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14 October 2024

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Stormwater Quality and Quantity review for the proposed development at 8 Noonan Road, Ingleburn

1.0 Executive summary

Stellen consulting was engaged to complete and review of the proposed development at 8 Noonan Road, Ingleburn regarding stormwater water quantity, quality and flooding.

The development proposes transitioning from a motor vehicle repair station to a resource recovery facility for vehicle dismantling and scrap metal recycling and processing.

The proposed stormwater water quantity, quality and flooding is described in the documentation prepared by SLR, dated 23 August 2022. Includes key components aimed at ensuring compliance with local and state water management regulations. These components include roof drainage maintenance, surface water runoff collection, the installation of a 5,000L rainwater tank, dish drains, kerbs, and Oceanguard pit baskets for debris capture. Additionally, a precast concrete pit with advanced filtration (StormFilter cartridges) will be used to enhance water quality treatment.

Water quality modeling (MUSIC X) demonstrates that the proposed system exceeds Campbelltown City Council's pollutant reduction targets, achieving reductions of 87% for total suspended solids (TSS), 67% for total phosphorus (TP), and 49% for total nitrogen (TN). These measures are designed to meet regulatory requirements and improve stormwater treatment effectiveness.

The system’s success will depend on regular maintenance and monitoring to ensure ongoing compliance and adaptability to future site or regulatory changes.

2.0 Introduction

Stellen Consulting was engaged to address concerns raised by Campbelltown council (Council) in its letter dated 13/12/2023 (development application 1398/2023/DA-U) for the proposed development at 8 Noonan Road Campbelltown, concerning stormwater quantity.

This report provides a review of the proposed stormwater management system and recommends some modifications to achieve compliance with state planning and local authority regulations.

This report details the design of the proposed stormwater treatment system and its assessment per the relevant requirements of the Campbelltown Development Control Plan 2015 and Campbelltown Council's Engineering Design Guide for Development, Section 4.15 - Stormwater Quality.

3.0 Site Description

3.1 Existing Site

The site is located on Lot 25 DP 809258 (8 Noonan Road, Ingleburn NSW 2565) and has an area of 2,772m^2. The site is bordered by Bunbury Curran Creek to the south Easte and surrounded by industrial buildings/lots on all other sides. The land slopes downward from the western corner to the eastern corner. The Project Site is within the catchment of Bunbury Curran Creek, a tributary of the Georges River.

The site currently operates as a motor vehicle repair station with truck wash bay, the subject site is zoned as E4 General Industrial. The site features an existing brick industrial building with a metal awning at the rear.

Figure 1 – Existing site

3.2 Proposed Development

The development includes the addition of a new 252m² storage shed along the southeastern boundary of the site and the creation of new parking areas on the southern and western sides. The proposed development is shown in the attached architectural plans prepared by Smith + Tracey Architects (Appendix A).

4.0 Stormwater Quality

5.0 Performance requirements

The proposed stormwater system and quality improvement measures are in accordance with the relevant requirements of the following:

- Campbelltown (Sustainable City) Development Control Plan 2015 section 2.10 Water Cycle Management
- Campbelltown City Council Engineering Design for Development – June 2009 section 4.15 Stormwater Quality.

5.1 Existing Stormwater Infrastructure

The site features an existing easement on the eastern side, located between Noonan Close and Bunbury Curran Creek. The current stormwater system includes roof drainage connected to pits and the runoff characteristics include impervious areas that gently slope into pits located on the southwestern boundary of the site and one pit located at the entrance at the eastern corner that directs water towards the Noonan Road via a kerb outlet. There is a 4m wide drainage easement located along the northeastern side boundary of the site that traverses from Noonam Road to Bunbury Curran Creek. (refer to Survey Appendix B).

5.2 Water Quality and Runoff

Proposed Development Stormwater Infrastructure: Key Components

- **Roof Drainage Maintenance and Collection:** The existing roof drainage system will be maintained. Roof water runoff collected by gutters and downpipes will be piped to a proposed rainwater tank, ensuring efficient water capture and reuse.
- **Surface Water Runoff Collection:** Surface water runoff is currently collected via a series of existing surface pits. This runoff is directed to a boundary pit located at the southern boundary of the site via gravity. It is assumed that this pit is connected to the easement, facilitating proper water discharge.
- **Replacement of Boundary Pit:** The existing boundary pit will be replaced with an Oceanguard Pit Baskets (OCEAN GUARD BCC 2015) and Precast Concrete Pit with StormFilter Cartridges (690ZPG BCC 2015) for the stormwater treatment unit featuring a Class D lid. This upgrade will enhance the site's stormwater treatment capacity, ensuring compliance with environmental standards.
- **Driveway and Parking Area:** The driveway and parking areas are expected to generate runoff containing oils, greases, sediments, and trash. Surface water runoff from these areas will be collected via a series of surface pits and directed to a boundary pit. Oceanguard pit baskets will be installed in the pits to capture

debris and pollutants, while a precast concrete pit equipped with StormFilter cartridges will provide advanced filtration, ensuring that contaminants are removed before water is discharged.

- **Rainwater Tank Installation:** A 5,000L rainwater tank will be installed to meet everyday office water demands. This tank will provide a sustainable source of water for non-potable uses, reducing reliance on mains water and promoting water conservation.
- **Dish Drain Installation:** A dish drain will be installed to redirect runoff while maintaining trafficability. This component ensures that water is efficiently channelled away from trafficked areas, preventing waterlogging and maintaining site usability.
- **Kerb Installation:** A kerb will be constructed to channel runoff towards the existing stormwater pits. This will help in effectively managing surface water flow and reducing the risk of erosion and water damage.
- **Ocean guard Pit Baskets Installation:** Ocean guard 6 pit baskets will be installed in the existing stormwater pits as indicated in the stormwater plans. These baskets will capture debris and pollutants, improving the quality of water entering the stormwater system.
- **Precast Concrete Pit with Storm Filter Cartridges:** A precast concrete pit equipped with StormFilter cartridges will be located downstream of the measures. This advanced filtration system will further enhance water quality by removing fine particulates and other contaminants.
- **Assessment and Cleaning of Existing Structures:** While some stormwater pits and pipes may already exist on the project site, there is currently no available information on these structures. It is recommended that these existing structures be surveyed and cleaned to ensure proper flow and functionality. Once cleaned, the existing system can be integrated with the proposed stormwater management structures as needed.

5.3 Stormwater Quality Assessment

A number of Water-sensitive urban design (WSUD) measures are proposed to manage runoff from the site including:

- 3 Ocean Protect Psorb cartridges (690mm) contained within the precast pit at the boundary pit
- 6 pits basket (Ocean Guard by Ocean Protect)

Conceptual water quality modelling using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC X) was undertaken to estimate the effectiveness of the proposed stormwater management strategy at removing pollutants, particularly sediment, phosphorous and nitrogen, over the long term.

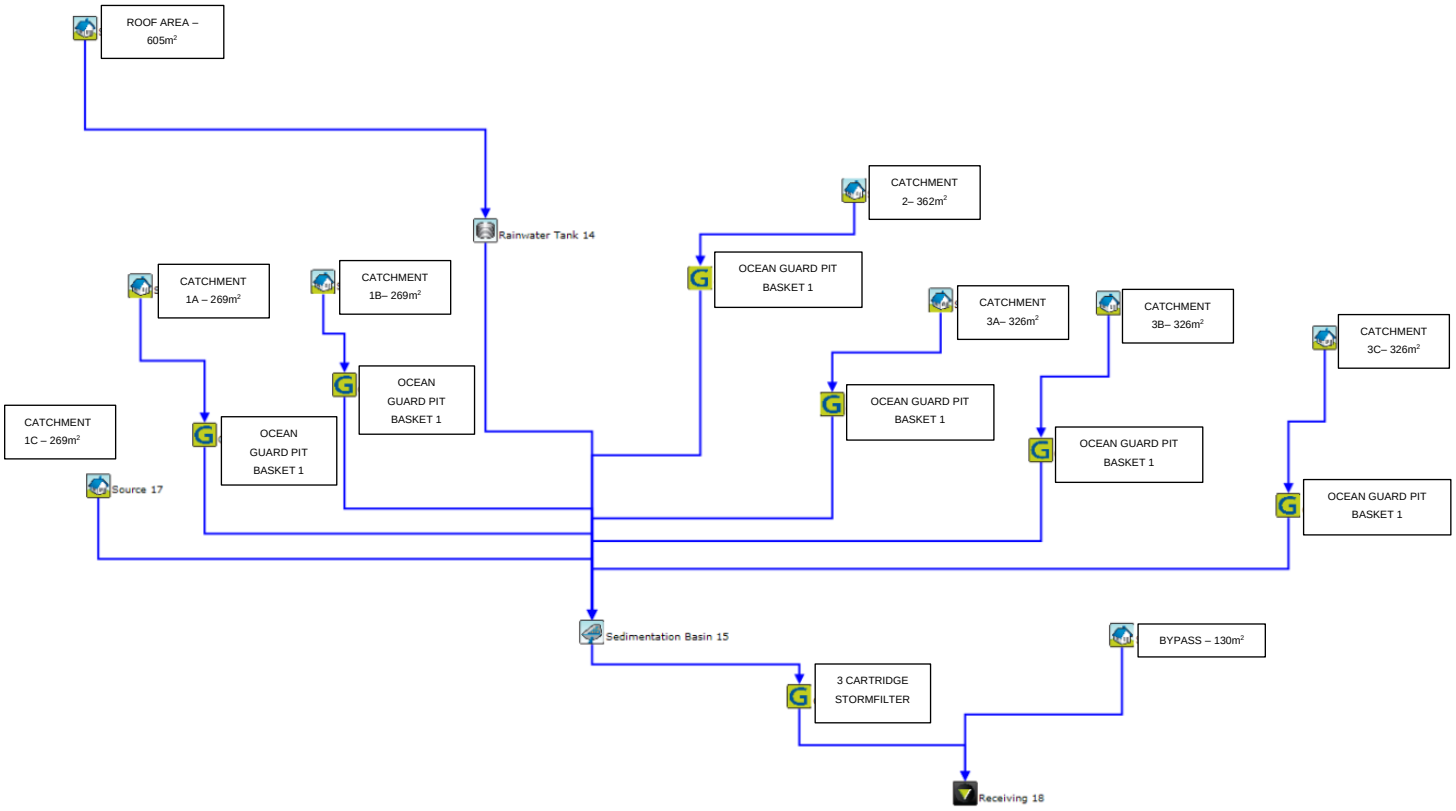
The model configuration and proposed treatment train are shown in Figure 3 below.

The water quality catchments for the roof and other areas were estimated based on the proposed stormwater management plan drawings listed in Appendix A.

The Water Quality Management Strategy design is required to meet the requirements of the Campbelltown City Council Engineering Design for Development – June 2009 section 4.15 Stormwater Quality.

Table 1: Comparison of Water Quality Objectives (Council DCP) and the proposed development

Pollutant	Load Reduction Target (Council DCP)	Load Reduction Achieved (Development)
Total Suspended Solids (TSS)	85%	87%
Total Phosphorus (TP)	65%	67%
Total Nitrogen (TN)	45%	49%
Gross Pollutants	95%	100%



	Sources		Residual Load		Percent Reduction	
	Generic Treatment 12	Generic Treatment 13	Generic Treatment 12	Generic Treatment 13	Generic Treatment 12	Generic Treatment 13
Flow (ML/yr)	0.206	2.04	0.206	1.902	0	6.786
Total Suspended Solids (kg/yr)	37.994	300.056	7.968	38.395	79.029	87.204
Total Phosphorus (kg/yr)	0.061	0.535	0.043	0.173	30	67.716
Total Nitrogen (kg/yr)	0.453	4.481	0.358	2.254	21	49.703
Gross Pollutants (kg/yr)	5.454	54.615	0	0	100	100

Figure 3 - Water Quality Management Strategy MUSIC Model Configuration

The MUSIC model results show that the proposed Water Quality Management Strategy provides a reduction in post-development loads of Total Suspended Solids, Total Phosphorous, Total Nitrogen and Gross Pollutants and meet the Council pollution reduction targets of 85%, 65%, 45% and 95% respectively.

6.0 Conclusions

The integration of a 5,000L rainwater tank, dish drains, kerbs, Oceanguard pit baskets, and a precast concrete pit with StormFilter cartridges collectively aims to enhance water capture, treatment, and reuse. The MUSIC model results showed that the proposed WSUD measures can meet the pollutant reduction targets set out by the Council. Continuous monitoring and maintenance of the stormwater management system will be essential to sustain these improvements and adapt to any future changes in site conditions or regulatory requirements.

Please contact me if you have any questions.

Kind regards,

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Civil Engineer

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Appendix A – Stormwater Management Plan

Stormwater Management Plan by Stellen Consulting dated July 2024