotechnical information, which now includes recent information available from the January-March 2015 investigations by NSW Trade & Investment Crown Lands, to suggest that a wave attenuator could not be designed in the location and configuration proposed, with

[1] It is expected that the factual and interpretive reports from the recent geotechnical investigation would be made available to parties (including Council) by NSW Trade & Investment Crown Lands in mid to late April 2015 for detailed review and design of the wave attenuator.

structural integrity. Piles could be readily driven through the overburden and into weathered rock. The thickness of the weathered rock will determine if pile driving may need to be accompanied by other common methods such as chiselling of harder rock. A large number of maritime structures have been designed at Eden in similar geotechnical conditions including the Breakwater Wharf, Mooring Jetty, Main Jetty and Cattle Bay Jetty.

Please contact the undersigned should you require any clarification or additional information.

Yours faithfully
Haskoning Australia Pty Ltd

G W Britton
Resident Director