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5 July 2018
Ref: J2266L_3.docx

Sydney Central City Planning Panel
C/- Planning Panels Secretariat
GPO Box 39
SYDNEY NSW 2001

By Email: enquiry@planningpanels.nsw.gov.au

Dear Panel Members

PROPOSED RESIDENTIAL CARE FACILITY (RCF) – OPAL AGED CARE
TOONGABBIE SPORTS AND RECREATION CLUB & ADJACENT LOTS
CITY OF PARRAMATTA COUNCIL DA/1281/2016
INDEPENDENT REVIEW OF FLOOD RISKS

The City of Parramatta Council (**Council**) and Opal Aged Care (**Applicant**) have jointly commissioned this review.

The review has been carried out independently and having regard to best practice within NSW for the management of flood risks. The reviewer acknowledges that his overriding duty is to the Panel and not to either party.

The Council and the Applicant provided the reviewer with a 113 page briefing document (**Brief**) which included the terms of reference for this review. The reviewer was instructed that the Brief was prepared by the Applicant and approved by the Council. The Brief attached copies of all relevant documents (that existed at the time it was prepared). The reviewer understands that a copy of the Brief has been provided to the Panel. Additional documents which the reviewer considers are relevant, and which emerged after the Brief was issued, are attached to this report or are referenced below.

The purpose of this review is to respond to item 5 in the 'Scope of Work' section of the Brief. This requires the reviewer to report on "*… the impacts of flooding on the proposed development of a residential care facility at the site ...*" including responses to seven matters listed within item 5 of the Brief.

This report provides the reviewer's response to the Brief. A draft of this report was provided to the parties before it was finalised and forwarded to the Panel.

Consultation Conducted during the Review

The reviewer conducted face-to-face meetings with:

(a) Terry Harvey of Martens & Associates on 14 June 2018;

(b) Paul Clark and Shaylin Moodliar of Council on 19 June 2018;

(c) Steven Molino of Molino Stewart on 19 June 2018;

(d) Mark Lederer of Opal Aged Care and Corey Taylor of PactPM on 25 June 2018;

(e) George Jeoffreys and Peter Cinque of the Sydney Western Region of the NSW State Emergency Service (**SES**) on 27 June 2018.

Additional Documentation provided during the Review

During the course of the review, the following additional documents emerged. Some of these were generated in response to the consultation conducted by the reviewer.

(a) Molino Stewart's letter of 31 May 2018. This letter responds to the matters raised in the SES' letter of 28 February 2018. Molino Stewart's letter also attaches a letter of the same date from Martens & Associates entitled '*Flood Assessment for Proposed Aged Care Facility – 12 Station Road & 4-10 Wentworth Avenue, Toongabbie'.* (As both parties have a copy of these two letters, they have not been attached to this report. The reviewer has assumed that the Panel will be provided with these letters).

(b) Email from Paul Clark of Council to the reviewer dated 27 June 2018. This has been reproduced in **Attachment A**. This was provided by Mr Clark following the reviewer's meeting with him on 19 June 2018. It includes a document entitled '*Key Points*' and a response to Molino's Stewart's letter of 31 May 2018. The reviewer understands **Attachment A** summarises Council's key flood risk concerns with the development proposal.

(c) Emails from Corey Taylor (PactPM) and Mark Lederer (Opal Aged Care) to the reviewer dated 25 June 2018. These are reproduced in **Attachment B** and contain additional descriptions about the Applicant's staffing, 'decanting' and emergency response procedures for the proposed development.

The reviewer understands that the SES is also preparing a written response to Molino Stewart's letter of 31 May 2018. This response had not been received at the time of drafting of this report. When it issues, the reviewer considers the SES' response should be provided to the Panel so that they are fully informed of the SES' views. The reviewer anticipates that the SES' written response will be consistent with the SES' views on Molino Stewart's letter of 31 May 2018 which were discussed when the reviewer met with the SES on 27 June 2018.

Consideration of Issues Broader than Flood Risk

This review considers the appropriateness of the development proposal having regard only to flood risk. It makes no comment on other issues.

Whilst it is clearly a very important issue for this development proposal, flood risk is but one of a number of issues that the Panel must take into consideration when making its assessment.

Format of the Remainder of this Report

The remainder of this report is structured into two sections:

(a) the reviewer's 'Commentary on Flood Risk Issues' that he considers to be relevant to the Application; and

(b) the reviewer's 'Response to Item 5 of the Brief' including responses to requirements (a) through (g) of that part of the Brief.

COMMENTARY ON FLOOD RISK ISSUES

Disparate Views on Flood Risk

1. This matter is characterised by the diverse views about flood risks expressed by various parties that have provided reports and advice. For example (with underlining by reviewer):

(a) " … *a site next to Girraween Creek that is catastrophically flood affected during extreme events*";[1]

(b) "*The proposed development is therefore at no greater risk from the direct or indirect effects of flooding than any other site within Girraween that is above the level of the PMF*";[2]

(c) "*the proposal would pose miniscule incremental risks to property and risk to life*";[3]

(d) "… *a high flood risk area.*".[4]

Confusion over what is 'the Site' and what are its Flood Characteristics

2. If approved, development will occur partly on land created by subdivision from a much larger parent parcel owned by the Toongabbie Sport and Recreation Club (**Club**), and partly on some smaller lots fronting Wentworth Avenue.

3. The flood characteristics of these parcels are different. In particular the northern portion of the Club's land is much more flood prone and has higher flood hazards than the southern portion upon which the development will take place after it is subdivided from the parent parcel.

4. The Brief defines the 'Site' as the land after the subdivision and upon which the development will be built. The reviewer has adopted this definition of the 'Site'. This is consistent with the depiction of the 'Site' shown on **Figures 1 and 2**.

5. In the opinion of the reviewer confusion has been created when comments have been made about the flood characteristics of the "*site*" which relate to the Club's land and not to the 'Site' as defined in paragraph 4 above. The following are examples (with the reviewer's opinions included in brackets):

(a) "*The site and the surrounding area are subject to major low, medium and high hazard flooding*".[5] (As can be seen from **Figure 2** the entirety of the Site is on low hazard land);

(b) "*… the proposed building siting in the floodway …*".[6] (The Site is not in a floodway);

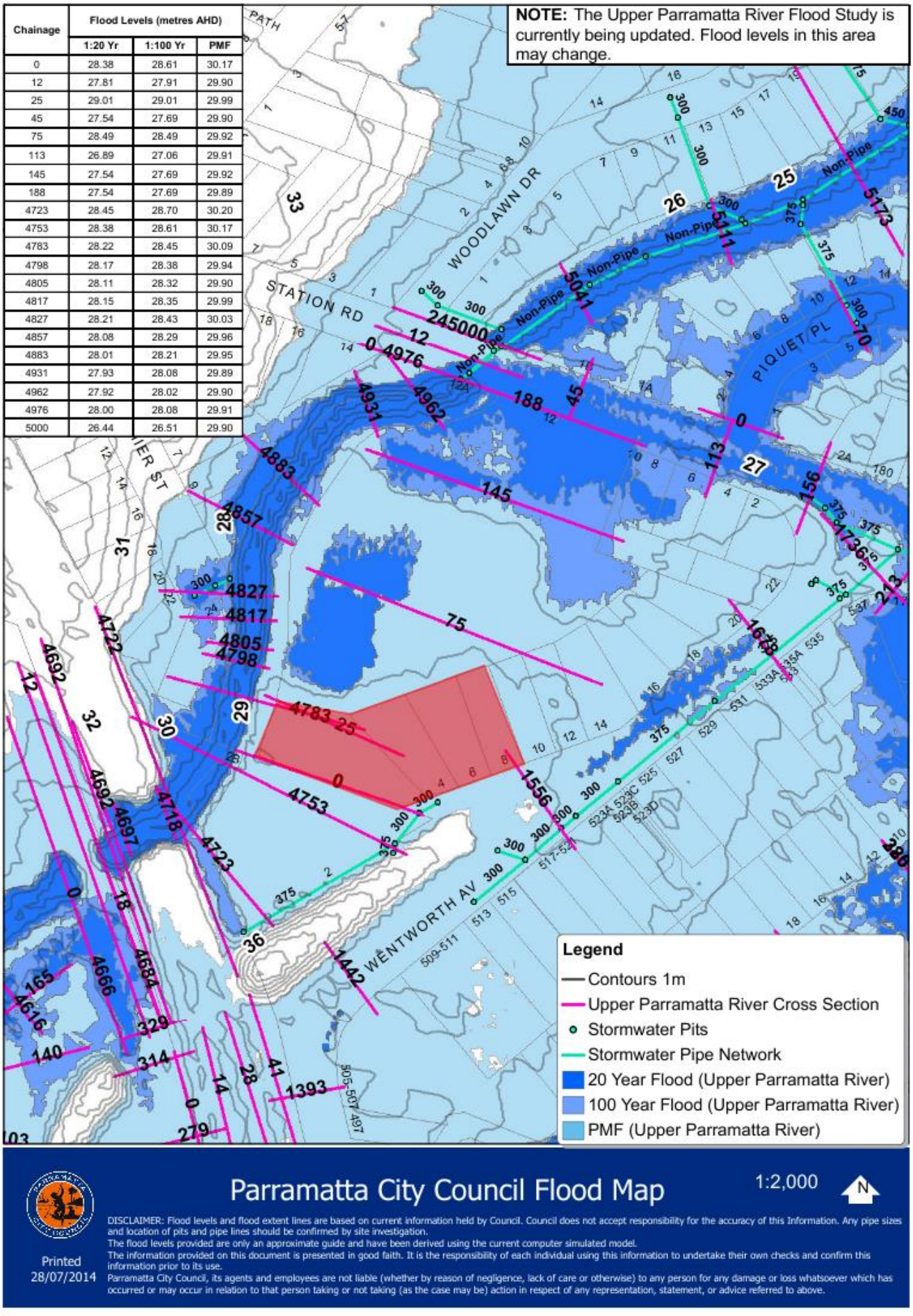
(c) "*Although the building footprint is technically above the 1% flood level, much of this site is below*".[7] (None of the Site is below the 100 year flood level – refer **Figure 1**);

(d) "*… much of the site is flood affected during the 1% AEP event …*".[8] (None of the Site is inundated in a 1% AEP flood event – refer **Figure 1**).

Use of the Term 'Flood Risk'

6. The term 'risk' is used in everyday language to mean 'chance of occurrence'. However this is not how 'risk' is used in the NSW Floodplain Development Manual (**Manual**) or more widely in the risk management industry.[9]

[1] Page 15 of 44. Officers report to Council Meeting of 6 December 2017 (which is Attachment 2 of the Brief).
[2] Page 4 of 4 of Molino Stewart's report dated 31 May 2018.
[3] Page 23 of Molino Stewart's report which is Attachment 2 of BBC Consulting Planners report dated 23 February 2018.
[4] Page 1. SES' letter to Council dated 28 February 2018.
[5] Page 22 of 44. Officers report to Council Meeting of 6 December 2017 (which is Attachment 2 of the Brief).
[6] Page 40 of 44. Officers report to Council Meeting of 6 December 2017 (which is Attachment 2 of the Brief).
[7] Refer third page of **Attachment A**.
[8] Refer first page of **Attachment A**.
[9] Refer AS/NZS ISO 31000:2009, Risk management - Principles and guidelines.



Chainage	Flood Levels (metres AHD)		
	1:20 Yr	1:100 Yr	PMF
0	28.38	28.61	30.17
12	27.81	27.91	29.90
25	29.01	29.01	29.99
45	27.54	27.69	29.90
75	28.49	28.49	29.92
113	26.89	27.06	29.91
145	27.54	27.69	29.92
188	27.54	27.69	29.89
4723	28.45	28.70	30.20
4753	28.38	28.61	30.17
4783	28.22	28.45	30.09
4798	28.17	28.38	29.94
4805	28.11	28.32	29.90
4817	28.15	28.35	29.99
4827	28.21	28.43	30.03
4857	28.08	28.29	29.96
4883	28.01	28.21	29.95
4931	27.93	28.08	29.89
4962	27.92	28.02	29.90
4976	28.00	28.08	29.91
5000	26.44	26.51	29.90

Figure 1: The Site superimposed on Council's Flood Map
(Source: Attachment A of Martens & Assoc letter dated 31 May 2018)

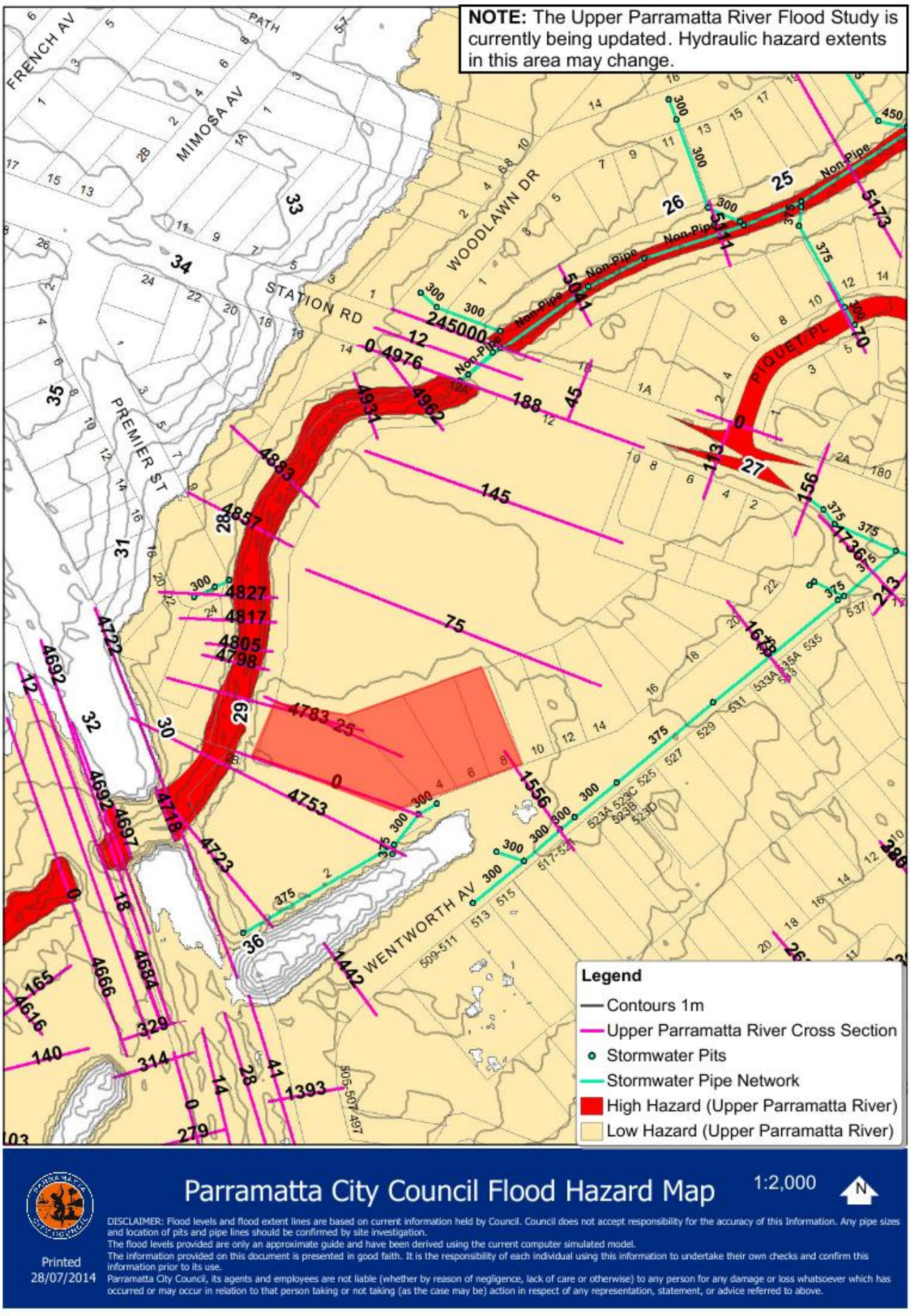


Figure 2: The Site superimposed on Council's Flood Hazard Map
(Source: Attachment A of Martens & Assoc letter dated 31 May 2018)

7. Consistent with the NSW Manual's usage of the term 'risk', within this review report 'flood risk' is the combination of both probability and consequence. Therefore the consequences of flooding must be considered together with the probability in order to assess flood risk. Referring to the consequences without an appreciation of the probability of those consequences will lead to bias in the assessment of flood risk.

8. The probability of occurrence of the PMF at the Site is quoted by Molino Stewart as being approximately a "*1 in 10 million chance of occurrence per year*". This is a very rare or remote possibility but nonetheless may be associated with severe flood consequences. It is necessary to combine these consequences with their probabilities, for the PMF as well as for more frequent events, in order to appreciate the flood risk to which the proposed development and its occupants will be exposed.

Standards of Acceptability of Flood Risks and Isolation Risks

9. Generally, all new greenfield development increases risk, e.g. increased traffic risks, increased fire risks, etc. Similarly for all new greenfield development within floodplains or development within the general vicinity of floodplains, there will be an increase in flood risk.

10. A key issue for consent authorities is not whether the development will increase risk, but whether the increase in risk is acceptable. This is particularly so when considering flood risks.

11. There are no prescriptive standards for flood risk acceptability. Acceptability of flood risks is determined by industry practice and the courts, and is guided to some extent by the NSW Floodplain Development Manual and Handbook 7.[10] (These later documents list the factors to be considered but do not prescribe standards). Further the NSW Manual specifies a 'merit approach' which balances flood risk considerations with socio-economic benefits and environmental impacts.

12. The acceptability of flood risks is also influenced by community standards for other natural hazards. For example when designing tall buildings to withstand cyclonic winds or earthquakes, structural loadings associated with rare events having probabilities of occurrence of about 1 in 1000 years or 1 in 2000 years are used.[11]

13. Such probabilities are about a thousand times or ten thousand times more likely to occur than a PMF. Nevertheless rainfalls with these probabilities of occurrence would be required for floodwaters to enter the grounds within the Site, and for access to and from the Site to become impassable (because roads external from the Site would be cut by floodwaters).[12]

14. There are also no prescriptive standards for the adverse impacts associated with a development becoming isolated from emergency services and requiring external assistance (e.g. in the case of fire or medical emergencies). The occupants of these developments have to deal with these emergencies on their own without the assistance that could, for example, be provided by fire appliances and personnel to help fight fires, or in the case of a medical emergency, ambulances to transport people to hospitals.

[10] Australian Disaster Resilience Handbook 7 – Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia. Australian Institute for Disaster Resilience. 2017.
[11] Refer Tables B1.2a and B1.2b from the Building Code of Australia which are reproduced in **Attachment C**.
[12] Based on the hydrological and hydraulic assessments documented in Martens & Assoc's letter dated 31 May 2018. As detailed by Martens & Assoc, their assessments are consistent with Council's flood modelling for the 100 year and PMF events, which adds confidence to their assessments of behaviour for flood events between the 100 year and PMF. Nevertheless both Council and Martens & Assoc have not considered blockage of the Creek which would tend to increase flood levels and flood hazards on the Site. However as discussed in paragraphs 34 to 42, the reviewer does not consider that the inclusion of blockage effects in the flood modelling would have any significant impact on the flood levels and hazards that have been determined.

15. Severe widespread rainfall events in the Sydney area approaching 100 year intensity have historically brought traffic in affected areas to a standstill. These events are often associated with 'east coast lows' which can dominate Sydney's weather for two or more days as occurred in 1974, 1986 and 1988. For much more severe events ranging from 2000 year to PMF, there will be extensive isolation of communities in many suburbs because of roads being cut and traffic becoming 'grid-locked'. The reviewer anticipates that within the Parramatta LGA alone, there would be well over 1000 properties that could not be accessed by emergency services' vehicles. In addition, the limited resources of emergency services are stretched during these events and even if road access was available, the services may not be able to attend to all the priority calls that are made.

16. The reviewer notes however that for potentially isolated developments that are not located on flood prone land, Council (and other NSW consent authorities) do not normally take such isolation into consideration when assessing development applications. This could be the result of ignorance of the isolation risk, or more likely because of a tacit acceptance of the risk by the community and consent authorities.

17. The isolation risks described in the previous paragraph can be mitigated to some extent by maintaining supplies and providing facilities on-site for support of occupants during the isolation period. In the opinion of the reviewer, vulnerable residents within private properties that become isolated are likely to be at greater risk than if those same residents were housed within a larger facility that was specifically designed and resourced to be self-supporting during periods of isolation.

RESPONSE TO ITEM 5 OF THE BRIEF

Requirement 5(a): Comment on the proposal for residents to shelter in place for the duration of a flood event that affects the site and its aftermath, noting that the floor level of the facility would be set to the level of the PMF.

18. The reviewer considers that the flood risks associated with sheltering-in-place are acceptable, assuming the facility has the necessary resources for its operation to be self-supporting for the duration of any period of isolation that might occur.

19. Even if road egress was available, the risks associated with moving residents are such that remaining on site is the preferred option.[13]

20. Further to the comments in paragraphs 16 and 17 above, having vulnerable residents located within the facility is likely to be safer than having them housed within their own homes (if these homes were isolated).

Requirement 5(b): Provide comment on the State Emergency Service (SES) letter dated 28 February 2018 relevant to risks to occupants, shelter in place, evacuation/rescue strategy, displacement of floodwaters as a result of the proposed filling of the subject site.

21. There are a range of views amongst flood risk practitioners about the appropriateness of sheltering-in-place. The majority of NSW councils allow sheltering-in-place as the primary response strategy for floodplain development proposals where evacuation ahead of imminent flooding cannot be demonstrated. Council also allows sheltering-in-place in certain circumstances.

[13] The reviewer makes these comments based on his experience in dealing with other RCFs with high care residents, and the advice provided by medical staff of those facilities. (The medical staff advised that the stress and trauma induced by relocating residents can be a significant consideration in its own right. This provides a strong preference for remaining on-site rather than evacuating the site).

22. The views expressed by the SES in relation to sheltering-in-place at this site are consistent with their stated policy across NSW that "*The NSW SES does not support shelter-in-place as a primary response strategy*".[14] This view is respected but is at odds with many in the flood risk management industry.

23. During the meeting with the reviewer, the SES stated that they would be opposed to such a development on any site that was isolated in a PMF, even if it was not flooded.

24. The reviewer acknowledges the SES' opposition to shelter-in-place and understands that as NSW's combat agency for floods, they prefer that there be no such developments in any areas that are flood prone, or in flood-free areas that can't be reached by vehicles during a flood.

25. Nevertheless the reviewer does not agree with the SES' opposition to sheltering-in-place in the circumstances of this development proposal.

26. In relation to the issue of "*displacement of floodwaters as a result of the proposed filling of the subject site*" the reviewer considers the potential flood impact is trivial and is unaware of any NSW council which would not allow filling in such a situation due to potential off-site flood impacts. This is because the land to be filled is well above the 100 year flood level and consequently could not influence water behaviour in a 100 year flood.

<u>Requirement 5(c):</u> Comment on the consistency of the development with the flooding provisions of the Parramatta DCP, the Floodplain Development Manual and Council's Floodplain Risk Management Policy with specific reference to the sensitive nature of the land use and dependency of occupants.

27. In regard to the first two of these documents, i.e. the DCP and the Manual, consistency with the provisions of these documents hinges primarily on whether the proposed use is compatible with the flood hazard, having regard to the nature of a residential care facility (**RCF**).[15]

28. In the opinion of the reviewer the use is compatible with the flood hazard given the proposed elevation of the building above the PMF and the low flood hazard of the external areas of the Site. The isolation of the facility during major floods is not inconsistent with the requirements of the DCP or the Manual provided it is designed and operated to be 'self-supporting' during periods of isolation.

29. The third document referred to above, i.e. Council's Policy, states that the Policy's objectives and principles will be achieved through, amongst other things, requiring that "*Developments with high sensitivity to flood risk (e.g. "critical" and "sensitive" land uses) are sited and designed to provide reliable access and minimise risk from flooding - in general this would not be anywhere within the extent of the Probable Maximum Flood (the largest flood that could ever occur)*."[16]

30. In the opinion of the reviewer this is a prescriptive control which shouldn't be interpreted to mean that these sensitive uses cannot be located within the floodplain, provided the use is compatible with the flood hazard. This view is consistent with the first and third objectives of the Policy which state "*Flood prone land is a valuable resource that should be managed and developed, subject to a*

[14] Paragraph 3, Page 2, SES' letter to Council dated 28 February 2018.
[15] Bewsher Consulting Pty Ltd together with its subconsultants, Don Fox Planning, authored the flood controls for the previous councils of Parramatta, Holroyd and Baulkham Hills, and the current Blacktown City Council, under a commission from the Upper Parramatta River Catchment Trust about 20 years ago. These DCPs including the accompanying flood planning matrices are largely consistent with Council's current DCP. The reviewer therefore is familiar with the objectives and controls of Council's DCP and its application to 'Sensitive Uses and Facilities'.
[16] Refer 'Application' item 1b on the third page of the Policy which is in Attachment 8 of the Brief.

merit approach that provides due consideration to social, economic and environmental criteria, as well as any flooding criteria, as identified in flood studies, independent assessments or strategically developed floodplain risk management studies and plans. …. Flood prone land should not be sterilised by unnecessarily precluding development through the application of rigid and prescriptive criteria, however inappropriate proposals should not be accepted.".

31. In the opinion of the reviewer, the proposed use is consistent with a proper application of the DCP, the Manual and the Policy.

Requirement 5(d): Comment on the proposed fill and any implication for flood management.

32. Refer to the reviewer's comments in paragraph 26 above.

33. In the reviewer's opinion having undertaken many hundreds of flood modelling assessments of fill on floodplains, the proposed fill will not adversely impact on flow conveyance or storage.

Requirement 5(e): Comment on the potential or possibility of the 1 in 100-year flood event breaching the watercourse and entering the site, particularly as a result of blockage by debris.

34. The reviewer has inspected the Creek adjacent to the Site including the various culverts and bridges within 500m upstream and downstream. The creek channel has in excess of a 100 year flood capacity which would be considerably greater than the capacity of the previous 'natural' watercourse in this location. The increased capacity appears to be the result of creek widening and rock stabilisation of the creek banks a few decades ago.

35. The existing Council flood study (and the Martens & Assoc modelling based on that study) has not made allowance for blockage of the creek channel or the upstream or downstream culverts.

36. Guidance for practitioners on the assessment of blockage for estimation of flood levels has emerged progressively over the last 5-10 years with the preparation of revisions to Australian Rainfall & Runoff (**ARR**) including ARR Revision Project 11.[17]

37. The ARR guidance is focussed almost entirely on the blockage of culverts and hydraulic structures as these locations have historically been the areas where blockages are more prevalent and have had potential to alter flood behaviour.

38. In the opinion of the reviewer, the upstream culverts across the Creek, and to a lesser extent the downstream culverts, would be the first locations where blockage might occur in a major flood. Nevertheless blockage of these structures would be unlikely to cause flood levels within the Creek to rise sufficiently to enter the Site in a 100 year event.

39. The downstream culvert and roadway at Station Street already overtops in a 100 year flood and floodwaters pass over a wide stretch of the roadway. Any blockage of that culvert would raise flood levels immediately upstream however due to the wide area of overtopping that already occurs, the additional overtopping flows are likely to be accommodated on the roadway without increasing the flood levels at the Site.

[17] Australian Rainfall and Runoff: A guide to flood estimation. Commonwealth of Australia (Geoscience Australia) 2016.

40. Blockage of the upstream culverts at Portico Parade is unlikely to alter flood levels at the Site, and if a change did occur, it would serve to reduce flood levels on the Site, not increase them.

41. The only realistic mechanism by which floodwaters could breach the Creek channel would be through blockage of the channel immediately adjacent to the Site by flood debris including the existing trees which presently occupy the Creek banks. The reviewer's inspection reveals that some of these trees could potentially be destabilised and washed into the Creek in a major flood. In future years, should maintenance of the Creek channel not occur as frequently as it has in the past, it is also possible that dead trees could slowly accumulate in the Creek channel over time.

42. However given the capacity of the existing channel it is unlikely that sufficient blockage would occur to cause 100 year flood waters to come onto the Site. In the opinion of the reviewer, if the flood study was revised to properly account for blockage,[18] the Site would remain flood-free in a 100 year event.

Requirement 5(f): Comment on Council's Floodplain Risk Management Policy.

43. Refer paragraphs 29 and 30 above.

Requirement 5(g): Provide a response to Council's Catchment Engineer's comments (provided April 2018). The applicant may provide comments in reply to these comments provided by Council's Catchment Engineer which will be provided subsequently.

44. The issues raised by Council's Engineer have all been addressed above.

REVIEW FINDING

45. Having regard only to flood risks, including the risks posed by isolation of the proposed development during floods, the reviewer supports the Application. This support is contingent upon conditions being provided (if required) to ensure the facility is self-sufficient for the period of any isolation.

Yours sincerely

Drew Bewsher
Director

cc. Dan Brindle, BBC Consulting Planners: Dan.brindle@bbcplanners.com.au
Shaylin Moodliar, Parramatta Council: SMoodliar@cityofparramatta.nsw.gov.au

[18] Any design blockage levels provided in such a model need to ensure the outcome is 'neutral' in terms of the annual exceedance probability (**AEP**). For example if one combines a 0.1% AEP blockage scenario with a 1% AEP rainfall, the resultant design flood will not be 1% AEP but rarer.

ATTACHMENT A

Additional Response Provided by Paul Clark of Council on 27 June 2018

Drew Bewsher

To:	drew@bewsher.com.au
Cc:	Shaylin Moodliar; Wendy Wang; Mark Leotta
Subject:	DA/1281/2016 - Regarding Steven Molino's response (31/05/2018) to SES. Opal Aged Care Toongabbie Sports and Recreation Club Wentworth Ave Toongabbie 28 06 2018
Attachments:	image001.jpg; image003.jpg; DA 1281 2061 – Toongabbie Sports Club – Aged Care - Station St, Toongabbie.docx

Good Morning Drew,

I am sorry but I have not been not able to add much to the comments we previously made, except to say that Council's assessment of this DA is holistic, merit and risk based and not reliant on a prescriptive interpretation of the DCP matrix. I hope this is evident throughout our documentation. I suggest the SES response is similar. (Note Council had no contact whatsoever with SES re their assessment and response.)

As regards levels and cutoff of access, Marten has sought to calibrate their model against Council predicted and adopted flood levels. I am not sure how valid this is and in any case, I doubt that it is valid to use events for which we do not have adopted flood levels for this assessment. We do know that much of the site is flood affected during the 1% AEP event, even without allowing for creek blockage - and despite the proposed filling. 100 year floodwaters come very close to this proposed building. We also know this is a substantial catchment and overland flow in large storms will be severe and will have unpredictable consequences. Trying to model 1 in 1000 year events on a computer and prove that occupants will be safe is neither meaningful nor real.

Regarding Steven Molino's response (31/05/2018) to the SES:

I think this does not really address the fundamental issues of this site and these occupants, which has been well appreciated and described by the SES.

It appears as reinterpreting the information about risk for this site to make things look more favourable.

It also seeks to break risks into small fragments that in each case look less concerning, then try to minimise their individual consequences.
BY contrast, Council's concern is that this development represents an aggregation of risks, one on top of the other, which together as a whole become unacceptable and unsustainable.

Molino Stewart describes flooding as being of short duration, that the site and surrounds are on a 'flood free island' even in the PMF, that this site is the same as any other in the locality, that evacuation is not needed, and that risks to life from this development are 'miniscule'. Council does not accept these points.

The SES carefully explains why those people likely to be present in such a facility will need emergency access and care, what such care consists of, why this this site prevents this and therefore why this development may be dangerous for occupants and not in the public interest.

Thank you for enabling this response.

For your convenience I have attached the dot points that I gave to you at our meeting.

kind regards

Paul

30/06/2018

Paul Clark | Senior Catchment and Development Engineer
Development & Traffic Services | City of Parramatta Council
PO Box 32, Parramatta NSW 2124
126 Church Street, Parramatta

30/06/2018

DA/1281/2061 – Toongabbie Sports Club – Station St, Toongabbie

Key points

Although the building footprint is technically above the 1% flood level, much of this site is below.

The building is close to the creek. The creek is narrow. Any object that entered the creek could easily cause sufficient blockage to trigger flooding over the banks.

This is a substantial catchment with short/no warning times.

The flow in events greater than 1% is very significant such that a broad area of the surrounding suburb will be inundated – and devastated.

There is no escape route from this site or flood free emergency access.

Occupants are frail, aged, and/or demented. All are highly dependent on carers and very vulnerable.

Shelter in place might be appropriate elsewhere, and/or for some user groups, but in this location with these occupants it is not safe or even practical. (eg providing back up sewage disposal 24/7 in perpetuity).

The SES has independently identified these problems and does not support the application.

It is unacceptable to place substantial fill in the floodplain adjacent to a creek of this nature.

ATTACHMENT B

Additional Information Provided by Corey Taylor of PactPM and Mark Lederer of Opal Aged Care on 25 June 2018

Drew Bewsher

From: Corey Taylor <coreyt@pactpm.com.au>
Sent: Monday, 25 June 2018 2:48 PM
To: Drew Bewsher
Cc: Dan.Brindle@bbcplanners.com.au
Subject: Fwd: Opal Toongabbie Flooding independent expert further information

Hi Drew,

Thank you for your time this morning.

The trailing email provides further commentary on the staffing, decanting and emergency response matters we discussed.

Let me know if you require any additional information.

Kind regards,

Corey Taylor

Director
Pact PM
m: +61 (0) 400 661 617
e: coreyt@pactpm.com.au

Begin forwarded message:

> **From:** Mark Lederer <Mark.Lederer@opalagedcare.com.au>
> **Date:** 25 June 2018 at 1:52:40 pm AEST
> **To:** "Corey Taylor (coreyt@pactpm.com.au)" <coreyt@pactpm.com.au>
> **Cc:** Dan Brindle <dan.brindle@bbcplanners.com.au>
> **Subject: Opal Toongabbie Flooding independent expert further information**
>
> Corey.
>
> Further to our meeting this morning, please find attached further information as discussed with Drew this morning.
>
> **Staffing**
> Weekday Staffing
> Between 10PM and 6am approx. 11 to 13 staff
> Between 6am to 4.30PM staff ranges from 20 to 35 staff
> Between 4.30Pm to approx. 10pm staffing ranges from 17 to 19 staff
>
> Weekend Staffing
> Between 10PM and 6am approx. 11 staff
> Between 6am to 4.30PM staff ranges from 13 to 30 staff
> Between 4.30pm to approx. 10pm staffing ranges from 17 to 19 staff
>
> **Decanting**
> In response to Drew's specific question, where would residents returning from an outing go if there was a flooding event, we advise should temporary relocation be required during a flood emergency

there are a number of Opal facilities with a reasonable distance to which a resident could be temporarily relocated to, refer below

Opal Facilities	Number of Beds	Status	Distance from subject site	Comments
Opal willows	95	To open 04/2019	6.2 klms or 11 mins	
Opal Blacktown	145	To open 11/2018	6.4 klms or 12 mins	240 beds within 10 klms or 12 mins
Opal Quakers Hill	127	Existing	11.37 klms or 18 mins	
Opal Bossley park	100	Existing	13.8 Klms or 23 mins	
Opal Glenn Lyn (auburn)	32	Existing	13.9 klms or 20 mins	789 beds within 14 klms or 23 mins
Opal Bankstown	155	Existing	24 Klms or 36 mins	
Opal Wallgrove (Lakemba)	52	Existing	24.1 klms or 29 mins	
Opal Canterbury	85	Existing	24.2 Klms or 31 mins	
Opal Cardinal Freeman (Ashfield)	133	Existing	25.6 klms or 33 mins	924 beds within 25.6 klms or 36 mins
Total beds	924			

Emergency Response
Opal's Warden Handbook for the Emergency response procedures for Health and Aged Care facilities has a flip chart which considers the full or partial evacuation of the facility may be instigated as a result of any of the following:

- Fire or explosion in the building
- Gas leak
- Ventilation System Contamination
- Structural Damage sustained to the building
- Bomb or hazardous substances threat
- Armed intruder incidents
- Civil Disorder
- Structural Fault
- Natural Disaster
- Chemical Spill
- Missing / wandering persons or residents
- Or by direction of the Emergency Services.

Please advise if further information of clarity is required.

Best

Mark

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ATTACHMENT C

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(v) for the purposes of **(iv)**, cyclonic areas are those determined as being located in wind regions C and D in accordance with AS/NZS 1170.2.

(d) Actions not covered in **(a)**, **(b)** and **(c)** above:

(i) the nature of the action; and

(ii) the nature of the building or structure; and

(iii) the Importance Level of the building or structure determined in accordance with **Table B1.2a**; and

(iv) AS/NZS 1170.1.

(e) For the purposes of **(d)** the actions include but are not limited to—

(i) liquid pressure action; and

(ii) ground water action; and

(iii) rainwater action (including ponding action); and

(iv) earth pressure action; and

(v) differential movement; and

(vi) time dependent effects (including creep and shrinkage); and

(vii) thermal effects; and

(viii) ground movement caused by—

(A) swelling, shrinkage or freezing of the subsoil; and

(B) landslip or subsidence; and

(C) *siteworks* associated with the building or structure; and

(ix) *construction activity actions*.

Table B1.2a IMPORTANCE LEVELS OF BUILDINGS AND STRUCTURES

Importance Level	Building Types
1	Buildings or structures presenting a low degree of hazard to life and *other property* in the case of failure.
2	Buildings or structures not included in Importance Levels 1, 3 and 4.
3	Buildings or structures that are designed to contain a large number of people.
4	Buildings or structures that are essential to post-disaster recovery or associated with hazardous facilities.

Table B1.2b DESIGN EVENTS FOR SAFETY

Importance Level	Annual probability of exceedance			
	Wind		Snow	Earthquake
	Non-cyclonic	Cyclonic		
1	1:100	1:200	1:100	1:250
2	1:500	1:500	1:150	1:500

***Table B1.2b DESIGN EVENTS FOR SAFETY** — continued*

Importance Level	Annual probability of exceedance			
	Wind		Snow	Earthquake
	Non-cyclonic	Cyclonic		
3	1:1000	1:1000	1:200	1:1000
4	1:2000	1:2000	1:250	1:1500

B1.3 * * * * *

This clause has deliberately been left blank

B1.4 Determination of structural resistance of materials and forms of construction

The structural resistance of materials and forms of construction must be determined in accordance with the following, as appropriate:

(a) Masonry (including masonry-veneer, unreinforced masonry and reinforced masonry): AS 3700.

(b) Concrete:

- (i) Concrete construction (including reinforced and prestressed concrete): AS 3600.
- (ii) Autoclaved aerated concrete: AS 5146.1.
- (iii) Post-installed and cast-in fastenings: SA TS 101.

(c) Steel construction—

- (i) Steel structures: AS 4100.
- (ii) Cold-formed steel structures: AS/NZS 4600.
- (iii) Residential and low-rise steel framing: NASH Standard – Residential and Low-Rise Steel Framing Part 1 or Part 2.

(d) Composite steel and concrete: AS 2327.1.

(e) Aluminium construction: AS/NZS 1664.1 or AS/NZS 1664.2.

(f) Timber construction:

- (i) Design of timber structures: AS 1720.1.
- (ii) * * * * *
- (iii) Timber structures: AS 1684 Part 2, Part 3 or Part 4.
- (iv) Nailplated timber roof trusses: AS 1720.5.

Qld B1.4(f)(v)

(g) Piling: AS 2159.

(h) Glazed assemblies:

- (i) The following glazed assemblies in an *external wall* must comply with AS 2047: