

18 October 2018
Ref No. 30444Rlet

SWNA Pty Ltd
C/- Horton Coastal Engineering Pty Ltd
18 Reynolds Cres
BEACON HILL NSW 2100

ATTENTION: Mr Peter Horton

Dear Sir

ADDITIONAL GEOTECHNICAL ADVICE
PROPOSED COASTAL PROTECTION WORKS
1150 – 1168 PITTWATER ROAD, COLLARROY, NSW

We understand that Northern Beaches Council has provided comments on DA2018/1289 for construction of coastal protection works at 1150-1168 Pittwater Road Collaroy. Based on an email from Greg Britton of Royal HaskoningDHV (acting on behalf of Northern Beaches Council) to Peter Horton (Horton Coastal Engineering Pty Ltd) dated 20 September 2018, it was noted that:

"Reference is made in the coastal engineering report to adoption of a scour level of -2m AHD. Note that JK Geotechnics adopted a scour level of -1.5m AHD in order to achieve a suitable Factor of Safety of 1.5 in the case of the WALLAP analysis (see p.12 or JK report, Section 4.4.2). In part they justify this on the basis of the existence of the rock toe, but the coastal engineering report notes that the rock toe has been ignored in the structural analysis. The discussion within the various reports may need some cross referencing/consistency."

The comments refer to our geotechnical report (Ref. 30444ZRpt) dated 20 July 2018, and we respond as follows:


- The WALLAP analyses were not completed in order to assess global stability, but to confirm structural stability with consideration of disturbing and balancing forces and moments. As noted in our report, the WALLAP Factor of Safety (FOS) calculation does not represent an assessment of global stability, it represents the balance of disturbing forces and moments with balancing forces and moments acting on the piled wall.
- The beach erosion scour level of RL-2m AHD adopted in our analyses was a worst case assuming removal of the rock toe and the upper portion of the cemented sand layer. As explained on page 12 of our report (last paragraph Section 4.4.2), the RL -2m AHD scour level scenario is considered to be an 'ultimate' design case. To satisfy 'ultimate' limit state design criteria, the analysis section must not fail, i.e. equivalent to a 'FOS' in excess of 1.0. For the WALLAP analysis adopting a beach erosion scour level of RL-2m AHD, a FOS of 1.15 was obtained. This demonstrates that the 'ultimate' limit state design criteria was met and would therefore be regarded as acceptable.
- Our report also noted that for a beach erosion scour level of RL -1.5m AHD a FOS of 1.5 was obtained in the WALLAP analysis. This comment was provided to illustrate the sensitivity of the FOS to the scour level, and the conservatism of the adopted design scour level of RL -2m AHD. It was not intended to imply that this was a design case. We consider that removal of the entire rock toe and scouring of the cemented sand layer down to RL -2m AHD to be very conservative.



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- The theoretical slip surfaces used in the SLOPE/W analyses were undertaken to demonstrate that the global stability analyses could achieve a minimum FOS of 1.5. In this regard, we note that for the worst case beach erosion scour level of RL-2m AHD (including removal of the rock toe) and with a minimum pile toe embedment of -7m AHD (as has been proposed) our SLOPE/W analyses indicated that a minimum FOS of 1.5 was achieved.

We reiterate the conclusion in Section 4.5 of our report that “we consider that the Collaroy – Narrabeen Beach Coastal Protection Works Design Specifications requirement for a minimum FOS of 1.5 against global slope stability failure” has been met.

We also reiterate that the proposed works have an acceptable FOS for structural stability for the design case of a -2m AHD scour level, which assumes that the rock toe is not present.

Should you require any further information regarding the above, please do not hesitate to contact the undersigned.

Yours faithfully
For and on behalf of
JK GEOTECHNICS



Paul Roberts
Principal Associate I Engineering Geologist