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12th December 2016

Mr. & Mrs. Mouldsdale
36 Pacific Parade
MANLY NSW 2085

D-11-264990

Dear Sir & Madam,

Re: Flood Report – Residential Development at 36 Pacific Parade, MANLY

INTRODUCTION

I, Edward A Bennett, practising Civil, Structural, Geotechnical & Environmental Engineer, confirm that I inspected the above property for the purpose of carrying out a flood report for this property in respect to flood levels for ARI 1:100 rainfall events (1% AEP) and the final overland flow levels to be adopted for the residential development above.

REPORT

Investigation into this allotment in respect to Flood Prone land, resulted in declaration from Council's officer, Mr. Patrick Stuart, that:

the Manly Council Interim Policy – Flood Prone Land (Manly Council, 2013) and the Manly Lagoon Flood Study FPL Summary Document. Also refer to clause 6.3 of the Manly Local Environment Plan 2013, available via the link:

<http://www.legislation.nsw.gov.au/#/view/EPI/2013/140/part6/cl6.3>

and upon further investigation:

The Manly Lagoon Flood Study (2013), reveals that the property, identified as 36 Pacific Parade Manly, is within the Flood Planning Area (FPA), and according to this flood study:

The Flood Planning Level (FPL) is 3.66m AHD. This includes a 0.5m freeboard on top of the 1% Annual Exceedance Probability (AEP) Flood Level (3.16m AHD).

and according to the Manly Lagoon Flood Study 2013, during a 1% AEP Flood, the property is identified as:

- Not within a Flood Storage area;
- Not within a Floodway;
- Not within an Overland Flow Path;
- Not within a high risk area; and

Report

- Not within a High Hazard area.

and that the Probably Maximum Flood (PMF) water level is 5.65m AHD, and giving further consideration to:

Manly Local Environmental Plan 2013

Current version for 5 August 2016 to date (accessed 13 December 2016 at 21:32)

[Part 6 Clause 6.3](#)

6.3 Flood planning

- (1) The objectives of this clause are as follows:
 - (a) to minimise the flood risk to life and property associated with the use of land,
 - (b) to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change,
 - (c) to avoid significant adverse impacts on flood behaviour and the environment.
- (2) This clause applies to land at or below the flood planning level.
- (3) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:
 - (a) is compatible with the flood hazard of the land, and
 - (b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and
 - (c) incorporates appropriate measures to manage risk to life from flood, and
 - (d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and
- (e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.
- (4) A word or expression used in this clause has the same meaning as it has in the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005, unless it is otherwise defined in this clause.
- (5) In this clause:

flood planning level means the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metre freeboard.

and it follows then, for this allotment, we should observe the above, particularly paragraph (1), parts (a), (b) & (c) :

- a. Minimise the flood risk to life and property associated with the use of land.*
- b. Allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change.*
- c. Avoid significant adverse impacts on flood behaviour and the environment.*

and to comply with this Policy, we have chosen **not to increase** the existing FFL, which is presently at average RL 3.06. I believe that the best practice and most adequate means of addressing the proposal's flood hazard as well as reducing the risk and cost of flooding at the property includes, the use of flood compatible structural building components including floor and wall building materials in areas below the FPL of 3.16 and the flood proofing of services below the FPL of 3.16.

This would effectively flood proof the existing building elements for 100mm above the existing ground levels, and have the ridge remain at RL 10.385 as designed.

CONCLUSION & RECOMMENDATIONS

The architectural plans are to be amended to show the ground floor level at RL 3.16 and the conditions of consent are to include a new condition requiring the use of flood compatible structural building components, including floor and wall building materials and the flood proofing of services in areas below the FPL 3.16, approx. 100mm

There are existing precedents, e.g. at No. 50 Pacific Parade, Manly and at 4 Rolfe Street, Manly, wherein these neighbouring properties have been granted approval granted after the Flood Prone Land (Manly Council, 2013) Policy and the Manly Lagoon flood Study FPL Summary Document was adopted, and have not increased their ground floor levels.

The upper level addition will of course serve as a safe area to evacuate in readiness for the 1%AEP flood to recede back to safe levels at the ground floor level and return to normal conditions.

From the 2013 Study, we can consider that any flood waters from the Flooding of Manly Lagoon will enter from north western side of Pacific Parade (the paved roadway), and pass through the properties along the north side, so the existing eastern side passage should have a constant fall of 1% towards the rear northern boundary, such that any localised depressions are built up to maintain a natural overland flow path.

The existing timber planter/garden boxes at the rear shall be demolish and there should be no future structures allowed on all boundaries within the rear yard.

We consider that **Manly Local Environmental Plan 2013**, paragraph (1), parts (a), (b) & (c) have been complied with.

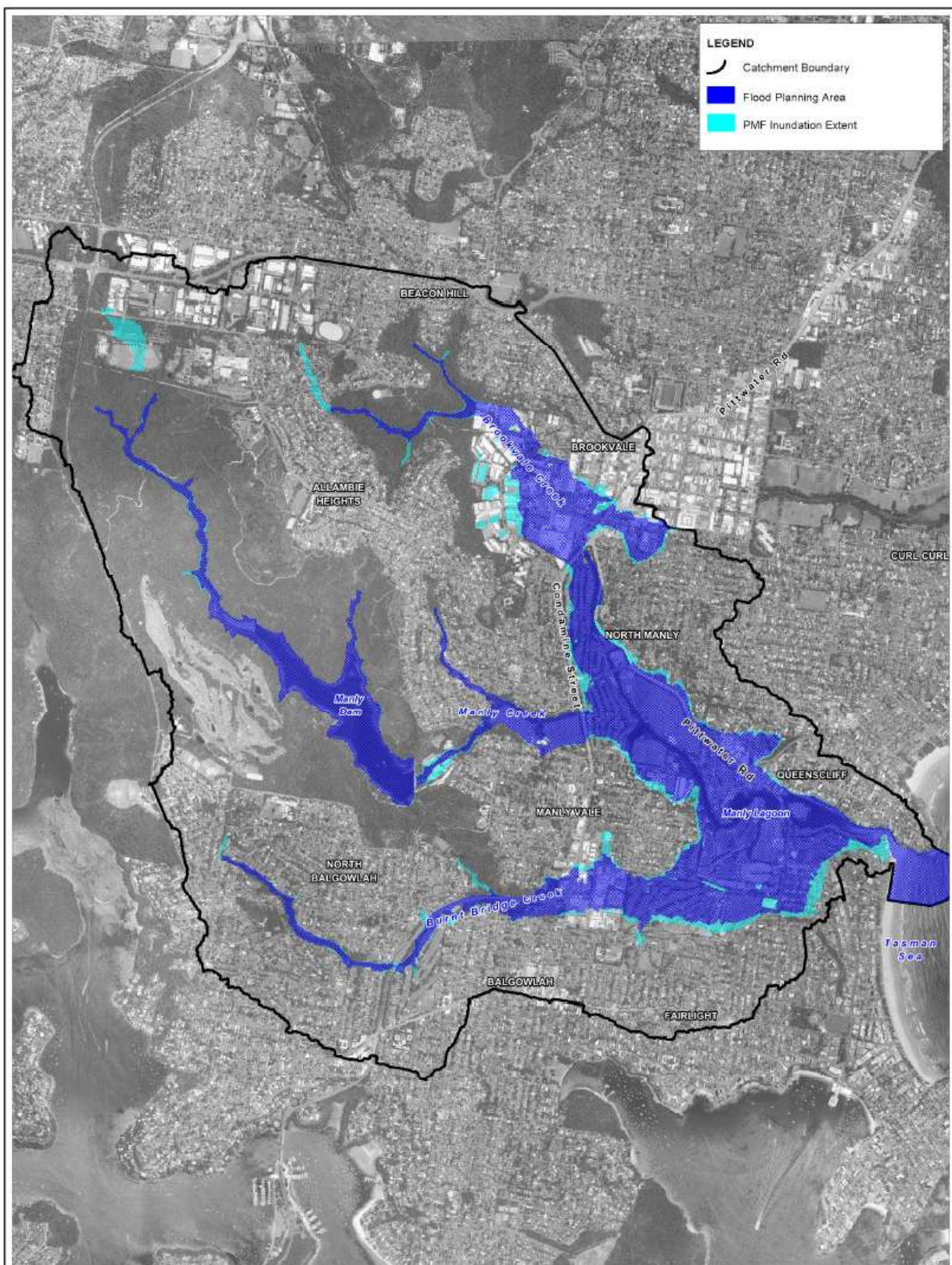
Yours faithfully,



E.A. Bennett M.I.E. Aust. Cp Eng. NPER 198230 BPB 0820



*Locality Map courtesy Satellite imagery by Google Earth
Manly Lagoon Flood Planning Map 2013*



Title
Manly Lagoon Flood Study - Flood Planning Area and PMF Extent

Figure:
1-1

Rev:
A

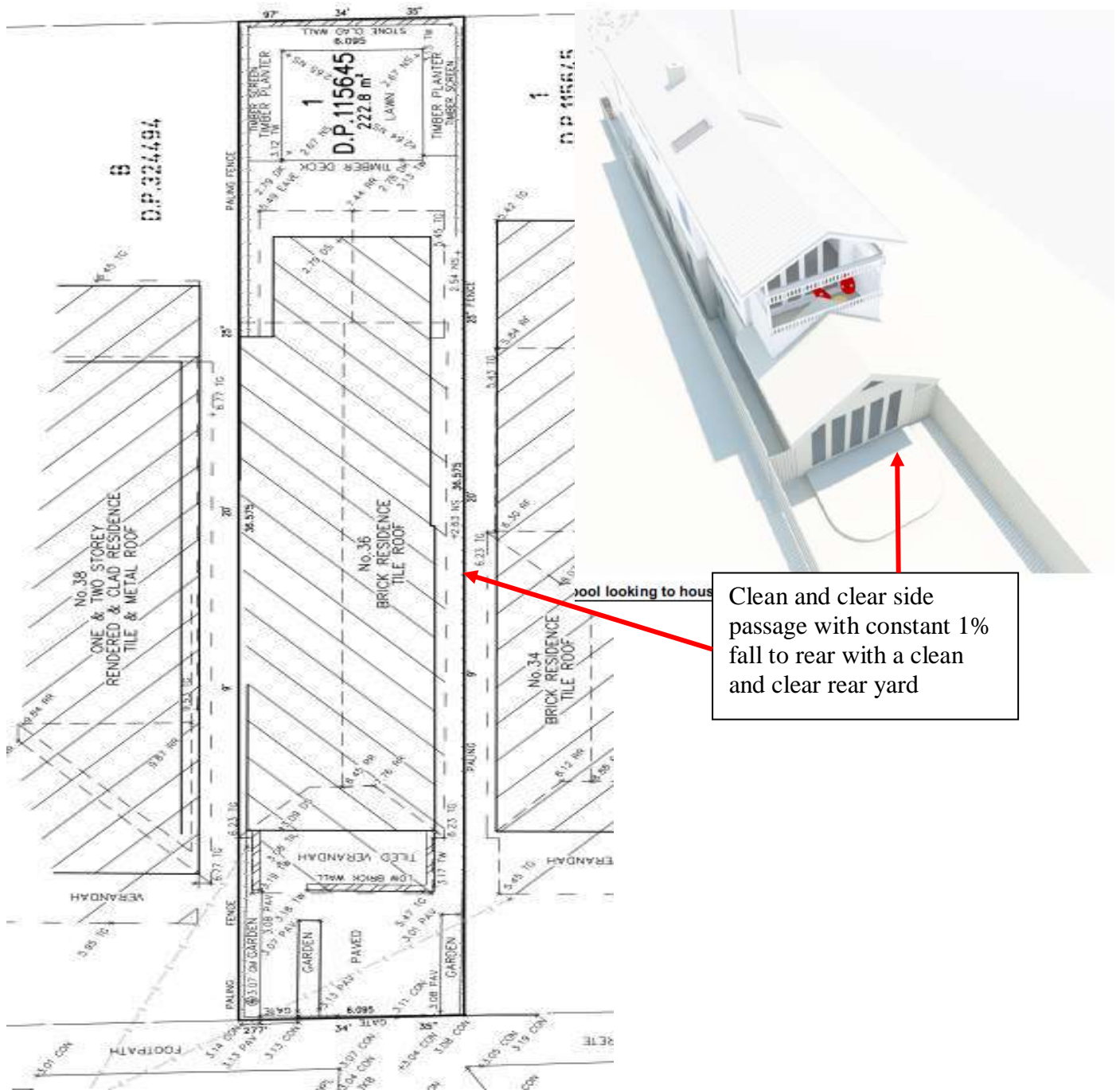


Fig: Site plan

