

60 Charlotte Street, Clemton Park

Stormwater and Flood Management Report



Date: 10 October 2008

Report No: 5002-AA001875

Hyder Consulting Pty Ltd

ABN 76 104 485 289

Level 5, 141 Walker Street, North Sydney NSW 2060, Australia

Tel: +61 2 8907 9000 Fax: +61 2 8907 9001 www.hyderconsulting.com

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Author: Darlan Castro

Checker: Bruce Caldwell

Approver: Greg Ives

Report no: 5002-AA001875

Revision 02

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Contents

1	Introduction	2
2	General Description	3
3	Stormwater Management	5
3.1	Existing Condition.....	5
3.2	Proposed Stormwater System.....	9
4	Cup & Saucer Creek Flood Management	14
4.1	Existing Condition.....	14
4.2	Proposed Redevelopment Condition.....	14
4.3	Redevelopment Issues and Requirements	15

Tables

Table 1: OSD Minimum Volume Required

Figures

Figure 1: Exiting Site

Figure 2: Existing Flows and Site Ponding/Flood Levels

Figure 3: Existing Catchments

Figure 4: 100 Year ARI Flow Comparison

Figure 5: Proposed Redevelopment Flows and Site Ponding/Flood Levels

Appendices

Appendix A: Existing Catchment Summary

Appendix B: Existing Condition – DRAINS Model Input and Output

Appendix C: Precinct Plan

Appendix D: Proposed Condition – DRAINS Model Input and Output

Appendix E: Sydney Water Feasibility Letter

Appendix F: Sample Flood Evacuation Plan

Drawing List

1 Introduction

Hyder Consulting has been commissioned by Davids Group to prepare this Stormwater and Flood Management Report in support of a Concept Plan and Project Application submission for 60 Charlotte Street, Clemton Park.

This document discusses the relevant site stormwater and flood information obtained and guidelines referred to in identifying stormwater and flooding issues that are to be managed for any proposed redevelopment of the site.

The following form the data base for development of this report:

- Canterbury City Council documents:
 - Stormwater Management Manual;
 - Flood Management and Flood Proofing (effective from: 7 November 1997);
 - Specification 9 A Guide to Stormwater Drainage Design (effective from: 10 November 1995).
- Sydney Water (1992) 'Cup & Saucer Creek Stormwater Catchment Management Study'.
- Sydney Water Feasibility Letter dated 26 September 2008'
- NSW Floodplain Management Manual (2005).
- Site and street survey carried out by Dunlop Thorpe and Company (28 August 2008).
- Site inspection during the course of this assessment.
- Australian Rainfall and Runoff (2000).
- Soils and Construction, Volume 1, 4th Edition, March 2004.
- Architectural concept plans prepared by Marchese + Partners International (Job No. 07033 Dwgs DA 1.01, 2.01-9, 3.01-2 dated 24-09-08 issue B)

2 General Description

The Figure 1 aerial photograph shows the site, which currently accommodates the existing Sunbeam Factory/Warehouse. The site is surrounded by Harp St, Charlotte St, Viking St, Troy/Sunbeam Ln with vehicle access and car parking areas in the north western and south eastern areas. The existing building and paved areas covers the entire site areas thereby providing 100% impervious surfaces.

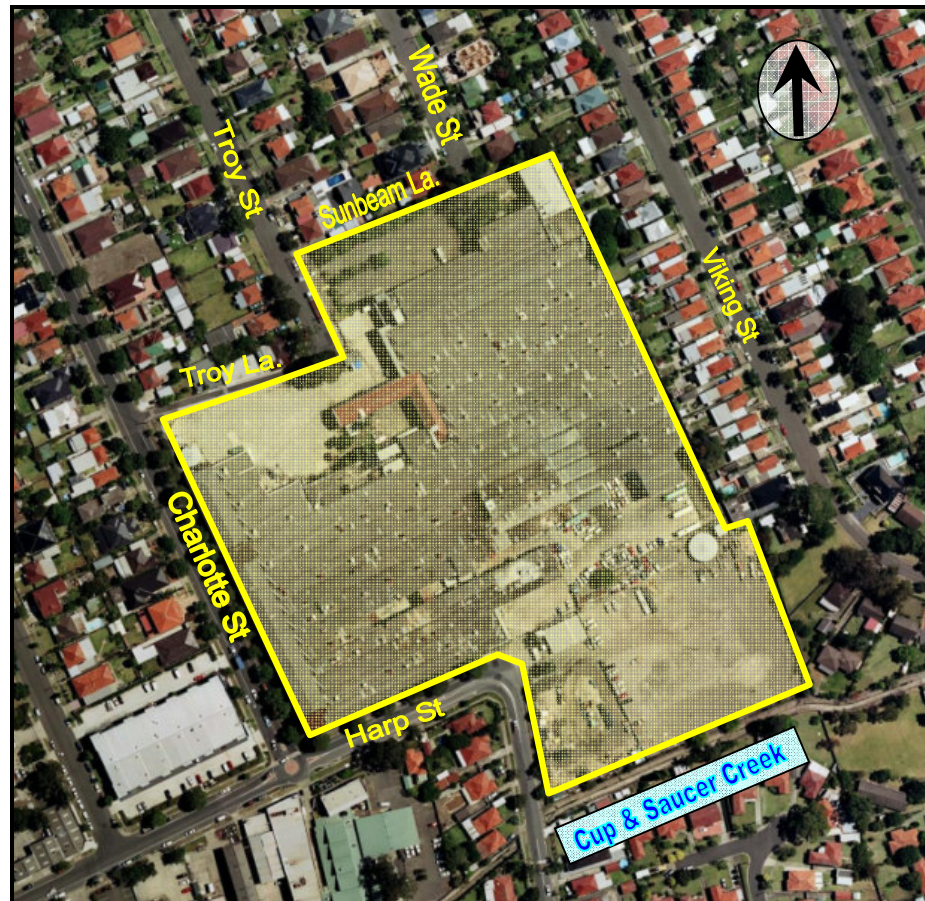


Figure 1: Exiting Site

The site has a general fall from its northern corner southward to the Cup & Saucer Creek stormwater channel. As indicated in Figure 2 there are street stormwater drainage systems that approach the site from Wade Street, Troy Street and Charlotte Street via Troy lane.

According to the stormwater system lay out provided by Canterbury Council, along Troy St. and Wade St. the existing pits and pipes system is limited to the downstream end of the streets.

These street drainage systems combine within the northern end of the site and convey flows via a stormwater conduit which extends southward under the existing warehouse building, through the southern car park and discharges into the Cup & Saucer Creek stormwater channel.

The Sydney Water Study (1992) and the Feasibility Letter (26/09/2008), indicate that the Cup & Saucer Creek channel has approximately 2 to 5 year ARI capacity in the vicinity of the site, and channel flows would enter the southern end of the site in larger events.

The Sydney Water Study provides design recurrence interval flood levels along the channel for a range of events (from the 1 year ARI to probable maximum flood).

The reported 100 year ARI flood levels along Cup & Saucer Creek vary from approximately 22.4mAHD at the upstream of the Alfred Street bridge to approximately 20.6mAHD at the eastern (downstream) site boundary. However, it is noted that error limits of $\pm 1.0\text{m}$ are indicated for the 100 year water levels. The basis for this seems to be the lack of rare flood event information. As such, it is considered that the reported 'middle' flood level estimates should be appropriate for redevelopment purposes.

The approximate 100 year ARI flood extent within the site (due to Cup & Saucer Creek channel flows only) is outlined in Figure 2. It should be noted that the flood extent has been interpolated from results within the Sydney Water report at a limited number of locations within proximity of the subject site.

In the existing condition, based on the interpolated 100 year flood levels, Alfred St. is subject to inundation. Water depths in the street will vary from approximately 0.5m at the intersection with Harp St. to 1.1m at the bridge over the channel.

3 Stormwater Management

As part of the investigation to support the submission of the Concept Plan for the site and the Project Application for Lot 1 and Lot 3, the existing stormwater system has initially been assessed. Then based on architectural concept plans (prepared by Marchese + Partners International) a proposed stormwater system (as shown on the accompanying civil drawings) including a pit and pipe network and detention storages, has been developed. For the purposes of this assessment rainwater tanks were assumed to be full when the design storm event occurs and therefore do not contribute to detention capacity.

3.1 Existing Condition

3.1.1 Stormwater Modelling Methodology

DRAINS software was used to develop a rainfall runoff model for the site and neighbouring catchments which impact on the development. The model has been used to facilitate the modelling of existing detention storages and pit and pipe system capacity and includes the following:

- Design rainfall IFD data provided by Canterbury City Council
- Paved area depression storage = 1mm
- Supplementary area depression storage = 1mm
- Pervious area depression storage = 5mm

The catchment areas, including the site, were determined based on a plan provided by Canterbury Council as shown in Figure 3. The percentage impervious area was estimated based on aerial photography and is shown in Table A2 Appendix A.

The stormwater network is represented in accordance with site survey provide by Dunlop Thorp & Co. dated 28 August 2008 and site visit. Where invert levels or pipe diameter could not be obtained from the survey, levels and diameters were assumed based on minimum cover of 0.6m and available upstream and downstream information.

3.1.2 Results

The results from the modelling indicate that the 100 year ARI flows arriving at the northern part of the site (corner of Troy St. and Troy La) will exceed the pipe system capacity and will spill over the kerb entering the site overland.

The peak flow entering the site overland at the above location is approximately $7.0\text{m}^3/\text{s}$ in the 100 year ARI. This flow will pond in the open area at the north western corner of the site reaching RL 26.2mAHD. The area will act as an above ground stormwater detention with approximate detained volume of 3600m^3 , slowly releasing the flow into the downstream Sydney Water channel.

The maximum flow crossing the site through the Sydney Water conduits is approximately $4.1\text{ m}^3/\text{s}$ in the 100 year ARI. This flow combined with the downstream catchments and the eastern external catchment will add to a peak flow from the site at the south eastern corner of the site of approximately $6.7\text{ m}^3/\text{s}$ in the 100 year ARI.

A summary of flows and storage volume are shown in Figure 2.

DRAINS modelling Data and Results are shown in Appendix B.