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gpb:gpb/10-27/lr927

5 October, 2010

Sydney Harbour Foreshore Authority  
Level 6, 66 Harrington Street  
THE ROCKS NSW 2000

**Attention: Mr Peter Nowland**

Dear Peter

## **EXTREME WATER LEVELS AND SEA LEVEL RISE CIRCULAR QUAY WEST, SYDNEY HARBOUR**

We refer to recent discussions between Mr Gary Blumberg of gbaCOASTAL (*GBAC*) and Mr Peter Nowland of Sydney Harbour Foreshore Authority (*SHFA*). Mr Nowland has requested advice on extreme water levels and sea level rise in relation to the proposed repaved lower promenade around Circular Quay West, Sydney Harbour.

The tide gauge at Fort Denison, Sydney Harbour has for operated for over 120 years. The largest recorded water level in Sydney Harbour is RL 1.5 m AHD which occurred on 25 May 1974. This peak water level was associated with the joint occurrence of a very large spring tide (RL 1.0 m AHD) and a 0.5 m surge. High winds (up to 75 knot gusts at Mascot) and low atmospheric pressure combined to generate the surge. It is also possible that the 9 m offshore significant wave heights at the time contributed to wave setup in the harbour (Forster et al, 1975).

The NSW Government has recently developed benchmarks for sea level rise along the NSW coast for the years 2050 and 2100 of 0.4 and 0.9 m respectively, relative to 1990 levels. These increments track predicted scenarios developed by the Intergovernmental Panel on Climate Change in the "median" to "high" range. They also make allowance for regional tectonic movements (DECCW, 2009a and 2009b).

It follows that a design still water levels in Circular Quay for 50 and 100 years planning periods would not be expected to exceed RL1.9 and RL 2.4 m AHD respectively.

Principal Gary Blumberg BSc(Eng)Civil MSc(Eng) MIEAust CPEng NPER3

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Wave runup at the seawall will result in transient water levels which exceed still water levels. However, wave action at West Circular Quay is due primarily to ferry wash, but these or any other craft are unlikely to be operating at such times of extreme weather and water levels.

It is considered that the current seawall crest level of RL 2.4 would remain serviceable in relation to extreme water levels and sea level rise for the next 50 to 100 years.

## References

Forster DN, Gordon AD and Lawson NV (1975)  
*The Storms of May-June 1974, Sydney, NSW*  
Proceedings 2nd Australian Conference on Coastal and Ocean Engineering  
Gold Coast

DECCW (2009a)  
*NSW Sea Level Rise Policy Statement*  
ISBN 978-1-74232-464-7, DECCW 2009/708, October 2009

DECCW (2009b)  
*Derivation of the NSW Government's Sea Level Rise Planning Benchmarks*  
*Technical Note*  
ISBN 978 1 74232 465 4, October 2009

We trust that the above meets your requirements in this matter. Should you wish to discuss or clarify any aspects, please do not hesitate to call the undersigned.

Yours faithfully  
**gbaCOASTAL Pty Ltd**

G P Blumberg  
Principal