NOVUS

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1 March 2024

Attention: Callum Firth, Senior Planning Officer
Office of the Independent Planning Commission
Suite 15.02, Level 15, 135 King Street
Sydney NSW 2001

Dear Callum,

Re: Novus Build-to-Rent – 39-43 Hassall Street, Parramatta Request for Information

Novus (**Proponent**) has carefully considered the questions provided by the Independent Planning Commission (**IPC**).

With some modifications, we accept several of the suggested conditions regarding flood gates, the Flood Emergency Response Plan (**FERP**), and imposing as a condition of consent the RL of the connection to land at 6.20m AHD. Due to the conservative assumptions used in the site-specific flood modeling, comprehensive and compliant flood mitigation measures and a robust FERP which will be carried out by the on-site Build-to-Rent operations team, there is adequate protection to life and the property from flood impacts including taking into consideration climate change.

Accompanying this response are the following attachments:

- *Attachment 1:* Detailed Response to the IPC's Request for Information
- *Attachment 2:* Flood Certificate
- *Attachment 3:* Legal Advice

As detailed below, the following suggestions made by the IPC's Independent Peer Reviewer are not practicable or reasonable to be adopted:

- Adopting a greater flow rate for design; or
- Adopting flood behaviour resulting from a potential 15% blockage of the Harris Street bridge in combination with the potential impacts of future climate change as the underlying basis for assessing the merits of the proposed development.

The background and rationale for this is set out below.

1. Applicable Flood Study & Planning Controls:

The proposal is compliant with the applicable legislation and planning controls for 39-43 Hassall St, Parramatta (**Subject Site**). These include the Parramatta Local Environment Plan 2011 (**PLEP 2011**) and Parramatta Development Control Plan 2011 (**PDCP 2011**). Per the brief prepared by the IPC on the 6th of February 2024,

the relevant applicable flood study for the Subject Site is the *Lower Parramatta River Floodplain Risk Management Study – Flood Study Review which is dated March 2005* (SKM, 2005a) (Council Flood Model 2005).

City of Parramatta Council (Council) has confirmed to the Proponent that the 1% AEP and PMF event levels at the Subject Site are 6.20m AHD (1% AEP) and 9.50m AHD (PMF). Refer to Attachment 2: Flood Certificate. These have been derived from the Council Flood Model 2005.

These are the levels that the proposal has been designed to.

2. Site-Specific Flood Modelling:

As the MIKE-11 software is outdated, a site-specific flood assessment (L&A Site Specific Flood Model (2022)) was required to demonstrate compliance with the relevant planning controls and model the potential impact of the proposed development on the existing flooding affectation at and surrounding the Subject Site. This is a typical approach which been previously been accepted on numerous sites within Parramatta CBD including 12a Parkes St, 14-20 Parkes St and the Powerhouse Museum.

The TUFLOW site-specific flood modelling undertaken by Lyall & Associates (L&A) has been technically validated by the DPHI Independent Peer Review, GRC Hydro, which noted that – *"it is prudent to use the best practice methodology and tools available and L&A have done this by building their site-specific model in TUFLOW (a 2D hydraulic modelling software package) as opposed to MIKE-11 (a 1D hydraulic modelling software package). In the course of reviewing the 2005 model relative to the catchment in 2022/2023, the Proponent discovered that the 2005 modelling work was no longer representative of current day conditions. Furthermore, it was assessed that bridge crossings traversing Clay Cliff Creek were misrepresented as culvert-like structures in the 2005 model resulting in an overestimate of the flood levels upstream of each bridge structure."*

IPC Independent Peer Review, Professor Seth Westra states that their review did not *"extend to a detailed technical review of the underlying data or models that supported this work*". This is fundamentally a technical matter so, where there is a difference of opinion, reliance must be placed on the DPHI Independent Peer Review undertaken by GRC Hydro who has had access to the Proponent's detailed flood model and data.

As noted above, a site-specific flood assessment undertaken by Molino Stewart (MS) and L&A was recently commissioned and accepted by Council as part of the approved planning proposal and associated planning controls of 12a Parkes St, Harris Park, a nearby mixed-use residential development 200m to the west of the Subject Site and adjacent to the Clay Cliff Creek. This reduced the 1% AEP of 12a Parkes St and reduced the hazard levels of flood waters surrounding the site. This approach formed the basis of the Proponent's site-specific L&A model (2022). Council subsequently approved the development, and it will be completed in 2024.

2. Conservative and Responsible Flood Modelling Assumptions

The Proposal has been designed to the 6.20m AHD (1% AEP), 6.70m AHD (FPL) and 9.50m AHD (PMF) prescribed by Council and it features an emergency access point to land at the 1% AEP and adopts a similar approach to other recent development approvals such as the 12a Parkes St, 14-20 Parkes St and 34 Hassall St (all within a 200m radius of the Subject Site). These approvals (the most recent being 15th December 2023 for 34 Hassall St) did not require climate change sensitivities to the extent requested by Professor Westra and the flood event levels prescribed by Council were considered sufficient or approved following site-specific modelling and accurate representations of bridge crossings.

DPHI Independent Peer Reviewer GRC Hydro, state "*the blockage could reasonably be calculated as 0% as per the ARR 2019 blockage assessment methodology*". Per the PDCP 2011 definition of Flood Planning Level, "*freeboard is a fixed safety factor which allows for modelling variation and factors such as waves and turbulence*". Council's

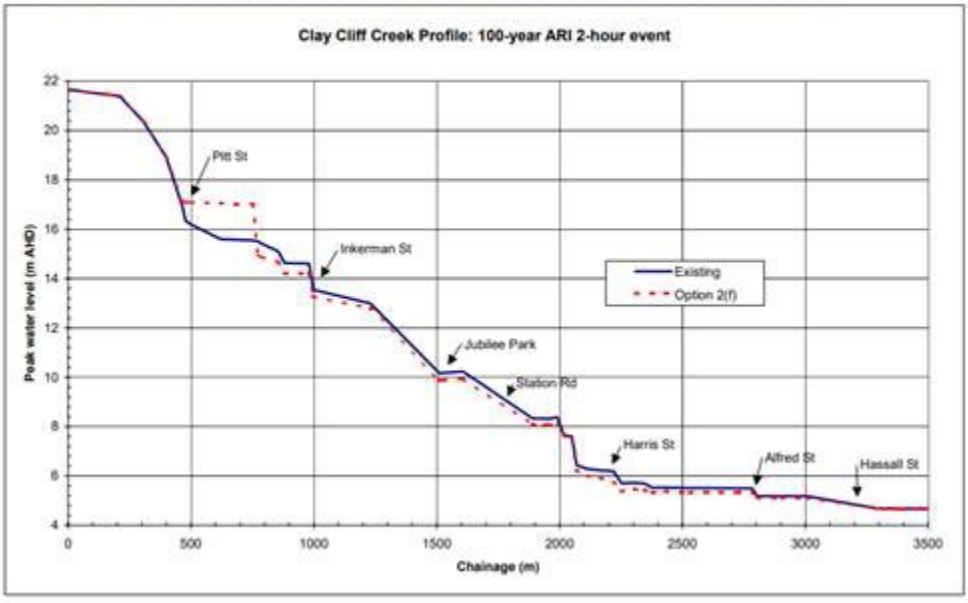
requirement of 500mm freeboard therefore accounts for modelling variations and other localised hydraulic effects. The L&A Site Specific Flood Model (2022) assumes a 15% blockage factor and freeboard, representing a more conservative position than the recommendation provided by GRC Hydro and Council's definition.

Dalland & Lucas (1992) undertook *the Clay Cliff Creek Catchment Flood Study* for Council and investigated several flood modification measures to lower flood levels in flooding problem areas such as that Clay Cliff Creek. Mitigation measures included a detention basin in Ollie Webb Reserve, which has been constructed but is not included in the Council Flood Model 2005 or the L&A Site Specific Model (2022), again representing a more conservative position when compared to the actual conditions surrounding the Subject Site.

The Lower Parramatta River Floodplain Risk Management Study and Plan, which is dated August 2005 (SKM, 2005b) included a sensitivity analysis that demonstrated if the Ollie Web Reserve Detention Basin was completed, it "*would result in a reduction in peak flow downstream of Ollie Webb Reserve in the 100 year ARI 2 hour event, which is the critical duration in Clay Cliff Creek, the peak flow would reduce from 35m^3/s to 19m^3/s*". It is understood that construction of the Ollie Webb Reserve Detention Basin was commenced in or around 2007. L&A Site Specific Flood Model (2022) conservatively assumes flow rates of 34.3m^3/s, a 180% increase over Council's sensitivity modelling assumptions and therefore represents a conservative estimate of the peak flow in Clay Cliff Creek at the location of the Subject Site. L&A Site Specific Flood Model (2022)'s climate change sensitivity (without the Ollie Webb Reserve Detention Basin) also assumes a flow rate of 41.6m^3/s, which is a 218% increase over Council's post-Ollie Webb Reserve Detention Basin flow rate of 19 m^3/s.

SKM, 2005b includes a graph (refer Figure 6-1) that depicts that if the Ollie Webb Reserve Detention Basin is completed, 1% AEP events would reduce to below 6.00m AHD compared to 6.20m AHD without the detention basin. This is comparable to the peak 1% AEP flood level of RL 5.73 m AHD derived by the L&A Site Specific Flood Model (2022) under zero blockage conditions. Despite this, the 1% AEP has been conservatively assumed at 6.20m AHD for the purpose of setting the Flood Planning Level (FPL) for the proposed development.

Figure 6-1: Peak flood levels for Option 2(f) in the 100 year ARI 2 hour event



Commissioned by Council, Cardno Willing further assert in their report entitled *Clay Cliff Creek Catchment Master Drainage Plan (2007)* that *Council is currently implementing the construction of a detention basin at Ollie Webb Reserve, in accordance with recommendations from the Lower Parramatta River Flood Plain Management Study. This basin will reduce flows in the main channel of Clay Cliff Creek.*

Based on the above facts, the Proponent maintains that it is not practicable nor reasonable to add further layers of contingency based on advice that is not a complete validation of the model and given the conservative assumptions of the L&A Site Specific Flood Model (2022).

3. Recent Precedents:

The precedent established in the Parramatta CBD including recent development approvals of mixed-use high density residential developments at 34 Hassall St (15th December 2023), 12a Parkes St and 14-20 Parkes St where climate change sensitivities where not required at the level requested by Professor Westra and the flood event levels prescribed by Council were sufficient or approved following site-specific modelling and accurate representations of bridge crossings.

4. Independently Reviewed & Interrogated:

L&A Site Specific Flood Model (2022) and the FERP have been developed and implemented by industry-leading experts in their respective fields of flood modelling and flood engineering – L&A and MS, acting on behalf of the Proponent in this regard. These teams are amongst Council's trusted panel of flood experts who inform their policy, planning controls and decision-making.

The DPHI Independent Peer Review from GRC Hydro concluded that the L&A Site Specific Flood Model (2022) has been carried out according to best practice and the results derived can confidently be relied upon. Flows used by the applicant are higher than those utilised in the previous Council endorsed study (SKM,2005a), which constitutes a conservative approach, and the hydraulic outcomes are entirely plausible. GRC Hydro found the design to be largely compliant with the City of Parramatta's PLEP 2011 and PDCP 2011 requirements. The two DCP controls where compliance is not explicitly achieved have been justified through detailed site-specific flood modelling:

- 72-hour Refuge Stay: The hydrographs have proven that the PMF flood durations on the subject site are a maximum of 6 hours, and that 24 hours back-up power supply and 6 hours back-up water and sewage services are sufficient.

- Level of the Driveway between the Road and Parking Spaces: GRC note "*The level of the driveway providing access between the road and parking spaces is lower than the required 0.2 metres below the 1% AEP (100 year ARI) flood level. It is currently proposed to have an elevation 0.25 m below the 1% AEP flood level. GRC understand that Council are able to approve driveways below the required level provided this does not obstruct or displace floodwaters.*" The driveway has been designed as an overland flow path and has been proven to not obstruct or displace floodwaters in the L&A Site Specific Flood Model (2022).

The DPHI Independent Peer Review GRC Hydro further concluded that "*in the Clay Cliff Creek 1% AEP event, shallow depths do impact the site, however the hazard of these is low and the flood risk can be managed by a Shelter in Place strategy. For larger, rarer flood events the building has been designed to comply with the City of Parramatta's DCP requirements and as such, there are passive measures to prevent inundation up to the 1% AEP plus 0.5 m level and then mechanical means to prevent the Parramatta River inundating the building basement right up to the level of the rarest possible event, the PMF. The use of mechanical means (flood gates) for this purpose is endorsed by their inclusion in the Parramatta DCP."*

The IPC's Independent Peer Review *"does not extend to a detailed technical review of the underlying data or models that supported this work"*. So, where there is a difference of opinion, reliance should be placed on the DPHI Independent Peer Review undertaken by GRC Hydro who has had access to the Proponent's detailed flood model and data.

5. Testing Scenario of 1% AEP (15% blockage and climate change)

The proposed design complies with the PDCP 2011 recommendations that the basement be passively protected up to the 1% AEP flood level and that the minimum habitable floor level should be at or above the 1% AEP flood level plus 0.5 m freeboard. We submit that for the purposes of considering climate change as per PLEP 2011 this has been considered in the conservative inputs into the model as well as by adopting the established and accepted ARR 2019 Blockage Assessment methodology. The review conducted by GRC Hydro concluded that:

"A 15% blockage factor for Harris Street bridge was a conservative assumption given that the blockage factor could reasonably be calculated to be 0% as per the ARR 2019 Blockage Assessment methodology. Therefore, the proposed design complies with the relevant PDCP 2011 and PLEP 2011 requirements even when the conservative assumption of 15% bridge blockage is made.

The proposed development has been conservatively designed with consideration of climate change. As part of the L&A Site Specific Flood Model (2022), a sensitivity analysis was undertaken in which the impact of climate change (0.9m sea level rise + 19.7% rainfall increase) was considered in addition to the impact of 15% blockage. The flood levels under this scenario range from 6.30m AHD to 6.49m AHD across the site and in the vicinity of the driveway servicing the basement ramp the flood level is 6.42m AHD. The ground floor level for the proposed development is therefore at least 0.5 m above the predicted climate change flood level across the site and the basement ramp crest is 0.28m above the flood level in this climate change event. The 6.20m AHD + 500mm freeboard provides sufficient contingency to protect the development by passive measures in future climate scenarios up to at least the 1% AEP event. It is important to note that the mechanically controlled flood gates would protect the development during floods that exceed the freeboard provisions – that is, where the rainfall increase may be greater than the 19.7%.

The Ollie Web Reserve Detention Basin has been demonstrated to significantly reduce the 1% AEP level to below 6.0m AHD and reduce flow rates from 35m^3/s to 19m^3/s. This has not been factored into the climate change sensitivity, adding another layer of conservatism and obviates the need to run additional climate change scenarios based on higher rainfall as opined by Professor Westra. The 19.7% rainfall increase is a climate change contingency as per Australian Rainfall & Runoff (ARR 2019) for Representative Concentration Pathway (RCP) 8.5 conditions in the year 2090. We understand that the request for a greater rainfall increase contingency of 22.9% may be because a review into ARR 2019 has commenced and there may be changes to the guidance, but that review is still in the early phases of consultation and is not yet in force and should not be given weight. This is similar to the Council's 2023 flood study that is presently on public exhibition and which both Independent Peer Reviewer's agree cannot be relied upon for undertaking the assessment of the proposed development.

In any circumstances, passive and active flood mitigation measures including the flood gates, will come into effect in a flood that may overtop entries into the basement, which will be smaller and more frequent than the PMF. The event which requires them to be deployed depends on their trigger level. For example, the driveway crest gate will be triggered when water overtops the wall of Clay Cliff Creek. This will be in even a little greater than 1% AEP flood event but then will provide protection up to the PMF ensuring adequate protection to life and property in all scenarios.

6. A Robust Flood Risk Assessment:

A comprehensive Flood Risk Assessment prepared by MS has determined that there is adequate protection of life and property from flood impacts as validated by the DPHI Independent Peer Review undertaken by GRC Hydro. The proposal has a robust and comprehensive emergency response plan that complies with the endorsed strategy in the DCP which includes Sheltering in Place, emergency back-up supply and a combination of passive and active flood mitigation protection.

The proposal is a BTR-owned and managed building, which enables the Proponent to have strong control over the implementation of training, routine maintenance and communication with staff and residents.

As such, the proposal sufficiently responds to Recommendation 20 of the NSW Flood Inquiry (2022) and has the appropriate measures in place to minimise risk to life.

The Proposal responds to Recommendation 24 of the NSW Flood Inquiry (2022) as it states, "*planning for and encouraging collaborative public and private sector investment in innovative mixed-use developments in flood prone regional cities and towns that are built above ground level to be flood resilient, are centrally located, and increase housing diversity by providing smaller social, affordable and market dwellings"*.

39-43 Hassall St, Parramatta is an innovative Build-to-Rent development that can provide immediate market rental housing supply close to Parramatta's jobs, transport, health, and education infrastructure amidst the current housing crisis. The approval of 39-43 Hassall St, Parramatta will encourage and provide confidence in the private sector to continue investing in housing.

We kindly request that the Consent Authority considers the facts put forward by the Proponent and maintains a consistent approach to demonstrate a fair and equitable approach to development assessment.

Yours sincerely,

[redacted]

Jason Goldsworthy
Co-Founder & Chief Development Officer
[redacted]

Attachment 1: Detailed Response to the IPC's Request for Information

a. A review of the flood assessment documentation to reflect the adoption of the recommended greater flow rate for design and recommended 1% AEP flood event level (15% blockage and climate change scenario).

Condition is not acceptable.

The flood assessment documentation already tests for this scenario. On the 1% AEP (with 15% blockage and climate change scenario as per Table 1 of MS's Flood Risk Assessment (June 2023)) the flood levels range from 6.30m AHD to 6.49m AHD across the site and importantly do not exceed the proposal's 6.70m AHD passive mitigation measures associated with the basement and the proposal's 7.0 m AHD finished ground floor level. Furthermore, the flood assessment documentation estimates that it takes a probability of about 1 in 2,300 before the driveway ramp crest is overtopped (6.70m AHD) by riverine floodwaters and of about 1 in 5,000 before the ground floor floods (7.00m AHD). The PMF has been estimated as a probability of 1 in 1,000,000.

BACKGROUND BEHIND THE 1% AEP FLOOD EVENT LEVEL

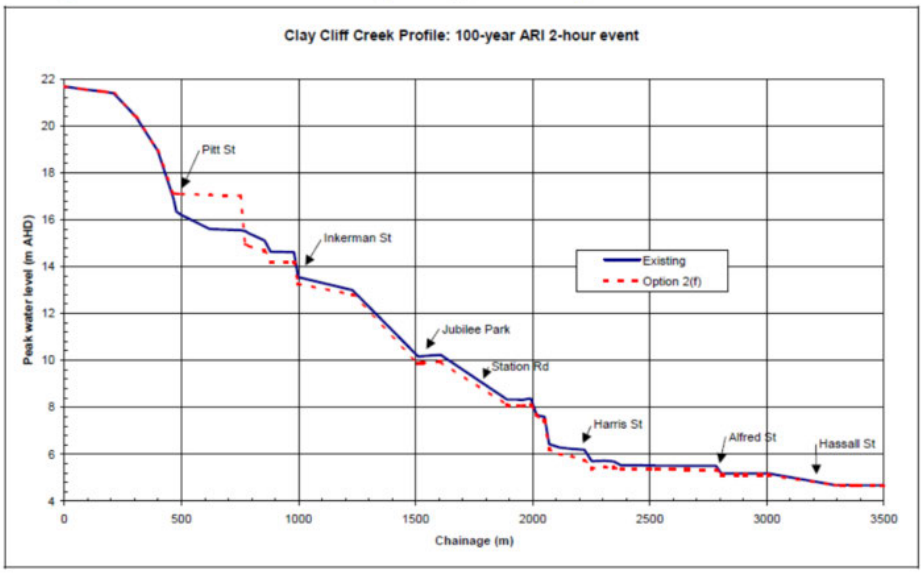
- Per the brief prepared by the IPC on the 6th of February 2024, the relevant applicable flood study to Subject Site is the Council Flood Model 2005.
- Furthermore, the Council Flood Model 2005 was the model subject to MS's *"Update of Parramatta Floodplain Risk Management Plans (2021)"* which informed the recent intensification of development in the Parramatta CBD, concluding that it presents a tolerable risk to life and property providing that amendments are made to the PLEP 2011 and PDCP 2011.
- This led to Council adopting 'Shelter in Place' as an appropriate strategy within the Parramatta CBD due to the high-density development proposed and the flashing nature of the flooding which may not allow enough time to evacuate safely. The PDCP 2011 was subsequently amended to endorse 'Shelter in Place' as a valid evacuation strategy.
- This has resulted in the Council upzoning of the Parramatta CBD to allow for 16,000 new jobs in commercial office buildings and 11,000 new dwellings within the CBD Planning Proposal boundary.
- Council Flood Model 2005 remains the current official model used by the Council and has been used as recently as 15th December 2023, to determine the relevant 1% AEP, PMF, flood planning levels and provide development approval for 34 Hassall St a mixed-use precinct featuring 604 apartments and 6 underground basement levels less than 20 meters immediately to the north of the Subject Site.
- All independent peer reviews acknowledge and recognise that Council has commissioned a revised flood study of the Parramatta CBD, however, this flood study is not yet finalised and therefore cannot be used as the basis for evaluating flood risk as per Council's direction to the Proponent, DPHI and GRC Hydro (DPHI Independent Peer Review).
- All independent peer reviews undertaken on the Subject Site including the reviews prepared by Professor Seth Westra (2024) and GRC Hydro (2023) have acknowledged that the Council Flood Model 2005 is a MIKE-11 one-dimensional flood model that does not consider the intricacies and details of specific sites, streetscapes, and the surrounding structures i.e. clear-span bridges.
- Using the Council Flood Model 2005, Council has confirmed to the Proponent that the 1% AEP and PMF event levels at the Subject Site are 6.20m AHD (1% AEP) and 9.50m AHD (PMF) respectively. Refer to Attachment 2: Flood Certificate. The flood planning level (FPL) for the site is therefore 6.70m AHD. The driveway crest level is at the FPL and the ground flood level is 0.3m above the FPL using Council's adopted flood levels. The Proponent has undertaken all *'Additional Recommended Actions'* noted by the Flood Enquiry Information throughout the design and planning process.

- The peak 1% AEP flood level derived by the Council Flood Model 2005 has not been blindly adopted but has been independently reviewed and modelled, with conservative assumptions, correct representations of bridges and with climate change sensitivities included.

MODEL METHODOLOGY, PRECEDENTS & THE RESULTING 1% AEP FLOOD EVENT LEVEL

- Following the submission of a planning proposal for another nearby site at 12a Parkes St, Harris Park (Nearby Site) further upstream along the Clay Cliff Creek, Council commissioned MS to complete an Independent Flood Assessment (MS (2018)) and L&A to prepare an up-to-date 2D site-specific flood model (L&A (2018)) for the Nearby Site and its surrounds.
- Council agreed with the site-specific approach and methodology undertaken by MS and L&A in 2018 and subsequently approved the planning proposal and associated planning controls to accommodate a mixed-use high-density residential development, the Nearby Site is under construction and is expected to be completed mid-2024.
- L&A have further developed this site-specific model using data that was available in 2022/2023 which have improved relative to those available in 2005 and more recently in 2018. This improved site-specific model (L&A Flood Model (2022)) has informed the Subject Site Flooding Investigation prepared by L&A (2022) which was submitted as part of the Subject Site's Development Application.
- This is best-practice methodology that incorporates factors which improve the accuracy of the Council Flood Model 2005:
    1. Use of a two-dimensional hydraulic model (TUFLOW) rather than the one-dimension model (MIKE-11) used by the Council Flood Model 2005.
    2. Improved representation of Clay Cliff Creek bridge crossings to correct their representation as culvert-like structures in the Council Flood Model 2005.
- It is noted that the peak 1% AEP flood level of 6.20m AHD advised by Council, while taken from Council Flood Model 2005, relates to the conditions as they were in the catchment at the time of the study in 2005.
- The *Lower Parramatta River Floodplain Risk Management Study and Plan* prepared for Parramatta City Council by SKM in August 2005 (SKM, 2005b) assessed the attenuating effects of the [then] proposed Ollie Webb Reserve detention basin and included a long section which shows that the peak flood level on the upstream face of the Harris Street bridge would reduce to below 6.0 m AHD with the basin in operation, Refer to Figure 6-1 below. The detention basin was subsequently constructed and therefore the flood modelling undertaken as part of SKM, 2005b demonstrates that Council's adopted flood level data are not based on contemporaneous catchment conditions and may be overestimating site flood levels by hundreds of millimetres.

Figure 6-1: Peak flood levels for Option 2(f) in the 100 year ARI 2 hour event



- This has not been factored in either the Council Flood Model 2005 or the L&A Site Specific Flood Model (2022).

- These resulting peak 1% AEP flood levels at the upstream face of the Harris Street bridge for the various assessed conditions are best summarised in Table 1 over the page. Also given in Table 1 is the available freeboard to the ground floor level of 7.0 m AHD and the driveway crest of 6.7 m AHD.
- By inspection of the values set out in Table 1, the proposed development incorporates a minimum 500 mm freeboard to the ground floor level of 7.0 m AHD under all of the assessed conditions, and a minimum of 0.2 m to the crest of the basement driveway of 6.7 m AHD, noting that a series of flood gates will prevent the ingress of floodwater to the basement during floods which exceed the freeboard provisions.
- While it can be demonstrated that the proposed development incorporates sufficient freeboard to protected against the assessed 15% blockage and climate change scenario, its adoption as the basis for assessing the merits of the proposed development are not considered to be practicable nor reasonable given that the approach has not been mandated in other Parramatta CBD approvals that are located in close proximity and subject to the same source of floodwater as the Subject Site.

FLOW RATES

- As set out in Table 1, the L&A Site Specific Flood Model (2022) adopts flow rates that are higher than those adopted by both SKM, 2005a and SKM, 2005b.

Table 1: Summary of peak 1% AEP flood levels at upstream face of Harris Street bridge

Source	*SKM, 2005a*	*SKM, 2005b*	*L&A Site Specific TUFLOW Model (2022)*		
Representative Condition	*Pre-Ollie Webb Reserve Detention Basin*	*Post-Ollie Webb Reserve Detention Basin*	*Pre-Ollie Webb Reserve Detention Basin*	*Pre-Ollie Webb Reserve Detention Basin with 15% Blockage*	*Pre-Ollie Webb Reserve Detention Basin with 15% Blockage and Climate Change*
Adopted 1% AEP Flow Rate[1]	*28 m^3/s*	*19 m^3/s*	*34 m^3/s*	*34 m^3/s*	*42 m^3/s*
Peak 1% AEP Flood Level[1]	6.2 m AHD	<6.0 m AHD	5.7 m AHD	6.2 m AHD	6.5 m AHD
Freeboard to Ground Floor Level of 7.0 m AHD	0.8 m	>1.0 m	1.3 m	0.7 m[2]	0.5 m
Freeboard to Basement Driveway Crest Level of 6.7 m AHD	0.5 m	>0.7 m	1.0 m	0.6 m[3]	0.3 m[3]

1. *Peak 1% AEP flow rates and flood levels rounded to 1 decimal place to reflect the underlying order of accuracy of the flood modelling.*
2. *The peak 1% AEP flood level along the southern face of the building is 0.1 m higher than at the upstream face of the Harris Street bridge, hence why the available freeboard is 0.1 m less than would otherwise be indicated by the peak flood level given in the table.*
3. *The peak 1% AEP flood level at the location of the basement driveway is 0.1 m lower than at the upstream face of the Harris Street bridge, hence why the available freeboard is 0.1 m greater than would otherwise be indicated by the peak flood level given in the table.*

b. Increased design levels to preserve a Flood Planning Level of at least 0.5m above the recommended 1% AEP design flood event, including of the basement crest and other sources of water ingress and building footprint currently proposed below this level.

Condition is not acceptable.

The Application design levels set the ground floor of the development at a minimum of 0.8 m above the 1% AEP and all residential units are set well above the PMF level. The basement crest meets the minimum 500mm above the 1% AEP. GRC Hydro and MS both agree that the proposed development has been designed cognisant of the site's flood affection and flood protection measures – both passive and active – have been proposed in compliance with the controls identified in the PDCP 2011 to adequately minimise the flood risk to life and property for the proposed land use.

The planning controls do not dictate that the 1% AEP has to build in a climate change risk. Rather, climate change has to be factored into assessing the acceptability of the development and its impacts on flood behaviour. The definition of Flood Planning Level in the Parramatta DCP specifically excludes an allowance for climate change and notes it is to be considered in a flood risk assessment, which has occurred. The purpose of setting a 500mm freeboard is to allow for contingencies including climate change risk – see the definition of "freeboard" in PDC2011. Considering there have been an independent flood model (verified by GRC) in addition to reliance on Council's flood model, the layers of conservatism already in-built into that model, it is submitted that the circumstances are not exceptional to require more than a 500m freeboard or a greater level of flood risk assessment than already undertaken.

While we don't accept the condition, we note that by inspection of the values set out in Table 1, the Application design levels incorporate a minimum 500 mm freeboard to the ground floor level of 7.0 m AHD under 15% blockage and climate change conditions, and a minimum of 0.2 m to the crest of the basement driveway of 6.7 m AHD, noting that a series of flood gates will prevent the ingress of floodwater to the basement during floods which exceed the freeboard provisions.

c. The provision of a land connection at the recommended 1% AEP event level.

Condition acceptable on the basis of the 1% AEP 6.20m AHD.

By inspection of the values set out in Table 1, the peak 1% AEP flood level under all assessed conditions with the exception of the inclusion of climate change permits a land connection at the Application design level of 6.2 m AHD as the Proponent's civil engineer Mott Macdonald has confirmed that the proposed public domain design will raise the footpath levels adjacent to the south-eastern pedestrian ramp from 6.1 m AHD to 6.2 m AHD. This will satisfy the requirement for an emergency access point to land at or above the 1% AEP.

d. A review of the Flood Emergency Response Plan to assess if a suitable response can be achieved in scenarios of higher rate-of-rise of flood water, including in a PMF event from overland and creek flooding.

Condition is acceptable.

The proposed Application is a Build-to-Rent development, which means that the building is developed, owned, and operated by the Proponent. The Proponent will manage the building during its operational life and the approach to health and safety is taken very seriously.

During normal business hours, there will be a dedicated on-site Building Manager to assist residents in a flood event, including a building manager. During non-working hours, there will be 1-2 capable and willing residents nominated as Flood Wardens.

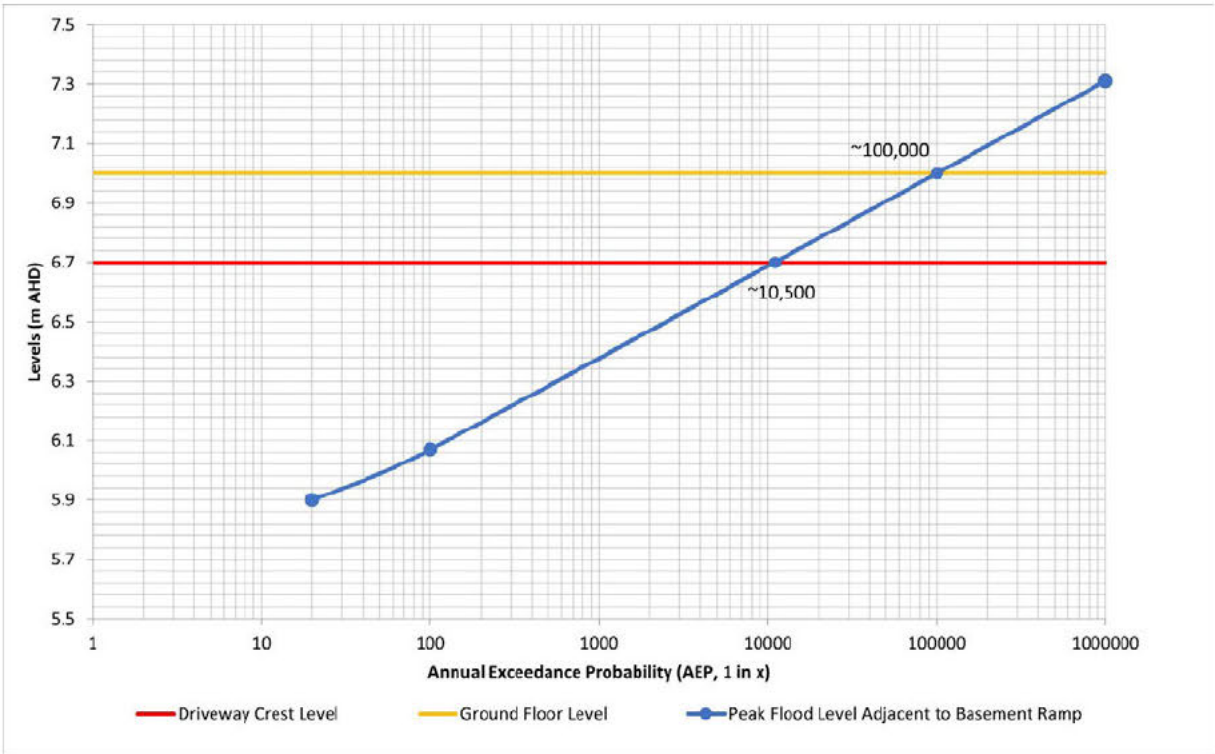
The *Flood Emergency Response Plan (FERP)*, prepared by MS in 2023, details the most appropriate flood emergency management strategy for the proposed Subject Site. The Flood Emergency Response Plan primarily considers the worst-case scenario highest risk flooding of the Subject Site. For the Subject Site, the highest risk of flooding would be due to riverine flooding.

SITE FLOODING PROBABILITY

The PMF has been estimated to have a probability of 1 in 1,000,000.

The *Flood Risk Assessment*, prepared by MS in 2023, estimates that it takes a probability of about 1 in 2,300 before the driveway ramp crest is overtopped by riverine floodwaters and of about 1 in 5,000 before the ground floor floods.

To determine the probability of combined creek and overland floods that would overtop the driveway ramp crest of ground floor, the figure below plots the 5% AEP, 1% AEP and PMF creek and overland events on a log linear graph using levels adjacent to the driveway ramp crest. The figure suggests that the basement ramp crest level of 6.70m AHD has about a 1 in 10,500 chance of being exceeded by combined overland and creek flooding and the ground floor level of 7.0m AHD has a 1 in 100,000 chance of being exceeded.



The higher of these probabilities should be considered in flood risk assessment. Therefore, there is a 1 in 2,300 chance of the level of the basement ramp crest being reached or exceeded in any given year. Although a combined creek and overland event could have a much higher rate of rise than riverine flooding, a creek and overland flood with a much lower AEP would be needed to reach the basement ramp crest.

The basement levels are therefore protected from flooding by passive measures in events with a probability as low as 1 in 2,300. It should be noted that flood barriers would protect the basement from flooding in larger and rarer events. However, there is a residual risk that one or more could fail when someone is in the basement. Therefore, it is necessary to have a response plan to deal with this residual risk and to ensure people are not in the basement or on the ground floor should it flood. The Flood Emergency Response Plan prepared by MS addresses this residual risk.

The FERP considers a flood rising as fast as the PMF and this rate of rise is not likely to be exceeded in climate change scenarios. There is sufficient time for occupants to go from the basement or ground floor to upper floors in the time it takes the PMF to rise from the alarm trigger level to it reaching the driveway crest or ground floor level.

FLOOD EMERGENCY RESPONSE

The FERP prepared by MS addresses the residual flood risk of the proposed development.

The proposed flood emergency response for the site is for site occupants to Shelter in Place in the building until the emergency has passed. If creek or riverine flooding occurs residents should shelter in their apartments and other site occupants should shelter in the communal refuge.

Shelter in Place (SIP) is a flood emergency response strategy that can be adopted when there is an appropriate refuge on site above the PMF level. Given that in the PMF the site will only be isolated by flood waters for up to 6 hours and that residential apartments are set up to comfortably accommodate people overnight, residents should Shelter in Place rather than evacuate off site. Other site occupants should shelter in the communal refuge area on Level 2. This approach is consistent with the approach to sheltering in place in large residential developments endorsed by Council in the PDCP 2023. Control 5 of Section 9.7.4 outlines conditions for permitting residents to safely remain in their own apartments with access to a communal refuge area, including emergency back-up power, water supply and sewerage.

The FERP is a 4 phased strategy (which is detailed in Section 5.3 of the FERP and briefly explained in the response to question (e)). During the Alert and Respond Phases, there are a series of triggers including to be on standby when BoM issues a *Severe Weather Warning with chance of flooding for Sydney* OR *BoM issues a Flood Watch for the Parramatta River* OR *Intense rainfall is observed* that ensure the Building Manager and Flood Warden are ready to evacuate the basement in a timely manner.

1. Prepared – this applies at all times when the other phases do not apply.
2. Alert – this occurs when a flood alert is triggered by one of several means which indicates flooding may be a possibility. It may be possible to revert to Prepared without the other two phases being triggered.
3. Respond – this occurs when a flood response is triggered by one of several means which indicates flooding is likely. This phase can be triggered without the Alert phase first being triggered.
4. Recover – this occurs following a flood response operation of any scale and lasts until operations have been returned to normal in which case it reverts to Prepared.

As per the FERP the following features will be integrated into the design, construction, and operation of the facility to minimise the risk to life from flooding and ensure that the building is a safe flood refuge in all floods (items highlighted in red are modifications proposed by the Proponent):

- The Property Manager directly manages the leasing of the building and will provide flood information/inductions for new residents. Further information will be included in the resident 'app' and welcome pack. This information will be reissued on the anniversary of a resident's tenancy.
- The Property Manager's leasing staff will take note of each resident's language/accessibility needs and priority will be given to these residents to ensure that during a flood event they have appropriate support and communication.
- There will be at least one flood warden on site at all times.
- The building is to be directly managed by one entity. The building manager and flood wardens are to receive severe weather warnings through subscriptions to automated alert services (e.g. BoM weather App).

- The building manager and flood wardens are to receive flood warnings through subscriptions to Parramatta's FloodSmart alert service.
- Upon receiving severe weather warnings or flood warnings the building manager will issue a notification through the resident app (the resident app is the primary communication tool between the residents and the building manager allowing the flow of important information in real time as well as instant messaging).
- All apartments are located above the PMF level.
- No habitable uses are located in the basement levels.
- The building is 34 storeys high, and the majority of used space in the building is well above flood levels.
- The building will remain structurally stable during a PMF.
- The basement is passively protected (driveway crest) from riverine floods with an annual exceedance probability (AEP) of about 1 in 2,300 and from much rarer creek floods.
- The ground floor is protected from floods with an AEP of 1 in 5,000.
- The basement levels (including Basement Levels 1 – 3 and the Upper and Lower Mezzanine levels) are protected from the ingress of flood waters up to and including the riverine PMF by a mechanical remotely controlled flood gate across the driveway. These can be closed by the Building Manager or Flood Warden using a control panel at the dry side of the door or operated remotely from the Building Manager's workstation. The Building Manager and Flood Warden will receive the flood warning alarm when floodwaters overtop the channel wall of Clay Cliff Creek, the driveway can then be assessed to be clear of obstructions before the mechanical barrier is activated. The basement will also be protected by flood barriers protecting the lift wells and stairwells.
- The driveway is protected from creek flooding up to 6.2 m AHD by flood gates at the southern end of the driveway that will be hydraulically activated when floodwaters overtop the channel wall of Clay Cliff Creek and flood the landscaped area along the creek.
- The loading dock is protected from creek and riverine flooding up to 6.7 m AHD by a flood gate across the vehicle entrance. This flood gate will be remotely controlled and can be closed by the Building Manager or Flood Warden using a control panel at the dry side of the door or operated remotely from the Building Manager's workstation. The Building Manager and Flood Warden will receive the flood warning alarm when floodwaters overtop the channel wall of Clay Cliff Creek, the driveway can then be assessed to be clear of obstructions before the mechanical barrier is activated.
- A sign will be installed at the entry to the driveway that will flash and indicate that the driveway and loading dock are closed whenever the flood gates at the southern end of the driveway are activated. There will also be a sign installed in the basement next to the exit driveway that will flash and indicate that the driveway is closed whenever these flood gates are activated. These signs will be manually activated if floodwaters are observed pooling in the intersection of Hassall Street and Harris Street, which may indicate overland flooding is occurring.
- There is a flood alarm that will be automatically triggered once floodwaters reach a flood level of 5.2m AHD and overtop the creek channel.
- Flood signage is to be displayed throughout the building. The signage will indicate:
    - If the flood alarm sounds:
        - Residents should proceed directly to their apartments via the stairs.
        - All other site occupants should proceed directly to Level 2 via the staircase off the lift lobby.
- A public address system capable of communicating messages throughout the building will be maintained.
- The resident 'app' will provide live flood notifications and alerts to residents.
- Given Parramatta's culturally diverse population, flood alerts will be multilingual on the resident app, as will flood announcements through the PA system.
- The development will include hearing augmentation loops in the main common areas on the ground floor, Level 1, Level 2, and Level 32.
- There is a 24-hour back-up power supply that will ensure the refuge areas have power. One lift will operate on this back-up power supply, providing access between the basement levels and the communal refuge on Level 2.

- There is a 6-hour back-up water supply and sewage collection that will ensure the refuge areas have working water and sewage facilities.
- Flood emergency response drills will be conducted bi-annually.
- The following are to be kept on Level 2 (the communal refuge area) and will be checked on a biannual basis by the building manager to ensure provisions are appropriately stocked:
    - An emergency kit,
    - First aid kit,
    - A laptop/tablet/smartphone with 4G/5G internet access and at least 24 hours of battery capacity,
    - Portable radio with batteries,
    - Torches with spare batteries,
    - Shelf-stable food/snacks,
    - Sufficient bottled water for the number of building occupants for up to 24 hours.

e. Inclusion of consideration for a non-zero probability of failure of flood gates.

Condition is acceptable with modifications.

The proposed development has been designed taking into consideration the fact that there is a non-zero probability of flood barrier failure. The basement and ground floor have been protected by passive measures as far as is practicable, with the basement protected by passive means from floods up to the 2,300 ARI riverine flood and the ground floor protected up to the 5,000 ARI event. This eliminates the need to protect the development via active measures, such as flood barriers, in events up to the 1 in 2,300 ARI.

The FERP is a 4 phased strategy (which is detailed in Section 5.3 of the FERP) which includes an evacuation strategy of the basement levels and ground floor that commences as soon as alerts are issues by BoM:

1. Prepared – this applies at all times when the other phases do not apply.
2. Alert – this occurs when a flood alert is triggered by one of several means which indicates flooding may be a possibility. It may be possible to revert to Prepared without the other two phases being triggered.
3. Respond – this occurs when a flood response is triggered by one of several means which indicates flooding is likely. This phase can be triggered without the Alert phase first being triggered.
4. Recover – this occurs following a flood response operation of any scale and lasts until operations have been returned to normal in which case it reverts to Prepared.

During the Alert and Respond Phases, there are a series of triggers including to be on standby when BoM issues a Severe Weather Warning with chance of flooding for Sydney OR BoM issues a Flood Watch for the Parramatta River OR Intense rainfall is Observed that ensure the Building Manager and Flood Warden are ready to evacuate the basement in a timely manner.

Once floodwaters are observed pooling at the intersection of Hassall Street and Harris Street the basement evacuation will commence, the actions to be undertaken by the Building Manager and Flood Warden include:

- The Building Manager will initiate sheltering on site.
- The Building Manager or delegate will activate the signs at the entrance to the driveway and in the basement indicating that the driveway, car park and loading dock are closed.
- The Building Manager will trigger the flood gates across the basement ramp and the loading dock entrance.
- The Building Manager or delegate will make an announcement over the public address system communicating, in the appropriate languages, that:
    - Local streets may be flooding and evacuating off site would be unsafe;
    - Everyone should stay inside the building; and

    - The basement car park has been closed and vehicles are not to leave the site. Vehicles will be protected from flood waters.
- The Building manager will notify Novus as the Building Owners that sheltering on site has been initiated.
- The Building Owners will send a flood notification to residents via the resident app informing them, in the appropriate languages:
    - Local streets may be flooding and evacuating off site would be unsafe;
    - Everyone should stay inside the building; and
    - The basement car park has been closed and vehicles are not to leave the site. Vehicles will be protected from flood waters.
- The Building Manager will notify commercial tenants that the carpark and loading dock have been closed due to flooding.
- No vehicles are to enter the basement or loading dock.
- No vehicles are to exit the basement car park.
- All commercial tenants, staff, residents, guests, patrons and visitors will follow the advice of the Building Owner, Body Corporate, Building Manager or Flood Wardens.
- All building occupants will remain within the building.
- Commercial tenants will communicate car park closure to staff or expected visitors who are not in the building when flooding occurs.
- Commercial tenants will postpone receipt of deliveries.

Therefore, site occupants would only be at risk in the basement if all of the following occurred:

- A flood occurs which has a frequency of less than 1 in 2,300 per year;
- The occupants fail to evacuate prior to flood levels at the basement ramp crest reaching 6.7 m AHD; and
- One or more of the active flood barriers fail to actuate.

The probability of water entering the basement levels while they are occupied is therefore extremely remote. Furthermore, anyone in the basement can reach a level above the PMF level via the fire stairs unless it is the flood barrier protecting the fire stairs which has failed. This barrier is a 7.0m AHD and therefore it would be necessary for a flood with a probability rarer than 1 in 5,000 AEP to enter by this means.

It is not consistent with the planning controls to require a zero probability of failure of flood gates and dismiss the flood protection that flood barriers provide in large events. Similar to fire sprinklers and fire drills in all buildings, flood gates require maintenance, training and routine drills to ensure that they are operated optimally. As per the PDCP 2011, flood gates are an endorsed flood protection measure and are widely used in Parramatta CBD including Parramatta Square, Parramatta Train Station, and Parramatta Police Station.

The PDCP 2011 and the Floodplain Management Manual talk to a risk-based approach not to eliminating all risk. The PDCP 2011 does not mandate zero risk but to ensure it is at an acceptable level (see objective O.06) which suggests some level of risk is assumed. The PLEP 2011 requires risks to be minimised not that they be eliminated.

The design team has collaborated with leading flood gate suppliers to ensure that they have been integrated for optimal performance. The electrically powered flood doors can be connected to the Building Management System, so if there is a problem the building management team will be notified of this issue so it can be fixed.

The proposed application is a Build-to-Rent development, which means that the building is developed, owned, and operated by the Proponent. One single entity will manage the building during its operational life.

The Proponent will commit to:
- Training staff and flood wardens in the operation and fault detection of flood doors.
- Routine maintenance by specialist suppliers.

- Flood gate management plan.
- Bi-annual testing.

f. Inclusion of consideration of human factors in an emergency response, including the 72-hour shelter-in-place provision of the Parramatta Local Environmental Plan.

Condition unacceptable.

It is considered that the FERP adequately deals with the contingency of human factors and a 72-hour Shelter in Place is unreasonable (noting however that each resident will be safely above the PMF level).

As far as is practical for the purposes of development, the FERP addresses means of ensuring that site occupants remain as comfortable as possible which will also discourage them from making irrational decisions that may result in individuals coming into contact with floodwaters. These measures include:

- Allowing residents to remain in their apartments. If residents are able to shelter in their homes, it reduces the likelihood that they will attempt to leave the site.
- The Building Manager will provide communication with residents during a flood emergency via the public address system and resident app and Property Management staff will ensure that during a flood, residents with language/accessibility needs are provided with appropriate communication. Residents who feel informed about the flood situation are less likely to attempt to leave the site.
- A 24-hour back up power supply. This will allow residents and site occupants to use the building's lighting, cook in their apartments, charge devices and travel via the lift that will remain operational.
- A 6-hour back-up water supply and sewage collection, to ensure site occupants have access to appropriate amenities and remain comfortable on site.

It should be noted that 72-hour shelter-in-place provisions are not a requirement of the PLEP 2011. Clause 7.9(3)(a)(ii) requires that the development be connected to an emergency electricity and water supply. The proposed development provides this back-up power and water supply, however, the duration of Shelter in Place provisions is only specified in the PDCP 2011. Control 5(b) of Section 6.7.4 of the PDCP 2011 states:

> *"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."*

However, the Flood Risk Management Manual 2023 advocates a merit-based approach in flood risk management. Therefore, the proposed provision of 24 hours of back-up power supply and 6-hours of back-up water supply and sewage collection should be considered based on the merits of the proposed measures in addressing the flood risk for the specific development.

Given that in the PMF the Subject Site will only be isolated by flood waters for up to 6 hours, 24 hours of backup power and 6 hours of sewage and water is sufficient as confirmed by MS and the Independent Peer Reviewers including GRC Hydro and Professor Seth Westra.

Despite the Shelter in Place provisions being sufficient the Proponent can accommodate an additional hour for the sewage and water provisions (a ~15% contingency) with some minor design amendments.

Attachment 2: Flood Certificate

Our Reference: FL/315/2021
Contact: Peter Sirianni
Telephone: [redacted]
Fax: 02 9806 5906

Nicholas Stephens
1 James Place
SYDNEY NSW 2060

13 December 2021

FLOOD ENQUIRY APPLICATION

Property Details

Address	39-41 Hassall Street, PARRAMATTA NSW 2150
	This form applies for up to three adjoining sites relating to the same development. A separate Flood Enquiry form and fee will be required for more than 3 or separate lots.

Delivery Preference

[redacted]

Reason for Enquiry

Proposed Re-development of Property Emailed

Property Type

***** GST not applicable from 1 July 2013*****

Flooding Application - Commercial	$542.50

Disclaimer: Flood levels and flood extent lines are based on current information held by Council. Council does not accept responsibility for the accuracy of this information. Any pipe sizes and loca ion of pits and pipe lines should be confirmed by site investigation.
The flood levels shown on the back of this form are only an approximate guide and have been derived using the current computer simulated model.
The information provided in his document is presented in good faith to assist the public in understanding Council's drainage requirements hat apply within the Parramatta Local Government Area. It is the responsibility of each individual using this information to undertake their own checks and confirm this information prior to its use.
City of Parramatta Council, its agents and employees are not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect of any representation, statement, or advice referred to above.

Refer to back of this form for level information issued

Flood Enquiry Information Issued - 13 December 2021

Mainstream Flooding

Is this property affected by mainstream flooding? **39-41 Hassall Street, PARRAMATTA**			☒ Yes ☐ No
Flood Levels	Closest Cross Sections: *(Please refer to Flood Study):* **Refer to Flood Map**		
5% AEP	RL 5.9	m AHD	**Comments**: **See Note on Flood/Hazard Map**
1% AEP	RL 6.2	m AHD	
PMF	RL 9.5	m AHD	
☒ Refer to flood maps provided for detailed flood levels.			
Flood information is obtained from the following flood study report: **Lower Parramatta River Floodplain Risk Management Study – Flood Study Review, 2005 (SKM)**			

Note: Flood inundation can be verified by detail survey to AHD undertaken by a Registered Surveyor.

Local Flooding

Is the property located within a Hatched Grey Area? *Properties located within a **Hatched Grey Area** are subjected to flooding from the local catchment.*	☐ Yes ☒ No
Is the property located within a Grey Area? *Properties located within a **Grey Area** are subjected to additional site drainage controls to manage flooding in the local catchment.*	☐ Yes ☒ No
Is the property likely to be affected by overland stormwater run-off from the local catchment? ***Note:** No site inspection conducted for this assessment. Based solely on the information supplied for this flood enquiry application.*	☐ Yes ☒ Subject to Detailed Investigation
***Note:** You are required to contact Council's Development Service Engineer for any details and requirements relating to development that is affected by local flooding.*	

Additional Recommended Actions

☒	The Applicant needs to discuss the proposal to re-develop this site with Council's Town Planner and Development Services Engineer.
☒	The Applicant needs to contact Council's Town Planner and organise a pre-lodgement meeting to discuss any proposal to redevelop this property.
☒	The Applicant needs to refer to Council's Local Floodplain Risk Management policy for details relating to developing a land affected by flooding.

Definitions: (As per NSW Floodplain Development Manual dated April 2005)

1. **AHD** – a common national surface level datum approximately corresponding to mean sea level.
2. **ARI** – the long term average number of years between the occurrences of a flood as big as or larger than, the selected event.
3. **PMF** – is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation.
4. **AEP** – Annual Exceedance Probability is the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage.

Attachment 3: Legal Opinion

1 March 2024

Our Ref: PLM:NOV006/4001

Perpetual Corporate Trust Limited
as custodian for Novus Trusco 1 Pty Ltd
as trustee for Harris Street Sub Trust

Dear Lionel

Novus Proposed Build to Rent: 39-43 Hassall Street Parramatta

SSD-34919690

We refer to the letter from the Independent Planning Commission (**IPC**) dated 22 February 2024 to the Department in respect of SSD-34919690 for the above proposed build-to-rent development (**SSDA**). The letter refers to independent flood advice received from Professor Seth Westra dated 21 February 2024 (**Westra Expert Advice**).

You have asked us to provide comment on the Westra Expert Advice and the request from IPC considering the framework for decision-making under the EP&A Act and the Land and Environment Court's approach to considering flood affected sites.

In summary we consider:

1. It is important to review the Westra Expert Advice in the context of the planning controls and how the opinions align with those controls, The planning controls do not require no risk, but a risk-based approach which has to be balanced with the objectives of the EP&A Act which include the orderly and economic development of land, as well as those of the NSW Government's Flood Prone Land Policy and its principal supporting document, the NSW Flood Risk Management Manual 2023 which promote a merits-based approach to flood risk management;
2. It is apparent that the basement crest and building footprint is already at least 0.5m above the estimated 1%AEP and the land connection will be at the 1%AEP level. The 1%AEP is already conservative considering assumptions in relation to blockages and that it does not factor in the ameliorative effects of the Ollie Webb Reserve detention basin.
3. In addition to this, climate change modelling has been undertaken to ensure that future rainfall increases are factored in at a 19.7% increase as per Australian Rainfall and Runoff (2019). The driveway crest and ground floor entry are set above the level that water could rise assuming a 19.7% increase in rainfall.
4. It is reasonable to consider contingencies for a failure of the flood gate but it is unreasonable to expect that a risk is eliminated and has a non-zero probability. The gates would only be relied upon in extremely low probability flooding (less than 1 in 2,300 chance per year). The risk of the failure of the flood gate is managed through visual confirmation of effectiveness, training and maintenance via a thorough Flood Emergency Response Plan (**FERP**) managed by centralized

24 hour building management (it will not be strata titled) which will ensure persons won't be present in the basement and if they are that they can escape to a safe refuge.

5. It is apparent that the risk of a higher rate of rise of flood waters and human factors will be appropriately mitigated with the FERP considering the refuge provided, the short distance to the public domain, the resident induction and flood evacuation training, detailed signage and warning, communication methods including apps and a 24 hour management presence and flood wardens.

Planning framework for consideration of flood impacts and behavior

The *Parramatta Local Environmental Plan 2011* (**PLEP 2011**) which was current at the date of lodgment of the SSDA should be the primary reference point for decision-making with respect to the SSDA. We note that whilst development control plans are not a mandatory matter for consideration for state significant development applications the *Parramatta Development Control Plan 2011* (**PDCP 2011**) (the 2023 DCP does not yet apply) is relevant in considering the public interest under section 4.15 of the EP&A Act for the guidance it gives and on the merit approaches that are taken in the CBD generally to allow the balancing of the social, economic and cultural impacts of the risk-based approach.

Clause 5.21 of the PLEP 2011 requires the consent authority to be satisfied of various matters in 5.21(2) and consider the matters in clause 5.21(3). The relevant clauses as they relate to the IPC letter are:

1. The IPC must be satisfied that the development:
    a. 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
    b. incorporates appropriate measures to manage risk to life in the event of a flood

2. The IPC must consider:
    a. the impact of the development on projected changes to flood behaviour as a result of climate change
    b. whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood

3. Noting that the objectives of clause 5.21 are:
    (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,
    (d) to enable the safe occupation and efficient evacuation of people in the event of a flood.

Clause 5.21 notes that expressions in the clause have the same meaning as in the *Considering Flooding in Land Use Planning Guideline* (**Guidelines**). The Guidelines note that the Floodplain Risk Management Manual (**Manual**) has the 1%AEP as an appropriate starting point for determining the Defined Flood Event for development controls. This is also what has been adopted by the Council in PDCP 2011, being 100 year ARI plus 0.5m freeboard[1] and this should be given weight. The Guidelines and the Manual note that the typical freeboard is 0.5m and that rarer flood events may be adopted where there is also consideration of social, economic, environmental, and cultural consequences. Any variation to this freeboard requires Council in its planning controls to demonstrate and document the merits based on a risk management approach that is consistent with the FRM process and the principles of the Manual.

The Manual notes:

[1] PDCP 2011 Control C.01

Estimation of flood behaviour has inherent uncertainties that reduce as the quality and quantity of flood data increases. Uncertainties can be further reduced by using experienced practitioners to develop fit-for-purpose models that are calibrated and validated considering historical flood information. These models are tools that can be used to examine the variability in conditions (for example, waterway entrance conditions, riparian, floodplain and catchment vegetation, and climate change) and undertake sensitivity analyses.

The FRM framework and FRM process provide the basis for understanding variability and uncertainty and considering these in decision-making. An example of accounting for uncertainty in management is the use of freeboard above the level of the defined flood event (DFE) or design flood. Freeboard provides more certainty that the desired reduction in frequency of exposure to flooding chosen by this selection of a DFE is achieved.

We note that the flood assessment for this project has not blindly adopted Council's 2005 flood model but has been validated by the proponent's experienced flood practitioners which has then been independently reviewed by GRC. Conservative assumptions have been incorporated into that model which would also be a way of factoring in climate change risks. In addition to this, the flood risk assessment adopted a 19.7% increase in rainfall as a climate change scenario as required by the Australian Rainfall and Runoff (2019) publication. This is the current industry standard and any percentage above this based on a potential change to the 2019 publication is arguably not justified given the premature status of that potential change and the conservatism already built into the flood model.

Relevant case law

Relevantly, in *OM Vinayak Pty Ltd v Central Coast Council* [2022] NSWLEC 1269 (27 May 2022) an expert sought to rely on SES plans, reports and media documents as establishing the flood characteristics of the site. Commissioner Dickson noted:

[62] I accept the agreed evidence of the experts as to the characteristics and flood risk of the subject property, as summarised at [46]. For the reasons that follow I am satisfied that the development proposed is compatible with the specific flood characteristics and risk applicable to the subject property.

[63] I accept and prefer the submission of Ms Nupuri that in his evidence Mr Dewar seeks to give inappropriate weight to documents that are neither environmental planning instruments, development control plans as defined by s 4.15(1) of the EPA Act or Council policies: Stockland Development Pty Ltd v Manly Council (2004) 136 LGERA 254; [2004] NSWLEC 472 at [8]. The documents to which Mr Dewar refers are informative of the flood characteristics, the intended response of emergency services and the risk of various flooding depths on the subject site. However, these documents do not fill the void or rise to the level of controls in a development control plan or environmental planning instrument.

[65] Applying the criteria listed at s 3.2 for performance-based assessment I am satisfied the proposed development is acceptable for the following reasons:

- *The Applicant has established, and the experts agree on, the flood hazard applicable to the subject site. I accept and prefer the evidence of Mr Wylie that the proposed development is compatible with the flood hazard on the basis that: firstly, the floor level of the dwelling is higher than the FPL; secondly, that the building is designed to withstand the characteristics of the flood (which is at low velocity) and finally; that the entire dwelling is a reliable area of refuge for residents. I note that in a 1%AEP flood event the depth of flooding expected is 0.3m which is classified by the Floodplain Manual as H1: Low Hazard. Further, in the annexed conditions the development will require certification from a structural engineer that the dwelling is structurally designed to withstand flood waters to the depth of the PMF and velocity of 05.m/s.*

- *There is no contention, or evidence in the proceedings, that the proposed development will affect flood behaviour or result in increased flood expectation of adjoining properties.*

- *The Flood Response Plan is responsive to the specific site and the flood characteristics of the subject site in the North Entrance Peninsula. If strictly complied with there is agreement in my view between the experts that there would be no risk to life from the proposed development as the finished floor level of the building is firstly above the flood level of the PMF and secondly the building is designed to withstand flood waters.*

- *There is no planning provision contained in DCP 2013 which provides guidance to an Applicant that shelter in place is a planning approach not supported by the Council. The period of isolation is expected to be approximately 12 hours. In my view the risk to life from occupants leaving during that time is minimal. Occupants who are located within a dwelling that is dry from ground level, with their possession safe, and in a structurally sound building able to resist flood flow forces and low inundation are in my assessment unlikely to seek to leave. Further, as a result of the conditions of consent they will have awareness of the Flood Response Plan.*

- *I am satisfied on the evidence that the development application incorporates appropriate measures to manage risk to life and property from flood. I accept there is a residual risk of occupants failing to comply with the Flood Response Plan. However, I am satisfied this risk is minimal, is mitigated by the following conditions of consent and is a risk that needs to be considered in the context of the long warning time (48 hours) of the specific flood events in this locality.*

The above case supports a submission that the ARR 2019 should be given primacy versus draft, untested or unadopted variations to ARR 2019. The case also confirms that it is reasonable to assume that residents will comply with the FERP noting that the detailed induction, training and maintenance regime ensures human factors have been considered. Where it is imposed as a condition of development consent that the FERP is to be implemented the proponent and the public are entitled to assume there will be compliance.

The IPC letter seeks that consideration be given to the non-zero probability of failure of flood gates. This has been considered including by setting occupation levels above the PMF and the maintenance, inspection and evacuation procedures in the FERP.

The Land and Environment Court has been satisfied with flood doors and contingencies for failure as per *Season Group Pty Ltd v Council of the City of Sydney* [2016] NSWLEC 1354 (24 August 2016) where Commissioner Tuor also had to address clause 7.15 of a LEP and noted *Sydney Development Control Plan 2012* (**DCP**), the NSW Floodplain Development Manual 2005 (**Flood Manual**), the Interim Floodplain Management Policy (**Flood Policy**), the Woolloomooloo Catchment Floodplain Risk Management Plan 2016 (**Risk Plan**) and the Woolloomooloo Flood Study (**Flood Study**) provide guidance as to the satisfaction of cl 7.15 of the LEP. The Commissioner concluded:

> *23.The experts disagree on the suitable flood planning level (FPL). In Mr Bewsher's opinion the FPL is the 1% Annual Exceedance Probability (AEP) for Stream Street (13.3m AHD). Whereas, Ms Colliers considers it is the 1% AEP plus 500mm (13.8m AHD) plus an allowance for climate change, which would equate to the Probable Maximum Flood (PMF) level of 14.1m AHD. The disagreement is based on whether the car park is a basement/below ground or above ground car park for the purpose of the Flood Policy. Regardless of this disagreement the experts accept that with the proposed mechanical measures such as the "Flood Panel Lift Door' (flood door) and treatment of openings, the car park would be flood proofed to the PMF. However, they disagree on whether the level of risk is acceptable due to the potential for failure of the flood door.*
>
> *24.Ms Collier acknowledged that for the car park to be exposed to flooding the flood door would need to firstly be in an open position (the default position of the door is closed);*

secondly, the flood door would need to fail; thirdly, the door would need to not be repaired; and fourthly, there would need to be a flood. She accepted that the probability of the combination of these events occurring is low but considered that the consequences would be high if they did occur. She was concerned that the door had not been certified to withstand the loads of flood waters and impacts in a PMF and had only been tested to 1.5m for water tightness. Furthermore, she considered that the location of the door sensor was accessible from a public place and could be damaged and that there is no statutory regime that would ensure the ongoing maintenance of the door and the sensor.

26.Mr Bewsher considered that the aim of the flooding policies is to reduce the flooding risk to an acceptable level and that the risk cannot be eliminated. The existing car park has no flood mitigation measures and is exposed to significant risk, which would be reduced by the proposal through the flood proofing of the car park to the PMF, the removal of commercial uses and the reduction in the number of cars as well as vehicle movements. He considered that the potential for failure of the flood door was minimal due to the backup measures such as automatic closure of the flood door to prevent it being opened in a flood. In addition, the conditions of consent requiring regular maintenance and the Emergency Response Plan (ERP) would further reduce risk to an acceptable level. He agreed that the flood door should be certified but considered that this could occur as a condition of consent, similar to the certification required for the structural adequacy of the building. Even if, in the unlikely event water were to access the car park, Mr Bewsher considered that it would be unlikely that people would be present due to measures such as the early warning systems, the restriction on lift access to the basement, signage and the occupants of the building being aware of the flood risk…..

34. The Flood Study identifies the flooding behaviour in Stream Street, including the speed and volume of flood that can occur. Mr Bewsher noted that the Flood Study is "conservative" as it assumes that 100% of the grates and 80% of the kerb inlets are blocked. However, the experts generally agreed on the flood characteristics of the area and the associated risks….

36. Guidance as to the satisfaction of cl 7.15 of the LEP is provided by documents including the Flood Manual which states that its primary objective is:

> *To reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods. At the same time the policy recognises the benefits flowing from the use, occupation and development of flood prone land.*
>
> *.... The policy avoids unnecessary sterilisation of flood prone land. Equally it ensures that flood prone land is not the subject of uncontrolled development inconsistent with its exposure to flooding….*

40.The key disagreement between the parties is whether 7.15(3)(a) and (c) of the LEP are satisfied. In particular, whether the proposed flood door is an appropriate measure to manage risk to life from the flood and consequently whether the proposal is compatible with the flood hazard of the land.

41.The management of risk and the compatibility with the flood hazard need to be considered within the context of not only the flood hazard but also the existing risk on the site and within the street….

44.Ms Collier, under cross examination, acknowledged that the probability of the flood door failing would be low and I accept the evidence of Mr Bewsher that the proposed flood door is an acceptable measure to minimise the flood risk to property and for occupants of the building. The measures that have been employed through the design of the flood door, its default shut position, the sensor and an early warning system reduce the potential for the flood water to enter the building. Furthermore, the additional door which is a different design and separate

power source provides an additional safeguard to ensure that the basement would be flood proof. The conditions of consent will provide a regime for maintenance of the flood door and include the requirement for an ERP to be prepared and implemented through a positive covenant on the title of the property. The ERP will require the Owners Corporation to enter into a service arrangement for repairs to all flood designed features of the building within 24 hours and for their ongoing maintenance.

45….. The proposal includes a range of measures that would limit the likelihood of people being present in the basement in the event of a flood including the early warning system, automatic closure of the flood door to ensue vehicles cannot enter or leave the basement, methods of egress from the basement and controls to prevent the lift from descending to the basement. In comparison to the existing arrangement, the proposal considerably reduces the risk.

46.The proposal therefore incorporates appropriate measures to manage risk to life from flood and is compatible with the flood hazard of the land given that it minimises the existing risk to an acceptable level. In accepting that the basement will be flood proofed to the PMF and that the flood door is unlikely to fail and the added security of the additional flood door, I note that there are other basement and at grade car parks and on street parking in Stream Street, and there is no signage or early warning system that would alert drivers or pedestrians not to use the street or the surrounding area in the event of a flood. Mr Bewsher has suggested that the sensor could also alert people to flooding in the street and thereby limit access. I accept that this measure would further improve risk to uses of the area and the development as would the provision of signage alerting people to the flooding hazard. A condition should therefore be included that requires the sensor to also activate an alarm system (flashing lights) on the exterior of the building in Stanley Lane and the entry to Stream Street to warn of flooding. A condition to this effect should therefore be included. Council may consider whether signage or other measures such as alarms on other buildings or parking restriction would further reduce the risk in the streets.

The draft FERP for this development includes, among other things, the following measures:

- Signs that will be activated when floodwaters are observed pooling at the intersection of Hassall Street and Harris Street. A sign will be installed at the entry to the driveway that will flash and indicate that the driveway and loading dock are closed whenever the flood gates at the southern end of the driveway are activated. There will also be a sign installed in the basement next to the exit driveway that will flash and indicate that the driveway is closed whenever these flood gates are activated.
- Flood signage is to be displayed throughout the building. The signage will indicate actions to take if the flood alarm sounds.
- The Building Manager or delegate will make an announcement over the public address system communicating that: ▪ Local streets may be flooding and evacuating off site would be unsafe; Everyone should stay inside the building; the basement car park has been closed and vehicles are not to leave the site and deliveries are not permitted
- The Building Manager and Flood Wardens will sweep the ground and basement floors, starting with the ground floor, clearing them to ensure that everyone has left these levels and turn off the electricity to the basement and ground floors.
- Once the Flood Wardens have cleared the ground floor the Building Manager or delegate will activate the internal flood barriers protecting the liftwells and stairwell
- The Building Manager or delegate will ensure notification of the flooding and closure is posted on the building's websites and social media pages.

If appropriate, a further restriction on lift access could be added to the FERP.

We consider that it is not reasonable nor practicable to require no risk as long as it is appropriately managed.

As per Commissioner Horton's decision *Kingdom Developments 5 Pty Ltd v Wollongong City Council* [2022] NSWLEC 1654 where he found at [100]:

> *(3) In respect of measures to minimise the risk to life and ensure the safe evacuation of people:*
>
> *(a) I do not accept the Respondent's argument that risk to life is not minimised because the proposed development is for residential development that will result in occupation of the site 24/7. Development of the sort proposed by the development application is permitted on the site, subject to the grant of consent. It is the measures taken to minimise the risk of life, and the safe evacuation of people, that is to be demonstrated by the development application.*
>
> *(b) The site has extensive enclosed areas that are positioned above the peak PMF level of 18m AHD, providing areas of refuge in the event of a PMF event, likely to be in the order of 3-4 hours in duration.*
>
> *(c) While a FERP is not in evidence, one is proposed. Furthermore, the features and elements of a FERP are identified by Mr Dhiacou at [81], and the preparation of a FERP is proposed in the conditions of consent, including a requirement for the FERP to form part of the Owners Corporation Building Management Manual.*
>
> *(d) I consider it reasonable that owners and occupiers of the proposed development will be familiar with the procedures contained in the FERP in respect of the communal open space, supported by signage in the communal open space.*
>
> *(e) With respect to the decision by the Commissioner in Zaki Property, I note that the use for which consent was sought in that case was a centre based childcare facility. I also note the Commissioner, at [92], observed that the FERP required "a large group of parents and lay carers to act in a certain way when the relevant flood events do occur [and] Irrational behaviour by some lay carers and parents in and around circumstances when the barrier comes down should be seen as a likely event...".*
>
> *(f) The circumstances in this case are different. Rather than a child care facility visited fleetingly by a large number of unrelated, non-resident users of a commercial facility, the FERP is for the information and action of residents of this site who can be expected to be familiar with a wide range of protocols applicable to shop top housing, including rules and procedures for use of communal open space, as is often the case in residential apartment development.*
>
> *(g) On this basis, I am satisfied that the proposed development will not adversely affect the safe occupation and efficient evacuation of people and incorporates appropriate measures to manage risk to life in the event of a flood .*

Unlike the situation mentioned in paragraph (e) above where irrational behaviour may occur, the risk of that occurring is much less for the residents of a single entity managed building that is not strata titled.

Yours faithfully

[redacted]

Penny Murray
Partner
Direct Line: [redacted]
Direct Fax: +61 2 8916 2000
Email: [redacted]

From:	Jason Goldsworthy
To:	Gabriel Wardenburg
Cc:	Caleb Ball; Lionel Puang
Subject:	Novus Build-to-Rent – 39-43 Hassall Street, Parramatta - IPC Request for Information
Date:	Wednesday, 6 March 2024 8:22:50 AM
Attachments:	image804744.png image970713.png

Hi Gabriel,

Confirming that we are **okay to accept a Condition of Development Consent** that commits Novus to design levels that preserve a Flood Planning Level of at least 0.5m above the IPC Independent Peer Reviewers 15% Blockage & Climate Change Scenario, including the basement crest and the other sources of water ingress as listed below **on the basis that the 1% AEP and PMF event levels are documented as 6.20m AHD (1% AEP) and 9.50m AHD (PMF) in the Conditions of Development Consent.**

Ingress points (noting all stated AHD levels include 0.5m freeboard):

1. Basement Ramp – equal to or greater than 6.92m AHD
2. Northern Western Fire Egress – equal to or greater than 6.79m AHD
3. Northern Lift Lobby Entry – equal to or greater than 6.79m AHD
4. Southern Fire Egress – equal to or greater than 6.91m AHD
5. Southern Lift Lobby Entry – equal to or greater than 6.91m AHD
6. Loading Dock Lift Entry – equal to or greater than 6.92m AHD

For clarity we already meet numbers two to six of the "Ingress Points" and working through a solution that satisfies number one – Basement Ramp. This will entail some redesign work (mainly limited to the Ground Floor and Level 1) however importantly we are confident that we can still satisfy Draft Condition B4 – *Prior to the issue of a Construction Certificate for above grounds, the Applicant must demonstrate to the Certifier that the ground floor ceiling of the retail areas provide a floor to ceiling height of 3.2m.* **This negates opening any further discussion with Council.**

We have gone through the Draft Conditions and highlight only two minor amendments (in yellow) that are required to **ensure clarity of the 1% AEP and PMF event levels:**

- Condition B5c – references PMF event inc. level
- Condition B5d – references 1% AEP event exc. level
- Condition B5i – references PMF event inc. level
- Condition B6 - references PMF event exc. level
- Condition E11 – references PMF event inc. level

For the benefit of everyone involved it would be great if it could be documented/acknowledge that the proposal is compliant with the applicable legislation and planning controls. These include the Parramatta Local Environment Plan 2011 (PLEP 2011), Parramatta Development Control Plan 2011 (PDCP 2011) and the Lower Parramatta River Floodplain Risk Management Study – Flood Study Review which is dated March 2005 (SKM, 2005a) (Council Flood Model 2005) as the applicable flood study.

Can you please confirm the process from here is the following:

- Draft Conditions amended/inserted to address the above.
- Architectural Plans before the IPC are stamped noting that they won't yet meet the amended Conditions of Development Consent.
- Novus goes away and prepares modified Architectural Plans (and any other supporting material) that seeks to satisfy the relevant Conditions of Development Consent.
    - Step 1: Architectural Plans (and any other supporting material) issued to DIP for endorsement (move to step 2 following endorsement).
    - Step 2: Architectural Plans (and any other supporting material) issued to DPIE for endorsement.
- DPIE confirms that Novus has satisfied the relevant Conditions of Development Consent and endorses the modified Architectural Plans (and any other supporting material).
- Endorsed Architectural Plans (and any other supporting material) then override the relevant previously stamped Architectural Plans as part of the original Development Consent via the IPC.

We have worked collaboratively for the last 24mths with all stakeholders (inc. Council) and we would like to avoid any further delays as such it would be greatly appreciated if you could work wrap up DPIE's response to the IPC this week – noting that we are ready to start construction immediately upon the Development Consent being received and a further delay may jeopardise this.

I will follow up with a phone call to clarify / ensure you have everything you need from us.

Thanks,

Jason

Jason Goldsworthy
Chief Development Officer

NOVUS

[redacted]

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