11592 – L2

5 April 2019

Mr R and Mrs D Gough

c/o Kaleidotecture Building Design

ken@kaleidotecture.com.au

Dear Bob and Denise,

**Subject:**          ***Proposed Alterations and Additions  - 10 The Crescent, North Narrabeen***
                              ***Flood Risk Assessment***

This assessment has been undertaken in support of the Development Application (DA) for alterations and additions to the existing dwelling at 10 The Crescent, North Narrabeen.  The proposed works are detailed on the architectural plans accompanying the DA; drawings A.02.1 to A.02.5 by Kaleidotecture Building Design, revision 4 dated 14 January 2019.  They include a bathroom, dining and entry addition to the first floor with associated internal modifications to the existing ground and first floor areas.

Flood information for the site was provided by Northern Beaches Council on 26 June 2017.  The site lies within the floodplain of Narrabeen Lagoon and is affected by low to medium hazard flood conditions resulting from overbank flooding associated with Mullet Creek.   Local flooding is predominantly characterised by the backwater effects of the tidal lagoon outlet at Narrabeen Beach.  Due to the relatively small catchment area, the predicted critical flood durations range from two to nine hours, indicating that the catchment is prone to flash flooding and there will be very limited notice that can be provided to prepare for a significant flood event.

Flood level information applicable to 10 The Crescent, North Narrabeen is summarised in Table 1, with hazard and risk mapping included at the end of this report.

***Table 1***    *Flood information*

| | |
|---|---|
| Design flood level (1% AEP/1 in 100 year ARI) | 3.53m AHD |
| Freeboard | 0.5m |
| Flood Planning Level (FPL) | 4.03m AHD |
| Probable Maximum Flood (PMF) | 4.87m AHD |
| Flood Risk Planning Precinct | Low to Medium |
| Flood Life Hazard Category | H1 – H4 |

The site is located on the southern side of The Crescent.  It covers 733m$^2$ of sloping land, rising from RL 3.0m AHD at the street frontage to the north, at an average 15% to RL 9.0 m AHD at the southern boundary.

The existing dwelling is located towards the higher rear end of the site, with a minimum floor level of RL 4.99m AHD at the garage entry and RL 5.01m AHD at the ground floor bedroom.  The first floor level is at RL 7.79m AHD.  Only the paved access driveway and front garden areas would be affected by floods up to and including the PMF.  The existing dwelling and the proposed works would not be affected by the floodwaters during any of the design flood events.  As such, the development provides a suitable option for residents to "shelter in place" during significant flood events.  The available flood refuge area would have four bedrooms, multiple living areas, a kitchen and four bathrooms with a minimum floor level providing 140mm freeboard to the PMF and the majority of living spaces over 2.98 metres above the PMF level.  The prescriptive controls required to satisfy Council's shelter in place requirements are summarised in Table 3.  There is rising land egress to the south of the site for emergency access.

***Table 3 Shelter-in-Place Requirements***

| Land Use Group | Residential |
|---|---|
| **Control 1** – Flood Risk Emergency Assessment | Accompanying report prepared |
| **Control 2** – Minimum Floor Level | Existing and proposed ground floor level (FFL 5.01m AHD) would provide 140mm freeboard to the PMF level and an extensive shelter-in-place refuge. |
| **Control 3** – Floor Space Requirement | The total floor area at completion of the proposed works would be approximately 280m$^2$, providing ample floor space per resident for a four bedroom home. |
| **Control 4** – Accessibility | The dwelling has level access from the adjacent ground areas via the garage. |
| **Control 5** – Building Stability | The building is located beyond the predicted extent of the PMF. |
| **Control 6** – Serviceability | The shelter-in-place refuge (the dwelling) would be fitted with the following emergency items:<br>• sufficient clean water for all occupants; and<br>• portable radio with spare batteries; and<br>• torch with spare batteries; and<br>• first aid kit. |

With respect to the DCP controls for flood affected lots:
- As far as is required, the development would comply with the Flood Prone Land Design Standard.
- All structures would be located above the Probable Maximum Flood level, floor levels within the development would be well above the Flood Planning Level and occupants would be able to safely shelter in place for events up to and including the PMF.
- No changes are proposed within the 1% AEP flood extent and there would be no loss of storage, flood conveyance or other noticeable changes to the 1% AEP flood characteristics as a result of the proposed works.
- No modifications to drainage infrastructure or natural watercourses are proposed.
- No flood mitigation or compensatory works are proposed.
- All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections would be located above the Flood Planning Level.
- All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections would be located above the Flood Planning Level.
- All storage areas, including those for hazardous or potentially polluting materials, would be located above the Flood Planning Level.
- The enclosed garage would be protected from inundation up to the PMF.
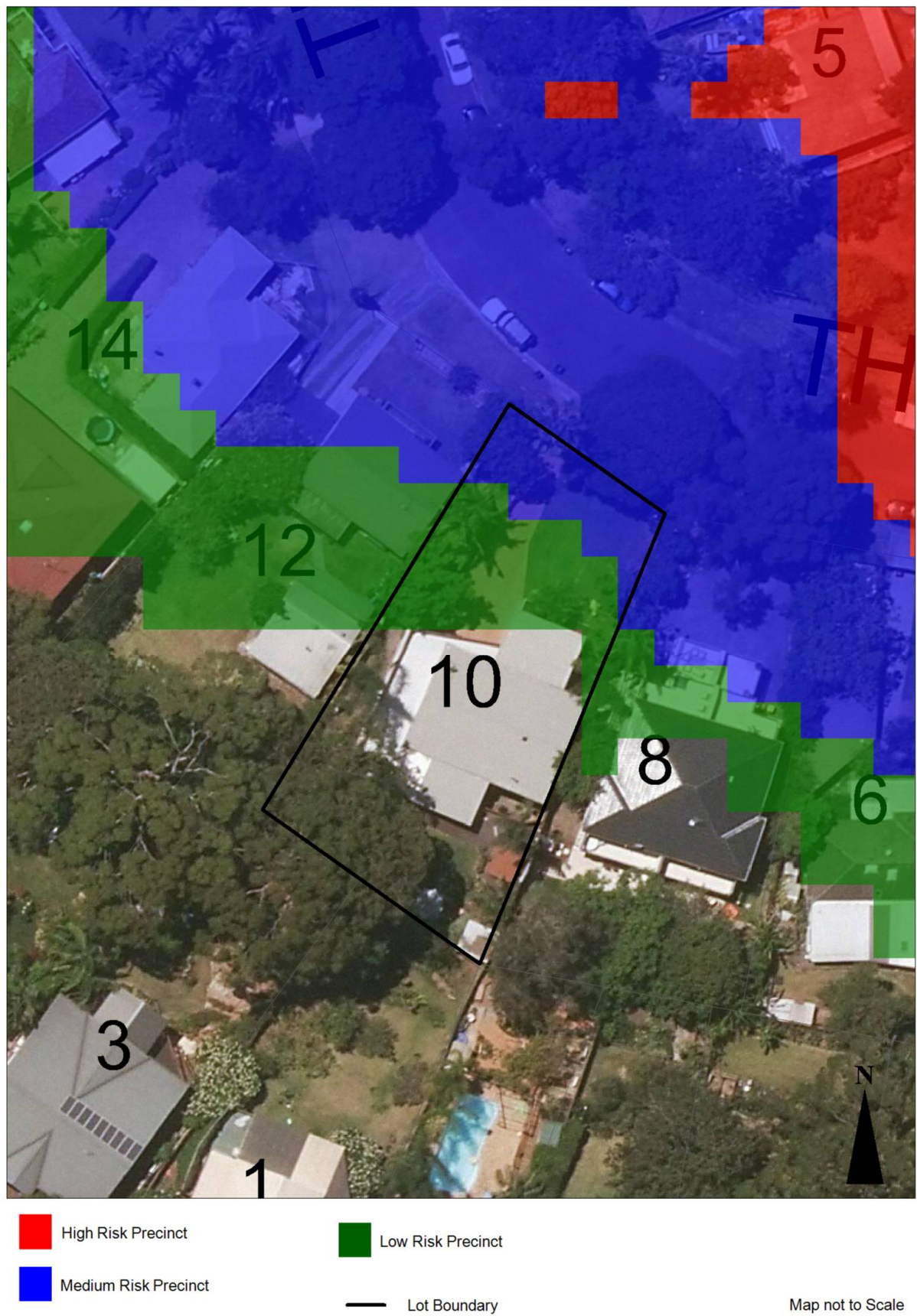- No new fencing is proposed.

The proposed works are not expected to have an impact on upstream or downstream flood levels, flow velocities or distribution, flood response or the safe evacuation of the property or neighbourhood. The dwelling is considerable suitable to act as a flood refuge to accommodate residents during extreme flood events.
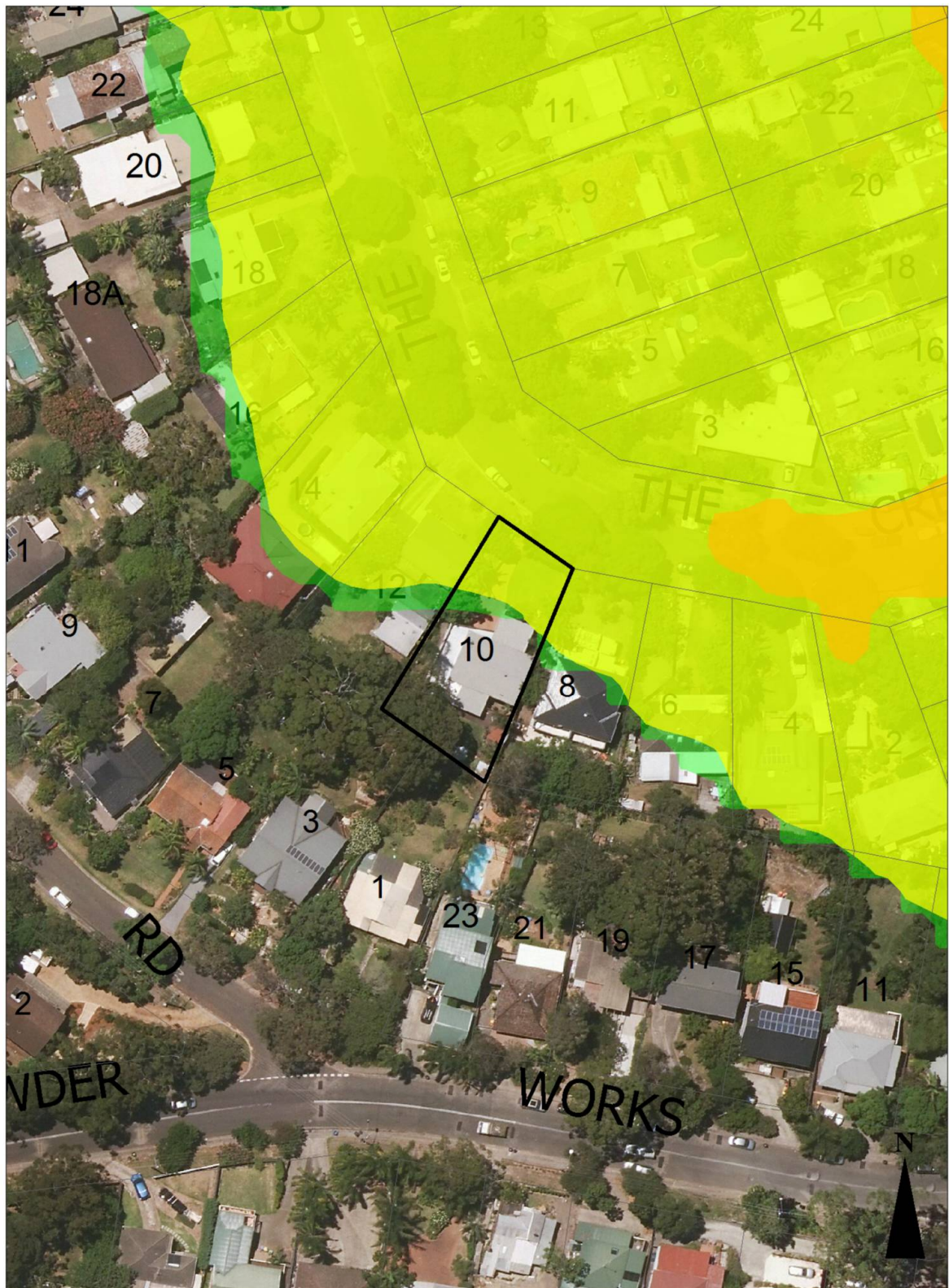
Please do not hesitate to contact me if you have any queries regarding the above assessment.

Yours sincerely,

Kate Waddington
BE(Hons) MEngSci (Water Resources)
MIEAust CPEng NER

High Risk Precinct

Medium Risk Precinct

Low Risk Precinct

Lot Boundary

Map not to Scale

Flood Life Hazard Categories

■ H6    ■ H5    ■ H3-H4    ■ H1-H2         —— Lot Boundary         Map not to Scale