REPORT

To	Anchor Estate
From	Water Technology
Date	23 August 2024
Subject	90-94 Phillip Street Parramatta Flood Advice
Our ref	24060144_R01V02

Dear Charbel,

24050144 90-94 Phillip Street, Parramatta Flood Advice

This report sets out our findings regarding how flooding may dictate building design features such as building footprints, minimum floor levels, basement entries and other design features of development at 90-94 Phillip Street, Parramatta (Figure 1) and how a planning proposal to increase the floor space ratio on the site would comply with floodplain development controls. The advice provided in this report is based on flood levels from the Parramatta Flood Study adopted in June 2024 and obtained in August 2024 from Parramatta Council.

The following flood advice has been prepared with reference to the following documents:

- Parramatta Local Environmental Plan (LEP) 2023
- Parramatta Development Control Plan (DCP) 2023
- Parramatta River Flood Study (2024)
- Parramatta Flood Certificate – August 2024
- Planning Circular PS 24-001 Update on addressing flood risk in planning decisions – 1 March 2024

1 CONTEXT

Anchor Estate owns the site 90-94 Phillip Street Parramatta NSW (Figure 1). The site is currently occupied by 2 existing buildings that are used for commercial purposes. Anchor Estate intends to demolish and develop the site into a multi storeyed building for commercial/residential purposes. While the existing zoning permits such a use, Anchor Estate intends to submit a planning proposal to Council to obtain permission to increase the building height and floor space ratios on the site.

2 FLOODING

The site is subject to riverine flooding from the Parramatta River in large events and to overland flows. Parramatta Council's adopted flood levels for the site are based on a two-dimensional flood model for the whole of the Parramatta River catchment within the LGA (Stantec, 2024).

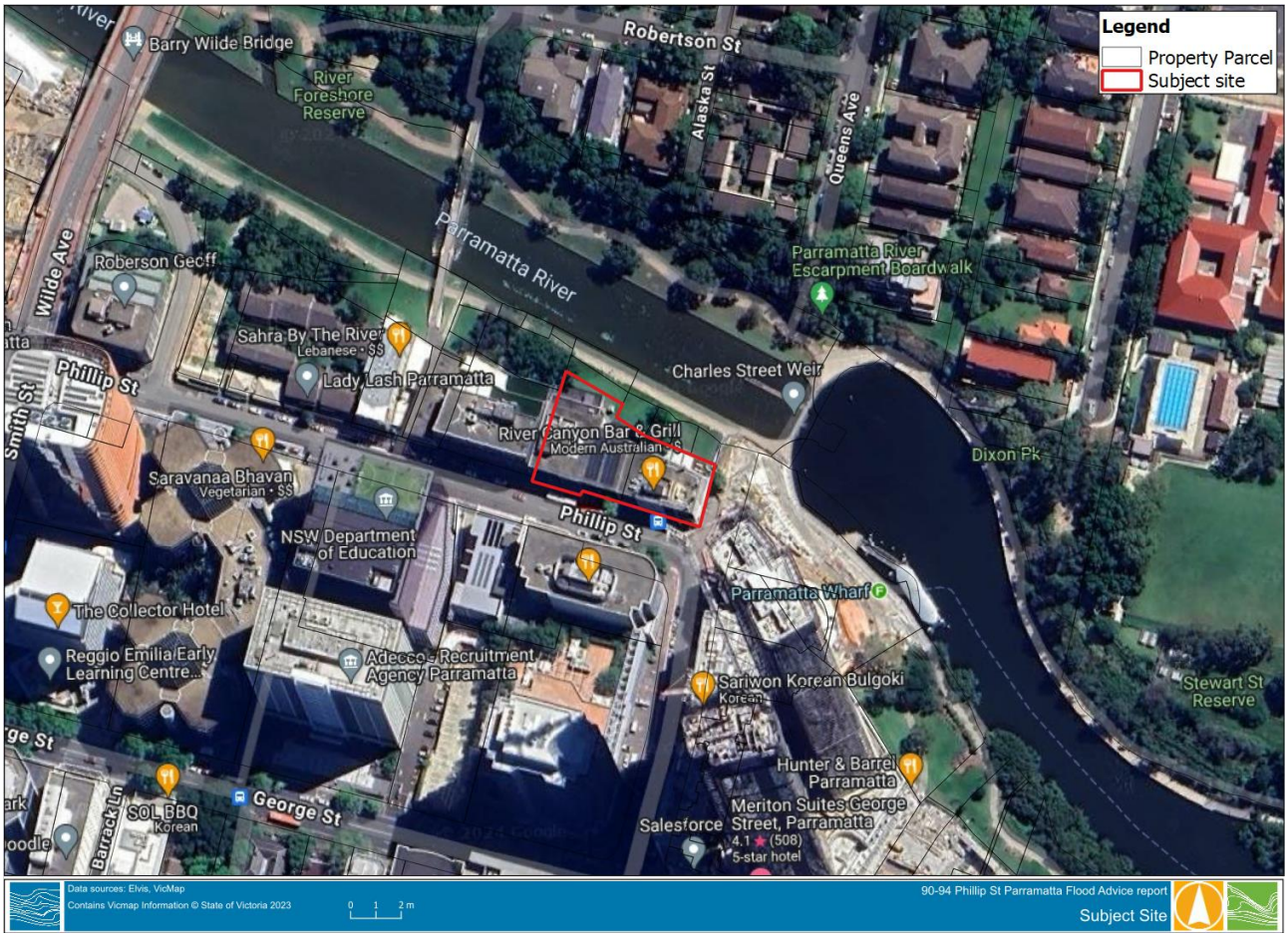

Figure 1 90-94 Phillip Street, Parramatta (Subject Site)

Flood information provided by Parramatta Council for the site and surrounding area is provided in Figures 2, 3 and 4 displaying the 5% AEP, 1% AEP and PMF flood extents.

The flood certificate indicates the flood levels at the site are:

- 5% AEP – 4.3m AHD
- 1% AEP – 5.3m AHD
- PMF – 11.5m AHD

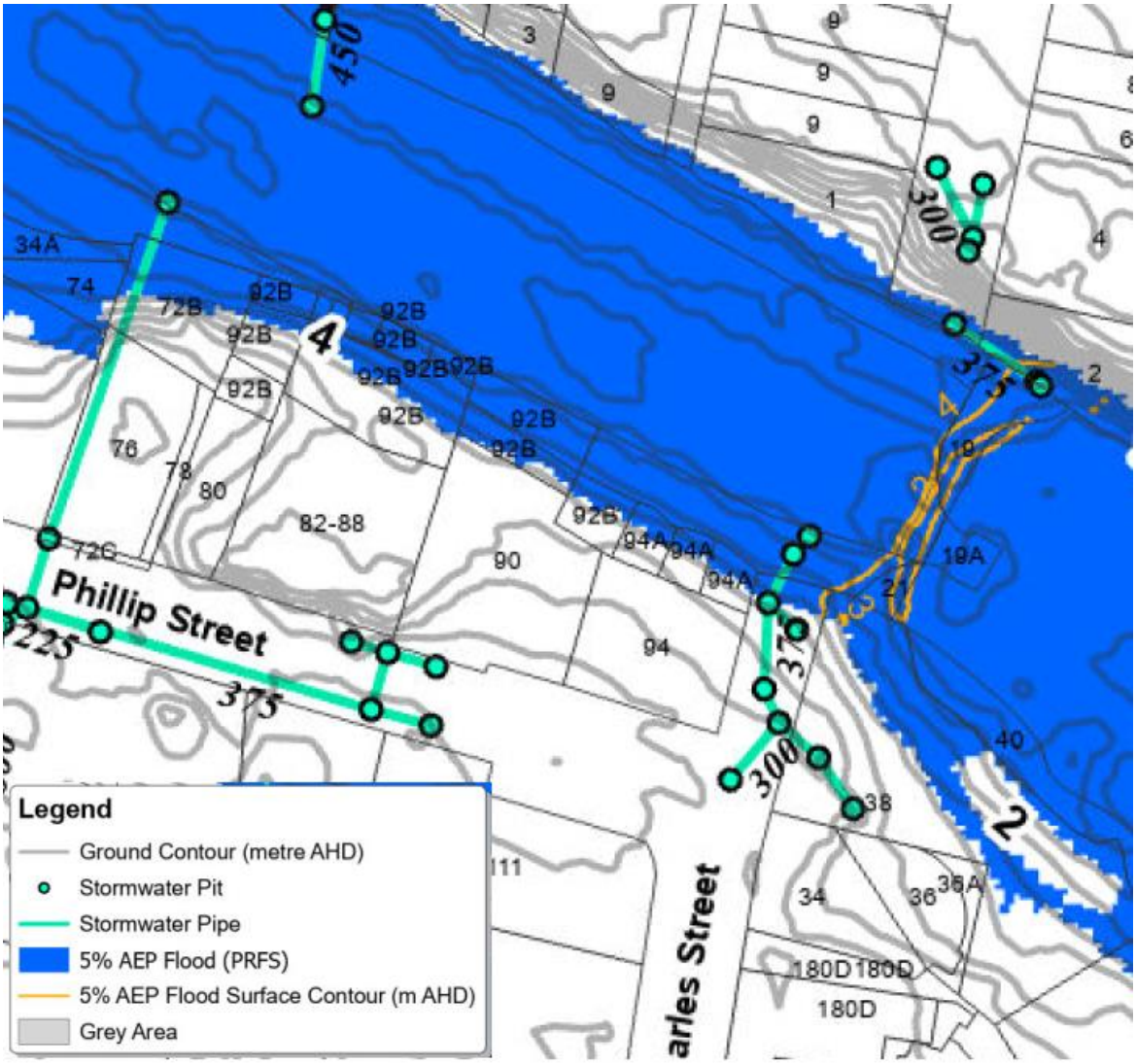

Figure 2 Flood levels (m AHD) in 5% AEP event (Parramatta Council, 2024)

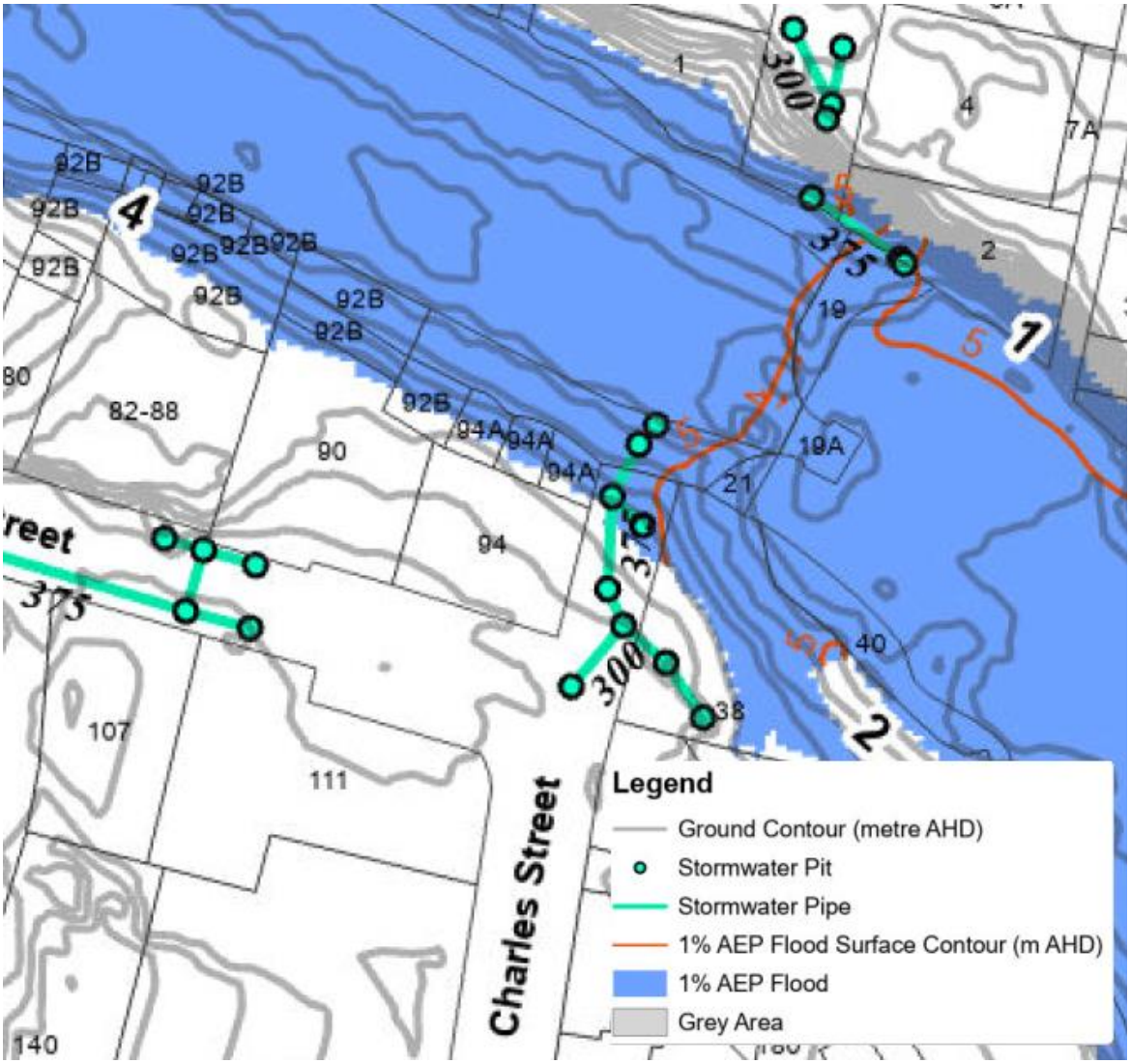

Figure 3 Flood levels (m AHD) in 1% event (Parramatta Council, 2024)

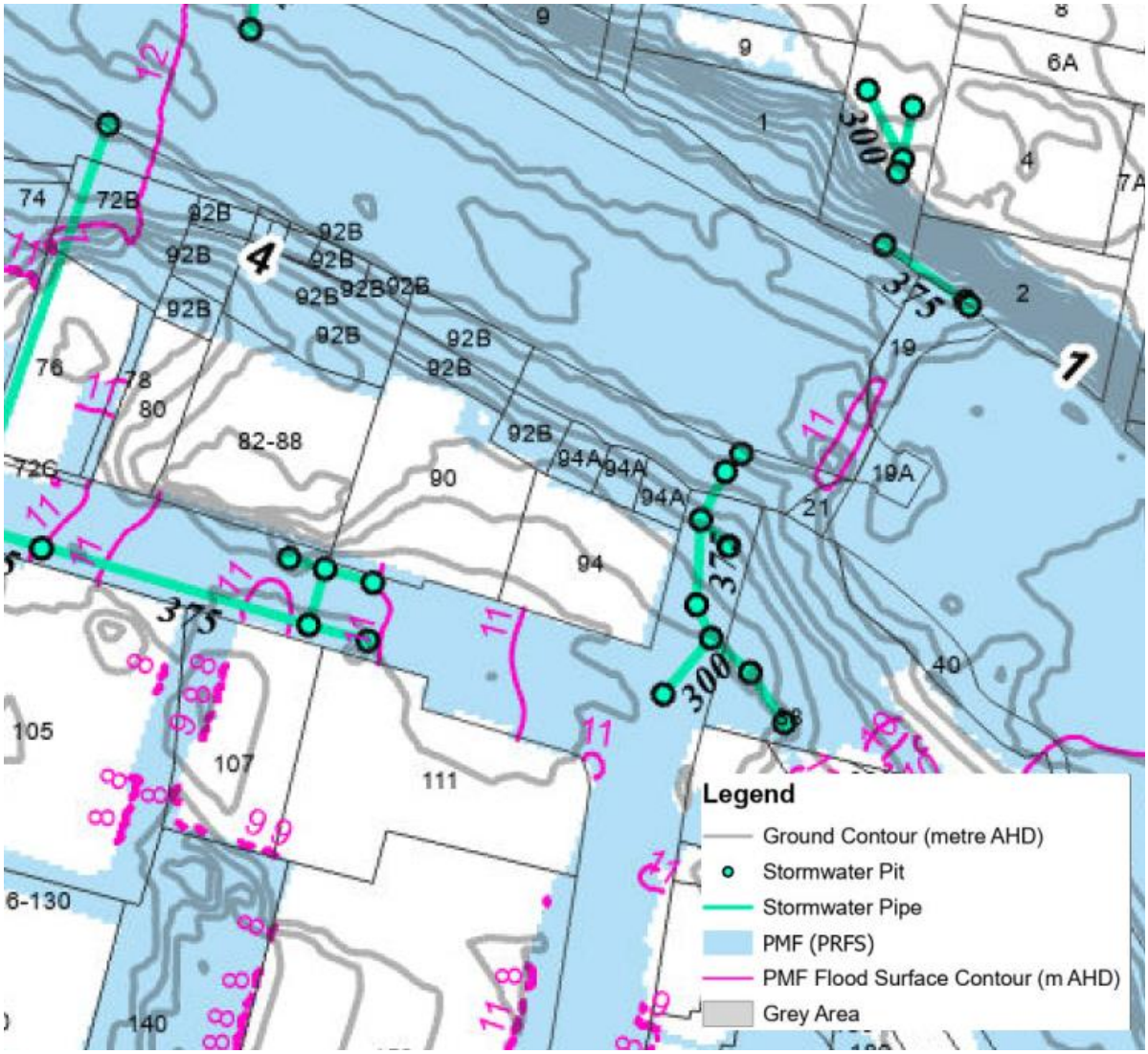

Figure 4 Flood levels (m AHD) in PMF event (Parramatta Council, 2024)

3 DEVELOPMENT FOOTPRINT

Mapping provided within the Flood Certificate indicates that the Phillip Street adjacent to the site is flood-free in the 1% AEP event.

According to the mapping, the PMF level is approximately 11.0m AHD at the eastern end of the site in the river and on Phillip Street south of the site. The flood certificate states that the PMF level for the site is 11.5m. As the PMF level rises to 12m AHD in the river upstream of the site, it is assumed that 11.5m is the PMF level in the river at the western end of the site.

As explained in Section 4 and Section 5 of this report, any development on the site must not create adverse flood impacts on neighbouring properties, Council is not in favour of buildings which have an undercroft area to accommodate flooding in events up to and including the 1% AEP flood nor extensive cut and fill within the flood planning area.

Satisfying these requirements at the subject site could be achieved by ensuring that the building footprint does not extend into the area below the 1% AEP flood level. Figure 5 shows an indicative building footprint for the building which does not require any development on land which is below the 1% AEP flood level. Although the basement car park would go below this level, it sits within an area which has a ground surface level above 5.3m AHD and therefore it would not have any impact on flooding below this level.

Given that the 1% AEP flood level is 5.3m AHD, the Flood Planning Level (FPL) is 5.8m AHD which is the 1% AEP plus 0.5m. As shown in Figure 5, a development on the site could be constructed which encroaches slightly within this area at ground level but a podium and tower could be constructed on land which is on land completely above this level.

The ground levels of the site were extracted from Geoscience Australia's ELVIS ground elevation database which, in Parramatta, has a 1m grid size and a 10cm vertical resolution.

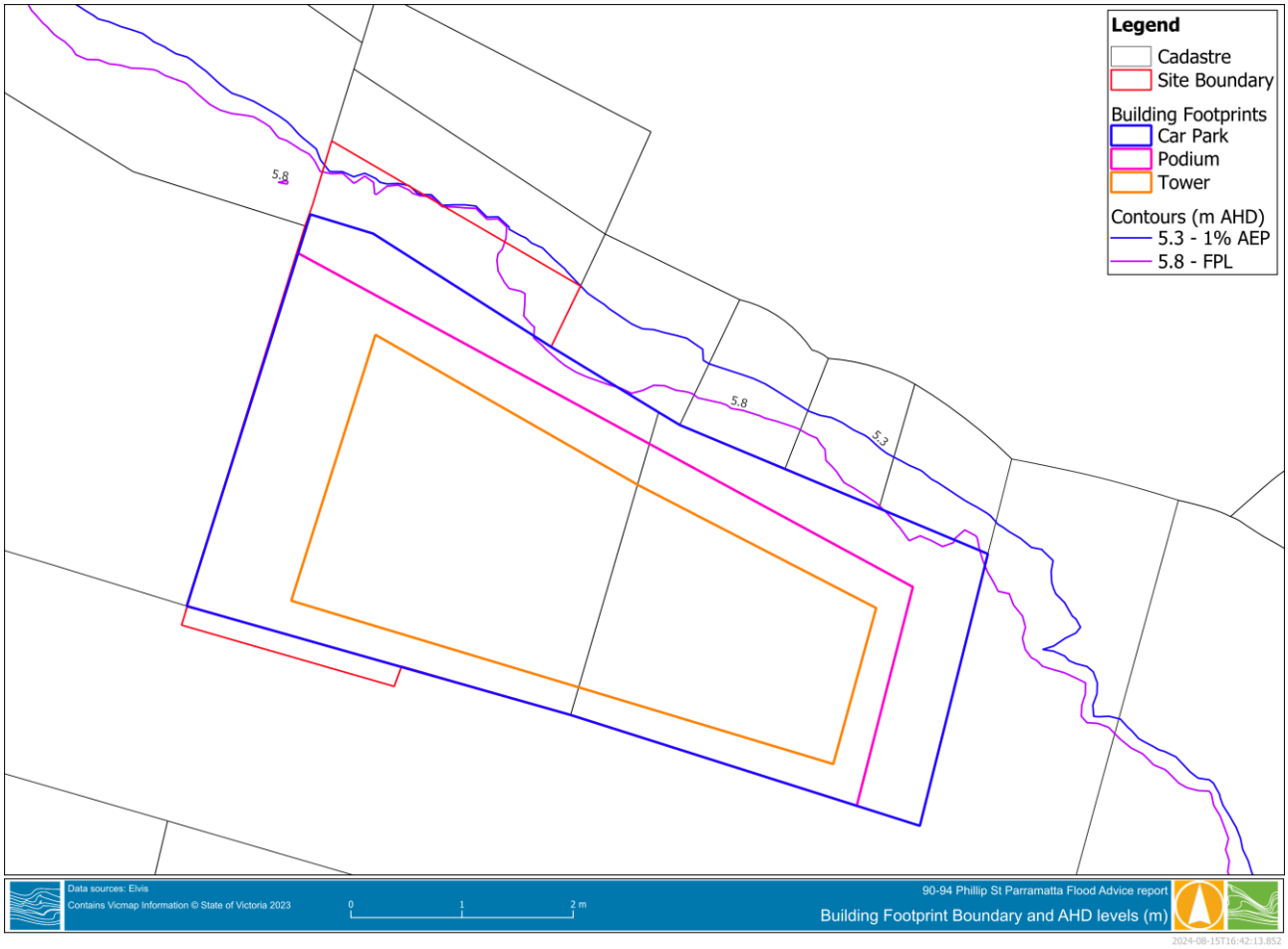

Figure 5 Proposed Indicative development footprint

4 LOCAL ENVIRONMENTAL PLAN PROVISIONS

This section discusses the Local Environmental Plan provisions that currently apply to this site including:

- Parramatta Local Environmental Plan (PLEP) 2023 Section 5.21
- PLEP 2023 Section 7.11

4.1 PLEP 2023 Section 5.21

Clause 1 of Section 5.21: Flood planning. sets out the following objectives:

(1) The objectives of this clause are as follows—

(a) to minimise the flood risk to life and property associated with the use of land,

(b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,

(c) to avoid adverse or cumulative impacts on flood behaviour and the environment

Clauses 2 and 3 of Section 5.21 set out the provisions which must be satisfied to meet the objectives in Clause 1. Table 3 sets out how these will need to be addressed by development at 90-94 Phillip Street.

Table 3: Development requirements to satisfy the Parramatta LEP 2011 Section 5.21 clauses.

Clause	Recommendations
(2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—	
(a) is compatible with the flood function and behaviour on the land, and	The flood planning area (FPL) is defined as the 1% AEP flood level plus 0.5m freeboard. According to the mapping in the Parramatta Flood Study (Stantec, 2024), overland flooding does not enter the site as the site adjacent Phillip Street is not flooded at 1% AEP and so development on the site would be compatible with the overland flow function. The northern boundary of the site would be marginally impacted by the 1% AEP riverine flooding with incremental affectation in larger floods. The entire site would be affected to a depth of more than 2m in the PMF (Figure 4 and 5). It is anticipated that when floodwater enters the site it functions as a floodway given its proximity to the river. The proposed development must demonstrate that it is compatible with the nature of flooding on the land through compliance with the specific requirements from the Paramatta DCP 2023, as outlined in Sections 4 of this report. The DCP indicates that Council considers mixed use developments to be compatible with the flood function of land between the 1% AEP and PMF levels provided development incorporates specific measures to manage flood risks.
(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and	Flood modelling has not been conducted to determine the impact of site development on flood behaviour. However, the site is not subject to flooding in the 1% AEP overland event based on the draft flood study and therefore the proposed development will not impact floodwaters in overland events up to and including the 1% AEP event. Anchor Estate must produce a flood engineer's report demonstrating that a proposed development will not increase flood affectation elsewhere. Council will expect that Council's new flood model will be used for this purpose. Given that the site likely functions as a floodway in large floods, any structures on the site have the potential to divert floodwaters onto neighbouring properties. By keeping the building envelop above the 1% AEP flood level, development on the site would have no impact on flood behaviour up to and including this event. While a building on the site would divert floodwaters in larger events, the fact that the site is already fully developed means that replacing these buildings with a building of a similar footprint is unlikely to have an incremental impact and therefore these provisions would be satisfied.

Clause	Recommendations
(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and	This is a standard clause in all LEPs in NSW. It has been demonstrated that vehicular or pedestrian evacuation from Parramatta CBD in extreme floods is neither practical nor safe because there is insufficient road capacity, the river and its tributaries can rise quickly and cut routes and there is nowhere for an evacuation centre in the CBD which could accommodate the number of people and vehicles which would need to evacuate an extreme event. The PLEP 2023 and PDCP 2023 therefore recognise that sheltering in place in buildings in Parramatta CBD is an acceptable emergency response providing those buildings have appropriate provisions to do so. Therefore, any development of this site will not exceed the evacuation capacity of existing evacuation routes. There are controls in PDCP 2023 which establish what council considers to be acceptable means of ensuring the safe occupation of a development and its efficient evacuation in the event of a flood. For example, pedestrian vertical evacuation is accepted as an evacuation strategy provided that adequately sized, functional, safe areas of refuge are available and accessible above the PMF level.
(d) incorporates appropriate measures to manage risk to life in the event of a flood, and	Again PDCP 2023 details what measures council considers as acceptable means of meeting this requirement. In addition to providing safe refuge above the PMF, basement levels, if any must be protected from the entry of (e.g. driveway crests) and must be protected up to the PMF by either passive or active measures (e.g. gates). The development must have a Flood Emergency Response Flood Plan prepared for the site to ensure flood risk is managed appropriately.
(e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	There is no riparian vegetation in the vicinity of the site. Any development would need demonstrate that it would not adversely impact on the stability of the riverbanks or create an area where sediment would accumulate.
(3) In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters—	
(a) the impact of the development on projected changes to flood behaviour as a result of climate change,	The 1% AEP flood level presented within the Parramatta Flood Model includes an allowance for climate change and as such as the development is to be above the FPL there should be no projected changes to flood behaviour as a result of climate change.

Clause	Recommendations
(b) the intended design and scale of buildings resulting from the development,	Development is envisaged to be a mixed-use high-rise building. PDCP 2023 planning controls suggest that Council considers this development type to be appropriate on a site such as this which predominantly sits between the 1% AEP and PMF levels.
(c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood,	The measures that PDCP 2023 requires in this regard are: ▪ adequately sized, functional, safe areas above the PMF level ▪ basement levels, if any, protected from floodwaters up to the PMF level. ▪ a Flood Emergency Response Plan for the site.
(d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.	The site is not subject to coastal erosion. It would not be possible to modify, relocate or remove a new building on the site as a flood response measure.

4.2 Parramatta Local Environmental Plan 2023 Section 7.11

PLEP 2023 provisions for Parramatta City Centre apply to this site and address flooding issues in Section 7.11: Floodplain Risk Management:

(1) The objective of this clause is to enable occupants of buildings in certain areas subject to floodplain risks to—

(a) shelter in a building above the probable maximum flood level, or

(b) evacuate safely to land above the probable maximum flood level.

(2) This clause applies to land identified on the Floodplain Risk Management Map.

(3) Development consent must not be granted to the erection of a building on land to which this clause applies unless the consent authority is satisfied the building—

(a) contains an area that is—

(i) located above the probable maximum flood level, and

(ii) connected to an emergency electricity and water supply, and

(iii) of sufficient size to provide refuge for all occupants of the building, including residents, workers and visitors, and

(b) has an emergency access point to land above the 1% annual exceedance probability event, and

(c) is able to withstand the forces of floodwaters, debris and buoyancy resulting from a probable maximum flood event.

(4) Subclause (3)(a) does not apply if there is pedestrian access located between the building and land above the probable maximum flood level.

(5) In this clause—

***annual exceedance probability** has the same meaning as in the Floodplain Development Manual.*

Floodplain Development Manual *has the same meaning as in clause 5.21.*

Floodplain Risk Management Map *means the Parramatta Local Environmental Plan 2011 Floodplain Risk Management Map.*

probable maximum flood *has the same meaning as in the Floodplain Development Manual.*

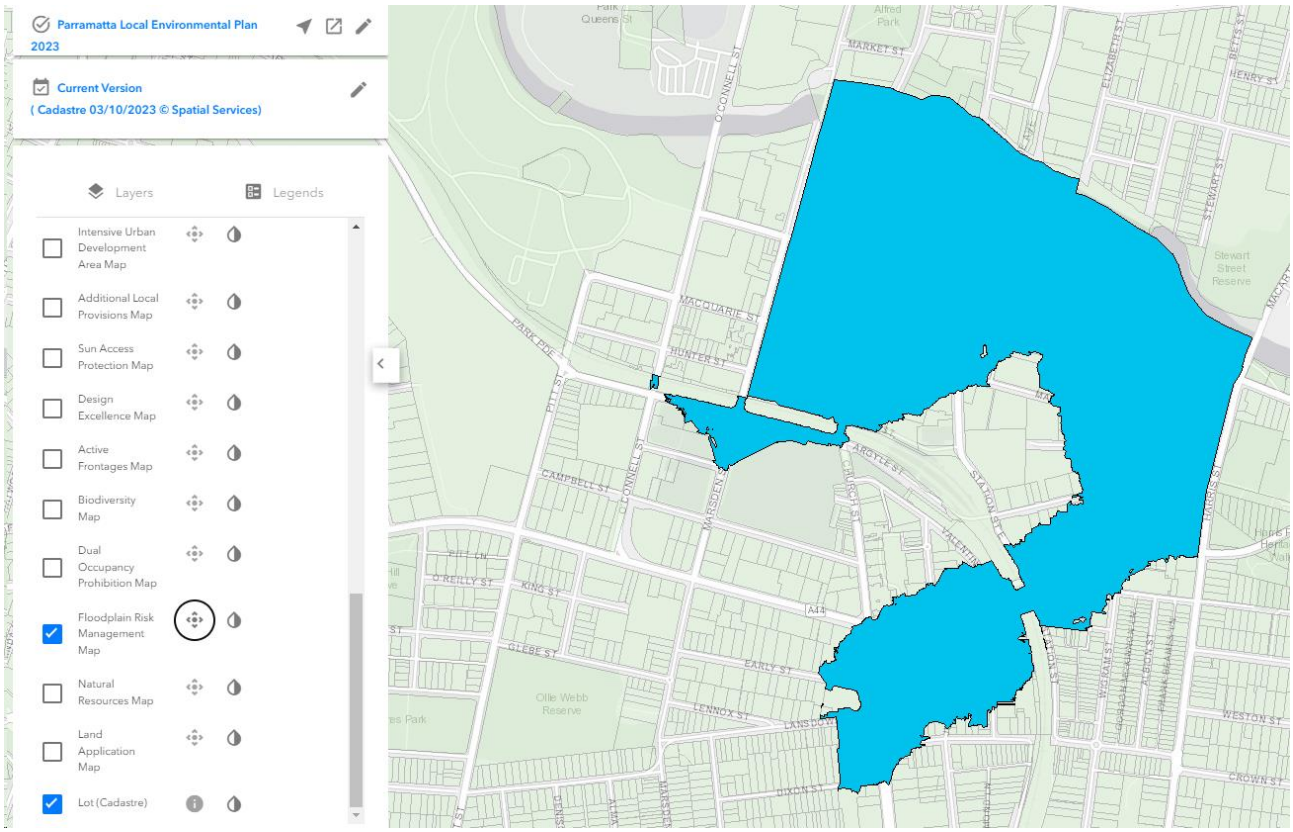

Figure 6 Floodplain Risk Management Map from PLEP website

The site is mapped within the Floodplain Risk Management Area on Council's Floodplain Risk Management Map (Figure 6). Therefore, the above provisions are applicable to the site. The proposed development must have the following:

- An adequate refuge above the PMF with the space and safety provisions to provide for all occupants with an emergency electricity and water supply;
- Have an emergency access point above the 1% AEP flood level; and
- Be able to withstand the forces of the PMF, including floodwaters, debris, and buoyancy.

The PDCP 2023 elaborates on the specific requirements to satisfy the above and these are detailed in Section 4 of this report. However, in relation to the planned development of the site and the sites features, it is noted that:

- the ground level on Phillip Street is above 8m AHD so the first floor of a commercial building on the site would likely be at or above the PMF level if conventional ceiling heights are provided. Therefore, it would not be difficult to provide refuge areas above the PMF level.

- the footpath along the Phillip Street frontage is flood free in the 1% AEP event (Figure 2) so providing an emergency access point above the 1% AEP flood level is achievable.
- a monolithic concrete mixed-use building should be able to be designed to withstand PMF forces although given its proximity to the river these could be significant. A structural engineer will need to sign off on the design and will need to have access to depth and velocity data from Council's flood model.

5 DEVELOPMENT CONTROL PLAN PROVISIONS

This section discusses the Development Control Plan provisions that currently apply to this site including:

1) Parramatta Development Control Plan (DCP) 2023 Section 9.7
2) Parramatta DCP 2023 Section 5.1.1

The Parramatta Development Control Plan 2023 addresses flooding issues in Sections "5.1.1 Flooding" and "9.7 Flood Risk Management". Where there is any inconsistency between these 2 sections, Section 9.7 prevails. As there is currently no specific development proposal for the site, the following discussion provides guidance on what implications these controls would have for design decisions regarding a future development proposal and whether it would be possible to comply with the requirements.

5.1 Parramatta Development Control Plan 2023 Section 9.7

Section 9.7 of the DCP 2023 identifies the site as part of the Floodplain Risk Management area to which this section applies.

Flood Risk Management (Section 9.7)

The following controls apply to this site:

> *C.01 Flood Hazard Modelling and hazard, risk and safety assessments for all development involving the construction of a new building or significant alterations to an existing building, and or intensification of a use is to address the PMF and floods greater than the 1% Annual Exceedance Probability (AEP) as part of the Development Application (DA), particularly where there is a potential risk to life.*
>
> *C.02 Where this information is available, Council requires an Applicant to make a Flood Information Enquiry. The information supplied to an applicant via a Flood Information Enquiry will form the basis of the DA flood assessment.*
>
> *C.03 In some cases, Council may require an applicant to prepare an additional flood study, for example for special local conditions, or if the proposed development is of a form or type that requires more site-specific flood modelling. Where Council requires an applicant to submit an additional flood study, the applicant must use parameters provided by Council to prepare the flood study.*

As the proposed development involves construction of a new building, Control 1 requires flood hazard modelling and hazard, risk and safety assessments to be undertaken for the 1% AEP flood and events up to and including the PMF. Site-specific modelling has not been prepared for the proposed development because it is only a planning proposal at this stage. However, Council's flood enquiry information, based on Council's adopted flood modelling, provides sufficient flood information on the 1% AEP and PMF floods to inform the flood hazard, risk and safety assessment. The information provided by Council's adopted flood modelling is sufficient to identify likely flood hazard. A Flood Emergency Response Plan (FERP) can be produced at DA stage that will include the assessment of the flood hazard, risk and safety of the proposed development. **Can comply.**

Control 2 requires the Applicant to make a Flood Information Enquiry. This enquiry has been made for the site and the flood enquiry information received, issued 30 August 2024 (Attachment 1). **Complies.**

Council may require an additional flood study be prepared, which Control 3 states must be prepared using parameters provided by Council. If Council requires an additional flood study, one will be prepared. **Can comply.**

5.1.1 Assessment and Minimisation of Flood Hazards, Risks and Potential for Harm (Section 9.7.1)

Control 1 of Section 9.7.1 of the DCP 2023 expands on the required flood hazard modelling, specifying that the modelling for the 1% AEP and PMF events must use the following General Flood Hazard Vulnerability Curves and hazard categories (Figure 5-1):

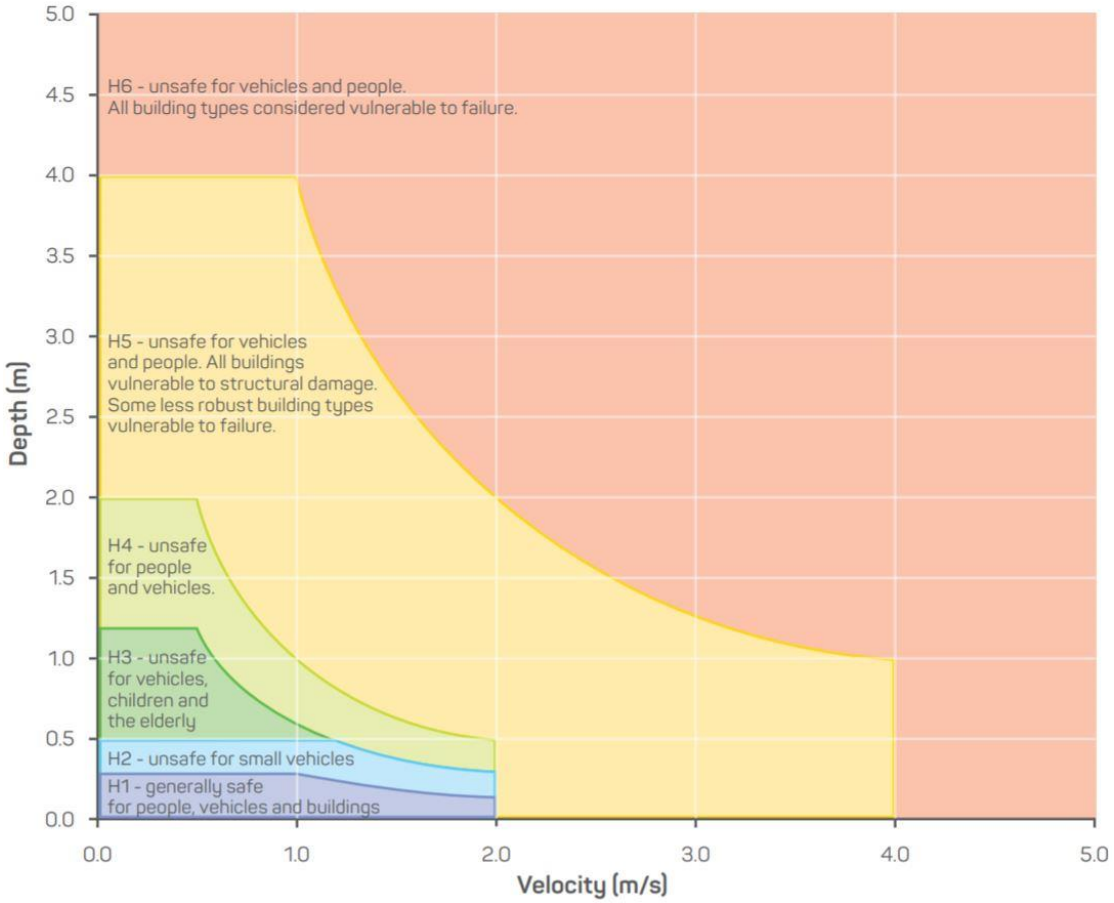

Figure 5-1: General flood hazard vulnerability curves

Site-specific modelling has not been prepared for the proposed development given that Council's flood enquiry information, based on Council's adopted flood modelling, provides sufficient flood information on the 1% AEP and PMF floods to inform the flood hazard, risk and safety assessment. The information provided by Council includes hydraulic hazard based on these general flood hazard vulnerability curves (Figure 5-1). A FERP will be produced at DA stage that will include a hazard assessment to assess flood hazards in the terms of the General Flood Hazard Vulnerability Curves required by Council (Figure 5-1). **Can comply.**

Control 2 states:

> *C.02 All development involving the construction of a new building or significant alterations to an existing building, and or intensification of a use is to be supported by a merit-based flood hazard and risk assessment that:*
>
> > *a) Presents evidence-based analysis of the hazard, risk and harm to occupants and those in the surrounds and demonstrates how harmful factors will be mitigated.*
> >
> > *b) Includes information on the following aspects as necessary, to enable Council to assess risk and potential for harm.*
> >
> > > *• 1% AEP and 5% AEP and PMF flood levels, flood extents, flow rates, depths and velocities and hazard conditions for mainstream and overland flow floods,*
> > >
> > > *• Modelled hydraulic hazard levels, (H1-H6), extent and behaviour for 1% AEP mainstream and overland flow floods,*
> > >
> > > *• Warning times and duration of flooding,*
> > >
> > > *• Available warning systems (if any),*
> > >
> > > *• Characteristics and vulnerabilities of future occupants*
> > >
> > > *• Likelihood of multiple storms – and multiple flood peaks,*
> > >
> > > *• 'horizontal' evacuation pathways including accessibility considerations*
> > >
> > > *• 'vertical' evacuation opportunities and shelter in place facilities above the PMF*
> > >
> > > *• Emergency services access availability,*
> > >
> > > *• Local terrain,*
> > >
> > > *• The development in context, and*
> > >
> > > *• The proposed use and occupation of the development.*

This report provides information on the 5% AEP and 1% AEP flood levels, flood extents, flood depths and hydraulic hazard for overland and riverine flooding as necessary and for the riverine PMF.

A detailed FERP will be produced at DA stage that references the flood hazard and risk assessment analysis of the flood risk to life of the proposed development and details flood risk management measures that are implemented to mitigate flood risk. It would also discuss evacuation strategies to implement for the proposed development. **Can Comply**

5.1.2 Land Uses and Building Levels (Section 9.7.2)

The following controls apply to the site:

> *C.01 To achieve a safe environment for occupants within a building, residential habitable rooms must be set at or above the Flood Planning Level (FPL), which is the adjacent 1% AEP flood level plus a 500mm freeboard safety factor.*
>
> *C.02 The following uses within a building will not be supported below the FPL:*
>
> > *a) Residential habitable rooms or uses, including those relying on flood gates, flood doors, barriers, crests, walls, windows or other physical barriers to exclude floodwaters up to the FPL.*
> >
> > *b) Gathering places such as places of worship and classrooms.*
> >
> > *c) Uses such as child care centres, aged care facilities*
> >
> > *d) Storage of valuable items including important records, archives and office files.*
>
> *C.03 Indoor, non-habitable floor space and corresponding uses may be permitted below the FPL, subject to a satisfactory flood hazard and risk assessment and appropriate flood mitigation measures. Such uses may include:*

a) Basement car parking and bicycle storage, with floodwaters excluded up to the PMF, subject to compliance with the controls in Section 6.7.8 Car Park Basements in Flood Prone Areas.

b) Plant and equipment, pumps, generators, batteries (all flood proofed as necessary if relied upon for shelter in place purpose).

c) Tanks, for water supplies, sewage holding, on site Detention, WSUD, liquid fuel, gas (all flood proofed as necessary relied upon for shelter in place purpose).

d) Loading docks, solid waste facilities, garbage and recycling transfer.

e) Short stay parking, taxis, deliveries, couriers etc

f) Storage and warehousing of 'non-valuable items' will be assessed on merit.

C.04 Outdoor uses below the FPL may be permitted provided the design is flood risk responsive and will not unreasonably expose patrons to harm from high hazard conditions (Hazard Level H3 or greater). Development Applications for outdoor uses below the FPL must be supported by an effective Flood Emergency Response Plan and may include:

- *Outdoor cafes, restaurants, bars*
- *kiosks,*
- *clubs,*
- *display areas,*
- *outdoor stages, cinemas and theatres.*

C.05 Commercial and retail development at street level that is below the FPL within a building that occupies land subject to flooding in a PMF event may be permitted if:

a) a satisfactory flood hazard and risk assessment is undertaken, and appropriate flood mitigation measures are incorporated accordingly, and

b) the development is designed to minimise damage to property and risk to life, and

c)) the development is not subject to or surrounded by high hazard flooding in the 1% AEP event, unless there is a flood free pedestrian access to a building (which could be another part of the same building) which is outside of the high flood risk precinct, and

d) any storage of goods below the FPL is only permitted where they are protected from floods up to the FPL.

C.06 Commercial and retail development within a basement below the FPL is, in general, not permitted within a building that occupies land subject to flooding in a PMF event.

C.07 Notwithstanding C.06, Council may at its discretion permit some types of commercial and retail development within a basement of a building below the FPL that occupies land subject to flooding in a PMF event if:

a) a satisfactory flood hazard and risk assessment is undertaken and appropriate flood mitigation measures are incorporated, and

b) occupants and visitors will not be subject to significant risk of harm caused by flooding at or near the site in a PMF event should any of the active flood barriers fail, and

c) the basement is capable of withstanding riverine and overland flow PMF forces including the weight of floodwaters potentially ponding in the basement should any of the active flood barriers fail, and

d) at least one access point from the basement to the shelter in place refuge is protected against a riverine PMF using passive, fail-proof barriers, and

e) the Flood Emergency Response Plan:

i. includes the information detailed in Control C.02 in Section 6.7.4 Flood Warning and Emergency Response Planning, and

ii. enables occupants and visitors of the development including those in the basement levels, to have direct flood-free access from the basement to the Shelter in place within the building that is above the PMF, and

iii. includes details of any physical flood exclusion measures in the development including procedures and practices for their operation, inspection and maintenance in perpetuity, and

f) building access and egress does not require people to traverse hazardous floodwaters – that is Hazard Level H3 and above in the PMF, and

g) any storage of goods below the FPL is only permitted where they are protected from floods up to the FPL.

Controls 1 and 2 pertain to residential developments within flood affected areas, Residential uses are proposed within the development, however, these are to be located outside of the flood impacted area, and above the FPL. **Complies**

Control 3 permits car parking, plant and equipment and storage below the FPL subject to a flood hazard and risk assessment as well as flood mitigation measures. There may be basement carparking within the development and other ancillary uses as permitted by Control 3. **Can comply.**

No outdoor uses are proposed below the FPL so Control 4 does not apply. **Complies.**

Control 5 relates to commercial development proposed at street level below the FPL. The FPL is 5.8 m AHD but street level is 8m AHD. All development other than basement parking is to be above the FPL; therefore, it complies. **Complies.**

Control 6 makes it clear that commercial or retail development in a basement below the FPL on land subject to PMF flooding is strongly discouraged. **Can comply.**

5.2 Section 5.1.1 Flooding

Section 5.1.1 Flooding of Parramatta Development Control Plan (PDCP) 2023 sets out 33 controls for flood risk management that apply to this site. It groups these under two headings:

- Floodplain Risk Management
- Flood Warning and Emergency Response Planning

The following sections discuss these in general terms. Section 6.7 of the DCP 2011 came into effect on 2 December 2022 and identifies the site as part of the Floodplain Risk Management area to which this section applies.

Under the heading of Floodplain Risk Management PDCP 2023 lists 15 objectives and 24 planning controls while there is one objective and 9 controls under Flood Warning and Emergency Response. Many of the latter controls are simply verbatim reiterations of the earlier controls.

With regard to planning control 24 (C24), it sets out a matrix approach to development control and under this provision alone a particular type of development below a particular flood level could have up to 15 specific design or operational controls applying to it. There is some overlap between the development controls called up by C24 and the other controls, so the following discussion groups the controls according to their design implications.

5.2.1 Land use Categories and Flood Risk Precincts

Regarding the matrix under C24 the applicable development controls within the matrix are based on the Land Use Category Definitions table (Table 5.1.1.1), the envisaged redevelopment with both residential apartments and commercial/retail spaces in the podium level falls under “Commercial or Industrial”, which includes retail premises, office premises and mixed-use developments. The same development controls would apply if the development fell under “Residential” land use.

However, were any of the commercial areas of the building proposed to be used for early education and care facilities, hospitals, residential care facilities, educational establishments, or emergency services facilities or if the residential tower were used for seniors housing, then the land use category would be Sensitive Uses and Facilities. According to Table 5.1.1.2 under C24, none of these uses are suitable at a site such as this where it can flood in a PMF, and this is reinforced by C16. Note that the DCP is unable to prohibit these uses (only an LEP can do that) and C17 suggests that in some circumstances centre-based childcare and aged care facilities may be approved. However, one of the requirements is that building occupants would not have to traverse hazardous floodwaters in any flood between the 1% AEP and the PMF. That would not be the case at this site and so it would be extremely difficult to get approval for such uses at the site.

Figure 7 shows that the site is mostly within the Low Flood Risk Precinct with small sections of the northern part of 90 Phillip Street being within the Medium and High Flood Risk precincts. The boundaries of these precincts are likely to be updated when Council adopts the new flood model results. However, if the development footprint is kept above the 1% AEP flood level, then the development should remain within the Low Flood Risk Precinct. The following discussion therefore assumes that the future use of the site would be for Mixed Use development in the Low Flood Risk Precinct and discusses the applicable planning controls from C24 for such development.

Figure 7 Flood risk precinct for 90-94 Phillip Street, Parramatta (*Source*: FloodSmart Parramatta)

5.2.2 Consistency with Other Plans

C01 simply requires that development is compatible with any relevant Floodplain Risk Management Plan. C32 is a repeat of this control as is the evacuation provisions of C24. As the Upper Parramatta River Floodplain Risk Management Plan was updated to accommodate the updates to the Parramatta LEP and DCP, any development which meets the requirements of the LEP and DCP will be compatible with the Upper Parramatta River Floodplain Risk Management Plan.

5.2.3 Risk to Life Management

C02 requires that risk to life be mitigated to Council's satisfaction and C33 is a repeat of this control. What would satisfy council is indicated by the following conditions:

- C07 – must have reliable access to a flood free location.
- C19 – must use a merit-based flood hazard and flood impact risk assessment that considers risks to occupants.
- C24 – must have reliable access for pedestrians required from the site to an area of refuge (including shelter in place) above the PMF level, on site (e.g. second storey) or off site and must be consistent with any relevant flood emergency response plan, flood risk management plan or similar plan.
- C28 – where shelter on site is required and permissible by C24 occupants must be able to stay there for the duration of the flood and any subsequent disruption.
- C29 - sets out the details of what the shelter must provide.
- C31 – sets out the details of accessibility to the shelter.

Condition C07 and C24 can be satisfied by having access for occupants of the basement and ground floor to the first floor or above and for occupants of the upper floors to remain where they are. This is consistent with the Upper Parramatta River Floodplain Risk Management Plan which supports sheltering in place although not necessarily with the NSW SES Local Flood Plan which advocates off site evacuation as its preferred response strategy. This means that a planning proposal to increase density at the site may be opposed by NSW SES. It is noted that condition C27 states that horizontal evacuation measures are preferred but only where certain conditions can be met. One of those is that there is an exit from the building above the PMF level. That cannot be met at 90-94 Phillip Street.

C29 sets out the following requirements for on-site shelter:

a) Refuge shelters must be adequate and fit for purpose (size, design, equipment, supplies) and maintained as such in perpetuity.

b) Unless otherwise advised by Council, facilities must be designed for a refuge stay of at least 72 hours, with longer time periods addressed in design, equipment, and provisioning.

c) It is recommended, and may in some cases be required, that large and high-rise residential buildings be provided with emergency back-up power, water supply and sewerage for all residential units and common facilities including lifts. This must be provided in the context of an overarching Emergency Response Plan that includes flooding, power outages, extreme weather events and other incidents.

d) Where the building design and back-up systems enable some residents to safely remain in their own apartments for extended periods during floods, all such residents must still have access to a communal refuge area of adequate size where support from other residents and emergency supplies are available.

e) The communal safe area of refuge must be permanently provided with as a minimum:

  • emergency electricity supply, and lighting,

  • clean water for drinking, washing and toilet flushing,

  • working bathroom and toilets,

  • suitable food,

  • personal washing facilities,

• medical equipment including a first aid kit,

• a battery-powered radio and relevant communications equipment, and

• a comfortable, safe, indoor, sheltered environment (corridors, lobbies, balconies, alfresco areas, car parks etc are not acceptable).

C30 sets out the following accessibility requirements for all safe areas of refuge (residents own apartment or a communal area):

a) fail safe access to the safe area of refuge from anywhere in the building including the basement (lift access is not allowed) that is protected from floodwaters up to the PMF by suitable flood doors, flood gates and the like; and

b) fail safe access to an exit/entry point located above the 1% AEP flood level plus 0.5m freeboard that enables people to exit the building during a fire and/or flood and allows emergency service personnel to enter a building to attend to a medical emergency.

5.2.4 Building Design Parameters

The FPL must be set at a 1% AEP level at any location plus a 500mm freeboard (C03, C24) unless specified for additional freeboard by Council to manage any exceptional circumstances. It shall be based on the higher of the 1% AEP riverine flood level or the 1% AEP overland flow flood level, as accepted by Council. The presented mapping that shows that the site is not affected by 1% AEP overland flooding so the minimum habitable floor levels of the site will be based on the 1% AEP riverine flood level. The presented riverine flood level is 5.3m AHD. As the ground level in Phillip Street is above 8m AHD it may be possible to have a habitable floor level below the Phillip Street ground level. All building components below the FPL will need to be of flood compatible materials (C24).

Significant filling or excavation below the FPL is generally not permitted (C04) so the footprints marked in Figure 5 should be related to the FPL rather than the 1% AEP flood level. They show that the car park footprint only marginally encroaches on land which is below the FPL and there is a significant area of land at the western end of the property which is not proposed to be developed where any small amount of compensatory cut could be balanced out. C15 states that, *"In general, Council will not support proposals for flood flow-through or flood storage chambers within or beneath a new building, and alternate design solutions will be required."* Which would make it challenging to get approval at this site for any building which cantilevered beyond the FPL contour, however, as shown in Figure 5, that should not be necessary on this site.

C12 requires that design responses to mitigate flood impacts should not have significant negative impacts on local amenity such as overshadowing or incompatibility with the streetscape. This should not be an issue for redevelopment of this site.

5.2.5 Flood Modelling

As redevelopment of the site would involve the construction of a new building, the applicant must make a Flood Information Enquiry to the Council to receive any flood relevant information for the site (C08). Council may require an additional flood study be prepared, which Control 09 states must be prepared using parameters provided by Council and account for climate change. It is likely that Council will require the impacts of proposed development of the site to be modelled using Council's new TUFLOW model. Development must be planned and design to respond to both riverine and overland flooding (C13). Council may also require an overland flood study where it is likely to dominate the riverine flooding (C10). Council's published flood maps suggest there is no overland flooding near the site so this may not be necessary.

The modelling will need to demonstrate that the development will not increase flood affectation elsewhere (C14, C24). This would need to take into consideration:

(i) loss of flood storage.

(ii) changes in flood levels, and velocities caused by changes to flood flows; and

(iii) the cumulate impact of multiple potential developments in the vicinity

The Council adopted model would be adequate for this analysis.

If future development has a similar footprint to the existing development on site, then this requirement should be able to be met. If the footprint is to be increased, then compensatory cut may be required but C14 suggests that this should not be "significant" below the FPL. Figure 5 suggests that the site can be developed without the need for significant cut to compensate for development below the flood planning level.

C06 makes it clear that the impacts of fencing and landscaping must be included in the modelling.

C18 expands on the required flood modelling, specifying that the modelling must include flood hazard modelling.

The modelling must then be used to prepare a merit-based flood hazard and flood impact risk assessment C19.

5.2.6 Car Parking

C20 states

> *"Council strongly discourages basement car parks on properties within the floodplain. Where site conditions require a basement car park on a property within the floodplain, development applications must provide a detailed hydraulic flood study and design demonstrating that the proposed basement car park has been protected from all flooding up to and including the PMF event. An adequate emergency response and evacuation plan must also be provided where basement car parks are proposed in the floodplain…"*

If the development proposal includes a basement car park, necessary detailed hydraulic modelling study with mitigation options such as flood gates (up to and including PMF event) must be presented to demonstrate the protection of the car parking area.

Controls 21, 22 and 23 set out the requirements that basement car parking must satisfy when it is proposed. This includes:

- a driveway to a street which will not have high hazard flooding in a 1% AEP flood. Council's mapping suggests that Phillip Street would meet this requirement.
- protection from the ingress of floodwater by passive measures at least up to the flood planning level. These measures are likely to include provision of a driveway crest at or above the flood planning level with associated wing/or bund walls to this level to prevent floodwaters flowing into the basement. As the FPL is 5.8m AHD a driveway entry at Phillip Street (about 8m AHD) would satisfy this requirement
- protection from the ingress of floodwater via the driveway up to the PMF level. These measures are likely to include provision of a self- triggering and self-powered flood gate at or near the driveway crest that reaches the level of the PMF. Such a gate would need to be up to 3.5m high depending on the driveway crest level.

- protection from the ingress of floodwater via stairwells and other openings up to the Probable Maximum Flood level. These measures are likely to include a combination of a self-closing flood doors, flood gates and bund walls. Flood doors may also be fire doors
- provision of flood-free escape stairs from the basement up to a place of refuge within the building above the PMF level with adequate facilities for users during and after a flood. In other words, a set of fire stairs between the basement and the first floor which has no entry on the ground floor.
- adequate car parking for the disabled and an escape path that can be followed to safety.

The above measures must be supported by a Flood Emergency Response Plan and a Building Management System and Plan which provides for the maintenance, testing and operation of the flood protection measures. All of these can be achieved on this site.

In addition, under C24 car parking and driveway access need to address the controls 1, 3, 5 and 6 within the Table 5.1.1.3 Floodplain Matrix Planning and Development Controls which are:

> *1, The minimum surface level of unenclosed parking spaces or carports shall be as high as practical, but no lower than 0.1 metres below the 1% AEP (100-year ARI) flood level. In the case of garages and other enclosed parking areas for less than 3 motor vehicles, the minimum surface level shall be as high as practical, but no lower than the 1% AEP (100-year ARI) flood level, plus 0.15 metres freeboard.* This provides the option of having unenclosed parking under the building as low as 5.2m AHD and may be a way of avoiding the onerous controls on basement parking.
>
> *3, Garages, and other enclosed car parking areas, capable of accommodating more than 3 motor vehicles, must be protected from inundation by floods equal to or greater than the 1% AEP (100-year ARI) flood. Ramp levels to be no lower than 0.5m above the 100-year ARI flood level. Where below ground car parking is proposed additional measures must achieve protection up to the PMF.* This is covered in detail by C21-23.
>
> *5. Unless otherwise approved by Council and provided this does not obstruct or displace floodwaters, the level of the driveway providing access between the road and parking spaces shall be no lower than 0.2 metres below the 1% AEP (100-year ARI) flood level.* Phillip Street is above the 1% AEP flood level.
>
> *6. Enclosed car parking, and car parking areas accommodating more than 3 motor vehicles, with a floor below the 1% AEP (100-year ARI) flood level, shall have adequate warning systems, signage, exits and evacuation routes. Refer to Flood Warning and emergency Response Planning section for requirements.* This is an additional requirement not covered by C21-C23 but can easily be achieved.

5.2.7 Emergency Planning

C25 states that, *"If required by Council all development in the floodplain involving the construction of a new building or significant alterations to an existing building, and or intensification of a use must be supported by a FERP"*. A FERP is a Flood Emergency Response Plan and according to C26 must include:

- Warning and evacuation measures
- Measures to prevent evacuation from the site by private vehicle.
- The most appropriate emergency response for flood and fire events that occur together.
- A FERP drill which is tested at least annually.

A FERP for the site can be prepared to ensure that the development complies.

6 MINISTERIAL DIRECTIONS

The most recent Ministerial Direction issued under Section 9.1 of the Environmental Planning and Assessment Act, 1979, includes 4.1 Flooding which states:

(1) A planning proposal must include provisions that give effect to and are consistent with: (a) the NSW Flood Prone Land Policy, (b) the principles of the Floodplain Development Manual 2005, (c) the Considering flooding in land use planning guideline 2021, and (d) any adopted flood study and/or floodplain risk management plan prepared in accordance with the principles of the Floodplain Development Manual 2005 and adopted by the relevant council.

As demonstrated in Sections 4 and 5 of this report, development under the planning proposal can be consistent with the flood provisions of both the Parramatta LEP, 2023 and the Parramatta DCP, 2023. These were both developed with regard to the NSW Flood Prone Land Policy, including the updating of floodplain risk management plans for the Parramatta CBD following the principles of the Floodplain Development Manual 2005.

(2) A planning proposal must not rezone land within the flood planning area from Recreation, Rural, Special Purpose or Conservation Zones to a Residential, Employment, Mixed Use, W4 Working Waterfront or Special Purpose Zones.

Such a rezoning is not proposed for this site.

(3) A planning proposal must not contain provisions that apply to the flood planning area which:

(a) permit development in floodway areas,

(b) permit development that will result in significant flood impacts to other properties,

(c) permit development for the purposes of residential accommodation in high hazard areas,

(d) permit a significant increase in the development and/or dwelling density of that land,

(e) permit development for the purpose of centre-based childcare facilities, hostels, boarding houses, group homes, hospitals, residential care facilities, respite day care centres and seniors housing in areas where the occupants of the development cannot effectively evacuate,

(f) permit development to be carried out without development consent except for the purposes of exempt development or agriculture. Dams, drainage canals, levees, still require development consent,

(g) are likely to result in a significantly increased requirement for government spending on emergency management services, flood mitigation and emergency response measures, which can include but are not limited to the provision of road infrastructure, flood mitigation infrastructure and utilities, or

(h) permit hazardous industries or hazardous storage establishments where hazardous materials cannot be effectively contained during the occurrence of a flood event.

The planning proposal applies to the entire site and part of the site is within the flood planning area. However, the planning proposal is to permit increased height and floor space ratios on the site but not to alter any of the other planning controls, including flood related planning controls which apply to the site.

With regard to the aforementioned items (a) to (h), the planning would not be permitting any of these items other than item (d).

In the case of (d) the planning proposal is permitting a significant increase in the development density of the land. However, as can be seen from Figure 5 it is possible to develop the site without significantly encroaching

into the flood planning area and that encroachment would be for car parking. Furthermore, the planning proposal would not remove the flood related development controls which prevent significant adverse impacts from development within the flood planning area. Therefore, the inconsistency is of a minor nature and would be permissible in accordance with provision 5(d) as discussed below.

(4) A planning proposal must not contain provisions that apply to areas between the flood planning area and probable maximum flood to which Special Flood Considerations apply which: ….

Parramatta LEP 2023 does not adopt clause 5.22 Special Flood Considerations so this provision does not apply.

(5) For the purposes of preparing a planning proposal, the flood planning area must be consistent with the principles of the Floodplain Development Manual 2005 or as otherwise determined by a Floodplain Risk Management Study or Plan adopted by the relevant council.

In the Parramatta LGA the flood planning area is the area below the 1% AEP flood plus 0.5m freeboard. This is consistent with the principles of the Floodplain Development Manual 2005.

Consistency

A planning proposal may be inconsistent with this direction only if the planning proposal authority can satisfy the Planning Secretary (or their nominee) that:

(a) the planning proposal is in accordance with a floodplain risk management study or plan adopted by the relevant council in accordance with the principles and guidelines of the Floodplain Development Manual 2005, or

(b) where there is no council adopted floodplain risk management study or plan, the planning proposal is consistent with the flood study adopted by the council prepared in accordance with the principles of the Floodplain Development Manual 2005 or

(c) the planning proposal is supported by a flood and risk impact assessment accepted by the relevant planning authority and is prepared in accordance with the principles of the Floodplain Development Manual 2005 and consistent with the relevant planning authorities' requirements, or

(d) the provisions of the planning proposal that are inconsistent are of minor significance as determined by the relevant planning authority.

As previously discussed in relation to provision 3(d), the provisions of the planning proposal which are inconsistent with 3(d) are of minor significance and so the planning proposal satisfies the requirements of (5)(d).

7 CONCLUSION

This letter has set out the flood management considerations for 90-94 Phillip Street based on the current LEPs and DCP applicable to the site and with reference to its consistency with the requirements of Ministerial Direction 4.1 Flooding.

Flood information on site was determined from the 2024 Parramatta River Flood Study. The 1% AEP event is shown to have a flood level of 5.3m AHD while the PMF flood level is shown to have a flood level of 11.5m AHD. The flood planning level is 5.8m AHD. As such it would appear that a mixed-use development on that part of the site outside of the flood planning area would be compatible with the flood risk and is permitted by the LEP and deemed suitable by the DCP. It would be possible for the site to be developed to meet all of the existing flood related development controls which apply to the site.

The flood planning level for the site is below the Phillip Street level of about 8m AHD. This means that it may be possible to have habitable uses on a floor level below Phillip Street. It also means that if there is parking below Phillip Street but no more than 0.6m below the FPL and it is not enclosed, then it does not need to be protected from the ingress of floodwaters.

Otherwise, enclosed basement carparking may need flood gates up to 3.5m high on the Phillip Street driveway crest. It would also be necessary to have measures to prevent the ingress of PMF flooding into the enclosed basement via stairwells, lift wells and other floor penetrations. An emergency access from the basement to the first floor would be required which does not have an exit at ground level.

It would need to be demonstrated through flood modelling, using Council's new flood model, that redevelopment of the site would not increase flooding on neighbouring properties. If the building has no bigger footprint than the existing building this should be able to be demonstrated.

Evacuation of the site in a flood would not be practical but sheltering in place is permitted by the LEP and supported by the DCP. Any mixed-use development on the site will need to have areas of safe refuge above the PMF level which should be able to be provided on the first floor level and above. Some of that space needs to be accessible and usable by occupants of the basement and ground floor. It will be necessary to provide adequate food and first aid to those sheltering in the building and 72 hours of emergency power and water are stipulated by the DCP. A Flood Emergency Response Plan would be required for the building's operation.

The planning proposal is consistent with all of the provisions of Ministerial Direction 4.1 Flooding with the exception of 3(d) which requires that a planning proposal does not permit and increase in development density within the flood planning area. As demonstrated in this report, other development controls which will be retained would prevent inappropriate development within the flood planning area on the site and the small encroachment into the flood planning area is of a minor nature and would be permissible under provision 5(d) of the Ministerial Direction.

In conclusion, the site has favourable flood planning conditions and the proposal currently complies with majority of the LEP, DCP and Ministerial Direction conditions. This is despite its location and proximity to the Parramatta River. Furthermore, this report indicates that the site is capable of responsibly responding to the flood features, with the current planning controls permitting a mixed-use tower. This planning proposal is simply seeking to the increase the height of the building over its established base.