

Fraser Drive, South Tweed

Volume 2 - Technical Reports

Appendix 13-20

May 2007

Prepared by



On behalf of



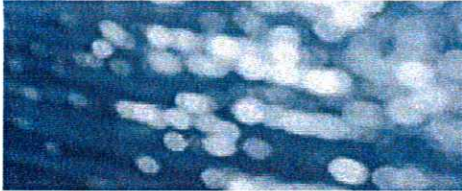
FRASER DRIVE, TWEED HEADS

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Appendix 13

Stormwater Management Plan



Villa World Ltd

Proposed Development
Fraser Drive – South Tweed

Stormwater Management Plan

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8TH DECEMBER 2006
JOB NO. 7214/29-1

PROPOSED DEVELOPMENT FRASER DRIVE – SOUTH TWEED

STORMWATER MANAGEMENT PLAN

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CLIENT	VILLA WORLD LTD Job No. 7214/29-1		
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1.0 INTRODUCTION

1.1 PURPOSE

This Stormwater Management Plan (SWMP) has been prepared on behalf of Villa World Ltd for the proposed development on Lot 9 on DP1039569 and part of Lot 2 on DP1000385, Fraser Drive, Tweed Heads South (the subject site). The aim of this management plan is to provide detailed policies, performance criteria and procedures to minimise the impact of the development on the physical and social environment. In particular, the SWMP provides monitoring and reporting mechanisms whereby the performance of the development can be measured and that agreed corrective actions are implemented in a timely manner if problems occur.

1.2 IMPLEMENTATION

This SWMP has been prepared in accordance with Tweed Shire Council's (TSC) '*Tweed Urban Stormwater Quality Management Plan*' and Development Design Specification '*D7-Stormwater Quality*' and good local engineering and environmental practice.

2.0 WATER QUALITY ASSESSMENT

Existing Conditions

The majority of the undeveloped site has previously been cleared for agricultural and farming use and is void of major vegetation, with the exception of the wetland area in the north-west corner of the site which contains Mangroves, Melaleucas and She-oaks. The cleared areas of the site are generally well grassed. The lower area at the northern end of the lot is in the process of being filled to bring the existing surface levels up above the regional 100 year ARI flood level of 2.6m AHD. These filling works are part of a previously approved application for the subject site.

The proposed subdivision development site is divided into four main existing site catchment areas. Approximately 2.4 hectares (ha) of the subject site discharges south towards existing residential lots on Shiraz Place and Merlot Drive. Two site catchment areas of approximately 1.8ha and 5.3ha discharge east towards Fraser Drive. The largest existing site catchment of approximately 23ha discharges north towards James Street. A SEPP 14 wetland area has been identified in the north-western corner of the subject site at the downstream outlet of the existing northern catchment area. As it is intended to retain the existing wetland area within the SEPP 14 zone the northern catchment point of discharge will be situated along the southern boundary of the SEPP 14 zone. Cardno Figure No DA19 in Appendix A shows the existing internal catchments for the site and the external catchments contributing to the site.

A number of external catchment areas contribute to the subject site. These external areas include approximately 8.4ha of existing residential lots along Seaview Street, Ocean Avenue and Hillcrest Avenue and a catchment of approximately 14.8ha contributing from the eastern side of Fraser Drive.

Based on typical pollutant loads as specified in Table 5.3 of Tweed Shire Council's 'Tweed Urban Stormwater Quality Management Plan' it was assumed that under existing site conditions the development site would generate pollutant loads equivalent to undeveloped land use loads.

TABLE 1 - TYPICAL POLLUTANT LOADS

Land Use	Typical Pollutant Loads (kg/ha/yr) for Tweed coastal areas* (Average Year)		
	Suspended Solids	Total Nitrogen	Total Phosphorus
Undeveloped	125	1.5	0.4
Rural	410	6.0	1.0
Urban	1200	18.0	3.0

* Taken from *Tweed Urban Stormwater Quality Management Plan* Table 5.3.

Proposed Site Drainage Strategy

The proposed drainage strategy for the Fraser Drive subdivision development is intended to incorporate water sensitive urban design (WSUD) wherever practical. The topography of much of the proposed development site limits the use of many WSUD techniques. It is therefore proposed to utilise conventional street drainage to convey stormwater runoff from the upper reaches of the catchment areas down to the stormwater treatment and detention devices to be constructed around the lower parts of the development site.

To assist in minimising the volume of stormwater runoff to be detained and treated from the catchment areas discharging to the south and south-east of the subject site, a number of strategies are proposed to be incorporated into the development. These strategies include minimising the density of the lots to be developed within the catchment discharging to the south and diverting catchment area from the southern catchments towards the eastern catchment.

Stormwater runoff from the northern and eastern catchment areas will be conveyed to detention and treatment devices to be located within open space areas situated at downstream outlet of each catchment. It is proposed to incorporate treatment devices such as gross pollutant traps and wetlands into the open space areas to assist in meeting Council's water quality objectives. These devices will be sufficiently sized to meet Council's 'deemed to comply' criteria outlined in the *Development Design Specification D7-Stormwater Quality*. Sufficient on-site detention storage volume will be provided within these open space areas to assist in maintaining peak flow rates equivalent to existing peak flows discharging off-site.

For the catchment areas discharging to the south and south-east it is proposed to retain the existing vegetation outside of the proposed building areas to assist in filtering and dispersing stormwater runoff from the subject site. Where necessary, areas will be revegetated to aid in this process. Inter-allotment drainage will be used to convey flows to the legal point of discharge of each catchment area.

Developed Conditions

The subject site will be developed into approximately 168 residential allotments and 66 medium density dwellings which are expected to increase pollutant loads at the stormwater discharge points. Cardno Figure No DA20 shows the catchments of the developed site. To assist in minimising the expected increase in suspended solids and nutrients discharging from the developed subject site it is proposed to install and construct gross pollutant traps and wetland areas in some of the open space areas proposed on-site.

Based on the typical pollutant loads summarised in Table 1 Council have outlined stormwater treatment objectives and maximum permissible loads that may be discharged from new urban developments. Table 5.4 of Council's *Tweed Urban Stormwater Quality Management Plan* outlines stormwater treatment objectives that new developments must demonstrate compliance with. Table 2 summarises part of the operational phase stormwater treatment objectives relating to the maximum permissible pollutant loads that may be discharged.

TABLE 2 - STORMWATER TREATMENT OBJECTIVES

Parameter	Maximum Permissible Pollutant Load Discharged (kg/ha/yr)* (Average Year)
Suspended Solids	300
Total Nitrogen	4.5
Total Phosphorus	0.8

* Taken from *Tweed Urban Stormwater Quality Management Plan* Table 5.4.