

NL181033

May 23, 2018

Pacific Link Housing
Attn: Mark Glew
PO BOX 1888
GOSFORD NSW 2250

Dear Mark,

RE: 18 Macleay Avenue, Woy Woy – Civil Engineering Advice.

1. INTRODUCTION

Northrop Consulting Engineers have been engaged to provide preliminary civil engineering advice for the consideration of developing a site located at 18 Macleay Avenue, Woy Woy. A desktop study & site visit has been conducted to investigate flood impacts as well as provide civil and stormwater advice to assist in assessing the feasibility outcomes to identify opportunities and constraints present for the site.

2. FLOOD IMPACT

Regional Flooding

A flood information application was lodged to Central Coast Council to determine if the site was impacted by regional flooding. The flood information letter provided by Council stated that the site was flood prone and affected by flooding from the Woy Woy Peninsula, and may be subject to flood related development conditions. The flood information letter is attached to the rear of this correspondence.

The letter identified that the 1% AEP flood level for the site was RL 1.82 AHD, and a corresponding minimum floor level of RL 2.32 AHD. This minimum floor level will likely be conditioned as the flood planning level for any new developments.

A review of the Gosford Electronic Mapping system (GEMS) was undertaken to assess the potential for additional flooding requirements. Figure 1 shows an extract from the Gosford Electronic Mapping System (GEMS) highlighting the 1% AEP flood extents in the proximity of the site.

It was assessed that two sub catchments contribute to the potential stormwater run-off that will affect the subject site. The first catchment consists of the upstream undeveloped hill area to the east of Shoalhaven Drive. Runoff is captured by the inlet pits located in Shoalhaven Drive and is piped to the drainage system, however any additional runoff not captured is expected to be directed north along Shoalhaven Drive towards Railway Street.

The second catchment consists of the local urban catchment bounded by Macleay Avenue, Shoalhaven Drive and Nambucca Drive. Both captured runoff and overland flow will be directed towards the subject site prior to discharge into the watercourse.

A simply hydraulic assessment was performed to assess the conveyance of peak flows through the site. A feasible solution may be to implement a central driveway with a minimum width of 6 metres to act as an overland flow path for the site. The driveway will require typical kerb (or similar) to provide an edge restraint for the surface flows. Estimated peak flows for the 1% AEP storm event results in a flow depth of approximately 120mm, assuming a minimum 1% longitudinal grade is achieved for the driveway. The associated velocity-depth product is within acceptable limits for safety. However, this value is at the upper limit of acceptability and will be highly subject to a detailed assessment.

The minimum floor levels will be required to maintain a 500mm freeboard above this flow depth, resulting in required levels being approximately 620 – 700mm above driveway level. Careful consideration should be taken on the impact this may pose on the development layout when considering vehicle movements, carparking & garage arrangement and accessible paths of travel.

There is a risk that Council will not endorse an overland flow route through the centre of the development, as will require a dedicated interallotment drainage & overland flow route. Should this occur, an alternative drainage arrangement could consist of relocating the existing drainage line traversing the site and providing a dedicated drainage channel along one edge of the site with suitable control measures in place.

If required, this channel will likely be 2 – 3 metres in width with a depth of 200 – 300mm. The minimum freeboard of 500mm in addition to the expected maximum flow depth will be required to the minimum floor level for all adjacent developments within the proximity of the channel.

Figure 5 illustrates the likely impact on site layout. Both options will likely involve civil works to relocate the existing interallotment drainage line to suit the proposed driveway location and it is highly likely that the size of the drainage pipe and/or kerb inlet pits will need to be upgraded.



APPENDIX A – SUPPLEMENTARY INFORMATION

- Flood Information Letter – Central Coast Council 14/05/18
- Dial Before You Dig – Council Water & Sewer Issued 10/05/18



14 May 2018

Daniel Holland
Northrop Engineers
dholland@northrop.com.au

Minimum Floor Level Enquiry:
LOT: 16 DP: 255220 18 Macleay Avenue WOY WOY

Subject: Flood Information L16 DP255220 H18 Macleay Avenue Woy Woy

The above lot has been identified as being flood prone and affected by flooding from Woy Woy Peninsula. As such, flood related development conditions may be relevant for the property.

ENQUIRY DATE:	10 May 2018
5% AEP FLOOD LEVEL:	RL 1.46m AHD
1% AEP FLOOD LEVEL:	RL 1.82m AHD
MINIMUM FLOOR LEVEL:	RL 2.32m AHD

DISCLAIMERS: Council provides you with the above information as general advice only, and you should not rely upon that information when making decisions relating to the purchase or development of the above property. Council **strongly recommends** that you seek site specific flooding advice from a suitably experienced expert prior to making any decisions relating to the purchase or development of the above property. That disclaimer and recommendation is provided for the following reasons:

1. The information in the above table is based on Council's records. Those records do not include a recent flood study or a recent detailed survey of the above property. For example, a recent detailed survey would provide precise ground levels for the subject property as well as identify, with precision, the location of any watercourses, drainage structures and systems, overland flowpaths and built structures that might impact on the extent and degree to which the subject property might flood. Council does not have sufficient information to provide you with accurate prediction of the likelihood and extent to which the above property might flood, and so cannot provide you with accurate



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design levels for potential development of that property.

2. Council does not, and cannot, warrant that it will, in its capacity as a consent authority under the *Environmental Planning and Assessment Act 1979*, grant consent to a development application that seeks to erect or use dwellings or other structures on the above property that conform with the levels set out in the above information. As a consent authority, Council is required to consider the suitability of the above property for the specific development proposed as well as consider the requirements of Council's Development Control Plan 2013 – Chapter 6.7 Water Cycle Management (this is available on Council's website).

GLOSSARY OF TERMS

Term	Definition
<i>AHD</i>	The Australian Height Datum (AHD) is the reference level for defining reduced levels adopted by the National Mapping Council of Australia. The level of 0.0 m AHD is approximately mean sea level.
<i>AEP</i>	The Annual Exceedance Probability (AEP) is the chance of a flood of a given or larger size occurring in any one year. Usually expressed as a percentage. Eg a 1% AEP flood event has a 1% chance of occurring in any one year. Equally, it is likely to occur on average once every 100 years.
<i>Minimum Floor Level</i>	The minimum floor level (MFL) provides a freeboard to building within flood prone land. This is also referred to as the Flood Planning Level.
<i>Freeboard</i>	A factor of safety usually expressed as a height above the adopted Flood Level. A freeboard tends to compensate for factors such as wave action and historical and modelling uncertainties.

The information provided in this letter is provided only to you, and is not intended to be provided to any third party.

Should you have any enquiries with regard to this letter, please do not hesitate to contact Fazlul Karim on (02) 4325 8222 during the hours of 8.40 am to 5.00 pm Monday to Friday.

Yours faithfully,

F. Karim

Fazlul Karim

Engineer – Development Assessment

Phone: 02 4325 8222

Internal Reference: 25816120