

Our Ref: 59916045-L01:BCP/bcp
Contact: Dr Brett C. Phillips

17th September 2015

The Manager
Bluesky Parramatta Pty Ltd
Suite 1702, Level 17, 25 Bligh St,
SYDNEY NSW 2000

Attention: Mr Tomas Simpson

Dear Tomas,

FLOODING ADVICE FOR 14-20 PARKES ST, PARRAMATTA

In response to your recent request, we are pleased to provide flooding advice to address outstanding flooding issues raised by Parramatta City Council in relation to the planning proposal for 14-20 Parkes St, Parramatta.

The Planning Proposal under consideration is given in **Attachment A**.

1. BACKGROUND

1.1 Subject Site

The subject site is 14-20 Parkes St, Parramatta. The extent of the site and its relationship to Clay Cliff Creek are disclosed in **Figures 1** and **2**.

1.2 Previous Studies

Previous studies which provide flooding information for the subject site are summarised in **Attachment B**. A previous study of the subject site and a study of an adjacent site are outlined as follows.

2001 Flood Impact Assessment of Development of 14-16 Parkes St, Parramatta

In 2001 it was proposed to redevelop the site at 14-16 Parkes Street in Parramatta and to erect a multi-storey building that is compatible with the flood risk on the site. The site is bounded by Parkes Street to the south, Wigram Street to the west, the existing Anglicare office to the east and Clay Cliff Creek to the north.

Parramatta City Council previously adopted the Clay Cliff Creek Catchment Flood Study (Dalland & Lucas, 1992) and Addendum No. 1 (Dalland & Lucas, 1993) and the 5% AEP and 1% AEP flood levels reported therein.

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In 1999 a report on flooding issues for 14-18 Parkes Street was prepared by Dalland & Associates, 1999. The development proposal that was assessed in this report was to construct a flood proof Basement Car Park and for the level of the ground floor of the building to be 500 mm above the estimated 1% AEP flood level.

The aim of the study was to estimate the spatial extent and flow patterns through and in the vicinity of 14-16 Parkes Street in both the 20 yr ARI and 100 yr ARI events and to estimate the magnitude and spatial extent of any changes to flood levels and velocities resulting from the re-development of 14-16 Parkes Street. The flood impact assessment was undertaken using a local 2D SMS model of 14-16 Parkes Street and its environs based on the available and collected data including detailed survey.

The development form which was adopted based on the outcomes of the flood assessment was a ground floor elevated 500 mm above the 100 yr ARI flood level supported on a grid of columns. The undercroft area is maintained in a non-vegetated condition to allow the free flow of floodwaters beneath the new building. Along the Wigram Street boundary a bar screen with the maximum allowable clear opening between bars was installed to bar non-authorized access to the undercroft area. The proposed building form on the Parkes Street side prevents any entry to the undercroft area from Parkes Street.

2014 Flood Impact Assessment, 113-117 Wigram St and 23-29 Hassall St, Harris Park

A mixed-use development of 113-117 Wigram St and 23-29 Hassall St is proposed comprising retail outlets, residential apartments and a multi-storey underground car park. The subject site is located adjacent to and north of Clay Cliff Creek.

Global Civil had previously prepared and amended flooding assessments for 113-117 Wigram St, Parramatta in response to Council comments.

Cardno was engaged to address the overall conclusions of Council's Peer Reviewer as documented in a Council memorandum dated 21 October 2013.

The study comprised a:

- Review of previous flood studies and available data
- Compilation of site specific data (including proposed development layout)
- Establishment of flood model to represent existing site scenario
- Revision of flood model to represent future site development
- Assessment of resultant flood behaviour and flood risks
- Review of flood emergency planning
- Preparation of an outline of a flood emergency response plan
- Review of compliance with Parramatta City Council development requirements

It was also noted that the flood impact assessments previously accepted by Council on 111 Wigram St and 122 Wigram St were undertaken using an updated version of the 2007 Clay Cliff Creek **xpswmm2D** floodplain model. Accordingly the assessment of the impact or otherwise of development on 113-117 Wigram St and 23-29 Hassall St was undertaken using an updated version of the 2007 Clay Cliff Creek **xpswmm2D** floodplain model.

An assessment of flooding in the 100 yr ARI and the PMF event was undertaken.

1.3 Previous Assessments of Planning Proposals for 14-20 Parkes St, Parramatta

Quantum Engineers have prepared previously five submissions on flooding considerations in relation to the Planning Proposal for 14 – 20 Parkes St, Parramatta.

The most recent submission dated 27 August 2015 summarise the various submissions as follows:

1st submission dated 15th April 2015 - our submission was based on the flood information provided in the Flood Enquiry Information prepared by Parramatta City Council dated 18th February 2015. This information indicated that the flood level directly impacting the site is a maximum RL8.43m AHD. As such, our proposal was developed on this provided flood level. Council did not provide any additional information besides the Flood Enquiry Information.

2nd submission dated 2nd July 2015 - our submission was produced in direct response to an email from Councils 'Project Officer' Diana Khoury dated 24th June 2015. The Council email outlines various areas which council required additional information. Generally, Councils engineer was requiring expansion on matters relating to the Parramatta LEP & DCP, and further discussion on the hazard categorization. Furthermore, Council requested elaboration on the objectives of S117 Direction.

We believe that the responses provided in direct response to Councils dated 24th June 2015, had been satisfied.

3rd submission dated 28th July 2015 - our submission was produced in direct response to an email from Councils 'Project Officer' Diana Khoury dated 16th July 2015

Councils' comments were based on previous comments provided by them, but these comments requested '....in more detail'. In addition, Council was now indicating that a substantially higher flood level was to be adopted in our Planning Proposal. Previously we had adopted flood levels according to the Flood Enquiry Information (as provided by Council). The new flood level which was to be adopted was the flood level at the intersection of Parkes Street & Wigram Street. This level is considerably higher. Previously, no mention of this was provided. According to the Flood Enquiry Information, this revised flood level is approximately 1.87m higher (originally RL6.43m AHD and now RL8.30m AHD).

To avoid further delays, the client decided to request a meeting with the relative parties at Council to discuss the 'flooding' issues. The meeting took place on 21st July at 3pm in Councils Chambers.

The meeting with Council Engineer (Jim Tsom) and Councils Flood Consultant (Don Still) detailed the reasons for the elevated flood level and also what will be required moving forward. We expressed our urgency to 'close-off' this matter in the next submission. We also expressed our disappointment at not been informed by Council earlier about their thoughts regarding the influence of flooding on this site. Especially since the flood level Council was now requesting is substantially different than the flood level indicated on Councils 'Flood Enquiry' Information, without anything to substantiate the adopted flood level.

4th submission dated 10th August 2015 - our submission was produced in direct response to an email from Councils 'Project Officer' Diana Khoury dated 4th August 2015.

1.3 Parramatta City Council Outstanding Flooding Issues of Concern

In an email sent by Parramatta City Council to Allan Caladine (Town Planning Consultant) on 25 August 2015, it was advised that Parramatta City Council's flood engineer has concluded that the applicant's latest flood planning proposal report submission 14-20 Parkes St (dated 10 August 2015) still requires further work.

Our last correspondence regarding flood matters discussed that the revised ground floor parameters at 14-20 Parkes Street were satisfactory, however a number of items relating to the S117 Direction 4.3 were still outstanding. These items included:

- (4) A planning proposal must include provisions that give effect to and are consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005 (including the Guideline on Development Controls on Low Flood Risk Areas).**

There is no concise statement of how the planning proposal satisfies the requirements of the 2005 Floodplain Development Manual.

- (6) (a) A planning proposal must not contain provisions that apply to the flood planning areas which: (a) permit development in floodway areas**

There is no discussion about "floodway areas" and how they are addressed (and this is important given that Council's hazard mapping shows that much of the site is in a high hydraulic hazard area.

- (6) (b) permit development that will result in significant flood impacts to other properties**

There is no concise statement regarding how this requirement has been addressed.

- (6) (c) permit a significant increase in the development of that land,**

The report acknowledges that "there will be an increase in the number of occupants on the premises". However, the report fails to address this matter which relates to any increase in flood-related risk for the extra population intended to now occupy the floodplain. It is considered that this matter can be addressed by providing a clear outline of the within-site works and measures which will address flood-time risk.

(6) (d) are likely to result in a substantially increased requirement for government spending on flood mitigation measures, infrastructure or services

The report simply states that the project “may require additional services and flood management measures. However the increase in provision is considered minimal”. This report is considered to be inadequate but the inclusion of how the project will be addressing flood risk should be able to definitely show how there would be no requirement for increased government spending.

Council's flood engineer reviewed the applicants latest flood report, and has clarified that *Item 6 (a) and 6 (b) (as noted above) have been satisfactorily addressed and that no further information is required* at this stage of the project.

2. OBJECTIVE

The objective of the study is to address Council's outstanding flooding issues of concern as documented in its email of 25 August 2015.

3. FLOODING ASSESSMENT

As discussed by Cardno, 2014 in relation to the flood impact assessment for 113-117 Wigram St and 23-29 Hassall St:

In view of the reliance of Council and Council's Peer Reviewer on the flood levels estimated by the 2005 SKM flood study in the vicinity of Wigram St and Hassall St, Harris Park the conditions “on the ground” in Wigram St and the MIKE-11 model configuration were reviewed.

A review of the MIKE-11 model revealed several issues of concern which contribute to the reported flood levels including:

- The weir flow rating curve was truncated and is not representative of the area available to spill flows from Wigram St back into Clay Cliff Creek;*
- The adopted link properties downstream of Wigram St was artificially constraining any weir flow notwithstanding the MIKE-11 model estimates that the flood level in Clay Cliff Creek is around 1 m lower than the footpath in Wigram Street and therefore does not drown flows from Wigram St at any time in a 100 yr ARI flood;*
- The adopted invert level at the northern end of Wigram St of 7.66 m AHD is incorrect. A local crest located just south of the Hassall St intersection at 8.0 m AHD means that Wigram St falls towards the low point in the vicinity of Clay Cliff Creek from both Parkes St.*

Based on this review and testing of modifications to the MIKE-11 model it was concluded that:

- In the Wigram St/ Hassall St area the adjusted MIKE-11 model gives results which are similar to the flood behaviour estimated in the 2007 Clay Cliff Creek study; and*
- The 20 yr ARI and 100 yr ARI flood levels adopted by Council to date and resulting flood mapping undertaken by Council in the Wigram St/ Hassall St area are unreliable and that assessments in this area should be based on the Clay Cliff Creek floodplain model first assembled in 2007.*

As discussed in Section 1.2 and Attachment A, the assessment of the impact or otherwise of development on 113-117 Wigram St and 23-29 Hassall St was undertaken using an updated version of the 2007 Clay Cliff Creek **xpswmm2D** floodplain model.

An assessment of flooding in the 100 yr ARI and the PMF event was undertaken.

This floodplain model covers 14-20 Parkes St, Parramatta.

The estimated 100 yr ARI flood levels and extent and hazards under current conditions on 14-20 Parkes St and with current or planned development on 111-117 Wigram St and 23-29 Hassall St are plotted in **Figures 3 and 4** respectively.

The estimated PMF flood levels and extent and hazards under current conditions on 14-20 Parkes St and with current or planned development on 111-117 Wigram St and 23-29 Hassall St are plotted in **Figures 5 and 6** respectively.

A comparison of the flood levels and plotted in **Figure 3** with Council's Flood Map (**Figure 1**) disclosed that:

- The 100 yr ARI flood level in Wigram St at Clay Cliff Creek is around 0.4 m lower than reported by Council;
- The 100 yr ARI flood level in Wigram St / Parkes St intersection is also around 0.4 m lower than reported by Council;
- The 2007 Clay Cliff Creek **xpswmm2D** floodplain model predicts flooding in Parks St which flows towards the Wigram St / Parkes St intersection

Figure 4 discloses a zone of high hazard in a 100 yr ARI flood on Wigram St between Parkes St and Clay Cliff Creek.

A comparison of the flood levels and plotted in Figure 5 with Council's Flood Map (**Figure 1**) disclosed that:

- The PMF level in Wigram St / Parkes St intersection is also around 0.2 m lower than reported by Council;
- The PMF level in Parkes St east of Wigram St are also around 0.2 m lower than reported by Council;

Figure 6 discloses a zone of provisional High Hazard across the site in a PMF except for the south east corner of the site which is classified as Medium Hazard.

4. THE PLANNING PROPOSAL

The Planning Proposal under consideration is given in **Attachment A**.

Features of the planned development include have responded to date to the 100 yr ARI flood levels adopted by Parramatta City Council at the Wigram St / Parkes St intersection:

- An undercroft area similar to the current undercroft which is maintained in a non-vegetated condition to allow the free flow of floodwaters beneath the new building;
- Along the Wigram Street boundary a bar screen with the maximum allowable clear opening between bars was installed to bar non-authorised access to the undercroft area;

- If needed the inclusion of a grated section of driveway to permit the flow of floodwaters into the undercroft area;
- Ground floor level set at 8.82 m AHD;
- Proposed ground floor levels for retail outlets and a terrace of 8.82 m AHD which provides 500 mm freeboard above the 100 year ARI flood level adopted by Council at the Wigram St / Parkes St intersection;
- Proposed Level 1 floor levels of apartments and car parking which are higher than the PMF level;
- A driveway ramp from Wigram St up to a ground floor level of 8.82 m AHD which provides greater than 500 mm freeboard above the 100 year ARI level in Wigram St adopted by Council;

The flooding results presented in Figures 3 to 6, which differ from Council's adopted flood levels, could inform refinement of the planning proposal during the DA phase as follows:

- From a flooding and flood risk perspective consideration could be given to relocating the driveway from the northwestern corner of the site to the southeastern corner of the site. The advantages of relocating the driveway would include:
 - Removing vehicular access from a zone of High Hazard in a 100 yr ARI event and relocating it to a zone of Medium Hazard in the PMF;
 - Increasing the time that the development could be safely accessed during extreme floods
- The possible lowering of the ground floor level for areas accessed from Wigram St to around 8.4 m AHD;
- The possible raising of retail floor levels and any lobby accessed from Parkes St to provide the required freeboard above the 100 yr ARI flood level in Parkes St and/or
- Adoption of walls and/or landscaping to provide the required freeboard above the 100 yr ARI flood level in Parkes St.

5. FLOOD RISKS

The flood risks at and in the vicinity of 14-20 Parkes St, Parramatta are discussed as follows.

5.1 Flood Levels and Hazards

The estimated 100 yr ARI flood levels and extent and hazards under current conditions on 14-20 Parkes St and with current or planned development on 111-117 Wigram St and 23-29 Hassall St are plotted in **Figures 3 and 4** respectively.

The estimated PMF flood levels and extent and hazards under current conditions on 14-20 Parkes St and with current or planned development on 111-117 Wigram St and 23-29 Hassall St are plotted in **Figures 5 and 6** respectively.

5.2 Flood Risk

The flood risk precincts in the vicinity of the site are plotted in **Figure 7**. The site includes zones High, Medium and Low Flood Risk precincts.

5.3 Rate of Rise of Floodwaters

To understand the likely warning times and associated response times during extreme flood events it is necessary to estimate the expected rate of rise of floodwaters. At 14-20 Parkes St, Parramatta the estimated rate of rise of flooding in a PMF event is up to 2.5 m/hr.

It is estimated that inundation of the ground floor from Wigram St would commence in around 40,000 year ARI event.

It is concluded that while both the entry to the car parking levels and the retail outlets facing Wigram St have a freeboard of 500 mm above the 100 year ARI flood level, that this freeboard would be exceeded in a PMF event (within around 20 minutes after the 100 yr ARI flood level is exceeded). The PMF is estimated to reach a level of around 9.4 m AHD. It is estimated that in a 4 hour PMF event that the onset of the inundation of the ground floor by PMF floodwaters would occur around 3 hours after start of the PMP storm.

5.4 Duration of Inundation

In a 4 hour duration PMP storm the estimated duration of inundation of the Ground Floor is around 1 hour and 30 minutes.

5.5 Shelter in Place

In the case of a 4 hour PMF event it is expected that there would be insufficient time to evacuate any residents and/or visitors from the site once floodwaters start spilling from Clay Cliff Creek and that instead residents and/or visitors should shelter in place.

5.6 Persons at Risk (PAR)

The following assumptions were also made when estimating the Population at Risk (PAR):

- During day-time hours on weekdays:
 - the average number of visitors/customers and retail staff on the Ground Floor was assumed conservatively to be 33 persons
 - the average duration of occupancy of the retail outlets would be 10 hours per day (out of 10 hours)
- During night-time on weekdays:
 - the average number of visitors/customers and retail staff on the Ground Floor was assumed conservatively to be 33 persons
 - the average duration of occupancy of the retail outlets would be 0 hours per night (out of 14 hours)
- During weekends:
 - the average number of visitors/customers and retail staff on the Ground Floor was assumed conservatively to be 33 persons
 - the average duration of occupancy of the retail outlets would be 10 hours per day (out of 24 hours)

The estimated total number of visitors/retail staff **directly** at risk during a PMF is conservatively estimated to be around 14. Any visitors or residents located on Levels 1 or above would be **indirectly** at risk during extreme floods greater than a 100 yr ARI flood up to the PMF

6. EMERGENCY PLANNING

6.1 DISPLANS

The North West Metropolitan District Disaster Plan (DISPLAN) and the Parramatta DISPLN are outlined in Attachment C.

It is noted that a copy of the Parramatta CBD Evacuation Plan is not available in the public domain.

It is noted also that the 2010 Parramatta DISPLAN, states in part that:

- i) the intent is to minimize the area of the CBD that is evacuated, noting that some emergencies may require the evacuation of some sections or large sections, if not all of the CBD; and
- ii) shelter in place is used when it is assessed that for safety of the occupants of a building(s) or for control reasons that it is safer for occupants to remain in the building than to be on the streets.

It is expected that this is also the intent for the all other areas within the LGA outside the CBD.

6.2 Local Plan

The 2010 Parramatta DISPLAN states that there are no sub-plans or supporting plans.

6.3 Sizing Temporary Flood Refuge

Two primary sources of information were located when considering the size of a temporary flood refuge:

- Building Code of Australia (BCA, 2008)¹
- US Flood Emergency Management Authority (FEMA, 2000)².

As outlined above, the Building Code of Australia (2008) stipulates that an area of public assembly such as halls or theatres should have a maximum density of 1 m² per person (BCA, 2008). FEMA, 2000 recommends a minimum of 0.45 m² per person for tornado shelters.

In the case of the proposed development a conservative maximum density of 2 m² per person has been adopted in view of the length of time visitors and/or retail staff may be required to shelter in place.

Based on the estimated number of persons that could be at risk on the Ground Floor the estimated area of refuge required is 28 m².

It is expected that this refuge would be easily provided in the proposed car parking levels which are at levels higher than the PMF.

¹ Building Codes of Australia (2008 Edition). *Part D Access and Egress. D1.13 Number of Persons Accommodated*

² FEMA (2000) *Design and Construction Guidance for Community Shelters*, Federal Emergency Management Agency, Mitigation Directorate, FEMA361, 1st Ed., July 2000

7. FLOOD EMERGENCY RESPONSE

As indicated in the 2010 Parramatta DISPLAN, it is expected that Building Owners and Managers (in accordance with existing OH&S requirements, the Building Code of Australia and relevant City of Parramatta regulations) are to have a building Emergency Management Plan which complies with the provisions of AS 3745.

7.1 Flood Warning

Discussions with the NSW SES have previously identified the following status of flood warnings for the Parramatta CBD:

- The Bureau of Meteorology does not prepare flood predictions for the Parramatta River or its tributaries;
- Only a Draft Flood Warning Plan has been prepared to date by the NSW SES. This draft was prepared a number of years ago and while it is planned that it will be updated this does not have a high priority in view of the level of flood protection in the Parramatta CBD that has been achieved by various works undertaken in the upper catchment including the Loyalty Road basin.
- Trigger levels for flood warning have not been identified for the Parramatta CBD.

Other sources of information regarding approaching severe weather conditions which could cause potential flooding at the site including:

- The Bureau of Meteorology through their website (www.bom.gov.au);
- Observation of local rainfall;
- The local SES (<http://parramatta-ses.com>);
- Parramatta City Council Emergency Management Officer;
- Local television stations; and/or
- Local radio stations.

An important indication of likely imminent flood activity would be intense local rainfall and residents, retail workers and visitors should take notice of extreme rainfall warnings issued by the Bureau of Meteorology and disseminated by local media.

7.2 Flood Emergency Detailed Response Plan

The building Emergency Management Plan will contain a Flood Emergency Detailed Response Plan. It is also expected that all wardens trained under the building emergency plan are to be aware of the flood evacuation site, routes to the site and how to liaise with the any building occupants at the site.

The Flood Emergency Detailed Response Plan (FEDRP) for the proposed development would describe:

- Flood behaviour at the site for the 100 yr ARI and Probable Maximum Flood (PMF),
- Flood protection measures, and
- A Flood Emergency Response Plan for the site, including:
 - A Flood Warning System
 - Evacuation strategy, measures, procedures and plan
 - FloodSafe Plans

A Flood Emergency Detailed Response Plan would accompany any DA lodged with Council.

An example Table of Contents for a FEDRP is given in **Attachment D**.

8. PLANNING CONSIDERATIONS

8.1 Parramatta Local Environment Plan 2011

Section 6.3 of the *Parramatta Local Environment Plan (LEP) 2011* outlines the minimum requirements for land lower than the Flood Planning Level (FPL) which is defined as land the 100 year AR flood level plus 0.5 metre freeboard. The LEP notes development consent should not be granted unless Council is satisfied the development:

- is compatible with the flood hazard of the land, and
- is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and
- incorporates appropriate measures to manage risk to life from flood, and
- is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and
- is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding

Table 1 Parramatta City Council Floodplain Matrix

Table 2.7: FLOODPLAIN MATRIX																											
Planning & Development Controls																											
Planning Consideration	Flood Risk Precincts (FRP's)																										
	Low Flood Risk							Medium Flood Risk							High Flood Risk												
	Sensitive Uses & Facilities	Critical Uses & Facilities	Subdivision	Filling	Residential*	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Uses & Facilities	Subdivision	Filling	Residential*	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development	Sensitive Uses & Facilities	Critical Uses & Facilities	Subdivision	Filling	Residential*	Commercial & Industrial	Tourist Related Development	Open Space & Non-Urban	Concessional Development
Floor Level		3			2,5	2,5	2,5							2,5	2,5	2,5	1,5	4,5							1,5	4,5	
Building Components		2												1	1	1	1	1							1	1	
Structural Soundness		2												1	1	1	1	1							1	1	
Flood Affection		2	2	1	2	2	2					1		1	1	1	2	1							1	1	
Car Parking & Driveway Access		1,3,5,6			1,3,5,6	1,3,5,6	1,3,5,6	2,4,6,7						1,3,5,6,7	1,3,5,6,7	1,3,5,6,7	2,4,6,7	1,5							2,4,6,7	1,5	
Evacuation		2,4,6	5		3,4	4	4					5,3,4		3,4,6	3,4,6	3,4,6	1,4	3,6							1,4	3,4,6	
Management & Design		2,3,4	1									1		2,3,4	2,3,4	2,3,4	2,3,4	2,3,4							2,3,4	2,3,4	

 Not Relevant

 Unsuitable Land Use

* For redevelopment of an existing dwelling refer also to 'Concessional Development' provisions

i. Freeboard equals an additional height of 500mm.

ii. The Parramatta LEP 2011 identifies development permissible with consent in various zones. Notwithstanding, constraints specific to individual sites may preclude Council granting consent for certain forms of development on all or part of a site. The above matrix identifies where flood risks are likely to determine where certain development types will be considered "unsuitable" due to flood related risks.

iii. Filling of the site, where acceptable to Council, may change the FRP considered to determine the controls applied in the circumstances of individual applications.

iv. Any fencing that forms part of a proposed development is subject to the relevant Flood Effects and Structural Soundness planning considerations of the applicable land use category.

v. Development within the floodplain may be subject to Clause 6.7 Foreshore Building Line in the Parramatta LEP 2011.

Floor Level

- 1 All floor levels to be equal to or greater than the 20 year Average Recurrence Interval (ARI) flood level plus freeboard
- 2 Habitable floor levels to be equal to or greater than the 100 year ARI flood level plus freeboard.
- 3 All floor levels to be equal to or greater than the Probable Maximum Flood (PMF) level plus freeboard
- 4 Floor levels to be equal to or greater than the 100 year ARI flood level plus freeboard. Where this is not practical due to compatibility with the height of adjacent buildings, or compatibility with the floor level of existing buildings, or the need for access for persons with disabilities, a lower floor level may be considered. In these circumstances, the floor level is to be as high as practical, and, when undertaking alternations or additions, no lower than the existing floor level.
- 5 A restriction is to be placed on the title of the land, pursuant to S.88B of the Conveyancing Act, where the lowest habitable floor area is elevated more than 1.5m above finished ground level, confirming that the subfloor space is not to be enclosed.

Building Components & Method

- 1 All structures to have flood compatible building components below the 100 year ARI flood level plus freeboard.
- 2 All structures to have flood compatible building components below the PMF.

Structural Soundness

- 1 An engineers report is required to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a 100 year ARI flood level plus freeboard.
- 2 An engineers report is required to certify that the structure can withstand the forces of floodwater, debris and buoyancy up to and including a PMF level.

Flood Affection

- 1 An engineers report is required to certify that the development will not increase flood affection elsewhere, having regard to: (i) loss of flood storage; (ii) changes in flood levels, flows and velocities caused by alterations to flood flows; and (iii) the cumulate impact of multiple potential developments in the vicinity.
- 2 The impact of the development on flooding elsewhere to be considered having regard to the three factors listed in consideration 1 above.

Car Parking and Driveway Access

- 1 The minimum surface level of open spaces or carports shall be as high as practical, but no lower than 0.1m below the 100 year ARI flood level. In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 100 year ARI flood level.
- 2 The minimum surface level of open parking spaces or carports shall be as high as practical, but no lower than 0.3m above the 20 year ARI flood level.
- 3 Garages capable of accommodating more than 3 motor vehicles on land zones for urban purposes, or enclosed car parking, must be protected from inundation by floods equal to or greater than the 100 year ARI flood. Ramp levels to be no lower than 0.5m above the 100 year ARI flood level.
- 4 The driveway providing access between the road and parking spaces shall be as high as practical and generally rising in the egress direction.
- 5 The level of the driveway providing access between the road and parking spaces shall be no lower than 0.2m below the 100 year ARI flood level.
- 6 Enclosed car parking and car parking areas accommodating more than 3 vehicles, with a floor below the 100 year ARI flood level, shall have adequate warning systems, signage, exits and evacuation routes.
- 7 Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 100 year ARI flood.

Evacuation

- 1 Reliable access for pedestrians required during a 20 year ARI peak flood.
- 2 Reliable access for pedestrians and vehicles required to a publicly accessible location during the PMF peak flood.
- 3 Reliable access for pedestrians and vehicles is required from the site to an area of refuge above the PMF level, either on site (eg. second storey) or off site.
- 4 Applicant is to demonstrate the development is consistent with any relevant flood evacuation strategy or similar plan.
- 5 Applicant is to demonstrate that evacuation in accordance with the requirements of this DCP is available for the potential development resulting from the subdivision.
- 6 Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon SES or other authorised emergency services personnel.

Management and Design

- 1 Applicant is to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with this the relevant FRMS and FRMP
- 2 Site Emergency Response Flood plan required where the site is affected by the 100 year ARI flood level, (except for single dwelling-houses).
- 3 Applicant is to demonstrate that area is available to store goods above the 100 year flood level plus freeboard.
- 4 No storage of materials below the 100 year ARI flood level.

8.2 Parramatta DCP 2011

Section 2 of the Parramatta DCP 2011 describes site planning considerations including design objectives, design principles and design controls. The development is located in Low, Medium and High Risk Flood Risk Precincts (refer **Figure 7**).

While part of the proposed development is located over a High Risk Precinct the risk to retail staff and visitors is mitigated by the provision of accessible car parking levels which are at levels higher than the PMF (refer **Attachment A**). Consequently the development should be assessed against the planning and development controls that apply to "Residential" in a Medium Flood Risk Precinct. These controls are identified above in **Table 1**.

8. RESPONSES TO PARRAMATTA CITY COUNCIL OUTSTANDING FLOODING ISSUES OF CONCERN

Drawing on the preceding assessments and considerations the following responses to Council's outstanding flooding issues of concern are provided:

- (4) *A planning proposal must include provisions that give effect to and are consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005 (including the Guideline on Development Controls on Low Flood Risk Areas).*

Flood risk can be defined as being existing, future or residual risk:

- **Existing flood risk** - the existing problem refers to existing buildings and developments on flood prone land. Such buildings and development by virtue of their presence and location are exposed to an 'existing' risk of flooding.
- **Future flood risk** - the future problem refers to buildings and developments that may be built on flood prone land in the future. Such buildings and developments may be exposed to a 'future' flood risk, i.e. a risk would not materialise until the developments occur.
- **Continuing risk of flooding** - the continuing problem refers to the 'residual' risk associated with floods that exceed management measures already in place, i.e. unless a floodplain management measure is designed to withstand the Probable Maximum Flood, it will be exceeded by a sufficiently large flood at some time in the future.

Measures available for the management of flood risk can be categorised according to the way in which the risk is managed. As a result, there are three types of measures for the management of flooding:

- Flood Modification Measures (for the existing risk)
- Property Modification Measures (for the future risk)
- Emergency Response Modification Measures (for the residual risk).

The flood risks on 14-20 Parkes Street are described in Section 5 above.

Existing Flood Risk

The existing flood risk on 14-16 Parkes Street was assessed in 2001 and informed the re-development of this site in 2001-2002. The development form which was adopted to respond to future flood risk was a ground floor elevated 500 mm above the 100 yr ARI flood level supported on a grid of columns. The undercroft area is maintained in a non-vegetated condition to allow the free flow of floodwaters beneath the new building. Along the Wigram Street boundary a bar screen with the maximum allowable clear opening between bars was installed to bar non-authorised access to the undercroft area. The current building form on the Parkes Street side prevents any entry to the undercroft area from Parkes Street.

The Planning Proposal maintains this approach to managing the existing flood risk.

Future Flood Risk

The future flood risk is addressed by the development achieving and/or exceeding the requirements of Council's Floodplain Matrix as given in the Parramatta DCP 2011 (refer Section 7.2) as discussed in Section 4 above ie. by maintaining the approach to the provision of the passage of floodwaters through the site adopted in 2001 and extending this approach to 18-20 Parkes St as needed.

Continuing Flood Risk

The estimated total number of visitors/retail staff **directly** at risk during a PMF is conservatively estimated to be around 14. Any visitors or residents located on Levels 1 or above would be **indirectly** at risk during extreme floods greater than a 100 yr ARI flood up to the PMF.

In the case of a 4 hour PMF event it is expected that there would be insufficient time to evacuate any residents and/or visitors from the site once floodwaters start spilling from Clay Cliff Creek and that instead residents and/or visitors should shelter in place.

Based on the estimated number of persons that could be at risk on the Ground Floor the estimated area of refuge required is 28 m². It is expected that this refuge would be easily provided in the proposed car parking levels which are at levels higher than the PMF.

As indicated in the 2010 Parramatta DISPLAN, it is expected that Building Owners and Managers (in accordance with existing OH&S requirements, the Building Code of Australia and relevant City of Parramatta regulations) are to have a building Emergency Management Plan which complies with the provisions of AS 3745.

The building Emergency Management Plan will contain a Flood Emergency Detailed Response Plan. It is also expected that all wardens trained under the building emergency plan are to be aware of the flood evacuation site, routes to the site and how to liaise with the any building occupants at the site.

A Flood Emergency Detailed Response Plan would accompany any DA lodged with Council.

An example Table of Contents for a FEDRP is given in **Attachment D**.

(6) (c) permit a significant increase in the development of that land

The flood risk on the site is addressed by the development achieving and/or exceeding the requirements of Council's Floodplain Matrix as given in the Parramatta DCP 2011 (refer Section 7.2) as discussed in Section 4 above ie. by maintaining the approach to the provision of the passage of floodwaters through the site adopted in 2001 and extending this approach to 18-20 Parkes St as needed.

Notwithstanding the adoption of a form of development which responds to the flood risk it is estimated around 14 visitors/retail staff on the Ground Floor would remain **directly** at risk during a PMF. Any visitors or residents located on Levels 1 or above would be **indirectly** at risk during extreme floods greater than a 100 yr ARI flood up to the PMF.

In the case of a 4 hour PMF event it is expected that there would be insufficient time to evacuate any residents and/or visitors from the site once floodwaters start spilling from Clay Cliff Creek and that instead residents and/or visitors should shelter in place.

Based on the estimated number of persons that could be at risk on the Ground Floor the estimated area of refuge required is 28 m². It is expected that this refuge would be easily provided in the proposed car parking levels which are at levels higher than the PMF.

As indicated in the 2010 Parramatta DISPLAN, it is expected that Building Owners and Managers (in accordance with existing OH&S requirements, the Building Code of Australia and relevant City of Parramatta regulations) are to have a building Emergency Management Plan which complies with the provisions of AS 3745.

The building Emergency Management Plan will contain a Flood Emergency Detailed Response Plan. It is also expected that all wardens trained under the building emergency plan are to be aware of the flood evacuation site, routes to the site and how to liaise with the any building occupants at the site.

A Flood Emergency Detailed Response Plan would accompany any DA lodged with Council.

An example Table of Contents for a FEDRP is given in **Attachment D**.

(6) (d) are likely to result in a substantially increased requirement for government spending on flood mitigation measures, infrastructure or services

The existing flood risk on 14-16 Parkes Street was assessed in 2001 and informed the re-development of this site in 2001-2002. The development form which was adopted to respond to the flood risk was a ground floor elevated 500 mm above the 100 yr ARI flood level supported on a grid of columns. The undercroft area is maintained in a non-vegetated condition to allow the free flow of floodwaters beneath the new building. Along the Wigram Street boundary a bar screen with the maximum allowable clear opening between bars was installed to bar non-authorised access to the undercroft area. The current building form on the Parkes Street side prevents any entry to the undercroft area from Parkes Street.

The Planning Proposal maintains this approach for the provision of the passage of floodwaters through the site adopted in 2001 and extending this approach to 18-20 Parkes St as needed. This approach is not reliant on any requirement for government spending on mitigation measures or infrastructure.

The Parramatta DCP 2011 also requires in part that:

Adequate flood warning is available to allow safe and orderly evacuation without increased reliance upon SES or other authorised emergency services personnel.

In the case of a 4 hour PMF event it is expected that there would be insufficient time to evacuate any residents and/or visitors from the site once floodwaters start spilling from Clay Cliff Creek and that instead residents and/or visitors should shelter in place. It is expected that this refuge would be easily provided in the proposed car parking levels which are at levels higher than the PMF.

The building Emergency Management Plan will contain a Flood Emergency Detailed Response Plan. It is also expected that all wardens trained under the building emergency plan are to be aware of the flood evacuation site, routes to the site and how to liaise with the any building occupants at the site.

A Flood Emergency Detailed Response Plan would accompany any DA lodged with Council.

The implementation of a FEDRP for the development is not reliant on any requirement for government spending on services.

We trust the discussion on flooding and flood risks encountered on 14-20 Parkes Street, the consideration of planning requirements, emergency planning and flood emergency response and the discussion of how the Planning Proposal responds to these considerations addresses Council's outstanding flooding issues of concern.

Yours faithfully

A handwritten signature in black ink that reads 'Brett C. Phillips'.

.....
Dr Brett C. Phillips
Director, Water Engineering
for **Cardno**

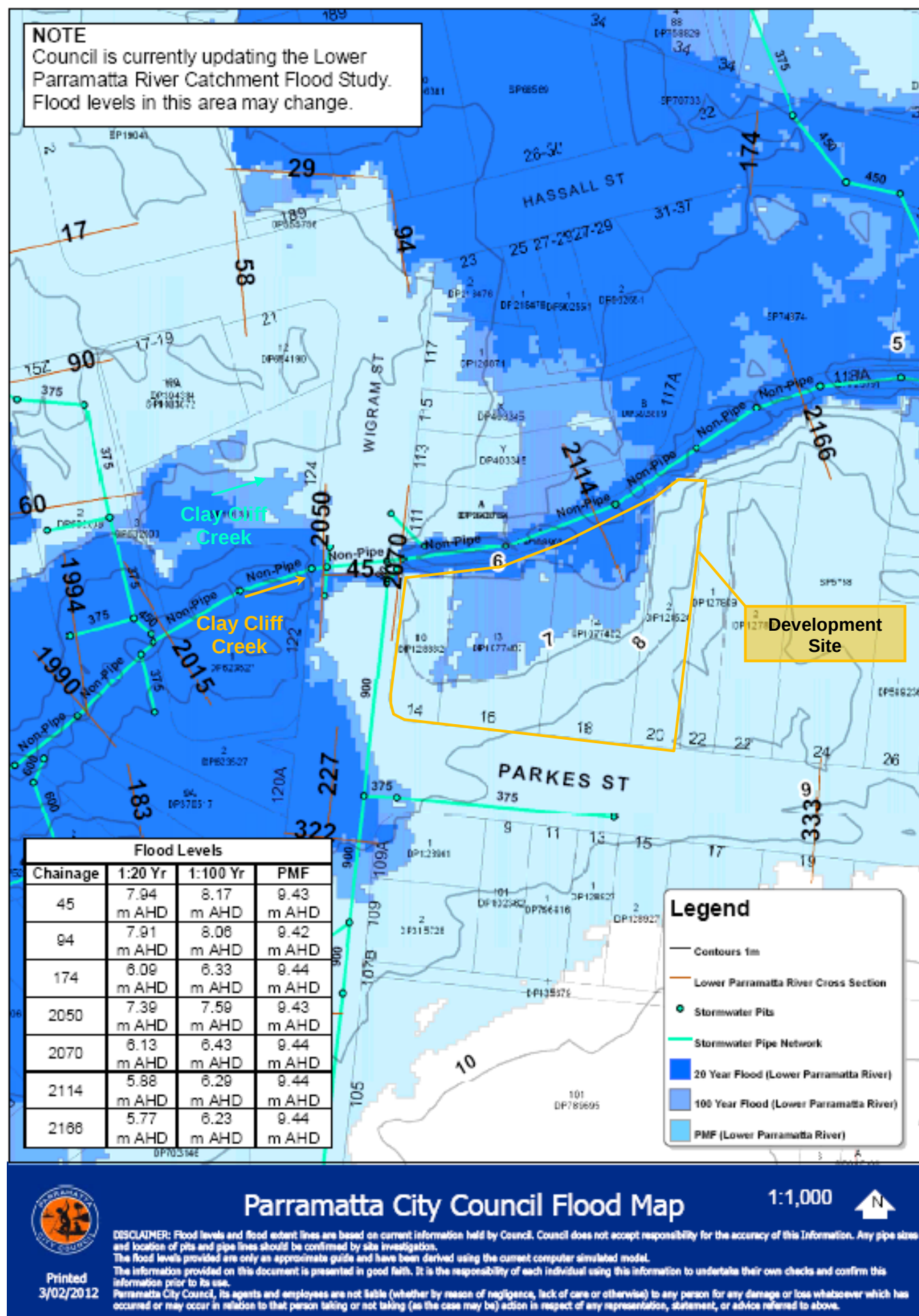


Figure 1 Locality Plan (Source: Parramatta City Council Flood Map)

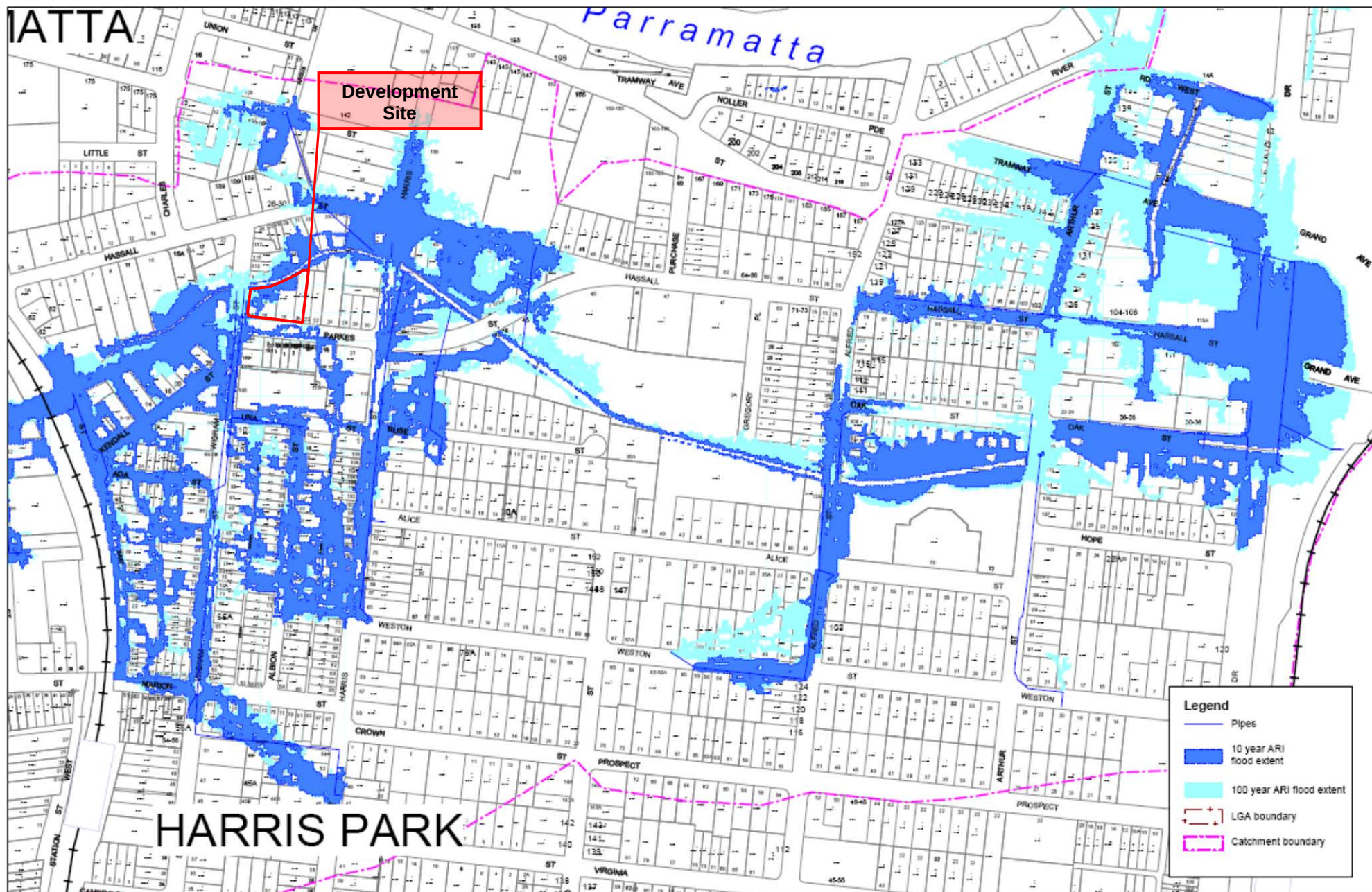


Figure 2 10 yr ARI and 100 yr ARI flood extents – Clay Cliff Creek (after Cardno Willing, 2007)

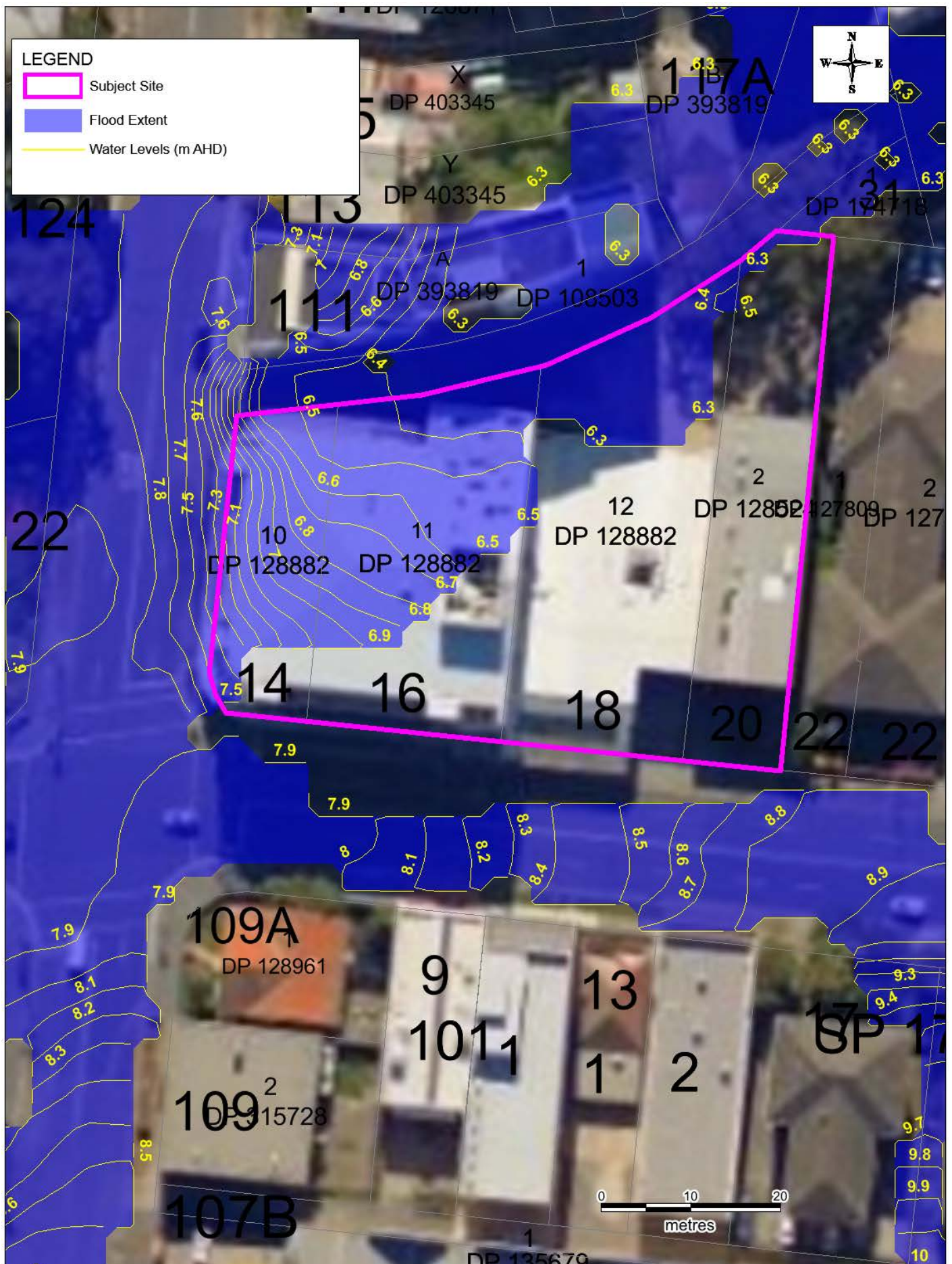


Figure 3 100 yr ARI Flood Extents and Flood Levels - Current Conditions

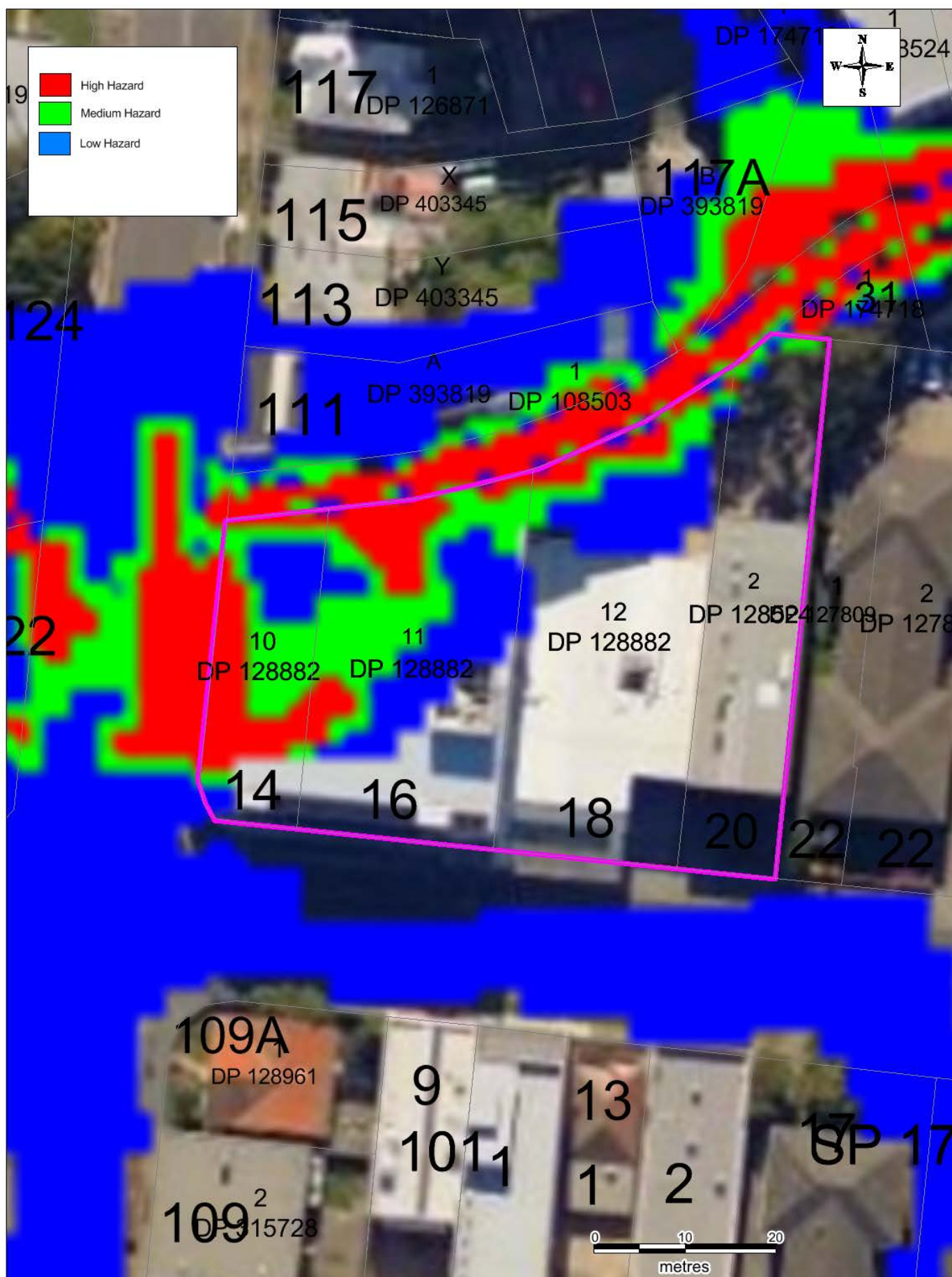


Figure 4 100 yr ARI Flood Hazards - Current Conditions

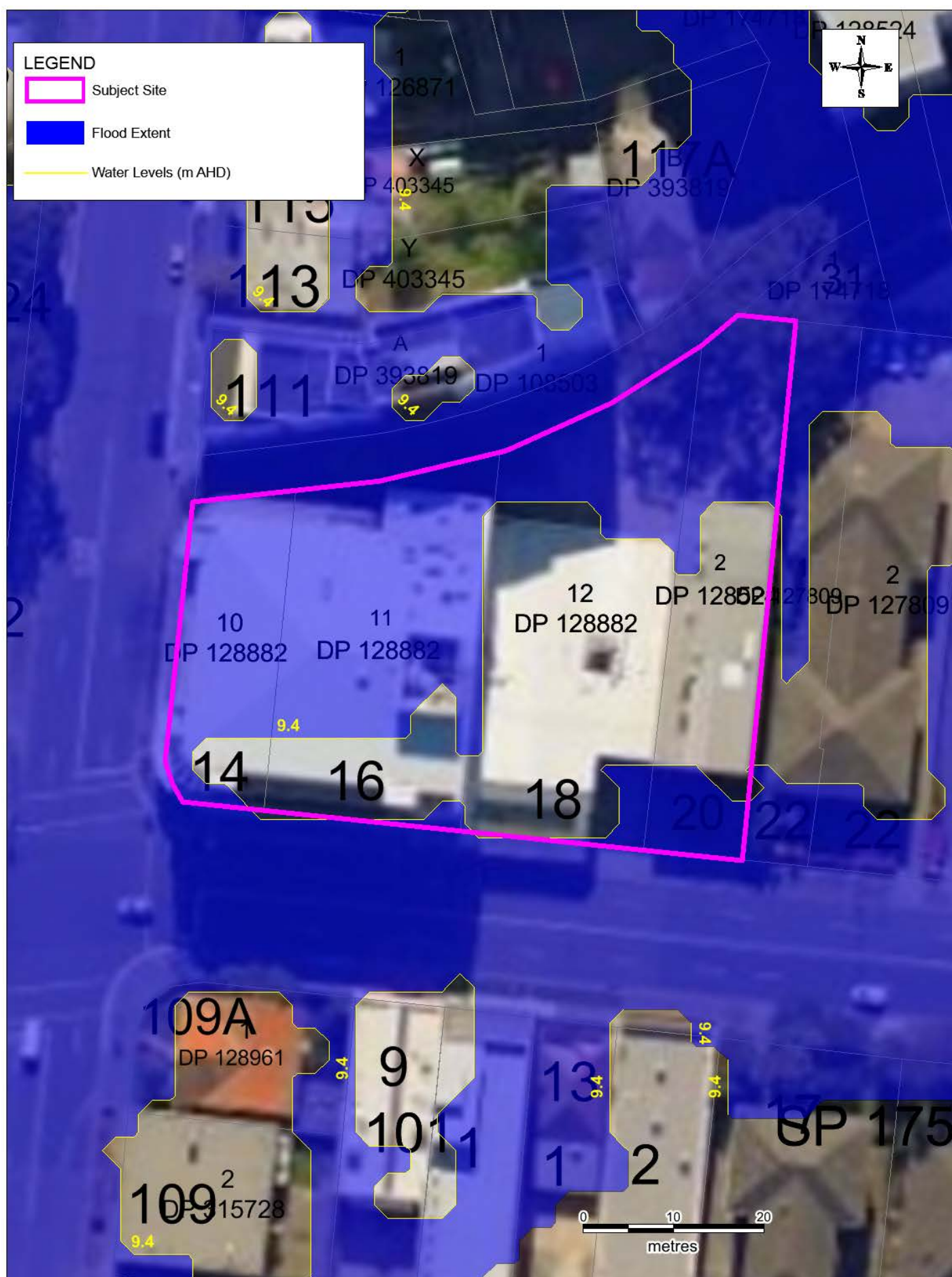


Figure 5 PMF Extents and Flood Levels - Current Conditions

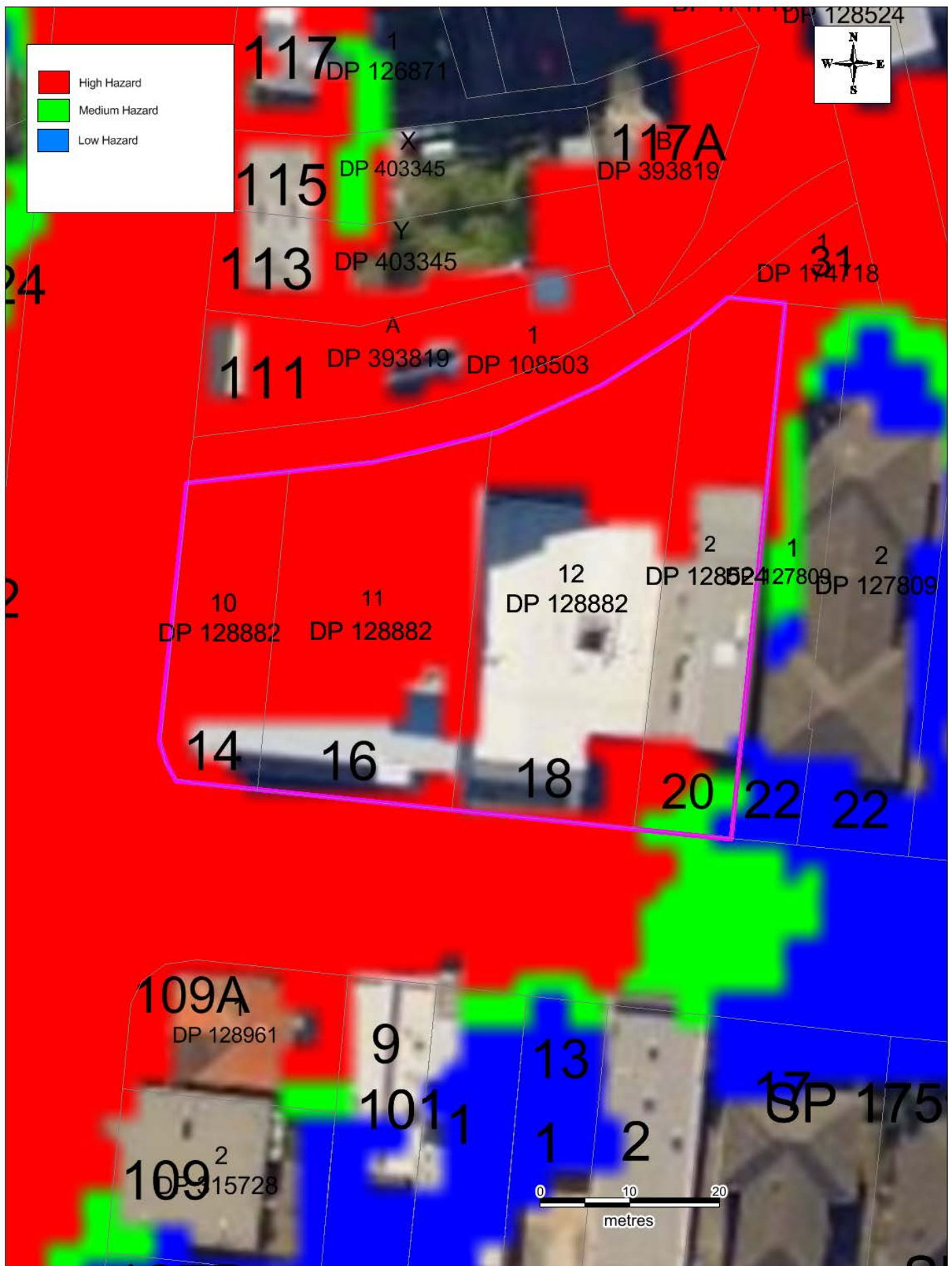


Figure 6 PMF Hazards - Current Conditions



Attachment B Previous Studies

B.1 2001 Flood Impact Assessment of Development of 14-16 Parkes St, Parramatta

In 2001 it was proposed to redevelop the site at 14-16 Parkes Street in Parramatta and to erect a multi-storey building that is compatible with the flood risk on the site. The site is bounded by Parkes Street to the south, Wigram Street to the west, the existing Anglicare office to the east and Clay Cliff Creek to the north.

Parramatta City Council previously adopted the Clay Cliff Creek Catchment Flood Study (Dalland & Lucas, 1992) and Addendum No. 1 (Dalland & Lucas, 1993) and the 5% AEP and 1% AEP flood levels reported therein.

In 1999 a report on flooding issues for 14-18 Parkes Street was prepared by Dalland & Associates, 1999. The development proposal that was assessed in this report was to construct a flood proof Basement Car Park and for the level of the ground floor of the building to be 500 mm above the estimated 1% AEP flood level.

The aim of the study was to estimate the spatial extent and flow patterns through and in the vicinity of 14-16 Parkes Street in both the 5% AEP and 1% AEP events and to estimate the magnitude and spatial extent of any changes to flood levels and velocities resulting from the re-development of 14-16 Parkes Street. The flood impact assessment was undertaken using a local 2D SMS model of 14-16 Parkes Street and its environs based on the available and collected data including detailed survey.

The development form which was adopted based on the outcomes of the flood assessment was a ground floor elevated 500 mm above the 100 yr ARI flood level supported on a grid of columns. The undercroft area is maintained in a non-vegetated condition to allow the free flow of floodwaters beneath the new building. Along the Wigram Street boundary a bar screen with the maximum allowable clear opening between bars was installed to bar non-authorized access to the undercroft area. The proposed building form on the Parkes Street side prevents any entry to the undercroft area from Parkes Street.

B.2 2005 Lower Parramatta River Floodplain Study

The Lower Parramatta River Floodplain Risk Management Study/Plan was completed in 2005 in accordance with the provisions of the Floodplain Development Manual applicable at that time. This study included a Flood Study Review which re-assessed flood levels in a number of watercourses and in the tidal section of Parramatta River, between the Charles Street weir and Ryde (road) Bridge. The Flood Study Review provided the base data for the subsequent Floodplain Risk Management Study.

The study was commissioned by Parramatta City Council to update the previous data on flood levels and extents. PCC was aware that the results predicted in the 1986 study would now be subject to change due to changes in the catchment such as urbanisation and the construction of flood mitigation projects in the upper catchment. It also recognised that the previous flood extent mapping was based on the best information available at the time, but it was of variable reliability and did not provide an assessment of flood hazard.

The LPRFS adopted the best current practice to review the flood data which included (SKM, 2005):

- up-to-date catchment hydrology for the Upper Parramatta River Catchment;
- existing/ updated hydrology for the tributaries within the Lower Parramatta River study area;
- Airborne Laser Survey;

- an additional 70 surveyed cross-sections;
- the widely used and accepted MIKE-11 hydraulic model;
- use of GIS to develop digital terrain models;
- multiple design storms to generate maximum flood levels; and
- appropriate methodology for estimating concurrent flows in tributaries.

Generally, results from the review compared well with previous studies. However, flood levels estimated in the 1986 Lower Parramatta Flood Study prepared by Willing and Partners in the Lower Parramatta River downstream of Subiaco Creek (including the Duck River confluence) were up to 1.2m lower than those derived in the 2005 review. The reasons for this difference as described in the 2005 Flood Study report include:

- revision of the critical duration to 9 hours for the Upper Parramatta River catchment in the 2005 study, due to the inclusion of channel routing and the effect of the Darling Mills Retarding Basin and other flood mitigation works. This leads to an increase in the volume of floodwaters;
- more detailed and complete survey data; and
- the adoption of an integrated modelling approach and consistent design storms for the main river and tributaries.

It is our understanding that Parramatta City Council adopted the design flood levels from this study for planning purposes in 2005.

Council and Council's Peer Reviewer has relied upon the flood levels estimated by this flood study in the vicinity of Wigram St and Hassall St, Harris Park as contained in Council's Flood Map (refer **Figure 1**).

B.3 2007 Clay Cliff Creek Catchment Master Drainage Plan

A Catchment Master Drainage Plan for the Clay Cliff Creek catchment at Parramatta was prepared in 2007. The aim of the study as set out by Parramatta City Council was to identify overland flow problem areas, locations of surcharge due to insufficient pipe capacity and pit inlet capacity, and localised flooding with areas of improvement. The study aimed also to prepare cost effective options based on cost benefit analysis.

The 2007 study assembled a hydrological model of the Clay Cliff Creek catchment and input local flow hydrographs into an **xpswmm** 1D/2D floodplain model. The estimated 10 yr ARI and 100 yr ARI flood extents are presented in **Figure 2**.

B.4 2011 Flood Impact Assessment, 111 Wigram St, Harris Park

Cardno was commissioned by ING Consulting Engineers Pty Ltd to undertake an assessment of the site and the proposed development in relation to flooding. The purpose of the assessment was to ensure that the proposed development does not have an adverse effect on 100 year ARI flood levels upstream and downstream of site and that risk of flooding to the public is acceptable to Parramatta City Council.

Cardno assessed flood behaviour for the 100 year ARI for the existing and proposed conditions. This was undertaken through update of our 2007 **xpswmm2D** model of the Clay Cliff Creek catchment prepared for the Parramatta City Council.

The assessment concluded that the proposed development does not have an adverse effect on 100 year ARI flood levels upstream and downstream of site and that the flood risk to the public is acceptable to Council.

B.5 2011 Flood Impact Assessment, 122 Wigram St, Harris Park

Cardno was commissioned by LJ Hooker Westmead to undertake the flood assessment of the proposed multi- storey mixed-use development at 122 Wigram Street, Harris Park. The purpose of the assessment was to ensure that the proposed development does not have an adverse effect on 100 year ARI flood levels upstream and downstream of site and that risk of flooding to the public is acceptable to Parramatta City Council.

Cardno assessed flood behaviour for the 100 year ARI for the existing and proposed conditions. This was undertaken through update of our 2007 **xpswmm2D** model of the Clay Cliff Creek catchment prepared for the Parramatta City Council.

The assessment concluded that the proposed development would maintain the floodplain of Clay Cliff Creek and would have little impact on flood behaviour being located between the hydraulic controls of Charles and Wigram Street crossings.

B.6 2014 Flood Impact Assessment, 113-117 Wigram St and 23-29 Hassall St, Harris Park

A mixed-use development of 113-117 Wigram St and 23-29 Hassall St is proposed comprising retail outlets, residential apartments and a multi-storey underground car park. The subject site is located adjacent to and north of Clay Cliff Creek.

Global Civil had previously prepared and amended flooding assessments for 113-117 Wigram St, Parramatta in response to Council comments.

Cardno was engaged to address the overall conclusions of Council's Peer Reviewer as documented in a Council memorandum dated 21 October 2013.

The study comprised a:

- Review of previous flood studies and available data
- Compilation of site specific data (including proposed development layout)
- Establishment of flood model to represent existing site scenario
- Revision of flood model to represent future site development
- Assessment of resultant flood behaviour and flood risks
- Review of flood emergency planning
- Preparation of an outline of a flood emergency response plan
- Review of compliance with Parramatta City Council development requirements

It was also noted that the flood impact assessments previously accepted by Council on 111 Wigram St and 122 Wigram St were undertaken using an updated version of the 2007 Clay Cliff Creek **xpswmm2D** floodplain model. Accordingly the assessment of the impact or otherwise of development on 113-117 Wigram St and 23-29 Hassall St was undertaken using an updated version of the 2007 Clay Cliff Creek **xpswmm2D** floodplain model.

An assessment of flooding in the 100 yr ARI and the PMF event was undertaken.

**Attachment C
DISPLANS****C.1 North West Metropolitan District Disaster Plan**

On 27th June 2012 the Interim Version of the "North West Metropolitan District Disaster Plan (Displan)" was endorsed by Chairman, State Emergency Management Committee, The Displan was prepared by the North West Metropolitan District Emergency Management Committee in compliance with Section 23 (1) of the State Emergency and Rescue Management Act, 1989, (as amended). The Parramatta LGA is one of the LGAs covered by this plan.

The Plan details emergency preparedness, response and recovery arrangements for the North West Metropolitan Emergency Management District, Local Emergency Management Areas and local government. It recognises that many of the details contained in the plan are similar to those contained in Local Plans and therefore this Plan may be utilised and applied at a local level in conjunction with a Local Displan.

The Plan's aim is to ensure a controlled response to emergencies by all agencies having responsibilities and functions in emergencies, (Section 12 (2) of the SERM Act), and it reflects and applies in conjunction with arrangements agreed to at State level and detailed in the State Disaster Plan

C.2 Parramatta DISPLAN

The Parramatta Disaster Plan (DISPLAN) released in 2010 details arrangements for preparing for, responding to and recovering from emergencies within the City of Parramatta.

As described in the plan, *it encompasses arrangements for:*

- a) *Incidents controlled by combat agencies.*
- b) *Emergencies controlled by combat agencies and supported by the Local Emergency Operations Controller.*
- c) *Emergency operations for which there is no combat agency.*
- d) *Circumstances where a combat agency has passed control to the Local Emergency Operations Controller*

The area covered by the plan comprises the whole of the City of Parramatta.

The Plan is based upon operation during both normal business hours and outside of normal business hours and takes into consideration special events that may from time to time operate outside and during normal business hours.

Transportation of people will be by either government/private transport or by private vehicle, with numbers and method dependant on circumstances and location of emergency.

Each agency with a statutory role has in place arrangements which detail that agency's response.

Each Emergency Service Organisation and Functional Area has in place an appropriate supporting plan/operational procedures which detail that agency's response.

It is expected that in the Parramatta CBD that Building Owners, Managers and Tenants will be provided with education regarding their responsibilities in both evacuation and general building emergency management. It is accepted that all buildings where required will have in place a practised Emergency Management Plan in line with AS 3745 and as per NSW OH&S Regulation 2001

Section 23 of the DISPLAN discusses evacuation as follows:

23. EVACUATION

- a) *The LEOCon, in consultation with the Combat Agency, will determine the need for evacuation.*
- b) *Police will control and coordinate the evacuation of persons to the chosen Safe site or marshalling point and supervise disaster victim registration.*
- c) *Transport resources will be arranged through and coordinated by the transport functional area coordinator, if private vehicles are not available.*
- d) *The LEOCon will determine, in consultation with the Combat Agency, when return of evacuees is possible.*

Concept of Operations

The evacuation process is based on a 5 stage process

- i) *Decision to Evacuate*
- ii) *Warning*
- iii) *Withdrawal*
- iv) *Shelter*
- v) *Return*

The concept of operations for an emergency in the Parramatta CBD can be summarised as:

Emergency occurs or is imminent in the CBD:

*Buildings may/may not begin self evacuation due to the emergency;
Public transport systems are disrupted, resulting in Transport/Traffic plans being enacted to provide an emergency service;
Emergency Service Agencies begin deployment in accordance with normal arrangements;
An area requiring Evacuation is identified;
When deemed safe to do so, "return" advised through Displan arrangements, and may include some caveats;
Throughout, the Emergency Services and Functional Area agencies continue to deal with the particular emergency.*

Withdrawal

If there is a decision to evacuate, or a self evacuation commences, there is a need to follow a process to move people to a place of safety while the status of the transport system is assessed and arrangements are made to move people out of the Parramatta CBD.

The withdrawal stage for the CBD is based on the following philosophy.

*Building to Assembly Area (covered by individual building evacuation plans)
Assembly Area to Safe sites in accordance with the CBD evacuation plan or this plan (based on building location) OR
Safe sites in accordance with the CBD evacuation plan or this plan*

Control Measures

For the purpose of this plan, the Parramatta CBD has been divided into three (3) zones (refer to map on Anexure 2)

- *Ollie Webb Reserve*
- *Macarthur Girls High School*
- *Parramatta Golf Course*

In the event of an emergency which severely disrupts transport and requires an evacuation of an area of the CBD, the control arrangements will recommend business and residents to either:

Stay at Work

This is used for all areas of the CBD (and surrounds) where the public are not directly threatened by the emergency. It may also imply that public transport may be affected and/or may not be available. This message is intended to stop or reduce the incidence of the public rushing to transport sites or exiting by private vehicles, thus allowing time for transport/traffic services to be re-established.

Stay at Work protocols assist in achieving a desired response for business and residents in the areas of the CBD unaffected by the emergency, such as:

*To carry on normal business;
Advise staff and others on their site, that an emergency has resulted in a disruption to public and private transport, and to allow for communication updates.*

Shelter in Place

This is used when it is assessed that for safety of the occupants of a building(s) or for control reasons, it is safer for occupants to remain in the building than to be on the streets. The time required to Shelter in Place will depend on the nature of the emergency.

CBD Residents/Permanent and Temporary

People who live in the area to be evacuated and those from temporary accommodation (hotels etc), will be directed to an Evacuation Centre (Refer to Parramatta Displan Sections 6.8. 1) and if necessary to temporary accommodation under the control of the Department of Community Services as per DISPLAN arrangements.

Commuters

People who are evacuated to their residence (as per a normal business day) will not receive further specialist management under this Annexure once their journey has concluded.

Evacuate to Safe Sites or Evacuation Centres

This is used as a control measure to identify those areas that require evacuation for safety and/or control reason. It is the intent to minimize the area of the CBD that is evacuated, noting that some emergencies may require the evacuation of some sections or large sections, if not all of the CBD.

People evacuated to Parramatta safe site will be requested to:

*Remain in position until further information is available, or
Make their way to other parts of the city and delay their journey home, or Make their way to specific transport terminals for movement out of the city, or Identify themselves if they have specific needs or
Move to an Evacuation Centre, or Combinations of the above.*

Support will be provided to people in Safe Sites or Evacuation Centres in accordance with this plan.

Return

LEOCON, in consultation with the combat agency and/or Functional Area, if applicable, will allow the area to be reoccupied when it is safe to do so in accordance with this plan

Building Owners and Managers

It is accepted that Building Owners and Managers in accordance with existing OH&S requirements, the Building Code of Australia and relevant City of Parramatta regulations, are to have a building Emergency Management Plan which complies with the provisions of AS 3745.

It is expected that all building Emergency Management Plans are to contain details of the most relevant Parramatta Safety Site. All wardens trained under the building emergency plan are to be aware of the Parramatta Safety Sites, routes to the site and how to liaise with the building occupants at the site.

It is accepted that all building Emergency Management Plans are to contain detail of how the information regarding an evacuation will be disseminated from the Chief Warden to occupants of the building.

It is noted that a copy of the Parramatta CBD Evacuation Plan is not available in the public domain.

It is noted also that the 2010 Parramatta DISPLAN, states in part that:

- iii) the intent is to minimize the area of the CBD that is evacuated, noting that some emergencies may require the evacuation of some sections or large sections, if not all of the CBD; and*
- iv) shelter in place is used when it is assessed that for safety of the occupants of a building(s) or for control reasons that it is safer for occupants to remain in the building than to be on the streets.*

It is expected that this is also the intent for the all other areas within the LGA outside the CBD.

Attachment D
Example FEDRP Table of Contents

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- 6.6 Emergency Procedure
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 - Commence Monitoring the flood level and time the rate of rise of flood level
 - Evacuate Visitors & Residents from Car Parking Levels
 - Warn Visitors & Residents of possible need to evacuate the Ground Floor
 - Evacuate Visitors & Residents from the Ground Floor
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APPENDICES

Appendix A Preliminary FloodSafe Plans