

Our Ref: X08066
Contact: Troy Eyles



9 August 2013

Meriton Group
Level 11 Meriton Tower
528 Kent Street
Sydney NSW 2000

Attention: Walter Gordon

Dear Walter

14-18 Boondah Road Warriewood - Impact of Draft Flood Study on Childcare

I refer to your email dated 2 August 2013 referring to the review of the child care centre at Warriewood taking into account the Draft *Narrabeen Lagoon Flood Study* currently on exhibition.

The child care building floor level is proposed to be set at 5.82m AHD, this level is above the PMF flood level with allowances for potential 2100 climate change. The proposal is to include a flow through type fencing 1.8m high surrounding the centre. The pool type fencing will allow overland flows to pass through the boundary and not impede overland flows during the rare storm events.

A flood emergency response plan will be implemented as part of the operation of the child care centre. During an extreme rainfall event in the Warriewood Valley, the intensity of rainfall as well as other factors (wind and debris etc) would make driving either difficult or potentially more dangerous than shelter in place. The proposed child care centre floor level is located above the PMF flood level and could provide a flood free evacuation area. Furthermore the modelling has shown that site located at 14-18 Boondah Road is predominately flood free during the large storm events including the PMF event.

The *Warriewood Valley Strategic Review* (2011) prepared by Cardno for Pittwater Council also took a review evacuation for the driver safety related rainfall events. For the Boondah Road site the flood evacuation route would be Macpherson Street. The Strategic review identified based on the 100 year ARI storm event with potential Climate Change (CC) that the existing sag along Macpherson Street near Brands Lane would be subject to flooding for 3 hours but the flood depths would remain less than 0.3m. During the PMF event the road was subject for flooding for greater than 6 hours, and 5 hours of flood depth deeper than 0.3m. Flooding also occurs along Ponderosa Parade, the existing 100 year + CC flood depth does not exceed 0.3m, and during the PMF the flooding subject to 6 hours. The report has noted that both Macpherson Street and Ponderosa Parade could be accessed for the entire 100 year ARI and immediately before and after intense rainfall for the PMF event.

It is also understood that Council are considering the implementation of road upgrades throughout the Warriewood Valley as part of the evacuation strategy. Upgrades to Ponderosa Parade or Macpherson Street (including to the East) could provide a flood free evacuation route for the site.

The Childcare centre is unlikely to be isolated for unacceptable periods of time during all storm events. The existing evacuation strategy would consist of evacuation through Macpherson Street and Ponderosa Parade evacuation

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routes until such time as it is considered unsafe to drive. At that time, a shelter in place strategy within the childcare centre will be adopted for short periods until the roads are reopened. However evacuation from the site would be possible during the entire storm event if the road is upgraded.

We have reviewed the Draft *Narrabeen Lagoon Flood Study* to determine the possible impacts on the site. From review of the Report there is one reporting point near the site, which is located at the upstream side of the culverts under MacPherson Street on Narrabeen Creek (this is just to the east of the intersection of Boondah Road and MacPherson Street).

The Report makes comparisons between the results of this report and the *Warriewood Valley Flood Study* prepared by Cardno Lawson Treloar in 2005. It should be noted that the flood modelling for the development is based on the results of the *Warriewood Valley Flood Study*, all the flood modelling for this project has utilised the hydraulic model built for the flood study. In Table 7.5 a comparison is made of the peak 1% AEP (100 Year ARI) flood levels between the two studies at the MacPherson Street culvert and that the flood level is the same in both studies, being RL 3.3m AHD. Given that the site is located at the point where the dominant control of the flooding changes from Narrabeen Lagoon to the flow from the creeks, it can be assumed that the flood levels around the site also have not changed.

This assumption is further backed up that the flood level for the site derived from the joint design events (due to both catchment and ocean influences) is also unchanged. This joint design event is based on the 1% AEP catchment flood combined with the impact of a 5% AEP ocean level (see Tables 7.1, 7.2 and 7.3).

As a result, with no apparent changes in the flood levels around the site, the previous planning and studies appear to be still valid.

Please note that this advice should be confirmed by requesting from Council the official FPL information for the site. Should you require any further information on this issue, please contact either Troy Eyles or the undersigned on 8808 5000.

Yours sincerely

Brown Consulting (NSW) Pty Ltd



Robert Peterson

Manager - Water & Environment