

Appendix B3: Soil and Water Management Sub- Plan

CABRAMATTA LOOP PROJECT

ACKNOWLEDGEMENT TO COUNTRY

Fulton Hogan acknowledges the Cabrogal of the Darug Nation People as the Traditional Owners of the land we are working on, and pay our respect to their Elders past, present and emerging.

We recognise their deep connection to Country and value the contribution to caring for, and managing the land and water.

We are committed to pursuing genuine and lasting partnerships with Traditional Owners to understand their culture and connections to Country in the way we plan for and carry out the delivery of the Works.



Document control

This is an e-copy of the Plan and it interfaces with the other associated plans, which together describe the proposed overall project management system for the project.

The latest revision of this plan is available on the Fulton Hogan server. If any unsigned hard copies of this document are printed, they are valid only on the day of printing.

The revision number is included at the bottom of each page. When revisions occur, the entire document will be issued with the revision number updated accordingly for each owner of a controlled copy.

Attachments/Appendices to this plan are revised independently of this plan.

Revision History

REV	DATE	AUTHOR / REVISED BY	ENDORSED BY	BRIEF DESCRIPTION OF CHANGE
01				
02				
03				
04				
05				

Table of Contents

1. Introduction	1
1.1. Purpose	1
1.2. Background	1
1.3. Structure of SWMP	1
1.4. Consultation for Preparation of the SWMP	1
2. Objectives, Targets and Environmental Performance Outcomes	5
2.1. Objectives	5
2.2. Targets	5
2.3. Environmental Performance Outcomes	5
3. Legal and Other Requirements	7
3.1. Legislation	7
3.2. Guidelines and Standards	7
3.3. Conditions of Approval	7
3.4. Revised Mitigation Measures	11
4. Existing Environment	15
4.1. Topography and Geology	15
4.2. Soils	15
4.2.1. Soil Types	15
4.2.2. Acid Sulfate Soils	15
4.2.3. Salinity	16
4.3. Areas of Contamination Concern	16
4.4. Watercourses	17
4.5. Water Quality	17
4.6. Groundwater	17
5. Environmental Aspects and Impacts	18
6. Environmental Mitigation Measures	18
7. Compliance Management	27
7.1. Roles and Responsibilities	27
7.2. Training	27
7.3. Complaints	27
7.4. Inspections and Monitoring	27
7.5. Auditing	27
7.6. Reporting	28
7.7. Non-conformances	28

8. Review and Improvement of SWMP 28

List of Tables

Table 1: Environmental Performance Outcomes Relevant to Soil and Water Management	5
Table 2: Conditions of Approval Relevant to SWMP	8
Table 3: Revised Mitigation Measures Relevant to SWMP	11
Table 4: Soil and Water Mitigation Measures	18
Table 5: Summary of Construction Water Quality Monitoring	34
Table 6: Action Criteria Based on the ASS Analysis for Three Broad Texture Categories (Source: Ahern et al. 1998)	38
Table 7: Treatment Levels and Aglime Required to Treat Total Weight of Disturbed ASS (Source: Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines 2002).....	39
Table 8: Quantity of Pure Neutralising Agent Required to Raise from Existing pH to pH 7 for One Megalitre of Low Salinity Acid Water.....	41
Table 9: Definition of Rain or Showers Intensity.....	45
Table 10: Water Quality Criteria for Onsite Reuse	52
Table 11: Water Quality Criteria for Offsite Discharge	52

List of Figures

Figure 1: Construction Water Quality Monitoring Locations	32
---	----

Appendices

Appendix A: Primary Erosion and Sediment Control Plan (ESCP)	
Appendix B: Water Quality Construction Monitoring Program	
Appendix C: Acid Sulfate Soil Management Procedure	
Appendix D: Heavy Rainfall Event Procedure	
Appendix E: Unexpected Contaminated Land and Asbestos Finds Procedure	
Appendix F: Dewatering Procedure	
Appendix G: Dewatering Permit	

Glossary/ Abbreviations

Term/ abbreviation	Definition
ARTC	Australian Rail Track Corporation
CEMP	Construction Environmental Management Plan
CoA	The Minister's conditions of approval for the CSSI.
Construction Boundary	Has the same meaning as the definition of the term in the Project approval: The area required for project construction as described in the documents listed in Condition A1 .
CSSI	Critical State Significant Infrastructure, as described in Schedule 1 of the project approval, the carrying out of which is approved under the terms of the project approval.
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
DPIE EES Group	Environment, Energy and Science Group of DPIE
DPIE Water Group	Water Group of DPIE and the National Resources Access Regulator
DPE	NSW Department of Planning and Environment
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992).
EIS	Environmental Impact Statement
ENM	Excavated Natural Material, as defined in <i>The excavated natural material exemption</i> .
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environment Protection Licence under the POEO Act
ER	Environmental Representative for the CSSI
ESCP	Primary Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
FFMP	Flora and Fauna Management Sub-Plan
HP	Hold Point: a point in the construction or verification process beyond which work may not proceed without receiving authorisation from the appropriate party.
Minister, the	NSW Minister for Planning and Public Spaces
NA	Not applicable
Non-compliance	Failure to comply with the requirements of the Project Approval or any applicable license, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of project system documentation including this PCEMP or supporting documentation.
OEH	Office of Environment and Heritage
OEMS	Operational Environmental Management System
PESCP	Progressive Erosion and Sediment Control Plan

Term/ abbreviation	Definition
Planning Secretary, the	Has the same meaning as the definition of the term in the Project approval: Planning Secretary of DPE (or nominee, whether nominated before or after the date on which the project approval was granted)
Planning Secretary's approval or agreement, the	Has the same meaning as the definition of the term in the Project approval: A written approval or agreement from the Planning Secretary (or nominee)
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
Project, the	Cabramatta Loop
Project approval, the	The Minister's approval for the CSSI.
Publicly Available	Has the same meaning as the definition of the term in the Project approval: To be made available on the website required under Condition B10 of the project approval.
Relevant council(s)	Has the same meaning as the definition of the term in the Project approval: Any or all as relevant, Fairfield City Council or Liverpool City Council.
SWMP	Soil and Water Management Sub-Plan
TfNSW	Transport for NSW
UDLP	Urban Design and Landscape Plan
Work	Has the same meaning as the definition of the term in the Project approval: Any physical work for the purpose of the CSSI including construction and low impact work.

1. Introduction

1.1. Purpose

This Soil and Water Management Sub-Plan (SWMP) describes how Fulton Hogan will manage construction of the Cabramatta Loop Project (the project) to ensure that impacts on soil and water are minimised.

This SWMP has been prepared to detail how Fulton Hogan will comply with the project approval, and implement and achieve relevant performance outcomes, commitments and mitigation measures specified in the EIS as amended by the Submissions Report (also known as 'Revised Mitigation Measures' (RMM)) during construction of the project. Additionally, this SWMP has been prepared to address the requirements of ARTC Technical Specification and Works Description (TSWD) Appendix 04 Additional Environmental Requirements and Environment Protection Licence (EPL) Number 3142 (held by ARTC for railway activities – railway infrastructure operations) to the extent that it applies to Fulton Hogan's activities.

It was originally contemplated in the EIS that flood management would form part of the SWMP. However, Fulton Hogan manages flooding risks, including emergency management of flooding, in a different manner to how it manages water quality risks associated with soil and water. For this reason and for ease of implementation on site, Fulton Hogan has therefore separately developed the Flood Management Sub-Plan (FMP), which is subject to the same consultation requirements as the SWMP under CoA C4(c).

For the avoidance of doubt, the CEMP (including this SWMP) relates to the construction phase only. Detailed design environmental requirements will be addressed as part of the detailed design phase, separate to the CEMP approvals process. Detailed design is generally completed about six months after CEMP approval. In addition, operational environmental requirements will be met during the operational phase (upon the completion of construction) and addressed in the Operational Environmental Management System (OEMS) required under CoA D1.

1.2. Background

Chapters 12 and 13 of the EIS assessed the extent and magnitude of potential impacts of construction and operation of the project on soils and water quality respectively. As part of this, detailed Soils and water quality assessments were undertaken and included in the EIS as:

- EIS Volume 4 – Technical Report 6 – Cabramatta Loop Project: Soils and Contamination Impact Assessment, prepared by GHD for ARTC, dated August 2019.
- EIS Volume 4 – Technical Report 7 – Cabramatta Loop Project: Surface Water and Groundwater Quality Impact Assessment, prepared by GHD for ARTC, dated August 2019.

1.3. Structure of SWMP

This SWMP is part of Fulton Hogan's environmental management framework for the project and is supported by other documents, such as primary and progressive erosion and sediment control plans and Environmental Work Method Statements. The review and document control processes for this SWMP are described in Chapters 11 and 12 respectively of the CEMP.

1.4. Consultation for Preparation of the SWMP

In accordance with CoA C4(c), consultation with DPIE Water Group, Sydney Water, Liverpool City Council and Fairfield City Council has been undertaken during the preparation of this SWMP. This includes consultation with DPIE Water Group and the EPA in relation to the Construction Monitoring Program (refer to Appendix B) to satisfy the requirements of CoA C8(b) and RMM C6.6 respectively.

For consultation details related to hydrology/ flooding, including emergency management of flooding, refer to Section 1.4 of the FMP, which is subject to the same consultation requirements as the SWMP under CoA C4(c).

A summary of the key issues raised in relation to the SWMP is provided below. It is noted that at the date of Revision 2 of the SWMP, DPIE Water Group and Sydney Water had provided no further comments. There were no outstanding issues in relation to the comments received from Liverpool City Council, Fairfield City Council and the EPA.

DPIE Water Group

On 13/08/21 Fulton Hogan invited DPIE Water Group to review and comment on the SWMP.

On 31/08/21 Fulton Hogan enquired about the progress of DPIE Water Group's review comments.

On 08/09/21 DPIE Water Group advised that an officer had been assigned to Fulton Hogan's enquiry and an update would be provided as soon as possible regarding its progress.

On 10/09/21 the officer advised that the SWMP was currently with DPIE Water for comment.

On 14/09/21 Fulton Hogan asked when comments would be provided.

On 15/09/21 the officer advised she had consulted with DPIE Water and did not have a date at that time.

On 15/09/21 Fulton Hogan attempted to contact the officer directly but was advised by the Service Centre (1800 633 362) that the officer's direct number could not be provided and the call could not be transferred.

On the same day, Fulton Hogan followed-up with an email to the officer to advise that given the time elapsed since originally providing the SWMP for comment (on 13/08/21), and as the date when comments will be provided by DPIE Water is currently unknown, it is Fulton Hogan's intention to submit the SWMP to the independent Environmental Representative (approved by the Planning Secretary of DPIE) for approval. In so doing, allowing the CEMP approvals process to progress, without delaying the commencement of the project.

Fulton Hogan advised that in the event comments are received from DPIE Water Group after the approval of the CEMP, Fulton Hogan will work with DPIE Water Group to address those comments at that point in time.

On 16/09/21, the officer thanked Fulton Hogan for advising that it will be progressing with the approval and that comments from DPIE Water will be sent through when they are completed.

Sydney Water

On 13/08/21 Fulton Hogan invited Sydney Water to review and comment on the SWMP. On 20/08/21 Sydney Water advised that the project is unlikely to affect the Upper South Creek Advanced Water Recycling Centre project. Further, the rail upgrades seem to be further south than where Sydney Water is currently intending/planning to cross (in terms of the railway). Sydney Water also noted that relocation of an existing Sydney Water gravity main in Jacquie Osmond Reserve does not have any impact on the Advanced Water Recycling Centre project. Sydney Water also noted that the Infrastructure Development team will also continue to review the alignment and identify Sydney Water impacts (they will be in touch with ARTC and Fulton Hogan to go through the process).

To avoid any doubt, on 24/08/21 Fulton Hogan asked Sydney Water to confirm it has no further comments in relation to the SWMP for the Cabramatta Loop Project. Fulton Hogan also clarified that separate to the SWMP approvals process, Fulton Hogan will consult with Sydney Water throughout the delivery of the project as required, including in regard to the relocation of the Sydney Water gravity main in Jacquie Osmond Reserve.

However, on the same day Sydney Water advised that the project team can only comment on impact of the Cabramatta Loop project to the Upper South Creek Advanced Water Recycling Centre project. With regard to the relocation of an existing Sydney Water gravity main, Sydney Water suggested that this be discussed with Fulton Hogan's appointed Water servicing coordinator and may require more extensive coordination with Sydney Water operations through the "WSC/e dev".

On 24/08/21, Fulton Hogan asked whether there was another Sydney Water contact that is responsible for wider Sydney Water operations that should review the SWMP. On 26/08/21, the Sydney Water Upper South Creek Project Team member forwarded the SWMP to another Sydney Water member for comment. On 31/08/21 the new Sydney Water member advised she is happy to review Cabramatta Loop Project documentation on behalf of

Sydney Water and has done similar for other infrastructure projects like Parramatta Light Rail where Sydney Water's costs were recovered under an Interface Deed.

On 06/09/21, Fulton Hogan clarified that it is providing Sydney Water with the opportunity to comment on its CEMP documentation required under the Minister's conditions of approval (CoA) for the project. Fulton Hogan noted that this is construction-related documentation, which describes how Fulton Hogan will manage construction of the project to ensure environmental impacts are minimised. When construction-related documentation is forwarded to government agencies and/or councils for comment, Fulton Hogan does not provide payment. This is the case for the CEMP documentation. Moreover, Fulton Hogan understands Interface Deeds are more commonly used to recover costs associated with the review of design-related documentation.

Fulton Hogan advised that in light of the above, should Sydney Water be open to commenting on the SWMP that comments be provided by 13/09/21. Alternatively, if Sydney Water had no comments or did not wish to comment on the plans, could Sydney Water send an email to confirm the same.

Moreover, separate to the CEMP documentation review process, Fulton Hogan advised that it will continue to consult with Sydney Water throughout the delivery of the project as required, including in regard to the relocation of the Sydney Water gravity main in Jacquie Osmond Reserve.

On 14/09/21, Fulton Hogan advised Sydney Water that as no correspondence had been received (due 13/09/21) in relation to the SWMP, it is Fulton Hogan's intention to submit the SWMP to the independent Environmental Representative (approved by the Planning Secretary of DPIE) for approval.

Fulton Hogan advised that this will allow the CEMP approvals process to progress, without delaying the commencement of construction of the project. Fulton Hogan advised that it anticipates this approach is a workable solution for all parties. Sydney Water raised no objections.

Liverpool City Council

Liverpool City Council provided comments, generally related to:

- wording in the revised mitigation measures
- a typographical error
- a question whether Fisheries has been consulted
- responsibility for some mitigation measures
- amendments to Appendix E Unexpected Contaminated Land and Asbestos Finds Procedure

Fulton Hogan responded to Liverpool City Council's comments. Liverpool City Council confirmed its comments had been addressed.

Fairfield City Council

Fairfield City Council provided comments, generally related to:

- the project approval and the appropriate regulatory authority
- controls and procedures to avoid or minimise potential adverse impacts to soil and water along the project corridor
- the SWMP addressed the relevant conditions of consent issued by the DPIE
- reference to a revoked guideline in Appendix E, Unexpected Contaminated Land and Asbestos Finds Procedure.

Fulton Hogan responded to Fairfield City Council and advised to close the SWMP consultation process, Appendix E of the SWMP would be amended to refer to the current guideline "*Consultants Reporting on Contaminated Land: Contaminated Land Guidelines* (EPA, 2020)". Fairfield City Council raised no objections.

EPA

The EPA advised that its position on all post approval management plans is to encourage the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, the EPA notes that it does not approve or endorse these documents as its role

is to set environmental objectives for environmental management and not to be directly involved in the development of strategies to achieve those objectives. Therefore, the EPA confirmed that it will not be providing comments on the SWMP or Water Quality Construction Monitoring Program (WQCMP) prepared by Fulton Hogan in support of the Cabramatta Loop Project. Furthermore, the EPA notes it will manage any issues within its jurisdiction, during the construction phase of the project through the relevant provisions of the *Protection of the Environment Operations Act 1997*, if required.

Copies of all consultation correspondence is included at Appendix A5 of the CEMP.

Ongoing consultation will be undertaken during detailed design and construction of the project as required by the environmental documents. This will be subject to a separate consultation process to that required for preparation of this SWMP.

2. Objectives, Targets and Environmental Performance Outcomes

2.1. Objectives

The key objective of the SWMP is to ensure that impacts to soil and water are minimised and within the scope permitted by the project approval. To achieve this objective, Fulton Hogan will undertake the following:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to soil and water along the Project corridor
- Ensure appropriate measures are implemented to address the relevant CoA and RMM outlined in Table 2 and Table 3 respectively.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Chapter 3 of this SWMP.

2.2. Targets

The following targets have been established for the management of soil and water impacts during the project:

- Ensure full compliance with the relevant legislative requirements, CoA and RMM outlined in Table 2 and Table 3 respectively.
- Minimise or avoid impacts on native soil and water
- Ensure notification of any unexpected threatened species/ TECs during construction.

2.3. Environmental Performance Outcomes

The construction-related environmental performance outcomes relevant to this SWMP are listed in Table 1. A cross reference is also included to indicate where the environmental performance outcome is addressed in this SWMP in terms of how it will be implemented and achieved.

Table 1: Environmental Performance Outcomes Relevant to Soil and Water Management

Key Issue (as listed in Table 22.5 of the EIS)	Environmental Performance Outcome	Document Reference
6. Soils, protected and sensitive lands	<p>Site-specific soil characteristics are taken into consideration during detailed design and construction.</p> <p>Any contamination is managed in accordance with relevant regulatory requirements.</p> <p>Any soil waste is assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (EPA, 2014) and <i>The Australian Rail Track Corporation excavated material order 2019</i>.</p>	<p>Detailed Design Section 4.2 Chapter 6 mitigation measure ID SWMM1. Appendix A</p> <p>Section 3.1 Chapter 6 mitigation measure ID SWMM63. Appendix E</p> <p>WEMP Sections 6.1, 6.2, 6.3 and 6.4.</p>

Key Issue (as listed in Table 22.5 of the EIS)	Environmental Performance Outcome	Document Reference
7. Water - hydrology	Construction compounds and work areas are laid out such that flows are not significantly impeded.	FMP
	The project avoids long term impacts to surface water	Detailed Design
	Opportunities to reuse water resources are considered during the design process.	Detailed Design
	The use of water during construction is minimised.	SWMP Chapter 6 mitigation measure ID SWMM41, SWMM46.
8. Water – quality	Impacts to water quality are minimised during construction and operation.	Chapter 6 mitigation measures. Operation
	Erosion and sediment controls during construction are implemented in accordance with <i>Managing Urban Stormwater: Soils and Construction Volume 1</i> (Landcom, 2004) and <i>Managing Urban Stormwater: Soils and Construction Volume 2</i> (DECC, 2008a).	Chapter 6 mitigation measure ID SWMM1, SWMM3.
	The project will protect or contribute to achieving the Water Quality Objectives, during construction and operation.	Appendix B, point 5 Operation
	Construction water quality discharge will comply with the requirements of ARTC’s existing EPL #3142.	Chapter 6 mitigation measure ID SWMM43. Appendix F, point 4c under Offsite Discharge
9. Flooding	Construction is undertaken in a manner that minimises the potential for adverse flooding impacts, through staging of works and the implementation of mitigation measures.	FMP
	Construction compounds and work areas are laid out such that flows are not significantly impeded.	FMP
	Flooding design criteria will be achieved.	Detailed Design
	The performance of the downstream drainage network is maintained during construction and operation.	FMP Operation

3. Legal and Other Requirements

3.1. Legislation

Legislation relevant to soil and water management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Environmental Planning and Assessment Regulation 2000*
- *Protection of the Environment Operations Act 1997* (POEO Act)
- *Water Management Act 2000* (WM Act)
- *Fisheries Management Act 1994* (FM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), and
- *Water Act 1912* (Water Act).
- *Contaminated Land Management Act 1997*

Relevant provisions of the above legislation are explained in the Register of Legal and Other Requirements included in Appendix A1 of the CEMP.

3.2. Guidelines and Standards

The main guidelines, standards and policy documents relevant to this SWMP include:

- Acid Sulfate Soil Manual (ASSMAC 1998)
- Acid Sulfate Soil and Rock – Victorian EPA Publication 655.1 – July 2009
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000)
- National Water Quality Management Strategy (NWQMS) (Department of Sustainability, Environment, Water, Population and Communities (DSEWPC), 1994)
- NSW Water Quality and River Flow Objectives (DECCW, 2006)
- Department of Environment and Conservation (DEC): Bunding & Spill Management. Insert to the Environment Protection Manual for Authorised Officers - Technical section "Bu" November 1997
- Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2
- Volume 2D Main Roads Construction (DECC 2008)
- DLWC, 1998. Constructed Wetlands Manual
- Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries, Cronulla, 16 pp
- NSW Fisheries, November 2003. Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings (Ref: NSWF – 1181)
- NSW Department of Primary Industries (Water) *Guidelines for controlled activities on waterfront land – Riparian corridors* (2018).
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA, March 2004)
- Floodplain Development Manual (NSW Government, 2005)
- WorkCover's Storage and Handling of Dangerous Goods Code of Practice (WorkCover, 2005)
- Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA, 2020).

3.3. Conditions of Approval

The CoA relevant to this SWMP are listed in Table 2. A cross reference is also included to indicate where the condition is addressed in this SWMP or other project management documents.

Table 2: Conditions of Approval Relevant to SWMP

CoA No.	Condition Requirements	Document Reference												
PART C - CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN														
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN														
C4	<p>CEMP Sub-Plans must be prepared in consultation with the relevant government agency(ies) and council(s) identified for each CEMP Sub-Plan in Table 3.</p> <p>Table 3: CEMP Sub-Plan and relevant public authorities</p> <table border="1"> <thead> <tr> <th></th> <th>Required CEMP Sub-Plan</th> <th>Relevant government agency(ies) and council(s) to be consulted for each CEMP Sub-Plan</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Traffic and Transport</td> <td>TfNSW and relevant council(s)</td> </tr> <tr> <td>(b)</td> <td>Noise and Vibration</td> <td>Relevant council(s)</td> </tr> <tr> <td>(c)</td> <td>Soil and Water</td> <td>DPIE Water Group, Sydney Water and relevant council(s)</td> </tr> </tbody> </table> <p><i>Note: This condition does not preclude the preparation of subplans the proponent has committed to preparing in documents referenced in Condition A1</i></p>		Required CEMP Sub-Plan	Relevant government agency(ies) and council(s) to be consulted for each CEMP Sub-Plan	(a)	Traffic and Transport	TfNSW and relevant council(s)	(b)	Noise and Vibration	Relevant council(s)	(c)	Soil and Water	DPIE Water Group, Sydney Water and relevant council(s)	Section 1.4
	Required CEMP Sub-Plan	Relevant government agency(ies) and council(s) to be consulted for each CEMP Sub-Plan												
(a)	Traffic and Transport	TfNSW and relevant council(s)												
(b)	Noise and Vibration	Relevant council(s)												
(c)	Soil and Water	DPIE Water Group, Sydney Water and relevant council(s)												
C5	The CEMP Sub-Plans must state how:													
(a)	the environmental performance outcomes identified in the documents listed in Condition A1 as modified by these conditions will be achieved;	Section 2.3												
(b)	the mitigation measures identified in the documents listed in Condition A1 as modified by these conditions will be implemented;	Through the implementation of this SWMP (in particular refer to Section 3.4).												
(c)	the relevant terms of this approval will be complied with; and	Through the implementation of this SWMP												
(d)	issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed.	Chapter 5, second paragraph Chapter 6												
C6	Details of all information requested by an agency to be included in a CEMP Sub-plan as a result of consultation, including copies of all correspondence from those agencies, must be provided with the relevant CEMP Sub-Plan .	Section 1.4												
C7	Construction must not commence until the CEMP and all CEMP Sub-Plans have been approved by the ER and must be implemented for the duration of construction. Where construction of the CSSI is staged, construction of a stage must not commence until the CEMP and sub-plans for that stage have been approved by the ER.	CEMP (main section) Sections 1.4 and 2.2												
CONSTRUCTION MONITORING PROGRAMS														

CoA No.	Condition Requirements	Document Reference									
C8	<p>The Construction Monitoring Programs set out in Table 4 must be prepared and implemented to enable comparison of the actual construction performance against the predicted performance.</p> <p>The Construction Monitoring Programs must be prepared in consultation with the relevant government agencies as identified for each Construction Monitoring Program.</p> <p>Table 4: Construction Monitoring and relevant public authorities</p> <table border="1"> <thead> <tr> <th></th> <th>Required Construction Monitoring Programs</th> <th>Relevant government agencies to be consulted for each Construction Monitoring Program</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Noise and Vibration</td> <td>EPA</td> </tr> <tr> <td>(b)</td> <td>Water Quality</td> <td>DPIE Water Group</td> </tr> </tbody> </table>		Required Construction Monitoring Programs	Relevant government agencies to be consulted for each Construction Monitoring Program	(a)	Noise and Vibration	EPA	(b)	Water Quality	DPIE Water Group	<p>Section 7.4</p> <p>Appendix B</p> <p>Section 1.4</p>
	Required Construction Monitoring Programs	Relevant government agencies to be consulted for each Construction Monitoring Program									
(a)	Noise and Vibration	EPA									
(b)	Water Quality	DPIE Water Group									
C9	<p>Each Construction Monitoring Program must provide:</p> <p>(a) details of baseline data available;</p> <p>(b) details of baseline data to be obtained and when;</p> <p>(c) details of all monitoring of the project to be undertaken;</p> <p>(d) the parameters of the project to be monitored;</p> <p>(e) the frequency of monitoring to be undertaken;</p> <p>(f) the location of monitoring;</p> <p>(g) procedure for the timing and frequency reporting of monitoring and analysis against relevant criteria, including details of the timing and frequency for reporting results to the ER, the Planning Secretary and relevant government agencies;</p> <p>(h) details of the methods that will be used to analyse the monitoring data;</p> <p>(i) procedures to identify and implement additional mitigation measures where results of monitoring identify unexpected impact; and</p> <p>(j) any consultation to be undertaken in relation to the monitoring programs.</p>	<p>Appendix B, point 1</p> <p>Appendix B1</p> <p>Appendix B, point 1</p> <p>Appendix B1</p> <p>Appendix B, point 8</p> <p>Appendix B, point 2</p> <p>Appendix B, point 8</p> <p>Appendix B, point 3</p> <p>Appendix B, point 8</p> <p>Section 7.6</p> <p>Appendix B, point 6</p> <p>Appendix B, point 7</p> <p>Section 1.4</p>									
C10	<p>The Construction Monitoring Programs must be submitted to the ER for approval at least one (1) month before the commencement of construction.</p>	<p>CEMP (main section)</p> <p>Section 1.4</p>									
C11	<p>Construction, which is required to be monitored under the Construction Monitoring Programs, must not commence until the Construction Monitoring Programs have been approved by the ER, and all relevant baseline data for the specific construction activity has been collected.</p>	<p>CEMP (main section)</p> <p>Section 1.4</p>									

CoA No.	Condition Requirements	Document Reference
C12	The Construction Monitoring Programs , as approved by the ER must be implemented for the duration of construction and for any longer period set out in the monitoring program or specific by the Planning Secretary, whichever is the greater.	CEMP (main section) Section 1.4
C13	The results of the Construction Monitoring Programs must be made publicly available in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program . <i>Note: Where a relevant CEMP Sub-Plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-Plan.</i>	Section 7.6
PART E – SOILS		
E32	All reasonably practicable erosion and sediment controls must be installed and appropriately maintained to minimise erosion and water pollution. When implementing such controls, any relevant guidance in the <i>Managing Urban Stormwater</i> series must be considered.	Chapter 6 mitigation measure ID SWMM1-SWMM7, SWMM21-SWMM32.
Contaminated Sites		
E33	An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared before the commencement of construction and must be followed should unexpected contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during construction.	Chapter 6 mitigation measure ID SWMM63. Appendix E
E34	The Unexpected Contaminated Land and Asbestos Finds Procedure required under Condition E33 must be implemented throughout construction. Where any unexpected contamination is found, the Proponent must conduct site investigations in accordance with Appendix C .	Chapter 6 mitigation measure ID SWMM63. Appendix E, point 3, point 10.
PART E – WATER		
E58	The CSSI must be designed, constructed and operated so as to maintain the <i>NSW Water Quality Objectives</i> where they are being achieved as at the date of this approval, and contribute towards achievement of the <i>NSW Water Quality Objectives</i> over time where they are not being achieved as at the date of this approval, unless an EPL in force in respect of the CSSI contains different requirements in relation to the <i>NSW Water Quality Objectives</i> , in which case those requirements must be complied with.	Detailed Design Appendix B, point 5
E59	Drainage feature crossings (permanent and temporary watercourse crossings and stream diversions) and drainage swales and depressions must be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person.	Detailed Design Chapter 6 mitigation measure ID SWMM1, SWMM3, SWMM4, SWMM33.

CoA No.	Condition Requirements	Document Reference
E60	Works on waterfront land must be carried out in accordance with controlled activity guidelines.	Chapter 6 mitigation measure ID SWMM34.
Stormwater Drainage		
E61	The CSSI must be designed and constructed so not to worsen the overall efficiency of the existing stormwater drainage system affected by the works except where it is allowed for in compliance with Condition E3 .	Detailed Design Chapter 6 mitigation measure ID SWMM1, SWMM3, SWMM4, SWMM12-SWMM20.

3.4. Revised Mitigation Measures

Relevant construction-related RMM from the Submissions Report are listed in Table 3. A cross reference is also included to indicate where the measure is addressed in this SWMP or other project management documents.

Table 3: Revised Mitigation Measures Relevant to SWMP

ID No.	Revised Mitigation Measure	Document Reference
C5 Soils and contamination		
General soil and erosion management		
C5.1	<p>A soil and water management plan will be prepared as part of the CEMP for the project and implemented for the duration of construction, in accordance with Soils and Construction - Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008a) (commonly known as 'the Blue Book')</p> <p>The soil and water management plan will include but not be limited to:</p> <ul style="list-style-type: none"> a primary erosion and sedimentation control plan and a maintenance schedule for ongoing maintenance of temporary erosion and sediment controls. The erosion and sedimentation control plan will include site specific details for managing sediment and erosion near Cabramatta Creek and associated drainage lines 	<p>This SWMP Section 3.2</p> <p>Chapter 6 mitigation measure ID SWMM1, SWMM4.</p> <p>Appendix A Section 7.4</p>
	<ul style="list-style-type: none"> measures and controls for the management of disturbed and stockpiled soils, including surface stabilisation of disturbed ground, covering of stockpiles where appropriate and implementation of clean-water diversions 	<p>Chapter 6 mitigation measure ID SWMM1, SWMM2, SWMM4, SWMM12, SWMM16, SWMM17, SWMM21-SWMM23, SWMM25,</p>

ID No.	Revised Mitigation Measure	Document Reference
	<ul style="list-style-type: none"> ▪ an incident emergency spill procedure which will include measures to avoid spillages of fuels, chemicals, and fluids onto any surfaces or into any adjacent/nearby waterways. 	SWMM42. Chapter 6 mitigation measure ID SWMM48-SWMM61. IERP
Acid sulfate soils		
C5.2	A field pH testing and field peroxide pH testing regime will be undertaken prior to piling work around Cabramatta Creek, in accordance with the <i>Acid Sulfate Soils Assessment Guidelines</i> (ASSMAC, 1998). Should ASS or potential ASS be identified during the testing, then measures to manage the potential impacts associated with encountering ASS or potential ASS will need to be developed and implemented in accordance with the <i>Acid Sulfate Soils Assessment Guidelines</i> (ASSMAC, 1998).	Chapter 6 mitigation measure ID SWMM65, SWMM66.
Unexpected contamination and ASS		
C5.3	An unexpected findings protocol pertaining to contamination and ASS will be included in the soils and water management plan. The protocol will include procedures for the assessment and management of unexpected contamination and ASS encountered (if any) during construction, including making the site safe, carrying out an assessment of the finds, and managing the finds based on the results of the assessment.	Chapter 6 mitigation measure ID SWMM63 Appendix E
C5.4	Awareness training will be provided for all onsite staff to assist in the identification of potentially contaminated material. In the event that indicators of contamination or ASS are encountered during construction (such as odours, soil discolouration or visually contaminated materials), work in the area will cease, and the finds will be managed in accordance with the unexpected contamination finds protocol.	Section 7.2 Chapter 6 mitigation measure ID SWMM63 Appendix E
Contamination of soils		
C5.5	Prior to the acceptance of any imported fill onsite (regardless of volume), the following actions will be taken to reduce the risk of receiving contaminated material: <ul style="list-style-type: none"> ▪ all fill used will be checked to confirm it is virgin excavated natural material (VENM) (eg clay, gravel, sand, soil or rock) or excavated natural material (ENM) eg naturally occurring rock and soil) that is not mixed with any other waste ▪ the supplier will provide formal certification that the fill material is clean VENM or ENM ▪ the supplier will provide information on what activities previously occurred onsite where their fill was sourced 	Chapter 6 mitigation measure ID SWMM64

ID No.	Revised Mitigation Measure	Document Reference
	<ul style="list-style-type: none"> ▪ signs of contamination will be checked for, such as odours (chemical/petrol), staining from chemicals, and rubbish such as bricks, timber, and Masonite ▪ the delivery of the material will be supervised to check the material received matches the material ordered ▪ all required documents and records will be maintained. 	
Contamination incident management		
C5.6	Spill containment kits will be present and maintained on site during all activities.	Chapter 6 mitigation measure ID SWMM54.
C5.7	All staff will be inducted about incident and emergency procedures in accordance with the incident emergency spill procedure and made aware of the locations of spill containment kits. Information regarding the correct and safe storage and handling of fuels and chemicals will be communicated to personnel.	Section 7.2
C6 Hydrology, flooding and water quality		
Flooding, changes to surface water and water quality		
C6.1	<p>A flood management procedure will be prepared as part of the soil and water management plan. It will include specific controls to be implemented during wet weather or forecasts of heavy rainfall for works undertaken near Cabramatta Creek and Jacquie Osmond Reserve and appropriate monitoring strategies following the flood to verify design performance and impact predictions</p> <p>It will also include a flood warning and evacuation procedure for emergency management of flooding up to the PMF event. Development of a flood warning and evacuation procedure for the project will be undertaken in consultation with stakeholders including Liverpool City Council and Fairfield City Council and the NSW SES.</p>	FMP
Flooding		
C6.2	<p>The site layout and staging of construction activities will:</p> <ul style="list-style-type: none"> ▪ avoid or minimise obstruction of overland flow paths and limit the extent of flow diversion required ▪ consider how the works will affect the existing stormwater network such that alternatives are in place prior to any disconnection or diversion of stormwater infrastructure. 	FMP
C6.3	<p>Detailed construction planning will consider flood risk for compounds and work sites near Jacquie Osmond Reserve and Cabramatta Creek. This will include identification of measures to not worsen existing flooding characteristics.</p> <p>Not worsen is defined as:</p>	FMP

ID No.	Revised Mitigation Measure	Document Reference
	<ul style="list-style-type: none"> ▪ a maximum increase in flood levels of 50 mm in a one per cent AEP event ▪ a maximum increase in time of inundation of one hour in a one per cent AEP event ▪ no increase in the potential for soil erosion and scouring from any increase in flow velocity in a one per cent AEP flood event. 	
Watercourse impacts		
C6.4	Works within or near Cabramatta Creek will be undertaken with consideration given to the NSW Department of Primary Industries (Water) <i>Guidelines for controlled activities on waterfront land – Riparian corridors</i> (2018).	Chapter 6 mitigation measure ID SWMM34.
Water quality		
C6.5	<p>Dewatered groundwater will be stored and reused on site for wetting down and reducing dust in disturbed areas (within existing erosion and sediment controls), or for irrigation in grassed areas. Requirements for testing will be included in the soils and water management plan and will include the following at a minimum:</p> <ul style="list-style-type: none"> ▪ No visible sheen or odour is noted. ▪ Water pH is between 6.5 and 8.5. ▪ Total suspended solids are less than 60 mg/L (approximately equivalent to a turbidity level of 50 NTU). Water may be dosed with gypsum, alum or a similar product to reduce sediment levels if required. ▪ All litter and debris must be filtered out and removed prior to reuse. ▪ Pump-out events are supervised at all times, and the pump is positioned to prevent reuse of sediment-laden water settled at the bottom of the trench or tank. <p>Sludge from the bottom of the trench or tank can be placed in a shallow pit lined with heavy duty plastic sheeting to dry out (evaporation pit). Once the sludge has dried out sufficiently to allow it to be spaded this waste can be stored with excess excavated spoil and disposed in accordance with the findings of the preliminary waste classification assessment (refer to Technical Report 6 – Soils and contamination impact assessment).</p>	Chapter 6 mitigation measure ID SWMM30, SWMM43. Appendix F
C6.6	<p>A water quality monitoring program will be developed and implemented, to monitor water quality due to the proximity of construction activities to surface water receiving environments.</p> <p>The program will include relevant water quality objectives, parameters, and criteria and specific monitoring locations identified in consultation with DPI (Water) and the EPA.</p>	Section 7.4 Appendix B, Table 5 Section 1.4

4. Existing Environment

This Chapter provides a brief summary of what is known about soil and water within and adjacent to the project based on information provided in Chapters 12 and 13 of the EIS.

4.1. Topography and Geology

The project site gently slopes from Cabramatta Station to Cabramatta Creek. From Cabramatta Creek to Warwick Farm Station the land is fairly flat (EIS, p12.3).

The project site is underlain by Bringelly Shales consisting of shales, carbonaceous claystones, medium grained siltstone and clay in the northern end of the project site, near Cabramatta Station, and Quaternary and Tertiary alluvial deposits consisting of silts, clays, fluvial sands and gravels in the rest of the project site (EIS, p12.3).

Based on the geotechnical investigations undertaken as part of the EIS to inform the concept design, the site is generally underlain by variable fill material of gravel, sand and clay, typically of a depth of one metre. The fill is underlain by a deep alluvial profile that generally consists of alluvial clay, extending to a depth of over six metres below ground surface within the project site (EIS, p12.3).

4.2. Soils

4.2.1. Soil Types

The following soil types underlie the project site:

- Blacktown residual landscape – mapped across the majority of the project site
- South Creek alluvial landscape – located along the floodplains of Cabramatta Creek.

As discussed in Section 4.1 above, there is a substantial amount of fill material within the project site, including railway ballast and fill consisting of gravel, sand and clay (EIS, p12.3).

4.2.2. Acid Sulfate Soils

Acid sulfate soils are naturally occurring soils containing iron sulfides, which, on exposure to air, oxidise and create sulfuric acid. This increase in acidity can result in the mobilisation of aluminium, iron, and manganese from the soils. The release of sulphuric acid and heavy metals to the environment can have potentially adverse effects on the natural and built environment as well as human health. The majority of acid sulfate soils are formed by natural processes under specific environmental conditions. This generally limits the occurrence of acid sulfate soils to low lying sections of coastal floodplains, rivers and creeks where surface elevations are less than 5.0 metres AHD (EIS, p12.4).

A review of the NSW Government Sharing and Enabling Environmental Data (SEED) website and both the Fairfield City Council and Liverpool City Council LEP acid sulfate soils maps indicated there are no known occurrences of acid sulfate soils (ASS) within the project site. Proposed signalling works located near Liverpool Station (south of the project site) are in an area classified as Class 5, however acid sulfate soils are not typically found within Class 5 areas (EIS, p12.4).

A review of ASRIS indicated that there was a low probability of acid sulfate soils occurring within the project site. The closest mapped occurrence of acid sulfate soils to the project site is about one kilometre east where Cabramatta Creek feeds into the Georges River (EIS, p12.4).

Given that the majority of excavation works within the project site would be relatively shallow, and unlikely to encounter the water table, the potential for the project to impact acid sulfate soils is considered minimal. There would be some deeper works associated with piling of the retaining walls and construction of the bridges, however, given that no acid sulfate soils have been mapped within the project site, the potential for impacts associated with acid sulfate soils during these activities is also considered minimal. Mitigation measures (e.g. Chapter 6 mitigation measure ID SWMM65) have been provided to manage any potential impacts in the unlikely situation that acid sulfate soils are encountered during works (EIS Volume 4 Technical Report 6 p36).

4.2.3. Salinity

The EIS (p12.4) identified that areas prone to salinity are usually at low positions in the landscape, such as in valley floors and along floodplains. The Salinity Potential in Western Sydney map (2002) indicates that the project site is located in an area of moderate salinity potential. However, electrical conductivity testing undertaken as part of the geotechnical assessment for the EIS found that the electrical conductivity of soils in the project site were significantly less than would be expected if the area contained saline soils (between 39 – 740 $\mu\text{S}/\text{cm}$) compared to 4000 $\mu\text{S}/\text{cm}$ or over (EIS, p12.4). The EIS (p12.4) therefore concluded that the presence of saline soils within the project site was considered unlikely and saline soils was not considered further as part of the EIS assessment.

4.3. Areas of Contamination Concern

No sites listed on the EPA's contaminated land register are located within one kilometre of the project site (EIS, p12.4).

The EIS (p12.4) identified that based on the land uses immediately surrounding the project site, as described in Chapter 2 (Location and setting) and Chapter 17 (Landscape and visual amenity) of the EIS, and the findings of the desktop review and site inspection, potential sources of contamination in the vicinity of the project site are considered to include:

- imported fill and ballast within the existing rail corridor – which may be associated with asbestos, hydrocarbons, heavy metals, and polycyclic aromatic hydrocarbons
- former rail haulage activities within the rail corridor leading to potential spillages of oils and lubricants from locomotive engines, metal dust and asbestos from wheel abrasion – which may be associated with asbestos, hydrocarbons, heavy metals, and polycyclic aromatic hydrocarbons
- unknown fill and waste materials within the road corridor – which may be associated with various hazardous materials, including asbestos, heavy metals, pesticides and hydrocarbons
- weed control within the rail corridor and in recreational areas including Jacque Osmond Reserve and Warwick Farm Recreation Reserve – which may be associated with herbicides and pesticides
- industrial activities adjacent to the rail corridor – which may be associated with hydrocarbons, oils, chemical storage, heavy metals, and hazardous building materials. However, given the proximity to the project site and/or current status of the industrial activities identified in Table 12.1 and Table 12.2 of the EIS, the potential for contamination from the majority of these activities is considered to be low.

The limited contamination assessment found no evidence of staining or odour that may indicate the presence of contamination in any of the test pits or boreholes (EIS, p12.5).

The EIS (p12.6) identified that all samples reported laboratory results either below the limit of reliability or below the relevant human health based screening criteria. Additionally, the majority of samples reported laboratory results either below the limit of reliability or below the relevant environmental screening criteria, with the exception of some samples collected at locations within the rail corridor at the southern extent and within Broomfield Street. However, soil concentrations at these locations are not deemed to have the potential to impact ecological receptors given the current land use and distance to ecological receptors. Soil samples collected from test pits within Jacque Osmond Reserve reported concentrations below the relevant environmental criteria (EIS, p12.6).

The preliminary waste classification undertaken as part of the limited contamination assessment indicated that soils within the project site would likely meet the classification of General Solid Waste, in accordance with the NSW EPA *Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014) (EIS, p12.6).

The EIS (p12.6) identified that the limited contamination assessment confirmed that the soils are considered suitable to remain within the project site for the uses proposed during operation (rail corridor and road corridor). Based on the findings of the desktop review, site inspection and limited contamination assessment no evidence of gross or widespread contamination was identified within soils in the project site. Therefore, the project site is not considered to meet the criteria requiring it to be notified to the EPA under Section 60 of the *Contaminated Land Management Act 1997* (EIS, p12.6).

No sampling of groundwater was undertaken as part of the EIS assessment (EIS, p12.6). However, based on the results of the limited contamination assessment which did not identify any gross contamination in soils (e.g. odour or staining), and the type and proximity of activities which have the potential to contaminate groundwater located near the project site, the potential for groundwater within the project site to be contaminated is considered low (EIS, p12.6).

Mitigation measures (e.g. Chapter 6 mitigation measure ID SWMM64) have been provided to manage any potential importation of contaminated fill during the construction of the project.

4.4. Watercourses

The project site crosses one watercourse, being Cabramatta Creek. The EIS (Volume 3 Technical Report 4 p42) identified the reach of Cabramatta Creek through the project site has a highly modified channel floor comprising oversized sandstone, ballast and shale gravels. The EIS identified that riffles are present where gravel has been manually placed and there are pools up to 0.3 m deep. Further, moderate quantities of rubbish was present but water quality was apparently good with low turbidity, minimal algal growth with resident fish and other aquatic fauna (EIS Volume 3 Technical Report 4 p42).

The EIS (p13.4) identified that Cabramatta Creek is a fifth order stream based on the Strahler stream classification system.

In addition, Cabramatta Creek is mapped as Key Fish Habitat (DPI, 2007). It is classified as Class 1 (major fish habitat) as it is a permanently flowing river (DPI, 2013) (EIS Volume 3 Technical Report 4 p42). However, the main body of the EIS (p13.9) makes the point that Cabramatta Creek does not comprise habitat for any threatened species, which is a key consideration in the definition of 'Key Fish Habitat'.

4.5. Water Quality

The EIS (p13.9) identified that according to the *Cabramatta Creek Floodplain Management Study and Plan* (Bewsher, 2004), Cabramatta Creek was noted to have the poorest water quality in the Georges River system in 2004. The major sources of pollution in Cabramatta Creek includes urban runoff and sewage effluent, most likely due to sewage overflows from the sewerage system during wet weather.

Detailed water quality monitoring data specific to the project site was not identified during the EIS desktop review (EIS, p13.9). However, as indicated in the EIS (p12.6), the most recently available local report, the *2016-2017 River Health Report Card for the Georges River* (Georges River Combined Councils Committee (GRCCC), 2018), identified the overall water quality health of Lower Cabramatta Creek as "good" (A-) which is considered 'good' as defined by the GRCCC when assessing against environmental guidelines (EIS, p13.9).

4.6. Groundwater

During a geotechnical investigation undertaken for the EIS to inform the project design, groundwater levels in boreholes drilled between Jacquie Osmond Reserve and the southern extent of the project site, ranged from three (3) metres to six (6) metres below ground level (mbgl). Previous geotechnical investigations (Parsons Brinckerhoff, 2009) undertaken within the project site identified groundwater in the northern section at depths of between 1.5 to 2 mbgl, decreasing to 0.5 mbgl in the vicinity of Cabramatta Creek, and increasing to a depth of 3 mbgl south of the creek near Peter Warren Automotive. In the southern end of the site between Jacquie Osmond Reserve and Warwick Farm Station, alluvial groundwater flow is to the south based on monitoring of groundwater levels during the geotechnical investigation, while in the rest of the project site alluvial groundwater flow is expected to be towards Cabramatta Creek (EIS p13.9). No sampling of groundwater was undertaken as part of the EIS assessment (EIS p12.6).

The EIS (p12.7) identified that the majority of excavation during construction is unlikely to exceed depths of two (2) to three (3) metres below ground level. Therefore, the potential to encounter groundwater would only be likely during piling activities associated with the retaining walls and bridge construction, and excavation associated with relocation of the Sydney Water gravity main in Jacquie Osmond Reserve. The EIS (Volume 4 Technical Report 7

p21) identified that this would not generate significant volumes of water and therefore it was determined that ongoing groundwater monitoring was not required.

5. Environmental Aspects and Impacts

The key construction activities and the associated potential sources of soil and water impact are identified through a risk management approach. The consequence and likelihood of each activity's impact on the environment has been assessed to prioritise its significance. The results of this risk assessment are included in Appendix A3 of the CEMP.

Ongoing environmental risk analysis will be undertaken during construction through regular inspections, monitoring and auditing as described in Chapter 8. This will ensure that issues requiring management (including cumulative impacts) are appropriately managed.

6. Environmental Mitigation Measures

Specific mitigation measures to address impacts on soil and water are outlined in Table 4.

Table 4: Soil and Water Mitigation Measures

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
GENERAL				
SWMM1	Prepare a primary <i>Erosion and Sediment Control Plan</i> (ESCP) (refer to Appendix A) in accordance with Soils and Construction - Managing Urban Stormwater Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008a) (commonly known as 'the Blue Book').	✓	✓	Environmental Coordinator
SWMM2	Install erosion and sediment controls in all construction areas where soil disturbance is going to occur, prior to soil disturbance occurring.		✓	Environmental Coordinator Project Engineers Foreman
SWMM3	Implement/ install all erosion and sediment controls in accordance with the primary ESCP contained in Appendix A. The plan has been prepared in accordance with the Blue Book (Landcom, 2004 and DECC, 2008) and includes relevant standard drawings and details from these texts.		✓	Environmental Coordinator Project Engineers Foreman
SWMM4	In addition to the overarching primary ESCP (refer to Appendix A), prepare Progressive Erosion and Sediment Control Plans (PESCPs) prior to commencing each stage or parcel of work where there is a risk of erosion and sediment loss, such as near Cabramatta Creek.		✓	Environmental Coordinator Project Engineers
SWMM5	Install erosion and sediment control measures for each particular section of works in accordance with the PESCP, prior to the commencement of any clearing, stripping or earthworks.		✓	Project Engineers Foreman

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
SWMM6	Install certain structures and controls (i.e. pipes and culverts) early (i.e. prior to clearing and stripping) to promote successful erosion and sediment control during construction (principally during clearing, stripping and earthworks).		✓	Project Engineers Foreman
SWMM7	Update PESCPs as required and as the works progress and the site changes.		✓	Environmental Coordinator
MINIMISING DISTURBANCE				
SWMM8	Establish clearing limits and work boundaries that are well defined using barrier tape (or equivalent) prior to any construction, clearing or stripping works commencing.		✓	Environmental Coordinator Project Engineers Foreman
SWMM9	Minimise the extent of clearing and retain as much native vegetation as possible.		✓	Project Engineers Foreman
SWMM10	Clear land progressively and clear the areas associated with the current section/ stage of works only.		✓	Project Engineers Foreman
SWMM11	Initially clear and grub leaving the soil surface in a reasonably rough condition with some surface vegetative cover.		✓	Project Engineers Foreman
DRAINAGE CONTROL				
SWMM12	Maximise the separation of 'clean' (offsite) run-on water from 'dirty' (onsite) (e.g. turbid) construction area runoff as much as possible.	✓	✓	Environmental Coordinator Project Engineers Foreman
SWMM13	Construct drainage structures early in the project including: <ul style="list-style-type: none"> - Sediment traps - Catch drains, and - Culverts/ pipes and associated inlet and outlet protection (e.g. dissipaters). 		✓	Project Engineers Foreman
SWMM14	Maximise the diversion of turbid construction runoff into sediment controls (e.g. sediment traps).		✓	Project Engineers Foreman
SWMM15	Control runoff during the construction of embankments (e.g. fill shaping and the construction of temporary batter drains).		✓	Project Engineers Foreman
SWMM16	Divert clean water runoff into pits and the stormwater drainage system as soon as practical to reduce surface flow lengths.		✓	Project Engineers Foreman

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
SWMM17	Divert offsite run-on water around the works site as much as possible. Use permanent cut-off drains to achieve this as much as possible.		✓	Project Engineers Foreman
SWMM18	Maintain slope lengths at appropriate lengths (refer to the standard drawings in the Primary ESCP in Appendix A) to reduce water velocity and minimise erosion.		✓	Project Engineers Foreman
SWMM19	Use geotextile linings or other surface protection methods to provide temporary surface protection in areas where appropriate (e.g. batter drains, culvert construction).		✓	Project Engineers Foreman
SWMM20	Use check dams within diversion drains where required to reduce water velocity and minimise erosion within the drains.		✓	Project Engineers Foreman
EROSION AND SEDIMENT CONTROL				
SWMM21	Progressively stabilise disturbed ground surfaces using temporary methods such as soil binders, cover crop species or other appropriate practices.		✓	Project Engineers Foreman
SWMM22	Stabilise stockpiled soils and batters progressively using temporary methods such as geotextile fabric, stabilised mulch, soil binders (e.g. Gluon polymer emulsion) or cover crop species.		✓	Project Engineers Foreman
SWMM23	Immediately commence stabilisation of waterways, including their banks, after the completion of any works within these areas. All stabilised areas to mimic a naturalised creek system and the disturbed areas to be planted with native species in accordance with the Landscape Design Drawings.		✓	Project Engineers Foreman
SWMM24	Minimise the generation of dust using methods such as water trucks (using preferably non-potable water), temporary stabilisation methods, soil binders, compaction, progressive revegetation techniques or other appropriate practices.		✓	Project Engineers Foreman
SWMM25	Use temporary ground covers such as soil binders (e.g. Gluon polymer emulsion), hydroseed or hydromulch as much as possible to stabilise batters, stockpiles and large surface areas.		✓	Project Engineers Foreman
SWMM26	Construct sediment control measures as close to the potential source of sediment as possible.		✓	Project Engineers Foreman
SWMM27	Minimise the tracking of mud and soil material onto local roads using shakers, rubble pads or washdown areas.		✓	Foreman
SWMM28	Provide sediment fencing (or equivalent) downslope of disturbed areas that cannot be directed into a designated		✓	Environmental Coordinator

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
	sediment trap or bund unless completely impractical (e.g. works within watercourses). Implement enhanced erosion controls in these locations.			Project Engineers Foreman
SWMM29	Use mulch bunds, earth bunds or straw bales as alternatives to sediment fencing where appropriate. However, do not use mulch in concentrated flow areas or where it has the potential to result in tannin leachate into waterways.		✓	Environmental Coordinator Project Engineers Foreman
SWMM30	Place wet sediment/ sludge from the bottom of a trench/ tank in a shallow pit lined with heavy duty plastic sheeting to dry out (evaporation pit). Once the sludge has dried out sufficiently to allow it to be spaded this waste can be reused onsite or disposed of offsite in accordance with the <i>Waste Classification Guidelines</i> (EPA, 2014a).		✓	Foreman
SWMM31	Install sediment controls around stormwater inlet pits where appropriate and where they will not cause or exacerbate flooding. Consider traffic management and safety if installing such devices on live traffic roads.		✓	Environmental Coordinator Project Engineers Foreman
SWMM32	Remove sediment controls only after works are complete and at least 70 per cent stabilisation of disturbed surfaces in the contributing catchment is achieved.		✓	Environmental Coordinator Foreman
WORKS IN OR NEAR WATERWAYS				
SWMM33	Design, construct and maintain any temporary waterway crossings and stream diversions in accordance with relevant guidelines (e.g. fish passage related and the requirements of the Blue Book). The design must be carried out by a suitably qualified and experienced person.		✓	Environmental Coordinator
SWMM34	<p>Prepare and undertake all works in or near waterways (i.e. Cabramatta Creek) in accordance with a 'Working In or Near Waterways' EWMS to minimise the potential for bank instability, scour, flooding, working over water and other adverse impacts of construction activities on the water quality of Cabramatta Creek. Give consideration to the NSW Department of Primary Industries (Water) <i>Guidelines for controlled activities on waterfront land – Riparian corridors</i> (2018).</p> <p><i>It is noted that EWMS (including that for 'Working In or Near Waterways') are prepared progressively throughout construction and prior to the commencement of the relevant activities, separate to the CEMP/SWMP approval process. Refer to CEMP Section 3.7 for additional details about EWMS.</i></p>		✓	Environmental Manager Project Engineers Foreman

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
SWMM35	Not used.			
SWMM36	Complete any vegetation clearing and removal of topsoil near waterways in accordance with a <i>Clearing and Grubbing</i> EWMS.		✓	Environmental Coordinator Project Engineers Foreman
SWMM37	Minimise impact to riparian vegetation.		✓	Environmental Coordinator Project Engineers Foreman
SWMM38	Undertake permanent replanting/ revegetation with local native species in accordance with the Landscape Design Drawings, as soon as practicable.			Project Engineers Foreman
SWMM39	Not used.			
STABILISATION OF DISTURBED AREAS				
SWMM40	Commence stabilisation of waterways, including their beds and banks, immediately after the completion of any works within these areas.		✓	Project Engineers Foreman
SWMM41	Control dust through progressive revegetation techniques and by watering unsealed areas (in that order to minimise the use of water).		✓	Project Engineers Foreman
SWMM42	Use temporary ground covers such as soil binders (e.g. Gluon polymer emulsion), hydroseed or hydromulch as much as possible to stabilise batters, stockpiles and large disturbed areas		✓	Project Engineers Foreman
SURFACE WATER QUALITY MANAGEMENT				
SWMM43	Carry out all dewatering (including for onsite reuse and offsite discharge) in accordance with the Dewatering Procedure contained in Appendix F. <i>It is noted that no sediment basins are required or proposed as part of the project as per the ESCP contained in Appendix A.</i>		✓	Environmental Coordinator
SWMM44	If water is to be reused onsite (e.g. for dust suppression or construction purposes), comply with the relevant reuse criteria contained in Appendix F.		✓	Environmental Coordinator Project Engineers Foreman
SWMM45	Check weather forecasts daily and implement the Heavy Rainfall Event Procedure (contained at Appendix D) where required.		✓	Environmental Coordinator

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
SWMM46	Where available and practicable, and of appropriate chemical and biological quality, use stormwater, recycled water or other water sources where feasible and reasonable, in preference to potable water for construction activities, including dust control.		✓	Environmental Coordinator Project Engineers Foreman
SWMM47	Where practicable, reuse water from construction sediment traps (e.g. for dust suppression or construction purposes) in preference to discharge. <i>It is noted that reuse may not be feasible or possible during wet site conditions.</i>		✓	Environmental Coordinator Project Engineers Foreman
MANAGEMENT OF OTHER ACTIVITIES WITH POTENTIAL WATER QUALITY IMPACT				
Concreting and saw cutting				
SWMM48	Wash concrete mixers, pumps, concrete tools and other equipment at specially designated washout areas that are constructed in a manner that will prevent storm water surface run-off from being contaminated.		✓	Environmental Coordinator Foreman
SWMM49	Locate washout areas within an area that is not subject to natural surface storm water run-off and away from drainage lines. Install signs to advise workers of their locations.		✓	Environmental Coordinator Foreman
SWMM50	Construct the washout areas with an impermeable type material capable of retaining any contaminated water and concrete residue. Ensure they are bunded and at least 50m away from a natural waterbody, surface drain or drainage pit.		✓	Environmental Manager Foreman
SWMM51	Monitor the washout areas to ensure that they are not getting over full and that the washing activity is not contaminating the surrounding area.		✓	Environmental Coordinator Foreman
SWMM52	As part of the project induction program, advise all personnel performing concreting or saw cutting activities of the concrete washout areas and their obligations to: <ul style="list-style-type: none"> - Clean their plant, tools and equipment within the designated area - Maintain the area in a clean condition, and - Ensure that contaminated water associated with their activities is appropriately controlled and prevented from reaching natural storm water surface drainage areas. 		✓	Environmental Coordinator
Spray sealing and asphalt paving				
SWMM53	Properly maintain and regularly check spray sealing and asphalt paving plant, equipment and associated tools to minimise the risk of spills.		✓	Foreman

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
SWMM54	Promptly contain and collect any spills of fuel or bitumen materials using spill kits. Maintain spill kits and fire extinguishers at all times in the spray trucks, tankers and associated plant.		✓	Foreman
SWMM55	Promptly report all spills to the Environmental Coordinator.		✓	Project Engineers Foreman
SWMM56	Allocate designated equipment washdown and cleaning areas for major asphalt works with appropriate environmental controls in place (e.g. bunds) to prevent washout water from reaching the receiving environment.		✓	Foreman
Storage and handling of fuels and chemicals				
SWMM57	Ensure vehicles and machinery are properly maintained to minimise the risk of fuel/oil leaks/spills.		✓	Project Engineers Foreman
SWMM58	Keep liquid chemicals and fuels in bunded storage areas or sheds that have the capacity to contain spills from leaky containers or from an incident involving a decanting activity. Ensure the bunded capacity is at least 120 per cent of the total capacity of all containers stored inside the bunded area or shed.		✓	Foreman
SWMM59	Do not locate bulk storage of fuels or chemicals within 100 metres of any watercourse or mapped EEC. In constrained areas where this cannot be achieved, additional risk assessment and additional mitigation measures must be considered and implemented to manage risk to sensitive receivers to an acceptable level.		✓	Environmental Coordinator Foreman
SWMM60	Undertake the storage, handling and use of fuels or chemicals in accordance with the <i>Occupational Health and Safety Act 2000</i> and WorkCover's Storage and Handling of Dangerous Goods Code of Practice (WorkCover, 2005). Ensure that refuelling is undertaken within a bunded area and at least 50m away from a natural waterbody, surface drain or drainage pit.		✓	Project Engineers Foreman
SWMM61	<p>During site induction, advise all personnel of the following:</p> <ul style="list-style-type: none"> - The location of bunded storage areas, liquid absorbent materials and other spill containment materials and kits. - Storage of large quantities of fuel for construction plant is not permitted. Licensed fuel trucks carrying emergency fuel spill kits must be used to service plant and equipment. - All drums and decanted containers must be labelled and stored within bunded areas whenever they are not in use. Whenever practical, all unattended 		✓	Environmental Coordinator

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
	drums/containers must be returned to the bunded storage area.			
Effluent				
SWMM62	Ensure portable toilet block systems are regularly serviced. All effluent facilities will be positioned with consideration of vicinity of watercourses, sensitive flora/ fauna habitats and residents.		✓	Environmental Coordinator Project Engineers Foreman
MANAGEMENT OF CONTAMINATED AND OTHER MATERIALS				
SWMM63	In the event that unexpected contamination or asbestos is identified or suspected, implement the Unexpected Contaminated Land and Asbestos Finds Procedure contained at Appendix E.		✓	Environmental Manager
SWMM64	<p>Prior to the acceptance of any imported fill onsite (regardless of volume), assess and inspect the fill to reduce the risk of receiving contaminated material by:</p> <ul style="list-style-type: none"> - Checking to confirm it is virgin excavated natural material (VENM) (e.g. clay, gravel, sand, soil or rock) or excavated natural material (ENM) (e.g. naturally occurring rock and soil) - Confirming the supplier has provided formal certification that the fill material is VENM or ENM - Confirming the supplier has provided information on what activities previously occurred onsite where their VENM or ENM was sourced - Checking for signs of contamination, such as odours (chemical/petrol), staining from chemicals, and rubbish such as bricks, timber, and masonite - Checking the delivery of the material received matches the material ordered - Ensuring all required documents and records are maintained. 		✓	Environmental Coordinator Project Engineers Foreman
MANAGEMENT OF ACID SULFATE SOILS				
SWMM65	Undertake a field pH testing and field peroxide pH testing regime by a suitably qualified person, prior to piling work around Cabramatta Creek, in accordance with the <i>Acid Sulfate Soils Assessment Guidelines</i> (ASSMAC, 1998).		✓	Environmental Manager
SWMM66	Should the presence of ASS/ PASS be confirmed, follow the Acid Sulfate Soil Management Procedure contained at Appendix C.		✓	Environmental Coordinator Project Engineers Foreman
GROUNDWATER				

ID	Mitigation Measure	Timing		Responsibility
		PC ¹	C ²	
SWMM67	In the event of significant groundwater inflows, undertake further assessment and consultation with DPI Water in relation to any licensing requirements. A water licence will be obtained as necessary in accordance with Part 5 of the <i>Water Act 1912</i> if dewatering of excavations is required, to satisfy the requirements of RMM D2.4.		✓	Environmental Manager Project Engineers Foreman

¹ PC means pre-construction; ² C means construction

7. Compliance Management

7.1. Roles and Responsibilities

Fulton Hogan's Project Team organisational structure and overall roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 4 of this SWMP.

7.2. Training

All employees, subcontractors and utility staff working on site will undergo site induction training relating to soil and water management issues, including:

- requirements of this SWMP
- relevant legislation
- roles and responsibilities for soil and water management
- identification of potential contamination or ASS, including indicators such as odours, soil discolouration or visually contaminated materials
- in the event that indicators of contamination or ASS are encountered during construction (such as odours, soil discolouration or visually contaminated materials), work in the area will cease, and the finds will be managed in accordance with the unexpected contamination land and asbestos finds procedure (refer to Appendix E).
- locations of spill containment kits
- information regarding the correct and safe storage and handling of fuels and chemicals.

Targeted training in the form of toolbox talks or specific environmental training will also be provided to personnel with a key role in soil and water management. Examples of training topics include:

- Erosion and sediment control installation methodology
- Working in or near waterways i.e. Cabramatta Creek
- Emergency response measures in high rainfall events
- Preparedness for high rainfall events
- Lessons learnt from incidents and other event e.g. high rainfall or flooding
- Incident and emergency response spill procedure.
- Location of the discovered and potentially contaminated works area (as per unexpected contaminated land and asbestos finds procedure)

Further details regarding staff induction and training are outlined in Chapter 5 of the CEMP.

7.3. Complaints

Complaints will be recorded and addressed in accordance with Section 6.2.3 of the CEMP and the Communication Strategy (CS).

7.4. Inspections and Monitoring

Regular inspections and monitoring specific to soil and water will be undertaken during construction in accordance with Table 5 in Appendix B. General requirements and responsibilities in relation to inspections and monitoring are documented in Sections 8.1 and 8.2 of the CEMP respectively.

7.5. Auditing

Auditing (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this SWMP, ARTC specifications and other relevant approvals, permits and licences. Auditing requirements are detailed in Section 8.4 of the CEMP.

7.6. Reporting

General reporting requirements and responsibilities are documented in Chapter 9 of the CEMP.

7.7. Non-conformances

Non-conformances will be dealt with and documented in accordance with Chapter 10 of the CEMP.

8. Review and Improvement of SWMP

The SWMP will be reviewed to ensure compliance with legislative requirements and its suitability and effectiveness for the project.

The review may be in the form of:

- A formal management review
- A second party audit, and/or
- An inclusion as a separate item at a site meeting.

The Environmental Manager may review and update the SWMP more regularly where:

- Significant changes in construction activities occur
- Where targets are not being achieved, or
- In response to audits and non-conformance reports.

Any changes to the SWMP will be approved by the ER and made in accordance with the process outlined in Section 1.6 of the CEMP.

Appendix A: Primary Erosion and Sediment Control Plan (ESCP)

CABRAMATTA LOOP PROJECT

EROSION AND SEDIMENT CONTROL PLAN



REV	DATE	DRN.	APP.	REVISION DETAILS	CLIENT	PROJECT TITLE	DRAWING TITLE
0 1	12/07/2021 5/08/2021	MB MB		Draft for SWMP Revised to include ARTC comments		Cabramatta Loop Project 	EROSION AND SEDIMENT CONTROL PLAN Cover sheet and locality plan

CONSTRUCTION NOTES:

1. THE EROSION AND SEDIMENT CONTROL PLAN (ESCP) SHOULD BE READ IN CONJUNCTION WITH THE PROJECT SOIL AND WATER MANAGEMENT SUB-PLAN (SWMP).

2. CONTROLS SHOWN ON THE PLAN ARE INDICATIVE ONLY. EXACT LOCATION WILL BE MODIFIED TO SUIT SITE CONDITIONS AND FUNCTION.

3. CONTROLS WILL BE INSPECTED FOLLOWING RAINFALL CAUSING RUNOFF (10mm), DAILY DURING RAINFALL, AND AT A MINIMUM WEEKLY. MAINTENANCE AND REPAIRS TO BE COMPLETED AS REQUIRED.

4. 'CLEAN WATER' FLOW TO BE MAINTAINED, MAXIMISING SEPARATION OF 'CLEAN' AND 'DIRTY' WATER AS MUCH AS POSSIBLE.

5. 'CLEAN WATER' DIVERSION BUNDS WILL BE INSTALLED TO A HEIGHT PREVENTING PONDING WATER WHERE POSSIBLE.

6. PAVEMENT WILL BE MAINTAINED FOR CONSTRUCTION GATES. A SWEEPER OR SIMILAR WILL BE USED TO KEEP THE PAVEMENT FREE OF RESIDUAL SEDIMENT. IF SHOULDER PAVEMENT CAN NOT BE RETAINED, ALTERNATIVE STABLE MATERIAL WILL BE USED.

7. DISTURBANCE IS TO BE MINIMISED WHERE POSSIBLE, RETAINING VEGETATION COVER FOR AS LONG AS POSSIBLE.

8. EARLY CONSTRUCTION OF DRAINAGE CONTROLS WILL BE COMPLETED - SEDIMENT TRAPS, PIT PROTECTION, CHECK DAMS, SHOULDER DYKES ETC.

9. ALL 'DIRTY WATER' MUST BE DIVERTED TO LOCAL SEDIMENT CONTROL MEASURES.

10. DEWATERING IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE SOIL AND WATER MANAGEMENT SUB-PLAN

11. DUST TO BE MINIMISED WITH WATER CARTS, LIMITING VEHICLE SPEEDS, VEGETATING / COVERING STOCKPILES AND THE USE OF SOIL BINDERS.

12. DISTURBED AREAS ARE TO BE PROGRESSIVELY REVEGETATED USING COVER CROPS OR PERMANENT REVEGETATION DESIGN.

13. TEMPORARY CONTROLS ARE TO REMAIN UNTIL THE SITE IS STABILISED WITH A C-FACTOR OF 0.05 (70% SURFACE COVER).


14. THIS PLAN IS TO BE REVISED AS SITE CONDITIONS OR CONSTRUCTION METHODS DETERMINE

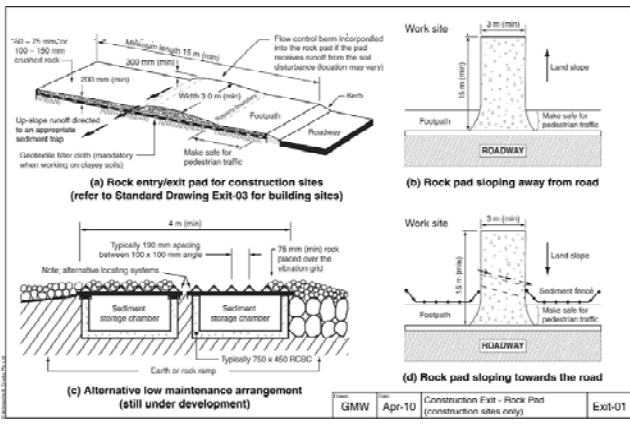
15. COVER/STABILISE STOCKPILES IN THE RAIL CORRIDOR AT THE END OF EACH SHIFT. STABILISED STOCKPILES OUTSIDE OF THE RAIL CORRIDOR WHICH WILL BE IN PLACE FOR MORE THAN 20 DAYS, IF STOCKPILES ARE SUSCEPTIBLE TO EROSION THIS IS REDUCED TO 10 DAYS FROM FORMING EACH STOCKPILE.

16. INSTALL PIT CONTROLS THAT ARE MOST SUITABLE TO GRADE, LOCATION TO TRAFFIC, A SAG INLET ETC. SEE STANDARD DETAILS. INSTALL PIT CONTROLS WHEN SITE WATER CAN RUNOFF TO PIT FROM DISTURBED WORK AREAS. DO NOT POSE RISK TO HUMAN LIFE WHEN PROTECTING PITS.

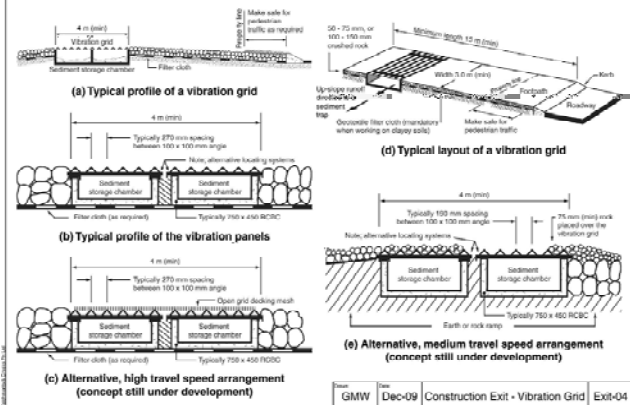
17. STABILISE VERGE WORKING AREAS USING TEMPORARY COVERS OR POLYMERS. RISK ASSESS AREAS AT END OF EACH DAY, IF RAIN FORECAST OR CHANCE OF RAIN COVER OR APPLY SOIL BINDERS.

NOTE: CONTROLS SHOWN ON THIS PLAN ARE INDICATIVE ONLY. THE EXACT LOCATION OF CONTROLS AND ACCESS TRACKS WILL BE DETERMINED ON SITE AND WILL BE INFLUENCED BY SPECIFIC SITE CONDITIONS.

REV	DATE	DRN.	APP.	REVISION DETAILS	CLIENT	PROJECT TITLE	DRAWING TITLE
00 1	12/07/2021 5/08/2021	MB MB		Draft for SWMP Revised to include ARTC comments		Cabramatta Loop Project 	EROSION AND SEDIMENT CONTROL PLAN



GMW	Apr-10	Construction Exit - Rock Pad (construction sites only)	Exit-01
-----	--------	---	---------



GMW	Dec-09	Construction Exit - Vibration Grid	Exit-04
-----	--------	------------------------------------	---------

MATERIALS

ROCK: WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK. NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTANCES) OR 100 TO 150mm (LARGE DISTANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE: 25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC: HEAVY DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH (BOM AF OR EQUIVALENT).

INSTALLATION

- REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE OFFICER FOR ASSISTANCE.
- CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSURE INTO SOFT (GROUNDED) CLAYS, SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT DO NOT CLEAR ADJACENT AREAS UNLESS REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
- IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF GROUNDHOLE OR LAYER OF HEAVY DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.
- PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAR, DRY-BLENDED ROCK.
- IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCK PAD, THIS CAUSING STORMWATER RUNOFF TO FLOW TOWARDS THE ROCK PAD, THEN FOR A MINIMUM 200mm HIGH FLUTE CONTROL BEHIND THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUSTAINABLE SEDIMENT TRAP.
- THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 1m WHERE PRACTICABLE AND AS NEAR THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST ON THE ROCK PAD SHOULD COMMENCE AT THE EDGE OF THE OFF-ROAD SEALED ROAD OR PAVEMENT.
- FLARE THE END OF THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.
- IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THEN COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

- INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL AFTER RUNOFF PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.
- IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED ON WHEELS ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MATERIAL MUST BE PHYSICALLY REMOVED. FIRST USE A SQUARE EGGED SHOVEL, AND THEN A STEEL BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.
- IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND BROOM THE MATERIAL FROM THE ROADWAY.
- WHEN THE VEGES BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE, A NEW 100mm LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.
- ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL, BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITIONS.

DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

- THE ROCK PAD SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT TRAP.
- REMOVE MATERIAL AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
- RE-GRADE AND STABILISE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

GMW	Apr-10	Construction Exit - Rock Pad (construction sites only)	Exit-02
-----	--------	---	---------

MATERIALS

ROCK: WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK. NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTANCES) OR 100 TO 150mm (LARGE DISTANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE: 25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC: HEAVY DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH (BOM AF OR EQUIVALENT).

INSTALLATION

- REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE OFFICER FOR ASSISTANCE.
- CLEAR THE LOCATION OF THE VIBRATION GRID, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSURE INTO SOFT (GROUNDED) CLAYS, SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT DO NOT CLEAR ADJACENT AREAS UNLESS REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
- GRADE THE LOCATION OF THE VIBRATION GRID SO THAT RUNOFF FROM THE UNIT WILL NOT FLOW INTO THE DRIVE.
- ENSURE THAT THE INSTALLATION OF THE VIBRATION GRID HAS ADEQUATE SEDIMENT STORAGE VOLUME UNDER THE GRID, WHERE NECESSARY, INSTALL SUITABLE FORECAST SETBACK COLLECTION CHAMBERS.
- PLACE A ROCK PAD/RAMP FORMING A MINIMUM 200mm THICK LAYER OF CLEAR, DRY-BLENDED ROCK OVER THE ROADWAY BETWEEN THE VIBRATION GRID AND THE SEALED SURFACE TO PREVENT TYRES FROM PICKING UP MORE SOIL AFTER THEY HAVE BEEN CLEANED.
- THE TOTAL LENGTH OF THE VIBRATION GRID AND ROCK RAMP SHOULD BE AT LEAST 1m WHERE PRACTICABLE AND AS NEAR THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST ON THE ROCK RAMP SHOULD COMMENCE AT THE EDGE OF THE OFF-ROAD SEALED ROAD OR PAVEMENT.
- FLARE THE END OF THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.
- IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THEN COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

- INSPECT VIBRATION GRID PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.
- IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED ON WHEELS ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MATERIAL MUST BE PHYSICALLY REMOVED. FIRST USE A SQUARE EGGED SHOVEL, AND THEN A STEEL BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.
- IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND BROOM THE MATERIAL FROM THE ROADWAY.
- WHEN THE VEGES BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK RAMP IS REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE, A NEW 100mm LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.
- ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL, BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITION.

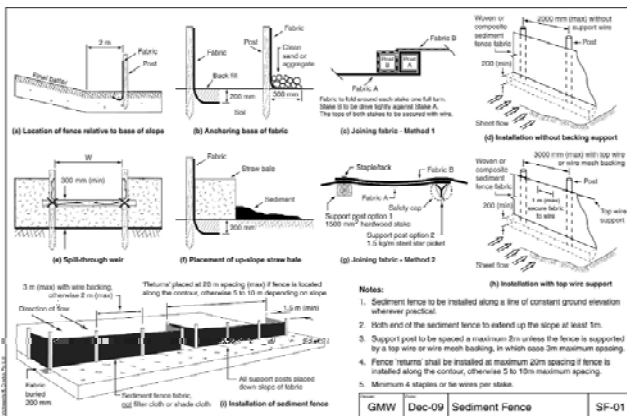
DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

- THE VIBRATION GRID SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT CONTROL DEVICE.
- REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
- RE-GRADE AND STABILISE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

GMW	Apr-10	Construction Exit - Vibration Grid	Exit-05
-----	--------	------------------------------------	---------

REV 0 1	DATE 12/07/2021 5/08/2021	DRN. MB MB	APP.	REVISION DETAILS Draft for SWMP Revised to include ARTC comments	CLIENT ARTC	PROJECT TITLE Cabramatta Loop Project Fulton Hogan	DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN IECA standard drawings
---------------	---------------------------------	------------------	------	--	---------------------------	--	--



GMW Dec-09 Sediment Fence SF-01

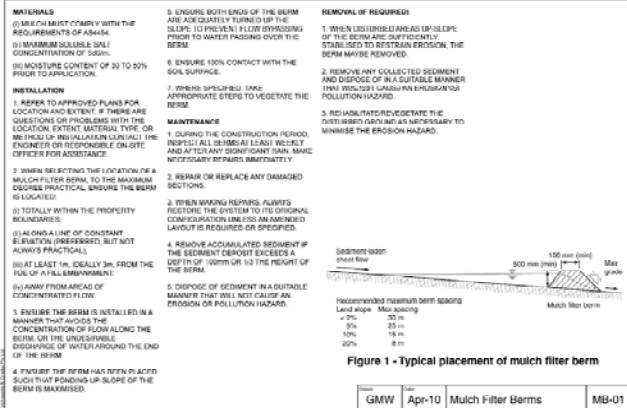
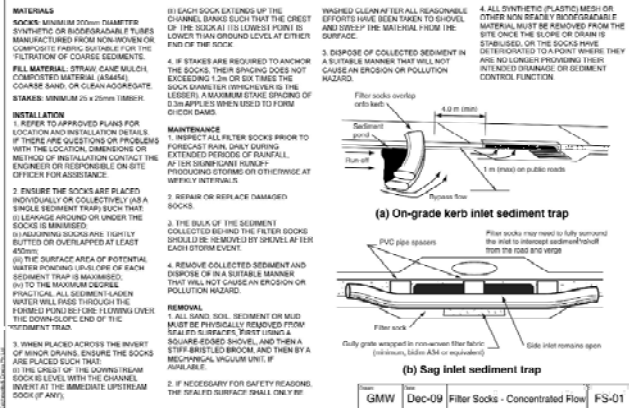


Figure 1 - Typical placement of mulch filter berm

GMW Apr-10 Mulch Filter Berms MB-01



GMW Apr-10 Sediment Fence SF-02



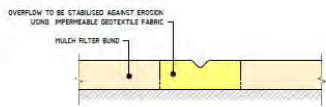
GMW Dec-09 Filter Socks - Concentrated Flow FS-01

REV 0 1	DATE 12/07/2021 5/08/2021	DRN MB MB	APP.	REVISION DETAILS Draft for SWMP Revised to include ARTC comments	CLIENT ARTC	PROJECT TITLE Cabramatta Loop Project Fulton Hogan	DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN IECA standard drawings
---------------	---------------------------------	-----------------	------	--	----------------	--	--

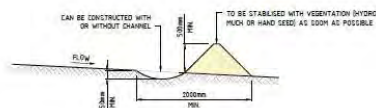


TYPICAL MULCH BUND DETAIL
SCALE 1:50

LAND SLOPE	RECOMMENDED MAX. BERM SPACING
-2%	30 m
5%	25 m
10%	15 m
20%	8 m



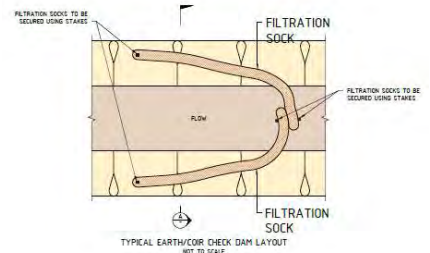
TYPICAL MULCH BUND ELEVATION A
SCALE 1:50



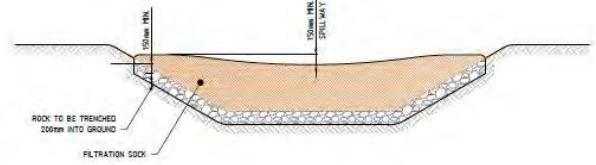
TYPICAL EARTH BUND DETAIL
SCALE 1:100



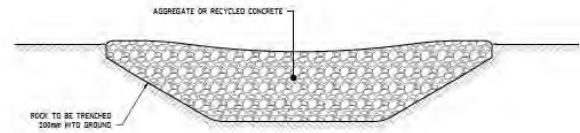
TYPICAL ROCK CHECK DAM LAYOUT
NOT TO SCALE



TYPICAL EARTH/COIN CHECK DAM LAYOUT
NOT TO SCALE

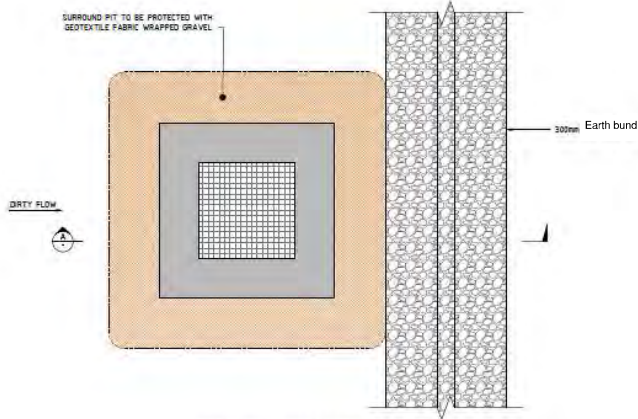


TYPICAL SECTION A - EARTH/COIN CHECK DAM
SCALE 1:50

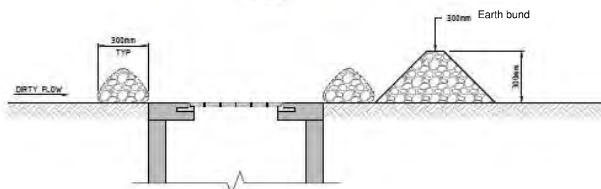


TYPICAL SECTION B - ROCK CHECK DAM
SCALE 1:50

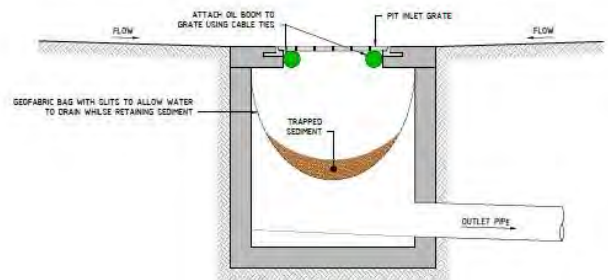
REV	DATE	DRN.	APP.	REVISION DETAILS	CLIENT	PROJECT TITLE	DRAWING TITLE
0 1	12/07/2021 5/08/2021	MB MB		Draft for SWMP Revised to include ARTC comments	ARTC	Cabramatta Loop Project 	EROSION AND SEDIMENT CONTROL PLAN IECA standard drawings



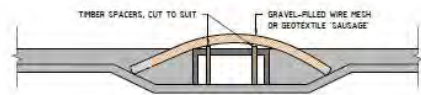
TYPICAL PIT CONTROL LAYOUT
SCALE 1:20



TYPICAL PIT CONTROL SECTION A
SCALE 1:20

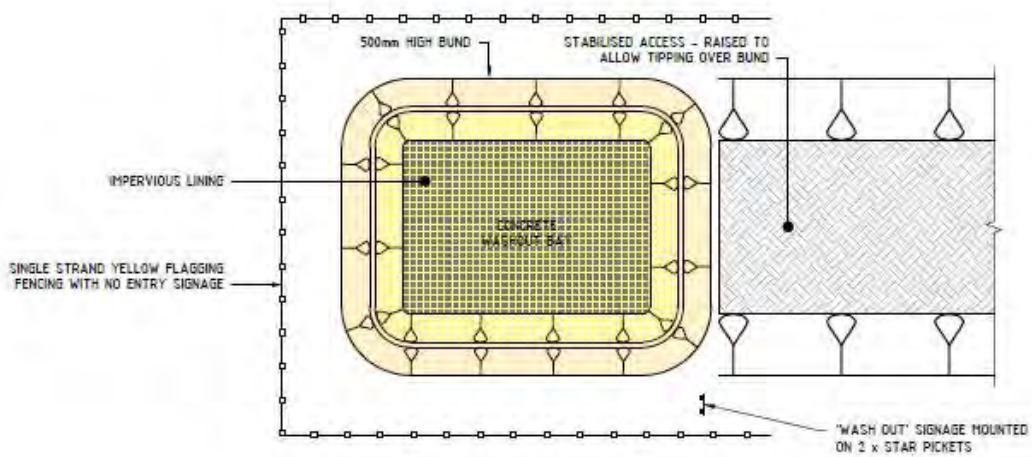


TYPICAL INLET PIT AND DRAIN WARDEN DETAIL
NOT TO SCALE



TYPICAL GULLY PIT PROTECTION LAYOUT
SCALE 1:50

REV 0 1	DATE 12/07/2021 5/08/2021	DRN. MB MB	APP.	REVISION DETAILS Draft for SWMP Revised to include ARTC comments	CLIENT ARTC	PROJECT TITLE Cabramatta Loop Project Fulton Hogan	DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN IECA standard drawings
---------------	---------------------------------	------------------	------	--	---------------------------	--	--



Typical concrete washout
Not to scale

REV 0 1	DATE 12/07/2021 5/08/2021	DRN. MB MB	APP.	REVISION DETAILS Draft for SWMP Revised to include ARTC comments	CLIENT ARTC	PROJECT TITLE Cabramatta Loop Project Fulton Hogan	DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN IECA standard drawings
---------------	---------------------------------	------------------	------	--	---------------------------	--	--



Figure 4 - mulch filter bund installed adjacent to a waterway



Figure 6 - construction access and egress with a vibration grid



Figure 8 - progressive and early stabilisation as works progress



Figure 5 - pit protection with downslope earth bund



Figure 7 - land irrigation on a grass filter bed





Figure 9 - sediment fence installed alongside a clean water drain

REV	DATE	DRN.	APP.	REVISION DETAILS	CLIENT	PROJECT TITLE	DRAWING TITLE
0 1	12/07/2021 5/08/2021	MB MB		Draft for SWMP Revised to include ARTC comments	ARTC	Cabramatta Loop Project Fulton Hogan	EROSION AND SEDIMENT CONTROL PLAN Photo examples

Basin Schedule


Catchment #	Reference	Catchment Size (ha)	Soil loss (m3/ha/yr)	Basin required?
1	Boundary to Junction Street	0.47	56	No
2	Junction to Broomfield South	0.61	56	No
3	Warwick to Railway Parade	0.34	22	No
4	Ancillary site (Warwick Farm)	0.83	22	No

Note: Boundary Street north catchments are smaller than tabled

REV 0 1	DATE 12/07/2021 5/08/2021	DRN. MB MB	APP.	REVISION DETAILS Draft for SWMP Revised to include ARTC comments	CLIENT 	PROJECT TITLE Cabramatta Loop Project 	DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN
---------------	---------------------------------	------------------	------	--	---	--	--

Legend


Sediment trap 


Mulch / earth bund or sediment fence 

Dirty water 

Clean water 

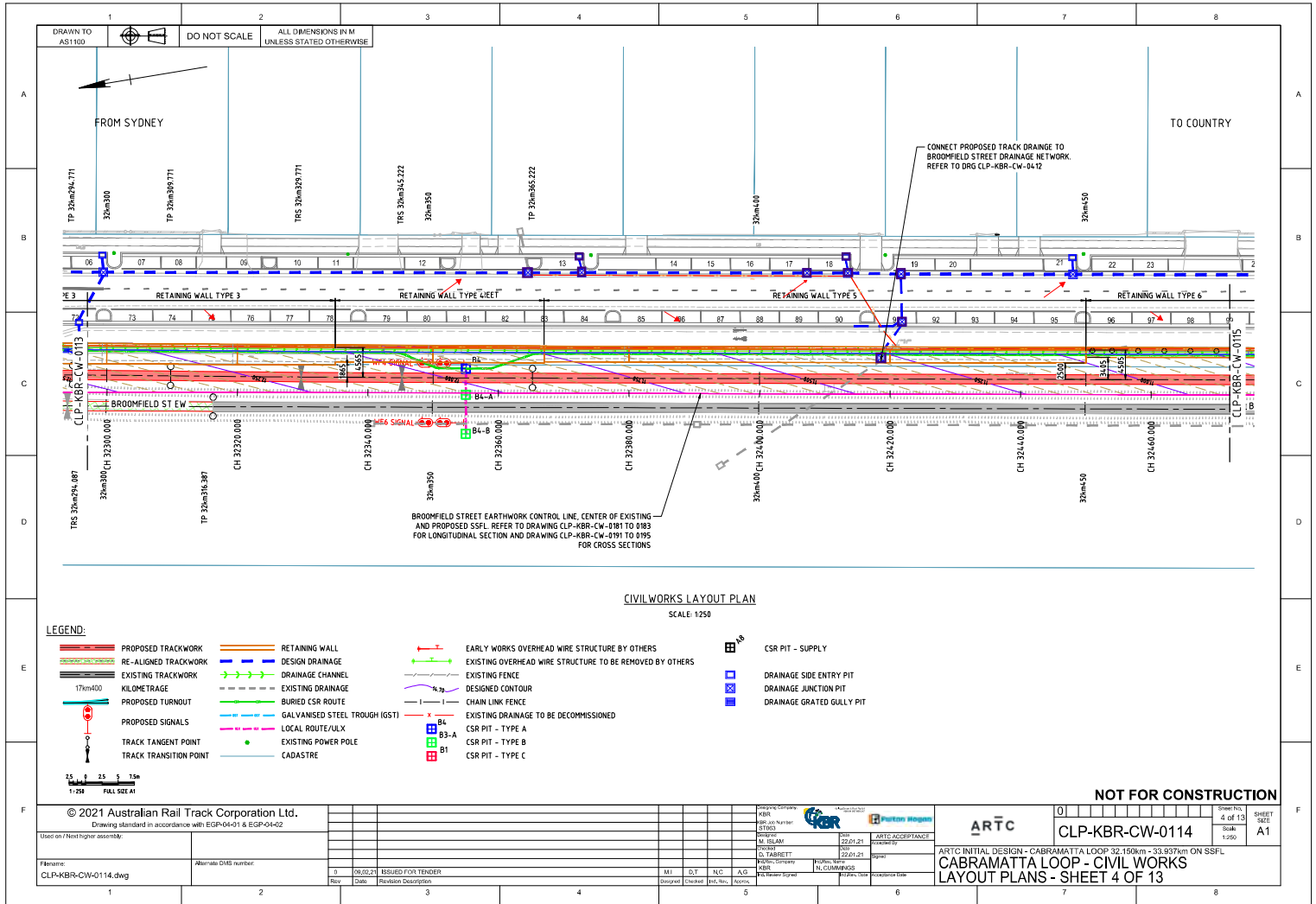
Clean water drain 

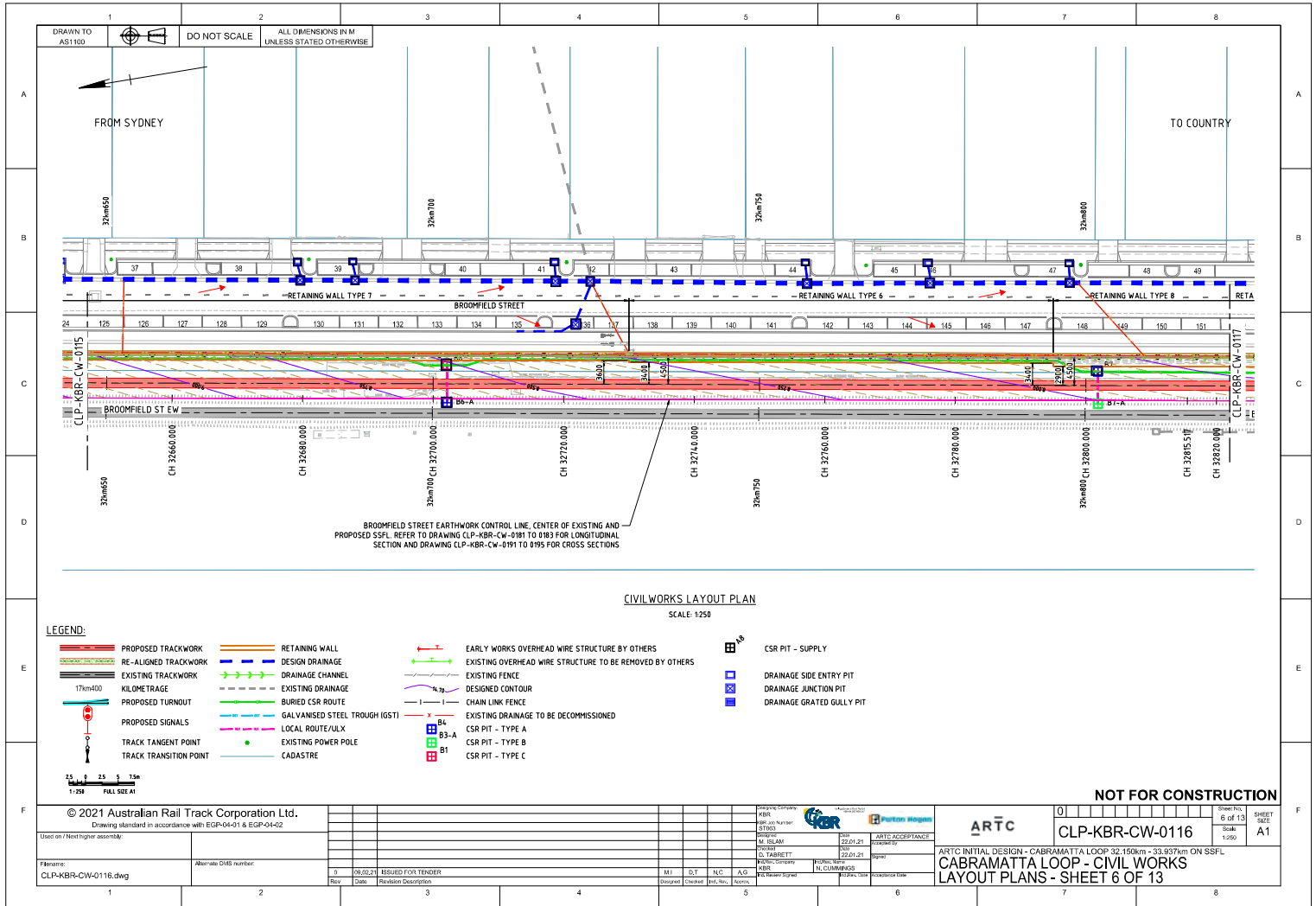
Existing waterway 

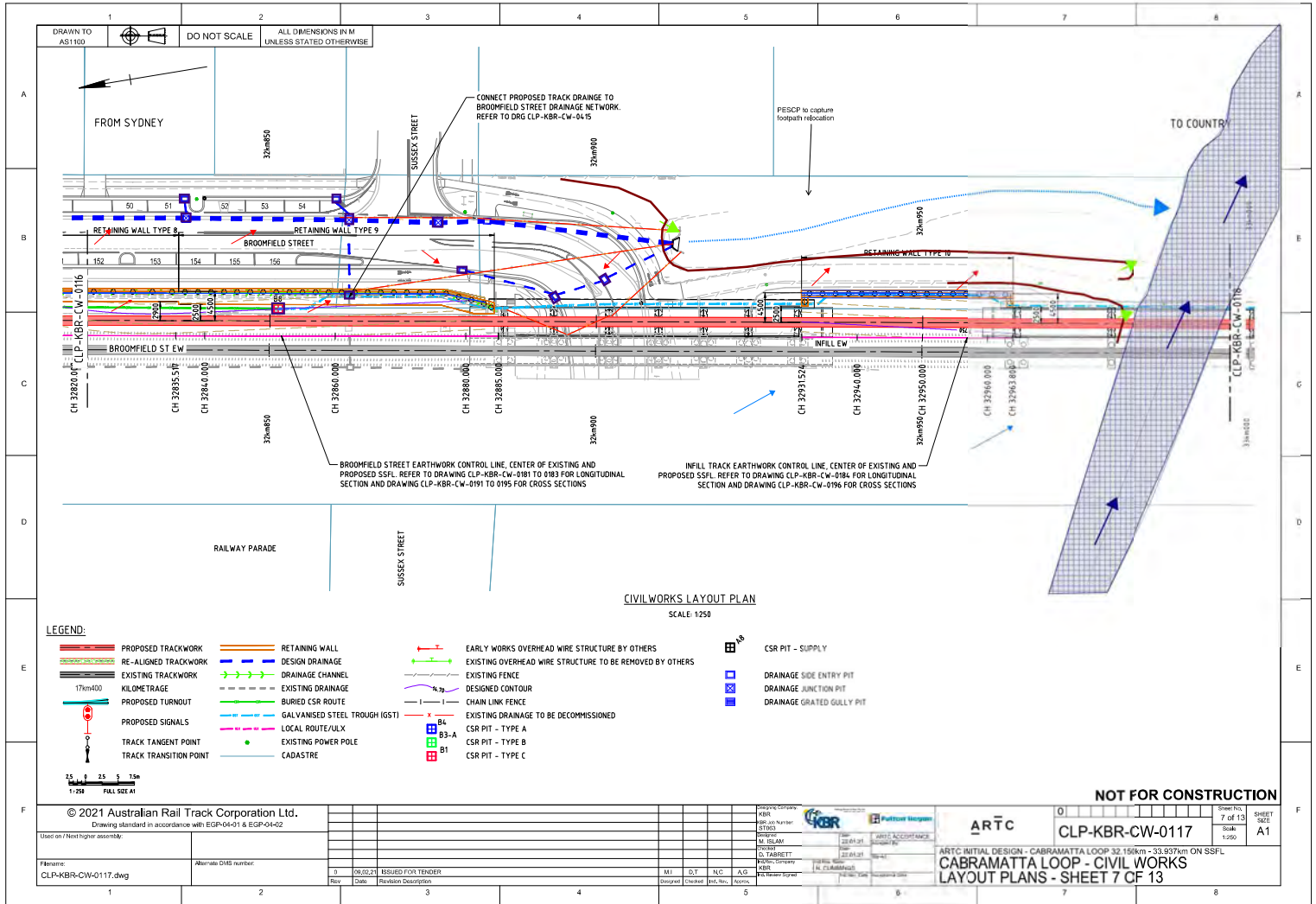
Pit protection (use most suitable grade check, sag pit, protection with earth bund) 

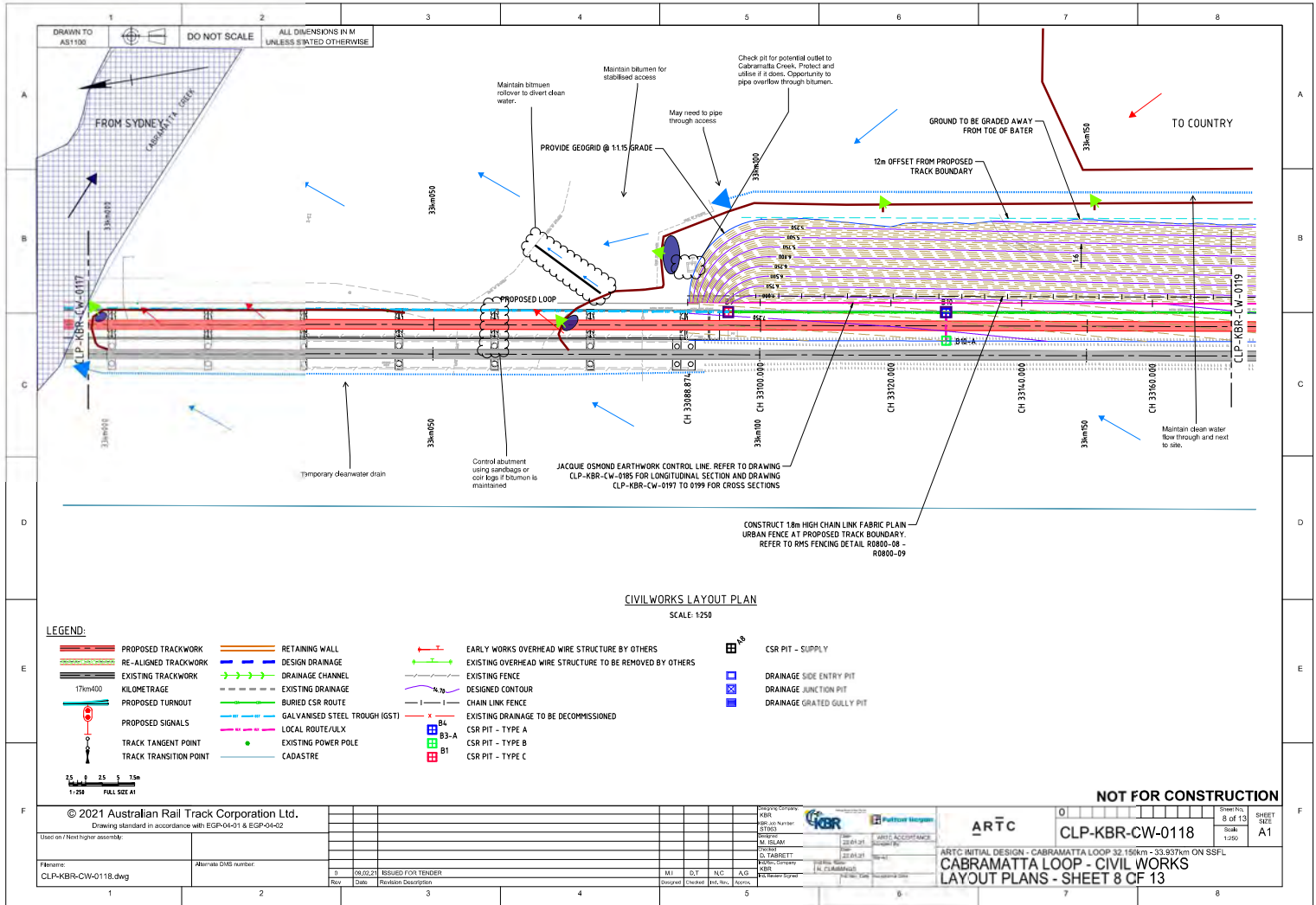
Overflow 

REV	DATE	DRN.	APP.	REVISION DETAILS	CLIENT	PROJECT TITLE	DRAWING TITLE
0 1	12/07/2021 5/08/2021	MB MB		Draft for SWMP Revised to include ARTC comments		Cabramatta Loop Project 	EROSION AND SEDIMENT CONTROL PLAN

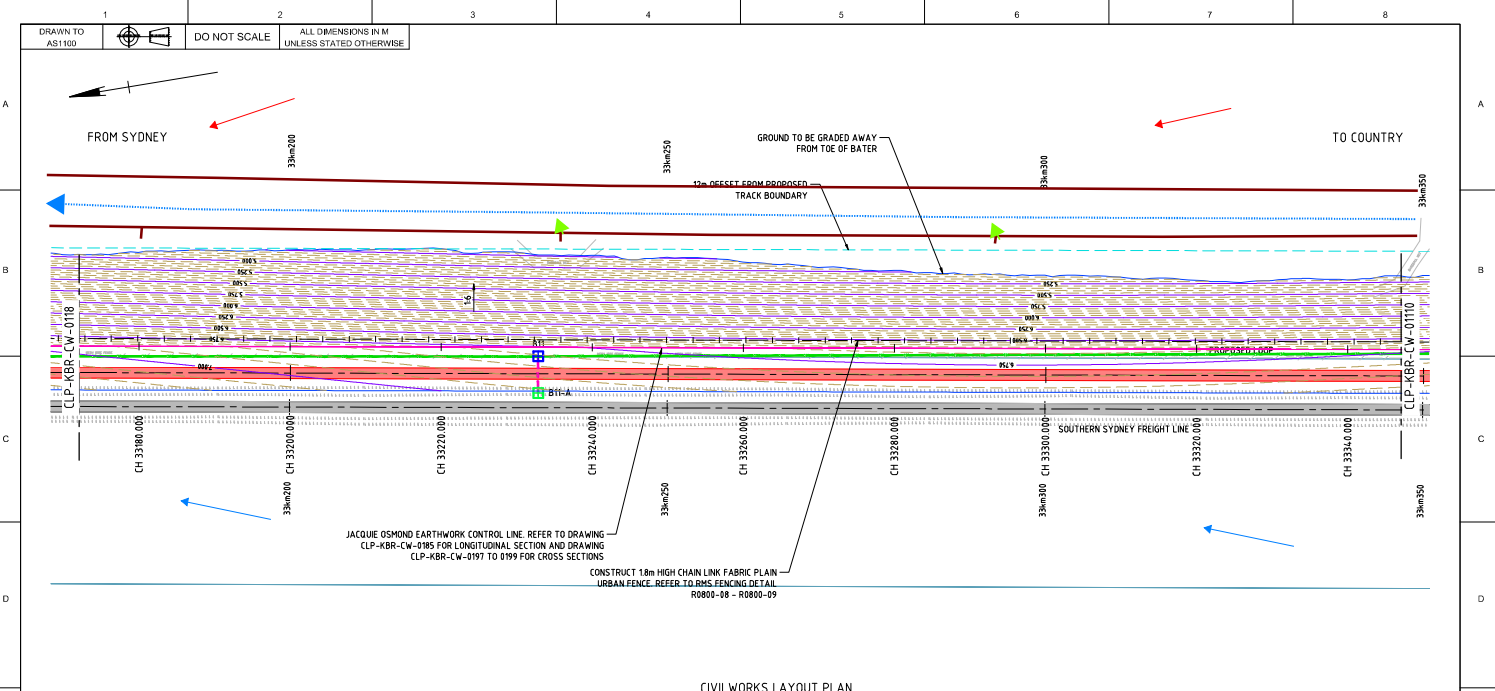








DRAWN TO AS1100 DO NOT SCALE ALL DIMENSIONS IN M UNLESS STATED OTHERWISE



JACQUE OSMOND EARTHWORK CONTROL LINE. REFER TO DRAWING CLP-KBR-CW-0185 FOR LONGITUDINAL SECTION AND DRAWING CLP-KBR-CW-0197 TO 0199 FOR CROSS SECTIONS
 CONSTRUCT 1.8m HIGH CHAIN LINK FABRIC PLAN - URBAN FENCE. REFER TO BHS FENCING DETAIL R0800-08 - R0800-09

CIVIL WORKS LAYOUT PLAN
 SCALE: 1:250

- LEGEND:**
- PROPOSED TRACKWORK
 - RE-ALIGNED TRACKWORK
 - EXISTING TRACKWORK
 - 17km/400
 - PROPOSED TURNOUT
 - PROPOSED SIGNALS
 - TRACK TANGENT POINT
 - TRACK TRANSITION POINT
 - RETAINING WALL
 - DESIGN DRAINAGE
 - DRAINAGE CHANNEL
 - EXISTING CHAINAGE
 - BURIED CSR ROUTE
 - GALVANISED STEEL TROUGH (GST)
 - LOCAL ROUTE/ULX
 - EXISTING POWER POLE
 - CADASTRE
 - EARLY WORKS OVERHEAD WIRE STRUCTURE BY OTHERS
 - EXISTING OVERHEAD WIRE STRUCTURE TO BE REMOVED BY OTHERS
 - EXISTING FENCE
 - DESIGNED CONTOUR
 - CHAIN LINK FENCE
 - EXISTING DRAINAGE TO BE DECOMMISSIONED
 - CSR PIT - TYPE A
 - CSR PIT - TYPE B
 - CSR PIT - TYPE C
 - CSR PIT - SUPPLY
 - DRAINAGE SIDE ENTRY PIT
 - DRAINAGE JUNCTION PIT
 - DRAINAGE GRATED GULLY PIT

© 2021 Australian Rail Track Corporation Ltd.
 Drawing standard in accordance with EGP-04-01 & EGP-04-02

File name: CLP-KBR-CW-0119.dwg
 Alternate DWS number:

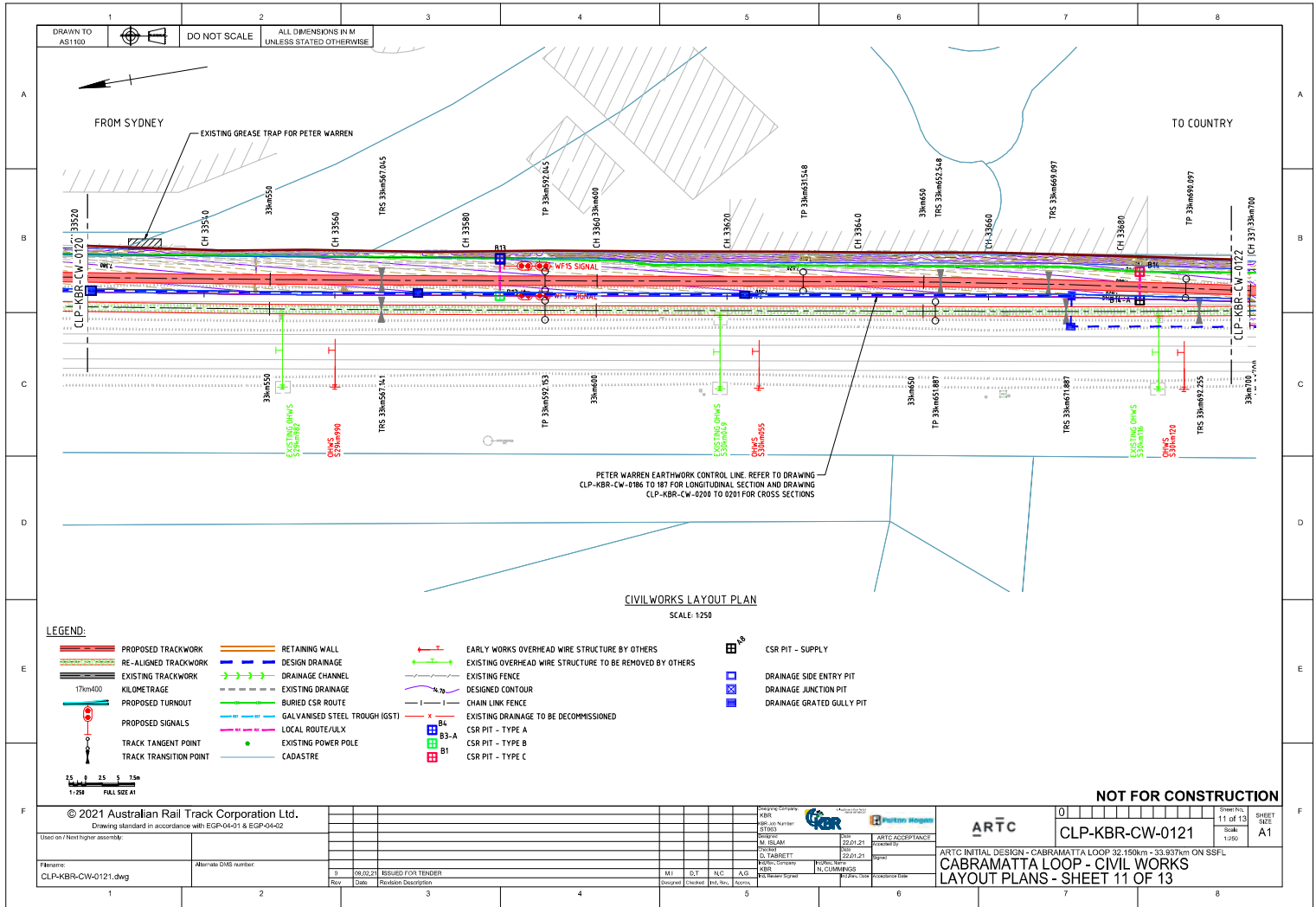
Rev	Date	Revision Description	By	Chk	App
1	06/08/21	ISSUED FOR TENDER			
2					

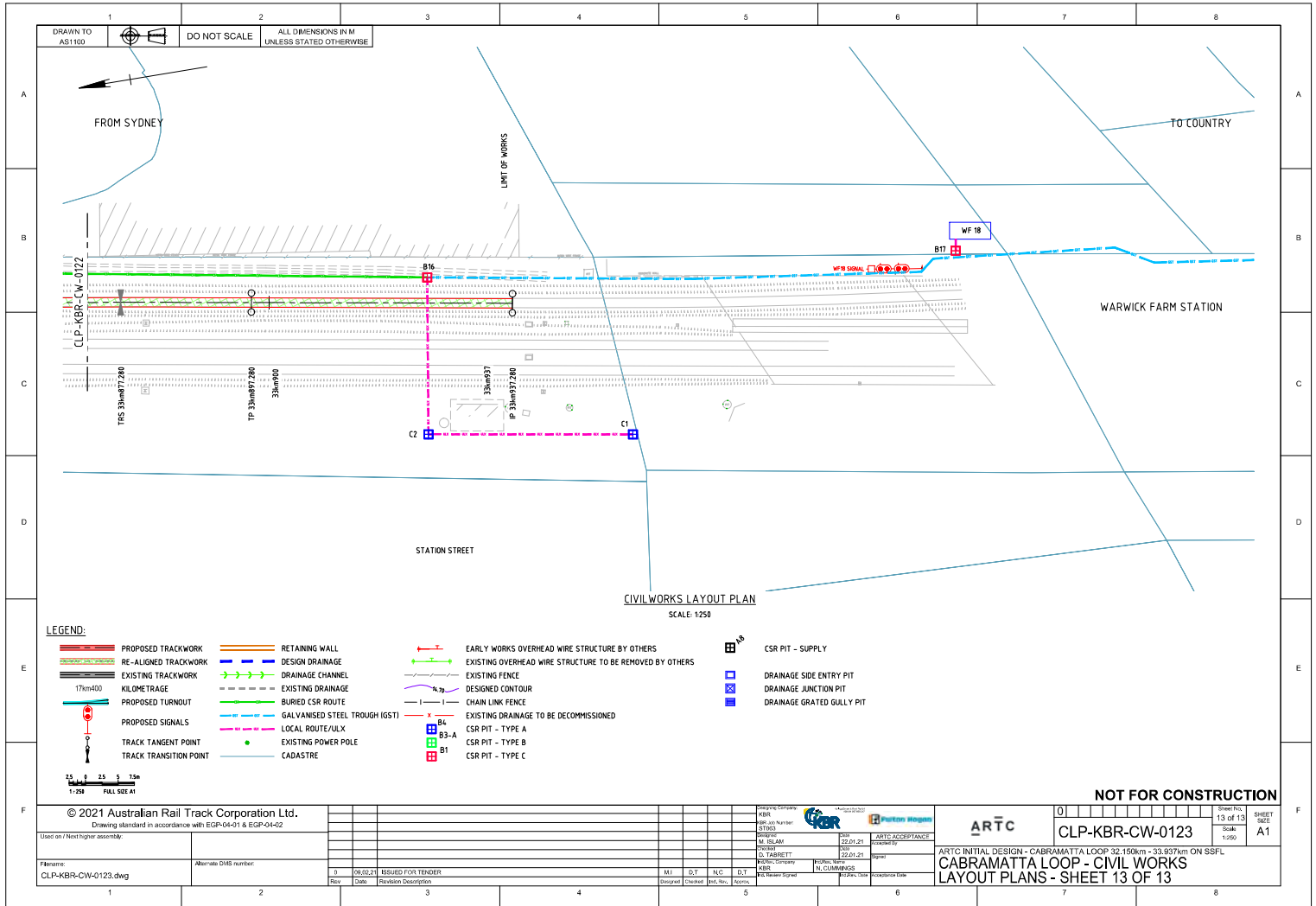
Project Name	CLP-KBR-CW-0119
Project Number	CLP-KBR-CW-0119
Project Manager	M. ISLAM
Project Engineer	G. HARRITT
Project Designer	N. CUMMINGS
Project Checker	
Project Approver	

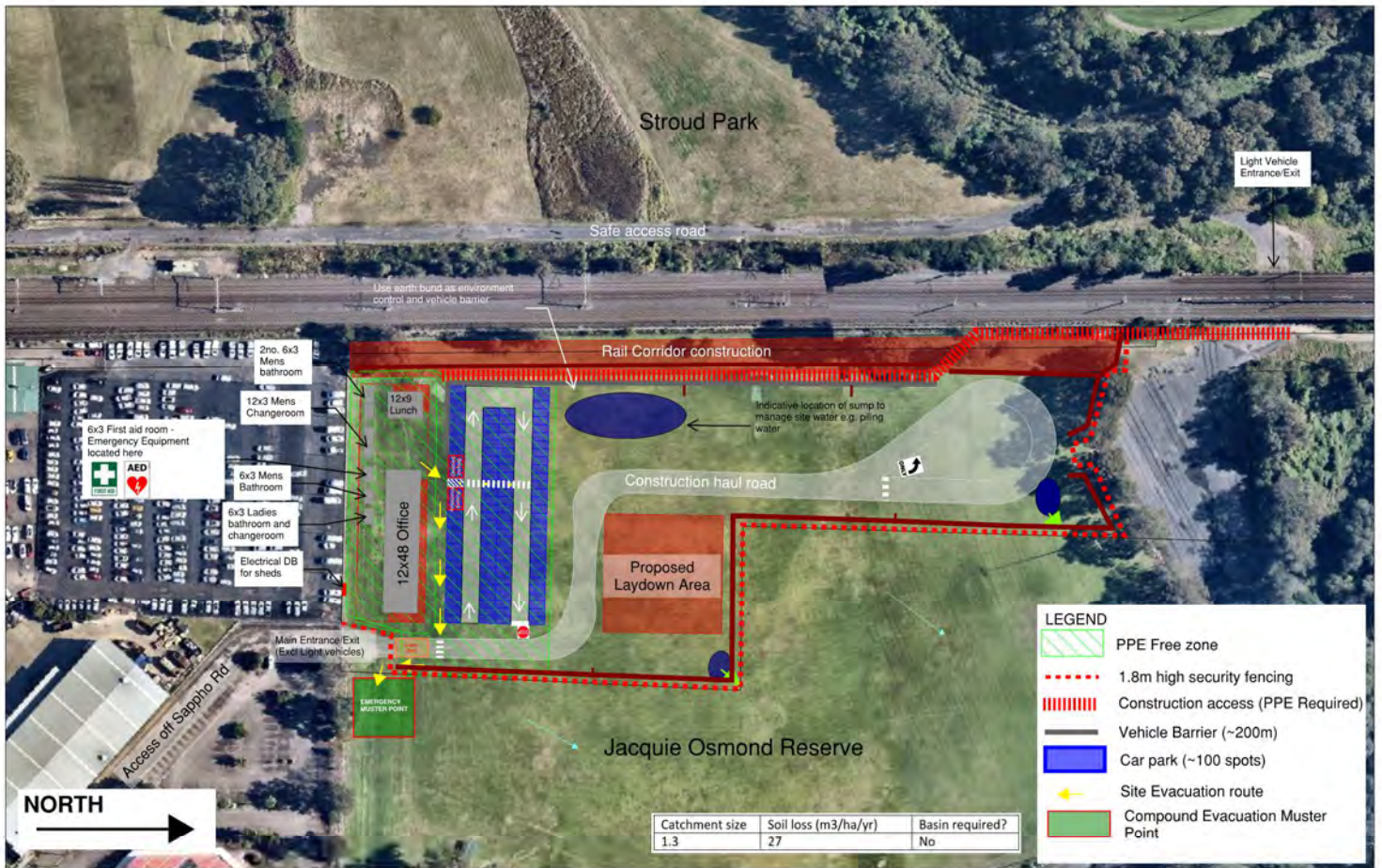
NOT FOR CONSTRUCTION

ARTC
 ARTC INITIAL DESIGN - CABRAMATTA LOOP 32.150km - 33.937km ON SSFL
 CABRAMATTA LOOP - CIVIL WORKS
 LAYOUT PLANS - SHEET 9 OF 13

Sheet No. 9 of 13
 Scale 1:250
 SHEET SIZE A1







ALL ORIGINAL 100 mm DIA ORIGINAL
 THIS SHEET MAY BE PREPARED USING COLOUR AND MAY BE INCOMPLETE IF COPIED
 DRAWING LOCATION NAME
 Cabramatta Loop Compound

PLOT DATE Mon Aug 9 13:34:05 2021		DESIGN MODEL FILED FOR DOCUMENTATION OF THIS DESIGN		SCALE at A3 1:1200		Cabramatta Loop Project	
NAME DATE NO.	NAME DATE NO.	NAME DATE NO.	NAME DATE NO.	NAME DATE NO.	NAME DATE NO.	NAME DATE NO.	NAME DATE NO.
CLIENT: ARTC				CONTRACTOR: Fulton Hogan			
DESIGNER:		CHECKER:		DATE PLOTTED (DDMMYY):		SCALE: 1	
PROJECT MANAGER:		SURVEY MANAGER:		SHEET NO.:		SHEET TOTAL: 1	

Appendix B: Water Quality Construction Monitoring Program

Appendix B Water Quality Construction Monitoring Program

1 Baseline Water Quality Monitoring Data

GHD was engaged by ARTC to prepare the baseline water quality monitoring program for the project contained in Appendix B1 (titled 'Australian Rail Track Corporation Cabramatta Loop: Water Quality Monitoring Report' dated September 2020).

ARTC commenced baseline monitoring of surface water quality in May 2019 at various sites upstream and downstream from the project and monitored baseline conditions for twelve months (i.e. to April 2020). The baseline monitoring results and data are documented in Appendix B1.

The baseline water quality monitoring program contained in Appendix B1 was considered during the development of this water quality monitoring program. It is noted that the baseline monitoring program provides information about general ecosystem health, rather than impacts specifically from road/ rail construction activities.

2 Construction Water Quality Monitoring Parameters

The purpose of water quality monitoring during the construction phase is to determine impacts resulting from construction of the project only (i.e. road/ rail construction) and no other unrelated sources, such as agricultural operations, sewage overflows, or runoff of nutrient rich fertilisers from nearby landscaped parks/ recreational areas/ golf courses.

The potential impacts from road/ rail construction activities will most likely result from sedimentation and spills. Nutrients and heavy metals from road/ rail construction activities are not anticipated. The construction surface water parameters therefore include:

- Total suspended solids
- pH, and
- Oil and grease.

3 Construction Water Quality Monitoring Locations

During the construction phase of the project, surface water quality in Cabramatta Creek will be monitored immediately upstream and downstream of the bridge works at Cabramatta Creek so that any impacts directly related to construction activities can be identified and addressed. Surface water quality will be monitored at a total of 2 locations (i.e. SW1 and SW2). The construction water quality monitoring locations are shown in Figure 1 and on the Sensitive Area Plans included at Appendix A6.

The precise location (easting and northing) of each water sampling location will be determined once the project team mobilises to site and agrees the location with the various landowners (where relevant).

4 Environment Protection Licence Criteria

There is no specific water quality discharge criteria in EPL Number 3142 (held by ARTC for railway activities – railway infrastructure operations). Fulton Hogan must comply with section 120 of the POEO Act as required by Condition L1.1 of the EPL. Monitoring results (Table 5) will be reviewed to demonstrate this requirement is met.

5 Relevant NSW Water Quality Objectives Criteria

The relevant NSW water quality objectives criteria are included in Table 5. Monitoring results will be checked against this criteria with the intent to maintain or contribute to achieving the NSW Water Quality Objectives in accordance with the requirements of CoA E58.

Refer to point 7 below for the procedures to be implemented when a monitoring result is outside of the NSW Water Quality Objectives criteria and/or EPL duty to comply with section 120 of the POEO Act.



CABRAMATTA LOOP PROJECT
SURFACE WATER
MONITORING LOCATION

LEGEND

SURFACE WATER MONITORING LOCATION

Figure 1: Construction Water Quality Monitoring Locations

6 Sampling, Testing and Analysis of Monitoring Data

Water quality sampling will be undertaken by a suitably qualified person and comply with the ANZECC Guidelines (2000) and NSW EPA's Approved Methods for Sampling and Interpretation of Results of Water Pollution (EPA, 2004). Surface water samples are collected using a grab sample technique. A probe/ meter will be used to provide instantaneous in-field readings for turbidity (NTU) and pH (pH Units).

Testing will be undertaken by a National Association of Testing Authorities, Australia (NATA) and processed following ISO/IEC 17025 procedures. Sampling results will be assessed for validity and reliability using Quality Assurance methods including Method Blank (MB) and Laboratory Control Spike (LCS) and Matrix Spike (MS).

7 Procedures to Identify and Implement Additional Mitigation Measures where Results of Monitoring Identify Unexpected Impact

Implementation of the mitigation measures listed in Table 4 will ensure water quality impacts are minimised during construction. In the event that results of water quality monitoring identify unexpected impact, Fulton Hogan will implement the following procedure:

- The Environmental Manager will investigate the issue to determine possible causes of the non-conformance (in accordance with Section 7.7) and to develop appropriate mitigation measures on a case-by-case basis.
- Water quality complaints will be managed in accordance with the complaints management process described in the Communication Strategy. Where investigation has confirmed clear and unambiguous impact resulting from the construction of the project, the Environmental Manager, in consultation with the project team, will identify additional contingency/ mitigation measures which may include, but not necessarily be limited to:
 - Stopping the activity contributing to the unexpected impact
 - Modification of the construction methods used
 - Modification of the soil and water management methods used
 - Conducting unscheduled monitoring to further verify exceedance trend, where relevant.

It is the responsibility of the Environmental Manager to ensure that the identified contingency measures are implemented.

8 Summary of Construction Water Quality Monitoring

Table 5 summarises the construction water quality monitoring for the project.

Information regarding non-conformances and reporting requirements are documented in Section 7.7 and 7.6 respectively of this SWMP.

Appendix B3: Soil and Water Management Sub-Plan

Cabramatta Loop Project



Table 5: Summary of Construction Water Quality Monitoring

Details	Location	Record	Responsibility	Parameters	Frequency	NSW Water Quality Objective Criteria
Construction surface water quality upstream and downstream in Cabramatta Creek at SW1 and SW2.	Refer to the surface water monitoring locations identified in Figure 1	Monthly Report Water quality sampling field record Chain of custody form (for environmental samples)/ Laboratory results	Environmental Manager (or delegate)	Turbidity (NTU)	Monthly (in-field)	Lowland rivers: 6-50 NTU No guideline for TSS
				pH	Monthly (in-field)	Lowland rivers: 6.5 – 8.5
				Oil and grease	Monthly (in-field) visual inspection and as required in response to spills on site. Laboratory testing only if sheen is visually present.	No visual evidence
Monitoring Bureau of Meteorology (BoM) weather forecast	All	Pre-start meeting record Email record to staff	Safety Manager Environmental Manager (or delegate)	Not applicable	Daily	N/A
Inspections to monitor and maintain erosion and sediment controls when rain or showers are forecasted to be 'heavy' or 'violent' in accordance with the Heavy rainfall event procedure (contained in Appendix D of this SWMP).	All, focusing on critical areas first (e.g. works areas near Cabramatta Creek and Jacquie Osmond Reserve, stockpile areas, chemical storage areas).	Standard inspection checklist form, or mobile software application, such as 'iAuditor'.	Foreman Environmental Manager (or delegate)	Not applicable	When rain or showers are forecasted to be 'heavy' or 'violent' in accordance with the Heavy rainfall event procedure (contained in Appendix D of this SWMP).	N/A

Annexure B1: Baseline Water Quality Monitoring Program (by ARTC)

