

Ref: 3535
12 December 2016

Moran Corporation Pty Ltd
c/- Geoform Design Architects Pty Ltd
Suite 145-H Moore Park Gardens
780 Bourke Street
EAST REDFERN NSW 2016

Attention Mr Rusty Moran

Dear Sir

RE: FLOOD IMPACT ASSESMENT – No 84 KIORA RD, MIRANDA

We refer to previous correspondence from Sutherland Council regarding the Flood Impact Assessment carried out for the above development site. Council raised a number of issues that required further clarification in our report however rather than re-issue the report we have addressed the issues below as the matters raised will not impact on the outcome of our initial flood impact assessment report.

Mark Albury (Building Services Consultant for Moran) spoke with Council staff who advised that Mr Joga Jaanti (Council stormwater engineer) did the review and comments. The issues raised by Council have been investigated on site and addressed as follows:-

- *Council advised that the analysis did not consider flows from Jackson Ave. They requested that this be done; considered and analyze the spilt of flows into Urunga Pde.*

Based on our site inspections Jackson Ave drains in the opposite direction to the site. The crest in Urunga parade is just west of the intersection with Jackson Ave as depicted by the green shading in the aerial photo. Additional survey was undertaken and the levels confirm that Jackson Ave falls east, north and south of the intersection. Based on this there is no change to the catchment area draining to the site.

- *Hydraulic analysis did not mention pit blockage assumptions. Analysis needs to be run with pits 50% blocked.*

The assumption of using 50% blockage for stormwater pits wasn't mentioned as there are no pits in the catchment upstream of the site. The flows coming to the site are purely overland flow from the east. There is no underground drainage system in the area until the intersection of Urunga Rd and Kiora Road which is effectively downstream of the site. As the pipe system is downstream of the site there was no need to mention pit blockages in the report.

- *Council needs the analysis done for all storms from 1 year ARI to the 100 year ARI.*

The flood investigation considered the flows from the 2 year ARI event to the 100 year ARI event and showed that the 100 year ARI flows can be contained in the gutter at the driveway. We didn't see any need to run the 1 year ARI storm as the resultant flow will be significantly less than those for the 20, 50 and 100 year ARI events.

- *Council requires analysis of the flows at the end of Urunga Lane as there is no overland flow path. They want to know what the post development impact is to nuisance flooding / ponding in the lane.*

We have looked at this issue and confirm that the site drains to Kiora Rd and any stormwater entering Urunga Lane is overland flow from the catchment upstream of the site. There is no development works occurring here and therefore there is no change to the flow in Urunga Lane as a result of the proposed development.

The investigation was primarily carried out to determine if the upstream overland flow would flood the site. It was found that the upstream catchment is not very large and therefore the overland flows can be contained within the road carriageway and kerb of Urunga Lane.

We trust this clarifies the concerns raised by Council, however should Council require a meeting to discuss the issues in more detail we will be happy to attend.

Yours faithfully
EWFw PTY LIMITED



Edward P Lucas MIEAust, CPEng

Enclosures Site Survey Plan at Jackson Ave