Water Sensitive Urban Design

10 Denver Drive, Portarlington

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Document History

Version	Date	Status	Author	Approved
0	09/02/2026	First Issue	YL	DM
1	10/02/2026	Updated report as drawing updated	YL	DM
2	17/04/2026	Updated report as drawing updated	YL	DM

Introduction & Council's Requirements

Melbourne Sustainability Consultants has been commissioned to provide guidance on achieving stormwater quality objective for the proposed development located at 10 Denver Drive, Portarlington.

The assessment is being carried out in compliance with Greater Geelong City Council's requirements specifically addressing the stormwater quality part of Planning Policy Clause 55.05-1 Standard B5-1 *Permeability and Stormwater Management Objective*.

Clause 55.05-1 Standard B5-1 outlines the following objectives:

- To meet the best practice water quality performance objectives for stormwater quality specified in the Urban stormwater management guidance (EPA Publication 1739.1, 2021):
    - Suspended Solids - 80% retention of typical urban annual load
    - Total Nitrogen - 45% retention of typical urban annual load
    - Total Phosphorus - 45% retention of typical urban annual load
    - Litter - 70% reduction of typical urban annual load
- To encourage stormwater management that maximises the retention and reuse of stormwater.
- To encourage development that reduces the impact of stormwater on the drainage system and filters sediment and waste from stormwater prior to discharge from the site.
- To encourage stormwater management that contributes to cooling, local habitat improvements and provision of attractive and enjoyable spaces.

Site & Proposed Development Description

The 636m^2 site is located at 10 Denver Drive, Portarlington within Greater Geelong local authority. The site currently contains residential housing as shown in the image below:

Figure 1: Site location and surroundings sourced from Google Maps

The proposed development is comprised of five townhouses (2 x 4-Bedroom). Each dwelling is proposed to have access to a private driveway/. Each unit will have access to a garage.

WSUD Assessment Tool

BLUE FACTOR

The BLUE FACTOR calculator is a tool developed by The Department of Energy, Environment and Climate Action (DEECA) and Microburst Software to assist with the design and assessment of stormwater management systems. The calculator enables users to determine the effectiveness of stormwater treatment measures in removing pollutants from stormwater runoff, thereby protecting waterways and aquatic ecosystems. Blue Factor is the successor to STORM and can already be used to replace it as an accepted tool.

The BLUE FACTOR assessment can be found in Section 3 of this report.

Summary of Initiatives

Initiatives listed below should be reflected on TP drawings either graphically on the plan (e.g. bike spaces, RWT etc.) or with a clear note. All WSUD initiatives listed in the report should be clearly noted on drawings including all areas diverting to the proposed treatment (e.g. RWT, raingarden etc.).

Category	Requirement
Stormwater	2,000L tanks for each unit collecting water from part of the roof of each unit – Water to be used for toilet flushing and laundry – Gutter guard, first-flush and filter installed for laundry reuse

1. Stormwater Quality Management Strategies & Site Demarcation

To achieve stormwater management objectives, it will be necessary to put in place stormwater treatment measures. The upcoming section outlines the surfaces that necessitate treatment and the specific treatment required. Effective management of stormwater flows in the building area will be crucial for the building's overall performance and its ability to meet stormwater management goals.

The development was evaluated using the BLUE FACTOR tool, a widely accepted tool in the industry, to verify compliance with the aforementioned best practice targets. To meet the required standards, the development must attain a minimum compliance score of 100%.

The total site area for the WSUD assessment is 636m^2. The following treatment will be implemented on-site:

Surface	Treatment	Area	Description
Roof Unit 1	Rainwater Tank	134.8m^2	Part of the roof runoff will be diverted into a 2,000L rainwater tank. The rainwater will be used for **toilet flushing and laundry**. Rainwater collection might require the implementation of a charged pipe system that cannot be running underneath the building footprint.
Roof Unit 2	Rainwater Tank	202.4m^2	Part of the roof runoff will be diverted into a 2,000L rainwater tank. The rainwater will be used for **toilet flushing and laundry**. Rainwater collection might require the implementation of a charged pipe system that cannot be running underneath the building footprint.
Permeable Areas	No treatment	160.5m^2	Part of the site will be designed as permeable. This will include landscaped areas.
Untreated Impervious Areas	No treatment	138.3m^2	Part of the site will be left untreated before being released at the legal point of discharge.

			This will include unconnected roof areas, pathways, untreated parts of driveways etc.

The development has prioritized maximizing permeable areas, resulting in decreased stormwater outflows from the site. Additionally, the proposed development includes vegetated areas, which not only reduces the heat island effect but also improves the local habitat.

2. WSUD Catchment Plan

Please refer to the next page for the full WSUD catchment plan including all treatment and areas included above.

3. WSUD Assessment Results

By identifying the impervious surfaces within the site and implementing treatments to mitigate the impacts of stormwater leaving the site, the proposed development has successfully fulfilled the objectives listed in the introduction.

All treatment measures and associated areas described above have been input into the BLUE FACTOR tool and the following results have been achieved:

Please note that mean annual runoff volume infiltrated cannot be achieved in Blue Factor since permeable areas (where water could infiltrate) are not considered in the calculation. Permeable areas are only input in catchment to demonstrated that all areas on site have been accounted for. This was confirmed by blue Factor developer.

Deemed-to-comply score has been achieved. TSS and litter have not achieved full compliance as it is difficult to achieve compliance with these requirements on these types of projects where TSS/Litter pollutant are already low. Reducing significantly the level of something that is already very low is complicated. This is in line with DEECA's position.

4. Proposed Treatment Typical Cross-Section

This section will include a typical cross-section of all WSUD treatments proposed in the development.

a. Rainwater Tanks

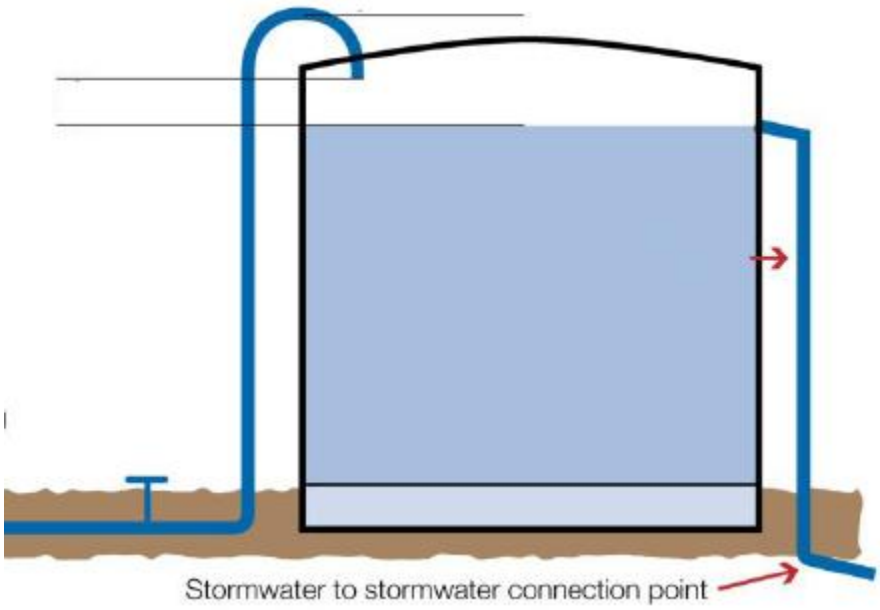
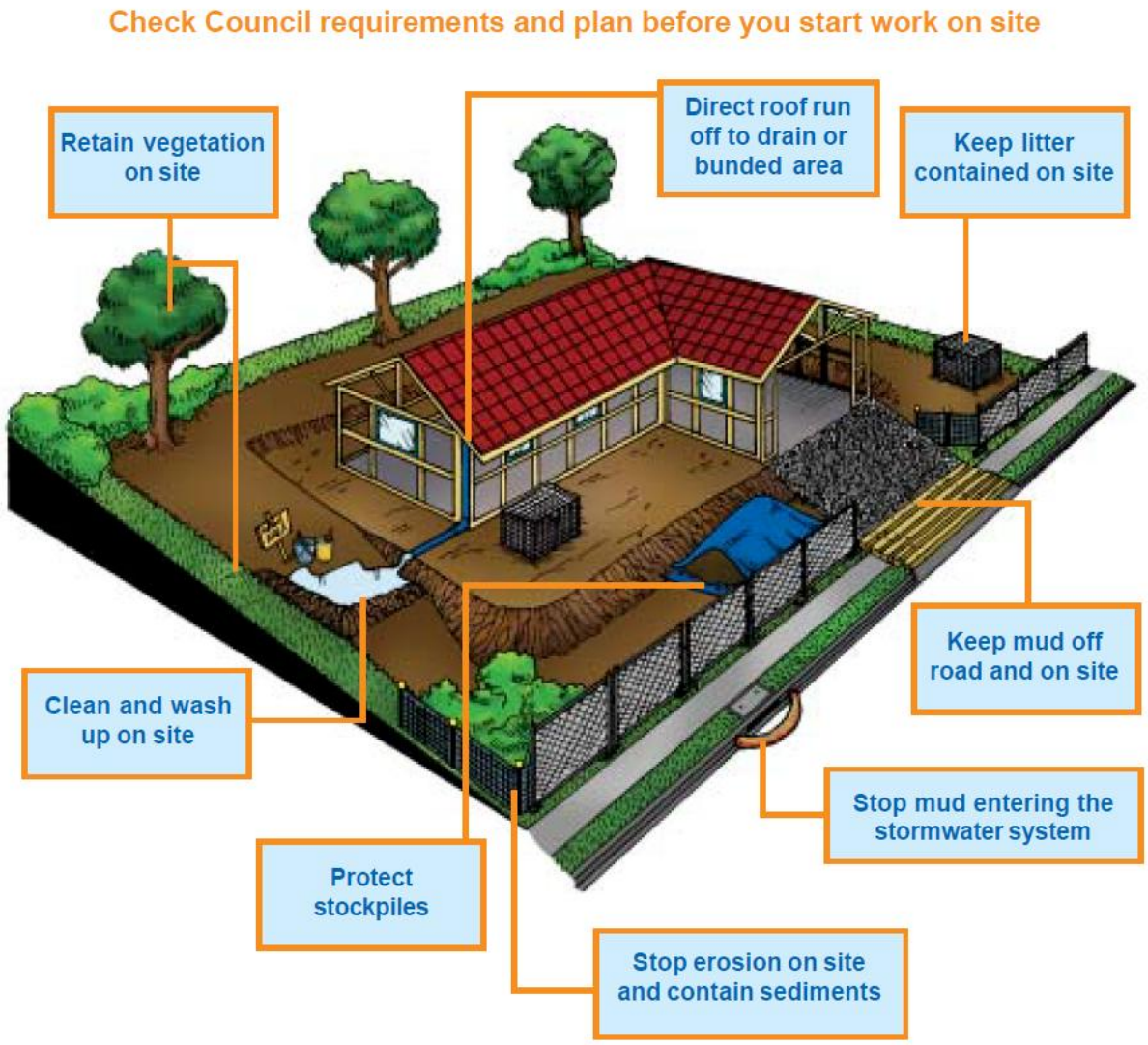


Figure 2: Typical Rainwater tank Cross-Section

5. Stormwater Management During Construction

To prevent contamination of stormwater discharge and to decrease the speed of flows produced during construction, steps will be taken to manage stormwater. These measures will involve establishing buffer strips and maintaining a clean site by removing loose rubbish. "Keeping Our Stormwater Clean - A Builder's Guide" by Melbourne Water provides additional information. The objectives depicted in the diagram below illustrate ways to minimise the effects of stormwater runoff during the construction phase.



Appendix 1 – WSUD Maintenance Manual

WSUD manuals are sourced from the City of Port Philip which has developed a detailed manual for the majority of treatment systems.