DesignFlow

17 March 2011

Rob Ball
Delfin Lend Lease
Level 2, 349 Coronation Drive
MILTON 4064

Dear Rob

RE: ADDENDUM TO YARRABILIBA PRECINCT 1 STORMWATER MANAGEMENT PLAN

This email provides additional information for the stormwater management strategy for Yarrabilba Precinct 1. As highlighted in Figure 1, the far northern component of Precinct 1 was excluded from the stormwater planning because it is situated outside the catchment we have focused on in the Stormwater Management Plan (SMP).

The details of the stormwater management strategy for this small catchment (1.85ha) are summarized in this letter. If required by Delfin and the Urban Land Development Authority, the details of this letter can be incorporated into the Yarrabiliba Precinct 1 Stormwater Management Plan.

Catchments

Figure 2 illustrates the pre development and post development catchments for this portion of the Precinct 1 development. The proposed earthworks will result in a reduction in the catchment areas as summarized below:

- Pre development = 1.85ha
- Post development = 1.15ha

Stormwater Quality

In order to meet the stormwater quality management objectives (80% reduction in TSS, 60% reduction in TP and 45% reduction in TN) a **170m² bioretention system** is proposed to receive runoff from the 1.15ha post development catchment. The location of the bioretention system is illustrated in Figure 2. This bioretention system will be temporary and will be ultimately replaced with another stormwater strategy for the whole catchment in this zone once the urban design is resolved. The bioretention system will be placed to avoid significant vegetation.

The 0.7ha catchment that drains south into the Precinct 1 will be accommodated and treated with the Precinct 1 Stormwater Strategy. This will require a minor adjustment to the proposed Bioretention B4 within Precinct 1 from 1450m² to 1500m².

A MUSIC model was established for the 1.15ha commercial catchment and the diverted 0.7ha catchment to bioretention Basin B4 in accordance with the SEQ MUSIC Modelling Guidelines (Water by Design, 2010). The following load reductions were achieved::

- Northern catchment bioretention (170m²)
  - TSS = 85%
  - TP = 74%

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- TN = 45%

- Northern catchment bioretention (1500m²)
  - TSS = 82%
  - TP = 72%
  - TN = 45%

Stormwater Quantity

No flood storage is proposed for this portion of Precinct 1. The reduction in catchment area from 1.85ha to 1.15ha means the peak flood flows are preserved. Details of the rational method calculations which support this recommendation are provided below. The 0.7ha catchment that drains south into the Precinct 1 will be accommodated and attenuated within the Precinct 1 Stormwater Strategy. Given the flood detention storages proposed for Precinct 1 over-attenuate flows there will be no need to adjust the flood detention storages to accommodate the additional 0.7ha.

Pre and Post Development 1, 2 and 10 yr ARI

Location ID	Catchment (ha)	tc (min)	I_1 (mm/hr)	C	Q1 (m^3/s)	I_2 (mm/hr)	C	Q2 (m^3/s)	I_{10} (mm/hr)	C	Q10 (m^3/s)
Pre	1.85	20.0	65	0.48	0.160	83.4	0.51	0.219	118	0.60	0.364
Post	1.15	15.0	75	0.70	0.167	90.0	0.74	0.213	132	0.87	0.367

Pre and Post Development 20, 50 and 100 yr ARI

Location ID	Catchment (ha)	Tc (min)	I_{20} (mm/hr)	C	Q20 (m^3/s)	I_{50} (mm/hr)	C	Q50 (m^3/s)	I_{100} (mm/hr)	C	Q100 (m^3/s)
Pre	1.85	20.0	136	0.63	0.440	159	0.69	0.564	177	0.72	0.655
Post	1.15	15.0	150	0.91	0.438	180	1.00	0.575	200	1.00	0.639

Please call me on 07 55281148 if you would like to discuss this proposal further.

Yours sincerely

Shaun Leinster
DesignFlow

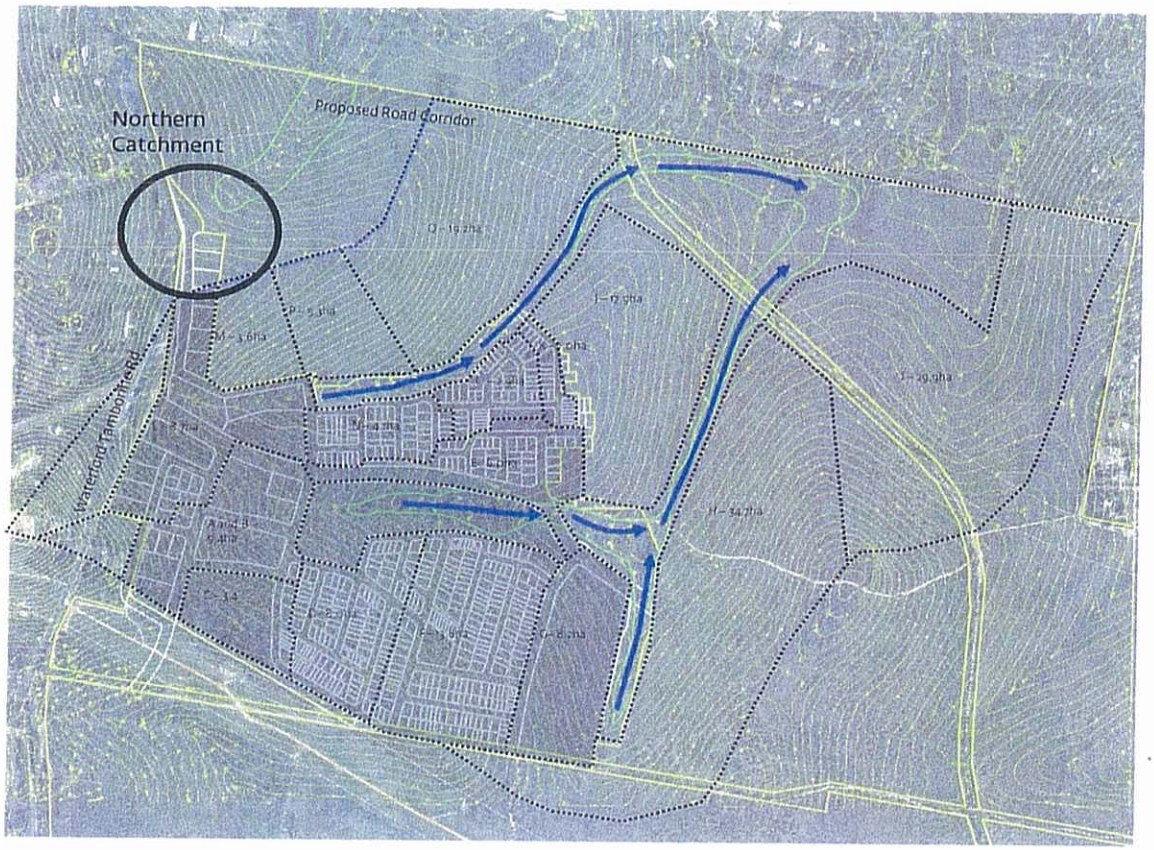

Figure 1: Location of Northern Catchment (which was not considered in the Yarrabiliba Precinct 1 Stormwater Management Plan)

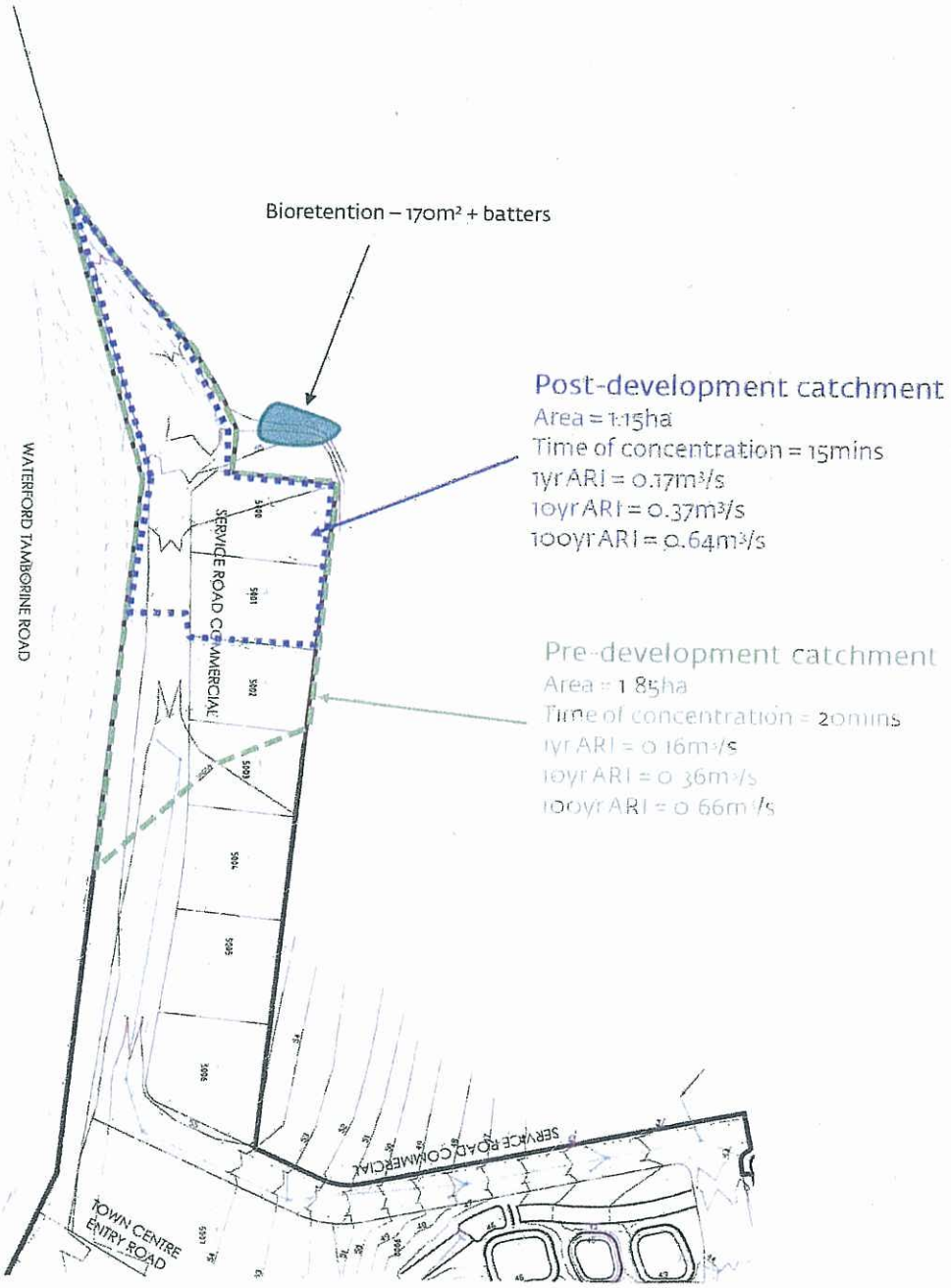

Figure 2: Stormwater management strategy for Northern Catchment (including pre and post development catchments)