Water Management Plan

Grocon Group

Development Application Submission

31 Wheat Rd, Sydney

EWFW

Suite 5, Level 1

330 Wattle St

Ultimo NSW 2007

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Table of Contents

1. Introduction

1.1. Purpose

This report has been produced by EWFW Pty Ltd in response to the request from Justin Clark from Grocon Group.

The purpose of this report is to provide an outline of the proposed water management systems for the development at 31 Wheat Rd, Sydney.

This report shall not be relied upon as providing any warranty or guarantee of the building, its services or equipment.

1.2. Authority

Authority to undertake this report was provided by Justin Clark of Grocon Group on 20 November 2012.

1.3. Objectives of Study

The objectives of the report are to:

- Outline the details of the proposed water management systems.

1.4. Outline

The following services have been assessed in this report:

- Water services
- Stormwater

1.5. Terminology

The abbreviations and notations referred to within this report relate to the following:

BMS	Building Management System
ESD	Ecologically Sustainable Design
L	Litres
L/m	Litres per minute
WC	Water Closet

2. Technical Information

2.1. Author Details

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2.2. Information Sources

- Information provided by Sydney Water.
- Information provided by Justin Clark of Grocon.
- Various manufacturers and suppliers.

2.3. Disclaimer of Liability

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2.5. Revision History

Revision	Date Issued	Comment
A	**22 November 2012**	**Draft**
B	**4 December 2012**	**Final Issue**
C	**11 December 2012**	**Final Issue – Revised site title**
D	**21 June 2013**	**Final Issue – Revised building**
E	**19 July 2013**	**For Development Application**

3. Project Description

31 Wheat Road, Sydney, is a development proposed for the Darling Harbour area which will provide Premium Grade office and retail space in one of Sydney's iconic foreshore locations. And in order to provide a structure befitting its surroundings, Grocon is committed to provide a building which offers a high level of environmental performance.

The development is being designed to exceed minimum requirements in terms of Ecologically Sustainable Design (ESD), and is targeting the following green building ratings:

- 6 star Green Star - Office Design (v3) rating;
- 6 star Green Star –Office As-Built (v3) rating; and
- 6 star NABERS Energy base building rating.

One key component of this is water consumption. The hydraulic services play a critical role in the management and long term minimisation strategies for water across the site.

Commercial buildings which incorporate retail areas can create a heavy dependence for water use across the site. In this development it is our objective to ensure the hydraulic services reduce this water demand. Not just for the short term but the life of the building. We believe this can be achieved through simple fundamental steps which are outlined in this report.

The scope and systems described within this report cater for these performance requirements, and will be further developed through the detailed design stage. These hydraulic components include:

- Sanitary fixtures and fittings including:
    - WCs
    - Urinals
    - Indoor taps
    - Showerheads
- Water Efficient Design
- Rainwater Harvesting System
- Water metering systems
- Fire Systems

4. Water Use Equipment

Potable water consumption for health and hygiene is a major factor in the overall consumption within commercial premises. It also provides a multitude of points of failure which can create water loss through leakage or misuse. By implementing efficient systems which are simple to maintain it is possible to reduce problems in the future. Reducing potable water consumption also provides more benefits than a reduced water bill. Efficient hydraulic systems will reduce pump running costs, minimise long term maintenance requirements and increase the life expectancy of the system to name a few.

This section outlines a range of water management systems and strategies that will be considered for the development.

4.1. Sanitary fixtures and fittings

4.1.1. WCs

The WCs that will be offered for consideration will have the lowest flush rating currently available on the Australian Market at 3L/flush (average). As such they offer high efficiency for a WC and assist in reducing consumption. As part of the design process we will look to utilise harvested rainwater for flushing wherever possible.

Further assessment will also be carried out during the Design Development phase to determine the viability of a Vacuum Drainage system for the WCs across the site in lieu of a traditional gravity drainage system. This system is deemed as Alternative Solution to the current plumbing code and therefore will need to be critiqued in detail before being considered for inclusion.

4.1.2. Urinals

With the technological developments in water management there are a range of water efficient urinals currently available. This project will include reduced flush urinals (such as the Caroma 0.8L cube) or waterless urinals. This will provide the benefit not only of a reduced flush demand but also the removal of potential excess water wastage through faulty or poorly calibrated flushing sensors. As with the WC's, we will conduct thorough water balances to utilise rainwater harvesting for the water supply whenever possible.

4.1.3. Indoor taps

Tap selection will be critical in order to reduce the overall consumption. During the design process we will be considering not only low flow tapware but also timer taps. This will ensure that every option is considered to reduce water wasted during hand washing. Flows will be limited to 4.5L/m or better.

4.1.4. Showerheads

The showerheads shall be selected based on efficient flow ratings. As such the shower fixtures selected will offer the highest savings in water consumption when juxtaposed with showering quality. Flows will be limited to 7.5L/m or better.

4.2. Efficient Design

Pipe sizing will be designed to meet the characteristics of the fixtures they are delivering water to. As fixtures and fittings become more efficient the flows required continue to reduce. In the case of hot water supply, oversized pipework creates a greater volume of water that needs to be removed before the hot water reaches the fixture. By correctly sizing pipework and reducing dead leg runs it is possible to reduce the energy loss from inefficient heating systems and reduce dead leg cold water wastage. Small pipes also reduce the demand on our limited resources at the time of manufacture. It is holistic benefits such as these which extend the reach of ESD.

4.3. Rainwater Harvesting System

Rainwater harvesting will be incorporated within the hydraulic design to help reduce the potable water demand to the site. Currently, the site incorporates a rainwater harvesting system which captures water from the roof area for re-use across the site. Based on the capture area it has been proposed that a tank with a capacity of $100m^3$ be installed. This storage capacity shall be further developed as part of the design process to ensure the maximum capture and reuse efficiency.

All captured rainwater shall be used for non-potable water requirements such as irrigation, WCs/Urinals flushing and cooling tower make-up water. The final areas of use will be determined as part of the Design Development process. At this time a water balance will be undertaken to determine the volume of harvested water available and establish the most efficient use of this water. This assessment will focus on minimising energy required for treatment and pumping of rainwater whilst maximising its use.

4.4. Water Metering Systems

From previous experience with Sydney Water's Every Drop Counts Program it is clear that metering systems are a critical component of water management. It is only by understanding the water consumption across the site that adjustments can be made to keep the system operating efficiently.

A system that both monitors and manages water consumption is to be installed. Water metering will be provided to all major water uses throughout the site. This will effectively determine where water is used and provide the data to assess how it can be continually reduced. These meters shall be connected to the building BMS. By logging the water consumption it will allow alarm points to be implemented ensuring immediate and effective rectification for any leakages.

4.5. Fire Systems

Fire system tests consume a large volume of water which may be readily re-used. It is proposed that water from fire system testing procedures is to be designed so that all test and drain down water is harvested to a storage tank. This tank will then be coupled with the non-potable water system to allow water to be re-used and further reduce the water consumption on site.

4.6. Mechanical Systems

Mechanical systems account for a large proportion of the water consumed within an office building. On the Wheat Rd project the mechanical and hydraulic engineers will be working together to limit the amount of water consumed through mechanical equipment. Options for water savings will be assessed during the Design Development Phase to look to strategies and equipment which minimise water use. However, these strategies will be closely scrutinised to ensure that water savings does not come at a cost to energy consumption and operational efficiency.