Appendix F

AUTHORITY CONSULTATION

Natural Resources Access Regulator

Meeting

FILE NOTE

Re: Meeting – GPT Site – Mamre Road Precinct

The subject development was discussed at a VC meeting chaired by Bruce Colman (Urbis) on 3/08/2020.

During the meeting the proposed treatment of the mapped watercourse as detailed in the Cumberland Ecology report dated 16/07/2020 was discuss. Figure 1 – proposed watercourse realignment

Key advice provided by NRAR

- The mapped watercourse within the subject site was previously assessed by NRAR and it was determined that it was not considered to be waterfront land as defined by the Water Management Act 2000.
- The reconstruction of a post development channel and establishment of a riparian corridor as per the DPE rezoning plan and DCP was and is supported by NRAR.
- NRAR is in general agreement that the proposed reconstructed watercourse within the GTP site can be realigned. Realignment should not include 90 degree sharp meanders. The alignment should mimic natural stream design.
- Realignment is to minimise impact to remnant vegetation areas upstream of the site.
- NRAR requires details of the realignment on up and down stream sites prior to signing off on final realignment.
- NRAR does not support the reduction in the corridor width from 40m to 20m in the upstream reach within the GPT site. It is noted that the reduction of stream ordering due to the removal of upstream 1st order watercourses is contrary to the requirements of the NRAR CAA Guidelines for riparian corridors.
- NRAR recommended that flood detention requirements be considered and suitable locations for basins be allocated early in the planning process.
- During the meeting it was confirmed that the development on the site was to be lodged through the State Significant Development process and therefore would be exempt for the need to obtain a Controlled Activity Approval.

Jeremy Morice
Water Regulation Officer

4/08/2020

Figure 2. Proposed re-aligned E2 zone

Figure 1 – Cumberland Ecology Report plan

Appendix G

COSTIN ROE CONSULTING LETTERS

DATED 18 August 2020 & 27 October 2020

TO NRAR

Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

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web: www.costinroe.com.au

18 August 2020

The GPT Group
Attention: Ms Stephanie Maxwell
Level 51, MLC Centre
19 Martin Place
SYDNEY NSW 2000

Dear Madam,

Re: Lot 59 DP 259135, Mamre Road, Kemps Creek, NSW
Drainage Considerations for E2 Zone Realignment

We provide this letter in relation to the proposed industrial warehouse distribution development at the above address. Specifically this letter discusses the proposed realignment of the E2 Zoned corridor located on the east of the property, and the civil engineering and stormwater management considerations around this.

The property is noted to have recently been rezoned IN1 General Industrial by the NSW Government. An E2 Environmental Conservation Zone is shown to bisect the site, its alignment being based on an existing gully. The existing gully is recognised by NSW Natural Resources Access Regulator (NRAR) as a first order watercourse, though not considered as waterfront land as defined by the Water Management Act 2000. This was confirmed by NRAR in a meeting held on 3 August 2020 and also in the Cumberland Ecology letter referenced 19200 – Let6 dated 16 July 2020.

With reference to drawing **Co13874.06-SK03** in **Enclosure 2**, the watercourse is noted to have a contributing catchment of 22.2Ha and subsequent 1% Average Exceedance Probability (AEP) design flow of approximately 4.4m^3/s. During dry weather there would be limited or no baseflow given the relatively small contributing catchment. The existing watercourse is noted to be located within land currently utilised in a rural capacity and is clear of trees, has several farm dams and limited to no ecological value.

As noted it is proposed by The GPT Group to realign the E2 Zone currently shown by DPIE and watercourse as part of the proposed development. With reference to drawing **Co13874.06-SK04** in **Enclosure 2**, flows from the contributing catchment are proposed to be conveyed within a new engineered, though naturalised, channel. The channel concept and a typical cross section in shown on the drawing. The section is noted to contain a 5m wide channel, with a 3.8m base and natural rock line channel banks. A 10m core riparian zone (CRZ) is proposed in accordance the requirements for a first order stream, as set out in the NRAR guidelines for works within controlled areas – refer **Enclosure 1**. The 10m CRZ will comprise battered vegetated slope. An overall 25m zone for the E2 Zone corridor and watercourse realignment is proposed.

In relation to conveyance capacity and stormwater management, as noted above, the calculated peak flow in the 1% AEP storm event is 4.4m^3/s. This peak flow is noted to be able to be conveyed within the proposed cross section at a depth of approximately 0.8m. The advanced concept designs to be included in the Development Approval documents will

ensure that the channel is maintained with a naturalised feel, per the recommendations of NRAR. Consideration to a meandering low flow conveyance area will be integrated into the channel, and where changes in direction occur (including adjacent to the proposed road) consideration to additional scour protection via natural rock rip-rap and other suitable scour protection means will be made. Consideration to bio-diversity corridor (refer Cumberland Ecology letter) can be achieved in the 10m zone either side of the flow conveyance channel.

Overall, we conclude that the existing watercourse can be realigned within the proposed 25m corridor. Further that the proposed 25m corridor meets the requirements of NRAR for a first order stream and that the 1% AEP flow of 4.4m3/s can be readily accommodated within the proposed naturalised channel.

We trust this letter sets out your current needs. Please contact the undersigned if clarification of any point is required.

Yours faithfully,

COSTIN ROE CONSULTING PTY LTD

MARK WILSON MIEAust CPEng NER
Director

Encl. 1. Figure 1 and Table 1.
2. Co13874.06-SK03 and Co13874.06-SK04

ENCLOSURE 1

Figure 1 and Table 1 below are extracts from the DPI NSW Office of Water showing requirements for riparian corridors and VRZ widths

Figure 1. The riparian corridor

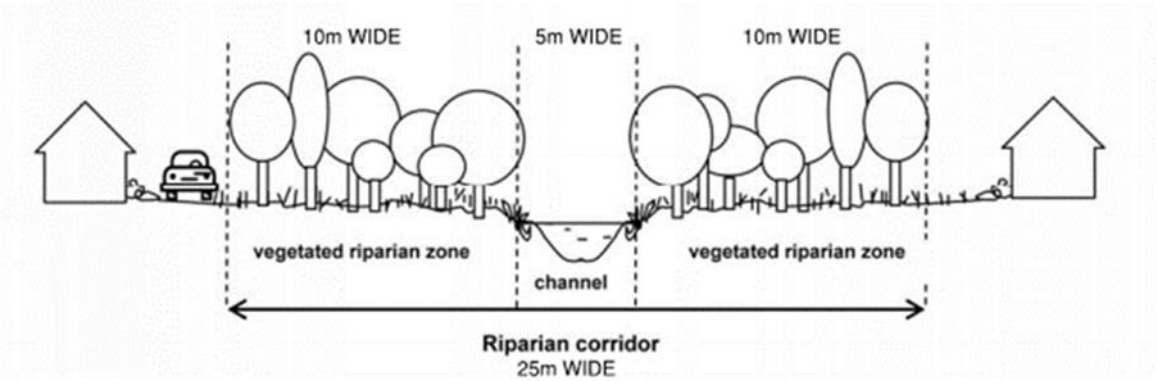


Table 1. Recommended riparian corridor (RC) widths

Watercourse type	VRZ width (each side of watercourse)	Total RC width
1st order	10 metres	20 m + channel width
2nd order	20 metres	40 m + channel width
3rd order	30 metres	60 m + channel width
4th order and greater (includes estuaries, wetlands and any parts of rivers influenced by tidal waters)	40 metres	80 m + channel width

ENCLOSURE 2
Co13874.06-SK03 and Co13874.06-SK04

CAT US3
18.58 HA

CATCHMENT US3 DISCHARGE POINT
DISCHARGE TO PROPOSED INTERALLOTMENT DRAINAGE.

CAT 1/2
13.45 HA

CATCHMENT 1/2 DISCHARGE POINT
DISCHARGE TO BIORETENTION BASIN.
REFER SK01.

CAT 3
6.59 HA

CATCHMENT 3 DISCHARGE POINT
LOW FLOW DISCHARGE TO BIORETENTION.
HIGH FLOW DISCHARGE TO RIPARIAN ZONE
REFER SK01.

CATCHMENT US2 DISCHARGE POINT
DISCHARGE TO RIPARIAN ZONE.

OVERLAND FLOW PATH

CAT US1
22.26 HA

CATCHMENT 4/5 DISCHARGE POINT
LOW FLOW DISCHARGE TO BIORETENTION.
HIGH FLOW DISCHARGE TO RIPARIAN ZONE
REFER SK01.

CAT 4/5
8.93 HA

OVERLAND FLOW PATH

CATCHMENT US2 DISCHARGE POINT
DISCHARGE TO INTERALLOTMENT DRAINAGE LINE AND
THEN TO RIPARIAN ZONE.

OVERLAND FLOW PATH

CAT US2
1.82 HA

OVERLAND FLOW PATH

CAT ROAD TEMP 1.28 HA

CAT ROAD 1 1.49 HA

CATCHMENT ROAD 2 DISCHARGE POINT
DISCHARGE TO RIPARIAN ZONE.
REFER SK01.

CAT ROAD 2 0.75 HA

LEGEND:

	CATCHMENT	AREA
	1 / 2	13.45 Ha
	3	6.59 Ha
	4 /5	8.93 Ha
	US1	22.26 Ha
	US2	1.82 Ha
	US3	18.58 Ha
	ROAD 1	1.49 Ha
	ROAD 2	0.75 Ha
	ROAD TEMP	1.28 Ha

20m 0 50 100 150 200m
SCALE 1:2000 AT A0 SIZE SHEET

ESTATE CATCHMENT PLAN
SCALE 1:2000

FOR INFORMATION ONLY

ISSUE	DATE	AMENDMENTS
B	20.07.20	ISSUED FOR INFORMATION
A	17.07.20	ISSUED FOR INFORMATION

ARCHITECT

CLIENT
GPT
The GPT Group

PROJECT
PROPOSED INDUSTRIAL ESTATE
MAMRE ROAD
KEMPS CREEK NSW

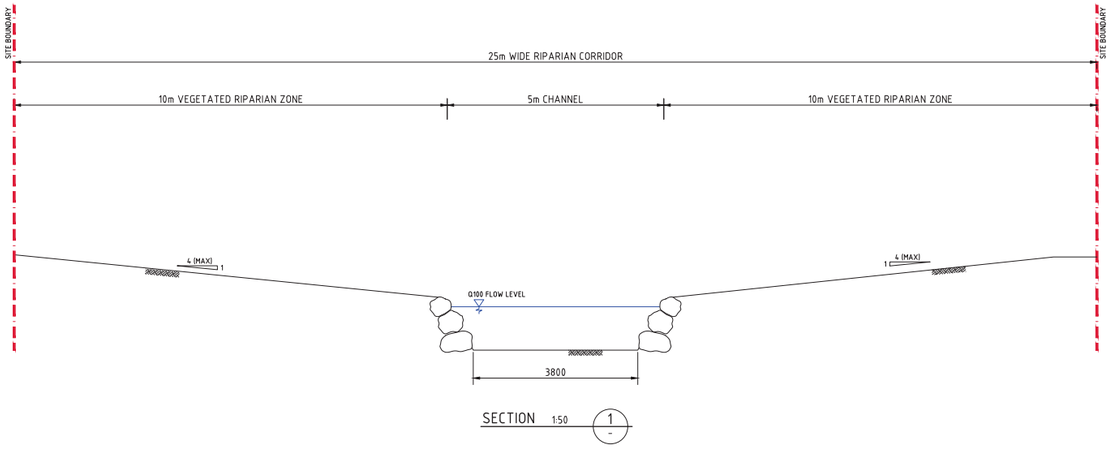
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF
M.W.	I.D.	JULY '20		A0	AS SHOWN	C013874.06 - SK03

Costin Roe Consulting Pty Ltd.
Consulting Engineers
Level 1, 8 Windmill Street
Walsh Bay, Sydney NSW 2000
Tel: (02) 8251-7699 Fax: (02) 9041-3721
email: mail@costinroe.com.au ©

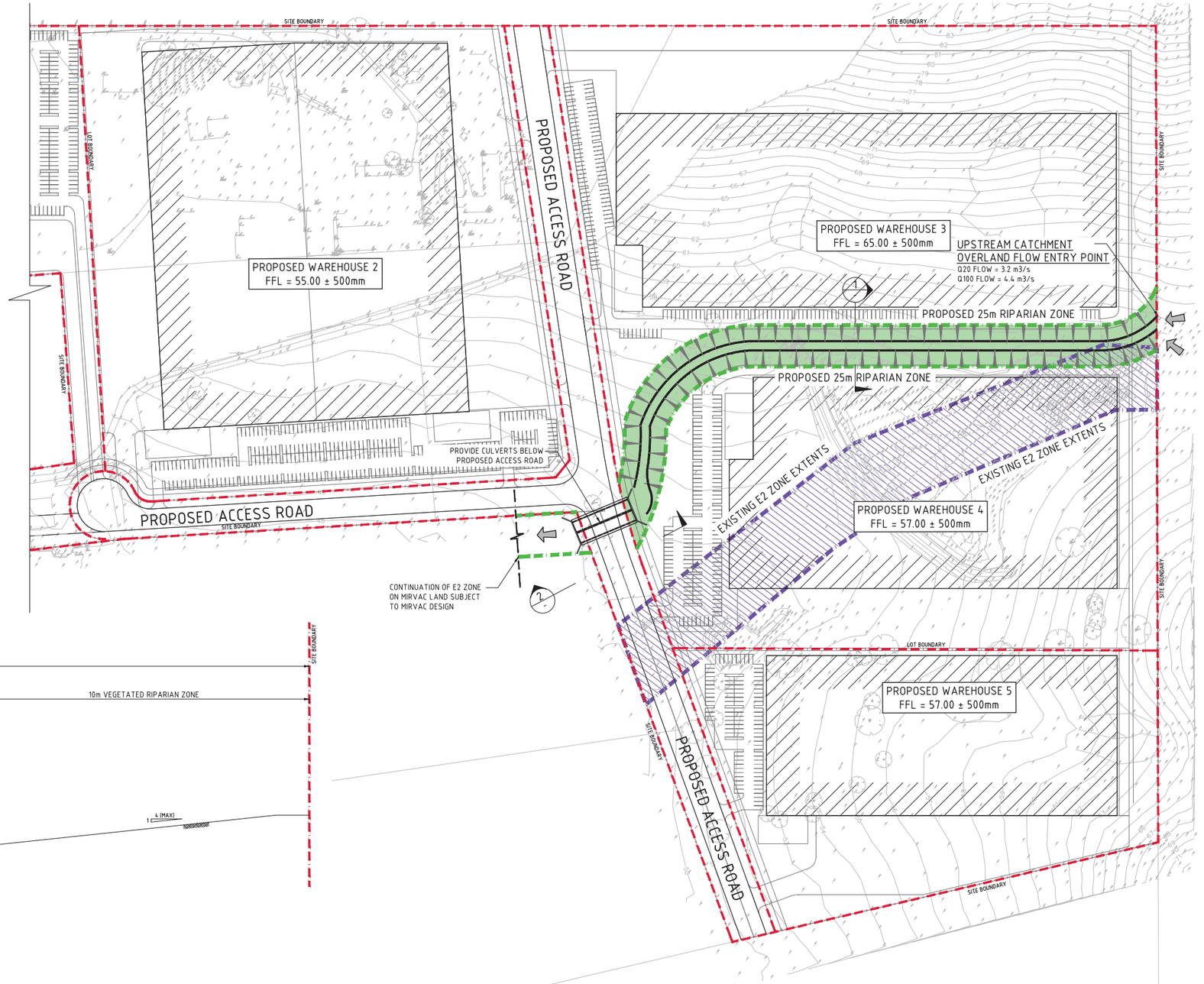
Costin Roe Consulting
PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
ESTATE CATCHMENT PLAN

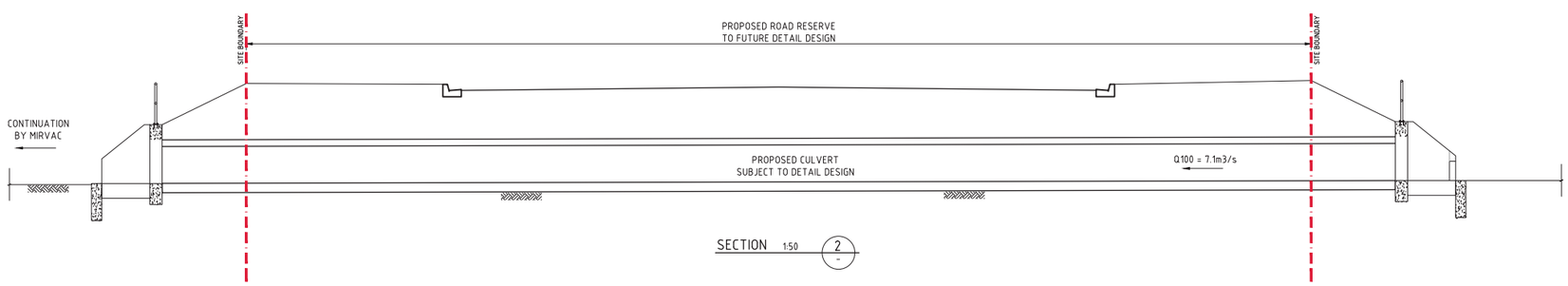
DRAWING No C013874.06 - SK03
ISSUE B



SECTION 1:50 (1)



PROPOSED E2 REALIGNMENT PLAN
SCALE 1:1000



SECTION 1:50 (2)

LEGEND:
- EXISTING E2 ZONE
- PROPOSED E2 ZONE
- OVERLAND FLOW DIRECTION
- 50.00 - EXISTING SURFACE CONTOUR

500mm 0 1 2 3 4 5m
SCALE 1:50 AT A0 SIZE SHEET

10m 0 10 20 30 40 50 60 70 80 90 100m
SCALE 1:1000 AT A0 SIZE SHEET

FOR INFORMATION ONLY

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	31.07.20	A

ARCHITECT

CLIENT: The GPT Group

PROJECT: PROPOSED INDUSTRIAL ESTATE
MAMRE ROAD
KEMPS CREEK NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M.W.	I.O.	JULY '20		A0	AS SHOWN	C013874.06 - SK04

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Costin Roe Consulting
PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE: PROPOSED E2 REALIGNMENT PLAN AND TYPICAL SECTIONS

DRAWING No: C013874.06 -SK04 ISSUE: A

Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

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27 October 2020

The GPT Group
Attention: Mr Matt Jordan
Level 51, MLC Centre
19 Martin Place
SYDNEY NSW 2000

Dear Sir

Re: Lot 59 DP 259135, Mamre Road Kemps Creek
E2 Corridor and Waterway Corridor

We provide this letter in relation to the proposed industrial warehouse distribution development at the above address. Specifically this letter discusses the geometry of the watercourse associated with the proposed realignment of the E2 Zoned corridor. This letter is noted to provide additional information to our letter, **Co13874.06-03.ltr** dated 18 August 2020.

As discussed in our letter dated 18 August 2020, it is proposed by The GPT Group to realign the E2 Zone, and associated watercourse, currently shown by DPIE as part of the proposed development. The general arrangement of the watercourse was shown on drawing **Co13874.06-SK04** and included as *Enclosure 2* in the previous letter.

We understand the geometry of the watercourse has been questioned by NRAR, specifically the changes in direction of the channel.

A 90-degree change in direction, with a prolonged curved radius, is proposed through the lower portion of the channel and at the entry to the culvert. The curved radius is noted to be approximately 55m in length, and the corresponding radius at the entry to the culvert is 25m – refer **Figure 1**.

It should be noted that the design presented so far is conceptual in nature and would be subject to a more detailed design process as part of the development application advance concept design, and throughout the detail design phase. The design progression would include integration of naturalised watercourse elements such as a low flow channel, channel meander, pools and riffles, bank scour protection, rock deflectors, and other elements recommended in industry practice documents for a naturalised channel. We note that the design provided thus far is completed to suitable level of detail to confirm the E2 realignment potential. Our comments provided in this letter are based on the current preliminary design, noting that the above elements can, and will, be incorporated into the design as the process progresses and in principle support of the realignment has been reached.

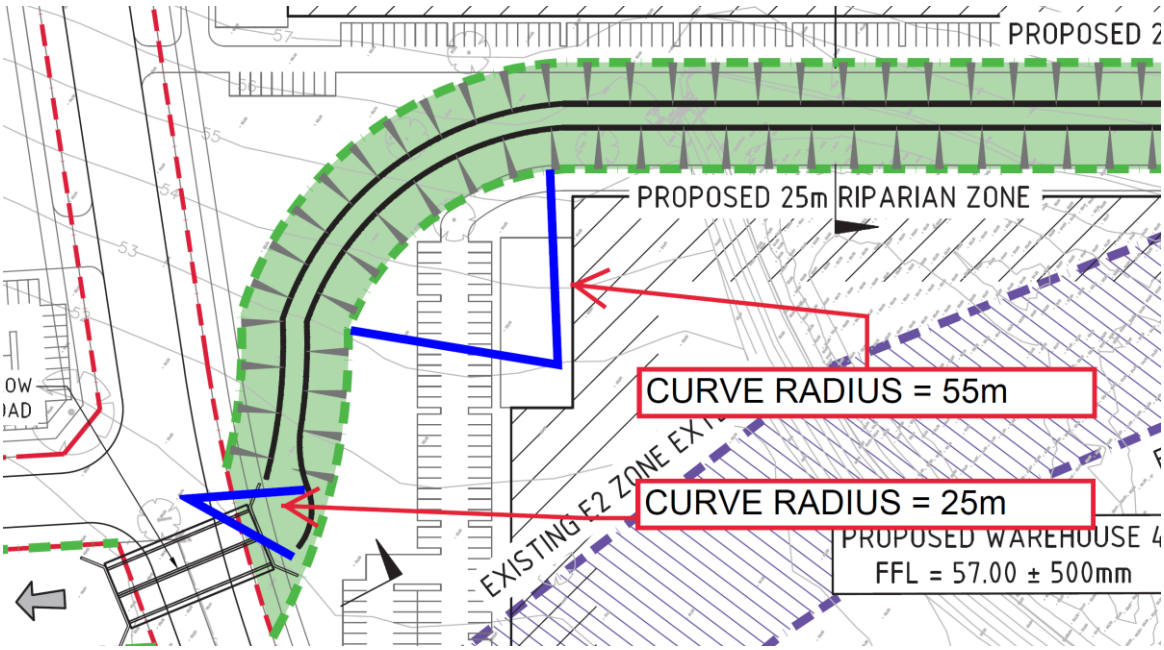

Figure 1. Proposed Channel Curves and Radius.

Review of recommended practice for naturalised creeks has been made using accepted industry methods for naturalised creek design, included in documents such as the *Queensland Urban Drainage Manual 2013*, and Brisbane City Councils *Natural Channel Design Guidelines 2003*. Within these documents recommended minimum radius of bends are recommended, based on the bankfull width of the watercourse. The recommended minimum radius for a constructed bend is 3 times the bankfull width.

For this project, noting the bankfull width of 5m, the minimum acceptable design radius of curvature as such is 15m. As shown in **Figure 1**, the proposed minimum radius is 25m, and where the larger change in direction is proposed (55m radius) the radius is noted to be 3.6 times greater than the minimum recommended curve radius.

The proposed geometry allows for generous curvature at changes in direction that are considered acceptable based on the noted literature, accepted industry and naturalised channel design practices. As noted in this letter, additional design elements would be included in the design as design progresses and in principal support of the concept has been agreed with NRAR.

We trust the information contained herein meets your current requirements, please contact the below if clarification of any points are required.

Yours faithfully,
COSTIN ROE CONSULTING PTY LTD

MARK WILSON MIEAust CPEng NER
Director