1-4 OLD BATHURST ROAD, EMU PLAINS

CONCEPT STORMWATER STRATEGY

PREPARED ON BEHALF OF Urbanco

PROJECT NO. 18326-A

DATE: 22 Jun 2022

+ SURVEYING
CIVIL ENGINEERING
PROJECT MANAGEMENT
SUPERINTENDENCY
WATER SERVICING COORDINATION

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REV	DESCRIPTION	AUTHOR	REVIEWER	DATE
A	Concept Storm Water Plan	T.K.	D.G.	22 Jun 2022

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1 INTRODUCTION

North Western Surveys has been commissioned by Urbanco to prepare a concept drainage strategy for the proposed re-zoning of Lot 1 in DP 1273251, 1-4 OLD BATHURST ROAD, EMU PLAINS (LGA Penrith City Council).

The concept proposes a below ground OSD storage system if required when further analysis of the downstream receiving system is undertaken. A WSUD system to achieve councils stormwater quality targets.

1.1 Scope of Work

This report addresses these objectives and controls by providing:

- Concept stormwater plan of the lot set into the existing surrounding details;
- Concept section demonstrating potential discharge to existing receiving system;
- Preliminary OSD storage calculation; and
- Concept WSUD solution;

2 SITE DESCRIPTION

2.1 Existing Property

The subject site is located approximately 2km north of the intersection of Great Western Hwy A44 and the M4 Motorway (see Figure 2.1).

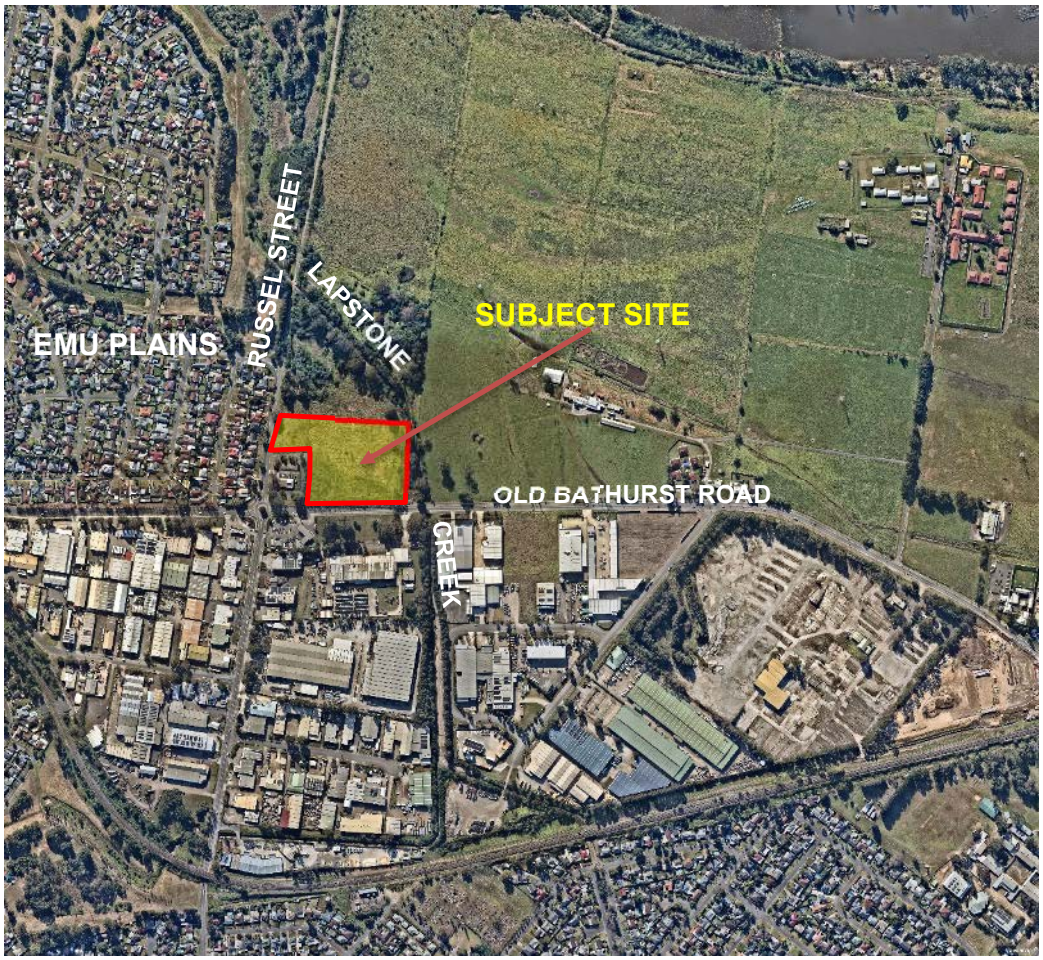


Figure 2.1 - Site Locality Plan

The property is predominantly vegetated with a grassed field in the northern part and dense trees in the southern part. The property is located adjacent to a crest on Old Bathurst Road and generally drains to the north to Lapstone Creek.

3 STORMWATER QUANTITY MANAGEMENT

3.1 General

Any development will produce a change in the land use and therefore result in a general increase in runoff. This is mainly due to an increase in impervious areas such as concrete from new roads and retail/industrial areas as well as roofs and driveways. This net increase will need to be addressed during detailed design and construction in order to adhere to Council guidelines which require the development maintaining the existing "natural" hydrological regime under ultimate catchment development condition or a non-worsening of flows.

Mitigation of this increase is undertaken by the design of a detention tank. The detention will also rely on the drains within the proposed road system to cater for rainfall runoff from the proposed site.

3.2 Catchment Areas

The existing catchment of the subject site is 2.08 hectares. The point of interest (POI) of the catchment, located to the north of the site (see Figure 3.1) will be used to generate maximum runoff ensuring downstream experiences no increase in runoff flows.

We note that upstream catchments bypass the site via existing drainage infrastructure.

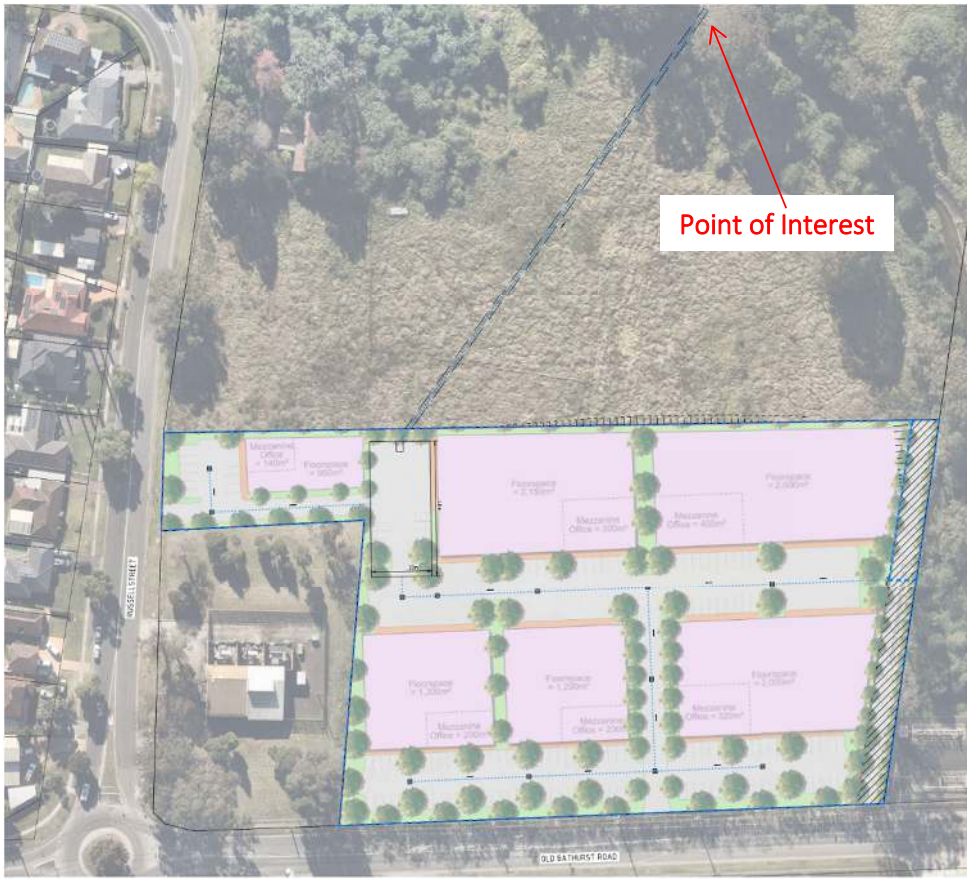


Figure 3.1 - Point of Interest Catchment Area

3.3 Pre and Post Development Hydrology

3.3.1 General

The requirement for the provision of OSD for this development will be based on an assessment of the impact of the proposed development works on the downstream peak flows and flood levels. As part of the concept design of the proposed works, a hydrological anlysis will be undertaken to determine if the post-development run-off flows will have a negative impact downstream.

Given the proximity of the site to the downstream creek and the proposed stormwater will connect directly to the downstream creek, it is expected that the hydroloigcal analysis would demonstrate that the peak flows from the development site would arrive at the discharge location prior to the peak of the main channel flows. In this instance, any post-development runoff from the proposed development may have no negative impact on the downstream peak flows or flood levels in which case OSD would not be required.

In the absence of a detailed hydrological analysis, we have also considered the potential need for OSD in the instance that the post-development flows do have a negative impact on the dowmstream peak flows an flood levels. If OSD is required for the proposed development, the detention system can is to be located at the downstream end of this catchment and willl detain runoff and reduce the post-development peak flows to pre-development levels.

Compliance to Council's Water Sensitive Urban Design (WSUD) and On-site detention (OSD) requirements can be achieved through the provision of a below ground storage tank. Based on Penrith City Council's engineering guidelines, the sizing of OSD storage has been estimated utilising the simplified OSD method (Table 7 and 8 of Penrith City Council's Stormwater Drainage Guidelines for Building Developments). It is estimate that up to 5% of the development site may bypass the OSD system and as such a **PSD of 89.5L/s/ha** and an **SSR of 331m^3/ha** would be adopted. Based on the cathment are of 2.08ha, a total of approximately **690m^3** of storage will be required and as shown on the concept stormwater plan provided in Appendix A, this can be provided via an below ground tank approximately 20m x 40m x 0.9m deep.

3.4 Flooding

The site is shown in Council's documents to be within a flood-affected area. Flood affects will be mitigated by filling the site areas affected to above the 1% AEP local flood level and restoring an equal amount of flood storage removed. All buildings will have adequet freeboard as per council specifications.

4 STORMWATER QUALITY MANAGEMENT

4.1 Construction Phase

During the construction, and until site stabilization has been achieved, all measures shall be in accordance with Managing Urban Stormwater, Soils and Construction ('The Blue Book').

These measures include, but not limited to;

- Sediment fencing downslope of any construction and around stockpiles with no length of the exposed area being greater than 80 meters,
- Providing a temporary sediment basin until site stabilization is achieved,
- Site access points to be fitted with shakedown pads or similar,
- Areas to the site not disturbed to be cordoned off using parawebbing or similar,
- Drainage outlets to be fitted with temporary sediment fencing,
- Diversion mounds to divert clean runoff around the proposed disturbed areas,
- Upon completion of each work area within the site, exposed areas to be stabilized with measures suitable to the season, and
- Dust control measures during construction including reuse of sediment basin water on areas marked for stabilization.

4.2 Proposed Stormwater Quality Measures

The proposed system has been developed by incorporating a combination of rainwater tanks, litter baskets, bio-filtration and mechanical filteration. The proposed system has been developed to achieve Council's pollutant reduction targets by treating captured runoff prior to discharge to receiving system.

4.2.1 Rainwater Tanks

Rainwater re-use tanks will be installed to capture roof run-off, retain a significant proportion of rainfall falling on roof areas and will be connected to provide for toilet flushing and outdoor irrigation. Daily usage demand for re-use will be incorporated in the detailed moelling of the WSUD treatment train.

4.2.2 Litter Basket Pit Inserts

Litter basket pit inserts are provided as pre-treatment removing litter, debris and other pollutants. These pit insets, such as an OceanGuard (Ocean Protect) units can be provided in the inlet pits within the carpark and landscaping areas as appropriate.

4.2.3 Mechanical Filtration

Mechanical filtration is provided as tertiary treatment to capture nutrients and suspended solids. Filter cartridges such as Stormfilter (OceanProtexct) unitscan be installed within the below ground OSD tank or within a standalone tank.

5 CONCLUSION AND RECOMMENDATIONS

This report has been prepared in support of the re-zoning application at Lot 1 in DP 1273251, 1-4 OLD BATHURST ROAD, EMU PLAINS on behalf of our client Urbanco. The concept strategy outlines the required stormwater management measures for the subject lot.

Below ground OSD storage (if required) and water quality treatment systems will be implemented in accordance with councils water management guidelines.

The existing watercourse downstream of the site will not experience an increase in flows and the runoff is treated to industry standard with regards to water quality.

6 REFERENCES

Engineers Australia (1987), *Australian Rainfall and Runoff*, Volumes 1 & 2

Landcom (now UrbanGrowth NSW) (2004), *Managing Urban Stormwater, Soils and Construction ('The Blue Book')*, Volume 1, 4th Edition, March 2004

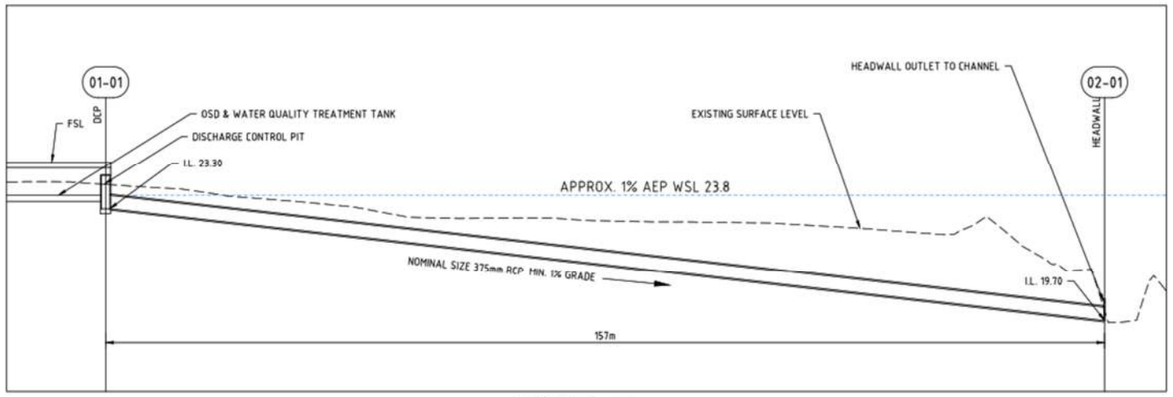
Penrith City Council (2014), *Penrith Development Control Plan 2014*

Penrith City Council (2016), *Stormwater Drainage Guidelines for Building Developments*

Penrith City Council (2013), *Design Guidelines for Engineering Works for Subdivisions and Developments*

Penrith City Council (2013), *Water Sensitive Urban Design (WSUD) Policy 2013*

Appendix A – Concept Stormwater Strategy



SECTION A
N.T.S.

LEGEND

- INLET PITS
- STORM WATER PIPE

PLAN REV.	DESCRIPTION	DATE	DESIGN	DRAFT	DESIGN CHECK	DRAFT CHECK
-	FOR INFORMATION ONLY	22/06/2022	T.K.	T.K.	-	-

HORIZONTAL SCALE (@A1): 1:500
0 5 10 15 20 25 30 35 40 45 50
SCALE 1:500 (A1) SCALE 1:1000 (A3)
VERTICAL SCALE (@A1): -

CLIENT/ PROJECT
-
-

SITE
LOT 1
DP 1273251
1-4 OLD BATHURST ROAD
EMU PLAINS
L.G.A. PENRITH CITY COUNCIL

NORTH WESTERN SURVEYS
LAND DEVELOPMENT CONSULTANTS
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TITLE
CONCEPT DRAINAGE PLAN

THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY

PROJECT MANAGER: GEORGE STOJANOVSKI
PLAN DATE: 22/06/2022
PLAN: -
PLAN REV: -
PROJECT REFERENCE: 18326