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Contact: Dr Brett C. Phillips

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The Assistant Development Director,
Landcom,
Level 14, 60 Station Street
PARRAMATTA NSW 2150

Attention: Rosemary Hooper
E: rhooper@landcom.nsw.gov.au

Stantec Australia Pty Ltd
ABN 17 007 820 322

Level 9
The Forum
203 Pacific Highway
St Leonards NSW 2065
Australia

Phone: 61 2 9496 7700
Fax: 61 2 9439 5170

www.cardno.com.au

Dear Rosemary,

**RESPONSES TO NATURAL ENVIRONMENT REFERRAL RESPONSE - FLOOD, 2-4
LAKESIDE CRESCENT & 389 PITTWATER ROAD, NORTH MANLY, NSW**

On 17 December 2021 Northern Beaches Council Natural Environment Section provided comments on flood considerations for Development Application No: DA2021/1912 for Alterations and additions to an existing building for a mixed use development including seniors housing and boarding house at 2- 4 Lakeside Crescent and 8 Palm Avenue and 389 Pittwater Road, North Manly

These comments are discussed below.

A Flood Emergency Detailed Response Plan (FEDRP) has been also prepared for the mixed-use development at 8 Palm Avenue and 2-4 Lakeside Crescent, North Manly. This development was created through the adaptive re-use of the former Queenscliff Community Heath Centre.

The FEDRP describes:

- Flood behaviour at the site in floods up to the Probable Maximum Flood (PMF),
- A Flood Emergency Response Plan for the development, including:
 - A Flood Warning System;
 - Evacuation strategy, measures, procedures and plan; and
 - A FloodSafe Plan

This FEDRP is attached for Council's consideration.

Officer comments

The proposed DA involves adaptive re-use of the Queenscliff Community Health Centre to be a mixed use development containing a boarding house with 12 rooms on the ground floor and seniors housing comprising 25 self contained dwellings on the upper floors. The 1% AEP level with 5% AEP tailwater is 3.16m AHD, 1% AEP level with climate change is 3.2m AHD and PMF 5.7m AHD. The FPL is 3.66m AHD and the site is mapped as a Medium Risk Precinct. The existing ground floor level is below the FPL. Flood walls are proposed within the landscape areas with openings for access. Flood barriers are proposed across openings and flood doors on external doors which are not protected.

Further details on how the flood doors will be self actuating and not rely on electricity or intervention to close is required.

The proposed flood doors are external doors. These doors open outwards so that when floodwaters reach these doors the external water pressure presses the doors into the door seals to provide a watertight barrier. These doors are self-closing and would be closed. These doors would be opened only by residents or staff when entering or leaving the building.

There are three doors which are identified as flood doors, but also identified as requiring “automatic door openers to meet AS 1428.1 requirements”. One available approach is to operate these doors via push to open buttons on the doors. In the event of an electrical failure the intent is these doors automatically close and do not get stuck open. A further consideration would be installing a sensor such that when floodwaters reach the flood doors that any system for electrically opening the doors is disabled so that the flood doors achieve their intended purpose.

A net increase of flood storage of 20.4 m³ has been calculated. This involves removing the existing walls in the north western courtyard (+ 26.3 m³), replacing the external entry steps with a side ramp (- 1.5m³) and constructing a new path beside existing north western courtyard (-4.4m³). 192.4m³ of storage volume is also proposed to be created by creating an opening within the enclosed southwestern community open space by removing the existing shed.

A designated shelter in place refuge area is provided on Level 1 which is above the PMF level. The shelter in place refuge above the PMF level must be intrinsically accessible to all people on the site, plainly evident, and self-directing, with sufficient capacity of access routes for all occupants without reliance on an elevator. Details are to be provided on how vulnerable people such as those in wheel chairs will access the refuge in the event that the lifts are not working.

The lifts may not be working during a major flood for two reasons as follows:

- (i) The lifts rely solely on mains power and the mains power supply may cut-off due to damage to overhead electricity wires during a major storm and/or inundation of electricity assets; or
- (ii) Floodwaters penetrate the liftwell and sensors prevent the lift from descending into floodwaters and/or shuts the lift down.

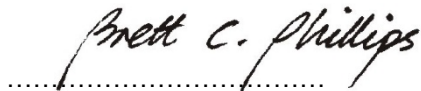
In relation to the first scenario, it is our understanding that consideration is being given to installing solar panels as part of the development and that this system would likely include battery storage. This would provide a back-up source of power to operate the lift in the event the mains power supply is disrupted. This would allow vulnerable people on the ground floor to use the lift to access the refuge.

In relation to the second scenario there are two approaches:

- the first approach is that consideration could be given to installing a stair lift to convey vulnerable people for the ground floor to the flood refuge on Level 1. This system could be battery operated with a trickle charge from the mains power supply. Even if the mains power was cut then the battery would power the stair lift;
- the second approach is that the flood wardens would manually assist any vulnerable persons on the ground floor up the stairs to Level 1.

It is also proposed when an evacuation is triggered in accordance with the FERP that vulnerable persons on the Ground Floor be evacuated first to Level 1. This will reduce the likelihood of the second scenario impacting on the evacuation of vulnerable persons from the ground floor.

Yours faithfully



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Dr Brett C. Phillips
Senior Principal
for **Cardno now Stantec**