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SUSTAINABLE CERTIFICATION ISO 9001 ISO 45001 ISO 14001

**Our Ref:** 110965.02 - Westlink Lot 4 - Response to Agency Comments on Stormwater.docx

PJM:pjm

18 Jun 2024

**ESR Australia**
Level 24, 88 Phillip Street
Sydney, NSW 2000

Attn: Grace Macdonald

**Subject: Westlink Lot 4 –-(SSD-9138102 Mod 2) Response to Penrith Council's Comments on Stormwater**

Dear Grace,

This letter has been prepared in response to Penrith Council's comments raised on 27 May 2024 relating to the Westlink Lot 4 Mod 2 application. It is understood that Council's Waterways Department has raised the following considerations.

**5 a)** Council notes that the approved development comprised of a 25m wide trunk drainage. The report states that as part of the detailed design of the trunk drainage channel, it has been determined that the design criteria can be satisfied by a 20m wide trunk drainage channel.

It is noted that The Trunk Drainage Checklist that was developed by Sydney Water in support of the Draft Stormwater Scheme Infrastructure Design Guideline (2022) indicates on Page 5:

> ***Channel Corridor Width***
>
> *Channels constructed as part of site development must be designed to fit the corridor widths and locations specified in the planning instruments. Typically, these widths are 20m, 25m, 30m, 40m and can be adjusted to a value between these specified widths, provided the hydraulic modelling requirements are met.*
>
> *Should the proponent wish to reduce an already planned corridor width, as specified in an existing scheme plan, detailed hydraulic modelling will be requested. This modelling is essential to demonstrate that the reduced corridor width meets all required criteria. Sydney Water will not provide endorsement or support for these works to be undertaken at a later stage as they are fundamental to the scheme plan*

JWP consulted directly with Sydney Water throughout the concept design process. This included weekly design review meetings. The final minutes of these meetings are provided in Attachment A to this letter. The minutes demonstrate (in particular at Item 5.1) that the alternative for a 20 m wide drainage channel was presented to Sydney Water as a viable technical solution that was supported by hydraulic assessment which demonstrated it was compliant with all of the design requirements. Sydney Water accepted the 20 m channel width at this location at the design meeting of 14/6/23. JWP is currently progressing with the detailed design documentation for the drainage Channel based on the adopted 20 m wide option.

**5 b)** The proposed reduction in width to 20m is not consistent with Sydney Water's Scheme Plan dated May 2024 which required a 25m channel (and was the approved with in the consent). The letter submitted in support from Sydney Water dated 17 July 2023 (Appendix H) does not seem to indicate that they support the change to a reduced width but rather indicates they would work with the developer on the design of the trunk drainage. This needs to be clarified.

Refer to the detailed response above. Sydney Waters guideline documents permit the variance of Stormwater Scheme Plan designated channel widths provided they are supported by appropriate hydraulic modelling that demonstrates the system meets all required criteria. This alternative approach was assessed

and justified during the concept design stage for the channel and the proposed 20 m width for the Westlink Stage 1 channel was accepted by Sydney Water

**5 c)** The Department needs to ensure that the design of the trunk drainage is prepared in accordance with Sydney Water's latest scheme plan and that the changes drainage infrastructure have not compromised the ability to meet the water quality / flow requirements until they can connect to the regional scheme.

Refer to the detailed responses above regarding the permissibility of varying the Scheme Plan channel widths with appropriate technical assessment.

The Westlink Industrial Estate, Kemps Creek – Stage 1 Water and Stormwater Management Plan prepared for Stage 1 by AT&L demonstrates that the proposed stormwater management system designed for Stage 1 meets the specific requirements of Condition B25 (k) of the Instrument of Consent for Westlink Stage 1. This system design and modelling was reviewed by me and certified as compliant on 24 April 2024 (refer Attachment B). As the Stage 1 stormwater scheme services the Lot 4 development this compliance should extend to the approvals relevant for Lot 4.

We trust this assessment will assist ESR , Penrith Council and the Department in considering this proposal. Please don't hesitate to contact the undersigned if you have any questions.

Yours faithfully

**PETER MEHL**
Director

Encl:

**ATTACHMENT A** Westlink Stage 1 – Trunk Drainage Design Coordination with Sydney Water – Project Meeting Minutes

**ATTACHMENT B** Westlink Stage 1, Abbotts Road Kemps Creek– Civil Infrastructure Design – Certification Relative to Condition B25 (k)

ESR

J. WYNDHAM PRINCE
CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

# Project Meeting Minutes

| | | | |
|---|---|---|---|
| **Project name:** | Westlink – Stage 1 | **Meeting number:** | 11 |
| **Purpose:** | Trunk Drainage - Design Coordination with Sydney Water | | |
| **Date:** | 12/07/23 | **Time: 9:00-9:30** | |
| **Attendees:** | Grace Macdonald, ESR (GM) | Jacob Dickson, ESR (JD) | |
| | | Peter Gillam, Sydney Water (PG) | |
| | Daniel Cunningham, Sydney Water (DC) | John Molteno, Sydney Water (JM) | |
| | Lubna Thalib, Sydney Water (LT) | Peter Mehl, JWP (PM) | |
| | | Daniel Gardiner, JWP (DG) | |
| | | | |
| **Apologies:** | Anna Thompson, Sydney Water (AT); Christian McNally, Sydney Water (CM); Daniel Galea, ESR (DG) | | |
| **Prepared by:** | Daniel Gardiner | | |
| **Distribution:** | As per attendees above plus: | | |

| # | ITEM | ACTION | DATE |
|---|---|---|---|
| **1.** | **Interim Connection to Downstream Private Property** | | |
| 1.1. | Sydney Water advised ESR on 26/4 that there were three preferences:<br>1. Utilise existing open drainage swale next to Abbots Rd. - ESR Response: The Existing Driveway on Lot 2 sets the hydraulic control for the significant flows expected. Its lowest point is about 0.9 m above the likely channel invert so the channel will pond water in the interim unless there is a relieving pipe outlet.<br>2. Construct the ultimate natural drainage channel to Mamre Rd – Sydney Water to assist in negotiations with downstream landowner. – ESR advise that they have attempted to contact the downstream landowner on a range of matters including most recently on managing noise and vibration during construction and he refuses to communicate. In addition, the development condition requiring completed designs within 2 months precludes this approach.<br>3. A temporary Underground Pipe adjacent to Abbotts Rd to Mamre Rd. - ESR response: a large diameter pipe is already proposed as part of the Abbotts Road concept plans. We can easily cross-connect the channel to that system to avoid creating an interim pond in the channel. Given the constraints to Options 1 and 2. This is ESR's preferred option.<br><br>AT requested that contact details of adjoining landowner to be provided by ESR.<br><br>SWC questioned the need for a large pipe in Abbott Road running parallel to the future drainage channel.<br>PM pointed out that the catchment flows currently surcharged onto the roadway and the new road designs prepared by AT&L for Abbots Road needed to provide for an oversized pipe system in the interim to comply with Safe Design requirements for these interim circumstances.<br><br>AT advised that SWC had liaised with Council regarding the Abbotts and Aldington designs and supported the Option 3 pipe solutions provided that: | | |

| | | | |
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| | • there was certainty that the drainage work in Abbotts Road would progress at the right time to ensure there was a means of discharge when this was required.<br>• the design documentation clearly demonstrated both the interim and permanent design solutions.<br>• There was no potential for the proposed widening of Abbotts Road at the Adlington intersection to impinge on the Trunk drainage corridor.<br>GM confirmed that the ESR's Stage 1 PC was conditional on the Abbotts Road upgrade being operational. Instrument to the Consent is linked in the minutes **here.** Conditions relating to road upgrades are Conditions B4 – B9.<br>In addition, Developer side deeds were in place that would ensure all potential contingencies were covered to ensure this occurred. GM also confirmed that the Abbotts Road design already included an allowance for the intersection widening.<br><br>SWC were to confirm the position with their Abbotts Road team and advise. | SWC | |
| **2.** | **Maintenance Path** | | |
| 2.1. | A separate maintenance only path is proposed on the north side of the channel. It is noted that a shared path will also be provided in the adjacent road verge for pedestrians and cyclists. This will allow the maintenance path to be graded more steeply to efficiently navigate the intended drop structures. A maximum Longitudinal gradient of 10% is proposed for the maintenance path.<br><br>SWC confirmed 10% grade is fine for the access road along the channel. The maintenance road must be designed such that the long-term integrity is not compromised in wet weather conditions. (i.e. cement stabilisation may be required). TBC at a later stage of design.<br><br>SWC requested the design consider whether the maintenance path could be moved north at the location of the drop structures to avoid having the retaining walls. JWP confirmed by email 7/6 that the batter slopes would likely need to be steeper than 1:3 to avoid having the maintenance track retaining wall. | JWP (Integrate into Design)<br><br>Note | |
| **3.** | **Base Flow Channel** | | |
| 3.1. | It is proposed to adopt the 4EY flows in sizing the base flow channel. This is consistent with Sydney Waters advice to DPE on 20 Dec 2022. (as outlined in a letter from Stantec to AT&L dated 8/2/23) A maximum depth of 1 m is proposed for the base flow channel.<br><br>Sydney Water confirms this low flow rate is fine to design to so long as the design can achieve a low flow meander per the design guidelines. Note that our design guidelines specify capacity to convey a **minimum** of 50% of the 12EY flow (appropriate for large catchments). | JWP (Integrate into Design) | |
| **4.** | **Drop Structures** | | |
| 4.1. | A maximum drop height of 0.9 m is proposed. The overall gradient of this portion of the channel is quite steep. Utilising the preferred 0.5 m drops will result in many more drops and associated rockwork and much less vegetated channel.<br><br>SWC confirmed support for this approach | JWP (Integrate into Design) | |
| **5.** | **Channel Width** | | |
| 5.1. | Would a reduced channel with be permitted for Stage 1 if we can demonstrate that the flows are contained, and the design complies with the technical guidelines? | | |

| | | | |
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| | SWC was inclined to agree with a reduced channel width (down to a min 20 m) where flows permitted.<br>SWC was currently reviewing the precinct hydrology modelling to confirm appropriate modelling parameters.<br><br>To allow advancement of the channel design within the required timeframes for Stage 1:<br>• SW (PG) provided details of the flows they had previously estimated at Aldington Road on 18/5. (Pre-development 1% AEP = 5.1 $m^3/s$ at Aldington Rd)<br>• AT&L prepared a brief summary letter outlining key hydrologic modelling parameters applied to the DRAINS modelling for Westlink and the stage 1 channel. GM issued this to SW on 15/5.<br>• JWP confirmed the adoption of AT&L's pre-development 1% AEP flow estimates of 7.2 $m^3/s$ at the western boundary for the design of the entire trunk drainage channel.<br>• SW (JM) responded with initial comments by email on 25/5 to specific questions raised by AT&L relating to broader precinct scale hydrology for the Mamre Road Precinct. SW advised AT&L there would be further advice forthcoming on losses to be applied in the hydrological modelling.<br>• JWP (DG) presented two alternate channel sections by email 5/6 that achieved a 20 m TD corridor width while complying with design arrangements agreed in principle (Option 8). Indicative cross sections of each option are provided in Attachment C.<br>• SW to review and confirm the preferred Option.<br>• SWC requested additional information on the 20m wide channel options, including overbank velocities for the establishment phase, channel profiles with additional profiles overlaid (Abbotts Road CL, boundary, maintenance track and channel banks) and preliminary hydraulic results.<br>• JWP provided the additional information above along with 3D images of the channel profile. SWC to review and confirm the preferred option.<br>• SWC agreed to the Option 1 20 m wide cross section at the meeting of 14/6/23. | JWP (Integrate into Design) | |
| **6.** | **Sydney Waters Role in Approvals** | | |
| 6.1. | Seeking more clarity on SWC's role in approvals of the drainage works at both DA and CC stages? Is there a different approach for TD /regional infrastructure (>15Ha) compared with works in the public road or on private allotments?<br>It is noted that Sydney Waters Draft guidelines- *Drainage Management for Aerotropolis and Mamre Road Precincts (June 2022),* indicates that SWC will approve, inspect, and accept assets that are part of the Trunk Drainage scheme.<br>(The previous diagrams presented in earlier issues of the minutes indicating a "Masterplanning Process" was confirmed by SW as not relevant to Mamre Rd Precinct)<br><br>On 1/6/23 SW (email from AT to all stakeholders) advised:<br><br>**DA stage**<br>Consent authorities in the Aerotropolis initial precincts and Mamre Rd precinct are referring development applications to Sydney Water as the Regional Stormwater Authority for advice as to the adequacy of the application on any matters that impact on Sydney Water's regional scheme infrastructure or the ability for the Regional Scheme to achieve the Wianamatta Waterway health targets.<br><br>This typically includes review of:<br>- Stormwater catchment and drainage<br>- Hydrologic and hydraulic modelling and reporting | | |

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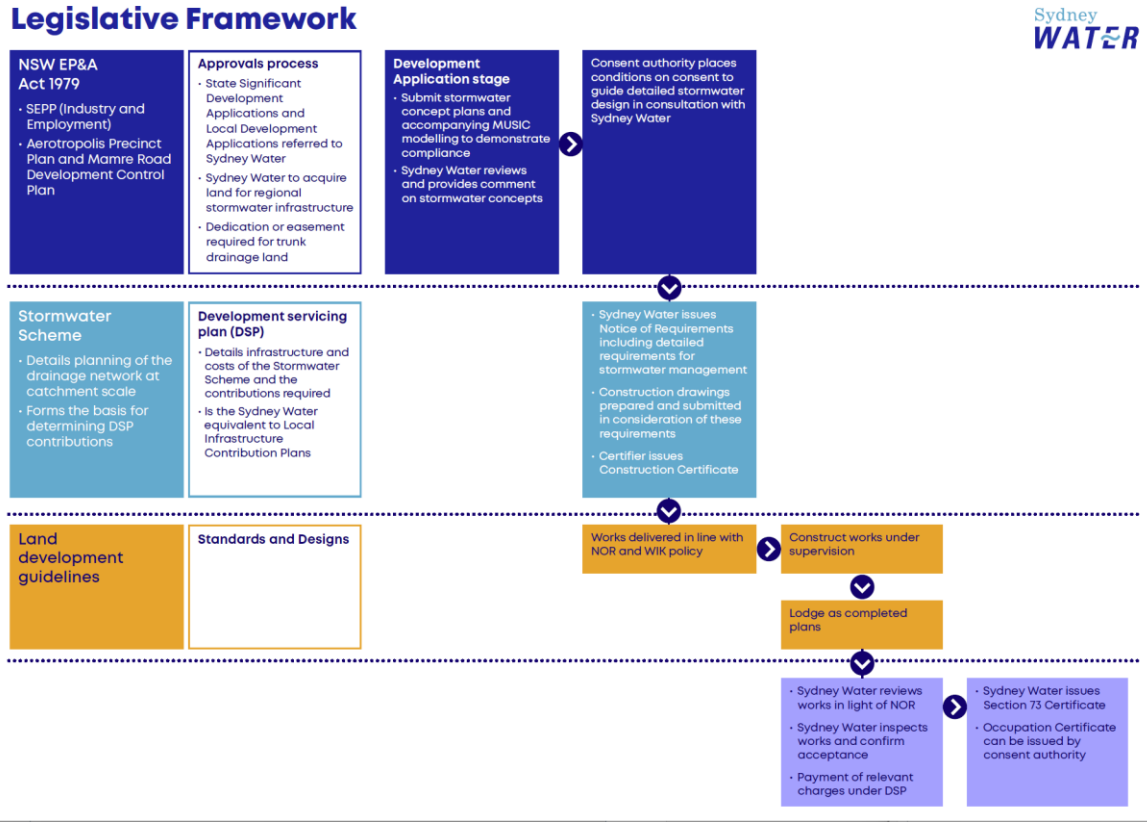
| | - MUSIC modelling and reporting<br>- On-lot non-potable water harvesting and re-use<br>- On-lot facility for connection to the regional scheme<br>- Street trees<br>- GPTs<br>- Any trunk drainage corridors including all connections and interfaces with the corridor<br>- Any regional scheme wetland/pond basins including all connections and interfaces with the basins.<br><br>**Post Consent**<br>As per ESR's conditions of consent, design of stormwater management system including trunk drainage must be designed in consultation with Sydney Water (and other agencies listed). As per at DA stage, Sydney Water will provide advice as to the adequacy of the application on any matters that impact on Sydney Water's regional scheme infrastructure or the ability for the Regional Scheme to achieve the Wianamatta Waterway Health Targets.<br><br>**Detailed Design/CC** – Sydney Water's involvement will be subject to the Works in Kind (WIK) procedure which is currently under development. As the ultimate manager of the trunk drainage asset Sydney Water approval will be required at key design development stages and throughout construction, completion and end of establishment. Sydney Water will continue to work with the proponent to develop the trunk drainage designs to Sydney Water's standards.<br><br>Note that the developer will also need to apply for a Notice of Requirements for a S73 certificate which is a requirement of obtaining an occupation certificate. All Sydney Water requirements (which include requirements for wastewater, water, recycled water and stormwater) will need to be met before a S73 will be issued.<br><br>It is also noted that the below diagram is the correct approvals process diagram for Mamre Rd Precinct | Noted | |
| |  | | |

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| **7.** | **Westlink Broader Drainage Strategy** | | |
| | JWP/ESR to outline the modified intent of the Stormwater management arrangements intended during subsequent development stages (i.e. 3 and 5) likely to drain into the Stage 1 drainage channel (OSD approach, external catchment management, pipe connections etc)<br><br>On 24/5 JWP presented a sketch plan showing the current general arrangement for the remaining stages at Westlink. A copy of his sketch plan is provided in Attachment A. It should be noted that this plan is indicative only and may be adjusted to suit future specific development requirements. | Noted | |
| **8.** | **Catchment Redistribution** | | |
| | Consistent with Sydney Waters verbal advice at the meeting of 17/4/23 ESR is proposing to redirect a maximum of 10% of the catchment areas discharging to each channel when compared to the post-development catchments detailed in the IWCM strategy.<br><br>JWP issued an email and plan outlining intended catchment diversions on 18/5. On 24/5 SWC requested further details clarifying the treatment of the catchment in the NW corner of the Westlink site. JWP updated and reissued the plan to Sydney Water on 26/5. A copy of his sketch plan is provided in Attachment B.<br><br>SW noted (AT email 30/5) that the proposed catchment redistribution exceeded the agreed 10% permissible limit but nevertheless confirmed that in this instance SW could facilitate the proposed change to catchments | Noted | |

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| **9.** | **DA Stage Documentation/Deliverables** | | |
| | The following DA stage Engineering documentation is proposed for the trunk drainage channel:<br><br>On 1/6/23 AT advised a number of additional items that have been added to the list below in red text<br><br>1. Concept Engineering Design Drawings that provide details of the general arrangements of the channel including:<br><br>a) Plans showing channel alignments, pipe drainage connections and /or discharge details, location of maintenance access paths and ramps, and adjacent existing and proposed infrastructure (including utility services) for the Channel from the eastern (upstream) end to a location that is 50 m downstream of the future Aldington Road extension. Provides details of the interim channel works needed to ensure a smooth transition onto the existing levels at the site's western boundary with Lot 2 in DP 25002.<br>b) Channel profile(s) indicating pipe inlet, outlet and drop structure locations and confirming 12EY, 1 EY and 1% AEP flood/flow levels.<br>c) Channel typical cross sections at key locations along the channel length that include indicative 12EY, 1 EY and 1% AEP flood/flow levels, proposed channel vegetation details (or reference to separate landscape plans)<br>d) 3x cross sections as well showing relationship with any service crossings within the reserve. include retaining wall heights in cross sections etc. ensuring capture of maximum heights and extents of wall/height in plans<br>e) General arrangements and sections for proposed culverts for any channel crossings, including maintenance access connections.<br>f) Channel catchment plans.<br>g) Pipe long sections for any pipe works within the trunk drainage reserve showing interface with street and lot drainage networks<br>h) Typical rock drop structure details, and inlet and outlet structure general arrangements. | | |

i) Indicative sediment and erosion control plans for the channel works.
j) adequate documentation of the ultimate scenario showing smooth connection to downstream future trunk drainage channel
k) Note estimated required rock sizing in channel to handle the flows

2. A concept design report for the Stage 1 Trunk Drainage channel that:
   a) Provides details of the hydrologic and hydraulic modelling undertaken to support the design. (Note Page 43 of Sydney Water Design Guidelines for hydrograph and results documentation requirements).
   b) Provides a range of mapping from the 1D/2D hydraulic (Tuflow) modelling undertaken in support of the channel design that demonstrates flood depths, levels, velocities and shear stresses for the key design events (1%, 0.2% AEP and PMF events).
   c) Provide details of climate change and model roughness sensitivity assessments.
   d) Demonstrates consistency with Sydney Waters Stormwater Scheme Infrastructure Design Guidelines (DRAFT) and discusses any deviations from the guidelines and provides suitable justification for these.
   e) Discusses Safety in Design related risk assessments undertaken in support of the design.

3. Copies of the Hydrologic (DRAINS) and hydraulic (TUFLOW) modelling and results files developed to support the design.

The design report, including the associated TUFLOW flood modelling will be progressed in support of the detailed design phase of the project. For concept design purposes JWP developed a generic HEC-RAS hydraulic model to help identify channel velocities and shear stresses and the key hydraulic parameters derived from this modelling was documented on the concept engineering plans.

JWP (detailed design Stage)

**10. Channel Design**

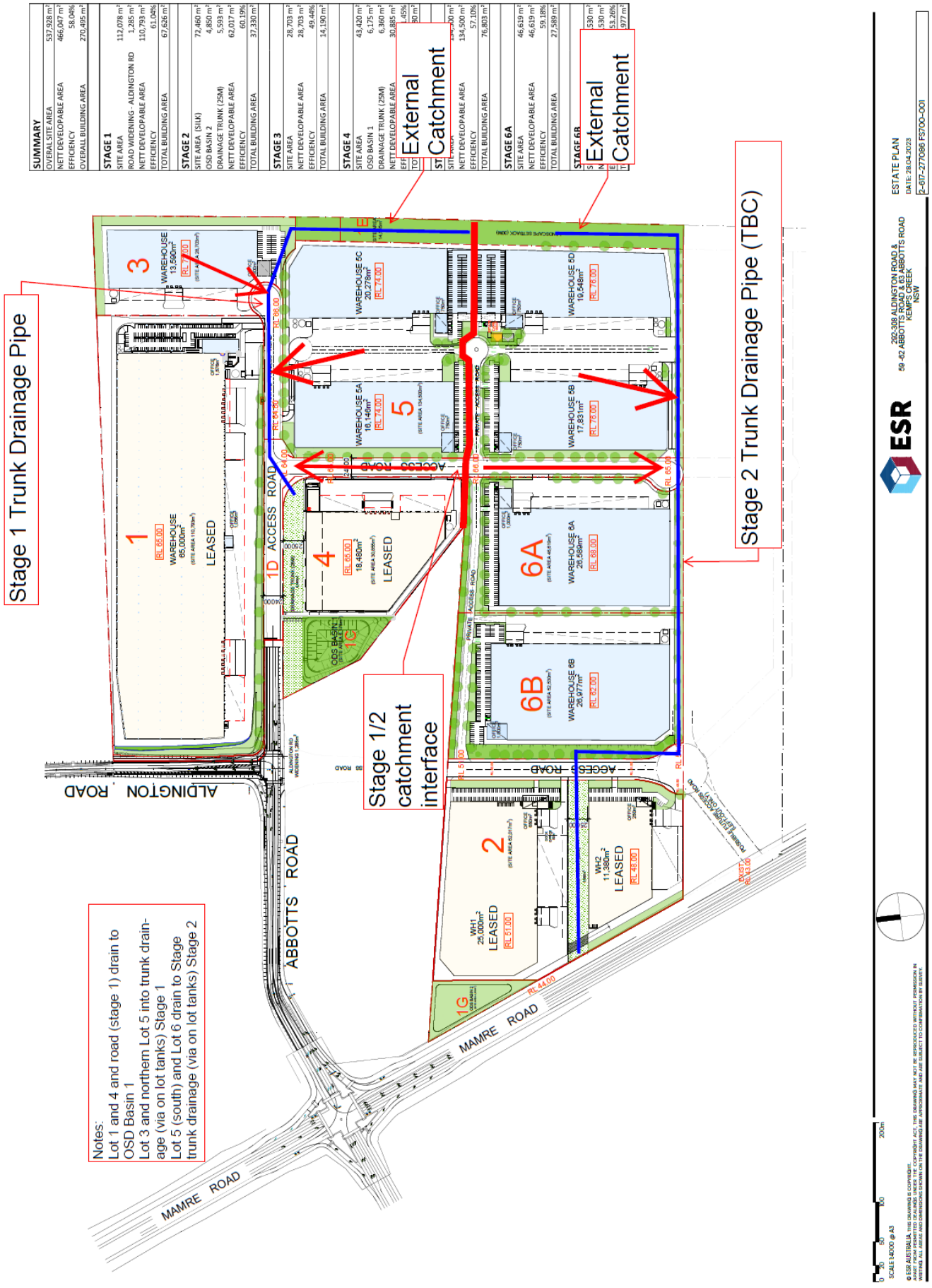
JWP presented an outline of the current design development and design options for the naturalistic drainage channel proposed for Stage 1

Application of the current SWC standard design template and adopting the approach of applying 0.9 m drop structures as previously discussed has led to the need for significant side retaining structures in lieu of batters. As this solution is not considered to be ideal, a range of additional channel solutions have been conceptualised for presentation and further discussion.

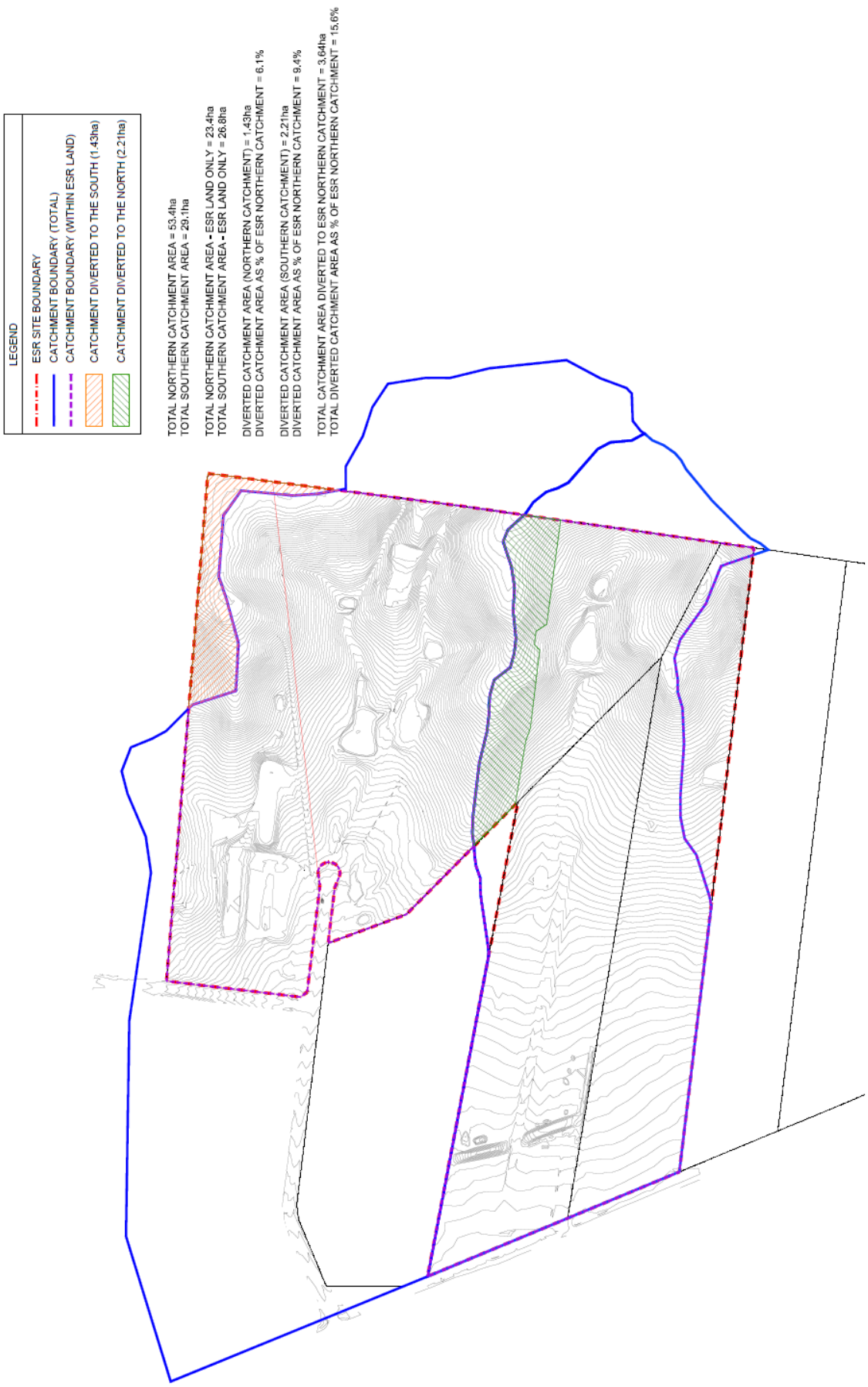
Channel options presented included:
(Concept profile, section and indicative hydraulic performance for each are attached to Minutes No 2)

| | |
|---|---|
| **Option 1** | SWC Standard Template and 0.9 regularly spaced drop structures – noting that substantial (up to 5 m high) retaining walls are required in lieu of batters. |
| **Option 2** | SWC template channel with vegetated batters on grade with Abbots Road (approx. 6.8%). Daylighting of inlet pipe further down the channel to avoid a deep rockwork trench. Full length rockwork lined base flow channel and vegetation only where velocities < 1.4 m/s. Vegetated batters on the Abbotts Road interface. |
| **Options 3, 4 and 5** | presented by JWP at the meeting but required extensive retaining walls in lieu of side batters, or a pipe to manage excess flows so were not progressed further. |
| **Option 6** | As for Option 2 but limiting maximum channel gradients to 5% and introducing five 0.5 m drops. |

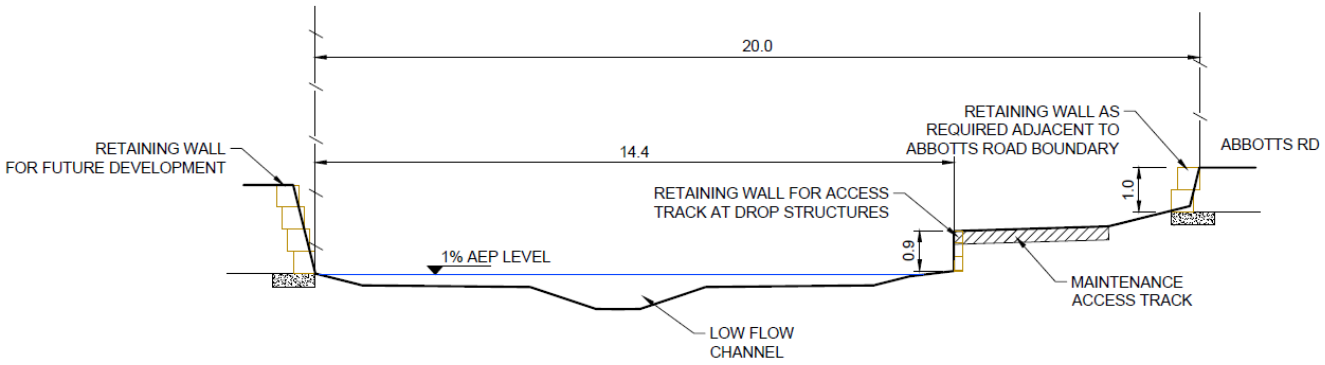
| | | | |
|---|---|---|---|
| | It is noted that the options canvassed are site-specific solutions only and would not be applied to locations further downstream on this channel (nor on channels in future stages) where more reasonable channel gradients are possible.<br>JWP discussed two refined variations of the Options based on Option 2 and a new Option 7 (as for Option 6 but with 2% max grades and 0.9 drops) at the meeting on 18/5. JWP refined these further based on Sydney Water feedback and assessed compliance against SW design parameters for the ultimate and establishment phases of the channel. Updated details were issued by email by PM on 22/5. (a copy is also attached to minutes No 3)<br><br>SW (PG) raised concerns regarding Option 2 and the risks of erosion of the soil/rock interface associated with longitudinal grades of 6.8% on dispersive clays. SW confirmed maximum longitudinal grades of 2.0% would be acceptable.<br><br>On 24/5 JWP issued an email to SW with updated details for "Option 8" which is a hybrid of Option 2 and Option 7 having max grades of 2.0%. A copy of his sketch plan is provided in Attachment C.<br><br>SW confirmed acceptance of Option 8 in principle (AT email 30/5) and advised that at detailed & construction design stages, the channel must be designed to Sydney Water's specs which is currently under development.<br><br>JWP (DG) issued Channel concept design plans to Sydney Water on 26/6/23. This was followed with a high-level concept design for the extension of the channel to Mulgoa Road on 27/6/23.<br>SW (AT) provided minor comments back to JWP on 5/7/23 and after consultation with AT&L on the OSD basin channel interface updated designs were prepared and issued by JWP (DG) on 7/7/23. [JWP Ref: 110965-03-DD001-DD072]<br><br>SW confirmed acceptance of the JWP concept plans for the naturalised trunk drainage channel at the project meeting of 12/7/23 | Noted | |
| **11.** | **Final Outcome (Concept Stage)** | | |
| | At the meeting of 12/7/23 Sydney Water confirmed:<br>• Acceptance of the engineering concept design for the naturalised trunk drainage channel as depicted in JWP Plan Numbers 110965-03-DD001 to DD070.<br>• Sufficient detail had been provided to allow progression of the bulk earthworks for Stage 1 (including the channel).<br>• The concept design stage for the channel was complete.<br><br>SW also advised that they were prepared to issue a letter to ESR confirming this position. | Noted<br><br>SW by 17/7/23 | |



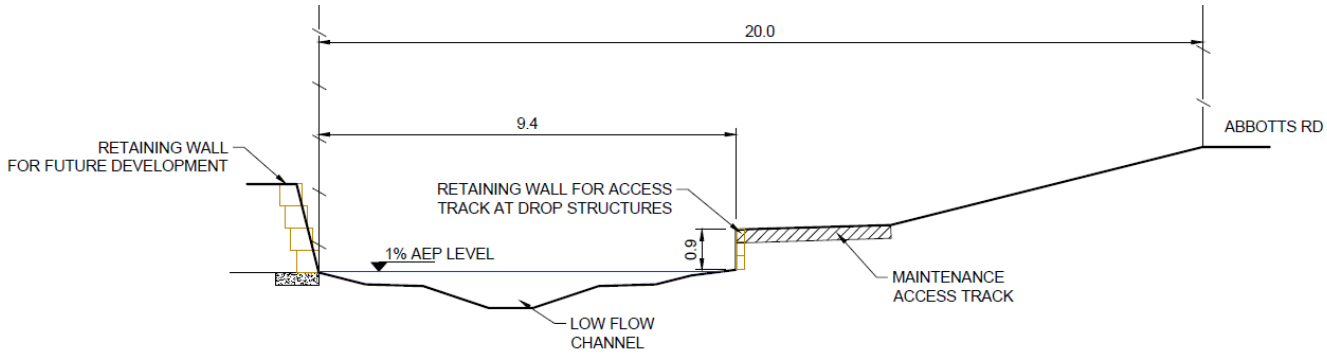

# ATTACHMENT A - WESTLINK – INDICATIVE ESTATE PLAN




# ATTACHMENT B - WESTLINK – CATCHMENT REDISTRIBUTION




20m WIDE CHANNEL CROSS SECTION - OPTION 1




20m WIDE CHANNEL CROSS SECTION - OPTION 2

# ATTACHMENT C - WESTLINK – 20 m CHANNEL OPTIONS

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SUSTAINABLE CERTIFICATION ISO 9001 ISO 45001 ISO 14001

**Our Ref:** 110965-02-Westlink St1 - Civil Infra Design - Condition B25 (k) Certification.docx
PJM:pjm

24 Apr 2024

**ESR Australia**

Level 24, 88 Phillip Street
Sydney, NSW 2000

**Attn: Grace Macdonald**

**Subject: Westlink Stage 1, Abbotts Road Kemps Creek– Civil Infrastructure Design – Certification Relative to Condition B25 (k)**

Dear Grace

I have completed a review and certification of the design package prepared by AT&L for CC Stage approvals of the proposed Westlink Stage 1 Civil Infrastructure Works. The review assessed the engineering designs and supporting models and addresses the requirements of Condition B25 (k) of the Instrument of Consent (DPE - 21 April 2023) for Westlink Stage 1

The following documentation was assessed in this review:

| Filename | Content | Date of document |
|---|---|---|
| 20-748-C13000 INFRASTRUCTURE CC SET_CURRENT.pdf | Westlink - Kemps Creek - Civil Works Package - Infrastructure Works - Stage 1 -State Significant Development Application - RTS-SSD-9138102 | Face Page 19-03-24<br>Relevant WSUD Sheets 22-04-24 |
| Westlink Industrial Estate Response to Agency Comments Condition B25 Rev 3.docx | Westlink Industrial Estate Response to Authority Comments – Condition B25 and B30 | 24-04-24 |
| CER002-03- 20-748 Condition B25b B30a Certificate.pdf | Design Certificate | 23-04-24 |
| 23272_C_SK_Pump Plan & Section Mark Up_Rev2_15.04.2024.pdf | Sparks and Partners markup of AT&L Engineering plans for the Interim Irrigation /Disposal system | 15-04-24 |
| R008-08-20-748- Stage 1 Water and Stormwater Management Plan.pdf | Westlink Industrial Estate, Kemps Creek – Stage 1 Water and Stormwater Management Plan | 18-03-24 |
| MUS007-11-20-748-WESTLINK STAGE 1 MOD 1.mxproj | MUSICX model files for Stage 1 | 07-02-24 |
| 20-748 Westlink Flow Duration Curve STAGE 1 MOD 1.xlsx | MUSIC modelling toolkit for Wianamatta - South Creek - Flow Duration Compliance template | 07-02-24 |
| SS20-4545_DB-000-501.pdf | Proposed Industrial Estate - OSD Basin – Abbotts Road Kemps Creek – Landscape Development Application. | 30-06-23 |
| **The following documents were previously reviewed by me in July 2023 and are still relevant to the updated design plans summarised above (refer to Attachment B for a copy of the review undertaken in support of the Westlink Stage 1 Bulk Earthworks approvals)** | | |
| 20-748-C11075[2].pdf | Stormwater Management Plan - Interim Arrangement | 24-07-23 |
| APPENDIX 2- LTR007-02 -20-748 Westlink Industrial Estate Hydrology.pdf | Letter from AT&L to Sydney Water confirming the basis of the hydrological assumptions adopted for the development. | 24-07-23 |
| APPENDIX 3- SPEL 100 Year Design Life Cals.pdf | Summary of Design/Safety Factor used for 100-year Design life on SPEL FRP tanks | 24-07-23 |

| Filename | Content | Date of document |
|---|---|---|
| DRN001-10-20-748 ESR WESTLINK STAGE 1 DRAINAGE.drn | DRAINS model files for Stage 1 | 24-07-23 |

The Westlink Stage 1 Instrument of Consent Condition B25 (k) requires that:

*B25. Within two months of the date of this consent, the Applicant must design the stormwater management system to the satisfaction of the Planning Secretary. The stormwater management system design must:*

*……..*

*k) include certification (and appropriate designed checklists) of the civil and landscape drawings by suitably qualified chartered professional engineer with experience in modelling, design and supervision of WSUD systems that the design drawings comply with the Technical Guide requirements and the stormwater targets are achieved; and*

*…….*

**Adopted Abbreviations**

The following abbreviations have been adopted for this assessment:

| Abbreviation | Document Title and Version |
|---|---|
| Technical Guide | Technical guidance for achieving Wianamatta-South Creek stormwater management targets (DPE- 2022) |
| WSMP | Westlink Industrial Estate – Stage 1 Water and Stormwater Management Plan (AT&L - 18 Mar 2024) |
| Engineering Drawings | Westlink - Kemps Creek - Civil Works Package - Infrastructure Works - Stage 1- State Significant Development Application - RTS-SSD-9138102 (AT&L – Cover Sheet 19 Mar 2024 – Relevant WSUD Sheets 22 April 2024) |
| Landscape Drawings | Proposed Industrial Estate - OSD Basin – Abbotts Road Kemps Creek – Landscape Development Application – SS20-4546_DB-000-02 (Site Image - 30 June 2023) |

**Compliance Checklist**

A compliance checklist was developed to summarise the outcomes of this review against the relevant components of the Technical Guide, and this is provided in Attachment A.

**Certification**

A detailed review of the Westlink Stage 1 Civil Infrastructure Design Package demonstrates that the specified WSUD systems are an appropriate size and achieve the performance and operational objectives specified in the Technical Guide. Consequently, I certify that the design addresses the specific requirements of Condition B25 (k) of the Instrument of Consent.

Yours faithfully

PETER MEHL
MIEAust CPEng NER (Civil)

Director

Encl:

**ATTACHMENT A** Technical Guide Compliance Checklist

**ATTACHMENT B** GPT Design Assessment Checklist

**ATTACHMENT A –Compliance Checklist against Technical Guide requirements**

| Requirement | Summary of Compliance |
|---|---|
| Stormwater Quality Targets | The Westlink Stage 1 MUSIC modelling was reviewed and is consistent with the performance reported in the Stormwater Plan. The allowable loads approach (Option 2) was adopted. Results are reported in Table 10 of the report. The system achieves the water quality performance targets specified in the Technical Guide. |
| Stormwater Flow Targets | The Westlink Stage 1 MUSIC modelling was reviewed and is consistent with the performance reported in the Stormwater Plan. The template Flow Duration Curve was derived for the system and demonstrates compliance. Results are reported in Table 12 of the report. The system achieves the Option 1 -MARV flow targets specified in the Technical Guide. |
| MUSIC modelling | The modelling parameters specified in Appendix A of the Technical Guide were adopted by AT&L as the basis of the MUSIC modelling prepared in support of the project |
| Water and Stormwater Management Plan (WSMP) | The Stage 1 WSMP includes the information specified in Table 7 of the Technical Guide. |
| Engineering Drawings | The Westlink Stage 1 Engineering Drawings include sufficient detail of the proposed WSUD elements to allow for a detailed appraisal of the system (including this review) and construction tendering purposes. The documented WSUD designs address the design considerations set out in Chapter 3 of the Technical Guide (refer to the specific details for each component summarised under WSUD Design Checklists below). |
| Landscape Drawings | The Plans prepared by Site Image were reviewed against the Technical Guide. Details of the planting in the Interim Pond/Detention Basin including species, zones and densities are included on the plans and the plans reference standard specifications for topsoil and mulch. Mulching is only applicable in the higher levels of the basin where localised shrubs and accent planting is proposed which is appropriate for a basin. The floor and batters of the basin will be finished with grasses and groundcovers. A mix of endemic species is proposed. Details of the hardscape elements are included in AT&L Civil Plans. |
| WSUD Design Checklists | The following WSUD system components were assessed against the design considerations set out in Chapter 3 of the Technical Guide and, where relevant, were also assessed against Penrith Council's WSUD Design Checklists (as contained in Version 3 of the WSUD Technical Guide), or other Industry standard design checklists where these were available. |
| i) Interim Rainwater Tanks | Two interim rainwater tanks with a storage volume totalling 310 kL are proposed for Westlink Stage 1. These will be decommissioned once the Sydney Water regional stormwater scheme is implemented. The MUSIC modelling for Westlink Stage 1 has adopted rainwater tank modelling parameters that are consistent with the Technical Guide. It is noted that Rainwater Tanks are not included in the civil infrastructure works but are indicated schematically on the Engineering Drawings to show the overall water management system intent. Consequently, I am unable to certify the tank designs are compliant with the Technical Guide or Penrith Council's Design Checklist. |
| ii) GPT | An Atlan (SPEL) Vortceptor SVO.1600 off-line vortex style wet sump GPT is proposed to pre-treat stormwater flows. This system was assessed in MUSIC as a generic node that removes gross pollutants only. This approach is consistent with the Technical Guide.<br>With reference to item 3.3 in the Response to Authority Comments I am satisfied that the risk of re-suspended litter being conveyed off-site in storm events greater than 5% AEP is acceptably low.<br>Also, refer to the GPT Design Assessment Checklist included at Attachment B for further details. |
| iii) Interim Pond | A constructed 2,754 kL pond is used to capture and collect stormwater for reuse |

| Requirement | Summary of Compliance |
|---|---|
| | in the interim irrigation disposal system. This is co-located at the base of the permanent detention storage (6381 kL) and will be backfilled once the regional stormwater scheme becomes operational. The pond is required to be lined to prevent infiltration. As the Technical Guide does not specifically provide design requirements relating to "Ponds" we have reviewed the design against the relevant "wetlands" parameters. It is noted that an Extended Detention Depth (EDD) of 0.75 m and a notional detention time of 3.9 hrs is achieved. It is noted that this arrangement is not directly compliant with technical guide recommendations, which suggest that the EDD zone of the WSUD element should not be counted as part of the OSD basin active storage volume. However, an assessment of the pond water level fluctuations in MUSIC demonstrates that the proposed 225 mm diam base flow outlet (common to both OSD and Pond EDD), in combination with the required irrigation disposal, will draw down the EDD storages to at or below the pond TWL 53.05 m within hours of the storm event. Consequently, I have formed the view that it is valid to count the EDD as active OSD storage in this instance. I also note that the MUSIC and DRAINS modelling implemented for the pond and the associated detention storage appropriately reflect the design configuration.<br>No PCC or industry Design Assessment Checklist is currently available for this element. |
| iv) Interim Proprietary Cartridge Filter | An AtlanFilter cartridge filtration device consisting of 60 cartridges is utilised to improve water quality performance in the interim phase. This system was assessed in MUSIC as a generic node that adopted nutrient removal rates consistent with the device's SQUIDEP performance specifications.<br>With reference to item 3.4 in the Response to Authority Comments it is noted that the invert of the AtlanFilter is set at the highest 4EY tailwater level (interim or long term) in the channel and will function as intended.<br>No PCC or industry Design Assessment Checklist is currently available for this element. |
| v) Interim Irrigation Disposal System | An interim irrigation area of 4.00 ha with a maximum gradient of 6% is provided to service Stage 1. A suitable pump system and rising main deliver flows collected at the interim pond to the irrigation disposal area.<br>No PCC or industry Design Assessment Checklist is currently available for this element. |