

Our Ref: 110265-07-Basin B8 Addendum
DC:lj

PO Box 4366
Penrith Westfield 2750
02 4720 3300
jwp@jwprince.com.au
www.jwprince.com.au

14 Jun 2022

Legacy Property Group

Level 45, 25 Martin Place
Sydney NSW 2000

Attn: Paul Perkovic

Subject: Orchard Hills North Planning Proposal - Basin B7 and New Basin B8 - separate basins for Precinct 1(rezoning area) and Precinct 2 (balance area)



Dear Paul,

J. Wyndham Prince have completed this preliminary sizing and concept design plan for the reconfigured arrangements to Basin B7, as shown in the Stormwater and Flood Management Strategy, submitted in support of the planning proposal. The catchment has been adjusted so that a new permanent basin, Basin B8 is included within Precinct 1 of the Orchard Hills North Precinct (refer Appendix A). This new basin has been sized to ensure that the flow downstream of the south-west boundary of the precinct, is not greater than existing conditions due to the proposed development within the precinct.

1. STORMWATER MANAGEMENT

The new basin is required within the OHN Precinct to service the portion of the catchment within Precinct 1. As such, the basin needs to ensure the flow downstream of the south-west boundary of Precinct 1 is no greater than the existing condition flow up to 1% AEP event, as a result of development in catchments C3 and C2B, as shown in Plate 1-1. Basin B8 will provide the stormwater detention for the developed condition catchment OH4, as shown in Plate 1-2.



Plate 1-1 Existing Catchment Conditions.

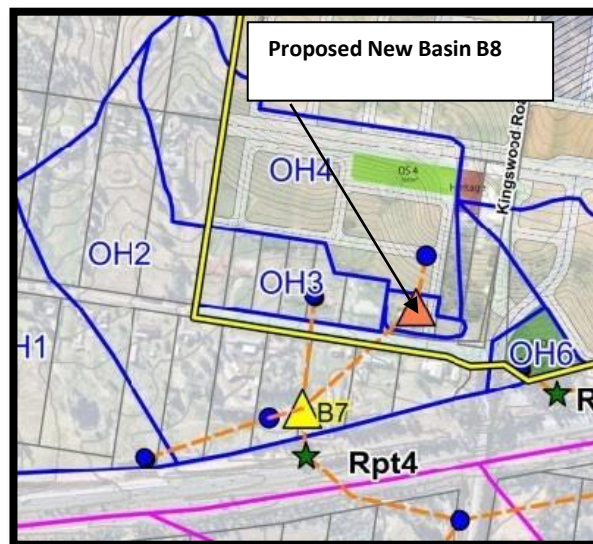


Plate 1-2 Developed Catchment Conditions.

The hydrologic modelling developed as part of the Orchard Hills North (OHN) stormwater and flood management strategy report (JWP, March 2022) has been used to determine the size of the proposed Basin B8. Both the existing and developed condition models remain unchanged from the 2022 strategy report, however an additional basin was included at catchment C2B (as shown in Plate 1-2) to ensure flow conditions are appropriately managed within the subject precinct.

1.1 Sub-catchments

The XPRAFTS model layout for the existing condition model which includes catchments C3 and C2B and C2A is presented in Plate 1-3 and the developed condition model which includes OH3, OH4 and B1 is shown in Plate 1-4. The area of the catchment and percentage impervious adopted in the existing and developed condition model is provided in Table 1-1.

The dummy node “Dum 1” was used to compare the existing and developed flow conditions. It is noted that the basin B8 node is represented by node B1 in developed condition as shown in Plate 1-4.

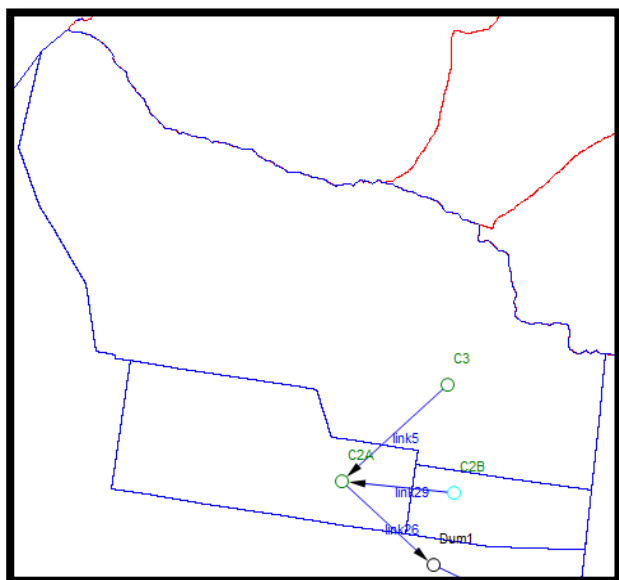


Plate 1-3 Existing conditions XP-RAFTS Model

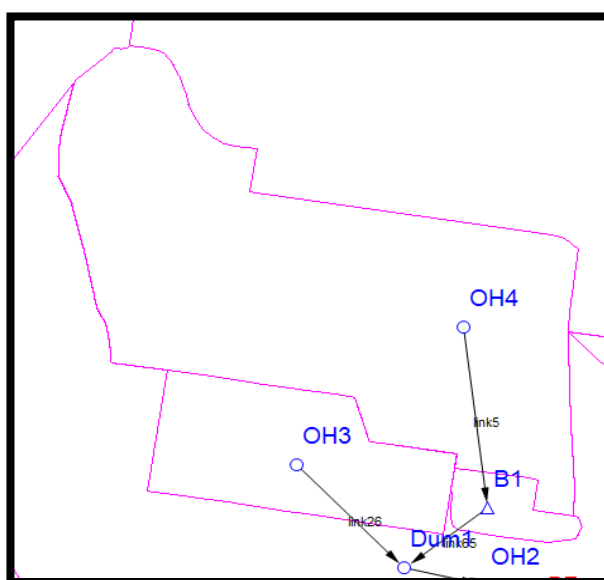


Plate 1-4 Developed conditions XP-RAFTS Model

Table 1-1 – Existing and Developed Area

Existing			Developed		
ID	Area (ha)	% Impervious	ID	Area (ha)	% Impervious
C3	9.11	10%	OH4	8.98	79%
C2B	0.85	60%	B1	0.47	87%
C2A	2.4	60%	OH3	2.4	60%
Total	12.361		Total	11.85	

1.2 Modelled Events

The XP-RAFTS model was assessed for the developed conditions both with and without detention basin B8 to gain an appreciation of developed conditions flows and to determine the optimal dimensions and performance of proposed basin B8, to limit developed conditions flow up to 1% AEP storm event to no greater than existing conditions.

Table 1-2 – Existing and Developed Peak Flows without Detention Basin B8

Comparison Node	0.5 EY			1%AEP		
	Ex m ³ /s	Dev m ³ /s	Dev/Ex	Ex m ³ /s	Dev m ³ /s	Dev/Ex
DUM 1	0.95	2.36	2.48	3.94	5.68	1.44

The results in Table 1-2 indicate that a stormwater detention is required to manage the increased flow from catchments OH4, in a developed condition of catchment of C3 and C2B. Therefore, Basin B8 has been designed to ensure that the developed conditions peak flows at the site discharge location do not exceed existing conditions flow up to 1% AEP event. The Table 1-3 summarised the developed conditions peak flows from the basin B8.

Table 1-3 – Existing and Developed Peak Flows with Basin B8

Comparison Node	0.5 EY			1%AEP		
	Ex m ³ /s	Dev m ³ /s	Dev/Ex	Ex m ³ /s	Dev m ³ /s	Dev/Ex
DUM 1	0.95	0.86	0.90	3.94	3.70	0.94

The results in Table 1-3 indicate that the detention basin B8 will ensure the flow downstream of the precinct after development in regions C3 and C2B will be less than existing condition flow up to 1% AEP event.

1.3 Basin Size

The summary of the proposed basin B8 storage volume required to ensure interim flow conditions are appropriately managed within the precinct is outlined in Table 1-4.

Table 1-4 –Basin B8 Storage Requirement

Event	Active Storage used (m ³)	Storage Depth (m)
0.5 EY	1385	0.65
1% AEP	3050	1.42

Basin B8 needs to have an active storage capacity of 3,050m³ to manage the flow of up to 1% AEP event from the Precinct. The modelling, therefore, demonstrated that the proposed basin strategy will ensure the flows are managed within the subject Precinct as a result of the OHN development.

1.4 Water Quality Treatment Device

It is noted that the water quality treatment devices have been sized as part of the Orchard Hills North (OHN) stormwater and flood management strategy report (JWP, March 2022) to meet the water quality targets of PCC Water Sensitive Urban Design (WSUD) policy. A bioretention raingarden is proposed to treat the stormwater for the OH4 catchment. The bioretention raingarden sizes are about 1.2% of the contributing catchment in the JWP, 2022 strategy, as such, the bioretention raingarden area of 1,078 m² is proposed to meet the water quality from the developed catchment OH4.

2. AREA B INDICATIVE BASIN B7 (REVISED)

It is understood that a revised Basin B7 will be required for Precinct 2 if Council decides to proceed with the rezoning of this Precinct. For context, the size of a revised basin B7 will be in the order of 9,000m³ with a raingarden device of approximately 1.2% of the catchment area. This will need to be the subject of further investigation whenever Council decides to proceed with the rezoning of Precinct 2.

3. CONCLUSION

To ensure flow management from the proposed development is managed appropriately and without reliance on land outside of Precinct 1, a new basin, Basin B8 is proposed to replace Basin B7 to service the proposed rezoning area. Basin B8 will require storage capacity in the order of 3,050m³ with raingarden sizing of approximately 1,078m². A Concept Plan has been prepared for Basin B8, refer to Appendix B for a preliminary layout and further design detail.

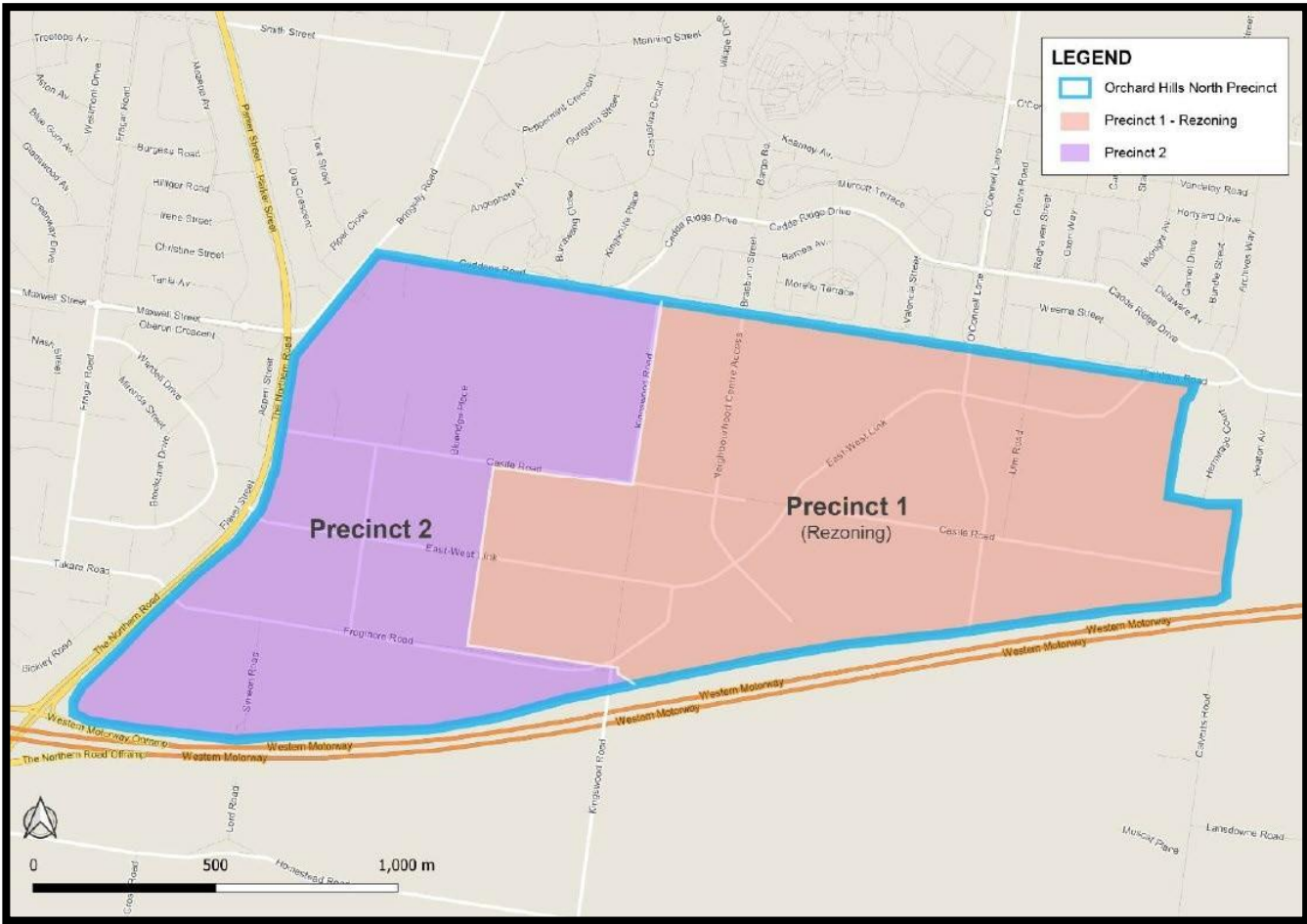
Yours faithfully

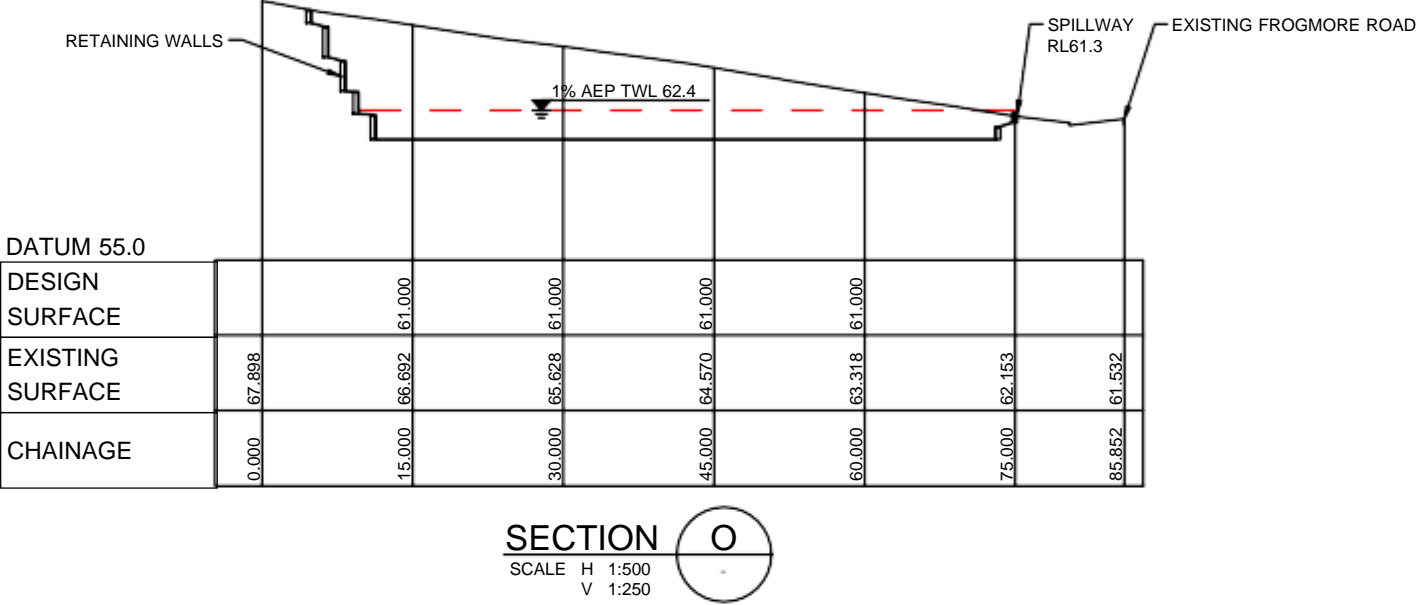
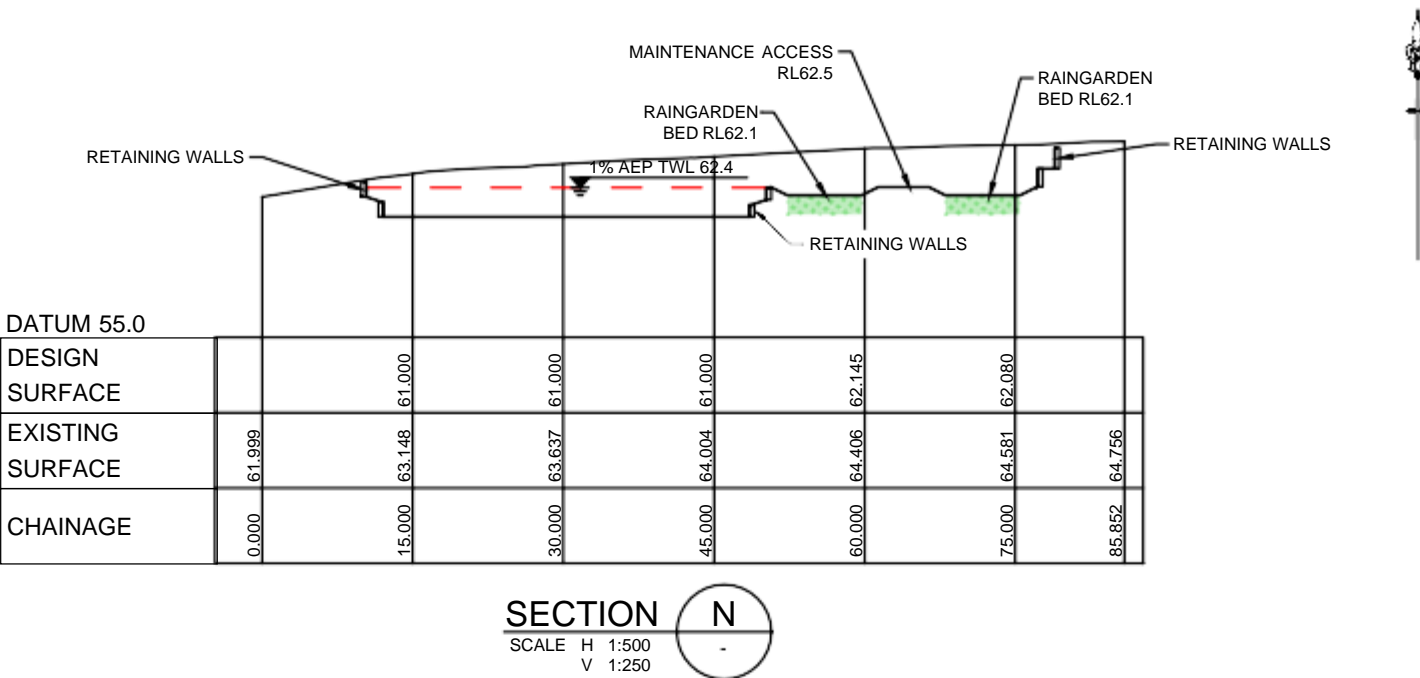
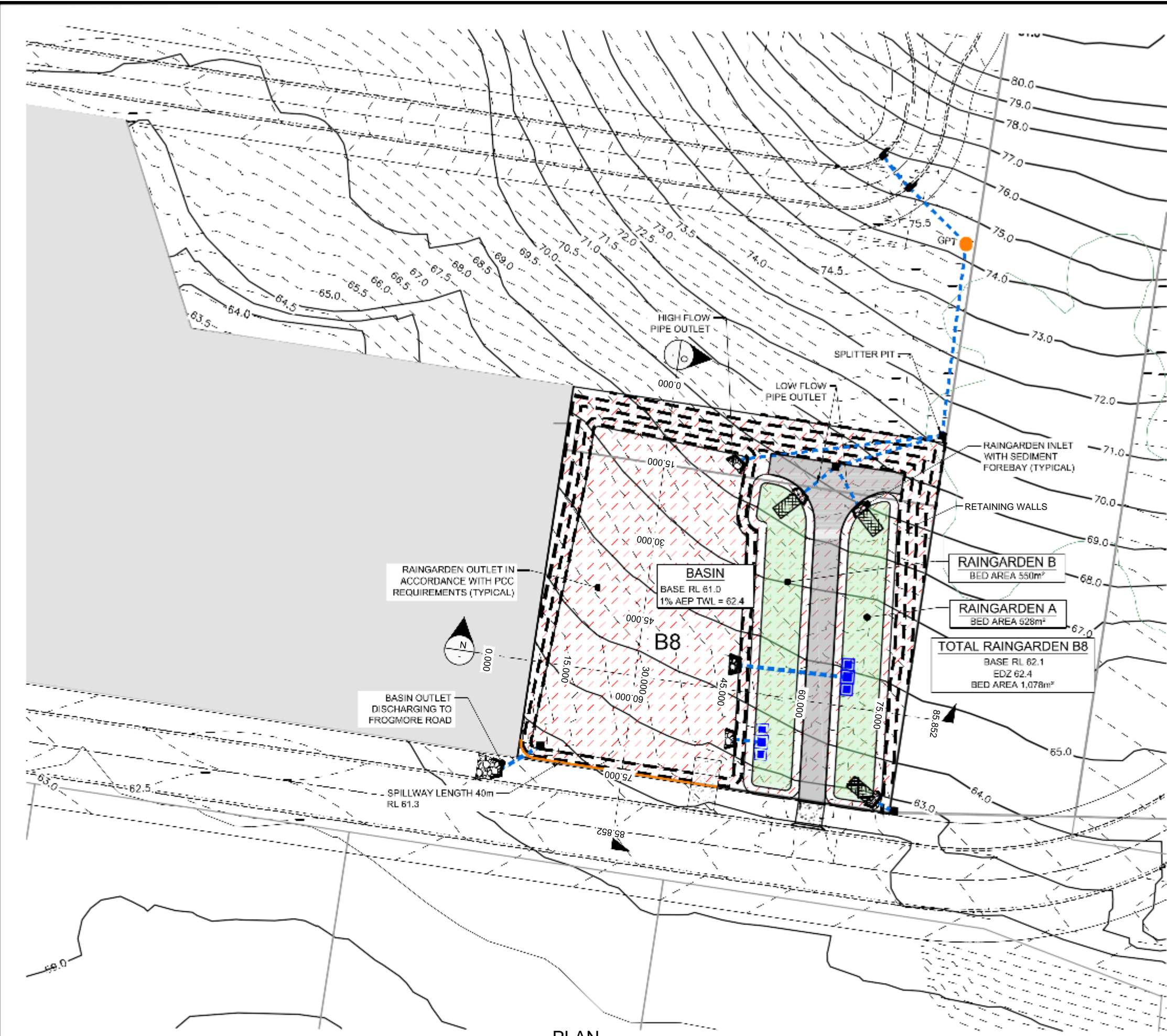


DAVID CROMPTON

Acting Manager – Infrastructure Design

Appendix A





LEGEND

- EXTENT OF CUT
- EXTENT OF FILL
- OSD BASIN WEIR/SPILLWAY
- REINFORCED TURF
- ROCK SCOUR PROTECTION
- RAINGARDEN MEDIA BED
- PERMANENT WATER
- STORMWATER DRAINAGE LINE
- GPT AND OUTLET
- FLOW SPREADER
- EXISTING CONTOURS
- PROPOSED CONTOURS
- RETAINING WALL
- TIERED SANDSTONE BLEACHERS (0.5x0.5x2.0 SANDSTONE LOGS)
- MAINTENANCE ACCESS TRACK (REINFORCED CONCRETE)
- MAINTENANCE ACCESS TRACK (CRUSHED SANDSTONE)
- EXISTING RESIDENTIAL LOT

BASIN SUMMARY TABLE

BASIN NAME	B8
OSD STORAGE VOLUME (m³)	3,220
DISTURBED AREA (m²)	2,341

FINAL ROAD ALIGNMENT AND GRADING TO BE CONFIRMED AS PART OF DETAILED DESIGN

DRAFT ISSUE ONLY DESIGNS SUBJECT TO CHANGE

1	ISSUE FOR INFORMATION	GA	GA	MS	DC	14/06/22
	AMENDMENT	DES	DRN	CKD	APR	DATE

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750
P 02 4720 3300 F 02 4720 3399 W www.jwprince.com.au E jwp@jwprince.com.au

AZIMUTH:
A.H.D.
ORIGIN:
M.G.A.

CLIENT:

LEGACYPROPERTY

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ORCHARD HILLS NORTH
BASIN CONCEPT
BASIN B8

PLAN No:
110265/SK113

FILE No: 110265SK113

SHEET SIZE: A1 ORIGINAL

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