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Our Ref: 240113-007-M-CL-MT-Drainage Updates
Contact: Mitch Trounce

1 July 2026

Department of Transport and Planning
1 Spring Street
MELBOURNE VIC 3000

Attention: Patricia Ocampo

Dear Patricia,

RE: Bannockburn South East PSP - Updated Drainage Strategy (April 2026)

This memo outlines the updates to the drainage strategy for the Bannockburn South East Precinct Structure Plan (BSEPSP), following independent review and further technical assessment undertaken by Neil Craigie.

Background

The exhibited Surface Water Management Strategy (SWMS), prepared by Alluvium, was subject to independent review by Neil Craigie. As a result of this review, an alternative approach was proposed which sought to simplify the drainage strategy and remove reliance on drainage basins and outfalls to Bruce Creek.

The amended strategy was subsequently progressed through detailed hydrologic and hydraulic assessment by Rain Consulting. This included 1D (RORB) and 2D (TUFLOW) modelling to test the functionality and performance of the revised system.

Based on the outcomes of this modelling, Creo Civil prepared concept designs and associated cost estimates. The revised strategy was developed collaboratively and presented to stakeholders, and was generally supported by relevant technical experts during the Standing Advisory Committee (SAC) process.

Further Review and Refinement

Following the Standing Advisory Committee's support of the alternate strategy, further review was undertaken by relevant stakeholders. A consolidated set of stakeholder comments was provided to Creo Civil in February 2026, identifying a number of concerns with the modelling prepared by Rain Consulting.

Subsequently, Neil Craigie was re-engaged to undertake an independent review of the stakeholder feedback, as well as the modelling completed by Rain Consulting. A summary of the findings of this review is provided in **Appendix A**.

This review identified concerns with aspects of the adopted modelling inputs and methodology (refer Appendix A). In response, Neil Craigie undertook independent re-modelling of the drainage system to verify performance and inform any necessary refinements. The outcomes of this re-modelling are documented in **Appendix B.**

Design Updates

The re-modelling resulted in a number of targeted modifications to the drainage strategy, which have been incorporated into the concept design and costings by Creo Civil. These include:

- An increase in 1% AEP level in WLRB02 & SBRB6 and associated bank height adjacent to the rail corridor.
- A reduction in syphon capacity, from 2 x 2100 mm diameter pipes to 2 x 1500 mm diameter pipes; and
- The inclusion of an additional floodway between SBRB6 and WLRB02 to improve conveyance and overall system performance.

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Rail Corridor Protection and Flood Level Response

The updated modelling undertaken by Neil Craigie has resulted in an increase in flood levels within WLRB02 and SBRB6, associated with the retardation of flows to pre-developed conditions across all events (50% AEP, 20% AEP, 10% AEP, 2% AEP and 1% AEP), including detention of the SSP3-7.0 (2100) 1% AEP event.

In response:

- The bank height adjacent to the rail corridor (WLRB02) has been increased by approximately 500 mm relative to the Rain Consulting model to maintain an appropriate level of protection; and
- The bank height at SBRB6 is proposed to increase by approximately 200 mm, reflecting the corresponding increase in flood levels and to maintain a consistent level of freeboard protection.

The revised design achieves the following freeboard:

- Approximately 600 mm to the SSP3-7.0 (2030) 1% AEP event; and
- Approximately 450 mm to the SSP3-7.0 (2100) 1% AEP event.

This outcome is considered appropriate and balanced, as:

- The increased bank heights reflect a more robust and conservative representation of flood behaviour under fully attenuated (pre-developed) flow conditions and climate change scenarios; and
- The adopted freeboard remains within accepted industry tolerances and continues to provide a suitable and consistent level of protection to key infrastructure, including the railway corridor.

Updated Plans and Costings

Following completion of Neil Craigie's independent re-modelling (refer **Appendix B**), Creo Civil reviewed and updated the concept design documentation to reflect the refined hydraulic outcomes.

This included amendments to relevant drainage infrastructure layouts, levels and extents to ensure consistency with the revised flood behaviour and system performance. The updated plans are provided in **Appendix C**.

Associated cost estimates were also updated to align with the revised design. These updates incorporate the changes to infrastructure requirements, land take and construction scope arising from the refined modelling. The updated costings are provided in **Appendix D** and are expressed in 2026/27 dollars.

Implications

The updated drainage strategy results in:

- An increase of approximately 1.165 hectares of land required for drainage infrastructure; and
- A corresponding increase in drainage-related development contributions of $1,364,718.11 (compared with Revision E cost estimates provided in December 2025)

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Conclusion

The revised drainage strategy reflects a robust and independently verified approach, incorporating stakeholder feedback and updated modelling.

It is considered to satisfy the requirements of relevant authorities and stakeholders and is appropriate for incorporation into the Bannockburn South East PSP and associated Development Contributions Plan (DCP).

Please don't hesitate to call me if you have any further queries on 0439 254 546 or via email at mitch.trounce@creocivil.com.au

Yours sincerely,
Creo Civil Consultants

Mitch Trounce
Director

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APPENDIX A – Neil Craigie Review of Rain Consulting Modelling & Reports

Neil M Craigie Pty Ltd

ACN 074 582 282 ABN 29 074 582 282

Waterway Management Consultants

5 March 2026
(Revised 7/4/26)

Mr Mitch Trounce
Director
Creo Civil Pty Ltd
(By Email)

Dear Mitch,

RE: BANNOCKBURN SOUTHEAST PSP
DRAINAGE STRATEGY REVIEW

I refer to your request for me to review the following documents and provide my suggestions and recommendations for the way forward:

- the Stormwater Management Plan prepared by Rain Consulting (reference: 590_01_R02v03_Flood_Modelling_Report, 3/10/2025 – *The R02v04 version dated 3/10/25 was used for the Revision dated 7/4/26*),
- the CCMA comments as set out in the letter to Harwood Andrews dated 16/10/2025,
- the various stakeholder comments (undated) and,
- the Addendum prepared by Rain to address VPA feedback (reference: 590_02_L01v01e_SWMS_Addendum, dated 22/1/2026).

I also acknowledge receipt of the expert evidence reports and the Stormwater Conclave Statement of Agreed Opinions dated 15/10/2025.

I should add that I have not contacted Rain Consulting to discuss any of the following, and I have not yet had access to the RORB models so my comments and recommendations are based entirely on my understanding of the listed reports and my past experience.

I note from the documents that there seems to be general consensus between Golden Plains Shire Council, VPA and the CCMA and the Stormwater Conclave that the DCP should be based on what is referred to as the Alternative Drainage Strategy (ADS) or the PSP, as prepared by Rain. This ADS has been based on earlier work I did for you and the landowner consortium in May 2025.

Director ***Neil McKinnon Craigie*** *BE(Civil), MEngSci, MIEAust, CPEng (Ret)*

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Stakeholder Feedback

The CCMA, Council and VPA and the Conclave identified several issues requiring further investigation and clarification. Rain responded in their Addendum report.

Overview of recommendations:

- Include a sensitivity check for the SSP3-7.0 climate scenario (2100)
- Re-design the retarding basins/find a solution within the scheme to target these more frequent flow rates - to bring back peak developed flow rates for all events including the 20% AEP, not just the 1% AEP.
    - Ideally, the burden of this re-design should be spread across the precinct, not just within the southern retarding basin
- Increased erosion potential should be acknowledged for downstream property.
- Confirm the figures or the unit used for mean outfall volumes in table 1-1 and 1-2
- Provide assessment of the impacts of frequent flows on the hydrological and hydraulic regime in Bruce Creek downstream of the development

Detailed comment log:

Stakeholders	Comment	Actions
Golden Plains Shire Council, CCMA, Alluvium	The update model from RAIN has attended the CCMA requirement to check the frequent rain event of 20% AEP to the downstream, for both pre and post development scenarios. However, they have used SSP 1-2.6 (2030) for both cases. Climate change was factored in, but only for 2100, SSP1 (not SSP3 as preferred by CCMA).	The analysis should also include a sensitivity check for the SSP3-7.0 climate scenario (2100).
Golden Plains Shire Council, Alluvium	Clause 1.2 and table 1-3: the discharge rate for developed scenario at the immediately downstream of railway is a constant 9.33 m3/s for all rain events. This means that for more frequent rain event (20% and 10% AEP), the discharge rate at the downstream outlet increased and significantly surged compared to the existing condition. The impacts previously mentioned should not be dismissed and would be hard to defend under the Planning Provisions Clause 56.07-4: Standard C25.	Requirement is to have discharge rate being restricted to pre-development (existing) flow at all storm event, not just 1% AEP. This needs to be addressed. Potential to reduce the impacts of the 20% AEP re-diversion under the railway by re-designing the retarding basins within the scheme to target these more frequent flow rates. This is likely to increase the size of retarding basins. Best practice would be to spread the increase in size of the basin across all the assets, not just the southern basin. The premise of the design should be to bring back peak developed flow rates for all events including the 20% AEP, not just the 1% AEP. This is the criteria that would expected to met to meet the planning provision above and provide a defendable drainage strategy.
Alluvium	Daily flows into the "Site Outfall – Syphon Location" are increased significantly (approximately 30% on number of events), largely due to the strategy redirecting the 20% AEP flows to the syphon outlet. This impact is amplified due to the SWMS proposed to redirect flows from catchments that typically don't drain to this location. The analysis fails to split out the impact of the redirection of flows. This has potential to impact on the downstream landholders land useability for agriculture, existing dam function and overall farm management.	The Impact of the re-diversion of peak flow rates need to be acknowledged and agreed to be being acceptable by all stakeholders.

Cont'd over

Stakeholders	Comment	Actions
Alluvium	Flood velocities are increased from existing conditions. For example for the 20% AEP under existing conditions velocities are largely below 0.5 m/s across the d/s property and approx. 1m/s on dam north-west corner (assumed overflow), which typically would suggest limited erosion potential. However, in the developed conditions for 20% AEP velocities are increased across the board with 0.8 m/s across the d/s property and approx. 1.5m/s on dam north-west corner (assumed overflow). While not a significant increase this does increase erosion potential and should also be acknowledged.	Increased erosion potential should also be acknowledged.
DTP	The mean outfall volume in table 1-1 and 1-2 seem unusually low.	Please confirm the figures or the unit used.
CCMA	Rain Consulting have provided a response based on the flows that will be directed immediately to the creek (adjacent to the development). It is not clear whether this was the intention of the recommendation (as it appears to be the same as recommendation 1.3) or whether the recommendation referred to the ultimate Bruce Creek outfall (approximately 4km downstream of the development). It is also noted that the model only addressed the immediate downstream properties and excluded the downstream dam (approx. 1.5km downstream) and the confluence with Bruce Creek. Whilst the analysis shows the immediate downstream property will have a mix of deeper and shallower flood extents for all flood events between 2% and 50% AEP, areas further downstream will be adversely impacted, and due to the boundary limits of the FIA it is not known what the impacts will be on properties downstream of the existing dam or what the impacts will be downstream of the confluence with Bruces Creek. Whilst the analysis shows the immediate downstream property will have a mix of deeper and shallower flood extents for all flood events between 2% and 50% AEP, areas further downstream will be adversely impacted, and due to the boundary limits of the FIA it is not known what the impacts will be on properties downstream of the existing dam or what the impacts will be downstream of the confluence with Bruces Creek. The CMA - noting that most development flows will be entering Bruce Creek at the confluence - consider an assessment of its impacts to the hydrologic and hydraulic regimes of Bruce Creek to be appropriate. The CMA are also of the opinion that more work is needed to demonstrate that the development will cause no adverse flood impacts to any downstream properties for all events between 50% and 1% AEP. A retarding basin that retards peak flows for a range of AEP events rather than just the 1% AEP event is recommended.	The VPA will meet with the CCMA to determine if an assessment of the impacts of frequent flows on the hydrological and hydraulic regime in Bruce Creek downstream of the development (at the ultimate creek outfall) is required. VPA request Rain's comments on this matter to assist in this discussion. We believe CCMA preference is to have this done via this Amendment, not after.

The Key Issues to be Addressed

Based on this feedback I have summarised what I perceive to be the key issues as follows:

1. Impact of the 20%AEP pipe diversion system on Bruce Creek and on the receiving tributary.

The diversion captures the pipe drainage system in the westerly catchment (naturally draining into Bruce Creek), and sends it to the east to be managed as part of the main

system draining south via the tributary of Bruce Creek. Larger flows continue overland into Bruce Creek. The tributary re-enters Bruce Creek some 4 km south of the railway.

2. Recommendations of EPA 1739.1 on water volume management

CCMA have submitted that Bruce Creek should be considered as a Priority Area and consequently that the PSP should meet the recommended targets at the confluence of the tributary and Bruce Creek.

3. Tributary peak flows downstream of the railway should be maintained at existing conditions for all events between 50% and 1% AEP

At present the Rain modelling shows 1%AEP flows are maintained at existing conditions using SSP1-2.6 2030 and 2100. The Addendum report claimed modelling was done for 2%, 5%, 10%, 20% and 50% AEP events but results were provided only for 2%, 5%, 10% and 20% AEP (SSP1-2.6 2030). The results for these events show similar peak outflow values indicating smaller events are not controlled to existing conditions.

Reworking basin sizings to correct this issue can be expected to potentially impact on DCP costs for drainage assets, especially if landtake is increased.

4. SSP3-7.0 checks should be run for the 1%AEP event.

My Responses

1. **The 20% AEP Pipe Diversion System**

My expectation based on other similar diversion scheme projects I have assessed is that 20% AEP diversion will suffice to reasonably offset the impact of urbanisation on a receiving waterway (in this case the abutting reach of Bruce Creek), having regard to runoff volumes, frequencies of runoff and peak rates of high flow runoff.

There is no doubt that the diversion will consequently add to volumetric runoff in the receiving drainage system-in this case the eastern tributary of Bruce Creek. Design of retarding basins in the tributary system can and should be able to offset impacts on peak rate of runoff south of the railway. Basins cannot effectively mitigate frequency or volume of runoff. However in this case there should be little meaningful impact on both parameters given the vastly larger urban area naturally drained to the tributary system.

It is reasonable for impacts to be assessed using the MUSIC model or similar (volume and frequency) and RORB (for peak flows) and for this to be done as part of SWMS development.

In my opinion the Rain Addendum has reasonably assessed the frequency and volumetric impacts using MUSIC, although I am not sure the correct units have been listed for mean daily flows in Tables 1.1 and 1.2. The figures seem far too low.

2. EPA 1739.1 Recommendations

For the BSE PSP no stormwater management strategy alone can deal with the increased volumetric runoff discharged south of the railway to meet the Priority Area targets defined in EPA 1739.1. I am satisfied that the current SWMS has dealt appropriately with this issue:

- *EPA Publication 1739.1 is not a compliance document. It is a guideline setting out guidance to help minimise risks from urban stormwater, so far as is reasonably practicable.*

- *EPA Publication 1739.1 sets out volume reduction targets which vary with mean annual rainfall. The volume reduction target is for mean annual impervious runoff (MAIR) and not total mean annual runoff (MAR). MUSIC modelling shows MAIR is 85% of MAR for 70% average catchment imperviousness in this area.*

- *For the 500 mm rainfall band which covers Bannockburn the Priority Area target is 77% reduction via harvest/evapotranspiration and 5% via seepage or 82% total MAIR. Hence the 1739.1 priority area target in Bannockburn is 0.85*82=70% of MAR. The Other Areas target is 31% reduction via harvest/evapotranspiration and 4% via seepage or 35% total MAIR. Hence the 1739.1 Other area target in Bannockburn is 0.85*35=30% of MAR.*

- *The IWM strategy by Spiire proposes recycled water supply for irrigation of open space, maximum utilisation of infiltration and evapotranspiration via wetlands, and capture of treated water for export to offsite assets such as She Oaks Reservoir for re-use.*

- *Recycled Class A is not proposed for toilet flushing and garden irrigation so a requirement for suitably plumbed and sized raintanks on all dwellings may be feasible. It can certainly be included as part of the SWMS.*

- *Roofwater storage and reuse has been modelled in Geelong as achieving up to 20% reduction in MAR from residential development at 70% imperviousness. Wetland evaporation losses can account for at best another 10% of MAR, which will suffice for the Other Area target to be achieved. The balance of 40% MAR needs to be achieved by the IWM offsite capture/transport/reuse approach.*

I have no argument against these proposals. The feasible SWMS target is 30% MAR reduction which will effectively comply with EPA 1739.1 at the tributary confluence with Bruce Creek, having regard to the other IWM proposals being implemented.

I do note that the pipe diversion system automatically guarantees the EPA 1739.1 Priority Area target guideline is achieved through the BSE PSP area along Bruce Creek down to the tributary confluence, and while assisting in mitigating existing creek environ erosion concerns, can effectively offset some of the excess runoff generated from existing (untreated) urban area upstream.

In my opinion the BSE SWMS cannot be expected to do anything further on this issue and no further work is required at this point in time.

3. Tributary Peak Flows south of the Railway

There is clearly more work to do on managing peak flows in the tributary downstream of the railway. I agree that proving smaller event peaks are maintained at or below those for existing conditions should form part of the current strategy, not least because of the need to confirm with reasonable surety the overall landtake and asset sizings for the DCP, but also to show downstream owners are not being impacted. It is not reasonable in my view to leave this work for a future stage of PSP implementation.

The original Rain report modelling shows 1%AEP flows are maintained at existing conditions using SSP1-2.6 2030 and 2100. The latest Addendum report provides modelling results for 2%, 5%, 10%, 20% and 50% AEP events in Table 1.3 (SSP1-2.6 2030). These results show more frequent events will result in significantly higher developed outflows than under existing conditions, so the basins need to be reworked to ensure compliance.

In the main Rain report Fig. 6.4 says 1%AEP 2030 flow d/s of railway at the west culvert= 2.6 m^3/s, comprising 1.7 m^3/s rail overflow and (by implication) 0.9 m^3/s culvert flow. For the east culverts flow d/s of railway= 7.0 m^3/s, comprising 3.1 m^3/s rail overflow and (by implication) 3.9 m^3/s culvert flow. Total therefore is <=9.6 m3/s.

(Notes: I use <= to signify there may be some timing difference between east and west peaks. It would help if the peak at the confluence just downstream was

also provided or at the very least the combined flow passing the railway was specified.

On an editorial note it would help readers if the figures in all Appendices were labelled eg. A.1, A.2 etc. and the climate change scenario was added to each title block)

Then in the Rain Addendum report there is Table 1.3:

Table 1-3 *Downstream Properties TUFLOW PO Analysis*

		Peak Flow (m^3/s)			
PO analysis location	Scenario	2% AEP	5% AEP	10% AEP	20% AEP
Immediately downstream of railway	Ex	8.94	5.42	3.41	2.91
	Dev	9.33	9.33	9.33	9.23
Critical duration and temporal pattern	Ex	2-hour TP22	2-hour, TP17	1.5-hour, TP11	1-hour, TP4
	Dev	2-hour TP26	1-hour, TP16	2-hour, TP16	1-hour TP10

From extrapolation of the existing conditions flows presented it seems like 1%AEP will be about 9-10 m^3/s which is about the same as implied in Fig. 6.4 of the original report.

But how can the 20%AEP, 10%AEP, 5%AEP and 2%AEP developed outflows from WLRB2 all be about the same?

Presumably these are all 2030 values too-again labelling would help.

Reworking the RB storage systems

When the 50%, 20%, 10%, 2% and 1% peak flows are all re-run to confirm the right values for existing conditions, then it is my expectation that water levels in the basins for developed conditions will rise significantly above the levels quoted by Rain which are currently based only on the 1%AEP event (at 78.09 m for WLRB2 only).

I would use the 50%, 10% and 1% events (SSP1-2.6 2030) to get reliable results across the AEP range using the RORB model as the fastest approach. It is easy to manually compute the hydraulics of the culvert outlet system taking into account likely tailwater regimes, without resorting to the complex and time-consuming process using TUFLOW (which can still be used as the final check).

Stage-storage relations are already available and can be fed into RORB as a table of values.

Trial and error runs can be made for each event initially assuming free flow weir outflow controls. Weir widths are varied to best approximate required outflows for each AEP and the headwater levels. Hydraulic gradeline checks can then determine the most suitable culvert size under the Railway to allow free flow over the inlet weirs.

From past studies I have done I expect, as trial starting values, that 50% AEP levels will be about 0.7-0.8 m above NWL, 10% AEP levels will be about 1.0-1.2 m above NWL and 1%AEP levels will be about 1.5-1.8 m above NWL. Some iterations are likely to be required to settle on the best arrangement. I would then set spillway level at or just above the 1%AEP level.

In the WLRB2 situation, my original design setup assumed that the 1%AEP outflow would result in the culvert characteristics (length, form and friction losses) determining the headwater level in the basin as being the most economic solution. That is, the outlet hydraulics would backflood the inlet structure weirs. This may also turn out to be the case for some of the lesser events. The trial and error runs can determine the best arrangement.

I note that Rain have adopted a downstream orifice control as the best solution with the twin conduits playing a passive role in conveying water under the railway. This seems a very expensive way to deal with a relatively simple hydraulic system. It may also explain why there is so little variation in outlet flows for various AEP's (a situation that can't be maintained to meet requirements). It may also be more prone to potential debris blockage issues.

> *(Note: for the 9.33 m^3/s outflow and tailwater level of 77.29 m quoted for 1%AEP by Rain, my computations indicate a single 2100 mm ID RCP culvert with very reasonable velocity of 2.7 m/s will suffice to force the headwater level of 78.09 m listed by Rain. Rain indicate 2*2100 mm ID is required using TUFLOW with the downstream orifice control. Conduit velocity is thus a very gentle and expensive 1.35 m/s).*

A final check run of the system can then be done using TUFLOW to confirm levels, storage volumes and peak flows. This can be done as a condition on final design.

Once all basins have been adjusted to ensure outflows south of the Railway are compliant across the AEP range then in my opinion there is no need for any further hydraulic modelling downstream of the Railway.

By definition those landowners are protected by peak flows being retained at or below existing conditions values. The current TUFLOW modelling shown in the Rain

report is adequate to define extents, depths and velocities for the 1%AEP event downstream of the Railway.

4. **SSP3-7.0 checks should be run for the 1%AEP event.**

Peak flows have been included in the Rain main report at Table 4.7 for 1%AEP SSP3-7.0 2100 for both existing and mitigated conditions, using RORB.

Once 1% AEP basin design levels have been adjusted to maintain the existing peak flows across the AEP range as set out above (using SSP1-2.6 2030), the 1%AEP SSP3-7.0 2100 scenario can then be run in RORB to make sure:

- WLRB embankment crest levels are safely above the higher water levels,
- WLRB2 outflows do not exceed existing condition values under the same CC scenario, and
- connecting waterway freeboard can still safely retain the flows.

When all such checks are complete the TUFLOW model can again be used as a final confirmation if needed. This can be done as a condition on final design.

Please do not hesitate to contact me if there are any queries in regard to this advice.

Yours faithfully,



Neil M Craigie

5 March 2026

(Revised 7/4/26)

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APPENDIX B – Neil Craigie Re-Modelling Report

Neil M Craigie Pty Ltd

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Waterway Management Consultants

12 March 2026

Mr Mitch Trounce
Director
Creo Civil Pty Ltd
(By Email)

Dear Mitch,

RE: BANNOCKBURN SOUTHEAST PSP
DRAINAGE STRATEGY REVIEW
RORB MODELLING RESULTS

Further to my review report dated 6 March I have completed remodelling of existing and developed conditions using the RORB models as supplied from Rain.

I could not follow Rain's rainfall loss rates so instead I resorted to the ARR Datahub and made adjustments according to pre-burst and year of consideration. Very similar to what Alluvium did in their original report.

Adopted Losses:

Loss	Datahub	Pre-burst	2030 Uplift	Adopted 2030	2100 Uplift	Adopted 2100
Initial	13 mm	1	1.05	12.6	1.15	13.8
Continuing	2.3 mm/hr		1.1	2.5	1.34	3.1

Adopted Kc=4.70 for existing conditions, 5.23 for developed conditions, both as per Rain model, m=0.8.

I then manually derived stage-discharge relations for the 3 storages (WLRB1A+B), SBRB6 and WLRB2) using the weir equation corrected for side contractions and ran/adjusted the number and level of weirs until obtaining the desired results.

In the case of WLRB2 hydraulic gradeline checks were made to verify that inlet control over the weirs would be maintained until the capacity of the twin 1500 mm ID RCP outlet (*) was near maximum creating its own headwater control.
(an alternative is a single 2100 mm ID pipeline)*

Director ***Neil McKinnon Craigie*** *BE(Civil), MEngSci, MIEAust, CPEng (Ret)*

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Adopted Control systems

Storage	Weir 1		Weir 2		Weir 3		Main spillway		Embankment crest level
	Crest	Length	Crest	Length	Crest	Length	Crest	Length	
WLRB1A+B	88.20	0.3	88.55	3.0			89.70	30	89.7 (Burnside Rd)
SBRB6	80.00	0.3	80.35	3.2			81.30	10	82.00 (Rail side)
WLRB2	77.00	0.3	77.35	1.5	78.40	8	79.10	20	79.50 (Rail side)

Note: Weir 1 in all cases will be a standard MW sidewinder control.

Stage-Storage Relations-all as per Rain and Creo tables

RORB Models-all as supplied by Rain with the only changes being the 3 retarding storage controls and losses.

All RORB results

All results from the Rain reports and this review using the RORB model are summarised in Table 1.

In summary:

- The RORB peak flows at the railway for all AEP under existing conditions with 2030 rainfalls are less than those obtained by Rain.

- The developed conditions peak flows for all AEP are all less than those obtained by Rain and those for existing conditions with 2030 rainfalls.

- The 1% AEP SSP3 7.0 2100 peak flows at the railway (10.93m3/s) are less than those for existing conditions under the same scenario (11.55m3/s).

- For the 1%AEP SSP3 7.0 2100 scenario flood levels for WLRB1A and B and WLRB2 are safely contained without main spillway activation. SBRB6 level maintains 360 mm freeboard to the rail side embankment.

WLRB2 Outlet System

Figures 1 and 2 illustrate my suggested design concept for the main control structure, twin 1500mm pipeline and the outlet pit on the south side of the railway. I have assumed a crest width of 6 m for the embankment. It may be reduced to 3-4 m on detail design.

If a single 2100 mm ID pipeline is adopted in lieu of the twin 1500 mm shown then all pit base levels and pipe inverts levels drop by 600 mm from those shown on Figures 1 and 2.

The main outlet control structure stands within the wetland proper and requires an access ramp for maintenance. There are several options available for design of such a ramp which extends up from 78.4 m to 79.3 on the top of the structure slab. Railings are to be added as part of detail design.

The main spillway is shown conceptually on Figure 3. It should be formed in excavation and graded to gradually divert flows around parallel to the railway from whence they would continue to the existing railway culverts. This spillway is not activated in the 1%AEP SSP 7.0 2100 scenario.

SBRB6 Outlet Waterway

Figure 4 shows my concept arrangement for this channel and the 1500 mm pipeline. The grassed spillway grades down at 20:1 from its crest width of 10 m at 81.30 m to match the 5 m channel base width at 81.00 m. The channel then grades uniformly to a level of 79.00 m at WLRB2.

For the 1%AEP SSP3 7.0 2100 scenario the channel conveys about 4 m^3/s at 0.55 m depth, so that tailwater at the base of the 20:1 grassed spillway is marginally below basin water level. Hence for larger flows the grassed channel itself controls the rate of outflow from the basin.

Figure 5 shows my suggested design concept for the main outlet structure.

Please do not hesitate to contact me if there are any queries in regard to this advice.

Yours faithfully,



Neil M Craigie

12 March 2026

TABLE 1	**Results for current and fully developed Bannockburn SE PSP conditions (ARR 2016 rainfalls with 2030 and 2100 uplift (SSP3 7.0))**								
Event	**Asset**	**Peak Flows for 2030 Existing Conditions (m3/s)**		**Developed 2030 Conditions**					
		Rain 2026	**This RORB review**	**Rain 2026**			**This RORB Review**		
				Peak Outflow (m3/s)	**Flood Level (m)**	**Storage (m3)**	**Peak Outflow (m3/s)**	**Flood Level (m)**	**Storage (m3)**
50% AEP	PSP south outlet at Railway	**-**	**1.02**				**0.96**	-	-
	WLRB1A+B						0.97	88.85	35,700
	SBRB6						1.70	80.79	4,460
	WLRB2						0.96	77.90	72,900
20% AEP	PSP south outlet at Railway	**2.91**	**1.86**	9.23	-	-	**1.80**	-	-
	WLRB1A+B						1.72	89.01	46,500
	SBRB6						2.72	80.96	5,750
	WLRB2						1.80	78.25	111,000
10% AEP	PSP south outlet at Railway	**3.41**	**3.10**	9.33	-	-	**2.94**		
	WLRB1A+B						2.22	89.10	52,900
	SBRB6						3.44	81.07	6,990
	WLRB2						2.94	78.51	139,000
5% AEP	PSP south outlet at Railway	**5.42**	**5.04**	9.33	-	-	**4.59**		
	WLRB1A+B						2.84	89.24	60,500
	SBRB6						4.14	81.17	8,6306
	WLRB2						4.59	78.65	156,000
2% AEP	PSP south outlet at Railway	**8.94**	**7.10**	9.33	-	-	**6.97**		
	WLRB1A+B						3.62	89.33	69,500
	SBRB6						4.93	81.32	105,000
	WLRB2						6.97	78.82	175,000

TABLE 1 Results for current and fully developed Bannockburn SE PSP conditions (ARR 2016 rainfalls with 2030 and 2100 uplift (SSP3 7.0))									
Event	**Asset**	**Peak Flows for 2030 Existing Conditions (m3/s)**		**Developed 2030 Conditions**					
		Rain 2026	**This RORB review**	**Rain 2026**			**This RORB Review**		
				Peak Outflow (m3/s)	**Flood Level (m)**	**Storage (m3)**	**Peak Outflow (m3/s)**	**Flood Level (m)**	**Storage (m3)**
1% AEP	PSP south outlet at Railway	**9.33**	**8.70**	9.3	-	-	**8.67**		
	WLRB1A+B			2.8	89.80	-	4.33	89.43	77,500
	SBRB6			4.6	80.70	-	5.78	81.45	12,400
	WLRB2			9.3	78.09	-	8.67	78.92	187,000
1%AEP SSP3 7.0 2100	**PSP south outlet at Railway**	**17.36**	**11.55**				**10.93**		
	WLRB1A+B						**5.7**	**89.63**	**94,100**
	SBRB6						**8.2**	**81.64**	**15,800**
	WLRB2						**10.93**	**79.04**	**205,000**

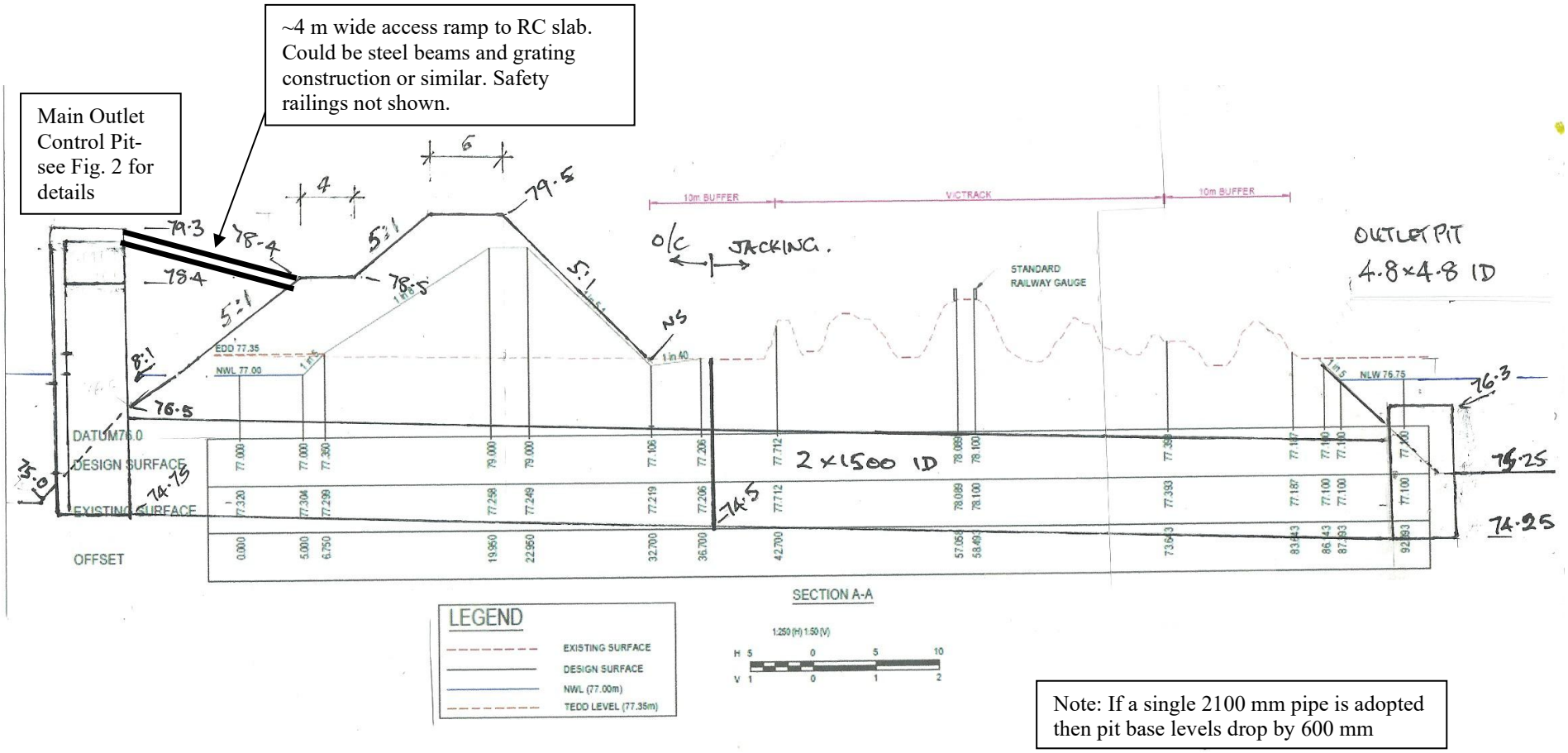


Figure 1 Outlet System for WLRB2

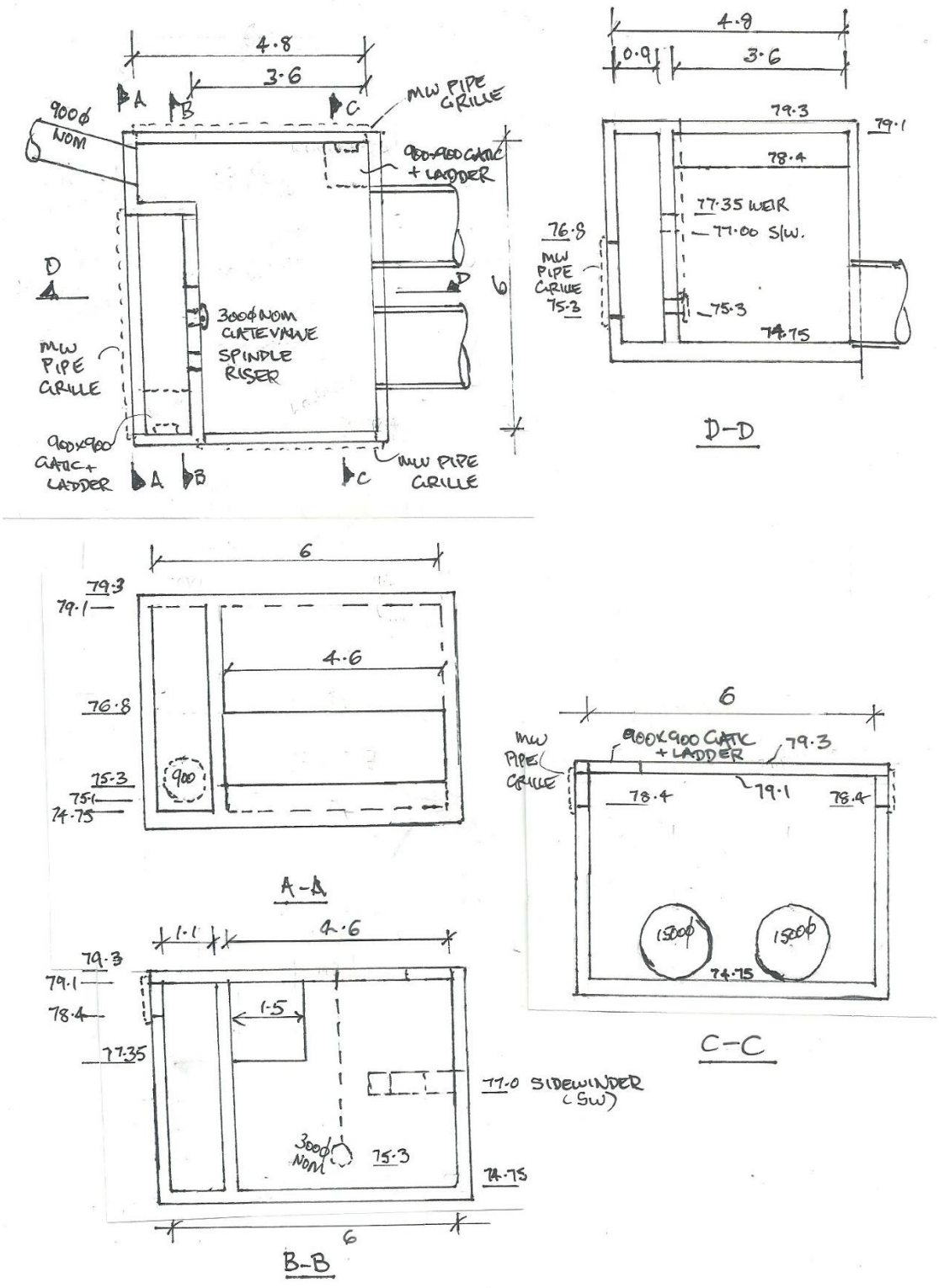
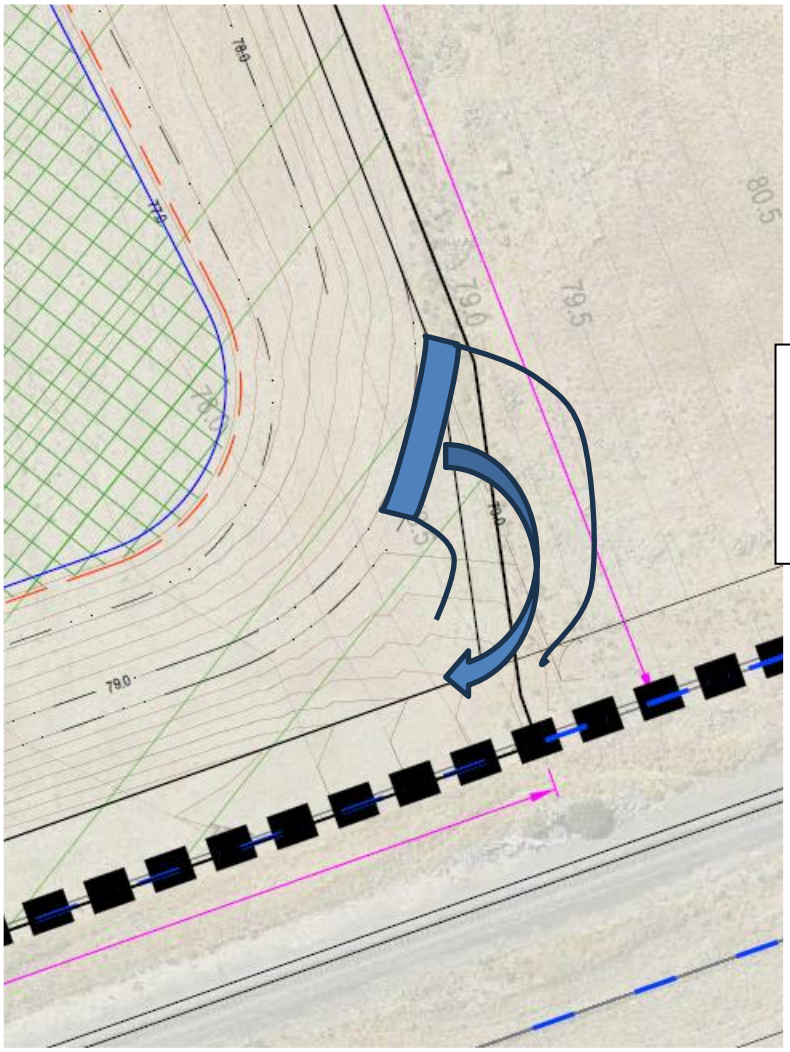


Figure 2 Main Outlet Control Pit for WLRB2

Note: reo, safety railings and access ramp not shown



Excavated and grassed 20 m wide spillway at crest level 79.1 m, diverting flow around parallel to railway. Spillway not activated in 1%AEP SSP3 7.0 event. Embankment crest 79.50 m

Figure 3 WLRB2 spillway concept

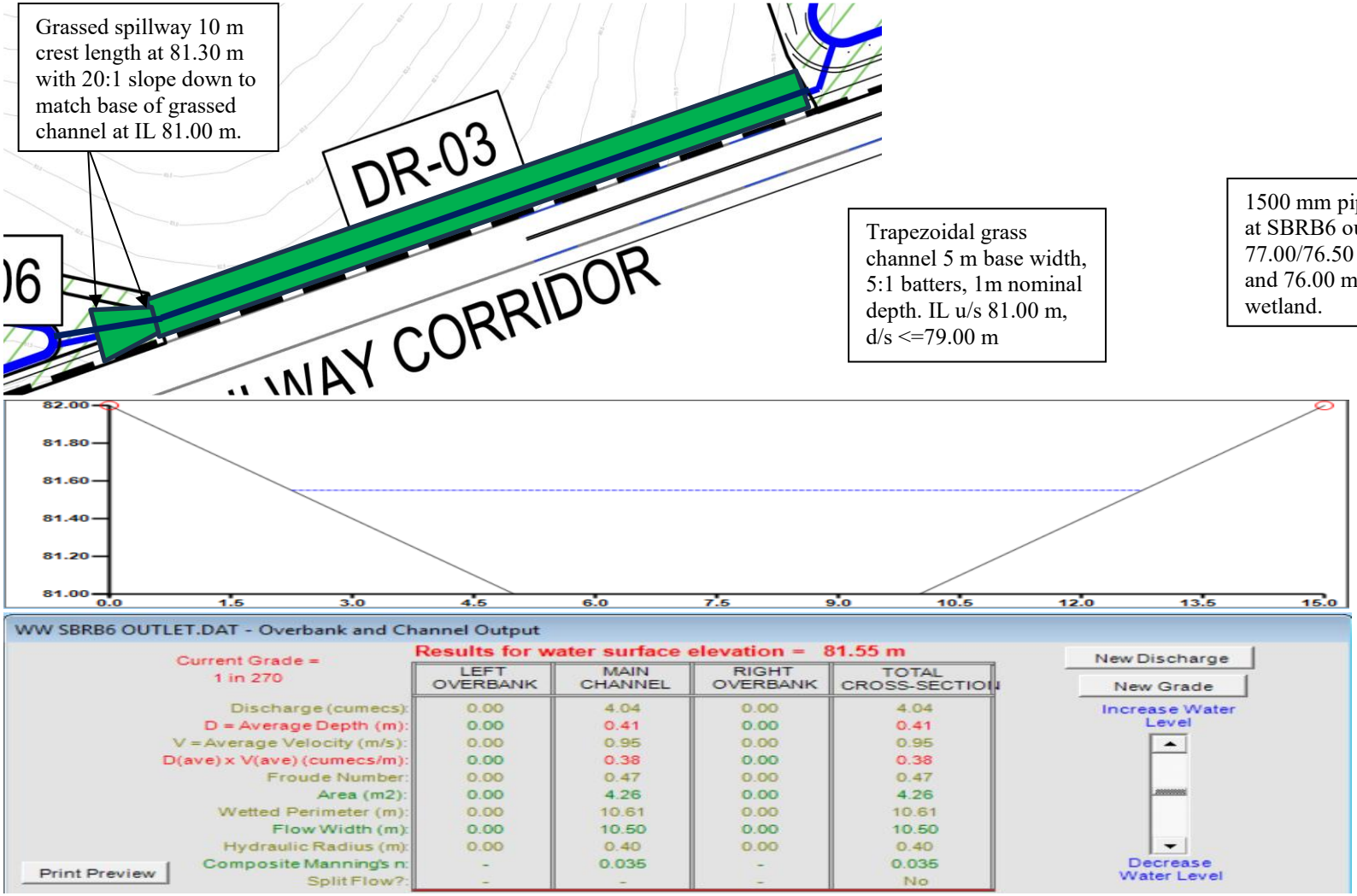


Figure 4 Concept design for pipeline and grassed channel outlet from SBRB6

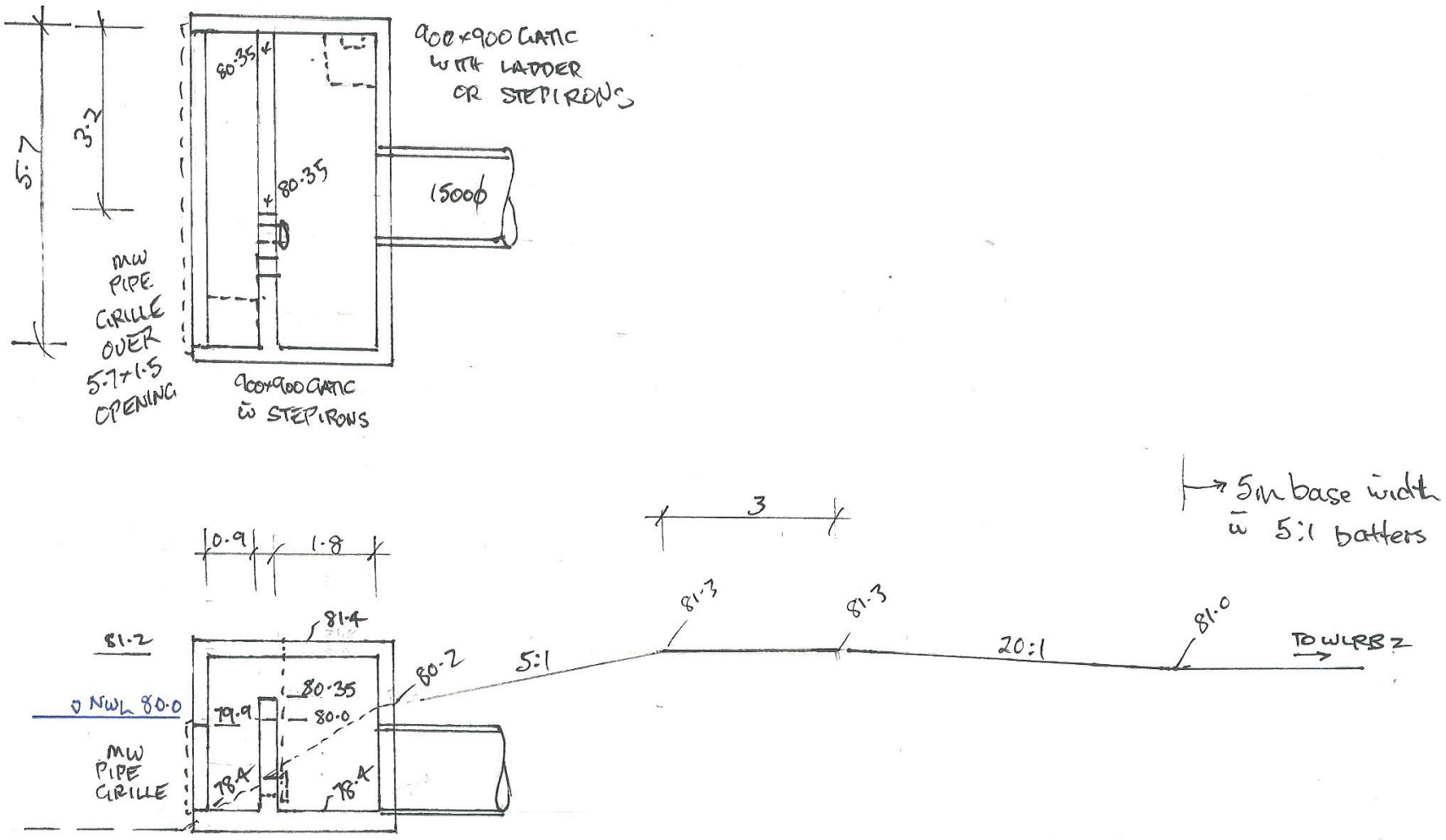
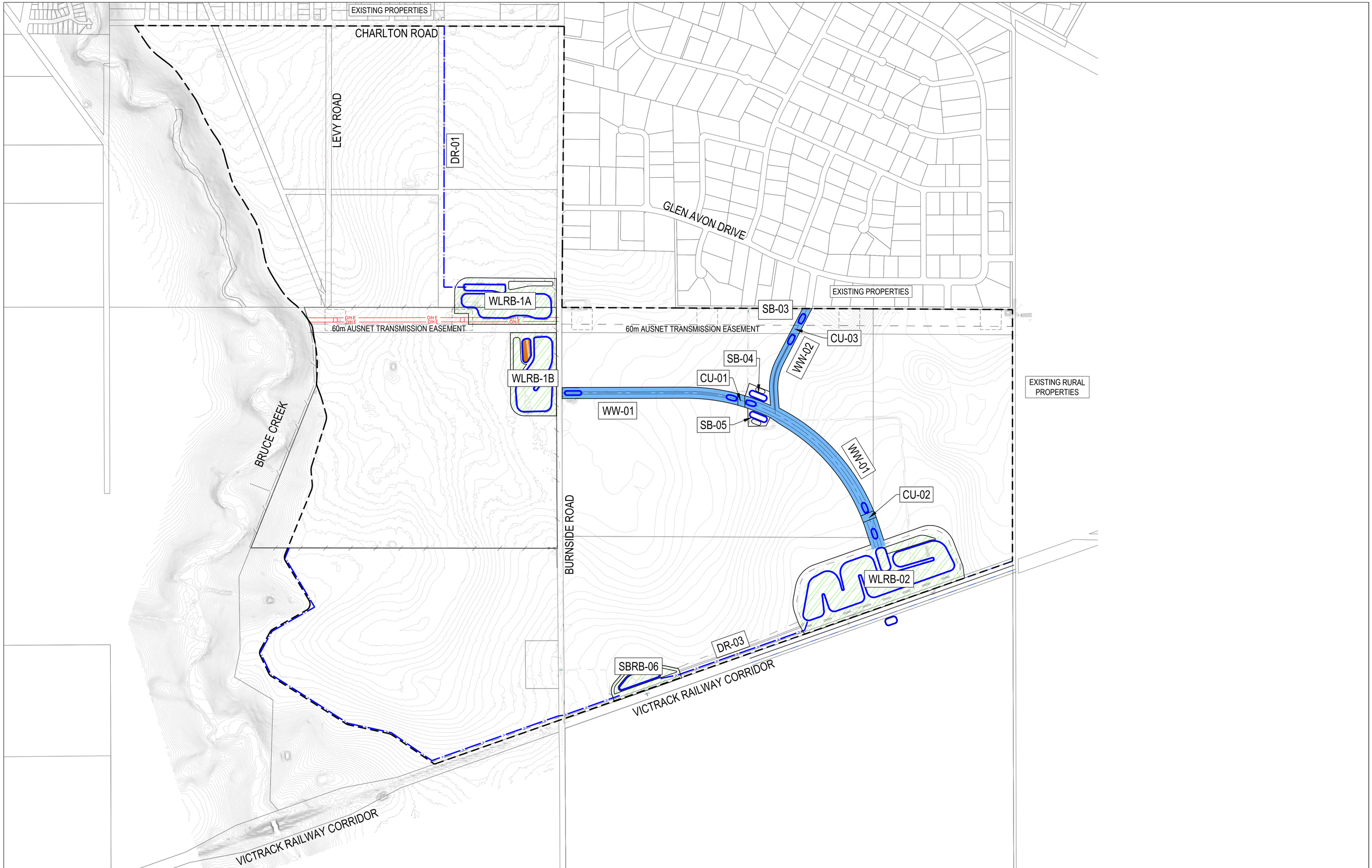


Figure 5 *Concept design for SBRB6 Outlet control structure*

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APPENDIX C – Updated Concept Plans (Revision D)



REVISION	DATE	ISSUE DESCRIPTION	DRAWN	CHECKED	APPROVED
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Newtown, VIC, Australia 3220

PROJECT

BANNOCKBURN SOUTH EAST PSP
ALTERNATIVE SWMS LAYOUT

DRAWING TITLE

CONCEPT PLAN
PROPOSED DRAINAGE LAYOUT
COVER PLAN

STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

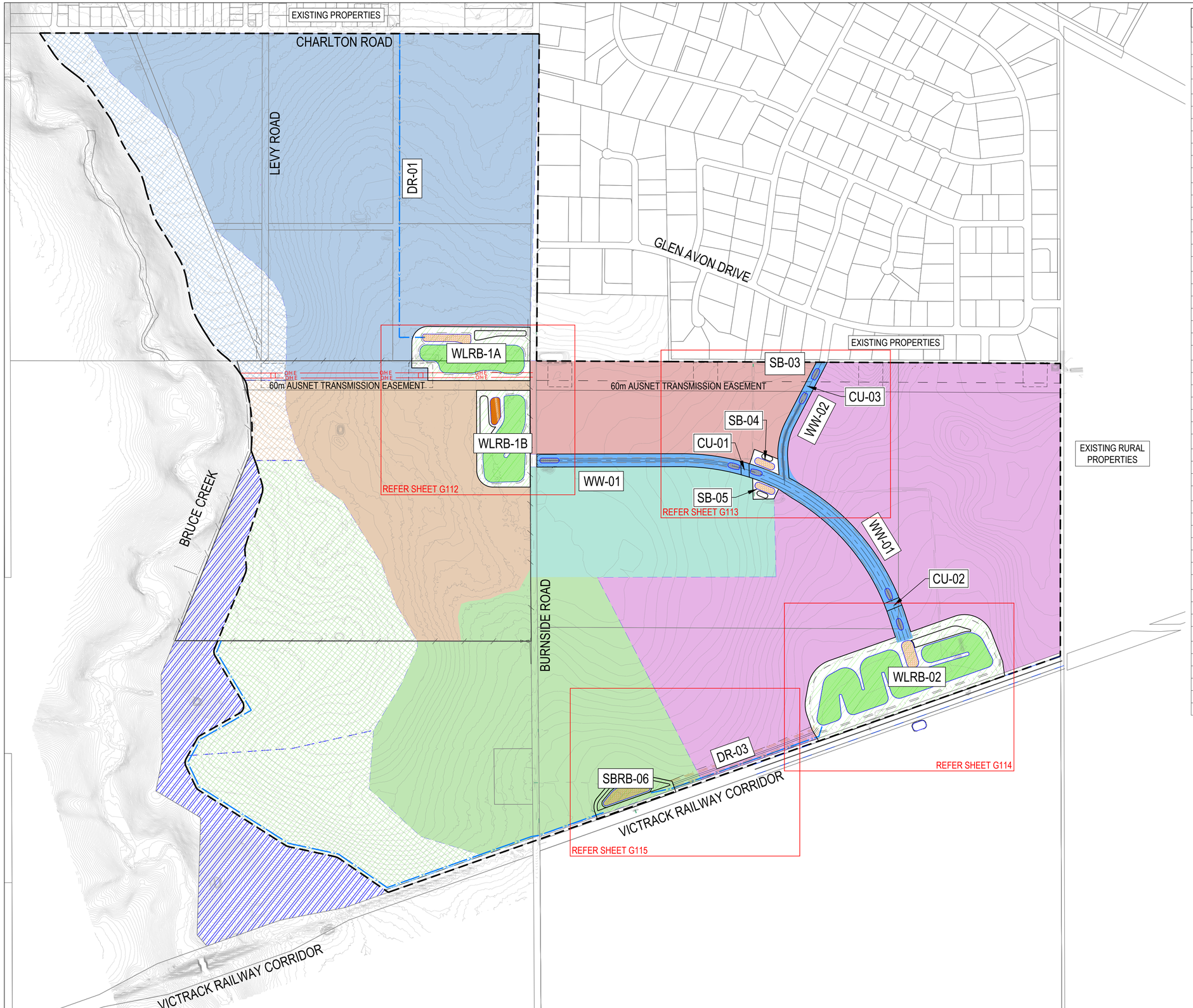
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DESIGNED	PROJECT ENGINEER
K.McKELVIE	J.RAMSEY
DRAWN	PROJECT MANAGER
K.McKELVIE	M.TROUNCE

PROJECT No.	DRAWING No.	REVISION
240113	G110	D



CATCHMENT DESIGN CRITERIA

DR-01	
ASSET LENGTH (m)	1020
20% AEP CATCHMENT AREA (ha)	-
20%AEP FLOW (m³/s)	-
WLRB-1A	
ASSET LAND TAKE (ha)	5.82
1%AEP CATCHMENT AREA (ha)	101.88
1%AEP FLOW (m³/s)	-
20% AEP CATCHMENT AREA (ha)	121.76
20%AEP FLOW (m³/s)	-
4EY FLOW (m³/s)	-
WLRB-1B	
ASSET LAND TAKE (ha)	4.88
1%AEP CATCHMENT AREA (ha)	38.21
1%AEP FLOW (m³/s)	-
20% AEP CATCHMENT AREA (ha)	41.31
20%AEP FLOW (m³/s)	-
4EY FLOW (m³/s)	-
SB-04	
ASSET LAND TAKE (ha)	0.392
1%AEP CATCHMENT AREA (ha)	23.08
1%AEP FLOW (m³/s)	-
20% AEP CATCHMENT AREA (ha)	23.08
20%AEP FLOW (m³/s)	-
4EY FLOW (m³/s)	-
SB-05	
ASSET LAND TAKE (ha)	0.362
1%AEP CATCHMENT AREA (ha)	24.79
1%AEP FLOW (m³/s)	-
20% AEP CATCHMENT AREA (ha)	24.79
20%AEP FLOW (m³/s)	-
4EY FLOW (m³/s)	-
DR-02	
ASSET LENGTH (m)	2450
20% AEP CATCHMENT AREA (ha)	58.30
20%AEP FLOW (m³/s)	-
SBRB-06	
ASSET LAND TAKE (ha)	2.00
1%AEP CATCHMENT AREA (ha)	58.10
1%AEP FLOW (m³/s)	-
20% AEP CATCHMENT AREA (ha)	116.40
20%AEP FLOW (m³/s)	-
4EY FLOW (m³/s)	-
DR-03	
ASSET LENGTH (m)	590
20% AEP CATCHMENT AREA (ha)	116.40
20%AEP FLOW (m³/s)	-
WLRB-02	
ASSET LAND TAKE (ha)	11.58
1%AEP CATCHMENT AREA (ha)	97.21
1%AEP FLOW (m³/s)	-
20% AEP CATCHMENT AREA (ha)	97.21
20%AEP FLOW (m³/s)	-
4EY FLOW (m³/s)	-

LEGEND

- STORMWATER DRAIN AND PIT (20% - 1%AEP)
- STORMWATER DRAIN AND PIT (Q1 - 4EY)
- FUTURE STORMWATER DRAIN AND PIT
- EXISTING STORMWATER DRAIN AND PIT
- LIMIT OF WORKS
- UNCONTROLLED 20%AEP CATCHMENT
- WATER WAY
- DRAINAGE RESERVE
- WETLAND
- SEDIMENTATION POND
- 20%AEP CATCHMENT AREA
- INDICATIVE 20%AEP DRAINAGE CATCHMENT
- INDICATIVE 20%AEP DRAINAGE ALIGNMENT
- EXISTING CONTOUR (0.50m)
- EASEMENT
- EXISTING OVERHEAD ELECTRICITY
- INDICATIVE 20%AEP DRAINAGE ALIGNMENT
- INDICATIVE CATCHMENT BOUNDARIES

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Newtown, VIC, Australia 3220

PROJECT: BANNOCKBURN SOUTH EAST PSP
ALTERNATIVE SWMS LAYOUT

DRAWING TITLE: CONCEPT PLAN
PROPOSED DRAINAGE LAYOUT
KEY SHEET

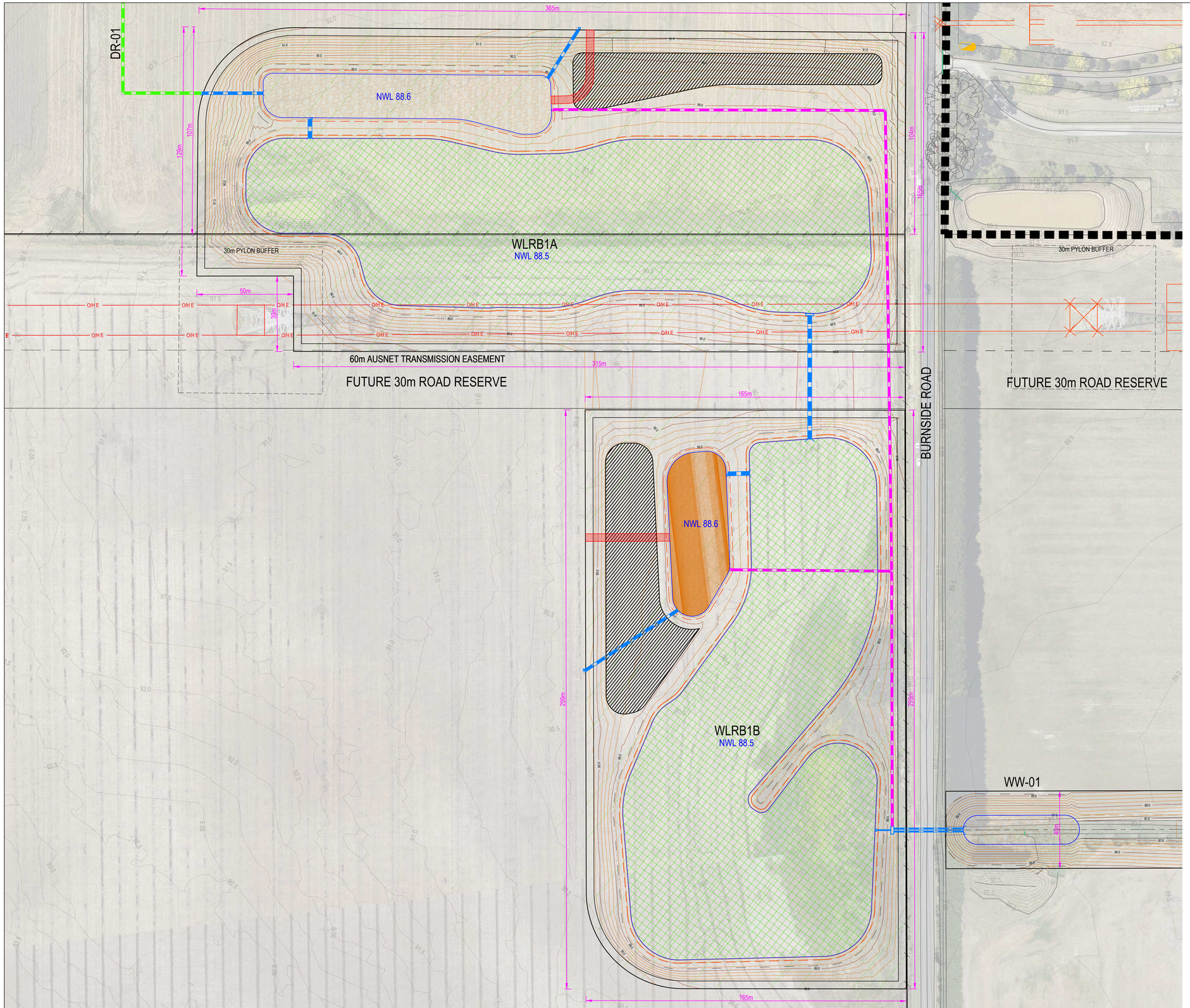
STATUS: PRELIMINARY
NOT FOR CONSTRUCTION

SCALE @ A1 : 1:6000
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DESIGNED	PROJECT ENGINEER
K.McKELVIE	J.RAMSEY
DRAWN	PROJECT MANAGER
K.McKELVIE	M.TROUNCE

PROJECT No.	DRAWING No.	REVISION
240113	G111	D



LEGEND

- STORMWATER DRAIN AND PIT (DCP)
- STORMWATER DRAIN AND PIT (20% - 1%AEP)
- STORMWATER DRAIN AND PIT (Q1 - 4EY)
- FUTURE STORMWATER DRAIN AND PIT
- EXISTING STORMWATER DRAIN AND PIT
- LIMIT OF WORKS
- SAFETY BENCH (1 IN 8 MAX, MINIMUM 2.8m WIDTH)
- CONCRETE PATH
- 3m WIDE RUNOUT AREA FOR MOWING
- SEDIMENT BASIN BASE
- ACCESS TRACK / RAMP
- SEDIMENT DRYING ZONE
- NORMAL WATER LEVEL (NWL)
- EXTENDED DETENTION DEPTH (EDD)
- OVERFLOW LEVEL
- 1%AEP LEVEL
- BATTER
- RIDGE
- EXISTING CONTOUR (0.10m)
- MAJOR CONTOUR (0.50m)
- MINOR CONTOUR (0.10m)
- MACROPHYTE ZONES

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ALTERNATIVE SWMS LAYOUT

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PROPOSED DRAINAGE LAYOUT
WLRB1A & WLRB1B LAYOUT PLAN

STATUS: **PRELIMINARY**
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SCALE @ A1 : 1:1000
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N

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K.McKELVIE	M.TROUNCE

PROJECT No.	DRAWING No.	REVISION
240113	G112	D

EXISTING PROPERTIES

EXISTING PROPERTIES

30m PYLON BUFFER

60m AUSNET TRANSMISSION EASEMENT

FUTURE 30m ROAD RESERVE

30m PYLON BUFFER

TRACK TO BE REALIGNED

SB-03

CU-03

WW-02

SB-04

SB-05

CU-01

WW-01

A

A

B

B

C

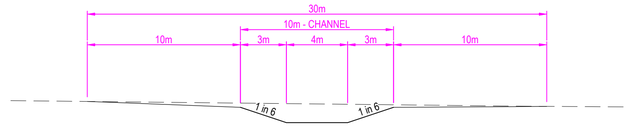
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LEGEND

- STORMWATER DRAIN AND PIT (20% - 1%AEP)
- STORMWATER DRAIN AND PIT (Q1 - 4EY)
- FUTURE STORMWATER DRAIN AND PIT
- EXISTING STORMWATER DRAIN AND PIT
- LIMIT OF WORKS
- SAFETY BENCH (1 IN 8 MAX, MINIMUM 2.8m WIDTH)
- CONCRETE PATH
- 3m WIDE RUNOUT AREA FOR MOWING
- SEDIMENT BASIN BASE
- ACCESS TRACK / RAMP
- SEDIMENT DRYING ZONE
- NORMAL WATER LEVEL (NWL)
- EXTENDED DETENTION DEPTH (EDD)
- OVERFLOW LEVEL
- 1%AEP LEVEL
- BATTER
- RIDGE
- EXISTING CONTOUR (0.10m)
- MAJOR CONTOUR (0.50m)
- MINOR CONTOUR (0.10m)
- MACROPHYTE ZONES

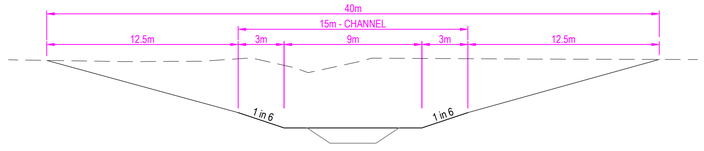
NOTE:

WATERWAY WIDTHS HAVE BEEN DESIGNED ASSUMING ACTIVE EDGES TO BOTH SIDES



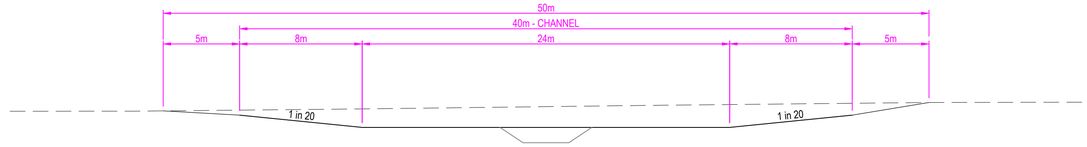
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NOT TO SCALE



TYPICAL WATERWAY SECTION - B-B

NOT TO SCALE



TYPICAL WATERWAY SECTION - C-C

NOT TO SCALE

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PROJECT

BANNOCKBURN SOUTH EAST PSP
ALTERNATIVE SWMS LAYOUT

DRAWING TITLE

CONCEPT PLAN
PROPOSED DRAINAGE LAYOUT
SB4 & SB5 LAYOUT PLAN

STATUS

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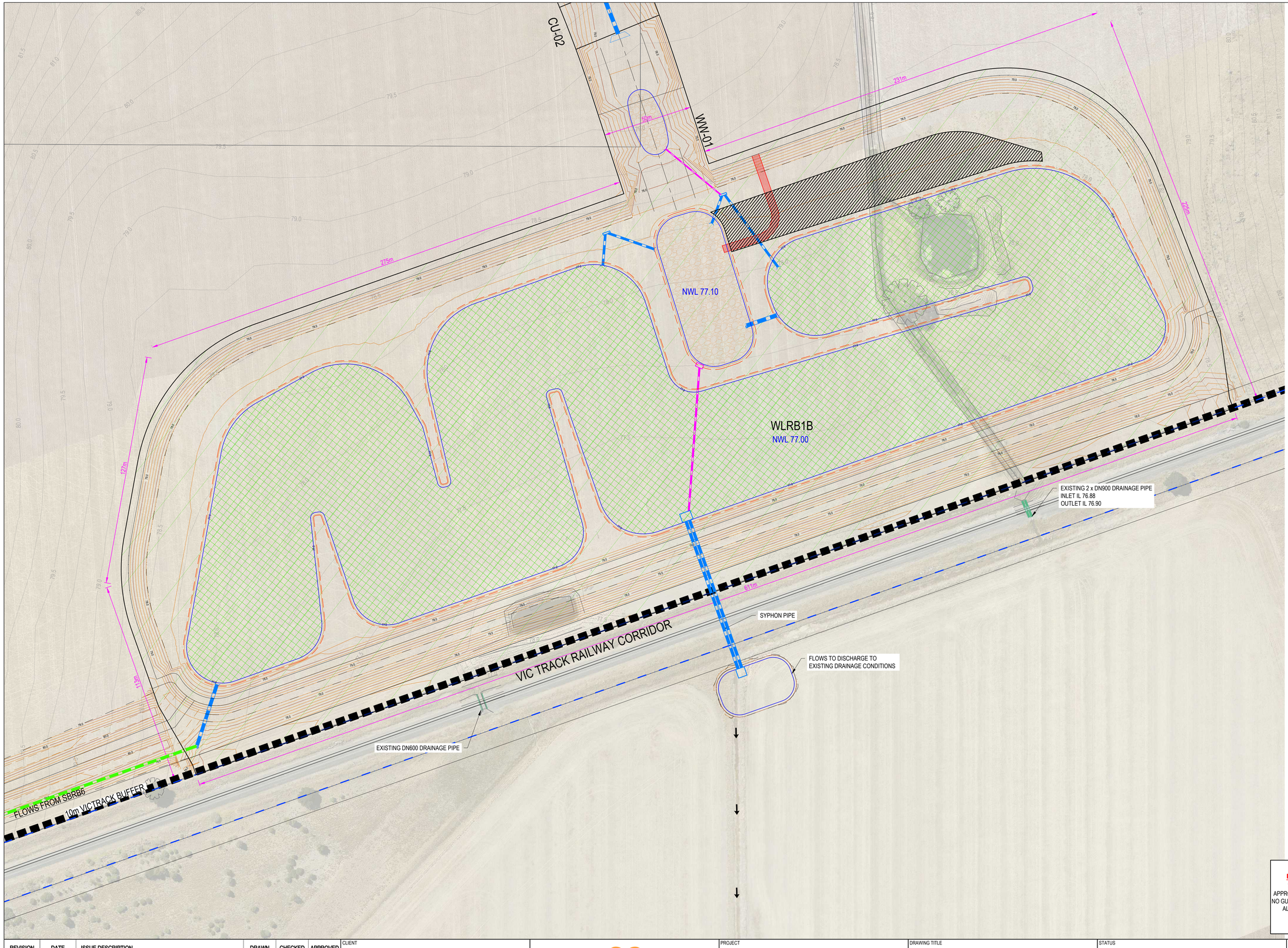
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- STORMWATER DRAIN AND PIT (20% - 1%AEP)
- STORMWATER DRAIN AND PIT (Q1 - 4EY)
- FUTURE STORMWATER DRAIN AND PIT
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PROJECT: BANNOCKBURN SOUTH EAST PSP
ALTERNATIVE SWMS LAYOUT

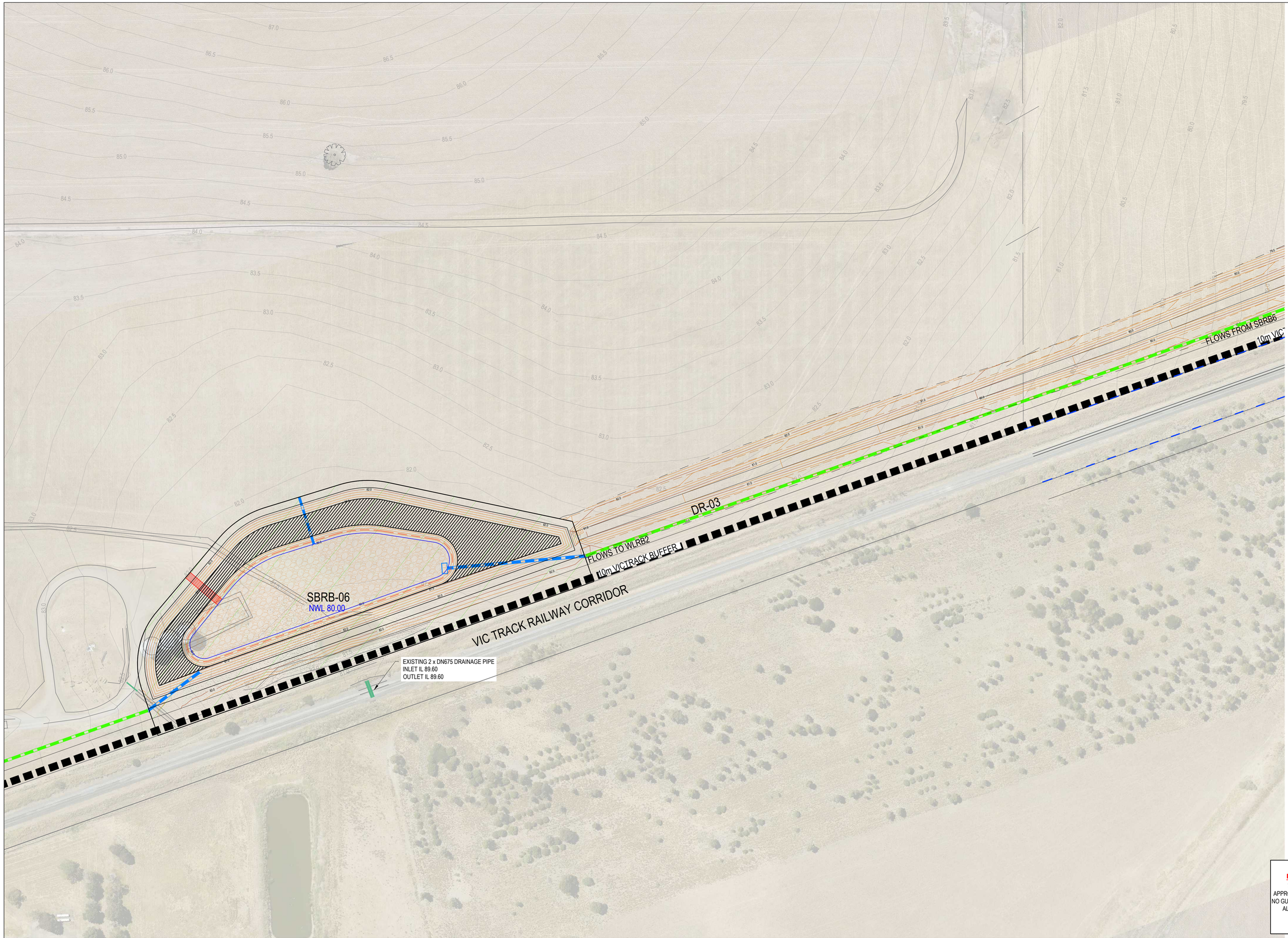
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PROPOSED DRAINAGE LAYOUT
WLRB2 LAYOUT PLAN

STATUS: **PRELIMINARY**
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SCALE @ A1 : 1:1000
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K.McKELVIE	M.TROUNCE

PROJECT No.	DRAWING No.	REVISION
240113	G114	D



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- STORMWATER DRAIN AND PIT (20% - 1%AEP)
- STORMWATER DRAIN AND PIT (Q1 - 4EY)
- FUTURE STORMWATER DRAIN AND PIT
- EXISTING STORMWATER DRAIN AND PIT
- LIMIT OF WORKS
- SAFETY BENCH (1 IN 8 MAX, MINIMUM 2.8m WIDTH)
- CONCRETE PATH
- 3m WIDE RUNOUT AREA FOR MOWING
- SEDIMENT BASIN BASE
- ACCESS TRACK / RAMP
- SEDIMENT DRYING ZONE
- NORMAL WATER LEVEL (NWL)
- EXTENDED DETENTION DEPTH (EDD)
- OVERFLOW LEVEL
- 1%AEP LEVEL
- BATTER
- RIDGE
- EXISTING CONTOUR (0.10m)
- MAJOR CONTOUR (0.50m)
- MINOR CONTOUR (0.10m)
- MACROPHYTE ZONES

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B	11/08/25	ISSUED FOR INFORMATION	K.McKELVIE	M.TROUNCE	M.TROUNCE
A	23/07/25	ISSUED FOR INFORMATION	K.McKELVIE	M.TROUNCE	M.TROUNCE

CLIENT: RAMSEY PROPERTY GROUP.

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Suite 1, 2 Bloomsbury Street
Newtown, VIC, Australia 3220

PROJECT: BANNOCKBURN SOUTH EAST PSP
ALTERNATIVE SWMS LAYOUT

DRAWING TITLE: CONCEPT PLAN
PROPOSED DRAINAGE LAYOUT
SBRB6 LAYOUT PLAN

STATUS: **PRELIMINARY**
NOT FOR CONSTRUCTION

SCALE @ A1 : 1:500
0 5 10 20 30
N

DESIGNED	PROJECT ENGINEER
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K.McKELVIE	M.TROUNCE

PROJECT No.	DRAWING No.	REVISION
240113	G115	D

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Suite 1/2 Bloomsbury Street,
Newtown, VIC, 3220

APPENDIX D – Updated Cost Estimates (Revision F)

Bannockburn South East DCP - Drainage Projects (Rev F)									
DCP Project No.	Project Name	LAND				CONSTRUCTION			Total Project Cost
		Total Land Area (ha)	Encumbered Land (ha)	DCP Land Acquisition (ha)	Land Acquisition Cost (at $700,000/ha)	Construction Cost	Delivery Cost (inc 20% Contingency)	Total Construction Inc. Delivery	
WLRB_01A	Wetland Retarding Basin No.1A - Delivery	5.820	2.000	3.820	$ 2,674,000.00	$ 7,855,799.38	$ 3,633,307.21	$ 11,489,106.59	**$ 14,163,106.59**
WLRB_01B	Wetland Retarding Basin No.1B - Delivery	4.876	0.000	4.876	$ 3,413,200.00	$ 5,984,764.38	$ 2,767,953.52	$ 8,752,717.90	**$ 12,165,917.90**
WLRB_02	Wetland Retarding Basin No.2 - Delivery	13.411	0.000	13.411	$ 9,387,700.00	$ 15,145,031.25	$ 7,004,576.95	$ 22,149,608.20	**$ 31,537,308.20**
SB_03	Sediment Basin No.3 - Delivery (Note: Design TBC Allowance Only)	0.203	0.203	0.000	$ -	$ 292,618.75	$ 135,336.17	$ 427,954.92	**$ 427,954.92**
SB_04	Sediment Basin No.4 - Delivery	0.392	0.000	0.392	$ 274,400.00	$ 455,125.00	$ 210,495.31	$ 665,620.31	**$ 940,020.31**
SB_05	Sediment Basin No.5 - Delivery	0.362	0.000	0.362	$ 253,400.00	$ 463,787.50	$ 214,501.72	$ 678,289.22	**$ 931,689.22**
SBRB_06	Sediment Basin Retarding Basin No.6 - Delivery	2.003	0.000	2.003	$ 1,402,100.00	$ 2,743,712.50	$ 1,268,967.03	$ 4,012,679.53	**$ 5,414,779.53**
WW_01	Waterway No.1 - Delivery	5.918	0.000	5.918	$ 4,142,600.00	$ 4,058,867.50	$ 1,877,226.22	$ 5,936,093.72	**$ 10,078,693.72**
WW_02	Waterway No.2 - Delivery	0.835	0.000	0.835	$ 584,500.00	$ 472,284.00	$ 218,431.35	$ 690,715.35	**$ 1,275,215.35**
CU_01	Culvert No.1 (N/S Collector Crossing WW_01)	0.000	0.000	0.000	$ -	$ 341,535.00	$ 157,959.94	$ 499,494.94	**$ 499,494.94**
CU_02	Culvert No.2 (E/W Collector Crossing WW_01)	0.000	0.000	0.000	$ -	$ 702,035.00	$ 324,691.19	$ 1,026,726.19	**$ 1,026,726.19**
CU_03	Culvert No.3 (Arterial Rd Crossing WW_02)	0.000	0.000	0.000	$ -	$ 532,625.00	$ 246,339.06	$ 778,964.06	**$ 778,964.06**
DR_01	Underground Drainage from Charlton Rd to WLRB_01A	0.000	0.000	0.000	$ -	$ 919,440.00	$ 425,241.00	$ 1,344,681.00	**$ 1,344,681.00**
DR_02	Underground Drainage from NW Corner of 430 Burnside Rd to SBRB_06	0.000	0.000	0.000	$ -	$ 2,295,200.00	$ 1,061,530.00	$ 3,356,730.00	**$ 3,356,730.00**
DR_02	Floodway & Underground Drainage from SBRB_06 to WLRB_02	0.000	0.000	1.165	$ 815,500.00	$ 1,295,453.75	$ 599,147.36	$ 1,894,601.11	**$ 2,710,101.11**
	TOTAL	**33.820**	**2.203**	**32.782**	**$ 22,947,400.00**	**$ 43,558,279.00**	**$ 20,145,704.04**	**$ 63,703,983.04**	**$ 86,651,383.04**

Bannockburn South East PSP
WETLAND/RETARDING BASIN WLRB-1A WORKS

Engineers Estimate as at 24 April 2026
Revision F

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 150mm and stockpile onsite for reuse.	58,200	m^2	$ 1.50	$ 87,300.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	124,000	m^3	$ 39.90	$ 4,947,600.00
NOTE	All earthwork volumes (solid) are calculated from existing surface to bottom of boxing/finished surface. Earthworks for footpaths, vehicular crossings and all areas requiring topsoil for Item 1 are deemed to be included in the earthwork volumes and tendered rate.				
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	Box Culvert				
2.1.1	2.1m wide x 0.6m high box culvert including base slab (Sed Pond to Wetland)	20	lm.	$ 3,410.00	$ 68,200.00
2.1.2	3.0 x 1.2m high box culvert including base slab (WLRB1A/WLRB1B Balance Pipe)	40	lm.	$ 6,250.00	$ 250,000.00
2.2	RRJ drains				
2.2.1	Ø1200mm R.C. Cl. 2 Pipe Drain (Q1-4EY Bypass)	300	lm.	$ 1,050.00	$ 315,000.00
2.2.2	Ø900mm R.C. Cl. 2 Pipe Drain (Inlet Pipes)	40	lm.	$ 860.00	$ 34,400.00
2.2.3	Ø600mm R.C. Cl. 2 Pipe Drain (Submerged Outlet Pipe)	20	lm.	$ 665.00	$ 13,300.00
2.2.4	Ø300mm R.C. Cl. 2 Pipe Drain (Balance Pipes)	200	lm.	$ 325.00	$ 65,000.00
2.3	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.3.1	Endwall to suit 2100 wide x 600 high box culvert	1	no.	$ 7,500.00	$ 7,500.00
2.3.2	Endwall to suit 2No. 2.4m x 0.9m high box culvert	1	no.	$ 25,000.00	$ 25,000.00
2.3.3	Endwall to suit 900dia pipe	2	no.	$ 5,000.00	$ 10,000.00
2.3.4	2700 x 900 Sediment Pond transfer pit	1	no.	$ 15,000.00	$ 15,000.00
2.3.5	3600 x 1500 Sediment Pond bypass pit including MW Grille Cover	1	no.	$ 25,000.00	$ 25,000.00
2.3.6	Allowance for other Junction Pits	6	no.	$ 5,000.00	$ 30,000.00
2.3.7	Allowance for Submerged Offtake Pits	4	no.	$ 2,000.00	$ 8,000.00
3	**CONCRETE WORKS**				
3.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	1800	m^2	$ 110.00	$ 198,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	175	m^2	$ 72.10	$ 12,617.50
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	0	m^2	$ 38.60	
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	100	m^2	$ 119.00	$ 11,900.00
5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted depth clay liner for sediment basin (allow to source off site)	4100	m^2	$ 23.50	$ 96,350.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	21250	m^2	$ 23.50	$ 499,375.00

6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	2350	m^2	$ 3.80	$ 8,930.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	21250	m^2	$ 3.80	$ 80,750.00
6.3	Re spread 200mm topsoil to all other disturbed areas	32525	m^2	$ 3.80	$ 123,595.00
7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	23600	No	$ 16.90	$ 398,840.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	8131	No	$ 19.60	$ 159,372.50
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	24394	No	$ 1.70	$ 41,469.38
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	2000	m^2	$ 8.20	$ 16,400.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	1	Item	$ 20,000.00	$ 20,000.00
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path around perimeter	3000	m^2	$ 72.00	$ 216,000.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	WL/SB: Install habitat logs approx. 4.0m long (no securing required) to wetland area.	2	No.	$ 5,000.00	$ 10,000.00
9.7	Fencing: Supply and install timber post and rail fencing around sediment basin pipe inlet headwall	1	No.	$ 1,500.00	$ 1,500.00
				Total - Wetland WLRB-1A Construction	**$ 7,855,799.38**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 255,313.48
10.2	Miscellaneous Authority Fees	1.00	%		$ 78,557.99
10.3	Traffic Management	5.00	%		$ 392,789.97
10.4	Environmental Management	0.50	%		$ 39,279.00
10.5	Survey/Design	5.00	%		$ 392,789.97
10.6	Supervision & Project Management	9.00	%		$ 707,021.94
10.7	Site Establishment	2.50	%		$ 196,394.98
10.8	Contingency	20.00	%		$ 1,571,159.88
				Total - Wetland WLRB-1A Delivery	**$ 3,633,307.21**
				Total - Wetland Cost WLRB-1A	**$ 11,489,106.59**

Bannockburn South East PSP
WETLAND/RETARDING BASIN WLRB-1B WORKS

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	48,750	m^2	$ 1.50	$ 73,125.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	82,000	m^3	$ 39.90	$ 3,271,800.00
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	Box Culvert				
2.1.1	2.1m wide x 0.6m high box culvert including base slab (Sed Pond to Wetland)	20	lm.	$ 3,410.00	$ 68,200.00
2.1.2	3.0 x 1.2m high box culvert including base slab (WLRB1A/WLRB1B Balance Pipe)	20	lm.	$ 6,250.00	$ 125,000.00
2.2	RRJ drains				
2.2.1	Ø900mm R.C. Cl. 2 Pipe Drain (Q1-4EY Bypass)	80	lm.	$ 860.00	$ 68,800.00
2.2.2	Ø1200mm R.C. Cl. 2 Pipe Drain (Q1-4EY Bypass)	200	lm.	$ 1,050.00	$ 210,000.00
2.2.3	Ø900mm R.C. Cl. 2 Pipe Drain (Inlet Pipes)	50	lm.	$ 860.00	$ 43,000.00
2.2.4	Ø600mm R.C. Cl. 2 Pipe Drain (Submerged Outlet Pipe)	20	lm.	$ 665.00	$ 13,300.00
2.2.5	Ø300mm R.C. Cl. 2 Pipe Drain (Balance Pipes)	200	lm.	$ 325.00	$ 65,000.00
2.2.6	2No. Ø750mm R.C. Cl. 2 Pipe Drain (Outlet Pipe Under Burnside Rd)	35	lm.	$ 1,350.00	$ 47,250.00
2.3	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.3.1	Endwall to suit 2100 wide x 600 high box culvert	1	no.	$ 7,500.00	$ 7,500.00
2.3.2	Endwall to suit 2No. 2.4m x 0.9m high box culvert	1	no.	$ 25,000.00	$ 25,000.00
2.3.3	Endwall to suit 900dia pipe	1	no.	$ 5,000.00	$ 5,000.00
2.3.4	Endwall to suit 2x750dia pipe	1	no.	$ 7,500.00	$ 7,500.00
2.3.5	2700 x 900 Sediment Pond transfer pit	1	no.	$ 15,000.00	$ 15,000.00
2.3.6	3600 x 1500 Sediment Pond bypass pit including MW Grille Cover	1	no.	$ 25,000.00	$ 25,000.00
2.3.7	Allowance for other Junction Pits	4	no.	$ 5,000.00	$ 20,000.00
2.3.8	Allowance for Submerged Offtake Pits	4	no.	$ 2,000.00	$ 8,000.00
3	**CONCRETE WORKS**				
3.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	1200	m^2	$ 110.00	$ 132,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	175	m^2	$ 72.10	$ 12,617.50
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	0	m^2	$ 38.60	
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	100	m^2	$ 119.00	$ 11,900.00

5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted clay liners for sediment basin (allow to source off site)	2600	m^2	$ 23.50	$ 61,100.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	25700	m^2	$ 23.50	$ 603,950.00
6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	1450	m^2	$ 3.80	$ 5,510.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	25700	m^2	$ 3.80	$ 97,660.00
6.3	Re spread 200mm topsoil to all other disturbed areas	20125	m^2	$ 3.80	$ 76,475.00
7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	27150	No	$ 16.90	$ 458,835.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	5031	No	$ 19.60	$ 98,612.50
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	15094	No	$ 1.70	$ 25,659.38
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	2000	m^2	$ 8.20	$ 16,400.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	1	Item	$ 20,000.00	$ 20,000.00
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path around perimeter	2700	m^2	$ 72.10	$ 194,670.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	WL/SB: Install habitat logs approx. 4.0m long (no securing required) to wetland area.	2	No.	$ 5,000.00	$ 10,000.00
9.7	Fencing: Supply and install timber post and rail fencing around sediment basin pipe inlet headwall	1	No.	$ 1,500.00	$ 1,500.00
				Total - Wetland WLRB-1B Construction	**$ 5,984,764.38**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 194,504.84
10.2	VicRoads Fees	1.00	%		$ 59,847.64
10.3	Traffic Management	5.00	%		$ 299,238.22
10.4	Environmental Management	0.50	%		$ 29,923.82
10.5	Survey/Design	5.00	%		$ 299,238.22
10.6	Supervision & Project Management	9.00	%		$ 538,628.79
10.7	Site Establishment	2.50	%		$ 149,619.11
10.8	Contingency	20.00	%		$ 1,196,952.88
				Total - Wetland WLRB-1B Delivery	**$ 2,767,953.52**
				Total - Wetland WLRB-1B	**$ 8,752,717.90**

Bannockburn South East PSP
WETLAND/RETARDING BASIN WLRB-02 WORKS

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	135,000	m^2	$ 1.50	$ 202,500.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	27,500	m^3	$ 39.90	$ 1,097,250.00
1.2.2	Cut to spoil	98,500	m^3	$ 39.90	$ 3,930,150.00
1.3	Extra over Item 1.2.1 for construction of dam bank to ANCOLD requirements	611	lm	$ 2,500.00	$ 1,527,500.00
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	Box Culvert				
2.1.1	2.1m wide x 0.6m high box culvert including base slab (Sed Pond to Wetland)	20	lm.	$ 3,410.00	$ 68,200.00
2.2	RRJ drains				
2.2.1	2No. Ø2100mm R.C. Cl. 2 Pipe Drain (Outlet Pipe)				
2.2.2	Ø1800mm R.C. Cl. 2 Pipe Drain (Inlet Pipe)	30	lm.	$ 1,990.00	$ 59,700.00
2.2.3	Ø1200mm R.C. Cl. 2 Pipe Drain (Q1-4EY Bypass)	100	lm.	$ 1,050.00	$ 105,000.00
2.2.4	Ø1200mm R.C. Cl. 2 Pipe Drain (Inlet Pipes)	80	lm.	$ 1,050.00	$ 84,000.00
2.2.5	Ø600mm R.C. Cl. 2 Pipe Drain (Submerged Outlet Pipe)	20	lm.	$ 665.00	$ 13,300.00
2.2.6	Ø450mm R.C. Cl. 2 Pipe Drain (Maintenance Bypass Pipes)	80	lm.	$ 525.00	$ 42,000.00
2.2.7	Ø300mm R.C. Cl. 2 Pipe Drain (Balance Pipes)	500	lm.	$ 325.00	$ 162,500.00
2.3	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.3.1	Endwall to suit 1800dia pipe	1	no.	$ 10,000.00	$ 10,000.00
2.3.2	Endwall to suit 1200dia pipe	2	no.	$ 5,000.00	$ 10,000.00
2.3.3	Endwall to suit 450dia pipe	2	no.	$ 2,500.00	$ 5,000.00
2.3.4	2700 x 900 Sediment Pond transfer pit	1	no.	$ 15,000.00	$ 15,000.00
2.3.5	3600 x 1500 Sediment Pond bypass pit including MW Grille Cover	1	no.	$ 25,000.00	$ 25,000.00
2.3.6	Twin Chamber Wetland Control Pit inc. Penstock sidewinder & MW Grille Cover	1	no.	$ 50,000.00	$ 50,000.00
2.3.7	Maintenance Control Pits inc. valves as required	2	no.	$ 10,000.00	$ 20,000.00
2.3.8	Allowance for other Junction Pits	10	no.	$ 5,000.00	$ 50,000.00
2.3.9	Allowance for Submerged Offtake Pits	10	no.	$ 2,000.00	$ 20,000.00
3	**OUTLET WORKS**				
3.1	2No. Ø1500mm R.C. Cl. 2 Pipe Drain - constructed under VicTrack land via microtunnelling	50	lm	$ 34,600.00	$ 1,730,000.00
3.2	Upstream and Downstream Junction Pits	2	No.	$ 50,000.00	$ 100,000.00
3.3	Construction of Downstream Pool	1	Item	$ 100,000.00	$ 100,000.00
3.4	Allowance for VicTrack/ARTC Compliance Requirements	1	Item	$ 1,220,000.00	$ 1,220,000.00
3.5	Allowance for Access Track from Burnside Rd	1500	lm	$ 125.00	$ 187,500.00
4	**CONCRETE WORKS**				
4.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	2000	m^2	$ 110.00	$ 220,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	250	m^2	$ 72.10	$ 18,025.00
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	0	m^2	$ 38.60	
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	500	m^2	$ 119.00	$ 59,500.00

5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted clay liners for sediment basin (allow to source off site)	3400	m^2	$ 23.50	$ 79,900.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	67250	m^2	$ 23.50	$ 1,580,375.00
6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	1450	m^2	$ 3.80	$ 5,510.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	67250	m^2	$ 3.80	$ 255,550.00
6.3	Re spread 200mm topsoil to all other disturbed areas	63550	m^2	$ 3.80	$ 241,490.00
7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	68700	No	$ 16.90	$ 1,161,030.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	15888	No	$ 19.60	$ 311,395.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	47663	No	$ 1.70	$ 81,026.25
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	10000	m^2	$ 8.20	$ 82,000.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	1	Item	$ 50,000.00	$ 50,000.00
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path	1300	m^2	$ 72.10	$ 93,730.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	WL/SB: Install habitat logs approx. 4.0m long (no securing required) to wetland area.	2	No.	$ 5,000.00	$ 10,000.00
9.7	Fencing: Supply and install timber post and rail fencing around sediment basin pipe inlet headwall	1	No.	$ 1,500.00	$ 1,500.00
				Total - Wetland WLRB-02 Construction	**$ 15,145,031.25**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 492,213.52
10.2	VicRoads Fees	1.00	%		$ 151,450.31
10.3	Traffic Management	5.00	%		$ 757,251.56
10.4	Environmental Management	0.50	%		$ 75,725.16
10.5	Survey/Design	5.00	%		$ 757,251.56
10.6	Supervision & Project Management	9.00	%		$ 1,363,052.81
10.7	Site Establishment	2.50	%		$ 378,625.78
10.8	Contingency	20.00	%		$ 3,029,006.25
				Total - Wetland WLRB-02 Delivery	**$ 7,004,576.95**
				Total - Wetland WLRB-02	**$ 22,149,608.20**

Bannockburn South East PSP
SEDIMENT BASIN SB-03

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	2,500	m^2	$ 1.50	$ 3,750.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	2,900	m^3	$ 39.90	$ 115,710.00
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	RRJ drains				
2.2.1	Ø1200mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 1,050.00	
2.2.2	Ø900mm R.C. Cl. 2 Pipe Drain (Inlet/Outlet Pipes)	0	lm.	$ 860.00	
2.2.5	Ø600mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 665.00	
2.2.6	Ø450mm R.C. Cl. 2 Pipe Drain (Maintenance Bypass Pipe)	0	lm.	$ 525.00	
2.2.7	Ø300mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 325.00	
2.2	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.2.1	Endwall to suit 1200dia pipe	0	no.	$ 5,000.00	
2.2.2	Endwall to suit 900dia pipe	0	no.	$ 3,500.00	
2.2.3	Endwall to suit 450dia pipe	0	no.	$ 2,500.00	
2.2.4	Sediment Pond Outlet Control Pit with MW Grille Cover	1	no.	$ 7,500.00	$ 7,500.00
2.2.5	Maintenance Control Pits inc. valves as required	0	no.	$ 7,500.00	
3	**CONCRETE WORKS**				
3.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	100	m^2	$ 110.00	$ 11,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	100	m^2	$ 72.10	$ 7,210.00
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	700	m^2	$ 38.60	$ 27,020.00
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	50	m^2	$ 119.00	$ 5,950.00
5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted clay liners for sediment basin (allow to source off site)	750	m^2	$ 23.50	$ 17,625.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	0	m^2	$ 23.50	
6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	650	m^2	$ 3.80	$ 2,470.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	0	m^2	$ 3.80	
6.3	Re spread 200mm topsoil to all other disturbed areas	2050	m^2	$ 3.80	$ 7,790.00

7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	650	No	$ 16.90	$ 10,985.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	513	No	$ 19.60	$ 10,045.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	1538	No	$ 1.70	$ 2,613.75
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	250	m^2	$ 8.20	$ 2,050.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	0	Item	$ 20,000.00	
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path	0	m^2	$ 72.10	
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	Fencing: Supply and install timber post and rail fencing around sediment basin pipe inlet headwall	1	No.	$ 1,500.00	$ 1,500.00
				Total - Sediment Basin SB-03 Construction	**$ 292,618.75**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 9,510.11
10.2	VicRoads Fees	1.00	%		$ 2,926.19
10.3	Traffic Management	5.00	%		$ 14,630.94
10.4	Environmental Management	0.50	%		$ 1,463.09
10.5	Survey/Design	5.00	%		$ 14,630.94
10.6	Supervision & Project Management	9.00	%		$ 26,335.69
10.7	Site Establishment	2.50	%		$ 7,315.47
10.8	Contingency	20.00	%		$ 58,523.75
				Total - Sediment Basin SB-03 Delivery	**$ 135,336.17**
				Total - Sediment Basin SB-03	**$ 427,954.92**

Bannockburn South East PSP
SEDIMENT BASIN SB-04 WORKS

Engineers Estimate as at 24 April 2026
Revision F

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	4,000	m^2	$ 1.50	$ 6,000.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	4,000	m^3	$ 39.90	$ 159,600.00
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	RRJ drains				
2.2.1	Ø1200mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 1,050.00	
2.2.2	Ø900mm R.C. Cl. 2 Pipe Drain (Inlet/Outlet Pipes)	30	lm.	$ 860.00	$ 25,800.00
2.2.5	Ø600mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 665.00	
2.2.6	Ø450mm R.C. Cl. 2 Pipe Drain (Maintenance Bypass Pipe)	50	lm.	$ 525.00	$ 26,250.00
2.2.7	Ø300mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 325.00	
2.2	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.2.1	Endwall to suit 1200dia pipe	0	no.	$ 5,000.00	
2.2.2	Endwall to suit 900dia pipe	1	no.	$ 3,500.00	$ 3,500.00
2.2.3	Endwall to suit 450dia pipe	1	no.	$ 2,500.00	$ 2,500.00
2.2.4	Sediment Pond Outlet Control Pit with MW Grille Cover	1	no.	$ 7,500.00	$ 7,500.00
2.2.5	Maintenance Control Pits inc. valves as required	1	no.	$ 7,500.00	$ 7,500.00
3	**CONCRETE WORKS**				
3.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	400	m^2	$ 110.00	$ 44,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	100	m^2	$ 72.10	$ 7,210.00
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	0	m^2	$ 38.60	
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	50	m^2	$ 119.00	$ 5,950.00
5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted clay liners for sediment basin (allow to source off site)	1600	m^2	$ 23.50	$ 37,600.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	0	m^2	$ 23.50	
6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	1200	m^2	$ 3.80	$ 4,560.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	0	m^2	$ 3.80	
6.3	Re spread 200mm topsoil to all other disturbed areas	2300	m^2	$ 3.80	$ 8,740.00

7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	250	No	$ 16.90	$ 4,225.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	575	No	$ 19.60	$ 11,270.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	1725	No	$ 1.70	$ 2,932.50
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	250	m^2	$ 8.20	$ 2,050.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	0	Item	$ 20,000.00	
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path	375	m^2	$ 72.10	$ 27,037.50
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	Fencing: Supply and install timber post and rail fencing around sediment	1	No.	$ 1,500.00	$ 1,500.00
				Total - Sediment Basin SB-04 Construction	**$ 455,125.00**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 14,791.56
10.2	VicRoads Fees	1.00	%		$ 4,551.25
10.3	Traffic Management	5.00	%		$ 22,756.25
10.4	Environmental Management	0.50	%		$ 2,275.63
10.5	Survey/Design	5.00	%		$ 22,756.25
10.6	Supervision & Project Management	9.00	%		$ 40,961.25
10.7	Site Establishment	2.50	%		$ 11,378.13
10.8	Contingency	20.00	%		$ 91,025.00
				Total - Sediment Basin SB-04 Delivery	**$ 210,495.31**
				Total - Sediment Basin SB-04	**$ 665,620.31**

Bannockburn South East PSP
SEDIMENT BASIN SB-05 WORKS

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	4,000	m^2	$ 2.00	$ 8,000.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	4,000	m^3	$ 39.90	$ 159,600.00
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	RRJ drains				
2.2.1	Ø1200mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 1,050.00	
2.2.2	Ø900mm R.C. Cl. 2 Pipe Drain (Inlet/Outlet Pipes)	30	lm.	$ 860.00	$ 25,800.00
2.2.5	Ø600mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 665.00	
2.2.6	Ø450mm R.C. Cl. 2 Pipe Drain (Maintenance Bypass Pipe)	50	lm.	$ 525.00	$ 26,250.00
2.2.7	Ø300mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 325.00	
2.2	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.2.1	Endwall to suit 1200dia pipe	0	no.	$ 5,000.00	
2.2.2	Endwall to suit 900dia pipe	1	no.	$ 3,500.00	$ 3,500.00
2.2.3	Endwall to suit 450dia pipe	1	no.	$ 2,500.00	$ 2,500.00
2.2.4	Sediment Pond Outlet Control Pit with MW Grille Cover	1	no.	$ 7,500.00	$ 7,500.00
2.2.5	Maintenance Control Pits inc. valves as required	1	no.	$ 7,500.00	$ 7,500.00
3	**CONCRETE WORKS**				
3.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	400	m^2	$ 110.00	$ 44,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	100	m^2	$ 72.10	$ 7,210.00
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	0	m^2	$ 38.60	
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	50	m^2	$ 119.00	$ 5,950.00
5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted clay liners for sediment basin (allow to source off site)	1600	m^2	$ 23.50	$ 37,600.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	0	m^2	$ 23.50	
6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	1200	m^2	$ 3.80	$ 4,560.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	0	m^2	$ 3.80	
6.3	Re spread 200mm topsoil to all other disturbed areas	2300	m^2	$ 3.80	$ 8,740.00

7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	300	No	$ 16.90	$ 5,070.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	575	No	$ 19.60	$ 11,270.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	1725	No	$ 1.70	$ 2,932.50
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	300	m^2	$ 8.20	$ 2,460.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	0	Item	$ 20,000.00	
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path	450	m^2	$ 72.10	$ 32,445.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	Fencing: Supply and install timber post and rail fencing around sediment basin pipe inlet headwall	1	No.	$ 1,500.00	$ 1,500.00
				Total - Sediment Basin SB-05 Construction	**$ 463,787.50**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 15,073.09
10.2	VicRoads Fees	1.00	%		$ 4,637.88
10.3	Traffic Management	5.00	%		$ 23,189.38
10.4	Environmental Management	0.50	%		$ 2,318.94
10.5	Survey/Design	5.00	%		$ 23,189.38
10.6	Supervision & Project Management	9.00	%		$ 41,740.88
10.7	Site Establishment	2.50	%		$ 11,594.69
10.8	Contingency	20.00	%		$ 92,757.50
				Total - Sediment Basin SB-05 Delivery	**$ 214,501.72**
				Total - Sediment Basin SB-05	**$ 678,289.22**

Bannockburn South East PSP
SEDIMENT BASIN/RETARDING BASIN SBRB-06

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	20,000	m^2	$ 2.00	$ 40,000.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	2,000	m^3	$ 39.90	$ 79,800.00
1.2.2	Cut to spoil	22,000	m^3	$ 39.90	$ 877,800.00
1.3	Extra over Item 1.2.1 for construction of dam bank to ANCOLD requirements	256	lm	$ 2,500.00	$ 640,000.00
2	**DRAINAGE**				
	Complete including excavation, supply of pipes, lay, bed, joint, anchor blocks, backfill, where necessary trench dewatering bedding in trenches, disposal of surplus spoil off site.				
2.1	RRJ drains				
2.2.1	Ø1800mm R.C. Cl. 2 Pipe Drain (Outlet Pipe)	75	lm.	$ 1,990.00	$ 149,250.00
2.2.1	Ø1500mm R.C. Cl. 2 Pipe Drain (Inlet Pipe)	40	lm.	$ 1,380.00	$ 55,200.00
2.2.1	Ø1200mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 1,050.00	
2.2.2	Ø900mm R.C. Cl. 2 Pipe Drain (Inlet Pipe)	40	lm.	$ 860.00	$ 34,400.00
2.2.5	Ø600mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 665.00	
2.2.6	Ø450mm R.C. Cl. 2 Pipe Drain (Maintenance Bypass Pipe)	0	lm.	$ 525.00	
2.2.7	Ø300mm R.C. Cl. 2 Pipe Drain	0	lm.	$ 325.00	
2.2	Drainage Pits				
	Supply all materials and construct the following pits to council specifications and standard drawings, including excavation, reinforcement, supply and placement of concrete, step irons, lids and frames and backfilling, all as specified.				
2.2.1	Endwall to suit 1800dia pipe	1	no.	$ 10,000.00	$ 10,000.00
2.2.1	Endwall to suit 1500dia pipe	1	no.	$ 7,500.00	$ 7,500.00
2.2.1	Endwall to suit 1200dia pipe	0	no.	$ 5,000.00	
2.2.2	Endwall to suit 900dia pipe	1	no.	$ 3,500.00	$ 3,500.00
2.2.3	Endwall to suit 450dia pipe	0	no.	$ 2,500.00	
2.2.4	Sediment Pond Outlet Control Pit with MW Grille Cover	1	no.	$ 15,000.00	$ 15,000.00
2.2.5	Maintenance Control Pits inc. valves as required	2	no.	$ 7,500.00	$ 15,000.00
3	**CONCRETE WORKS**				
3.1	Sediment Pond Base - Supply and install reinforced N32 grade concrete, 150 mm deep on 150mm depth crushed rock bedding	2800	m^2	$ 110.00	$ 308,000.00
4	**ROCK WORKS**				
4.1	Access Ramp: Supply all material and construct 100mm depth of 0-40mm NDCR with 6% cement stabilisation on a 100mm depth of 0-100mm FCR	200	m^2	$ 72.10	$ 14,420.00
4.2	Maintenance Track: Supply all material and construct 100mm depth of Class 2 crushed rock and topsoil or hydromulch (mixed well) on a bed of 270mm compacted depth of 20mm Class 4 fine crushed rock, placed and compacted in two layers.	0	m^2	$ 38.60	
4.3	Provide rockworks to pipe inlet/outlets as required (allowance)	50	m^2	$ 119.00	$ 5,950.00
5	**CLAY LINER**				
5.1	Sediment Basin: Placement of 450 mm compacted clay liners for sediment basin (allow to source off site)	5500	m^2	$ 23.50	$ 129,250.00
5.2	Wetland: Placement of 450 mm compacted clay liners for wetland (allow to source off site)	0	m^2	$ 23.50	
6	**TOPSOIL**				
6.1	Sediment basin: Re spread 200 mm topsoil for planting areas	2700	m^2	$ 3.80	$ 10,260.00
6.2	Wetland: Re spread 200 mm topsoil for planting areas	0	m^2	$ 3.80	
6.3	Re spread 200mm topsoil to all other disturbed areas	14300	m^2	$ 3.80	$ 54,340.00

7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	600	No	$ 16.90	$ 10,140.00
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	3575	No	$ 19.60	$ 70,070.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	10725	No	$ 1.70	$ 18,232.50
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	600	m^2	$ 8.20	$ 4,920.00
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	0	Item	$ 20,000.00	
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path	1800	m^2	$ 72.10	$ 129,780.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	2	No	$ 200.00	$ 400.00
9.5	Allowance for seats	2	No	$ 2,500.00	$ 5,000.00
9.6	Fencing: Supply and install timber post and rail fencing around sediment basin pipe inlet headwall	1	No.	$ 1,500.00	$ 1,500.00
				Total - Sediment Basin SBRB-06 Construction	**$ 2,743,712.50**

10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 89,170.66
10.2	VicRoads Fees	1.00	%		$ 27,437.13
10.3	Traffic Management	5.00	%		$ 137,185.63
10.4	Environmental Management	0.50	%		$ 13,718.56
10.5	Survey/Design	5.00	%		$ 137,185.63
10.6	Supervision & Project Management	9.00	%		$ 246,934.13
10.7	Site Establishment	2.50	%		$ 68,592.81
10.8	Contingency	20.00	%		$ 548,742.50
				Total - Sediment Basin SBRB-06 Delivery	**$ 1,268,967.03**

Total - Sediment Basin SBRB-06	**$ 4,012,679.53**

Bannockburn South East PSP
WATERWAY WW-01 WORKS

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	57,300	m^2	$ 1.50	$ 85,950.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	60,000	m^3	$ 39.90	$ 2,394,000.00
2	**DRAINAGE**				
3	**CONCRETE WORKS**				
4	**ROCK WORKS**				
4.1	Rock lining of pilot channel including geofab layer	6000	m^2	$ 119.00	$ 714,000.00
5	**CLAY LINER**				
6	**TOPSOIL**				
6.1	Respread topsoil to 200mm depth	51300	m^2	$ 3.80	$ 194,940.00
7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	0	No	$ 16.90	
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	12825	No	$ 19.60	$ 251,370.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	38475	No	$ 1.70	$ 65,407.50
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	0	m^2	$ 8.20	
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	0	Item	$ 20,000.00	
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path (one side of waterway)	4000	m^2	$ 72.10	$ 288,400.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	4	No	$ 200.00	$ 800.00
9.5	Allowance for seats	4	No	$ 2,500.00	$ 10,000.00
				Total - Waterway WW-01 Construction	**$ 4,058,867.50**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 131,913.19
10.2	VicRoads Fees	1.00	%		$ 40,588.68
10.3	Traffic Management	5.00	%		$ 202,943.38
10.4	Environmental Management	0.50	%		$ 20,294.34
10.5	Survey/Design	5.00	%		$ 202,943.38
10.6	Supervision & Project Management	9.00	%		$ 365,298.08
10.7	Site Establishment	2.50	%		$ 101,471.69
10.8	Contingency	20.00	%		$ 811,773.50
				Total - Waterway WW-01 Delivery	**$ 1,877,226.22**
				Total - Waterway WW-01	**$ 5,936,093.72**

Bannockburn South East PSP
WATERWAY WW-02 WORKS

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	8,400	m^2	$ 1.50	$ 12,600.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	0	m^3	$ 39.90	
1.2.2	Cut to spoil	3,000	m^3	$ 39.90	$ 119,700.00
2	**DRAINAGE**				
3	**CONCRETE WORKS**				
4	**ROCK WORKS**				
4.1	Rock lining of pilot channel including geofab layer	1200	m^2	$ 119.00	$ 142,800.00
5	**CLAY LINER**				
6	**TOPSOIL**				
6.1	Respread topsoil to 200mm depth	7200	m^2	$ 3.80	$ 27,360.00
7	**AQUATIC PLANTING**				
7.1	Aquatic Planting	0	No	$ 16.90	
7.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	1800	No	$ 19.60	$ 35,280.00
7.3	Hydroseeding (Allow 75% of Terrestrial Area)	5400	No	$ 1.70	$ 9,180.00
7.4	WL/SB: Supply and install heavy jute mat (800gsm) pre-slit at density 6/m2 in wetland and sediment basin, including overlap of matting (300mm longitudinally/direction of flow), 150mm vertically)	0	m^2	$ 8.20	
7.5	Supply, install and maintain plant protection netting for a selected species in the aquatic zones.	0	Item	$ 20,000.00	
8	**LANDSCAPE**				
8.1	Supply and install 3m wide shared path (one side of waterway)	840	m^2	$ 72.10	$ 60,564.00
9	**MISCELLANEOUS**				
9.1	Civil Works Defects Maintenance incl pits, pipes and rockwork – 1 year	12	Month	$ 2,500.00	$ 30,000.00
9.2	3 months Plant Establishment maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas.	3	Month	$ 2,000.00	$ 6,000.00
9.3	24 month Plant Maintenance period of all soft landscape works including watering of plants and trees during establishment, weed control of all planted areas as per specification.	24	Month	$ 750.00	$ 18,000.00
9.4	Allowance for timber bollards	4	No	$ 200.00	$ 800.00
9.5	Allowance for seats	4	No	$ 2,500.00	$ 10,000.00
				Total - Waterway WW-02 Construction	**$ 472,284.00**

10	**DELIVERY**				
10.1	Council Fees	1.00	%		$ 4,722.84
10.2	VicRoads Fees	5.00	%		$ 23,614.20
10.3	Traffic Management	0.50	%		$ 2,361.42
10.4	Environmental Management	5.00	%		$ 23,614.20
10.5	Survey/Design	9.00	%		$ 42,505.56
10.6	Supervision & Project Management	2.50	%		$ 11,807.10
10.7	Site Establishment	20.00	%		$ 94,456.80
10.8	Contingency	0.00	%		$ -
				Total - Waterway WW-02 Delivery	**$ 203,082.12**

Bannockburn South East PSP
CULVERT CU-01

Engineers Estimate as at 24 April 2026
Revision F

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Site Preparation	1	Item	$ 2,500.00	$ 2,500.00
1.2	Diversion works (item)	1	Item	$ 15,000.00	$ 15,000.00
1.3	Waterway re-shaping	1	Item	$ 5,000.00	$ 5,000.00
1.4	stripping of topsoil	650	m2	$ 5.00	$ 3,250.00
1.5	Excavation	150	m^3	$ 39.90	$ 5,985.00
1.6	Formation of batters	1,000	m^3	$ 15.00	$ 15,000.00
1.7	Upstream & Downstream Rockworks to Pools	500	m^3	$ 230.00	$ 115,000.00
2	**DRAINAGE STRUCTURE**				
2.1	Culverts - 2No. 750dia RCP	29	l.m	$ 1,350.00	$ 39,150.00
2.2	Foundation Slab	0	m2	$ 300.00	
2.3	Rock, Class 3 compacted to 95% modified	0	m2	$ 30.00	
2.4	Apron Slab	50	m2	$ 300.00	$ 15,000.00
2.5	Wing wall	40	m2	$ 1,000.00	$ 40,000.00
2.6	Endwall	40	m2	$ 1,000.00	$ 40,000.00
3	**ON STRUCTURE**				
3.1	Structural Fill	150	m3	$ 161.00	$ 24,150.00
3.2	Vehicle Barrier	60	l.m	$ 350.00	$ 21,000.00
3.3	Signs	1	Item	$ 500.00	$ 500.00
				Total - Culvert CU-01 (Excluding Delivery)	**$ 341,535.00**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 11,099.89
10.2	VicRoads Fees	1.00	%		$ 3,415.35
10.3	Traffic Management	5.00	%		$ 17,076.75
10.4	Environmental Management	0.50	%		$ 1,707.68
10.5	Survey/Design	5.00	%		$ 17,076.75
10.6	Supervision & Project Management	9.00	%		$ 30,738.15
10.7	Site Establishment	2.50	%		$ 8,538.38
10.8	Contingency	20.00	%		$ 68,307.00
				Total - Culvert CU-01 Delivery	**$ 157,959.94**
				Total - Culvert CU-01	**$ 499,494.94**

Bannockburn South East PSP
CULVERT CU-02

Engineers Estimate as at 24 April 2026
Revision F

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Site Preperation	1	Item	$ 2,500.00	$ 2,500.00
1.2	Diversion works (item)	1	Item	$ 15,000.00	$ 15,000.00
1.3	Waterway re-shaping	1	Item	$ 5,000.00	$ 5,000.00
1.4	stripping of topsoil	760	m2	$ 5.00	$ 3,800.00
1.5	Excavation	150	m^3	$ 39.90	$ 5,985.00
1.6	Formation of batters	1,000	m^3	$ 15.00	$ 15,000.00
1.7	Upstream & Downstream Rockworks to Pools	500	m^3	$ 230.00	$ 115,000.00
2	**DRAINAGE STRUCTURE**				
2.1	Culverts - 2No. 750dia RCP	29	l.m	$ 8,000.00	$ 232,000.00
2.2	Foundation Slab	200	m2	$ 300.00	$ 60,000.00
2.3	Rock, Class 3 compacted to 95% modified	200	m2	$ 30.00	$ 6,000.00
2.4	Apron Slab	100	m2	$ 300.00	$ 30,000.00
2.5	Wing wall	75	m2	$ 1,000.00	$ 75,000.00
2.6	Endwall	75	m2	$ 1,000.00	$ 75,000.00
3	**ON STRUCTURE**				
3.1	Structural Fill	250	m3	$ 161.00	$ 40,250.00
3.2	Vehicle Barrier	60	l.m	$ 350.00	$ 21,000.00
3.3	Signs	1	Item	$ 500.00	$ 500.00
				Total - Culvert CU-02 (Excluding Delivery)	**$ 702,035.00**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 22,816.14
10.2	VicRoads Fees	1.00	%		$ 7,020.35
10.3	Traffic Management	5.00	%		$ 35,101.75
10.4	Environmental Management	0.50	%		$ 3,510.18
10.5	Survey/Design	5.00	%		$ 35,101.75
10.6	Supervision & Project Management	9.00	%		$ 63,183.15
10.7	Site Establishment	2.50	%		$ 17,550.88
10.8	Contingency	20.00	%		$ 140,407.00
				Total - Culvert CU-02 Delivery	**$ 324,691.19**
				Total - Culvert CU-02	**$ 1,026,726.19**

Bannockburn South East PSP
CUVLERT CU-03

Engineers Estimate as at 24 April 2026
Revision F

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Site Preperation	1	Item	$ 2,500.00	$ 2,500.00
1.2	Diversion works (item)	1	Item	$ 15,000.00	$ 15,000.00
1.3	Waterway re-shaping	1	Item	$ 5,000.00	$ 5,000.00
1.4	stripping of topsoil	900	m2	$ 5.00	$ 4,500.00
1.5	Excavation	250	m^3	$ 39.90	$ 9,975.00
1.6	Formation of batters	1,000	m^3	$ 15.00	$ 15,000.00
1.7	Upstream & Downstream Rockworks to Pools	600	m^3	$ 230.00	$ 138,000.00
2	**DRAINAGE STRUCTURE**				
2.1	Box Culverts 1.5(h)x3.0(w)	34	l.m	$ 4,000.00	$ 136,000.00
2.2	Foundation Slab	100	m2	$ 300.00	$ 30,000.00
2.3	Rock, Class 3 compacted to 95% modified	90	m2	$ 30.00	$ 2,700.00
2.4	Apron Slab	50	m2	$ 300.00	$ 15,000.00
2.5	Wing wall	50	m2	$ 1,000.00	$ 50,000.00
2.6	Endwall	50	m2	$ 1,000.00	$ 50,000.00
3	**ON STRUCTURE**				
3.1	Structural Fill	200	m3	$ 161.00	$ 32,200.00
3.2	Vehicle Barrier	75	l.m	$ 350.00	$ 26,250.00
3.3	Signs	1	Item	$ 500.00	$ 500.00
				Total - Culvert CU-03 (Excluding Delivery)	**$ 532,625.00**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 17,310.31
10.2	VicRoads Fees	1.00	%		$ 5,326.25
10.3	Traffic Management	5.00	%		$ 26,631.25
10.4	Environmental Management	0.50	%		$ 2,663.13
10.5	Survey/Design	5.00	%		$ 26,631.25
10.6	Supervision & Project Management	9.00	%		$ 47,936.25
10.7	Site Establishment	2.50	%		$ 13,315.63
10.8	Contingency	20.00	%		$ 106,525.00
				Total - Culvert CU-03 Delivery	**$ 246,339.06**
				Total - Culvert CU-03	**$ 778,964.06**

Bannockburn South East PSP
UNDERGROUND DRAIN DR-01

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**DRAINAGE**				
1.1	Ø1800mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,990.00	
1.2	Ø1500mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,380.00	
1.3	Ø1350mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,190.00	
1.4	Ø1200mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,050.00	
1.5	Ø900mm R.C. Cl. 2 Pipe Drain	960	lm	$ 860.00	$ 825,600.00
1.6	Junction Pits (Allow 1 per 80m)	12	No.	$ 7,820.00	$ 93,840.00
				Total - DR-01 (Excluding Delivery)	**$ 919,440.00**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 29,881.80
10.2	VicRoads Fees	1.00	%		$ 9,194.40
10.3	Traffic Management	5.00	%		$ 45,972.00
10.4	Environmental Management	0.50	%		$ 4,597.20
10.5	Survey/Design	5.00	%		$ 45,972.00
10.6	Supervision & Project Management	9.00	%		$ 82,749.60
10.7	Site Establishment	2.50	%		$ 22,986.00
10.8	Contingency	20.00	%		$ 183,888.00
				Total - DR-01 Delivery	**$ 425,241.00**
				Total - DR-01	**$ 1,344,681.00**

Bannockburn South East PSP
UNDERGROUND DRAIN DR-02

Engineers Estimate as at 24 April 2026
Revision F

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**DRAINAGE**				
1.1	Ø1800mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,990.00	
1.2	Ø1500mm R.C. Cl. 2 Pipe Drain	190	lm	$ 1,380.00	$ 262,200.00
1.3	Ø1350mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,190.00	
1.4	Ø1200mm R.C. Cl. 2 Pipe Drain	1,750	lm	$ 1,050.00	$ 1,837,500.00
1.5	Ø900mm R.C. Cl. 2 Pipe Drain	0	lm	$ 860.00	
1.6	Junction Pits (Allow 1 per 80m)	25	No.	$ 7,820.00	$ 195,500.00
				Total - DR-02 (Excluding Delivery)	**$ 2,295,200.00**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 74,594.00
10.2	VicRoads Fees	1.00	%		$ 22,952.00
10.3	Traffic Management	5.00	%		$ 114,760.00
10.4	Environmental Management	0.50	%		$ 11,476.00
10.5	Survey/Design	5.00	%		$ 114,760.00
10.6	Supervision & Project Management	9.00	%		$ 206,568.00
10.7	Site Establishment	2.50	%		$ 57,380.00
10.8	Contingency	20.00	%		$ 459,040.00
				Total - DR-02 Delivery	**$ 1,061,530.00**
				Total - DR-02	**$ 3,356,730.00**

Bannockburn South East PSP
UNDERGROUND DRAIN DR-03

Engineers Estimate as at 24 April 2026
Revision F

creo CIVIL

Item	Description	Quantity	Unit	Rate	Amount ($)
1	**SITEWORKS & EARTHWORKS**				
1.1	Excavate (stripping of topsoil) to a minimum depth of 200mm and stockpile onsite for reuse.	11,650	m^2	$ 1.50	$ 17,475.00
1.2	Excavate to design levels as shown in the civil drawings				
1.2.1	Cut to fill	2,000	m^3	$ 39.90	$ 79,800.00
1.2.2	Cut to spoil	2,500	m^3	$ 39.90	$ 99,750.00
2	**DRAINAGE**				
2.1	Ø1800mm R.C. Cl. 2 Pipe Drain	470	lm	$ 1,990.00	$ 935,300.00
2.2	Ø1500mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,380.00	
2.3	Ø1350mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,190.00	
2.4	Ø1200mm R.C. Cl. 2 Pipe Drain	0	lm	$ 1,050.00	
2.5	Ø900mm R.C. Cl. 2 Pipe Drain	0	lm	$ 860.00	
2.6	Junction Pits (Allow 1 per 80m)	6	No.	$ 7,820.00	$ 46,920.00
3	**TOPSOIL**				
3.1	Respread topsoil to 200mm depth	11650	m^2	$ 3.80	$ 44,270.00
4	**LANDSCAPING**				
4.1	Aquatic Planting	0	No	$ 16.90	
4.2	Terrestrial Planting (Allow 25% of Terrestrial Area)	2913	No	$ 19.60	$ 57,085.00
4.3	Hydroseeding (Allow 75% of Terrestrial Area)	8738	No	$ 1.70	$ 14,853.75
				Total - DR-03 (Excluding Delivery)	**$ 1,295,453.75**
10	**DELIVERY**				
10.1	Council Fees	3.25	%		$ 42,102.25
10.2	VicRoads Fees	1.00	%		$ 12,954.54
10.3	Traffic Management	5.00	%		$ 64,772.69
10.4	Environmental Management	0.50	%		$ 6,477.27
10.5	Survey/Design	5.00	%		$ 64,772.69
10.6	Supervision & Project Management	9.00	%		$ 116,590.84
10.7	Site Establishment	2.50	%		$ 32,386.34
10.8	Contingency	20.00	%		$ 259,090.75
				Total - DR-03 Delivery	**$ 599,147.36**
				Total - DR-03	**$ 1,894,601.11**