

The University of Sydney
G12 Services Building
22 Codrington Street
DARLINGTON NSW 2008

Our Ref: 1508-0019 RPT01

18th November 2016

Attention: Lena Louangkhoth

**RE: USYD - DARLINGTON TERRACES MIXED USE BUILDING
ADDITIONS AND ALTERATIONS TO THE DARLINGTON ROAD
TERRACES AND PUBLIC DOMAIN IMPROVEMENTS
INTEGRATED WATER MANAGEMENT PLAN
86 and 87, 94 to 96, 98 to 119 and 121 to 131 Darlington Road, Darlington**

Dear Lena,

The project will incorporate rainwater re-use provisions, implement water reduction and energy savings measures and treat cooking and laundry trade waste water to a level acceptable to discharge to the Sydney Water Corporation sewer.

The existing University owned terrace dwellings are being refurbished and four new two, three and four storey buildings are being provided on the land between the terraces and Darlington Lane for student accommodation and education facilities. There are 38 existing terraces and these are already used as student accommodation. The sites are split into three separate properties called Building A, Buildings B and C and Building D. The Building A site includes terraces 121 to 131, Building B and C site includes terraces 98 to 119 and Building D site includes terraces, 94 to 96. It is proposed that the accommodation will provide for 337 beds and the building classification is primarily Class 3.

The buildings will require the following hydraulic services;

- Stormwater Drainage (within each Building)
- Sanitary Plumbing and Drainage
- Kitchen (Grease) Waste Plumbing and Drainage and Grease Arrestor Treatment Pits for Building A and Building B sites
- Potable Hot and Cold Water
- Non Potable Rainwater Re-use system for toilet flushing and irrigation water for Building A and Building B
- Fire Hydrant Service
- Roof Drainage
- Natural Gas Service
- Fire Sprinkler Service

Design standards will be Plumbing Code of Australia, AS3500 (drainage and water services), AS5601 (gas), AS2419 (hydrants), Building Code of Australia and The University of Sydney Design Standards.



Rainwater Re-use, Stormwater and Water Sensitive Urban Design (WSUD)

The roof water from Building A and Building B sites will be collected, conveyed and discharged into rainwater harvesting tanks serving Building A and Building B. Overflow from the roofwater tanks and ground surface water will discharge by gravity to the Onsite Detention Tanks for each lot as required by Sydney Water and discharged to the new stormwater drainage main extension located in Darlington Lane. The existing terrace roofs facing Darlington Road discharge to the kerb at Darlington Road as they currently drain.

Retained roofwater will be treated with gross filtration (Enviropod membranes), followed by fine filtration to submicron level and then UV sterilized prior to being reticulated as Non-potable Cold Water for sanitary flushing in Building A and Building B, and external hose taps for landscape irrigation in common areas.

Rainwater retention tanks have been sized based on the roof areas of the Buildings A and B allowing 0.05m³ of storage for every m² of roof area. Based on the building population WC use will be approximately 1270m³/year with roof area collection providing 1,273m³ of rainwater per year (1390.8mm average rainfall). The combined volume of the rainwater tanks is 65m³ that will provide 2.66 weeks storage of the weekly non potable water demand for toilet flushing. Rainwater tanks will also provide irrigation to the landscaped areas within the Building A, B & C development site.

Overflow from the roofwater tanks and ground surface water will discharge by gravity to the Onsite Detention Tanks for each lot as required by Sydney Water and discharged to the new stormwater drainage main extension located in Darlington Lane. Stormwater discharges from the on site detention tanks are being treated with Enviropod filters to achieve removal of gross pollutants (90%), nitrogen (45%), phosphorus (65%) and suspended solids (85%).

Water Services

Water supply to the buildings will be protected with RPZD backflow prevention to provide site containment and prevent backflow of contaminated water into the site's potable water supply. All water systems and supplies to major equipment to be metered to monitor water consumption.

Taps at basins and shower outlets will be low flow type and WC fixtures will be 3/4.5 litre flush type.

Hot Water Services

Hot water plant in Buildings A and B will be solar preheat systems with gas booster heating to reduce energy consumption for heating water. Solar contribution will be approximately 50% of overall hot water usage. Building C will have small instantaneous local hot water heater/s at point of use. Hot water plant in Building D and its associated terraces, will be a gas booster heating system. Hot water will be circulated by pumps through flow and return piping systems through the new buildings and existing terrace buildings to minimise water wastage associated with draining hot water dead leg branch pipes.

Sanitary Drainage

Due to the rainwater re-use system proposed for toilet flushing in Buildings A and B the sewage discharge will be higher than the potable water consumption. Based on Building A site having a population of 52 and Building B 75, the annual waste water discharge would be 2,912kL and 4,200 kL respectively while the annual potable water usage is expected to be



2,392 kL and 3,450 kL respectively. These figures show a 17.8% reduction in potable water usage due to the rainwater harvesting system.

Trade Waste Drainage

Grease arrestors are proposed for Buildings A and B to receive discharges from the Student Communal food preparation areas. Trade waste treatment will be Sydney Water Corporation approved grease arrestor pits sized to suit proposed cooking allowances.

Combined lint arrestor/cooling pits are proposed for Buildings A and B to receive discharges from the Student Communal laundry areas. Trade waste treatment will be Sydney Water Corporation approved arrestor pits sized to suit the washing discharges.

Yours faithfully,
L H O G R O U P P T Y L T D

A handwritten signature in black ink that reads "Michael Armitage". The signature is written in a cursive, flowing style.

Michael Armitage
Director