



Engineering Referral Response

Application Number:	Mod2014/0079
To:	Luke Perry
Land to be developed (Address):	Lot 100 DP 1015283 , 145 Old Pittwater Road BROOKVALE NSW 2100

Reasons for referral

This application seeks consent for the following:

- New Dwellings or
- Applications that require OSD where additional impervious area exceeds 50m² or
- Alterations to existing or new driveways or
- Where proposals affect or are adjacent to Council drainage infrastructure incl. watercourses and drainage channels or
- Torrens, Stratum and Community Title Subdivisions or
- All new Commercial and Industrial and RFB Development with the exception of signage or
- Works/uses in flood affected areas

And as such, Council's development engineers are required to consider the likely impacts on drainage regimes.

Officer comments

The submitted plans and additional information by the applicant's hydraulic engineer has been assessed and is satisfactory.

No objection to approval, subject to conditions as recommended.

The following conditions of consent DA2008/1741 are to be amended as follows.

Condition 2 Approved Plans and Supporting Documentation

Stormwater Plans - Endorsed with Council's stamp		
Drawing Number	Dated	Prepared By
W4548-300 Revision C	30/08/2013	Cardno (NSW) Pty Ltd
W4548-301 Revision E	16/10/2013	Cardno (NSW) Pty Ltd
W4548-310 Revision C	17/06/2013	Cardno (NSW) Pty Ltd
W4548-311 Revision A	30/08/2013	Cardno (NSW) Pty Ltd
W4548-312 Revision D	30/08/2013	Cardno (NSW) Pty Ltd
W4548-313 Revision F	16/10/2013	Cardno (NSW) Pty Ltd
W4548-314 Revision D	25/06/2013	Cardno (NSW) Pty Ltd
W4548-315 Revision G	16/10/2013	Cardno (NSW) Pty Ltd

Stormwater Plans - Endorsed with Council's stamp		
Drawing Number	Dated	Prepared By
W4548-316 Revision C	17/06/2013	Cardno (NSW) Pty Ltd
W4548-317 Revision C	20/06/2013	Cardno (NSW) Pty Ltd
W4548-318 Revision E	16/10/2013	Cardno (NSW) Pty Ltd
W4548-319 Revision A	30/08/2013	Cardno (NSW) Pty Ltd
W4548-320 Revision B	22/05/2013	Cardno (NSW) Pty Ltd
W4548-330 Revision C	30/08/2013	Cardno (NSW) Pty Ltd
W4548-331 Revision D	16/10/2013	Cardno (NSW) Pty Ltd
W4548-332 Revision D	16/10/2013	Cardno (NSW) Pty Ltd
W4448-333 Revision B	22/05/2013	Cardno (NSW) Pty Ltd

Condition 23 **Flood Wall Barrier System**

All flood wall barriers that are proposed to achieve the minimum 500 mm freeboard to the 100 year ARI flood event are to be either a permanent structure engineered to suit the location or a mechanically automated device.

The applicant is to provide written confirmation from a suitably qualified engineer that the proposed wall/barrier arrangement shown on the civil drawings by Cardno (NSW) Pty Ltd provides the required minimum freeboard of 500 mm to the new building.

Details demonstrating compliance are to be submitted to the Certifying Authority prior to the issue of any Construction Certificate.

Reason: To protect the building from flooding in accordance with Council and NSW Government policy. Also, to ensure that the freeboard achieved to the new retail development at the completion of the works is not "eroded" over time as a result of uncontrolled works in landscaped areas.

Condition 40 **Footpath Construction**

The applicant shall provide/reinstate a 1.5 metre wide concrete footpath along the Cross St and Green St frontages adjacent to the Palm Tree car park. The works shall be in accordance with the following:

- (a) All footpath works are to be constructed in accordance with Council's minor works policy.
- (b) Council is to inspect the formwork prior to pouring of concrete to ensure the works are in accordance with Council's specification for footpath.

Details demonstrating compliance are to be submitted to the Principal Certifying Authority.

Reason: To ensure compliance of footpath works with Council's specification for engineering works. (DACENE07)

The following condition of consent is to be added under the heading of Conditions to be satisfied prior to the issue of the construction certificate.

Flood

In order to provide protection from flood inundation the following is required:

(a) Flood Protection

All flood barrier systems shall be designed to withstand the hydraulic forces of the floodwaters up to a minimum level of 500mm above the 1 in 100 year ARI flood levels as a result of the augmentation works. Buoyancy (particularly in relation to cars in the ground floor car park), flowing water with debris, wave action, the flood compatibility of materials and waterproofing shall be addressed. Structural details for the construction for all elements are to be prepared by a suitably qualified Engineer.

(b) Movement Prevention Devices

i) Car storage/parking areas are to provide Movement Prevention Devices (e.g. bollards) adequate for the 1 in 100 year ARI flood levels which can be engaged in a flood event to prevent movement of vehicles downstream and onto roadways.

ii) Structural details for all elements and confirmation of adequacy to prevent vehicle movement downstream and onto roadways is to be prepared by a suitably qualified Engineer with experience in flood design / management who is eligible for Membership to Engineers Australia.

(c) Flood Management Plan

A flood management plan for Lot 100, DP 1015283, No 145 Old Pittwater Road (Warringah Mall) and Lot 2 DP 600059 No. 75 Old Pittwater Road, Brookvale is to be prepared by a suitably qualified Engineer with experience in flood management who is eligible for Membership to the Engineers Australia.

The management plan shall include as a minimum:

(i) A detailed description of the flood threat. This is to include plans showing the route of the trunk drainage network and areas which will be subject to overland flow. Locations where overland flow will enter the site are to be clearly identified. The characteristics of overland flow through the site are to be described (such as expected depth and velocity of flow, etc). The description is to be aided by a suitable sized set of plans.

(ii) Details of the advance weather warning system which is to be used to detect the possibility of flood producing rainfall approaching the lands.

(iii) Details on the water level trigger(s) which are to be incorporated in the Flood Management Plan and the actions associated with each.

(iv) Details on how land owners/ site management will manage a flood threat. This is to include details on the alerts/warnings/messaging which will be issued to occupants and how land owners/ site management will prevent occupants from accessing the various carparks during a flood threat.

(v) A plan showing the location(s) where occupants on the lands are to evacuate to during a flood threat.

(vi) A set of instructions detailing the installation and operation of the flood barrier system. The instructions are to include details showing where the equipment is stored and the location where each flood barrier is to be installed.

(vii) Details of a regular training programme which is to be implemented by land owners/ site management

dealing with the various aspects of the Flood Management Plan. The training programme is to include an awareness session for Centre Management staff highlighting the locations where floodwater will impact the site and the critical doorways which will need to be manned in order to prevent patrons from entering the carparks during a flood threat.

(viii) Details and locations of appropriate flood warning and evacuation signage.

(ix) A system 'testing regime'

(x) The Flood Management Plan is to include provision for the dissemination of flood warnings to the owner/occupiers of the sites to which the plan applies. Flood warnings are to be broadcast audibly and electronically to allow owners and occupiers effective warning time to undertake the appropriate actions.

Clear instructions dealing with the dissemination of flood warnings to the upstream land owner/occupiers are to be incorporated in the Flood Management Plan.

(xi) The Flood Management Plan is to provide review regime (ongoing) of the plan in its entirety. The time period for ongoing plan reviews is to be determined by the Engineer certifying the Flood Management Plan.

The review is to be conducted and certified by a suitably qualified Engineer with experience in flood management who is eligible for Membership to Engineers Australia as being appropriate for the management of a flood event, the review is to ensure at a minimum:

- a. the requirements of the plan are being implemented;
- b. the requirements of the plan are still adequate and appropriate.

The Flood Management Plan is to be certified by a suitably qualified Engineer with experience in flood management who is eligible for Membership to Engineers Australia as being adequate and appropriate for the management of a flood event.

Details demonstrating compliance are to be submitted to the Certifying Authority for approval prior to the issue of any Construction Certificate.

Reason: To provide management in the event of a flood.

Referral Body Recommendation

Recommended for approval, subject to conditions

Refusal comments

Recommended Engineering Conditions:

Nil.