

**PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL**

Approval no: DEV2023/1441

Date: 29 February 2024



8 August 2023

Gavin Edwards
RPS
Level 4, HQ South
520 Wickham Street
Fortitude Valley QLD 4006
(via email)

Dear Gavin

RE: YARRABILBA PRECINCT 4G STORMWATER MANAGEMENT FOR RECONFIGURING A LOT

This letter is provided to support the stormwater management strategy update associated with Yarrabilba Precinct 4G. The precinct layout and land use remain generally in accordance with the approved *Yarrabilba Precinct 4F Stormwater Management Plan – Version 2* (DesignFlow, 2023) (referred to herein as the P4F SMP-V2) which encompasses Precinct 4G as part of a multi-precinct stormwater management strategy.

Stormwater Quality

Precinct 4G falls within the former catchment 6E1 (now referred to as catchment 4G1) from the above referenced SMP-V2 with development density lower than the assumptions of the previous study (previously assumed medium, now low density). The updated strategy layout is provided in Figure 1 (Attachment 1) with a corresponding MUSIC model representing the above updates completed and the findings summarised in Table 1 below. The MUSIC assessment updates are provided in Attachment 2. Overall, the minor amendments to the overall Precinct 4 (southern zone) treatment strategy to reflect the functional design of Precinct 4G meets the stormwater quality design objectives presented in the previously approved *Yarrabilba Precinct 4F Stormwater Management Plan – Version 2* (DesignFlow, 2023).

Table 1: MUSIC Modelling Results (Precinct 4G including associated development areas to the south)

Pollutant	Load Generated (kg/yr)	Load Discharge (kg/yr)	Reduction Achieved (%)	Water Quality Objectives	Complies
Total Suspended Solids	61100	10400	82.9%	80%	✓
Total Phosphorus	131	35	73.4%	60%	✓
Total Nitrogen	836	420	49.7%	45%	✓
Gross Pollutants	10500	272	97.4	90%	✓

Waterway Stability

The Precinct 4G development layout and revised stormwater quality management strategy above remains consistent with the previously approved *Yarrabilba Precinct 4F Stormwater Management Plan – Version 2* (DesignFlow, 2023) by maintaining buffers to waterways and wetlands. No instream works are identified adjacent to Precinct 4G while all stormwater outlets to the waterway corridor are to be rock stabilised. No changes to the existing strategy arise from Precinct 4G.

Flooding

Precinct 4G is generally in accordance with the *Yarrabilba (Quinzeh Creek) Flood Study – Version 1* (DesignFlow, 2017). No flood detention infrastructure is required as part of precinct 4G as it falls within the regional strategy that is managed by Flood Basin 15 (Fauna Way) (approved previously as part of Precinct 3B). All lot levels in Precinct 4G are well above the 100 year ARI flood level of RL29.06 interfacing the western boundary of the precinct with at least 500mm freeboard.

I trust this provides sufficient information to support the current stormwater management approach for Precinct 4G. If have any questions, please contact DesignFlow.

Yours Sincerely



Shaun Leinster
Director
RPEQ 15637
DesignFlow

Attachments:

1. Precinct 4G catchment and stormwater treatment layout
2. Updated Precinct 4G (P4 southern zone) MUSIC model assessment

ATTACHMENT 1: PRECINCT 4G (P4 SOUTHERN ZONE) CATCHMENT AND STORMWATER
TREATMENT LAYOUT

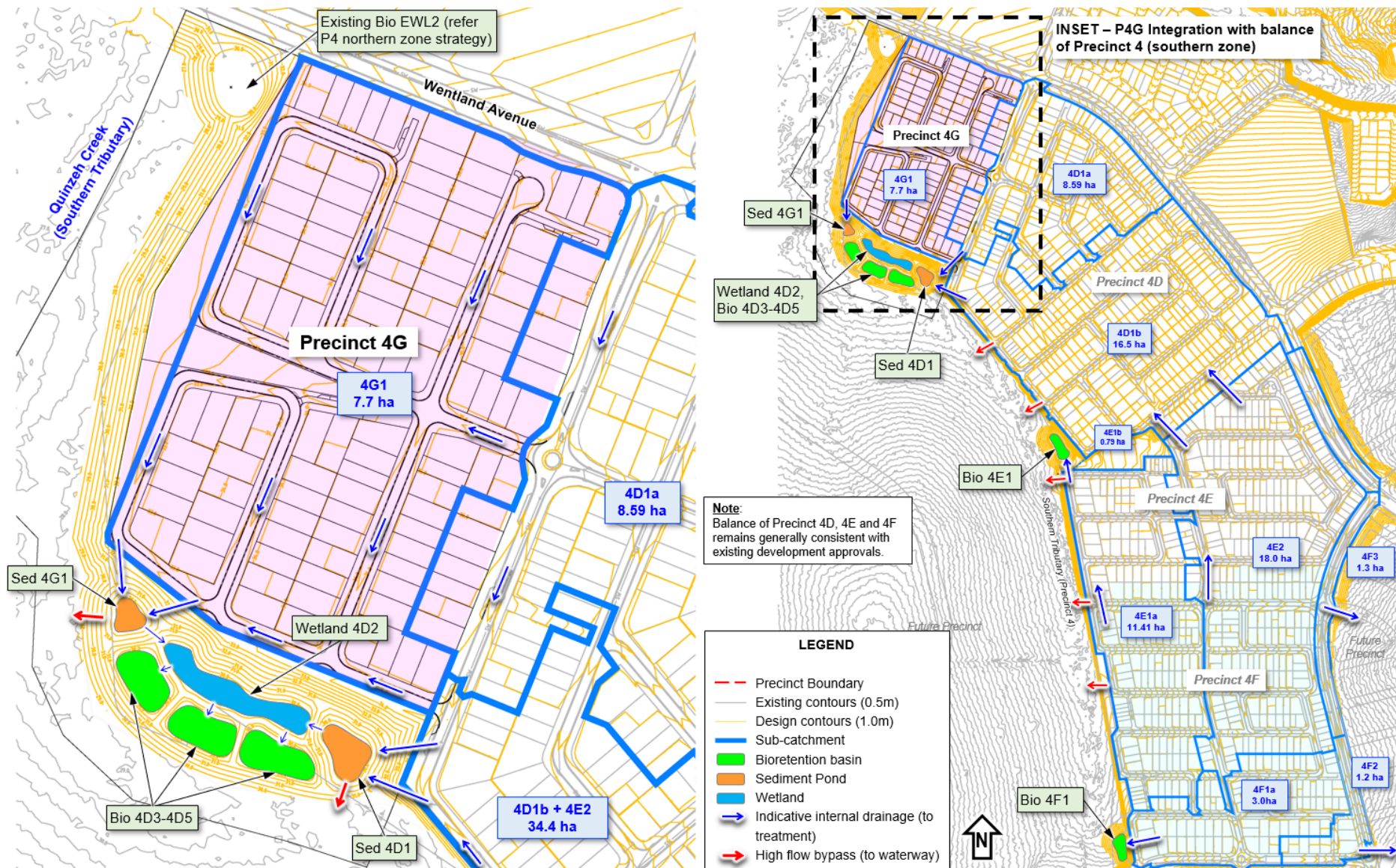


Figure 1: Precinct 4G (including P4 south) stormwater management strategy update

ATTACHMENT 2: PRECINCT 4G (AND P4 SOUTHERN ZONE) MUSIC MODEL VERIFICATION ASSESSMENT

The information provided below represents a minor update to the stormwater quality modelling documented in Section 4 of the approved *Yarrabilba Precinct 4F Stormwater Management Plan – Version 2* (DesignFlow, 2023) to reflect the development layout of Precinct 4G (formerly labelled as catchment 6E1). Previous Precinct 4F falls within a multi-precinct scale catchment (including Precinct 4G) draining to a large treatment system adjacent to Precinct 4G (shaded in Table 2) and has therefore included a previous (preliminary) assessment of Precinct 4G.

Table 2: Precinct 4 (southern zone) stormwater treatment elements

Treatment Type and ID	Size	Catchments	Comment
Bioretention Basin 4F1	800 m ²	4F1a, 4F1b	Proposed basin in Precinct 4F
Bioretention Basin 4E1	800 m ²	4E1	Existing basin in Precinct 4E treating part of Precinct 4E and part Precinct 4F
Sediment Pond 4D1/4G1 ^{1,2}	800/400 m ²	4D1a/b, 4E2, 4G1 ¹	Large scale integrated treatment system
Wetland 4D2	1500 m ²		
Bioretention 4D3-4D5	3 x 1000 m ²		

Note:

1. Previous catchment 6E1 was renamed to catchment 4G1 (and sed pond 4G1) to reflect current precinct numbering.
2. Precinct 4G drains directly to Sediment Pond 4G1

The data presented in Table 3 below identifies the updates that have occurred as part of the local Precinct 4G urban and civil functional design (green shaded cells) with all other MUSIC modelling assumptions remaining consistent with the previous P4F SMP-V2 assessment. Key updates include:

- Catchment 4G1 (formerly catchment 6E1) updated to 7.7ha and 60% impervious (from preliminary estimate of 7.8ha and 70% impervious) based on precinct layout.
- Adjacent catchment 4D1a area amended from 8.95ha to 8.59ha (based on updated catchment boundary of 4G1 above).
- Adjacent catchment 4D1b area amended from 16.5ha to 16.4ha (based on updated catchment boundary of 4G1 above).
- 4G1 high flow bypass (formerly 6E1 HF bypass) updated to 1.23m³/s (as estimated Q₂ from 7.7ha low density residential) from 1.42m³/s previously (refer Table 4 below).

Table 3: Catchment data

Catchment ID	Total Area (ha)	% Impervious	Surface Type	Sub-Area (ha)	Impervious %
4D1a	8.6	60%	Road	2.15	60%
			Roof	3.22	100%
			Ground	3.22	20%
4D1b	16.4	60%	Road	4.10	60%
			Roof	6.15	100%
			Ground	6.15	20%
4E1a	11.41	60%	Road	2.85	60%
			Roof	4.28	100%
			Ground	4.28	20%
4E1b	0.79	5%	Park	0.79	5%
4E2	18.00	60%	Road	4.50	60%
			Roof	6.75	100%
			Ground	6.75	20%
4G1	7.70	60%	Road	1.93	60%
			Roof	2.89	100%
			Ground	2.89	20%
4F1a	6.00	66%	Road	1.50	70%
			Roof	2.25	100%
			Ground	2.25	30%
4F1b	0.60	66%	Road	0.15	70%
			Roof	0.23	100%
			Ground	0.23	30%
4F2	1.50	66%	Road	0.38	70%
			Roof	0.56	100%
			Ground	0.56	30%
4F3	1.30	70%	Road	1.30	70%
Total	72.3	60%		72.8	60%

Notes:

1. Green shaded cells denote data updates since the approved *Yarrabilba Precinct 4F Stormwater Management Plan – Version 2* (DesignFlow, 2023).
2. Catchment 4G1 has been relabelled from previous catchment 6E1 to be consistent with precinct naming.

Table 4: Secondary link data

From Node	To Node	Outflow Components	HFB Threshold	Comment
4G1 HF Bypass	J1	High flow bypass	1.23 m ³ /s	HFB estimated at Q2 pipe flow from 7.7ha future development (low density)

The MUSIC model layout is shown in Figure 1 (consistent with previous assessment) with the results presented in Table 5.

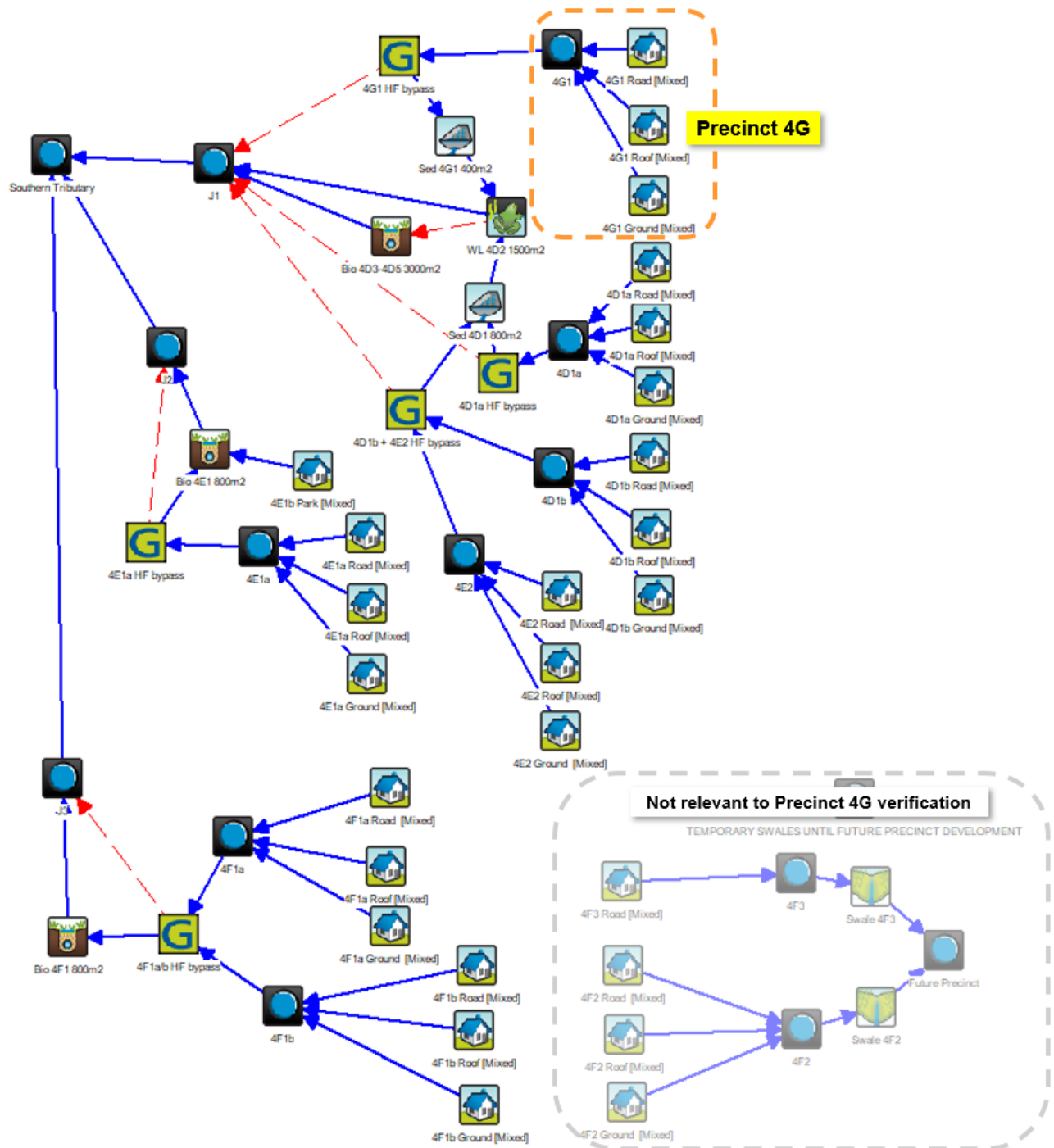


Figure 1: Precinct 4G (including P4 southern zone) MUSIC model layout

Table 5: MUSIC results

Catchments	Treatment ID	Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction (%)
4D1a/b, 4E2, 4G1	Sed 4G1/4D1, Wetland 4D2, Bio 4D3-4D5	TSS	44900	7010	84.4
		TP	96.4	24.9	74.1
		TN	616	311	49.5
		GP	7720	152	98
4E1	Bio 4E1	TSS	10400	2400	76.8
		TP	22.5	7.14	68.2
		TN	140	74.4	47
		GP	1750	50.1	97.1
4F1a, 4F1b	Bio 4F1	TSS	5830	1010	82.6
		TP	12.5	2.94	76.5
		TN	80	35.1	56.1
		GP	996	70.5	92.9
Total Precinct 4 (south) (✓ denotes compliance with water quality objectives)		TSS	61100	10400	82.9 ✓
		TP	131	35	73.4 ✓
		TN	836	420	49.7 ✓
		GP	10500	272	97.4 ✓

Conclusion

The updated MUSIC modelling for Precinct 4G (in conjunction with the broader P4 southern zone) confirms that the water quality objectives can be achieved with the minor updates to land use assumptions and remains generally consistent with the approved *Yarrabilba Precinct 4F Stormwater Management Plan – Version 2* (DesignFlow, 2023).