BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
ABN 26 134 067 842

Urban City Consulting Pty Ltd

Stormwater Management Report

521-555 The Northern Road, Londonderry

March 2018

PLANNING
PROJECT MANAGEMENT
ENGINEERING
CERTIFICATION

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Project No.	SY180007
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SUSTAINABLE CERTIFICATION AS/NZS 4801 Endorsed OHS Management System
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1 Introduction

This report has been prepared as a supplementary report to detail and discuss any calculations and assumptions that have changed since the initial submission. The previous work documented compliance with the on site detention system, water quality system and justification of the sizing of the dam arising from the facilities water usage.

The need for this report is due to the change in internal building configuration which will allow the facility to organise its growing rooms in a more economical way in line with the latest technologies. This has led to changes in the internal configuration impacting on the loading dock location which has in turn impacted on the dam configuration. As a result the on site detention system has been redesigned to ensure compliance with councils on site detention policy.

2 Site Location and Development Proposal

2.1 Site Location

The site of the proposed development is described as Lot 138 in DP 752037. This lot is known as 521-555 The Northern Road, Londonderry. The location of the site is shown in Figure 1.0 below.

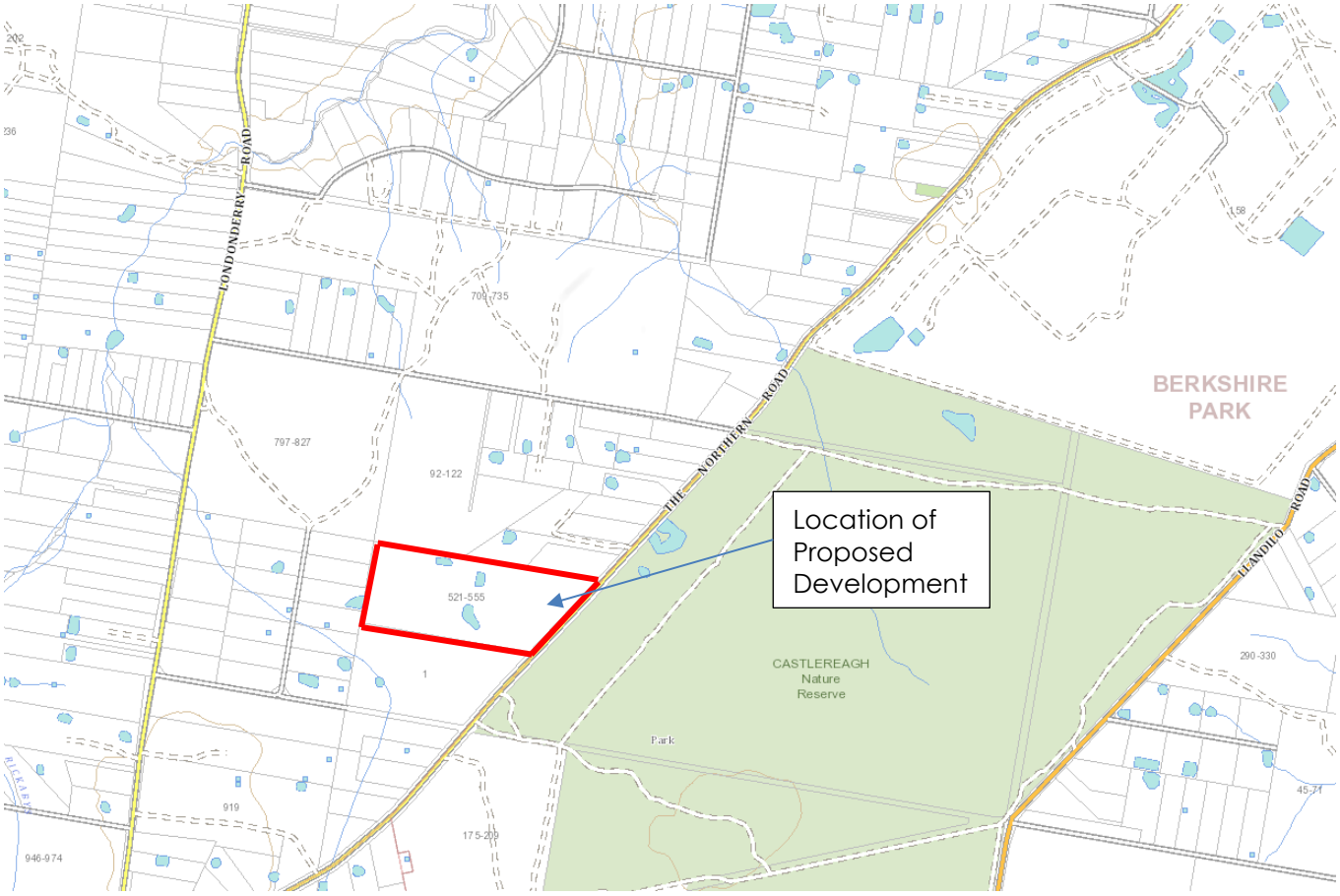


Figure 1.0 Location of proposed development

2.2 Existing Site

The area of the site proposed for the current development is mostly vacant with an existing cottage and two dam on the site. The site falls to the south-west with a slope of approximately 0.5%.

2.3 Proposed Development

The proposed development consists of the construction of a large building with growing rooms for the production of Mushrooms. Stormwater from the roof area of the proposed building and hardstand areas is to be collected through a conventional pit and pipe systems and discharged into the dam. The dam is proposed to have a basic storage volume of 14,700 cubic metres with an on site detention storage component of 12,500 cubic metres. A separate drainage system will also be installed on the site which will cater for the wash down waters from the cleaning processes across the site. This drainage system will direct waters rich in organic material to a wetland system designed to remove the organics in a suitable manner sufficient for reuse within the facility. This wetland system has been designed by another consultant and is not part of this submission.

3 Hydrological Data

3.1 General

The discharge rates of for the catchment and the sizing of the on-site detention system have been calculated using the design rainfall events in the AR&R.

3.2 Discharge Calculations

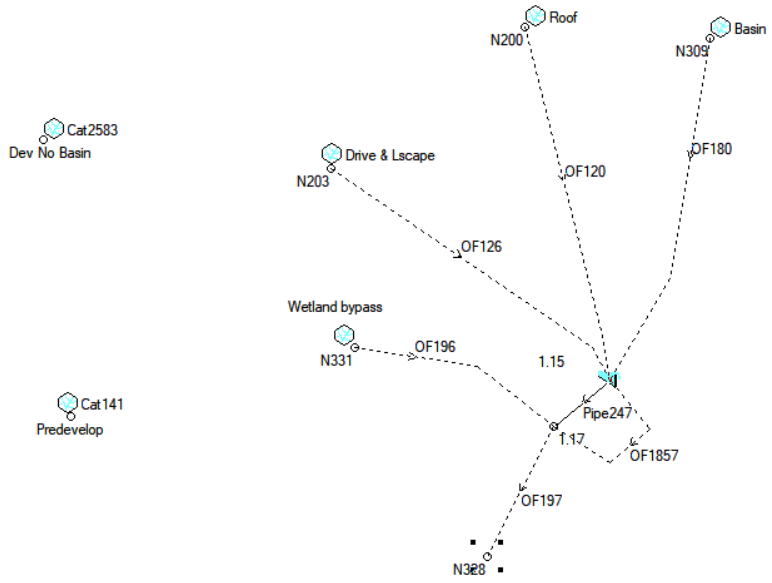
A DRAINS model was set up to estimate the pre and post development flows from the site. The following discharge rates were determined for the different design storms with a critical storm events. These discharge rates are utilised to conduct the initial sizing of the on-site detention system.

Table 3-1: Pre and Uncontrolled Post Development Discharge

ARI (1 in)	Pre – Development (l/s)	Post Development[1] (l/s)
2	382	2710
5	820	3610
20	1500	4840
50	2070	5480
100	2550	6180

The piped drainage system will be capable of conveying the 20 year ARI runoff volume and will be configured as set out in the concept design plans located in Appendix A. The drainage system will capture runoff from both the roof and hardstand areas and discharge it into the dam. A minimum grade of one percent shall be maintained. The drainage system will be fully detailed during the detailed design phase of the project.

The DRAINS model has been set up as per the arrangement shown below



4 Hydraulic Analysis

4.1 On Site Detention Basin

The on-site detention basin has been located above the permanent storage level of the dam, being RL 34.27m. A storage volume of 12,500 cubic metres of storage volume is required during the 100 year ARI critical storm event to reduce the outflows from the site from its post development flow rate to that of at least the pre developed rate. The below table shows the post developed discharge from the site once the on site detention system has been included in the calculations.

The resulting 100 year flood level will be RL 36.01m AHD, which is the spill level of the dam should the site experience a storm event greater than the 100 year ARI event. Table 4-1 as shown below shows the pre and post development flows for the proposed development. In each case the detention basin will reduce the post development flow back to that of at least the pre development state.

Table 4-1: Pre and Uncontrolled Post Development Discharge

ARI (1 in)	Pre – Development (l/s)	Post Development[2] (l/s)
2	382	292
5	820	337
20	1500	359
50	2070	423
100	2550	492

5 Discussion

The investigations undertaken in preparing this report have shown that the stormwater generated from the proposed development can be adequately managed through the provision of the on site dtentnio facility.

The specific results from the investigations undertaken have demonstrated that:

1. The proposed development can be drained to the OSD system, as demonstrated in the adjoining engineering plans.
2. The maximum water level of the osd system is at least 0.5m below and proposed infrastructure, so the freeboard requirements of council are met.
3. All roof water and hardstand areas are to be diverted to the dam/OSD system for reuse or detention purposes.

The implementation of the systems and measures described above would provide an adequate means of disposing of runoff generated by the proposed development on the site.

6 References

The Institution of Engineers Australia, 1987, "*Australian Rainfall and Runoff : A guide to Flood estimation*", The Institution of Engineers Australia, Canberra

Hawkesbury Development Control Plan, 2002, "Part 1 design Specifications. http://www.hawkesbury.nsw.gov.au

ATTACHMENT A

PROPOSED DEVELOPMENT