

ADVERTISED PLAN



MOUNT LILYDALE MERCY COLLEGE WATER SENSITIVE URBAN DESIGN ASSESSMENT

Stage 4 – Power Canteen & Staff offices

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1. Introduction

Brogue Consulting Engineers were engaged by Mercy Education Limited to undertake a water-sensitive urban design assessment of the proposed stage 4 development, which involves the expansion and refurbishment of the current building for the canteen and staff offices. This report aims to address the requirements of planning scheme clause 53.18 - Storm Water Management in Urban Development specifically from the new Stage 3 works.

This report had been based on the Cirillo Architects drawings issued 20/02/2024 and the Tract Consultants Landscape Town Planning Report issued 16/02/2024.

2. Objectives and Goals

The main objective of this report is to review the Stage 4 site drainage and its contributing catchment following the development of the Canteen & office Building and propose water-sensitive urban design measures to reduce the pollutants in accordance with best practice environmental management guidelines (BPEMG) as set out below by the Victorian stormwater committee (1999). This will be assessed through the use of the Melbourne Water STORM calculator to achieve a treatment rating of 100% or better.

Pollutant	Retention of typical urban annual load
Suspended Solids	80%
Total Nitrogen	45%
Total Phosphorus	45%
Gross Pollutants	70%

Table 2.1 Best Practice Environmental Management Guidelines (1999)

3. Site Summary

The proposed Stage 4 building at Mount Lilydale Mercy College will be a 2-storey building with a sub-floor level. The site is located at a high point within the surrounding area. The Stage 4 development additional catchment comprises the extension part of the building and the proposed paving surrounding the building and landscaped areas. Roof drainage for the existing structure is excluded from the development catchment and does not contribute to the stormwater discharge assessed in this report.

Catchment	Area (m ²)
Development Catchment Area	750 m ²
Extended Building Roof Footprint	375 m ²
Proposed impermeable Pavement Area	42 m ²
Landscape Area & Permeable surfaces	333 m ²

Table 3.1 Catchment area summary



Figure 3.1 Aerial imagery

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3.1 Site Layout

The new development is expected to be built over the existing landscaped batter next to the central driveway. The selected area of works is approximately 750sqm.

Refer to **Appendix 1** for site survey, layout and catchment.

4. WSUD Treatment

A desktop study of the existing and proposed site conditions was prepared for the purpose of this WSUD analysis. An assessment through Melbourne Water's STORM was undertaken to provide evidence of compliance with best practice environmental management guidelines.

4.1 Assumptions

The following assumptions for the development was considered:

- Up to 160 students are expected to be utilising the building and facilities in the post conditions per typical day.
- Stormwater runoff that develops from the northern decking will be treated by a grassed buffer strip prior to discharge into the stormwater drains.
- Roof runoff could be harvested into a rainwater tank for reuse in toilet flushing/irrigation purposes.

4.2 Treatment Types and Results

Below are the treatment recommendations and performance targets following the STORM assessment.

A minimum 5,000L rainwater tank shall be harvested from all new roofed areas of the building. This tank should be connected to the building for toilet flushing and irrigation. Down pipes connected to the tank are to be fitted with first flush devices diverted to buried drainage system to increase the quality of water stored for reuse.

In addition, the new timber decking will need to be formed such that runoff is drain via a minimum 3m² buffer strip (grassed surface) prior to its discharge into the stormwater point of discharge (drain).

This treatment will enable a STORM rating of 105% to be achieved, with a tank supply reliability of 70%.

Refer to **Appendix 2** for the Melbourne Water STORM summary.

4.3 Maintenance Plan

The below maintenance schedule should be used as a guide for rainwater tank maintenance. It is based on an average maintenance requirement for tanks in Victoria, and timings may need to be adjusted to suit specific site needs and assets. Regular inspections should be undertaken every 3 months, and the site manager should be responsible for all tank inspections and maintenance.

Tank Inlet

- Check that inlet is not blocked by accumulated debris.
- Remove all debris build up
- Attend to this between 1-3 months.

First Flush Devices and Filters

- Ensure device and filters are not blocked, and flow is not limited by litter/sediment accumulation.
- Remove all litter and sediment from the first flush devices. Flush out all sediment from valves.
- Attend to this between 1-3 months.

Tank Outlet

- Ensure outlet is not blocked by sediment or litter.
- Flush and clean tank outlets
- Attend to this between 1-3 months.

Pumps

- Check that water pressure is maintained as specified, and no leaking around pumps and equipment.
- Replace seals and leaks as need and clean all pumps per the pump specifications.
- Attend to this between 1-3 months.

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Roof/Gutters

- Check that no accumulated debris are in gutters, and discoloration and smells from tank water.
- Remove all debris and sediment buildup in the gutters.
- Attend to this between 3-6 months.

Tank

Check for tank defects and damage, and ensure sediment and sludge is not accumulated.

- Replace any defective or damaged tanks as needed. Remove sediment and debris and clean the tank interior as needed.
- Attend to this every 2-3 years.

5. Construction Measures

Construction activities can significantly pollute site run off with sediment and litter if improperly managed. This report outlines source control treatments for construction activities as outlined in the CSIRO Victorian Stormwater Committee best practice environmental management guidelines section 6.3. This is to be read in conjunction with the environmental management plan and site management plan.

5.1 Sediment Traps

Sediment traps to be installed on all pit inlets within the catchment area and any downstream pits that may reasonably be affected by construction works. Silt traps to be maintained weekly or after major or consistent rain falls.

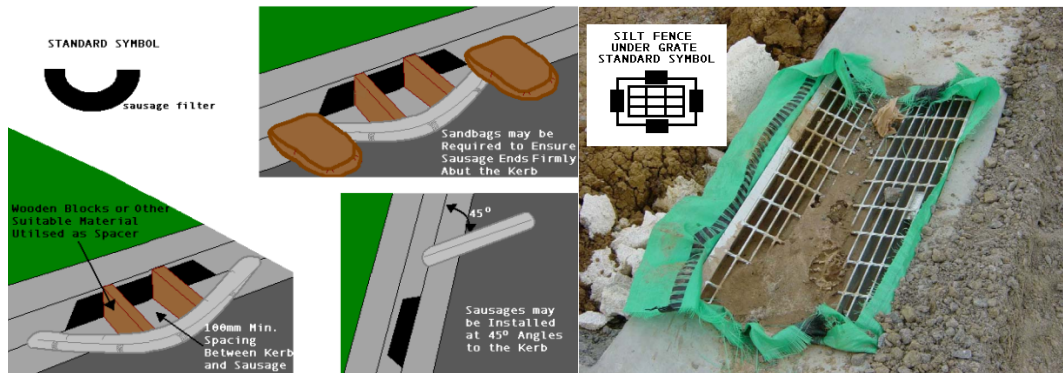


Figure 5.1A & 5.1B: Gravel sausage and under grate silt fence (EPA Victoria 2004, Publication 960 p.50/p.53)

5.2 Silt Fences

Geofabric lined silt fences are to be installed on the downhill side of the construction catchment. Refer to **Appendix 4** for silt fence layout.

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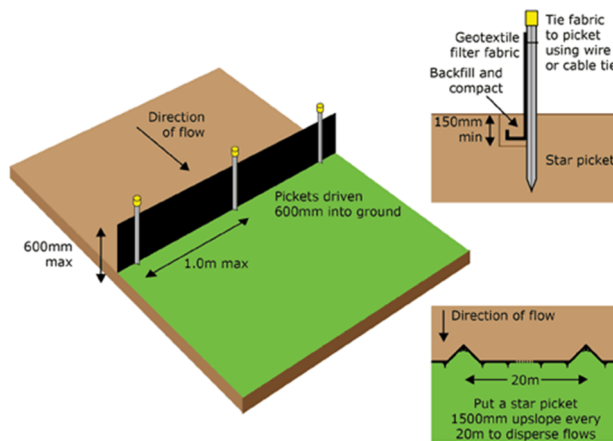


Figure 5.2: Silt fence (source: EPA Victoria 2004, Publication 960 p.30)

5.3 Stockpile Management

Long term material stockpiles or stockpiles on sloped land should be avoided where possible. Where stockpiles are necessary measures should be taken to ensure they are not within overland flow paths and silt fences should be installed on the downhill side to control sediment runoff. Long term stockpiles should be fitted with secured fabric or vegetated to prevent wind scouring.

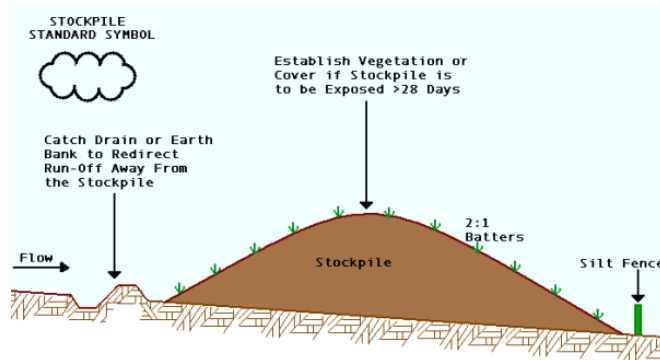


Figure 5.3: Stockpile protection (source: EPA Victoria 2004, Publication 960 p.25)

5.4 Litter Control

Bins should be placed regularly around the site and next to site offices and dining areas to ensure appropriate litter controls. Site cleanup should be undertaken and bins emptied daily to reduce litter ingress into the drainage system.

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Figure 5.4: Site bin (source: EPA Victoria 2004, Publication 960 p.84)

5.5 Vehicle Management

Where excessive mud is present vehicle and pavement washdown should be undertaken regularly to reduce exporting sediment from the site. Gravel or rumble grids should be installed on vehicle access routes for additional sediment removal from exiting vehicles.



Figure 5.5: Rumble grid (source: EPA Victoria 2004, Publication 960 p.63)

6. Conclusion

The proposed Stage 4 works will only require a minimum amount of stormwater management measures to ensure that pollutant reduction is compliant with the Victorian Stormwater Committee (1999) best practice environmental management guidelines.

The following are the recommend measures required at minimum:

- A 5,000L rainwater tank harvesting roof rainwater for regular reuse in toilet flushing and irrigation.
- A minimum 3m² buffer (grassed) strip for treating storm runoff form the timber decking structure.

In consideration of the proposed works, a suitable location for the rainwater tank could be under the landscape batter on the west. This would be coordinated with the services engineer and architect to ensure it can be plumbed to the toilets and irrigation system.

The application of the above measures will enable the selected development works to achieve a performance rating of 105%, well beyond the minimum target as set by the committee.

In addition, it is recommended that the appointed Contractor ensure that property erosion and sediment control measures are set up and operated during the works, including the installation of sediment traps on stormwater pits, silt fences and rumble grids alongside proper litter, and stockpile management to reduce the construction impacts to the catchments discharge pollutant levels.

With the combination of temporary and long-term management strategies, the development of the new building will comply with the requirements set out in planning scheme clause 53.18, CSIRO Victorian Stormwater Committee best practice environmental management guidelines and will minimize impacts on local waterways.

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APPENDIX 1.0 - FEATURE AND SERVICES SURVEY PLAN



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- LEGEND**
- UNDERGROUND COMMUNICATIONS
 - UNDERGROUND ELECTRICITY
 - UNDERGROUND WATER
 - UNDERGROUND GAS

- NOTES**
1. THE TITLE BOUNDARIES SHOWN ON THIS PLAN HAVE NOT BEEN DETERMINED BY THIS SURVEY. THE LOCATION OF THOSE BOUNDARIES SHOULD NOT BE RELIED UPON FOR ANY PURPOSE UNLESS THEY ARE VERIFIED BY A TITLE RE-ESTABLISHMENT SURVEY CARRIED OUT UNDER THE DIRECTION OF A LICENSED SURVEYOR.
 2. THE LOCATION OF SURFACE PITS, VALVE COVERS, ETC. SHOWN HEREON HAVE BEEN DETERMINED BY THIS SURVEY.
 3. THE LOCATION AND DEPTH OF ALL SERVICES ARE NOT GUARANTEED TO HAVE BEEN IDENTIFIED WITHIN THE SURVEY. UNDERGROUND SERVICE DETECTION WAS COMPLETED BY ENVIRONMENTAL LOCATION SYSTEMS PTY LTD ON 23 OCTOBER 2023. ALL EXCAVATION WITHIN CLOSE PROXIMITY TO UNDERGROUND SERVICES MUST BE UNDERTAKEN BY HAND TO EXPOSE ACCURATE LOCATION AND DEPTH.
 4. LEVELS SHOWN THUS Ⓜ ARE IN METRES TO THE AUSTRALIAN HEIGHT DATUM.
 5. DATUM FOR LEVELS BEING YERING PM 77 (RL: 112.549AHD).
 6. SEE MILLAR MERRIGAN PLAN 12316MASTER1_V10 FOR FURTHER DETAIL OF ABOVE GROUND FEATURES.
 7. MILLAR & MERRIGAN PTY. LTD. ACCEPT NO RESPONSIBILITY FOR ANY MANIPULATION OF THE DIGITAL INFORMATION ASSOCIATED WITH THIS PLAN BY OTHERS.

APPENDIX 1.0 - FEATURE AND SERVICES SURVEY PLAN

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Initials	Date
Surveyed	SC/MF 23.10.2023
Drafted	DT 30.10.2023
Checked	CS 01.11.2023
Amended	CS 22.11.2023

FINAL PLAN

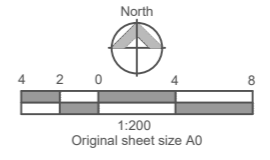
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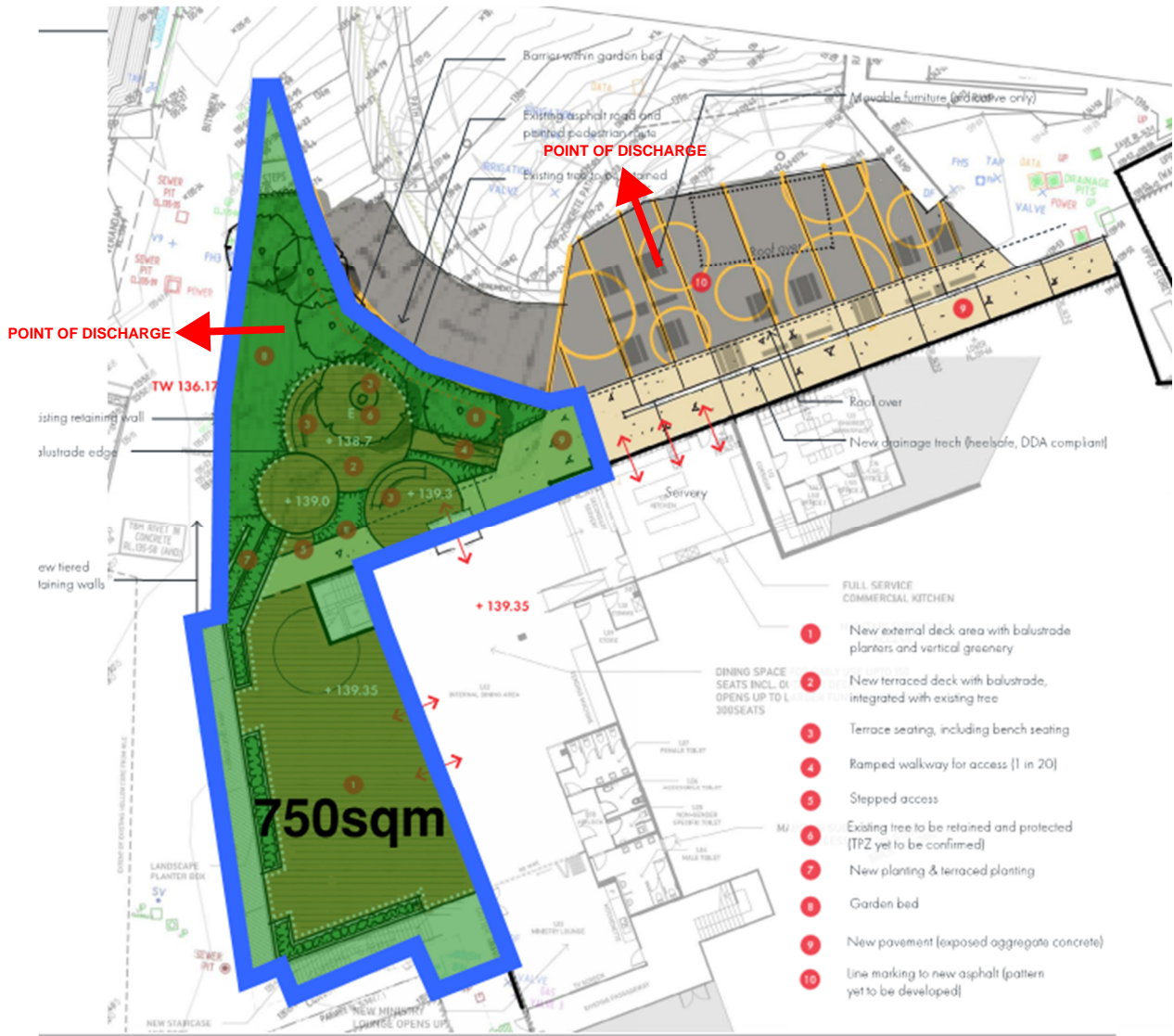
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UNDERGROUND SERVICES PLAN
 MOUNT LILYDALE COLLEGE
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 YARRA RANGES COUNCIL

12316UG1
 VERSION 2
 SHEET 1 OF 2

APPENDIX 2.0 – CATCHMENT PLAN



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STORM Rating Report

TransactionID: 0
Municipality: YARRA RANGES
Rainfall Station: YARRA RANGES
Address: 120 YARRA RANGES

LILYDALE
VIC 3140

Assessor: BROGUE
Development Type: Other
Allotment Site (m2): 750.00
STORM Rating %: 114

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
ROOF	375.00	Rainwater Tank	5,000.00	80	119.50	70.00
OTHERS	42.00	Buffer Strip	3.00	0	66.00	0.00

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