

**Our Reference: SY140363**

28/10/2020

Thompson Health Care P/L  
C/- Gartner Trovato Architects  
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Attention: Mr Sean Gartner

Dear Sean

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ENGINEERS  
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**Re: THC Mona Vale – 23-25 Bassett Street, Mona Vale  
Stormwater Management – Response to Council Water Quality RFIs**

This letter is prepared in response to the Northern Beaches Council's water management referral response dated 30.07.2020.

The use of filter cartridges for the development was unsupported by Council, with Council requesting one or more additional stormwater treatment methods to be incorporated into the design to apply water sensitive design to a greater degree. These requested additional stormwater treatment measures were outlined by Council as follows:

1. Vegetated swale device which could include swales, bio retention strips alongside roads/paths;
2. Reuse of rainwater tank internally for toilets and laundry to significantly increase reuse and reduce potable water demand; and/or
3. Incorporation of a roof garden, or green roof given the significant roof space available.

ACOR's response to the above request for additional stormwater treatment measures is as below;

1. Use of vegetated swales / bio retention / raingardens for this development is ineffective as most hardstand areas (roof area and driveway hardstand areas), being the source area of highest pollutant loads, cannot be drained into the vegetated devices due to the limited space available to drain these areas into vegetated treatment devices.

Notwithstanding the above, ACOR have updated the concept stormwater drainage design to incorporate 60sqm of vegetated swales into the available landscaped areas along the frontage to Bassett Street and the rear gardens.

The MUSIC treatment results from these vegetated devices have minimal effect on the overall water quality targets, as generally these vegetated swales are treating runoff from pervious areas with minimal source pollutant loads. This is due to gross pollutants and suspended solids from any small impervious areas such as footpaths in the rear gardens already being filtered and polished through pervious areas before further treatment by the vegetated swales. Thus, the treatment effectiveness of these swales is minimal.

We note that the roof area is the largest impervious catchment area which constitutes 57% of the total site area, is a major source of pollutant load. Due to the limited space in landscape areas and the location of downpipes, it is not possible to drain downpipes individually into the swales. Treatment of roof runoff by draining downpipes into a swale yields a minimal positive effect due to the higher surface runoff from the roof.

Flood study indicates that the site is inundated in a 100-year flood event, therefore using a centralised basin is not a viable solution for this site.

The design proposed that 70% of the roof to be connected to a 30kL rainwater tank, which is re-used for harvesting 1300sqm of external landscape area. The remaining 30% of the roof, which cannot be drained to the rainwater tank, is to connect to the filter cartridges pit.

2. Reuse of rainwater internally for laundry and toilets will require a high level of treatment, as it is an aged care facility with sensitive occupants. Recycled rainwater will require treatment to a Class A+ water quality for an aged care facility to minimise exposure of sensitive occupants to sources of bacteria. We note Council's hesitation previously expressed regarding the use of filter cartridges or other aspects which require ongoing maintenance, and thus it would be advisable to limit additional sources of maintenance for non-potable water treatment and risk exposure to residents.
3. Implementation of a green roof has been assessed within the project design team and has been determined as not applicable and unfeasible from Architectural grounds and has thus not been considered further.

The updated MUSIC water quality model incorporates a rainwater tank with external re-use, gross pollutant pit baskets, grass buffer strips, vegetated swales, and filter cartridges to achieve the desired water quality targets.

The proposed stormwater quality design incorporates 11 filter cartridges, 5 gross pollutant pit baskets, 60sqm of vegetated swales and a 30kL rainwater tank and achieves the following pollutant load reduction targets which satisfies Council water quality targets;

Gross Pollutants 100%

Total Suspended Solids 85%

Total Phosphorus 77%

Total Nitrogen 55%

Please do not hesitate to contact the undersigned should you wish to discuss further.

Yours faithfully,

**ACOR Consultants Pty Ltd**

A handwritten signature in blue ink, appearing to read 'Matthew Buttarelli'.

Matthew Buttarelli  
BEng BBus MIEAust  
Associate Senior Civil Engineer