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20 December 2016

Our Ref: 16528-C2/af

Woolworths PO Box 8000 Baulkham Hills NSW 2153

Attention: Tony Pratt

Dear Tony,

### RE: FLOOD ASSESSMENT REPORT 130-138 AND 140-142 PARRAWEENA ROAD, TAREN POINT, NSW

I refer to the Planning Proposal being prepared for a proposed retail development at the aforementioned property which is at the corner of Parraweena Road and Kareena Road, Taren Point. This Flood Assessment Report has been prepared to support the Planning Proposal in so far as it can be demonstrated that the development is able to satisfy the requirements of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. This report also demonstrates how the development will comply with the DCP in regards to floor levels and flood evacuation.

The following documents and resources were reviewed and are referenced as part of the flood assessment:

- Sutherland Shire Council Flood Risk Management DCP 9.3/17 Edition 1.
- Flood Information report by Sutherland Shire Council for 130-142 Parraweena Road dated 10 November 2016.
- Section 3.36C of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the SEPP).
- Sutherland Shire Council Internet Mapping Site.

# Introduction

The site is within the upper reaches of the Gwawley Bay catchment (see Figure 1 below from Sutherland Shire Council Internet Mapping Site). The high point of the site is in the north west corner at the intersection of Parraweena Road and Kareena Road. Parraweena Road falls in an easterly direction and Kareena Road falls in a southerly direction.

Based on flooding information available in Council's Flood Information report, it is understood that a large proportion of the eastern and southern parts of the site is within the area identified as flood prone land. In accordance with Section 1.8 of Council's Flood Risk Management DCP, flood prone land is defined as land which is subject to inundation by the Probable Maximum Flood (PMF). A large proportion of the site (approximately 75%) is within the area identified as flood prone.



### Compliance with the SEPP

The following assessment seeks to demonstrate that the development proposed under the Planning Proposal is compatible with the requirements of the SEPP. Section 3.36C of the SEPP has been reproduced here in italics with our responses to the items following.

#### This clause applies:

(a) to all development specified for this code that is to be carried out on a flood control lot, and – Since the site is within an area identified as flood prone land, the site would be considered to be a flood control lot.

(b) in addition to all other development standards specified for this code. – All other relevant standards would be adhered to as required.

(2) The development must not be on any part of a flood control lot unless that part of the lot has been certified, for the purposes of the issue of the relevant complying development certificate, by the council or a professional engineer who specialises in hydraulic engineering as not being any of the following:

(a) a flood storage area, - In their Flood Information report, Council has identified a flood storage area to be those parts of a floodplain that are important for the temporary storage of floodwaters during the passage of a flood. Given that the site does appear to be inundated by floodwater, albeit the majority less than 0.2m, it is likely that the site would be deemed to be within a flood storage area. The development will be designed to ensure that any habitable areas of the site are located outside a flood storage area or would allow the flood storage to be retained at a safe depth. The site will be designed to ensure that there is no loss of floodplain storage. This may be achieved by keeping certain parts of the site low or by the provision of compensatory flood storage areas within the site.

(b) a floodway area, - In their Flood Information report, Council has identified a floodway to be an area where significant volume of water flows and are often aligned with obvious natural channels. Given the site and surrounding topography, it is unlikely that the site would be deemed to be within a floodway area.

(c) a flow path, - Council does not define a flow path in their Flood Information report, however, it an appropriate definition of a flow path would be land for the channelised conveyance of water. A flow path could be a floodway (refer above) or possibly from surcharge from a sag pit that is blocked or partially blocked. There are no sag pits in the vicinity of the site and the site is not likely to be a floodway, therefore I do not believe the site would be deemed a flow path.

(d) a high hazard area, - that a high hazard area is an area of land where there is danger to personal safety, difficulty in evacuation by trucks and able bodied adults would have difficulty wading to safety. The depth of flood waters is a reliable indicator (although velocity is also an indicator) in determining the hazard posed by the floodwater. Given that the site is affected by the very upper reaches of the floodplain, and is not in a floodway, it is unlikely that the flood velocities would be high. Therefore the flood depth is the critical indicator. In low velocity floodwater, (According to Figure L1 - Velocity & Depth Relationships of the Floodplain Development Manual, 2005), regardless of velocity, flood depths of up to 0.3 m are deemed safe for wading. Given that only a very small portion of the site along the southern and eastern boundaries have flood depths



greater than 0.3m, the majority of the site would be deemed to be not within a high hazard area. The development will be designed to ensure that the any habitable areas of the site are located outside a high hazard flood area. This may be by means of slightly altering the landform to reduce the flood depths, making certain parts of the sites inaccessible or suspending the building and/or carpark above the high hazard potion of the site.

(e) a high risk area. – In their Flood Information report, Council has identified that a high flood risk area is an area of land below the flood planning level and subject to a high hydraulic hazard or where there are significant evacuation difficulties. Only a very small portion of the site along the eastern boundary would be deemed a high risk area given that the flood depths are up to 1m, so to ensure the safety of the occupants of the site, the development will be designed to ensure that any habitable areas of the site are located outside a high risk area. This may be by means of making this part of the site inaccessible or suspending the building and/or carpark above the high risk portion of the site.

(3) The development must, to the extent it is within a flood planning area:

(a) have all habitable rooms no lower than the floor levels set by the council for that lot, and – The development will be designed such that the floor levels are set at or above the Flood Planning Levels. Given the topography of the site, there should be no issues setting the floor levels at the correct height and still ensuring that there is no loss of floodplain storage. Details will be provided at Development Application stage.

(b) have the part of the development at or below the flood planning level constructed of flood compatible material, and – Given that the majority of the site will be located above or only partially within flood waters, there should be no issues designing the building with flood compatible materials. Masonry or concrete structures are the most likely construction materials to be used in the flood affected areas of the site.

(c) be able to withstand the forces of floodwater, debris and buoyancy up to the flood planning level (or if on-site refuge is proposed, the probable maximum flood level), and – refer (b) above.

(d) not increase flood affectation elsewhere in the floodplain, and – The development will be designed to ensure there is no loss of floodplain storage. This may be achieved by provision of compensatory flood storage, lowering certain parts of the site or providing suspended slabs above the flood. The development will also be designed such that there is no channelisation of flows. Details will be provided at Development Application Stage.

(e) have reliable access for pedestrians and vehicles from the development, at a minimum level equal to the lowest habitable floor level of the development, to a safe refuge, and – Reliable access to the development will be provided. Refer to site analysis below.

*(f) have open car parking spaces or carports that are no lower than the 20-year flood level, and* – Noted. These development will be designed to ensure that this is the case. Details will be provided as Development Application stage. Give the site topography, there should be no issues satisfying this requirement.

(g) have driveways between car parking spaces and the connecting public roadway that will not be inundated by a depth of water greater than 0.3m during a 1:100 ARI (average recurrent interval) flood event. Noted. These development will be designed to ensure that this is the case. Details will be provided as Development Application stage. Neither street frontage is affected by the 100 year ARI flood therefore there should be no issues satisfying this requirement.



(4) A standard specified in subclause (3) (c) or (d) is satisfied if a joint report by a professional engineer who specialises in hydraulic engineering and a professional engineer who specialises in civil engineering confirms that the development:

(a) can withstand the forces of floodwater, debris and buoyancy up to the flood planning level (or if on-site refuge is proposed, the probable maximum flood level), or - A report can be provided with the Development Application submission.

(b) will not increase flood affectation elsewhere in the floodplain. – Terrain modelling will be undertaken at Development Application stage to ensure that the proposed landform does not reduced floodplain storage compared to the existing topography.

(5) If a word or expression used in this clause is defined in the Floodplain Development Manual, the word or expression has the same meaning as it has in that Manual unless it is otherwise defined in this clause. - noted

(6) In this clause: - The definitions below are noted and have been considered.

flood compatible material means building materials and surface finishes capable of withstanding prolonged immersion in water. Floodplain Development Manual means the Floodplain Development Manual (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.

flow path means a flow path identified in the council's flood study or floodplain risk management study carried out in accordance with the Floodplain Development Manual.

high hazard area means a high hazard area identified in the council's flood study or floodplain risk management study carried out in accordance with the Floodplain Development Manual.

high risk area means a high risk area identified in the council's flood study or floodplain risk management study carried out in accordance with the Floodplain Development Manual.



### Compliance with the DCP

The Flood Planning Risk is a category identified in Council's Flood Risk Management DCP that will be applied to determine the suitability of a type of development on a parcel of land. For land that is affected by flooding, evacuation during a flooding event may be required. The availability of flood free evacuation routes to land that is above the PMF is one of the criteria used in determining the Flood Planning Risk.



Figure 1: Site Locality within Gwawley Bay Catchment

The definitions for Flood Planning Risks as identified in Section 2.3 of Council's Flood Risk Management DCP are listed below:

### High Flood Risk Precinct

This has been defined as the area of land below the 1% Annual Exceedance Probability (AEP) flood that is either subject to a high hydraulic hazard or where there are significant evacuation difficulties.

<u>Note:</u> The high flood risk precinct is where high flood damages, potential risk to life, evacuation problems would be anticipated or development would significantly and adversely affect flood behaviour. Most development should be restricted in this precinct. In this precinct, there would be a significant risk of flood damages without compliance with flood related building and planning controls.



### Medium Flood Risk Precinct

This has been defined as land below the 1% AEP flood that is not subject to a high hydraulic hazard and where there are no significant evacuation difficulties.

<u>Note:</u> In this precinct there would still be a significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls.

#### Low Flood Risk Precinct

This has been defined as all other land within the floodplain (i.e. within the extent of the probable maximum flood) but not identified within either the High Flood Risk or the Medium Flood Risk Precinct.

<u>Note:</u> The Low Flood Risk Precinct is where risk of damages are low for most land uses. The Low Flood Risk Precinct is that area above the 1% AEP flood and most land uses would be permitted within this precinct.

#### Site Assessment

An adjacent site to the south fronting Kumulla Road has been identified as a site in a Medium Flood Risk precinct, which is land identified as being flood affected but with no significant evacuation difficulties. Kumulla Road would be inundated during the PMF and as such, evacuation west along Kumulla Road would be potentially through flood waters.

Given that the site at the corner of Parraweena Road and Kareena Road would not require evacuation via flood affected roads, it would be expected that if a flood risk management plan were prepared for the site, it would be identified as land with lower or no greater flood risk than the parcel of land fronting Kumulla Road.

On the basis of the available evacuation routes and the majority of the site being above the 1% AEP or 100 year Average Recurrence Interval (ARI), it is expected that the site would be classified in the Low Flood Risk precinct. Note that the majority of the site is above the PMF, therefore also above the 100 year ARI flood.

In accordance with Schedule 3 of Council's Flood Risk Management DCP, some of the planning considerations for commercial developments (including retail) within Low Flood Risk precincts include:

- Setting the floor level at least 500mm above the 100 year ARI flood level.
- Ensuring that the development does not result in loss of flood storage or change in flood levels.
- Refuge to above the PMF should be provided.

Given that the majority of the site is above the PMF, it is not expected that setting the floor level with sufficient freeboard above the 100 year ARI flood level will be an issue. It is also unlikely that the development will result in an increase in flood levels or loss of flood storage. Compensatory flood storage could be provided in the south eastern corner of the site if required to ensure that the existing flooding conditions are maintained. Finally, since the majority of the site is above the PMF, evacuation or refuge above the PMF will not be an issue.



It should be noted that the planning controls for Medium Flood Risk precincts are the same as for Low Flood Risk precincts in relation to setting floor levels, impact on existing flood levels, and evacuation. So even if the site was classified in a Medium Flood Risk precinct which is unlikely, the design approach in relation to flooding would remain the same.

# Flood Evacuation

If evacuation is required during a flood event, vehicular and pedestrian evacuation could be made either north along Kareena Road and west along Parraweena Road, or south along Kareena Road towards Kingsway and Port Hacking Road where various hospitals and medical facilities are available. Both these evacuation routes are unaffected by flooding. Refer Figure 2 below which identifies flood evacuation routes from the site.



Figure 2: Site Locality and Available Evacuation Routes

# Conclusion

Based on the available flooding information, there will be no issues setting an appropriate floor level for the proposed development. It is also likely that the existing flooding conditions will be unaffected, and that evacuation to above the PMF will be readily available. As such, any flooding issues relating to the site are minor and can be dealt with in more detail at the design stage.



I trust this information meets your requirements. If you have any further inquiries, please do not hesitate to give me a call.

Yours faithfully,

ANDREW EPANCIS For, and on behalf of, H & H Consulting Engineers Pty Ltd