

WATER MANAGEMENT REPORT: 15 JUBILEE AVENUE, WARRIEWOOD - BUS DEPOT

Project No.00016108

Date: 13 August 2020

Prepared for:
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1. Introduction

1.1. Background Information

This Water Management Report accompanies the DA Civil Drawings developed by Lindsay Dynan Consulting Engineers Pty Ltd (LD), namely:

- 16108-LD-DR-C-1000_P01
- 16108-LD-DR-C-1100_P01
- 16108-LD-DR-C-1150_P01
- 16108-LD-DR-C-1200_P01
- 16108-LD-DR-C-1400_P01

1.2. Site Context

The proposed development address is 15 Jubilee Avenue, Warriewood (the Site) also known as Lot 202 DP1019363. The existing greenfield site covers an area of approximately 4560m² bordered by Jubilee Avenue along the northern boundary, industrial units along the western and southern boundaries, and a single residential dwelling along the eastern boundary. A generalised slope runs from northeast to southwest across the site, consisting mostly of short grass with some mild to dense vegetation in the southwest corner. Easements are located along the southern boundary, over an existing channel along the western boundary and over a sewer pipe that runs in a north-south direction through the site. The existing site is accessed via a single driveway access point along Jubilee Avenue. The location of the site is shown in Figure 1.

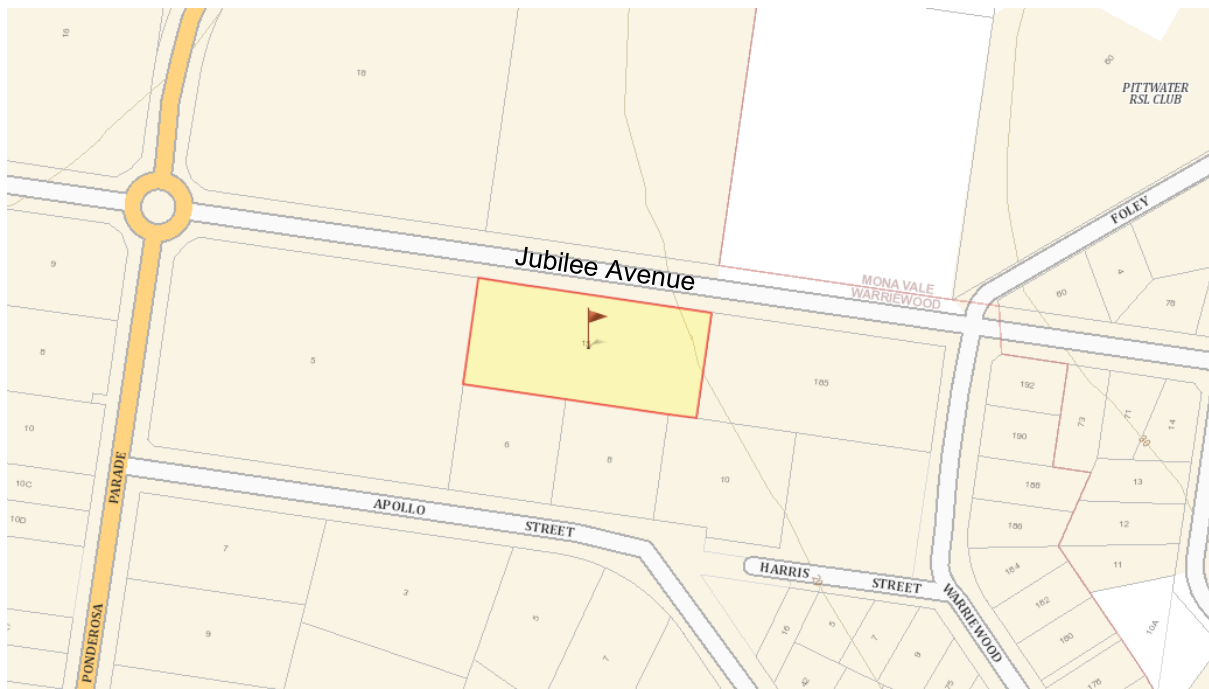


Figure 1 – Locality map (Source: <https://maps.six.nsw.gov.au/>, accessed 12/08/20).

1.3. Proposed Development

The proposed bus depot upon completion of all works will consist of new hardstand pavement with associated parking spaces, a small office building, landscaped areas, a bioretention basin, and a below ground on-site detention (OSD) tank.

1.4. Guidelines/Specifications

The design complies with the following guidelines/specifications:

- Pittwater 21 Development Control Plan
- Warriewood Valley Urban Land Release Water Management Specification (WMS)
- Relevant Australian Standards

1.5. Design Software

The following design software was used:

- Drainage Design: DRAINS Version 2020.033 – 8 April 2020
- CAD Drawings: AutoCAD 2020

2. Existing Flood Regime

This section should be read in conjunction with Lindsay Dynan's Flood Risk Management Report prepared for the proposed development.

Extracts taken the Ingleside, Elanora and Warriewood Overland Flow Flood Study depict the extent of flooding for the development site and surrounding areas for the events of 20% (Annual Exceedance Probability) up to the 1% AEP and Probable Maximum Flood (PMF) are presented below.



Figure 2 - 20% AEP Flood extent

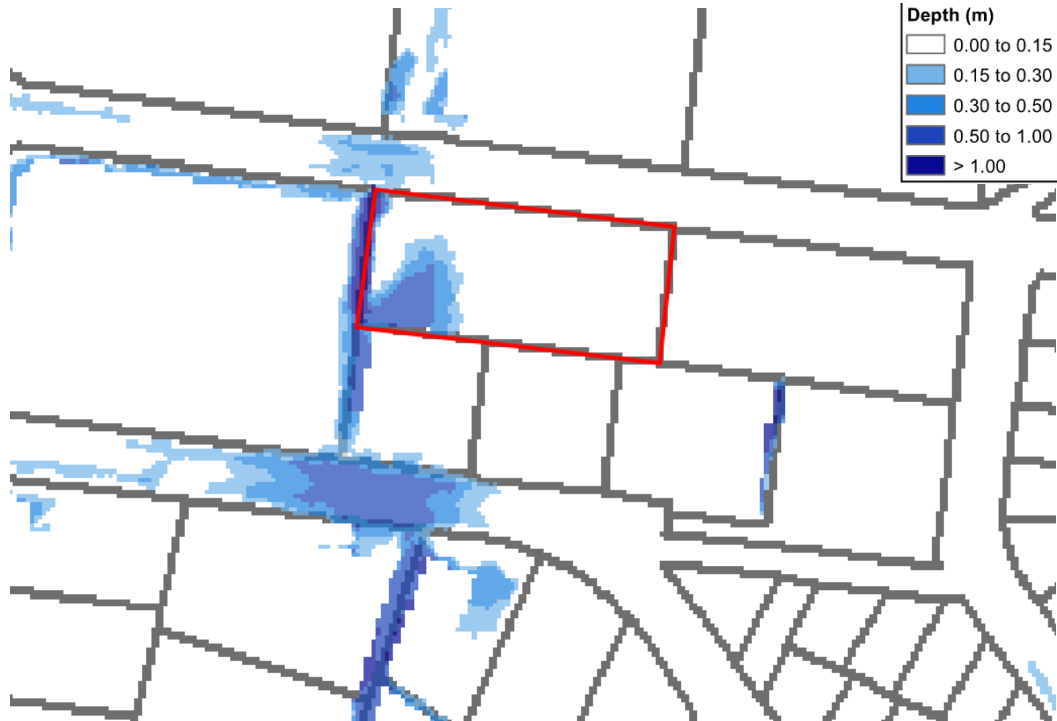


Figure 3 - 1% AEP Flood extent

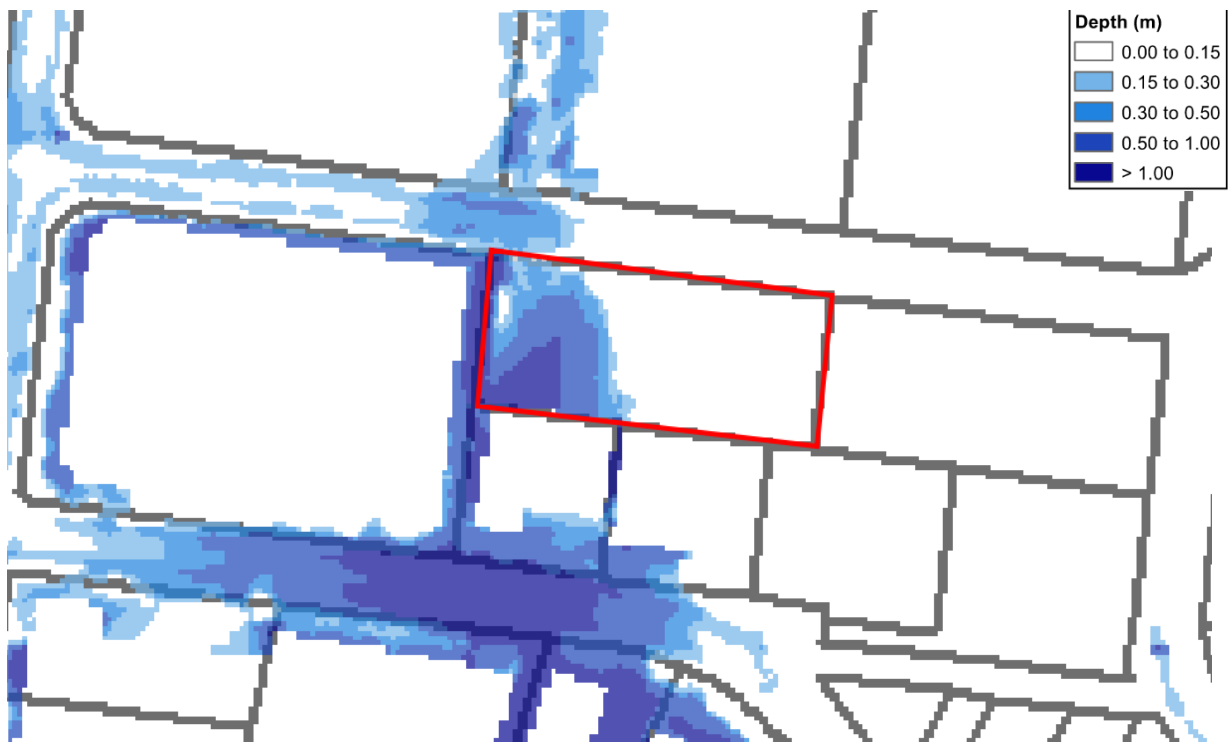


Figure 4 - PMF extent

The existing flood regime that exists on the site provides constraints when designing for both Water Sensitive Urban Design (WSUD) measures and On-site Detention (OSD).

Further to the available information from council's resources, Council have provided further advice on the flood specific levels identified for the site reported below.

- 1% Annual Exceedance Probability (AEP) existing flood levels applicable to the site are approximately:
 - North western corner of the site RL 17.86m AHD
 - South western corner of the site RL 17.90m AHD
- Probable Maximum Flood level RL 18.7m AHD

The 1% AEP flood extent is depicted on the Civil Work Plan (16108-LD-DR-C-1200_P01) as part of the DA drawing package prepared by Lindsay Dynan. It is proposed that the design levels within the 1% AEP flood extent will remain at or below existing levels to ensure there is no net loss of site flood storage in a 1% AEP flood event (refer to Flood Risk Management Report for further description).

3. Stormwater Quantity

In accordance with the Pittwater Council DCP controls, OSD is required for the proposed development. As mentioned above, the western portion of the site is affected by flooding in events from the 20% AEP up to the 1% AEP and PMF.

As a result, locating the OSD detention facility outside of the 1% AEP flood extent is proposed to ensure that area outside of the 1% AEP flood extent collected to conveyed through a controlled outlet. This design has been undertaken in accordance with section A7 – *Considerations for Area Affected by the 1% AEP Flood - Warriewood Valley Urban Land Release Water Management Specification (WMS)*.

An ILSAX DRAINS model was developed to assess the pre-development and post-development run-off and storage requirements. It should be noted that the area below the 1% AEP flood extent has been excluded from the model. A summary of the pre and post development flows have been provided in Table 1 **Error! Reference source not found..**

Table 1 - DRAINS model results, comparison of pre and post development peak flows and OSD volume.

AEP (%)	Pre-development flow (L/s)	Post development flow (L/s)	OSD volume (m ³)
20	64	64	13
10	86	71	18
5	112	76	24
2	142	84	33
1	170	135	81

Drains outputs for each AEP have been provided in the Appendix further in this report.

Should you require any further advice or clarification of any of the above, please do not hesitate to contact us.

Yours faithfully
LINDSAY DYNAN
CONSULTING ENGINEERS PTY LIMITED

Reviewed by

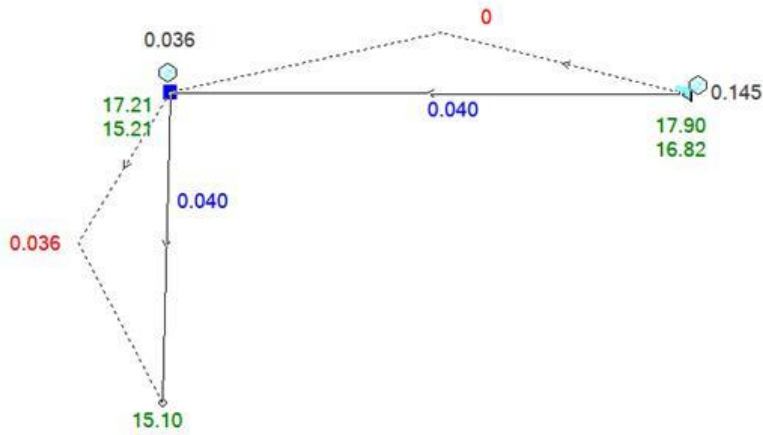


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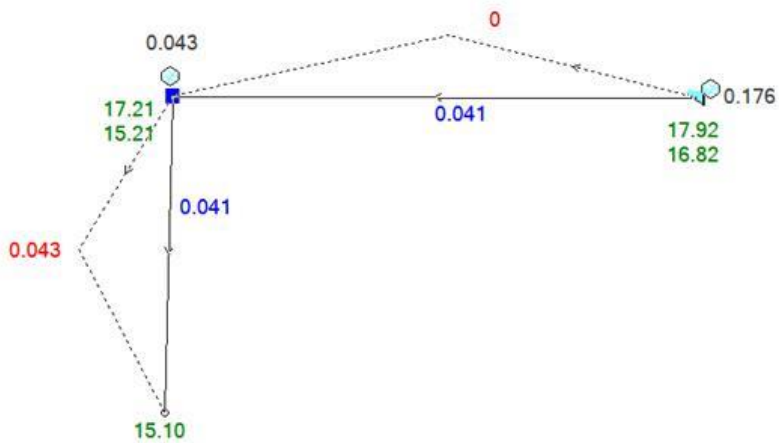
5% AEP

0.112



2% AEP

0.142



1% AEP

0.17

