

Flood Risk Management Report for No. 2a Gregory Place, Harris Park

Summary

The Planning Secretary has issued their Environmental Assessment Requirements (SSD-31179510) for a concept proposal for an affordable housing and build-to-rent comprising approximately 483 dwellings within three freestanding four to eight storey buildings.

The key issues and relevant assessment requirements of the issued State Significant Development Guidelines are listed below:

Flooding Risk

- *Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual.*
- *Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.*

GRC Hydro Pty Ltd was engaged by the proponent to establish a 2D flood model to ascertain the existing conditions and proposed conditions due to the impact of the proposed development on flood behavior. This considered the relevant flood levels and flood hazards.

It was identified that a portion of the site is subject to indentation under a 5% AEP and a 1% AEP flood events. Modelling of the proposed development identified impacts both upstream and downstream due to lost flood storage.

Compensatory flood storage was incorporated under building C at the western end of the site which resulted in the proposed development having negligible impact on the flood behavior.

Evacuation during or prior to a PMF event has been considered and a Flood Emergency Response Plan has been established and annexed to this report.

The site is subject to PMF inundation from both Clay Cliff Creek and the Parramatta River, with evacuation routes cut by deep water. Refuge in place is considered appropriate.

The detailed design stages of the project will resolve the requirements for the structure to withstand flood impacts, occupant warning systems, sufficient refuge space above the PMF, appropriate signage and the like. The proposed concept does not preclude the incorporation of these requirements at a later and more appropriate stage of the design.

Introduction

It is proposed develop the site for affordable housing and build-to-rent comprising approximately 483 dwellings within three freestanding four to eight storey buildings.

The key issues and relevant assessment requirements of the issued State Significant Development Guidelines are listed below:

Flood Risk

- Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual.
- Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.

The site is located next to an open channel (Figure 1). The Channel drains to Parramatta River. The catchment area upstream of the site is some 245 ha (Figure 2). The catchment is approximately 3.5 km long. The site area is some 1.95ha.

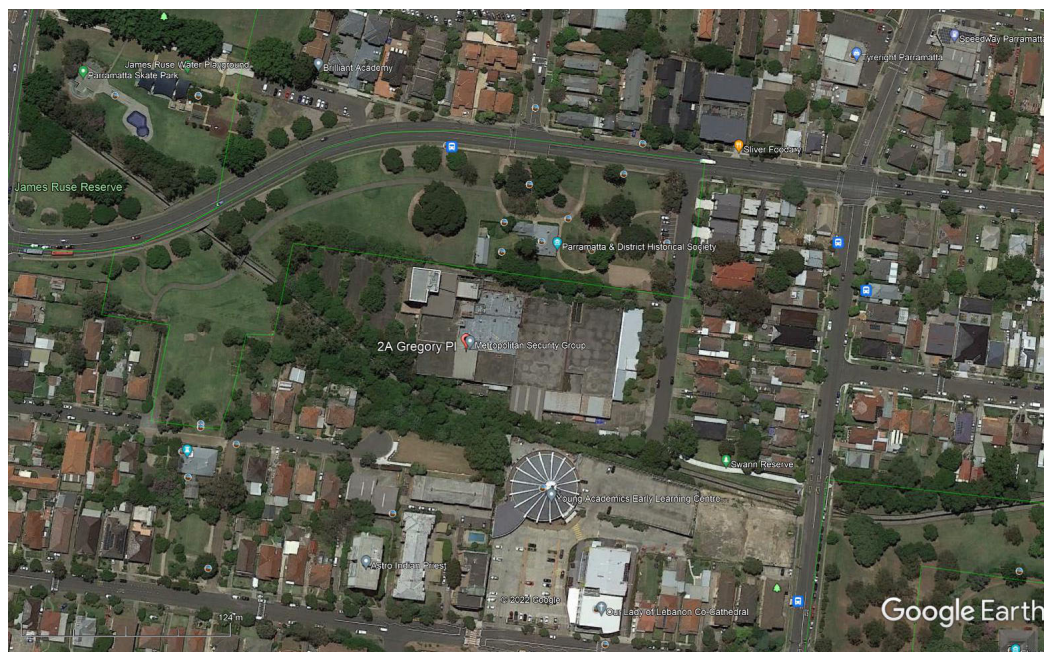


Figure 1, Location



Figure 2, Catchment Map

The owner engaged GRC Hydro to establish a 2D model for existing conditions and for proposed development in order to determine the relevant flood levels, the flood hazard and the impact of the proposed development on flood behavior.

The GRC Hydro report and results are given in Appendix B. Extracts from the document were per-used in this report.

Categorization of the Flood Risk

The subject site is inundated by the 1% AEP Flood with low hydraulic hazard and is classified to be located in a medium flood risk precinct. The extent of the 5% AEP and 1% AEP Floods are shown on Figures 3 and 4.

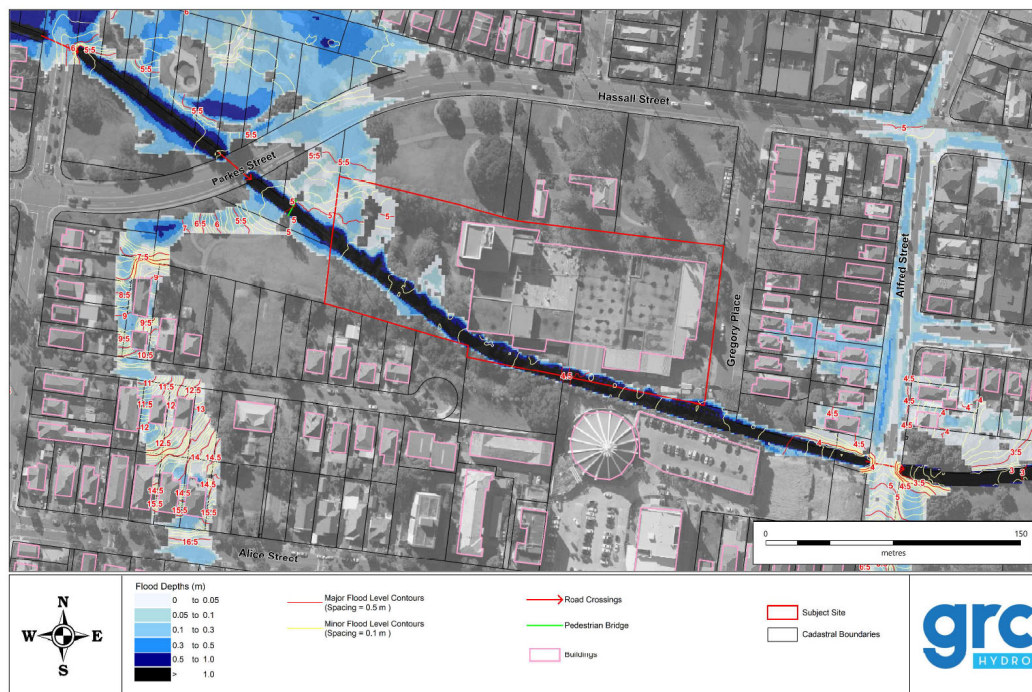


Figure 3, 5% AEP Flood, Existing Conditions

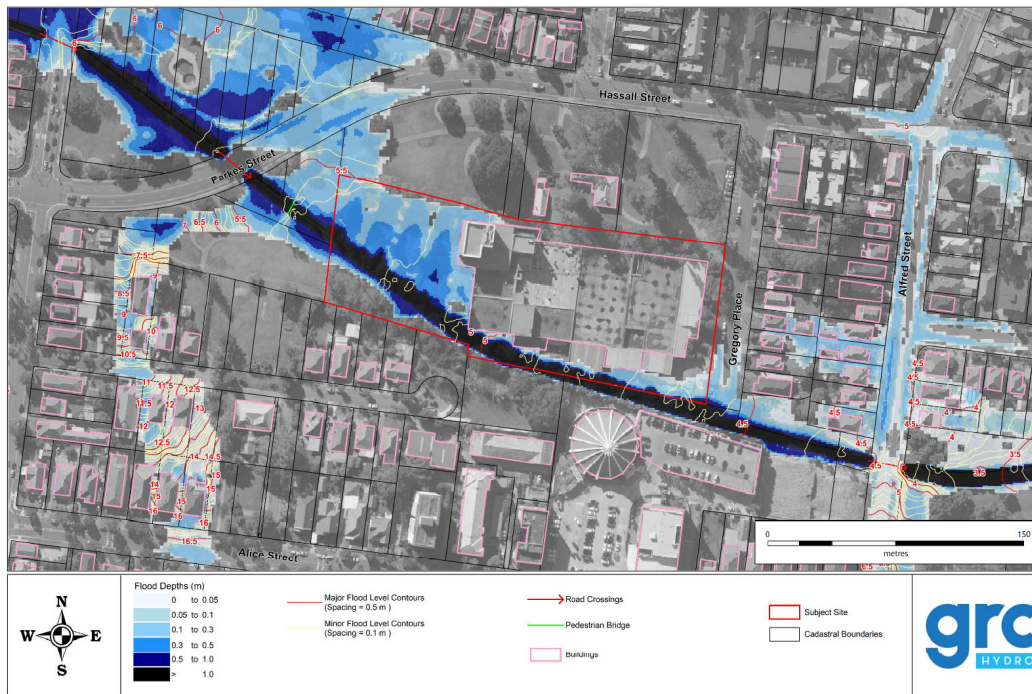


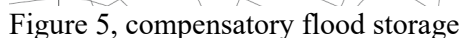
Figure 4, 1% AEP Flood, Existing Conditions

A small area at the North Western corner of the site is inundated by the 5% AEP flood. The inundated by the 5% AEP flood area will be maintained by the proposed development.

Floor Levels

The 1% AEP flood level at the North Western corner of the site is at RL 5.5 m AHD. The adopted floor level is 500 mm above the 1% AEP flood level or at RL 6.0 m AHD.

The initial modelling of the proposed development indicated some impact upstream and downstream of the site mostly due to the lost flood storage. Compensatory works were necessary to minimize the impact. It is proposed to provide an additional flood storage in the area of building C between the roof of the proposed carpark and the suspended slab of the building (Figure 5 and Drawing C-3709-01).



The areas of the highest increase in flood levels between 0.05 and 0.1m are within the site. The areas with moderate increase in flood levels between 0.02 and 0.05m is mostly within natural reserves. The remaining area is either no impact or a very small increase in flood levels between 0.01 to 0.02m.

It can be concluded that the proposed development would have negligible impact on flood behavior.

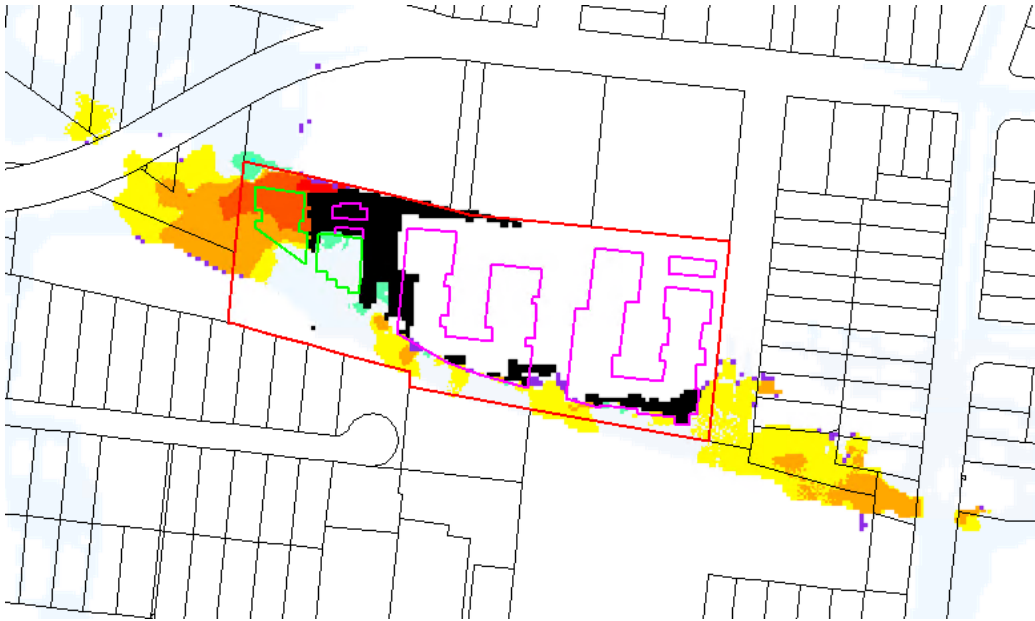


Figure 6, Impact of the proposed development on 1% AEP Flood level

	>=Value	<Value	Count		Color
	-10	-0.3	0	(0 %)	Blue
	-0.3	-0.2	0	(0 %)	Light Blue
	-0.2	-0.1	1	(0 %)	Cyan
	-0.1	-0.01	122	(0.27 %)	Green
	-0.01	0.01	43628	(95.08 %)	White
	0.01	0.02	1223	(2.67 %)	Yellow
	0.02	0.05	704	(1.53 %)	Orange
	0.05	0.1	189	(0.41 %)	Red-Orange
	0.1	10	19	(0.04 %)	Red

Figure 7, Legend

Evacuation

The PMF from Clay Cliff Creek would result in the site to be inundated with flood levels between 6 and 7 m AHD. However, the PMF levels driven by the flooding in Parramatta River are much higher. The Parramatta River PMF level is at RL 9.3 m AHD or some 3.3 m above the adopted floor level.

Evacuation to higher areas from the site would be risky during the PMF event because people would have to wade through a deep water. Evacuation from the site is not recommended. The residents from the ground floor would have to evacuate to first or second floor within the buildings during the extreme floods such as the PMF. A flood emergency response plan is given in Appendix A.

Building material

The proposed buildings must be constructed from flood compatible material up to the PMF level or RL 9.3 m AHD or higher. Concrete, bricks, cement render and hardwood can be considered as flood compatible materials.

Flood warning/signage

The occupants should not use the basements during extreme flood such as PMF. The basement areas would be protected from the 1% AEP flood, however these can get inundated during larger floods. A flood warning system will have to be installed to warn the residents not to use the basements in a case of a very large flood. The inundated street in front of the site should be used as a trigger to instigate the flood emergency response plan (Appendix A).



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Appendix A

Flood Emergency Response Plan

1. Floods in Harris Park are considered as “flash floods” and no warning system for this catchment is available. However the Bureau of Meteorology provides flood warning for Parramatta River. Storms leading to major flooding are typically 2 hours long, however shorter storms as little as a 10 minutes long can produce significant flooding. Once the storm passes floodwaters usually disappear rapidly.
2. During floods many local and major streets and roads will be cut by floodwaters. Travelling through floodwaters on foot, or in a vehicle can be very dangerous as the water may be polluted, obstructions can be hidden under the floodwaters, or you could be swept away. It is recommended to remain within the home as much as practical as this is the safest option. If you need to leave the home do so early in the flood event, before the flood level reaches the road level in front of the dwelling.
3. Develop your own family flood plan and be prepared if flooding should occur while children are coming home from school or when you are returning from work. Talk to the Council to determine the safer travel routes that are less likely to be cut by floodwaters.
4. Do not attempt to save the car if floodwaters start to enter the basement car park, it is too dangerous as water levels will rise rapidly and you could be trapped.
5. As the flood level approaches the carpark level (but only if safe to do so) relocate any items that may be damaged by water, or poisons, or wastes to as high a level as possible.
6. As the flood level approaches the habitable floor levels:
 - a. Gather medicines, special requirements for babies or the elderly, mobile phones, first aid kit, special papers and any valuables into one location,
 - b. Put on strong shoes, raise any items within home that may be damaged by water (e.g. photo albums to as high a level as possible, with electrical items on top. Turn off and disconnect any large electrical items such as TV that cannot be raised,
 - c. Place wet towels across the bottom and lower sides of external doors to slow down the entry of water through the door.
7. In the very rare event that floodwaters may enter the home move to the foyer of the first or the second floor within the building. The occupants of the remaining units should not evacuate the units unless instructed to do so by the SES or the Police. Remember floodwaters are much deeper and flow much faster outside.
8. In the case of a medical emergency ring 000 as normal, but explain about the flooding.
9. A laminated copy of this plan should be permanently attached (glued) on an inside cupboard door in the kitchen and laundry and to the inside electrical meter box.
10. This flood management plan should be reviewed every 5 years, particularly with the potential effects of Climate Change with sea level rise and increased rainfall intensities.

Appendix B

Flood Study by GRC Hydro