

Statement of Joanne Mary Pocock

This written statement is provided in response to a Requirement, dated 23 September 2011, pursuant to section 5(1)(d) of the *Commissions of Inquiry Act 1950* (Qld) to provide a written statement, under oath or affirmation, to the Queensland Floods Commission of Inquiry.

I, Joanne Mary Pocock, Development Planning Manager of [REDACTED] Roderick Street, Ipswich, in the Statement of Queensland swear as follows:

INTRODUCTION AND QUALIFICATIONS

1. I am employed by Ipswich City Council (ICC) as Development Planning Manager for the City of Ipswich. I work in the Planning and Development Department. I report to the ICC City Planner, Mr John Adams.
2. I discuss further below the structure of the Development Planning Branch, which reports to me, and set out an overview of the ICC development assessment process.
3. I hold the following qualifications:
 - Bachelor of Built Environment (Urban & Regional Planning) with distinction from the Queensland University of Technology given under seal 27 March 1998;
 - Graduate Diploma of Urban and Regional Planning with distinction from the Queensland University of Technology given under seal 26 March 1999;
 - Masters of Urban and Regional Planning with distinction from the Queensland University of Technology given under seal 24 February 2003;
 - Diploma in Business (Frontline Management) (2003); and
 - Certificate IV Training and Assessment (2009).
4. I am a full member of the Planning Institute of Australia.
5. I commenced employment with ICC in July 2001. Prior to that, from November 1998 to July 2001 I worked for Maroochy Shire Council as a development assessment officer assessing development applications.
6. The positions that I have held with ICC, and the related responsibilities are:



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- (a) July 2001 - late 2003: Senior Development Planner and Development Planner in the Central West development team. In this capacity I was involved in the assessment of development applications;
- (b) Late 2003 - January 2011: Development Team Coordinator for the West (geographic) team. In this position I was responsible for the assessment and determination by the West team (formerly the Central West team) of development applications made pursuant to the Ipswich Planning Scheme and for the day-to-day management of the planners in that team;
- (c) 25 January 2011 to present: Development Planning Manager. In this role I am the Branch Manager for the Development Planning branch of the Planning and Development Department. I have management responsibility for the Development Planning branch consisting of three planning based development assessment teams, a technical support team and an administration team. In this role I assist with and have managerial oversight of the Council's determination of development applications made pursuant to the Ipswich Planning Scheme.

7. In this statement I will provide a brief description of:

- the structure of the ICC Planning and Development Department;
- the ICC development assessment process; and
- some threshold matters relevant to each of the Commission Requirement notices.

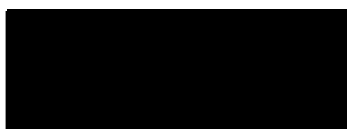
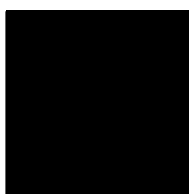
8. I will then respond to the Commission's Requirement in relation to the following development sites:

- 84/100 Chubb Street and 8 Georgette Street, One Mile;
- 2 Haig Street, Brassall; and
- 70A Chubb Street, One Mile.

I was personally involved in the development assessment process for each of these sites.

9. The sources of information for the matters set out in this statement are:

- (a) my personal knowledge and recollection of relevant events;
- (b) my review of the relevant ICC development application files a copy of which I understand have been produced to the Commission pursuant to a Requirement notice dated 5 August 2011; and



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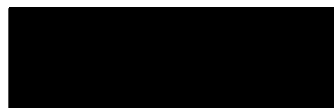
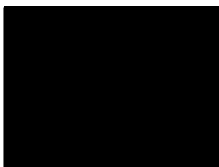
- (c) my understanding of the ICC development assessment process, the relevant ICC planning scheme and any other relevant codes and policies.

STRUCTURE OF THE ICC PLANNING DEVELOPMENT DEPARTMENT AND DEVELOPMENT PLANNING BRANCH

10. The ICC Planning and Development Department is one of six operational departments within ICC. The department is overseen by the City Planner, Mr Adams, who reports to the ICC Chief Executive Officer, Mr Wulff.
11. Within the Planning and Development Department there are five branches:
- Strategic Planning
 - Development Planning
 - Engineering and Environment
 - Building and Plumbing
 - Business Support.
12. Each branch has a manager. As noted, I am the Development Planning Manager.
13. Within the Developing Planning branch there are three geographic based planning assessment teams, a development application compliance/technical support team and an administrative support team.
14. Each planning assessment team comprises a team coordinator, senior development planners, development planners and assistant development planners and other support staff.
15. Over the years there have been slight changes to the description and structure of the geographic planning regions. The current planning assessment teams and their coordinators are:
- Development Assessment Central - Ms Natalie Plumbe;
 - Development Assessment West - Mr Brett Davey; and
 - Development Assessment East - Mr Tim Foote.
16. Approximately 120 people are employed within the Planning and Development Department. I am responsible for approximately 35 of these people within the Development Planning branch.

OVERVIEW OF THE ICC DEVELOPMENT ASSESSMENT PROCESS

17. In this section of my statement I set out for the assistance of the Commission a high level summary overview of the ICC Development Assessment process. There has been no material



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change in this process since 2004.

Pre-lodgment Meeting (if requested)

18. In some cases a development application is preceded by a pre-lodgment meeting. These meetings are held with relevant Council officers at the request of an applicant to discuss the proposal, development concepts, proposed uses, planning scheme issues, development constraints, relevant codes, potential policy implications and the such like. Although Council officers will take notes of the meeting, the meeting has no formal status and no formal minutes are produced, although officers notes are recorded in the corporate record keeping system against the relevant properties. Since about July 2009, a register of all pre-lodgement meeting discussions has been maintained in Council's corporate property and application management software system, Pathway.

Development application

19. Development applications are lodged electrically or in hard copy, and, upon registration in the Council database, are referred to the relevant development planning team coordinator (based on geography) for initial review.

Assessment officer allocation

20. The team coordinator will allocate an assessment officer to be responsible for the coordination of the assessment of the application. Allocation is generally determined based on the complexity of the application and workload.

Integrated Development Assessment Panel (IDAP) presentation

21. The assessment officer presents the application to an internal panel known as IDAP (Integrated Development Assessment Panel). IDAP meets twice a week, each Tuesday and Thursday, and considers all applications received by Council. Each meeting agenda is sent to all technical staff within the Development Planning branch and the Engineering and Environment branch, as well as to the City Planner and the Strategic Planning Manager.
22. The Tuesday IDAP meetings focus on major and complex applications. Thursday's meetings are for minor and lower complexity applications.
23. At IDAP the strategic principles for the assessment are discussed, including any flood related issues. The need for the application to be referred to other internal specialist officers is identified and any immediately obvious issues or deficiencies in the application are raised or discussed. Through the IDAP process strategic guidance is provided to the assessment officer.

Acknowledgement Notice (if required)

24. If it is determined at IDAP or in the early application assessment process that an Acknowledgement Notice is required for the application pursuant to the *Sustainable Planning Act 2009* (SP Act) the notice is prepared and issued to the applicant. Should the application require referral to concurrence, advice agencies or third party advice agencies as identified in the Acknowledgement Notice, it is the responsibility of the applicant to undertake the appropriate action.

Application internal referral

25. If internal referral is required, this is actioned. Primarily such referrals are sent to the Engineering and Environment branch. Allocation to officers within the Engineering and Environment branch are also generally effected by reference to the geographic area relevant to the application, mirroring the approach taken within the Development Planning branch.

Information/referral stage requirements

26. The planning officer and internal referral officers assess the application to identify any outstanding information requirements and to determine whether a further information request is required to be issued to the applicant. If required, an information request is prepared for review and signing by the team coordinator or senior planner. Preparation of the information request is undertaken in accordance with the timeframes specified in the SP Act, and the applicant then has six months to respond to Council.
27. Any referring agencies may make separate information requests, which are copied to Council.

Public Notification (if required)

28. For impact assessable applications, the applicant is responsible for carrying out the public notification requirements in accordance with the SP Act, and for supplying Council with a notice of compliance.

Council development application assessment

29. The planning officer and internal referral officers assess the application based on the application material which includes any responses to information requests, public notification submissions, referral agency responses and conditions (if applicable), and consider all relevant planning scheme matters.
30. Internal referral officers forward their completed assessment, including any recommendations for conditions or reasons for refusal to the planning officer who cross-references all information and completes their assessment against the Planning Scheme and provides a report

and recommendation about the application to the relevant Delegate. The planning officer report includes a summary, recommended conditions, relevant decision details and the completed planning scheme assessment report checklist.

Recommendation review

31. The delegate reviews the planning officer's report, asks questions and provides feedback. Once the delegate is satisfied with the report and recommendation these are sent to the relevant divisional Councillor and to the Chair of the Council Planning Committee for consultation. When the Chair of the Planning Committee is also the relevant Divisional Councillor, a substitute Chair (generally the Depute Mayor) considers the application.
32. This consultation is required under the conditions of the planning officer's delegations. The consultation email includes a summary of the planning assessment report and attaches a copy of the report and recommendation.
33. The Councillors can respond in one of 5 ways:
 - (a) *I note the delegated power [].* In this instance the delegate will proceed to determine the application;
 - (b) *I request the matter be referred to the Planning & Development Committee [];*
 - (c) *I wish to declare a material personal interest in the matter [].* In this instance the delegate will proceed to determine the application;
 - (d) *I request the matter be held pending clarification of issue(s) below [].* In this instance the relevant delegate will discuss any questions with the relevant Councillor; and
 - (e) *I wish to declare a conflict of interest in the matter [].* In this instance the delegate will proceed to determine the application.

Referral to planning & development committee

34. If an application is referred to the Development & Planning Committee, I will prepare a committee report for the City Planner. At committee it may be decided to:
 - (a) remove the report from the agenda if, after discussion, the committee is satisfied with the original proposal decision;
 - (b) agree with the recommendation, but pass the recommendation by a resolution of Council; or

- (c) change the recommendation by a resolution of Council, in which case the *Local Government Act* requires that the Council give its reasons for doing so.

Application determination

35. Within five (5) business days of determination of an development application a decision notice is issued to the applicant and any referral agencies (and if appropriate, any submitters). An applicant may seek to negotiate an approval in accordance with the relevant provisions of the SP Act, or appeal the decision in the event of refusal.

When approval takes effect

36. Following the expiry or waiver of all appeal periods the approval takes effect.

THRESHOLD ISSUES

1974 Flood advice in Decision Notices

37. In a number of the Commission's Requirement notices issued to ICC planning officers, the Commission seeks information as to the basis for the following statement appearing in the Council Decision notice:

"Advice

***The following advices are offered for your information only
and should not be viewed as mandatory conditions of this approval.***

...

Flooding

The subject site was fully inundated in the 1974 flood. Council, and its servants and agents, accept no liability or responsibility for any loss or damage to person or property of whatever nature or however caused as a direct or indirect consequence of the granting of the approval herein contained. Such approval has been granted at the request of the Developer and in reliance of (sic) information submitted by the Developer in support thereof".

38. This advice is included as a generic notification for information and advice purposes only in respect of sites the subject of development approvals which were affected by the 1974 flood. The statement as to the 1974 flood level has no policy relevance to the assessment by Council of development applications throughout the period under consideration (2004 - January 2011) as the regulated flood line throughout this period was the 1 in 100 flood line mapped under the Ipswich Planning Scheme.

39. The flooding advice notification is one of a number of such generic notifications included within decision approval notices where appropriate. Other notifications commonly included in such notices relate to "Portable Long Service Leave" and "Fire Ants".
40. For some locations within Ipswich there is a similar such notification in relation to "Mining" which reads:

"Mining

The land to which this approval relates may have been worked by underground coal mining operations. Council, and its servants and agents, accept no liability or responsibility for any loss or damage to person or property of whatever nature or however caused as the direct or indirect consequence of the granting of the approval herein contained. Such approval has been granted at the request of the developer and in reliance of information submitted by the developer in support thereof."

41. I am unable to assist the Commission as to the genesis of these generic statements. The statement as to the 1974 flood level has been included as a standard advice in decision notices for as long as I have been employed by ICC. Based on discussion with other Council officers I believe the notification has been included for many years prior to my joining Council in 2001. However, I am unable to say when or why the statement was first included.
42. My understanding of the purpose of the notification is to alert applicants that their site flooded in 1974, even though, for development assessment purposes, the relevant consideration for flooding issues is the flood line mapped under the Planning Scheme.

DEVELOPMENT ASSESSMENT CHECKLISTS

43. A standard inclusion in all ICC planning officer assessment reports is the completion of an assessment checklist. The checklist is a "ready reckoner" that all matters relevant to the assessment of the application have been addressed. This ensures that all formalities are attended to, and that no issues inadvertently "fall through the cracks". The completed checklist is signed by the planner responsible for the assessment and by the planning team coordinator.
44. The checklist is an initiative that was introduced shortly after the introduction of the 2004 Ipswich Planning Scheme. The actual checklist document was developed by myself and Mr [REDACTED] Mr [REDACTED] is now a Senior Technical Support Officer in the Development Planning Department. Attached to my statement and marked "JMP-1" is a copy of the pro-forma ICC assessment checklist.

45. For the assistance of young or newly appointed planners, the process outlined in the development assessment checklist sets out the order of assessment for a development application pursuant to the Planning Scheme. It is difficult to have a training manual for young or newly appointed planners specific to how to assess a particular development application, owing to the nature of the every application being different and every site being different. However, all newly appointed planners are assigned a Senior Development Planner as a peer mentor within their team. They also receive formal training in relation to the Council's Corporation Applications Systems, GIS Mapping Products and Data Management Systems. The peer mentor is responsible for their day-to-day on the job training, assisted by the Team Coordinator and other team members.

84/100 CHUBB STREET, 8 GEORGETTE STREET, ONE MILE - 437/05CA

Application Background and Overview

46. I was the Delegated Officer and Team Coordinator for a development application concerning properties at 84 Chubb Street, 100 Chubb Street and 8 Georgette Street, One Mile. The Planning Officer primarily involved in the assessment was Mr Michael Ellery.
47. The subject site is large, comprising 7.71 hectares. The site abuts Chubb Street to the west of the site, and extends 300 metres to the Bremer River to the east. Residential development abuts the higher portion of the site to the north and to the west. Also to the north is the vacant lot comprising 70A Chubb Street, itself the subject of a development application discussed later in this statement.
48. Each of the subject lots has a different zoning. 8 Georgette Street is zoned Residential Low Density (RL2), 84 Chubb Street is zoned Recreation (in recognition of its previous use as an indoor gymnasium and outdoor sports centre) and 100 Chubb Street is zoned Large Lot Residential. The whole of the application site could be adequately serviced by urban infrastructure and was generally suitable for residential purposes.
49. The application was lodged on 1 February 2005. It was a combined application for a Material Change of Use and Reconfiguring a Lot. The material change of use component sought a development permit for 118 aged accommodation units and an ancillary recreation facility, which included a communal facilities building, a swimming pool, tennis court and lawn bowls. A total of 48 visitor parking spaces were proposed for the site. Two vehicular access points were proposed to Chubb Street, located on the elevated portion of the site. No vehicular access to Georgette Street was proposed.
50. The proposal to reconfigure 3 lots into 2 lots sought to excise an area of 6,830m² of linear open space along the Bremer River that would be dedicated to Council and connect with two existing lots owned by Council. The remainder of the development site was then proposed to

be amalgamated into a single lot to be developed for the aged accommodation and ancillary recreational facilities.

51. The existing 100 Chubb Street site contained a dam to be adapted for use as a detention basin as part of the site's stormwater solution.
52. The application was impact assessable. However, only one submission unrelated to flooding issues was received.
53. The site is affected by both the Q100 and Q20 flood lines. The application proposed balance cut and fill to ensure that all unit sites were located above the adopted Q100 flood line.
54. The site was inundated in 1974 and partially inundated in 2011. However, the inundation experienced in 2011 did not extend to the location of the proposed unit sites.
55. Council required, as part of its assessment process, that a Stormwater Management and Flooding Report be obtained. The report produced by Cardno concluded that:
 - (a) the development could proceed without adversely impacting on flood levels;
 - (b) although the impact of the proposed development produced a maximum increase of 5mm in flood levels within the site for the 100 year ARI local flood event, the peak water levels for the Q100 developed case were generally less than those for the base case 100 year ARI flood level of 23.8m AHD quoted by Council by as much as 41mm, indicating that the development could proceed without adversely impacting on flood levels;
 - (c) the impact of proposed filling of the site (limited to areas at or above 20m AHD, which is above the defined Q20 level of 18.9m AHD) would be offset by the excavation of a volume greater than that filled, thereby creating additional flood storage capacity on the site;
 - (d) the works would have negligible impact on the duration or velocity of flooding or warning times; and
 - (e) the geology of the site was not likely to be affected by the development, nor were soil creep and slips likely on the site, but these issues would need to be considered as part of the detailed design.
56. All accommodation units were located above the Q100 flood line, with the ancillary recreation facility, including two tennis courts and a bowling green, related shelter structures, a communal vegetable and herb garden, pedestrian pathways and passive recreation areas located within the Q20 flood line.

57. Based on the information provided by the applicant and subsequently approved by Council, the finished pad levels of the multi dwelling units were all located above the Q100 flood level of 23.8m AHD. This was in part due to the cut and fill arrangement on the site, compensatory in nature, whereby the volume of cut was greater than the volume of fill, thus creating additional flood storage.
58. The applications were uncontroversial and on 17 March 2006 were approved subject to conditions. The approval was not sought to be negotiated.
59. The material change of use component of the approval has not yet been complied with.
60. On 31 August 2006 an application was lodged for Operational Works (municipal and internal works stage 1). On 22 February 2007 sub-staging of the development was approved. The Operational Works application relates to stage 1 of the development and is addressed further below.
61. A subsequent development permit 323/10 dated 13 September 2010 was approved to sub-divide the land and create a Community Management Scheme for the approved Multiple Residential. No intensification of the use was established by this approval.
62. As at the date of this statement, the Operational Works have commenced, but no buildings have been constructed on the site in conjunction with the proposed use.
63. Attached to my statement are copies of the following key documents relating to this application:

JMP-2: Development application and enclosed assessment report lodged 1 February 2005

JMP-3: ICC Information Request dated 30 March 2005

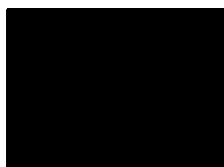
JMP-4: Letter David Brett & Associates to ICC in response to ICC Information Request dated 25 August 2005

JMP-5: Cardno (Qld) Pty Ltd Stormwater Management Plan and Flooding Report dated 9 August 2005

JMP-6: Memorandum Assistant Development Engineer to Development Team Coordinator dated 9 March 2006

JMP-7: Memorandum Senior Development Planner to Development Team Coordinator dated 16 March 2006

JMP-8: ICC Assessment Checklist - Impact Assessable Development



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JMP-9: ICC Development Application Decision Notice dated 20 March 2006.

Question 1: The known Q100 and Q20 flood levels at or around the time of the application

64. The levels are:

- 100 year ARI event - 23.8m AHD
- 20 year ARI event - 18.9m AHD.

Question 2: The known site level or levels

65. Council records indicate that the site levels range from RL7.0m AHD at its eastern boundary (the left bank of the Bremer River) up to RL25.0m AHD at the western boundary (Chubb Street) of the site.

Question 3: What assessment propose was followed specific to flood impacts

66. The assessment process followed was in accordance with the process I have outlined in paragraphs 17 and following of this statement.

67. Upon lodgment of the development application I nominated Senior Development Planner, Michael Ellery as the assessing officer for the application. The proposal was forwarded to the IDAP meeting at which time it was identified that the OV5 1 in 20 and the 1 in 100 flood lines affected the site, and that no flood study had been submitted with the application. It was therefore identified that the proposal would necessitate internal referral to ICC's Development Engineers to undertake a preliminary assessment to determine the specific information required. The application was referred to the appropriate geographically based engineering team, where it was allocated to an Assistant Development Engineer for review.

68. It was also noted that due to the proposed filling below the flood line, the application triggered State Government referral as notified in Council's Acknowledgement Notice dated 8 February 2005. Referral coordination was undertaken by the Planning Services section of the then Department of Local Government, Planning, Sport and Recreation who referred the application to the following State agencies:

- Environmental Protection Agency;
- Department of Natural Resources and Mines; and
- Department of Primary Industries and Fisheries.

69. Council's Information Request to the Department of Local Government, Planning, Sport and Recreation dated 24 March 2005 requested information regarding flooding and stormwater quality, as well as information concerning other matters unrelated to flood. All of Council's

information request items were included on the referral coordination information request issued by the Department on 30 March 2005.

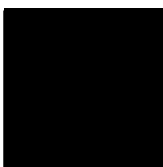
70. Though not directly relevant to flooding, the Department of Primary Industries and Fisheries requested information about the impact of the development on the local marine environment in the locality.
71. A flood study prepared by Cardno (Qld) Pty Ltd dated 9 August 2005 was submitted as part of the applicant's response to the Council's Information Request, together with a Stormwater Management Plan to address the stormwater discharge from the site as a result of the development. The adequacy of this report was reviewed and no outstanding issues were raised.
72. Council's Assistant Development Engineer finalised his assessment of the application, including as to stormwater management and flood related matters. He concluded that from an engineering technical viewpoint the application could be supported subject to the imposition of appropriate conditions. This report was endorsed by the Assistant Development Manager - Engineering.
73. A final planning report including the ICC Development Checklist was prepared by the Development Planner. This report included an approval recommendation and conditions formulated on the basis of Council's assessment of the application, including internal referral feedback and feedback from the third party agencies. This report was reviewed by me as the Delegate and on 16 March 2006 I approved the development in accordance with the recommendation. I have annexed to my statement the key documents relating to this approval process.

Question 4: What consideration was given to:

- (a) the proximity of the site to the Bremer River;
- (b) the flood risk or potential impact of flood on the proposed use for the site;
- (c) the frequency with which flooding has occurred at the site in the past.

(a) Proximity to Bremer River

74. The site shares its eastern boundary with the top of the western bank of the Bremer River. The flood study and Stormwater Management Plan prepared by Cardno addressed the flood and stormwater discharge issues relevant to the development. The adequacy of this report was reviewed by the Council's Assistant Development Engineer and no outstanding issues were raised.




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75. The Stormwater Management Plan proposed measures to prevent bank erosion by piping stormwater (1 in 100 event) from the development to the river in order to avoid discharge of water over the bank which would cause erosion and impacts into the riparian vegetation area along the river.
76. To reduce the peak flow discharged from the site in order that flood levels in the Bremer River not be affected, it was proposed that the existing dam on the site be increased in the size and constructed as a detention basin for the development. Directing stormwater runoff from the site to the detention basin also resulted in a cleaner water discharge into the river from the basin immediately after traversing the bio-retention areas.

(b) Potential flood risk

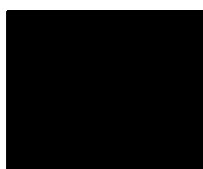
77. The Cardno flood study demonstrated there was minimal impact to the flood levels in the post development situation. Council's Assistant Development Engineer concurred that the flood risk was minimal and that the proposed use could be supported subject to the imposition of reasonable and relevant conditions of approval.
78. The flood modelling of the proposed development and compensatory earthworks indicated that for the 100 year ARI storm event, the development caused a maximum increase of 5mm in the flood levels within the site. However, as a result of the development the flood levels were generally decreased by up to 41mm.

(c) The frequency of past flooding at the site

79. It is my understanding that the frequency with which flooding has occurred at the site in the past was a policy consideration in the formulation of the 1 in 100 flood line. This flood line, as it relates to the site, was applied in considering the application.
80. It maybe that historical river heights in relation to the site can be sourced from the Bureau of Meteorology or other sources. However, this information was not obtained for the purposes of considering the application, the relevant policy consideration for those purposes being the location of the Q100 flood line.

Question 5: The measures proposed to mitigate the potential for flooding at the site by reference to the location of proposed habitable floor levels

81. As discussed in paragraph 57, it was demonstrated to Council's satisfaction that the Q100 flood level did not impact the proposed habitable areas.
82. Further measures proposed to mitigate the potential for flooding at the site included:




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- (a) Condition 2 of the development permit required that the proposed development of the site be undertaken generally in accordance with plan no. 20038-03A, prepared by the PMM Group and dated July 2005. That plan, which is annexed to the Development Permit, identifies the location of all proposed sites and hence all habitable flood levels above the Q100 flood line;
- (b) Conditions 17(g), (h) and (i) of the approval which specify:
 - (g) development of the property with buildings or other structures below the flood level associated with an ARI of 20 years will not be permitted.
 - (h) there shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 20 years. The extent of earthworks on the site shall be limited to the area and scope as defined in the Stormwater Management Plan and Flooding Report prepared by Cardno.
 - (i) pollutant control devices and/or bio-retention areas shall be installed in the stormwater system.
- (c) the site development design provides for access and egress from Chubb Street with the result that the available access routes (and if necessary evacuation routes) for the site are located above the 1 in 100 flood line.

Question 6: What process the Council used to assess the adequacy of any expert reports

- 83. Ipswich Planning Scheme Policy 2 - "Information Local Government May Request" outlines in section 1(8) the requirements for the information to be contained in expert reports to address the Planning Scheme requirements with respect to Flooding and Stormwater Flow Paths. This Planning Scheme Policy guides applicants in the preparation of development application what they should submit, and how issues such as flooding and drainage should be addressed.
- 84. The Assistant Development Engineer, Mr [REDACTED] who undertook the engineering assessment of the proposal concurred that the proposal could be supported from an engineering technical viewpoint and advised of conditions of approval to be applied should the application be approved.
- 85. I am advised by Mr [REDACTED] that the process generally followed to assess the adequacy of expert reports such as flood studies and the compliance with relevant codes is to ensure firstly that the study has been prepared by a RPEQ who is suitably qualified and experienced. The flood study is then reviewed by Council to determine that generally the following items are contained or have been addressed and found to be satisfactory:

- (a) specific software used to model the existing and post development flood impact;
- (b) the methodology used;
- (c) the parameters of the study and assumptions made to create the model are acceptable;
- (d) if an existing model is used the source of the model; and
- (e) pre and post development site profile is reflected accurately against the proposal plans.

Question 7: What conditions were included with respect to protection from the impacts of flooding

86. The following conditions were included in the approval with respect to protection from the impacts of flooding.

Stormwater

- (a) The Developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

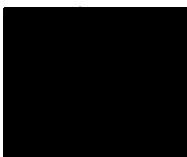
Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

- (b) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.
- (c) Due consideration shall be given in the design and construction of the development in relation to the effect of the developed catchment flows on the downstream discharge receival areas. Suitable stormwater control devices are to be provided to ensure that there is no increase in velocity in watercourses. Such control devices are to be designed so as to integrate the landscaping, recreational, infrastructural and drainage roles of watercourses.

- (d) All stormwater runoff from the developed areas of the site shall be discharged through the proposed detention basin and outlet in a manner and to a point to be approved by the Senior Development Engineer. Any piped infrastructure conveying stormwater flows shall have an appropriately designed outlet at the low water level in the adjacent Bremer River.
- (e) Stormwater drainage plans and calculations are to be submitted and approved by the Senior Development Engineer, in conjunction with the submission of an Operational Works application.
- (f) The Developer shall develop the site from a stormwater management perspective in line with the recommendations contained in the Stormwater Management Plan and Flooding Report, prepared by Cardno (Qld) Pty Ltd dated 9 August 2005 subject to the inclusion/provision of the following:
- (i) The increased stormwater runoff volume (post-development) associated with a Q5 storm event shall be retained on site;
 - (ii) Detailed on-site flood routing and detention/retention basin and/or easement sizing shall be provided as part of the Operational Works application;
 - (iii) Accommodation of Council approved water quality treatment measures;
 - (iv) Adoption/incorporation of Council approved hydraulic/river bank stability study recommendations; and
 - (v) A Level V roofwater and interallotment drainage system, in accordance with QUDM, shall be provided for this development.

The Developer shall comply with all requirements of Council approved design inclusions and alterations in association with the above mentioned items.

- (g) Development of the property with buildings or other structures below the flood level associated with an ARI of 20 years will not be permitted.



Solicitor

(h) There shall be no filling or removal of material in the flood area below the flood level associated with an ARI of 20 years. The extent of earthworks on the site shall be limited to the area and scope as defined in the Stormwater Management Plan and Flooding Report, prepared by Cardno (Qld) Pty Ltd dated 9 August 2005.

(i) Pollutant control devices and/or bioretention areas shall be installed in the stormwater system. Locations and types of the devices or treatment areas shall be submitted with the Operational Works Application for approval.

In addition to the requirements of Condition 5 of the Reconfiguring a Lot approval (that forms part of this approval 437/05), there shall be no clearing of vegetation below the adopted flood level unless otherwise approved by the Development Manager. Stormwater drainage outlets shall be the subject of detailed design in the preparation of plans for each stage of the development.

(j) The Developer shall provide a rainwater retention system for the purpose of on-site landscape irrigation. The minimum retention capacity shall be 1,000 litres/proposed dwelling.

(k) Runoff, including pipe discharge, from the development site down the embankment shall be controlled to a maximum velocity of 1.8m/s or unless otherwise accommodated in design and agreed with the Senior Development Engineer.

(l) It is noted that the discharge pipe from the detention basin is proposed to extend and discharge into Council's land, Lot 94 on RP859820. The Developer shall obtain the written consent of the Conservation, Parks and Sport Manager for any such pipe prior to the submission of any application for operational works. Alternatively, the Developer may chose to relocate the pipe so that it discharges within the subject site.

Erosion & Silt Management

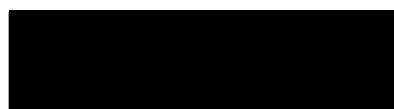
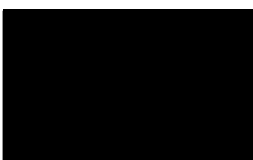
(a) The Developer shall be responsible for the installation and maintenance of silt management facilities from the time of commencement of construction until this development has been completed. All silt management facilities are to be in accordance with the document "Soil Erosion and Sediment Control" published by the Institution of Engineers Australia, or equivalent.

- (b) Diversion drains and ponds, as necessary, shall be installed on the site before any other work is undertaken on site to ensure that "dirty water" is contained and/or isolated.
- (c) A procedure shall be submitted with the engineering drawings for approval for maintaining the facilities, setting out the frequency of attention, with inspections to be made after each significant rainfall event.
- (d) The Developer shall lodge a \$10,000 siltation and erosion performance bond with Council, prior to the commencement of works, which shall only be released by Council at the termination of the maintenance period. Where Council determines that a draw-down of the bond is required, the Developer shall restore the bond to its full amount within 10 days of a notice from Council to that effect. Such bond shall guarantee adequate performance in the circumstances (i) and (ii) below:
 - (i) In the event that instructions issued to the Consulting Engineer by the Senior Development Engineer for the installation of erosion control measures, are not complied with within 24 hours, Council will call upon the bond to the extent required to carry out the necessary works.
 - (ii) If the Senior Development Engineer determines that silt damage has occurred on the site, or the downstream drainage system has become silted, the Developer shall be responsible for restoration. Such restoration shall be completed in the time determined by the Senior Development Engineer.

Should the Developer fail to complete the works determined by the Senior Development Engineer within the specified time, Council shall complete the work and recover all costs from the Developer associated with that work.

Plan of Survey

- (a) The Developer shall grant, free of cost to or compensation payable by Council, minimum 4.0 m wide easements located centrally over proposed and existing stormwater drains, water mains and sewerage rising mains, where they are located within private property.



Solicitor

The documentation associated with these easements may be prepared by the Developer in a form satisfactory to Council's City Solicitor, or the Developer may submit easement plans, only where Council is party to the easements, to Council for the preparation of easement documents at the Developer's expense.

- (b) Easements shall be centrally located over the alignment of stormwater paths and be of a width sufficient to encompass the overland flow from a storm event with an ARI of 100 years.
- (c) Easements shall be of sufficient width to contain any fitting, access chamber etc located on stormwater drains, water mains, and sewerage rising mains.
- (d) All pre-existing easements crossing the site shall be pegged where they cross each property boundary and at every change of direction.
- (e) All land (excluding that contained within approved parkland) below the flood level associated with an ARI of 10 years shall be dedicated as Drainage Reserve at no cost to Council. Land below this level shall not be considered as parkland contribution.
- (f) Existing Easement A on RP859820 shall be relinquished prior to the approval of any application for Building or Operational Works for the subject site. The easement shall not be relinquished until such time as the plan of survey dedicating the required additional open space as shown on the approved plan and as conditioned by the Reconfiguring a Lot component of this approval has been registered by the Department of Natural Resources and Mines.

General

- (a) All disturbed verge areas and allotments shall be graded, grassed and left in a mowable condition. The grass cover shall be obtained as early as possible during the development and an acceptable grass cover shall be achieved before the development can be accepted "Off Maintenance".
- (b) With reference to any works, on land under other private ownership, written permission for the works shall be obtained and forwarded to Council. Similarly, written clearances shall be obtained after the works are completed, unless otherwise accepted by the Senior Development Engineer.

- (c) All works required for this development shall take due regard of any and all existing services and, if considered necessary by the relevant authority or the Senior Development Engineer, such works shall be altered at the cost of the Developer.
- (d) Any filling for a greater depth than 500 mm shall be conducted in accordance with Australian Standard 3798. Test results as required by Australian Standard 3798, and a certificate of quality and uniformity of fill shall be provided by a RPEQ. The level of responsibility shall be Level 1.
- (e) A certificate from a RPEQ shall be issued to Council certifying that any retaining wall greater than 800 mm in height is structurally sound and capable of withstanding any likely surcharge loads. Retaining walls greater than 1.0 m in height are to be provided with railings or other barriers to provide pedestrian safety.
- (f) Retaining walls shall be designed so that there are no imposed loads placed upon Council's underground services. This may include extending the footing to a level 300 mm below the invert of the pipe.
- (g) For batters resulting from cutting and filling of the site and producing slopes greater than 1:6, Council requires a RPEQ to certify that they are stable and properly drained.
- (h) A hydraulic and river bank stability study shall be undertaken in regard to the site by a RPEQ. Such study shall be comprehensive taking into account all matters relating to the site and shall include, but shall not be limited to, the following:
- Geology of the site and any related problems;
 - Instability features such as slips, soil creep etc;
 - Effects of existing vegetation and of any possible removal and or modification of same;
 - Effects of any fill material and the types of fill material recommended;
 - Water eg: ground water; scour potential in flood situations including the effects of turbulence; effects of rapid draw down of water level.

Such studies shall include any necessary recommendations in regard to the proposed development to ensure long term stability.

- (i) Approval of the Senior Development Engineer is required for any fill intended to be placed over Council's underground services.

Question 8: The basis for the Council's statement in its decision notice in relation to the 1974 flood "advice"

87. In response to this question I refer to the matters set out in paragraphs 37 - 42 above.

84-100 CHUBB STREET, 8 GEORGETTE STREET, ONE MILE - OPERATIONAL WORKS APPLICATION 5752/06

88. By its Requirement dated 23 September 2011 the Commission has asked that I provide information in relation to OA5752/06 (carrying out operational and municipal works) in connection with the 84 Chubb Street site.
89. I had no direct involvement in the assessment of the operational works matters, but have reviewed the relevant Council files and am able to comment on the matters raised by the Commission on the basis of that review, and on the basis of my general knowledge of the site.
90. Attached to my statement are copies of the following key documents relating to this application:

JMP-10: Letter DKS Queensland Consulting to ICC dated 28 August 2006 and attached Development Application for Operational Works (lodged 31 August 2006)

JMP-11: Letter ICC to David Brett & Associates Pty Ltd dated 22 February 2007 approving sub-staging of the development

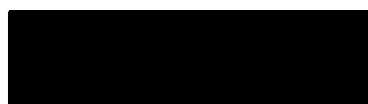
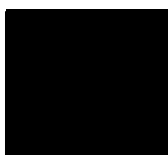
JMP-12: ICC Outstanding Issues Request dated 23 February 2007

JMP-13: Memorandum Development Engineer to Senior Development Engineer dated 15 March 2007

JMP-14: ICC Development Application Decision Notice dated 19 March 2007

A full copy of the relevant file has previously been produced to the Commission in response to the Commission's Requirement notice dated 5 August 2011.

91. The operational works application relates only to the carrying out of municipal and operational works in relation to Stage 1 of the proposed development. Stage 1 comprises 41 of the proposed 118 units, and is located on the western side of the site abutting Chubb Street.



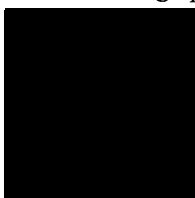
Solicitor

92. This location is situated well above the Q100 flood line, and as a result there were no flood related considerations relevant to the approval.
93. The operational works the subject of the application do not involve construction of the approved units. They are works in the nature of road works, footpaths, car park, refuse collection, stormwater drainage and sewerage.
94. The Council included as a condition of its approval of the application that the proposed detention basin also be constructed in Stage 1 so as to enable stormwater runoff from the areas of the site to be developed as part of the Stage 1 operational works to be discharged through the detention basin in the manner proposed in Council's original development approval.
95. The application for operational works was lodged on 31 August 2006. The Council approved sub-staging of the development on 22 February 2007. Additional information was sought by the Council in an outstanding issues letter dated 23 February 2007 and on 15 March 2007 a recommendation was made by the Development Engineer to the Senior Development Engineer to approve the operational works for Stage 1 subject to conditions. The Council decision notice then issued on 19 March 2007.
96. To the best of my knowledge the Q100 and Q20 flood levels for the site at the time of the operational works application were consistent with those at the time of the earlier MCU and RAL application.
97. No additional flood or drainage reports were obtained for the purpose of the Stage 1 operational works application as, having regard to the location of the proposed works, these would not have been considered necessary or relevant to the assessment of the application.

2 HAIG STREET, BRASSALL - APPLICATION NO. 195/06/MCU

Application background and overview

98. I was the Delegated Officer and Team Coordinator for a development application concerning 2 Haig Street, Brassall. Council's consideration of the application extended over some years from early 2006 to late 2009. The planning officer primarily involved in the assessment was Ms [REDACTED] who took over responsibility for the application in 2007, following the resignation of the planning officer who had originally been appointed to undertake the assessment.
99. The subject site comprises an area of 1.28 hectares. It is bounded by Haig Street to the north, Collins Street to the west, Workshops Street to the south and the Bremer River to the east. A large proportion of the site, towards the north and west, is relatively flat, at a level between



Solicitor

RL19m AHD and RL21m AHD, but the site slopes away to the east towards the river, with a site level at the eastern boundary of RL15m AHD.

100. The application was lodged on 12 January 2006. It was originally lodged as 52 multiple residential units (town houses), later modified, as a result of the applicant's response to Council's information request, to 48 residential units, to be constructed in six stages.
101. The type of development was material change of use of premises. It was an impact assessable development. However, no submissions were received.
102. The application was subjected to detailed consideration over an extended period. A final response to information request was received on 4 December 2009 and an approval decision made on 23 December 2009.
103. The approval was not sought to be negotiated and has not yet been taken up. To date no development has been undertaken on the site.
104. The Q100 flood level at the site is 18.9m AHD. Approximately two thirds of the site is situated above this level and one third of the site sits between the Q100 and Q20 flood levels. The site sustained partial inundation in the 2011 flood event.
105. At the time of the application the land was included within the Recreation zone of the 2004 Ipswich Planning Scheme, reflecting the previous use of the land as a tennis centre. That use had been abandoned prior to the lodgment of the development application.
106. The adopted flood level was Q100. The site is affected by both the 100 year ARI and 20 year ARI flood events. The assessment of the application was an iterative process, with a considerable focus on flood and stormwater management related issues. This assessment underwent extensive review and analysis, with a number of updated expert reports obtained as the assessment process progressed. The applicant undertook rigorous technical reporting to support the proposed development, including a flood study, a stormwater management plan and an assessment of river bank stability to ensure the proposed development was physically suitable for the site and did not detrimentally impact on the river bank.
107. In response to Council's information request multiple flood studies (4) were undertaken for the site by Cardno (Qld) Pty Ltd. In response to issues raised by Council the applicant, through Cardno, also produced a number (7) of updated stormwater management plans.
108. The applicant produced an assessment on river bank stability by Morrison Geotechnic Pty Ltd (this report was also reviewed and updated through a number of iterations) to ensure the proposed development was physically suitable for the site and to demonstrate that the development would not detrimentally impact upon the river bank or increase flood hazard by

way of increased depth or velocity of flood waters for the development or upstream or downstream properties.

109. For stability purposes the approval permitted the building footings for 14 units to be constructed within the extent of the Q100 flood line, but expressly required that the habitable floor levels of the units be designed to be constructed to achieve a minimum of 250mm freeboard above the Q100 flood event in compliance with Planning Scheme requirements. The other 34 units in the proposed development were all to be constructed above the Q100 flood line.
110. A portion of the site was proposed to be partially filled to a level 500mm higher than the 100 year ARI level, with compensatory earth works proposed to ensure that there was no net loss of flood plain storage as a result of the development. Hydrodynamic modelling of the proposed development was undertaken to substantiate the earth works.
111. Attached to my statement are copies of the following key documents relating to this application:

JMP-15: Development Application and supporting Planning Assessment Report lodged 12 January 2006

JMP-16: ICC Information Request dated 2 February 2006

JMP-17: Letter David Brett & Associates to ICC dated 1 February 2007 in response to the ICC Information Request, enclosing Carndo (Qld) Pty Ltd Flood Study dated 8 August 2006

JMP-18: Letter ICC to David Brett & Associates dated 14 March 2007 re outstanding issues

JMP-19: Letter David Brett & Associates to ICC dated 30 July 2007 in response to outstanding issues letter and enclosing:

- Morrison Geotechnic Bremer River Bank Stability Assessment Report dated 23 July 2007
- Cardno response to Flood Issues dated 1 June 2007
- Cardno conceptual Stormwater Management Plan - Version 1 - dated 17 July 2007

JMP-20: Letter David Brett & Associates to ICC providing further information and reports (this attachment excludes the enclosures) dated 20 March 2009

JMP-21: Letter ICC to David Brett & Associates dated 19 May 2009 re outstanding issues

JMP-22: Letter David Brett & Associates to ICC dated 9 October 2009 in response to outstanding issues letter and enclosing:

- revised Morrison Geotechnic River Bank Stability Assessment Report dated 31 August 2009
- Cardno Stormwater Management Plan - Version 7 dated 7 October 2009
- Cardno Flood Study - Version 4 dated 7 October 2009

JMP-23: Further revised Morrison Geotechnic River Bank Stability Assessment Report dated 23 October 2009

JMP-24: Memorandum ICC Development Engineer to Senior Engineering Officer dated 9 November 2009

JMP-25: Memorandum ICC Development Planner to Team Coordinator dated 22 December 2009

JMP-26: ICC Assessment Checklist - Impact Assessable Development

JMP-27: ICC Development Application amended Decision Notice dated 23 December 2009

A full copy of the relevant file has previously been produced to the Commission in response to the Commission's Requirement notice dated 5 August 2011.

QUESTION 1: The known Q100 and Q20 flood levels at or around the time of the application

112. These levels are:

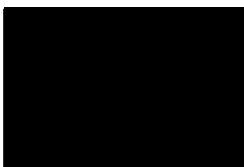
- 100 year ARI event - 18.9m AHD
- 20 year ARI event - 15.0m AHD.

QUESTION 2: The known site level or levels

113. Council records indicate that the site levels range from RL15 metres AHD at its eastern boundary (the left bank of the Bremer River) up to RL21 metres AHD at the western boundary of the site.

QUESTION 3: What assessment process was followed specific to flood impacts

114. The assessment process followed was in accordance with the process I have outlined in paragraphs 17 and following of this statement.


Solicitor

115. Upon lodgment of the development application I nominated [REDACTED] as the assessing officer for the application. The proposal was forwarded to the IDAP meeting at which time it was identified that the OV5 1 in 20 and the 1 in 100 flood lines affected the site, and that no flood study had been submitted with the application. It was therefore identified that the proposal would necessitate internal referral to ICC's Development Engineers to undertake a preliminary assessment to determine the information necessary to assess the application against the relevant parts of the Planning Scheme, in particular OV5. The application was referred to the appropriate geographically based engineering team, where it was allocated to the Senior Engineering Officer, Mr [REDACTED] for review.
116. It was determined by the Senior Engineering Officer that it would be necessary to request further information from the proponent to address the flood impacts. This request was included in an Information Request issued to the applicant by the Council on 2 February 2006.
117. A flood study prepared by Cardno was included in the applicant's response to Council's Information Request on 1 February 2007.
118. The review of this material identified some outstanding issues resulting in an outstanding issues request being sent to the applicant on 14 March 2007. In relation to the Cardno flood study, Council sought additional information as set out in appendix A to the outstanding issues letter (annexure JMP-18). This included, at item 6 of appendix A, that the submitted flood study be referred to a third party for review.
119. A response was received from the applicant on 30 July 2007, which included a further report from Cardno dated 1 June 2007. With their report Cardno attached a CD comprising the model files produced for their flood analysis for review by others. The model files were reviewed internally within the Council Engineering Services Department and considered to be relevant and appropriate, with the result that the Council Engineers did not consider it necessary to proceed with third party review of the study.
120. Relevant to the issue of flooding and stormwater, the applicant also provided with its 30 July 2007 response a stormwater management plan produced by Cardno and a Bremer River bank stability assessment report by Morrison Geotechnic, to demonstrate that the proposed development was physically suitable for the site and that it would not detrimentally impact upon the river bank or increase flood hazard by way of increased depth or velocity of flood waters for the development of upstream or downstream properties.
121. This material was referred to Council's engineers for further review. In the meantime, the applicant had requested that the application be placed on hold.

122. On 13 November 2007 Ms [REDACTED], the Council Engineer ([REDACTED]) and I met with the applicant's representatives and advised them that the development design and its impacts on river bank stability and flood related issues had not been satisfactorily addressed. The applicant undertook to address the outstanding issues.
123. A further response was received from the applicant on 7 March 2008 which incorporated a River Bank Stability Assessment from Morrison Geotechnic dated 6 December 2007, a revised Stormwater Management Plan prepared by Cardno dated 16 January 2008 and a revised Flood Report prepared by Cardno dated 10 January 2008.
124. Another meeting was requested by Council regarding the adequacy of the further reports and to discuss the hydraulics report and bank stability issues. This meeting was held on 18 March 2008 and attended by Ms [REDACTED], Mr [REDACTED] and myself, together with the applicants consultants and experts. The meeting was substantially concerned with flooding, stormwater management and bank stability issues.
125. On 19 June 2008 Council received further material from the applicant regarding the issues raised in this meeting. This material included a revised Stormwater Management Plan. The information was still determined to be unsatisfactory. Further outstanding issues letters were issued to the applicant on 31 July 2008, 16 September 2008 (by email) and 19 May 2009.
126. On 9 October 2009 the applicant produced an updated Cardno Flood Study, updated Cardno Stormwater Management Plan and updated River Bank Stability Assessment Report by Morrison Geotechnic. This last report was further updated on 23 October 2009.
127. The latest material was considered by the Council engineers to satisfactorily address the remaining outstanding issues. An engineering report prepared by the Development Engineer and endorsed by the Senior Engineering Officer on 9 November 2009 recommended that the development proposal could be supported subject to recommended conditions of approval.
128. A final planning report including the ICC development checklist was prepared by the Development Planner. This report included an approval recommendation and conditions formulated on the basis of Council's assessment of the application. This report was reviewed by me as Delegate. I approved the application in accordance with the recommendation on 23 December 2009. I have annexed to my statement the key documents relating to this approval process.

QUESTION 4: What consideration was given to:

- (a) the proximity of the site to the Bremer River;
- (b) the flood risk or potential impact of flooding on the use proposed for the site;

(c) the frequency with which flooding has occurred at the site in the past.

(a) Proximity to the Bremer River

129. The site shares its eastern boundary with the top of the western bank of the Bremer River. It is affected by both the 100 year ARI and 20 year ARI flood events. As a result, multiple flood and related studies were undertaken and submitted to Council, as discussed in my response to question 3.

(b) Potential Flood Risk

130. The Cardno flood study submitted to Council demonstrated that there is minimal impact to the flood levels in the post development situation. On that basis the Council's development engineers considered that the potential impact of flooding on the use proposed for the site was minimal, and that the use could be supported subject to the imposition of reasonable and relevant conditions of approval.

(c) The frequency of past flooding at the site

131. As previously noted in my statement, it is my understanding that the frequency with which flooding has occurred in the past was a policy consideration in the formulation of the 1 in 100 flood line. Information as to historical river heights in relation to the site was not obtained for the purpose of considering the application. The assessment with respect to flooding was undertaken in accordance with the requirements of the planning scheme.

Question 5: The measures proposed to mitigate the potential for flooding at the site by reference to the location of proposed habitable floor levels.

132. Condition 20(h) of the Council's approval expressly requires that the floor levels of any habitable rooms of all dwellings proposed for the site be located a minimum of 250mm above the 100 year ARI flood event in accordance with part 11, section 4 sub-section 7(c)(v) of the 2004 Planning Scheme.

Question 6: Whether the impact on upstream and/or downstream properties was taken into account when assessing the development application, particularly with respect to:

(a) the impacts of any land filling or excavation work carried out as part of the application;

(b) the impacts of any stormwater or overland flow management facilities.

(a) Land filling or excavation work

133. To provide flood immunity for the development, it was proposed to fill the site areas located below the 100 year ARI flood level to a level 500mm above that level. This was to be

achieved by compensatory excavation works, proposed to be undertaken concurrently to increase the available storage for large flood events and to augment the flood immunity for the site. Expert hydrodynamic modelling of the proposed development and compensatory earthworks indicated that for the 100 year ARI storm event, the development caused a maximum increase of 2mm in the flood levels within the site, which was considered negligible as it does not impact upstream or downstream of the site and does not result in any loss of flood plain storage. Similarly, the 20 year ARI storm event causes a maximum increase of 3mm in the flood levels within the site, which was also considered to be negligible.

(b) The impact of any stormwater or overland flow management facilities

134. The development was conditioned to provide all necessary stormwater drainage for the development to be in accordance with the Queensland Urban Drainage Manual (QUDM) to cater for an ARI 100 storm event. Conditions 20(d) to 20(g) of the approval specified the conditions in relation to these aspects.
135. The assessment by Council's development engineers was that the stormwater management infrastructure required to be constructed on the site, and the stormwater discharge would not adversely affect any flood levels in the Bremer River.

Question 7: What process the Council used to assess the adequacy of any expert reports

136. The Council's Senior Engineering Officer, Mr [REDACTED] who oversaw the engineering assessment of the proposal identified in his report dated 9 November 2009 that the following documents had been considered in his assessment of the application:
- (a) Ipswich Planning Scheme Policy 2 – Local Government Information;
 - (b) Ipswich Planning Scheme Policy 3 – General Works;
 - (c) Ipswich Planning Scheme Part 12, Div 6 – Residential Code;
 - (d) Ipswich Planning Scheme Part 12, Div 9 – Parking Code;
 - (e) Ipswich Planning Scheme Part 12, Div 15 – Earthworks Code (Including lot filling);
 - (f) Queensland Urban Drainage Manual Volume 1 Second Edition 2007;
 - (g) Australian Rainfall and Runoff (Engineers Australia);
 - (h) Ipswich City Council Standard Drawings;
 - (i) Australian Standard 2890.1 - Off-Street Car Parking;
 - (j) Australian Standard 2890.2 - Commercial Vehicle Facilities;
 - (k) Australian Standard 3798 - Guidelines on Earthworks for Commercial and Residential Developments;
 - (l) Water Supply (Safety and Reliability) Act 2008;

137. Additionally, his assessment report stated that *“the proposal generally complies with or has been conditioned to comply with the above codes”*. This report also made the recommendation that the proposal could be supported, and advised of conditions of approval to be applied should the application be supported.
138. I am advised by Mr [REDACTED] that the process generally followed to assess the adequacy of reports such as flood studies and to determine compliance with the relevant codes is to ensure firstly that the study has been certified by a RPEQ who is suitably qualified and experienced. The flood study is then reviewed by Council to determine that generally the following items are contained or have been addressed and found satisfactory:-
- (a) Specific software used to model the existing and post development flood impact
 - (b) The methodology used
 - (c) The parameters and assumptions made to create the model are acceptable
 - (d) If an existing model is used, the source of the model; and
 - (e) Pre and post development site profile is reflected accurately against the proposal plans.

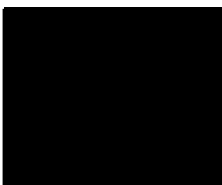
Question 8: What conditions were included in the approval with respect to protection from the impacts of flooding

139. The following conditions were included in the approval with respect to protection from the impacts of flooding:

Stormwater

Stormwater Quality

- (a) The quality of stormwater leaving the developed site must achieve the following reductions in average annual pollutant load:
 - 80% for total suspended solids
 - 60% for total phosphorus
 - 45% for total nitrogen
 - 90% for gross pollutants
- (b) The water quality objectives listed in (a) must be achieved through the implementation of the nine (9) bio-retention basins generally in accordance with the Stormwater Management Plan Version 7 dated 15 October 2009 prepared by Cardno Pty Ltd subject to the following amendments:



[REDACTED]
Solicitor

- (i) The nine (9) bio-retention basins must each have a drainage layer depth of 200mm and a transition layer depth of 100mm. The filter media median particle size for all bio-retention basins must be 0.45mm with a hydraulic conductivity of 180mm/hr. All other parameters for the bio-retention basins must be in accordance with the modelled parameters represented in Table 1 below:

Bioretention Basin	Extended detention depth (m)	Surface Area (m ²)	Filter Area (m ²)	Filter Media Depth (m)
A	0.2	66.0	33.7	0.7
B	0.2	26.9	5.9	0.7
C	0.2	75.4	42.4	0.7
D	0.2	70.3	31.7	0.7
E	0.2	79.9	37.3	0.7
F	0.2	22.8	3.7	0.7
G	0.2	21.9	3.6	0.7
H	0.2	21	4.1	0.7
I	0.2	20.9	3.1	0.7

- (ii) A high flow bypass must be incorporated into the design of the bio-retention basins to ensure that only flows up to the 3 month ARI storm event are treated through the bio-retention basins;
- (iii) Geofabric must not be used between the bio-retention swale layers and the filter media layer
- (iv) Detail pre-treatment to bio-retention basins to ensure scour protection and removal of gross pollutants
- (v) Bioretention basins A, D, E, F, G, H and I must include an impermeable liner to prevent exfiltration to the surrounding soils. Details of the lining must be submitted with application for operational works relevant to each stage.
- (vi) Bioretention basin under drain design is to be in accordance with Section 5.3.5 of the Water Sensitive Urban Design Technical Design Guidelines (WSUD TDG) for South East Queensland and Section 3.4.5 of the

Construction and Establishment Guidelines - Swales, Bioretention Systems and Wetlands, Version 1 dated February 2009, prepared by Healthy Waterways. A copy of the calculations used to size the drainage must be provided at the time of lodging the operational works application. Similarly calculations must be provided to demonstrate that the pipes which are connected downstream of the drainage pipes are suitably sized so as not to become the hydraulic control and filter media is free draining.

- (vii) Underdrainage must consist of either slotted PVC pipe or flexible perforated pipe (e.g. Ag pipe) and not presocked ag pipe.
- (viii) Provide a uPVC riser with screw cap lid at the head of each slotted pipe for maintenance flushing. The plan must include a detail in accordance with BCC drawing UMS153 with a note that states that risers are not to be slotted.
- (ix) Detailed planting plans for bioretention areas demonstrating compliance with the plant species and densities outlined in Appendix A of the WSUD TDG (version current at the time of operational works detailed design for each relevant stage.
- (x) Specify on the plan the grade at which drainage pipes are to be laid and the relevant width of the drainage pipe slots. It should be noted that a minimum of 0.5% slope is required and depending on the length of the bioretention this may impact significantly on the depth of the drainage layer. The length of all 100mm slotted drainage pipes must not exceed 25m. For longer lengths the pipe size must be increased or duplicated to increase conveyance
- (xi) Provide the bioretention filter media levels ensuring that the surface of the filter is flat to allow even absorption through the filter
- (xii) All inlets to the bioretention basins must be as near to the outlet as possible to minimise mixing of high flows with first flush
- (xiii) The drawings must include a note which refers to the Healthy Waterways Bioretention Basin Construction and Establishment Sign-off

Forms (including the Pre-start meeting form and Forms A-G) for use throughout construction.

- (c) Prior to lodgement of detailed operational works drawings for each stage, the Developer must receive certification from the consulting engineers who prepared the approved Stormwater Management Plan certifying that the detailed drawings are in accordance with the approved Stormwater Management Plan, these conditions of approval and the WSUD TDG. A copy of the certification, and completed copies of the WSUD TDG Design Assessment Checklist and Calculation Summary Checklist, must be lodged in conjunction with an operational works application.

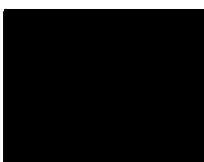
Stormwater Quantity

- (d) The developer must provide all necessary internal and external stormwater drainage to service the development. Such drainage works (except for building gutters and downpipes) must be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

In the case where the piped system is carrying part of the flow, the overland flow paths must be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system.

- (e) Appropriate works must be carried out to ensure that stormwater drainage from the new kerb and channel discharges suitably into the existing drainage system.
- (f) A suitable roofwater and internal drainage system must be designed in accordance with QUDM for the development. The design must be not less than QUDM Level IV.
- (g) Ponding, concentration or redirection of stormwater must not occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.
- (h) The floor levels of any habitable rooms of all dwellings must be located a minimum of 250 mm above the 100 year ARI flood event.

- (i) Construction of buildings or other structures is not permitted below the flood level associated with an ARI of 100 years with the exemption of Units 1 to 14 as part of this approval.
- (j) There must be no filling or removal of material in the flood area below the flood level associated with an 100 ARI of years with the exception of what has been specified in Flood Study Version 4 for 2 Haig Street Brassall prepared by Cardno dated 7 October 2009. There must be no disturbance to vegetation in the flood area, without prior written approval of the Senior Development Engineer.
- (k) For stormwater management purposes the development must be designed and constructed in accordance with the Stormwater Management Plan (SMP) submitted by Cardno and dated 15 October 2009 and Flood Study submitted by Cardno and dated 7 October 2009 and otherwise conditioned as part of this approval. Pipe discharge arrangement to Bremer river from the development must be in accordance with Section 5 of the above mentioned Stormwater Management Plan.
- (l) Compensatory earthwork drawings and calculations must be submitted as required by Condition 22 '*Earthworks*' below. This submission must also include the following recommendations outlined in the above mentioned Flood Study report and River Bank Stability Assessment submitted by the Developer.
- Maximum height of fill must not exceed 500mm above the flood event equivalent to the ARI of 100 years
 - Maximum depth of cut must not exceed 1m between the proposed retaining wall profile and property boundary and batters must not be steeper than 1:4
- (m) All stormwater runoff from the development must be discharged in a manner and to a point to be approved by the Senior Development Engineer. In this instance all stormwater runoff from impervious areas (including roofwater) for associated storm events up to and including ARI of 100 years must be piped to a single discharge point located below the low level tide mark in the Bremer River.
- (n) Stormwater headwall structures must be constructed in accordance with the relevant DMR standard drawings for reinforced concrete headwalls and aprons, unless agreed otherwise with the Senior Development Engineer.



Solicitor

- (o) Stormwater drainage plans and calculations are to be submitted and approved by the Senior Development Engineer, in conjunction with the submission of first operational works application.
- (p) The developer, prior to the commencement of use of each stage, must submit to Council, certification from an RPEQ that the stormwater infrastructure and overland flow for that stage is connected to the outlet system as stated above.

Earthworks

- (a) Compensatory earthworks drawings must be submitted with the first operational works application addressing the following as a minimum and as required by Condition 21(l) '*Stormwater*' above.
 - (i) Cut/fill depths, batter slopes, retaining wall heights
 - (ii) Cross sections indicating Q100 flood line, reduced level of top of the bank, reduced level of proposed retaining wall etc
 - (iii) Indicate expected total fill height and extend
 - (iv) Batter slopes of fill/cut
 - (v) Total height of retaining wall
 - (vi) Quantify cut/fill volumes at each section
- (b) As part of the operational works application an RPEQ must certify that the submission as detailed above is in accordance with the above mentioned Flood Study report.

Site Stability

- (a) In terms of earthworks and construction of in-ground services, all works including retaining wall construction must generally be designed and undertaken to account for recommendations and requirements in accordance with "River Bank Stability Assessment" report prepared by Morrison Geotechnic Pty Ltd and dated 23 October 2009 and to the satisfaction of the Senior Development Engineer.
- (b) Retaining walls and batters resulting from cutting and filling require RPEQ certification for Riverbank stability and proper drainage.

Building Requirement

Proposed Units 1-11 along the crest of the bank must not exceed design surcharge loading of 10kPa as recommended in "River Bank Stability Assessment" report prepared by Morrison Geotechnic Pty Ltd and dated 23 October 2009.

Retaining Walls

- (a) The developer must obtain written comments from adjoining property owners with respect to any proposed earthworks and retaining walls within three (3) metres of the site boundary, in accordance with Ipswich *Planning Scheme Part 12, Division 15 – Earthworks Code (Section 12.15.4.19)*. The written comments must be submitted to Council for consideration as part of the operational works application.
- (b) Finished heights of all retaining walls must be shown on the relevant drawings. The maximum height of gravity boulder retaining walls must be 1.25m. If further height is required, the retaining structure is to be designed and certified by a structural engineer. The total maximum height of any retaining wall is to be 2.5m. Retaining walls over 1.25m high must be constructed with an engineer designed and certified concrete foundation, with an initial retained height of 1.25m, then a minimum set back of 0.6m prior to another maximum retained height of 1.25m to total a maximum height of 2.5m.
- (c) A certificate from a RPEQ must be issued to Council certifying that any retaining wall greater than 1.0m in height is structurally sound and capable of withstanding any likely surcharge loads. The design and construction of retaining walls must comply with the following minimum requirements unless agreed otherwise with the Senior Development Engineer:
 - (i) The minimum design surcharge loading must be 10kPa.
 - (ii) Retaining walls must be designed so that there are no imposed loads placed upon Council's underground services. Retaining walls crossing over services must have support footings extending at least 300mm below the invert of the service pipe.
 - (iii) All retaining walls must be provided with Council approved subsoil and surface drainage systems.
 - (iv) Backfill to retaining walls must be comprised of approved drainage material contained within a geo-fabric wrap.

- (v) A drainage system in the form of a mounded V-drain or similar which discharges to a legal point of discharge must be constructed along the top of all gravity retaining walls to prevent stormwater sheeting or concentrating over retaining structures.
- (vi) Retaining walls in public areas that are 1.0m or greater in height must be provided with railings or other barriers to provide pedestrian safety.

Question 9: The basis for the Council's statement in relation to the 1974 flood "advice"

140. In response to this question I refer to the matters set out at paragraphs 37 - 42 of my statement.

70A CHUBB STREET, ONE MILE

Application Background and Overview

141. I was the Delegated Officer and Development Team Coordinator for a development application concerning 70A Chubb Street, One Mile (although, at the time of approval of the application I was attending a State PIA conference in Longreach and Mr Tim Foote as Development Team Coordinator for another geographical team signed off on the approval recommendation in my absence). The planning officer primarily involved in the assessment of the application was Mr [REDACTED]. As Planning Team Coordinator I had responsibility for overseeing assessment of the application by the planning officer and other internal ICC referral officers.
142. The subject site is a "T" shaped vacant lot with a total area of 1.032 hectares, with direct access to Chubb Street via a 15 metre wide "access handle". Chubb Street is the high point along a "peninsula" at One Mile around which the Bremer River loops. The subject land is situated within an urban area of One Mile approximately three kilometres from the Ipswich CBD.
143. The land to the north and east of the site comprises low density residential development. The land to the south is the subject of the material change of use approval for aged accommodation units at 84/100 Chubb Street discussed earlier in this statement.
144. The subject site slopes gently from the west to the east across the lot and generally away from Chubb Street toward the Bremer River located 300 metres to the east of the site. The land drains generally towards the east.
145. The land is located in the residential low density (RL2) zone of the 2006 Ipswich Planning Scheme. The proposal was consistent with the intent of the zone for low density development of 10 - 15 dwellings per hectare.

146. The relevant flood regulation line was Q100. As detailed below the expert reports variously placed the Q100 flood line at the site between RL23.39 - RL23.80 AHD. This Q100 flood level was lower than the site levels which, when allowance is also made for the minimum required 250mm freeboard for finished construction levels, would give considerable flood immunity for dwellings to be constructed on the site.
147. The site was not inundated in the 2011 flood. Council records indicate that the site was inundated in the 1974 flood.
148. The application was lodged on 23 August 2007 for an approval to reconfigure 1 lot into 11 new residential lots. As detailed in my statement below the application was carefully assessed, particularly as regards stormwater management and related drainage issues, but was uncontroversial and relatively straight forward.
149. The application was code assessable and therefore not subject to submissions. It was approved, subject to conditions, on 17 September 2008. The application sought to negotiate the conditions of approval and a negotiated decision notice issued on 23 October 2008.
150. The approval has not yet been taken up and no operational works approvals have been sought for the proposal.
151. Annexed to my statement are copies of the following key documents relating to this application.

JMP-28: Application by Ipswich Ideal dated 20 August 2007 (received 23 August 2007)

JMP-29: ICC Information Request dated 20 September 2007

JMP-30: Letter Daniel Willis to ICC dated 31 January 2008 in response to the ICC Information Request

JMP-31: Environmental Hydrology Associates (EHA Pty Ltd) Stormwater Management Plan dated 29 January 2008

JMP-32: Cardno Stormwater Management Plan and Flooding Report dated 9 August 2005

JMP-33: Daniel Willis Town Planning & Environment Stormwater Quality Management Plan dated 31 January 2008

JMP-34: ICC outstanding issues letter dated 14 March 2008

JMP-35: Letter Daniel Willis to ICC dated 6 May 2008 in response to ICC outstanding issues letter

- JMP-36:** Updated EHA Pty Ltd Stormwater Management Plan dated 6 May 2008
- JMP-37:** Updated Daniel Willis Town Planning and Environment Stormwater Quality Management Plan dated 2 May 2008
- JMP-38:** Memorandum Senior Environmental Planner to Senior Development Planner dated 13 May 2008
- JMP-39:** Memorandum Development Engineer to Senior Engineering Officer dated 16 June 2008
- JMP-40:** Memorandum Development Planner to Development Team Coordinator dated 3 September 2008
- JMP-41:** ICC Assessment Checklist - Code Assessable Development
- JMP-42:** ICC Development Application Decision Notice dated 17 September 2008
- JMP-43:** ICC Development Application Negotiated Decision Notice dated 23 October 2008.

Question 1: The known Q100 and Q20 flood levels at or around the time of the application

152. These levels are:

- Q100 - approximately 24.0m AHD based on Council's known flood levels for the site
 - 23.39m AHD based on the Cardno flood report produced by the applicant. This flood report, prepared for the adjoining 84 Chubb Street development, included a cross section taken on the 70A Chubb Street site which indicated a developed Q100 site level of 23.39 AHD
- Q20 - approximately 18.9m AHD although this level was not relevant to the subject application

Question 2: The known site level or levels

153. Council records indicate that the site levels range from approximately RL23.75m AHD at the eastern boundary up to RL25.0m AHD at the western boundary of the site (the Chubb Street frontage).

Question 3: What assessment process was followed specific to flood impacts

154. The assessment process followed was in accordance with the process I have outlined in paragraphs 17 and following of this statement.

155. Upon lodgment of the development application I nominated Development Planner, [REDACTED] as the assessing officer for the application. The proposal was forwarded to the IDAP meeting at which time it was identified that the OV5 1 in 100 flood line affected the site and that no flood study had been submitted with the application. It was therefore identified that a hydraulics assessment would likely be required in addition to a stormwater management plan. It was also identified that the proposal would necessitate internal referral to ICC's development engineers to undertake a preliminary assessment to determine the specific information required. The application was referred to the appropriate geographically based engineering team, where it was allocated to an Assistant Development Engineer for review.
156. By an Information Request to the applicant dated 20 September 2007 (JMP-29) Council requested information regarding stormwater quality and quantity and demonstration that the requirements of Part 11, Division 4, Section 7 - Flooding and Urban Storm Flow Path Areas had been addressed, together with other matters unrelated to flood or stormwater.
157. A response to the Information Request was received on 4 February 2008. This response included a Stormwater Management Plan prepared by Environmental Hydrology Associates (EHA Pty Ltd) dated 29 January 2008, a copy of the Cardno (Qld) Pty Ltd flood report undertaken for the adjoining site at 84 Chubb Street dated 9 August 2005 and a Stormwater Quality Management Plan prepared by Daniel Willis Town Planning & Environment dated 31 March 2008. Copies of each of these reports have been annexed to my statement. Other information request items, unrelated to flooding, were also addressed in this response.
158. This information was reviewed to determine its adequacy. A number of issues were raised by the Development Engineer, relating particularly to the Stormwater Management Plan and the predicted development peak discharge for the 5 year ARI storm event. In addition, some issues regarding the Stormwater Quality Management Plan were raised by the ICC Senior Environmental Planner. As a result, an outstanding issues letter was forwarded to the applicant on 14 March 2008 outlining the items which remained outstanding.
159. A response to the outstanding issues letter was received on 6 May 2008. This response included a revised Stormwater Management Plan prepared by EHA Pty Ltd dated 6 May 2008. This information was again reviewed. The Senior Environmental Planner and the Development Engineer each advised that the additional information provided by the applicant addressed their concerns and the application proceeded to the decision stage.
160. Council's Development Engineer finalised her assessment of the application. Her recommendation concluded that from an engineering technical view point the application could be supported subject to the imposition of conditions of approval which included stormwater related requirements. These requirements included that the site be developed, from

a stormwater perspective, generally in accordance with the Stormwater Management Plan prepared by EHA Pty Ltd dated 6 May 2008 and in accordance with the other conditions recommended by the Development Engineer. This report was endorsed by the Senior Engineering Officer.

161. On the basis of their review of the supporting information provided by the applicant, the engineers were satisfied to proceed on the basis of an actual Q100 flood level of 23.8m AHD. This level was equivalent to the lowest surveyed level on the site at its eastern extremity which meant the site was above the Q100 flood event.
162. A final planning report including the ICC development checklist was prepared by the Development Planner. This report included an approval recommendation and conditions formulated on the basis of Council's assessment of the application. This report was reviewed by the acting Delegate and the development was approved in accordance with the recommendation on 17 September 2008. I have annexed to my statement the key documents relating to this approval process.

Question 4: What consideration was given to:

- (a) the proximity of the site to Bremer River;
- (b) the flood risk or potential impact of flooding on the use proposed for the site;
- (c) the frequency with which flooding has occurred at the site in the past.

(a) Proximity to Bremer River

163. The site is separated from the Bremer River by approximately 300 metres. The proximity of the site to the Bremer River was considered in the application with regard to:
- (a) stormwater discharge from the site, which was conditioned to ensure that stormwater discharge was maintained at pre-development flows for all storm events up to and including a 1 in 100 year ARI storm event; and
 - (b) the potential impact from river flooding as identified by Council's planning scheme overlay OV5 - 1 in 100 flood line - Council's records indicated that the site was affected by the OV5 - Q100 flooding overlay, but following the production of the Cardno flood study and other reports, detailed reports and the assessment of those reports, Council was satisfied that the applicant had demonstrated the site was free of Q100 flood impacts.

(b) Potential flood risk

164. The Stormwater Management Plan prepared by EHA Pty Ltd Rev B dated 29 January 2008 concluded that the ground levels of the site were expected to be almost completely above the 100 year ARI flood level. The EHA report reviewed cross sections of the Bremer River adjacent to the site which were the subject of flood modelling undertaken by SKM in 2000-2001 and based on these cross sections, interpolated the 100 year ARI peak flood level at the site to be approximately RL23.67m AHD. This assessment concurred with the Cardno report prepared for 84 Chubb Street, which indicated that at the location of the subject site the developed case flood peak level is 23.39m AHD. On that basis, the Council's Development Engineer and Senior Engineering Officer concurred that the proposed use could be supported subject to the imposition of reasonable and relevant conditions of approval.

(c) The frequency of past flooding at the site

165. As previously noted in my statement, it is my understanding that the frequency with which flooding has occurred in the past was a policy consideration in the formulation of the 1 in 100 flood line. Information as to historical river heights in relation to the site was not obtained for the purpose of considering the application. The assessment with respect to flooding was undertaken in accordance with the requirements of the Planning Scheme.

Question 5: The measures proposed to mitigate the potential for flooding at the site by reference to the location of proposed habitable floor levels

166. It was demonstrated to Council's satisfaction that the Q100 flood level did not impact the site. The approved flood study prepared by Cardno for the adjoining 84 Chubb Street site identified the developed Q100 level at the subject site as RL23.39m AHD. A detailed site survey demonstrated that the minimum site level was RL23.80m AHD.
167. Notwithstanding the Q100 flood line did not impact on the site, further measures proposed to mitigate the potential for flooding at the site included:
- (a) Condition 2 of the Development Permit required the plan of survey submitted by the developer to conform with proposed plan no. 4628/P2 prepared by Saunders Havell Group and dated 16 August 2007, which plan detailed all proposed allotments being located above the Q100 line;
 - (b) in accordance with the Ipswich Planning Scheme, the dwellings on allotments would be constructed to have building pads with a minimum 250mm immunity above the Q100 flood line; and

- (c) the earthworks for the site were proposed as a balance arrangement such that the internal road servicing the lots would be lower than the lots and the building pads for the dwellings, thereby further elevating the building pads and accommodating stormwater run-off via the internal roads toward the east of the site into the drainage system.

Question 6: Whether the impact on upstream and/or downstream properties was taken into account when assessing the development application, particularly with respect to:

- (a) the impacts of any land filling or excavation work carried out as part of the application;
- (b) the impacts of any stormwater or overland flow management facilities

(a) Land filling or excavation work

- 168. The balance cut and fill to be undertaken on the site will not alter the pre-development impacts from the site on upstream or downstream properties.

(b) The impact of any stormwater or overland flow management facilities

- 169. Stormwater from the 11 lots is to be attenuated by treating roof water from all proposed lots through a kerbside bio-retention swale and associated bio-retention basin located along the eastern road alignment adjacent to proposed lot 4, after which it is discharged to the existing stormwater drain to the east of the site as the lawful point of discharge. This attenuation is in accordance with QUDM and appropriately caters for a Q100 storm event.

Question 7: What process the Council used to assess the adequacy of any expert reports

- 170. The Council's Senior Engineering Officer, Mr [REDACTED] who oversaw the engineering assessment of the proposal concurred that the proposal could be supported from an engineering technical viewpoint and endorsed the engineering related conditions of approval to be applied should the application be approved.
- 171. I am advised by Mr [REDACTED] that the process generally followed to assess the adequacy of expert reports such as flood studies and the compliance with relevant codes is to ensure firstly that the study has been prepared by a RPEQ who is suitably qualified and experienced. The study is then reviewed by Council to determine that generally the following items are contained or have been addressed and found to be satisfactory:
 - (a) specific software used to model the existing and post development flood impact;
 - (b) the methodology used;

- (c) the parameters of the study and assumptions made to create the model are acceptable;
- (d) if an existing model is used, the source of the model; and
- (e) pre and post development site profile is reflected accurately against the proposal plans.

Question 8: What conditions were included with respect to protection from the impacts of flooding

172. The following conditions were included in the approval with respect to protection from the impacts of flooding:

Roadworks

- (a) The proposed access road shall be designed and constructed with asphaltic concrete surfacing to a width of 6.5 m for the full length of all property frontages. A minimum 4.25 m verge width on one side of road shall be provided to accommodate relevant services as shown in ICC Standard Drawings SR 22 and SR 23. The maximum area to implement the swale is 4.25m in width at some sections. The applicant shall adjust the cross section of swale at those locations such that the maximum slope of the batter is 1 in 4. Any reduction in stormwater quality and detention quantity requirements as stated in the Stormwater Management Plan prepared by EHA (Report No. SW-07-08-REP-001 Rev. D) and dated 6 May 2008 shall be compensated for through the use of the proposed road verge in front of Lots 1 and 2. Any such modifications shall be submitted with the lodgement of an operational works application. Works shall include:
 - (i) Concrete kerb and channel on both sides;
 - (ii) Concrete footpath 1.5 m wide on one side, with kerb ramps designed in accordance with ICC Standard Drawing SR.18. The construction of footpaths shall be in accordance with Council's Standard Drawing SR.19. The concrete footpaths shall be on the same side as the street lights, and the maximum longitudinal grade shall not exceed 1:8. and
 - (iii) Stormwater drainage infrastructure designed in accordance with Council's Planning Scheme Policy 3 – General Works, Queensland Urban Drainage Manual, the Department of Main Roads Drainage Design Manual and Stormwater Management Plan, dated 6 May 2008, prepared by EHA Pty Ltd in that order of precedence.

- (b) Roadworks shall be designed and constructed in accordance with Council's Standards, Queensland Streets, Austroads Publications, AMCORD, the relevant and appropriate roadworks design standards and guidelines, and any other documentation deemed appropriate by Council. Such design and construction shall ensure that road carriageway widths are consistent with the road function and position in the road hierarchy and are in accordance with the relevant design speed environment.
- (c) Road pavement designs shall comply with Ipswich City Council's Planning Scheme Policy 3 - General Works, Part 1 – Standard for Design of Roadworks. The proposed road shall have single way cross-fall to accord with the stormwater system design as identified in the approved plans.

Stormwater

- (a) Stormwater quality for the development shall achieve the following water quality objectives as outlined within the South-east Queensland Regional Plan (SEQ RP) Part 11.
 - (i) 80% for total suspended solids;
 - (ii) 60% for total phosphorus;
 - (iii) 45% for total nitrogen; and
 - (iv) 90% for gross pollutants
- (b) The water quality objectives listed in (a) shall be achieved through the implementation of the swales and bio-retention swale in accordance with the Stormwater Quality Management Plan (Rev B) prepared by Daniel Willis Town Planning & Environment reference 06-010 and dated 2 May 2008 and the Stormwater Management Plan Report No. SW-01-08-REP-001 Revision D) prepared by Environmental Hydrology Associates Pty Ltd and dated 6 May 2008, subject to the following:-
 - (i) Any additional rainwater tanks other than what is required under the Queensland Development Code and used specifically as a stormwater attenuation device would not be supported by Council.
 - (ii) The Developer shall provide stormwater detention by proposed swales and drainage easement through Lot 4 on the subject land, which shall be designed and constructed to ensure that flows, at any point downstream

in the catchment, are not increased by the development for any combination of frequency and duration from the storm event with an ARI of 2 years up to and including the storm event with an ARI of 100 years.

- (iii) The sides of any grassed embankment and/or basin shall not exceed a maximum 1:6 grade unless otherwise approved by the Senior Development Engineer. Appropriate provision for managing low flows and maintenance shall be made to the satisfaction of the Senior Development Engineer.
 - (iv) The developer shall demonstrate that all discharges from the proposed drainage reserve are within all QUDM requirements.
 - (v) The developer shall demonstrate that the overland flowpath(existing drainage reserve) between 8 & 10 Battersby Street has sufficient width in accordance with QUDM requirements to cater for flows associated with a storm event with an ARI of 100 years.
- (c) Detailed cross sections and final locations for stormwater infrastructure required by (b) shall be submitted for approval in conjunction with any application for Operational Works and be in accordance with the Water Sensitive Technical Design Guidelines for South East Queensland specifically Chapters 10 Plant Selection for WSUD, Chapter 2 Swales (Incorporating Buffer Strips) and Chapter 3 Bio-retention Swales published by Healthy Waterways.
- (d) Bollards shall be installed along the swale drain interface in accordance with Ipswich City Council's Standard Drawing SP.43 Revision B at maximum of 1.5m centres at an alignment of 650mm from the edge of kerb. Every 3rd bollard shall be required to be replaced with an approved street tree. The Developer shall submit a Streetscape Plan (including bollard and interface details) for approval in conjunction with application for Operational Works that generally complies with Typical Cross Section (Drawing number SK-003 Project number 07052 Revision A) prepared by dks Consulting Engineer dated 6 May 2008.
- (e) Appropriate works shall be carried out to ensure that stormwater drainage from the new kerb and channel discharges suitably into the existing drainage system.

- (f) The Developer shall provide all necessary stormwater drainage (both internal and external to the development) and such drainage works (except for roofwater systems) shall be designed and constructed in accordance with QUDM such that the overall drainage system caters for a storm event with an ARI of 100 years.

Overland flow paths shall be suitably designed to cater for the water from a storm event with an ARI of 100 years. In the case where the piped system is carrying part of the flow, the overland flow paths shall be designed to cater for that volume which is represented by the difference between the predicted volume from the storm event with an ARI of 100 years and the capacity of the pipe system, noting the requirements of QUDM.

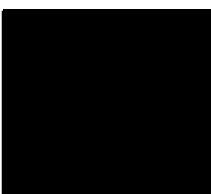
- (g) A suitable roofwater system shall be designed in accordance with QUDM, for allotments that do not have adequate fall from within the allotment to the design invert level of the kerb and channel. The design is to be to a minimum Level II in QUDM.

- (h) All stormwater flows within and adjacent to the development, other than inter-allotment drainage, shall be confined to dedicated roads, drainage reserves, registered drainage easements or within parkland. The registered drainage easements, if related to piped drainage, shall be centrally located over such underground pipe system and shall be not less than 4.0 m wide, except for drainage easements required for side boundaries which may be 3.0 m wide where approved by the Senior Development Engineer. In addition, the easements shall be of suitable width to contain the predicted overland flow from the storm event with an ARI of 100 years in that location.

- (i) No ponding, concentration or redirection of stormwater shall occur onto adjoining land unless specifically approved by Council in consultation with the owner of the adjoining land.

OTHER MATTERS

173. The Commission Requirement asks that, in addressing these matters, I make commentary and provide opinions I am qualified to give as to the appropriateness of particular actions or decisions.



Solicitor

174. I do not have any concerns or issues with the approach taken by Council officers in their assessment of the applications addressed in this statement. In each case I consider the assessment to have been undertaken professionally and comprehensively, that relevant questions were asked and information sought, and that the actions taken and decisions made were appropriate.
175. With the benefit of my review of the relevant application files I would make one observation. Part 11, section 4 sub-section 7(c)(iv) of the 2004 Ipswich Planning Scheme requires that the floor levels of any habitable rooms of all dwellings must be located at minimum of 250mm above the 100 year ARI flood event. This requirements carries into the 2006 Planning Scheme.
176. As this requirement for a 250mm freeboard above the 100 year ARI flood event for habitable rooms is a requirement of the Planning Scheme, it is generally not included as an express condition of the development approvals. However, I observe that in the case of the 2 Haig Street application, condition 20(h) of the Council Decision Notice expressly provided that:
- "The floor levels of any habitable rooms of all dwellings must be located a minimum of 250mm above the 100 year ARI flood event".*
177. No such express condition was included in the approvals for 70A Chubb Street and 84 Chubb Street, nor, for the reasons identified above is such a condition required. However, notwithstanding the Planning Scheme requirements, in my opinion, so as to provide additional certainty and clarity as to Council's requirements, the inclusion such a condition in development approvals may be appropriate, particularly for those applications which involve sites that fall partially within the level of the 100 year ARI flood event.

I make this statement conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867* (Qld).

Signed and declared by Joanne Mary Pocock at *Ipswich* in the State of Queensland this *7th* day of October 2011 before me:

.....
Deponent

.....
Witness