

26 August 2020

Anthony Williams WPP 60 Denison Street HAMILTON NSW 2305 Our ref: Your ref[.] 2219424

Dear Anthony

Proposed mixed use development - stormwater management Wests City – 309 King Street Newcastle

Further to our meeting and Councils request for additional information, we provide the following clarifications and attached drawings for the issues raised by Council.

Stormwater Management

The stormwater management system for the development consists of 4 management systems as follows:

- Roof water collection from non-trafficable roofs
- Roof drainage from trafficable roofs and podium areas
- 1:100 year ARI overflow drainage to open space
- Emergency overflow drainage to open space.

These systems are shown on the attached drawings and described below.

West and east metal Roof water collection

Roof water from the metal roof to the stair and lift over run in each tower will be collected into water tanks at that level. The water will be used for landscape and common area toilets. Overflow from this system is directed to the lower harvesting tank.

West Tower non-trafficable roof

Roof water is collected from this roof and directed to the rainwater harvesting tank on the ground floor. The water will be used for landscape and common area toilets and laundry. Overflow from this system is directed to the detention tank on the ground floor.

Total harvesting proposed is at least 75kL consisting of at least 5kL on each of the roof tops and 65kl at ground floor

Roof water in excess of the reuse system will overflow and be directed to the detention system with overflow from the detention tank to the street

Emergency overflow (EOF) will also be provided to the roof parapets to spill to open area in the case of any blockages.

Full detailed design of the hydraulic plumbing for the roof drainage will be carried out as part of detailed design for construction

Podium drainage.

Drainage from the east tower roof podium and the lower landscape podium areas to will be collected and drained via the detention tank on the ground floor. Overflow from the detention tank will be directed to discharge at grade.

Emergency overflow will also be provided in the facades of the upper podium areas for direct overflow to open space.

The ground floor landscape areas to the east of the building and in King Street at grade will drain via conventional pit and pipe system to the kerb inlet pit in King Street. Stormwater will be directed through GPT and jellyfish environment control devices prior to discharge. 1:100 yearARI storm events will overflow from these at grade areas to the street.

Ground floor and basement parking drainage

Rainwater from these areas will be collected and drained to the basement B2.

The water will be directed to a collection tank and then and then pumped via the GPT and jellyfish environment control devices to the kerb inlet pit in king street.

Stormwater harvesting.

Harvesting tanks at the roof and the ground floor is provided to collect 75kL of rainwater.

Stormwater detention

The existing site is fully impervious and the proposed development will include up to 2190m2 of landscaped areas. As such, runoff will be decreased post development.

Additional to the rainwater harvesting measure provided, detention of overflow from the roof harvesting and upper podiums will be provided. The capacity of the system will be 60m3 of detention to reduce peak runoff rom that currently experienced from the site.

Major overflow 1:100 year ARI event

Storms greater than the 1:100 ARI events will be directed to at grade overflow system for discharge to the street. This discharge will be to King and Bull streets as shown on the drawings.

Emergency overflow is also provided to open space from the roof tops, the upper level podiums and the ground floor landscape areas.

The final detailed design of these systems will be carried out in conjunction with the hydraulic engineer during detailed design of the project to meet these stormwater management requirements.

For clarity, we provide response to the dot points raised by Council below:

Council RFI Item	GHD Response
Stormwater	
The landscape diagrams (DA520, page 94) indicate that the development proposes total landscaping of 2,190 sq.m which equates to 33% of the site area. The total rainfall depth storage requirement for the development in accordance with the DCP Element 7.06 works out to be 16.75mm i.e. 74.38m3 i.e. 74.38KL for 4,441m2 of the impervious area. The total rainwater storage of 40KL for the development is 34KL short of the DCP compliance.	Additional stormwater harvesting storage has been added to meet the 75kL requirement. This includes 5kL on each of the roof tops and 65kL at ground floor
The DCP Element 7.06.02 (c) (i) states that "for large scale development it will be necessary to undertake a more rigorous hydrologic and hydraulic assessment to	The existing site is full impervious and the proposed development will introduce landscaping to reduce runoff.
demonstrate that the flooding and runoff regimes are being satisfied in accordance with Council's requirements and the Stormwater and Water Efficiency for	Water harvesting will be provided from the non-trafficable roof areas and used for landscape watering, and common area toilets and washing machine taps.
not provided hydrological and hydraulic modelling. It is recommended that assessment using appropriate modelling is provided to demonstrate that DCP requirements are met for stormwater quantity and quality targets. Appropriate site discharge	The proposed stormwater systems provides collection and drainage to the street system for 1:20 ARI events. The existing site has stormwater runoff undetained including runoff direct from carpaking hardstand areas.
control mechanisms (reuse and retention) should be proposed and updated drainage plan to be submitted.	The post development stormwater management will collect and route stormwater runoff by detention provisions. All 1:20 year ARI runoff is directed via GPT and environmental controls to meet water

It is unclear how the rainwater tanks proposed on	quality requirements prior to discharging to the street drainage system. 1:100 ARI event runoff is collected and discharged to open space at grade.
roof will collect run-off from the roof platform	the roof to the plant and lift over-runs will drain into the tanks. Overflow will be connected to the main tank on the ground floor
It appears that the proposed rainwater tanks on roof and ground floor will solely be used for landscape watering. If correct, this in non-compliant to DCP and appropriate provisions should be made for reuse using toilet cisterns and washing machine taps.	Water reuse to common areas toilets cisterns and washing machine taps will be from the main havesting tank on the ground floor. The roof top tanks will service landscape areas and overflow to the main harvesting tank at the ground floor
It appears that the overflow from rainwater tanks on the roof will be directed into the ground floor rainwater tank. If correct, it is likely that the proposed UPVC DN150 pipe network on ground floor will be unable to cater for the overflow	The pipe system is designed for 1:20 year ARI (minor storm) events. The pipe sizing for these storms down through the building will form part of the hydraulic detailed design.
quantity and proposed 450x450 pits may surcharge. It should be noted that the DCP requires underground piped drainage, surface inlet pits, roof gutters and downpipes (the minor system) to be designed to cater for the 20-year ARI event without creating significant ponding or flows in trafficable areas. There should be designed provision for	The overflow from the roof rainwater tanks will be directed as an isolated system to the main harvesting tank. Overflow from the main harvesting tank is to open space at ground floor via the detention tank and the detention tank overflow.
overflows in extreme events (the major system) to convey stormwater to the discharge point of the site. In general, the design capacity of the major system should be the 100-year ARI event.	These overflow systems are provided as separate pipe and pit systems so as not to overload the 1:20 storm system. Overflow is to direct open space.
	Emergency overflow (EOF) to open space will also be provided via openings in roof and podium balustrades.
It appears that the 450x450 pit on the ground floor (RL 3.70) near the basement ramp is lower than the proposed GPT (RL 4.56). It is unclear how the stormwater run-off will be conveyed in this section.	The ground floor and basement floors drain to a collection tank at the lower basement level and then pumped to the site outlet. GPT and environmental controls are provided at the outlet prior to connecting to Councils system. Drawings have been revised to reflect this
It is likely that the proposed UPVC DN150 pipe from the GPT up to the existing kerb inlet pit on King	Pipe and pit sizes have been reviewed and the drawings updated

Street will be unable to cater for the overflow quantity. Pipe dimension to be reviewed.	
Plans to provide surface and invert levels of all proposed pits in the development.	Surface and invert levels have been provided on the updated drawings
Drainage plans to be provided for landscaped areas located on Levels 1, 4, 5 & 14.	Drainage plans have been provided for the landscaped areas
	The detailed design of the pipe system within the building will be carried out by hydraulic engineers as part of the plumbing detailed design for the building. This will include the re-use water collected and plumbing to appropriate common area toilets and laundry facilities.
Ausgrid	
Existing Electricity Easements A title search of the development site should be completed to check for existing electricity easements. If easements are present, Ausgrid must assess the proposed activity within the easement. Please direct the developer to Ausgrid's website, www.ausgrid.com.au to download our "Living with Electricity Easements" brochure.	Consultation has been carried out with Ausgrid including existing and proposed supply arrangements. The existing transformer will remain to service the adjacent club premises. Existing ventilation and operation of the transformer will remain and be integrated into the landscape areas to meet Ausgrid requirements. New transformers will be provided at the west of the site to serve the new development. This arrangement is shown on the architectural drawings.

Regards

Aparty

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