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# ARUP

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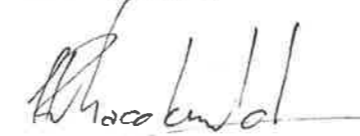
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The above should be considered in design through appropriate studies, which are anticipated to include:

- Wind/wave climate study to establish local design conditions at the site.
- Wave disturbance modelling to characterise the influence of the development on the existing wave environment.
- Sediment modelling.
- Scour assessment.

Please do not hesitate to contact me if you want to discuss the above further.

Yours sincerely



Lewis Macdonald  
Senior Engineer

20 June 2014

Dear Laurie

### Cottesloe Jetty - Influence on Swell

As requested we have carried out a preliminary assessment of the effect that the construction of the Cottesloe Jetty will have on the swell. The effects have been considered for two aspects; the observation chamber and the structure providing support to the elevated jetty. We would like to highlight that this assessment is preliminary in nature and confirmation will be required through detailed analysis and modelling.

The attached sketch shows the relative scale of the proposal to its surroundings and its proximity to the existing breakwater. It includes an indicative wave train based on an 8second period long-crested wave incident from the south-west.

Based on the preliminary assessment, the influence of the observation chamber on swell is anticipated to be small.

- The swell wavelength is significantly greater than the diameter of the observatory and therefore any wave disturbance is likely to be localised in the lee of the structure. Furthermore, an 8second period is at the lower end of swell wave period that can be expected at the site and for longer period waves the disturbance caused by the observatory will become less significant.
- At the location of the underwater observatory the breakwater is influencing the current wave environment and this is likely to be more significant than the influence of the proposed observation chamber.

Based on the observations above and considering that the remaining structure supporting the jetty comprises a combination of discrete and well-spaced piles it can reasonably be assumed that their effect on the swell will be negligible.

Local effects at the structure must be considered in the design and these will include:

- Localised scour due to the action of waves and currents.
- Associated influence on the toe stability of existing breakwater.

Swell  
Y = 8s  
L = 100m, L (5m) = 50m  
Water Depth = 5m

