# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

November 2023



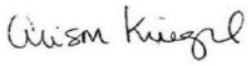
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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| AEP | Annual Exceedance Probability |
| ANZECC | Australian and New Zealand Environment and Conservation Council |
| AR | Amendment Report |
| ARSR | Amendment Report Submissions Report |
| ASS | Acid Sulfate Soil |
| ASRIS | Australian Soil Resource Information System |
| AWS | Automatic Weather Station |
| BGL | Below Ground Level |
| BH | Borehole |
| BOM | Bureau of Meteorology |
| BTEXN | Benzene, toluene, ethylbenzene, xylene and naphthalene |
| CA | Consistency assessment |
| CAQMP | Construction Air Quality Management Sub-plan |
| CCLMP | Construction Contaminated Land Management Sub-plan |
| CCS | Community Communication Strategy |
| CEMP | Construction Environmental Management Plan |
| CFMP | Construction Flood Management Sub-plan |
| CLM Act | Contaminated Land Management Act 1997 |
| CoA | Conditions of Approval |
| Commonwealth CoA | Federal Conditions of Approval under the EPBC Act for the M12 Motorway |
| Construction | Includes all activities required to construct the M7-M12 Integration project:<br>• as described in the documents listed in Infrastructure Approval SSI-663-Mod-6 Condition 1A, including commissioning trials of equipment and temporary use of any part of Modification 6 (M7 Widening), but excluding low impact work which is carried out or completed prior to approval of the CEMP<br>• as described in the documents listed in Infrastructure Approval SSI 9364 (M12 Motorway) Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out to complete prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, demolition of acquired residential houses, structures and sheds, and works specified in Appendix B of the M12 Motorway Infrastructure Approval which have been approved under an environmental management plan in accordance with M12 Motorway Condition A24. |

| Acronym | Definition |
|---|---|
| CSWMP | Construction Soil and Water Management Sub-plan |
| CWRMP | Construction Waste and Resources Management Sub-plan |
| CSSI | Critical State Significant Infrastructure |
| DAWE | Former Commonwealth Department of Agriculture, Water and the Environment (now Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW)) |
| DCCEEW | Department of Climate Change, Energy, the Environment and Water |
| D&C | Design and construction |
| DEC | Former NSW Department of Environment and Conservation |
| DECC | Former NSW Department of Environment and Climate Change |
| DECCW | Former NSW Department of Environment, Climate Change and Water |
| DO | Dissolved Oxygen |
| DPE | NSW Department of Planning and Environment |
| DPI | NSW Department of Primary Industries |
| EAD | Environmental Assessment Documentation |
| EC | Electrical conductivity |
| EIS | Environmental Impact Statement |
| Environmental Assessment Documentation, M7 EAD, M12 EAD | The set of documents that comprise the Division 5.2 Approval of the M7 Widening:<br>• Transport for NSW (August 2022) Westlink M7 Widening Modification Report<br>• Transport for NSW (November 2022) Westlink M7 Widening Submissions report.<br>The set of documents that comprise the Division 5.2 Approval of the M12 Motorway:<br>• Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS)<br>• Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report)<br>• Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR)<br>• Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR)<br>• Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment)<br>• WSP (October, 2021) M12 Motorway – West Package Detailed Design: Proposed changes between east of Badgerys Creek and The Northern Road Consistency Assessment<br>• GHD (October, 2021) M12 Motorway – Central Package Detailed Design: Design and boundary changes between Cecil Park and east of Badgerys Creek Consistency Assessment |

| Acronym | Definition |
|---|---|
| | • Arcadis (June, 2022) M12 Motorway – West and Central Package Sydney Water Pipeline Crossings: Proposed Sydney Water pipelines crossings for M12 West and Central Consistency Assessment<br>• Arcadis (July, 2022) M12 Motorway – Design Boundary Changes: Proposed construction and operational design boundary changes for the M12 Project Consistency Assessment<br>• Arcadis (August, 2022) M12 Central Boundary Changes: Proposed construction design boundary changes for M12 Central – Minor Change Consistency Assessment<br>• WSP (September, 2023) Proposed construction and operational design boundary changes for the M12 Project (East) Consistency Assessment<br>• John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Laydown Area Adjacent to Cecil Road<br>• John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Power supply to AF9<br>• John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Temporary construction signage.<br>The documents that comprise the EPBC referral:<br>• Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW<br>• Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286. |
| Environmental Representative | A suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. The principal point of advice in relation to all questions and complaints concerning environmental performance. |
| EPA | NSW Environment Protection Authority |
| EP&A Act | Environmental Planning and Assessment Act 1979 |
| EPBC Act | Environmental Protection and Biodiversity Conservation Act 1999 |
| EMS | Environmental Management System |
| EPL | Environment Protection Licence |
| ER | Environmental Representative |
| ERG | Environmental Review Group |
| ESCP | Erosion and Sediment Control Plan |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representative (refer to Section 5.1.1 of the CEMP) |
| EWMS | Environmental Work Method Statements |

| Acronym | Definition |
|---|---|
| Federal Approval | Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999 subject to specific CoA as detailed in Annexure A of the approval. |
| Final construction footprint/s | For M7 Widening, the area shown in the map(s) shown in the Modification Report.<br>For M12 East package, the area shown in the map(s) submitted under Commonwealth CoA 2, determined by TfNSW in accordance with a consistency assessment(s) or a modification assessment under the NSW Environmental Planning and Assessment Act 1979 where no new significant impacts to protected matters are identified. |
| GDE | Groundwater Dependent Ecosystem |
| HRC | Healthy Rivers Commission |
| Infrastructure Approval/s | Approval (SSI 663 Mod 6) for carrying out the M7 Widening modification under Section 5.25 of the EP&A Act subject to specific CoA as detailed in Schedule 2 of the Approval.<br>Approval (SSI 9364) for carrying out of the M12 Project under Section 5.19 of the EP&A Act subject to specific CoA as detailed in Schedule 2 of the Approval. |
| ISC | Infrastructure Sustainability Council |
| km | Kilometre(s) |
| M7 CoA | Minster's Conditions of Approval for the M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) |
| M7-M12 Integration project, the Project | The M7-M12 Integration project incorporates the following:<br>M7 Motorway (Mod 6 Widening) (SSI 663 Mod 6) – modification (mod) to the M7 Motorway approved on 17 February 2023 under Division 5.2 of the EP&A Act<br>M12 Motorway (CSSI 9364) – approved on 23 April 2021 under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and split into separate packages (West, Central (main construction), Central (temporary roundabout) and East). The M12 Motorway is also subject to a federal approval under the Environment Protection and Biodiversity Conversation Act 1999. The M7-M12 Integration project incorporates the M12 East package only. |
| M12 CoA | Minister's Conditions of Approval for the M12 Motorway (CSSI 9364) |
| M12 East package | M12 Motorway – East package |
| M12 REMMs | Revised Environmental Management Measures listed in M12 Motorway Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 REMMs) |
| NRAR | Natural Resources Access Regulator |
| NSW CoA | NSW Conditions of Approval |
| OCCLMP | Overarching Construction Contaminated Land Management Plan |
| OCEMP | Overarching Construction Environmental Management Plan |

| Acronym | Definition |
|---|---|
| OCS | Overarching Communication Strategy |
| OCSWMP | Overarching Construction Soil and Water Management Plan |
| PASS | Potential Acid Sulfate Soil |
| PIRMP | Pollution Incident Response Management Plan |
| Planning Secretary | Secretary of the NSW Department of Planning and Environment, or delegate |
| POEO Act | Protection of the Environment Operations Act 1997 |
| Primary CoA/REMM | CoA or REMM that is specific the development of this Plan |
| Redox | Reduction-oxidation |
| REMM | Revised Environmental Management Measure as provided in the Amendment Report |
| RTA | Roads & Traffic Authority. Former NSW Roads and Maritime Services. Now TfNSW |
| RUSLE | Revised Universal Soil Loss Equation |
| SDS | Safety Data Sheet |
| SAP | Sensitive Area Plan |
| SAQP | Sampling and Analysis Quality Plan |
| Secondary CoA/ REMM | CoA or REMM that is related to, but not specific to, the development of this Plan |
| SEMP | Site Establishment Management Plan |
| SEPP | State Environmental Planning Policy |
| SRE | Sensitive Receiving Environment |
| TfNSW | Transport for New South Wales (formerly NSW Roads and Maritime Services) |
| UEMMs | Updated Environmental Management Measures |
| Work | Includes:<br>• any physical activity for the purpose of Modification 6 (M7 Widening), including construction and low impact work<br>• any physical work to build or facilitate the building of the CSSI (M12 Motorway), including low impact work, environmental management measures and utility works. However, it does not include activities that inform or enable detailed design of the CSSI and generate noise that is no more than 5 dB(A) above the rating background level at any sensitive receiver. |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |
| WHS Act | Work Health and Safety Act 2011 |
| WSIA | Western Sydney International Airport |
| WSP | Western Sydney Parklands |

# 1 Introduction

## 1.1 M7-M12 Integration project planning context

The M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) (M7 Widening) and the M12 East package of the M12 Motorway Project (SSI 9364) will be delivered together under what is referred to as the M7-M12 Integration project by Western Sydney Orbital Company (WSO Co) and John Holland.

The M7 Widening and M12 East package have a complex interface in the vicinity of Cecil Hills and Cecil Park where the M7-M12 interchange is proposed.

- Due to construction programming and development of the M12 Motorway project Overarching Construction Environmental Management Plan (OCEMP), the Construction Environmental Management Plan (CEMP) and Sub-plans have been prepared in a two-step process:
  - M12 East package CEMP and Sub-plans: prepared under the OCEMP and Sub-plans and endorsed by the Environmental Representative (ER)
  - M7-M12 Integration project CEMP and Sub-plans (including this Construction Soil and Water Management Plan (CSWMP or Plan)) endorsed by the ER (and AA, where appropriate) and approved by the Planning Secretary (where required). Once approved, the M7-M12 Integration project documents supersede the M12 East documents.

This CSWMP forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project and addresses the following requirements for the M7 Widening and M12 Motorway:

- M7 Widening:
  - Minister's Conditions of Approval (CoA) for M7 Widening (SSI-663-Mod-6) (M7 CoA)
  - Updated Environmental Management Measures listed in the Westlink M7 Modification Report (August 2022) and the Submissions Report (November 2022) (M7 REMMs)
- M12 Motorway:
  - Commonwealth CoA for M12 Motorway Project (EPBC 2018/8286) (Commonwealth M12 CoA)
  - CoA for M12 Motorway Project (SSI 9364) (NSW M12 CoA)
  - Revised Environmental Management Measures listed in M12 Motorway Environmental Impact Statement (EIS) (October 2019), the Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 REMMs)
  - Overarching Construction Environmental Management Plan (OCEMP)
  - Relevant consistency assessments.
- Applicable legislation
- Transport for NSW (TfNSW) specifications.

## 1.2 Background

### 1.2.1 M7 Widening

The Westlink M7 (formerly called the Western Sydney Orbital (WSO)) is an existing 39-kilometre-long toll road connecting the M5 Motorway at Prestons, the M4 Motorway at Eastern Creek and The Hills M2 Motorway at Baulkham Hills (the approved project).

TfNSW sought a modification to the approval granted for the Westlink M7 (Department of Planning and Environment (DPE) reference number SSI-663 M7 Motorway (Modification 6 Widening)) under the Environmental Planning and Assessment Act 1979 (EP&A Act). This modification will enable widening of part of the motorway in response to current and projected traffic growth, and to address reduced motorway efficiency while enhancing safety.

The modification will enable the construction and operation of an additional lane in both directions within the existing median of the Westlink M7 for approximately 26 kilometres (km). Works will occur from about 140 metres (m) south of the Kurrajong Road overhead bridge at Prestons (southern end) to the Richmond Road interchange at Oakhurst/Glendenning (northern end), excluding widening through the Westlink M7/M4 Motorway (Light Horse) Interchange.

The modified portion of the Westlink M7 is herein referred to as M7 Widening.

### 1.2.2 M12 Motorway

TfNSW are constructing and will operate the M12 Motorway to provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network. The M12 Motorway will run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for about 16 kilometres (km) and is expected to be opened to traffic prior to opening of the WSIA.

The M12 Motorway will be constructed in separate stages or work packages:

- M12 West – between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek
- M12 Central – between about 250 metres west of South Creek and the Western Sydney Parklands at Duff Road, Cecil Park
- M12 Central temporary roundabout installation (package delivered by TfNSW Sydney Roads Performance Contractor)
- M12 East as part of the M7-M12 Integration project (the subject of this Plan):
    - Elizabeth Drive connections (EDC) – connections between the M12 Motorway and Elizabeth Drive at Cecil Park
    - the M7/M12 interchange – a grade-separated motorway-to-motorway connection between the M7 and M12 Motorways.

The M12 Motorway packages of work are being delivered under separate contracts on behalf of the proponent, TfNSW. There will be periods during which the works associated with the M12 Central and M12 East packages will overlap. Coordination between the contractors will be required to manage cumulative impacts.

A detailed M12 Motorway Project description is provided in Section 2.1 of the CEMP.

## 1.3 Statutory context

### 1.3.1 M7 Motorway

Approval for the construction and operation of the Western Sydney Orbital project (now the M7 Motorway) was granted on 28 February 2002 under the then Division 4, Part 5 of the EP&A Act. Specifically, the approval granted consent for the construction and operation of a 39 km-long, four traffic lane motorway with a 15 m wide central median, from the F5/M5 Motorway at Prestons in the south to the M2 Motorway at West Baulkham Hills in the north. The potential to use the median for additional traffic lanes or public transport in the future was identified in the EIS for the original approved project (Roads and Traffic Authority, 2000).

The M7 Widening was assessed as part of a Modification Report and a Submissions Report. Together these documents are referred to as the M7 Widening Environmental Assessment Documentation (M7 EAD). Updated Environmental Management Measures (referred to as M7 REMMs in this Plan) are nominated in these assessments to manage the identified impacts. The M7 Widening must be carried out in accordance with all procedures, commitments, preventative actions, performance outcomes and mitigation measures set out in the M7 EAD as required by M7 CoA 1E.

Approval for the M7 Widening under the EP&A Act was granted by the Minister for Planning on 17 February 2023 (CSSI-663-Mod-6).

### 1.3.2 M12 Motorway

The M12 Motorway Project is subject to an approval under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as Critical State Significant Infrastructure (CSSI). The M12 Motorway Project is also a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), requiring a separate approval from the Australian Minister for the Environment.

The M12 Motorway Project was assessed as part of an EIS, Submission Report, Amendment Report, ARSR and ARSR Biodiversity Amendment and subsequent consistency assessments:

- WSP (October, 2021) M12 Motorway – West Package Detailed Design: Proposed changes between east of Badgerys Creek and The Northern Road Consistency Assessment
- GHD (October, 2021) M12 Motorway – Central Package Detailed Design: Design and boundary changes between Cecil Park and east of Badgerys Creek Consistency Assessment
- Arcadis (June, 2022) M12 Motorway – West and Central Package Sydney Water Pipeline Crossings: Proposed Sydney Water pipelines crossings for M12 West and Central Consistency Assessment
- Arcadis (July, 2022) M12 Motorway – Design Boundary Changes: Proposed construction and operational design boundary changes for the M12 Project Consistency Assessment
- Arcadis (August, 2022) M12 Central Boundary Changes: Proposed construction design boundary changes for M12 Central – Minor Change Consistency Assessment
- WSP (September, 2023) Proposed construction and operational design boundary changes for the M12 Project (East) Consistency Assessment

- John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Laydown Area Adjacent to Cecil Road
- John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Power supply to AF9
- John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Temporary construction signage.

These documents are herein referred to as the M12 EAD. The CSSI must also be carried out in accordance with all procedures, commitments, preventative actions, performance outcomes and mitigation measures set out in the M12 EAD as required by M12 CoA A2.

Approval for the M12 Motorway Project under the EP&A Act was granted by the Minister for Planning on 23 April 2021 (CSSI 9364). Approval for the M12 Motorway Project under the EPBC Act was granted by the Australian Minister for the Environment on 3 June 2021 (EPBC 2018/8286).

## 1.4 Scope of the Plan

The scope of this CSWMP is to describe how potential soil and water impacts will be managed during construction of the M7-M12 Integration project. The relevant information and requirements for both the M7 Widening and the M12 East package are included in this Plan.

The M12 East package components of this Plan have been prepared under, and are consistent with the M12 Motorway OCEMP, in particular the Overarching Construction Soil and Water Monitoring Sub-Plan (OCSWMP). SMART (Specific, Measurable, Achievable, Realistic and Timely) principles are to be considered and applied during the preparation and ongoing implementation of this Plan.

This Plan, including any minor amendments approved by the ER, is applicable to all activities during construction of the M7-M12 Integration project, including all areas where physical works will occur or areas that may be otherwise impacted by the construction works, and under the control of John Holland. All John Holland staff and sub-contractors are required to comply with the requirements of this Plan and related environmental management plans, over the full duration of the construction program.

This Plan has also been prepared in consideration of Dis-1, Wat-1, Wat-2 and Lan-2 of the Infrastructure Sustainability Council (ISC) Technical Manual v1.2, which deal with receiving water quality, water use monitoring and reduction, non-potable water use and topsoil, respectively.

A copy of this CSWMP will be kept on the premises for the duration of construction.

Operational soil and water impacts and operational measures do not fall within the scope of this CSWMP and are therefore not included within the processes contained within the CSWMP.

## 1.5 Environmental management systems overview

The Environmental Management System (EMS) for the M7-M12 Integration project is described in Section 3 of the CEMP. The EMS is consistent with the overarching EMS described in Section 3 of the M12 Motorway OCEMP.

To achieve the intended environmental performance outcomes, John Holland has established, implemented, maintained and continually improved an EMS in accordance with the requirements of

ISO14001:2015. The John Holland EMS will be adopted as the guiding environmental management framework for the M7-M12 Integration project.

The EMS consists of governance documentation, incorporating environmental management plans, policies, procedures and tools, including:

- **John Holland Environment Policy**: Outlines the commitments and intentions established by John Holland as a business to ensure environmental performance and targets are achieved. The John Holland Environment Policy applies to the M7-M12 Integration project (Appendix A3 of the CEMP)
- **M7-M12 Integration project CEMP**: Details the processes and procedures to be implemented during construction to comply with applicable CoA, REMMs, Environment Protection Licence (EPL), legislative obligations and contractual requirements. The relevant compliance obligations are detailed in CEMP Appendix A1, with a cross reference to where they are met in this Plan
- **M7-M12 Integration project Environmental Management Sub-plans**: These documents describe procedures and controls for specific environmental aspects requiring more rigorous management strategies
- **Monitoring Programs**: Details the monitoring regime to be implemented during construction to compare the actual performance of construction against the objectives outlined in the relevant Plan, including setting specific triggers and associated responses
- **M7-M12 Integration project Sensitive Area Maps (SAPs)**: A series of maps providing key features of the alignment and relevant environmental constraints. Features include waterways, heritage, biodiversity contamination and sensitive receivers amongst other site relevant features
- **Environmental Work Method Statements (EWMS)**: Management measures identified in this CSWMP may also be incorporated into site or activity specific Environmental Work Method Statements (EWMS) for activities assessed as having high environment risk or other activities as required in TfNSW Specification G36. EWMS incorporate appropriate mitigation measures and controls and identify key procedures to be used concurrently with this Plan. Construction personnel undertaking a task governed by an EWMS must undertake the activity in accordance with the mitigation and management measures identified in the EWMS. EWMS will be reviewed by WSO Co/TfNSW Environment and Sustainability Manager (ESM) (or delegate) and independent Environmental Representative (ER) before the commencement of the construction activities to which they apply. See Section 3.3.3 of the CEMP for details of the EWMS preparation and approval requirements
- **Erosion and Sediment Control Plans (ESCPs)**: A practical guide to provide more detailed site-specific erosion and sediment control measures. ESCPs will be developed by the ESR in consultation with construction personnel and the Contractor's Soil Conservationist, as required. ESCPs will be modified to reflect site conditions at the time of construction. See Section 3.3.4 of the CEMP for details of the ESCPs preparation and approval requirements
- **Procedures, strategies and protocols**: Detailed procedures for inclusion in work packs. Detailed procedures, strategies and protocols have been/will be developed as required and are included as appendices to this CSWMP. Procedures, strategies and protocols relevant to this Plan include:
    - Construction Soil and Water Quality Monitoring Program (Appendix B)
    - Dewatering Management Plan (Appendix C)

- Erosion and Sediment Control Procedure (Appendix D)
- Concept Erosion and Sediment Control Plan (Appendix E)
- Tannin Management Procedure (Appendix F)
- Stockpile Management Procedure (Appendix G)
- Site Stabilisation Sub-plan (Appendix H)
- Water Reuse Strategy (Appendix I)
- Acid Sulfate Soils and Salinity Sub-plan (Appendix L)
- Asbestos Management Plan (Appendix N)
- Unexpected Contaminated Land Finds Procedure (Appendix M)

The Construction Contaminated Land Management Plan (CCLMP) details the methods for identification and management of contamination within the project area. This includes the Sampling and Analysis Quality Plans (SAQP) for the project, contained in Appendix E of the CCLMP, and the requirements for Detailed Site Investigation (DSI). The SAQP and DSI will identify contamination across the project area. This information be used in conjunction with this Plan to ensure that the appropriate mitigation and management measures area applied to areas of known contamination.

Management measures identified in this Plan may also be incorporated into site or activity specific EWMS. EWMS incorporate appropriate mitigation measures and controls and identify key procedures to be used concurrently with the CSWMP and ESCPs.

As outlined in Section 7.4 and 7.7 of the OCEMP, regular monitoring, inspections and auditing of compliance with the EWMS will be undertaken by Project management, quality and environmental personnel to ensure that all controls are being followed and that any non-conformances are recorded and corrective actions implemented. Where appropriate, improvements will be incorporated following reviews as described in Section 8 and Section 7.8 of the OCEMP.

A register of EWMS will be maintained in Appendix A5 of the CEMP.

### 1.5.1 CSWMP preparation, endorsement and approval

This stage specific CSWMP for the M12 East package has been developed under, and is consistent with, the approved OCSWMP and Overarching Construction Soil and Water Monitoring Program.

This Plan has been prepared by a suitably qualified person certified under the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)).

This CSWMP and Construction Soil and Water Monitoring Program (Appendix B) will be reviewed by WSO Co and TfNSW Environment and Sustainability Manager (ESM) or delegate and the independent Environmental Representative (ER) to confirm they are consistent with, and incorporate, all relevant elements of the approved OCEMP, prior to submission to the Planning Secretary for information.

As identified in Section 1.1, the CEMP and Sub-plans for the M7-M12 Integration project will be developed in a two-step process (refer to Section 1.2 of the M7-M12 Integration project CEMP for additional detail regarding the CEMP delivery strategy):

- Construction of the M12 East package did not commence until the M12 East package CSWMP and the Construction Surface Water Monitoring Program were approved by the ER and

provided to the Planning Secretary for information. The M12 East package CSWMP will be superseded by this CSWMP.

- Construction of the M7 Widening will not commence until the M7 Widening components of this M7-M12 Integration project CSWMP are reviewed by the ER for consistency with the M7 Widening approval, endorsed by the Contractor's Soil Conservationist and Contractor's Contamination Consultant and approved by the Planning Secretary.

**M7 Widening components**

This CSWMP has been prepared, in part, to satisfy the M7 CoAs and REMMs in relation to soil and water management during construction of the M7-M12 Integration project, particularly M7 CoA C4(d) (soil and water). The M7 Widening components of this plan will be prepared in consultation with DPE Water, WaterNSW, reviewed and endorsed by the ER once this Plan is confirmed to be consistent with the M7 CoA (M7 CoA A20(d)) and approved by the Planning Secretary.

**M12 East package components**

The M12 East package components of this CSWMP have been developed under, and were considered by WSO Co, TfNSW ESM (or delegate) and the ER to be consistent with the DPE-approved M12 Motorway Overarching CSWMP (OCSWMP) and subsequently provided to the Planning Secretary for information. The OCSWMP was prepared to satisfy the M12 CoA in relation to the management of soil and water during construction of the M7-M12 Integration project, particularly M12 CoA C4(e) (surface water and groundwater) and NSW CoA C4(d) (soil) and subsequently approved by the Planning Secretary.

No further approvals for the M12 East package components of this Plan are required. Revisions or updates to this Plan, including for the M7 Widening or M12 East package components are addressed in the M7-M12 Integration project CEMP.

### 1.5.2 Interactions with other management plans

This CSWMP has the following interrelationships with other management plans and documents:

- M7-M12 Integration project Sensitive Area Plans (SAP) and Site Establishment Management Plan(s) (SEMP) – identify measures to avoid and/or minimise erosion and sedimentation impacts during the establishment of ancillary facilities. The SEMP includes details of site-specific soil and water management requirements to be implemented during establishment of ancillary facilities
- M7-M12 Integration project Communication Management Plan, which was developed under, and is consistent with the Overarching Communication Strategy (OCS), details the procedures and processes for community notification, consultation and complaints management
- M7-M12 Integration project Construction Flood Management Plan – addresses how flood related risks and impacts will be managed during construction of the M7-M12 Integration project
- M7-M12 Integration project Pollution Incident Response Management Plan – identifies how pollution incidents will be managed
- M7-M12 Integration project Construction Contaminated Land Management Plan – addresses the management of contaminated lands, unexpected contaminated finds and landfill gas including the details site investigation progression

- M7-M12 Integration project Construction Air Quality Management Plan – identifies procedures for the management of dust and odour, including measures to manage stockpiles
- M7-M12 Integration project Construction Waste and Resources Management Plan – addresses the management of waste including the classification and handling of spoil
- M7-M12 Integration project Sustainability Management Plan – has been developed under the overarching Project Sustainability Strategy, which sets out a framework covering energy management, workforce travel, resource use and procurement to minimise and manage greenhouse gas (GHG) emissions.

## 1.6 Consultation

### 1.6.1 Consultation for preparation of this Plan

As described in Section 1.1, the CEMP will be developed in a two-step process. This Plan and Monitoring Program incorporates the relevant information and requirements of the M7 Widening and M12 East package.

M7 Widening components of the M7-M12 Integration project CEMP and Sub-plans are subject to the consultation requirements as identified in M7 CoA 1H, C4 and C9.

In accordance with M7 CoA C4(d), the M7 Widening components of this CSWMP will be prepared in consultation with DPE Water, Water NSW and relevant councils (Blacktown City Council, Fairfield City Council and Liverpool City Council). DPE Water provided feedback noting that approval would be required prior to the construction of any water supply works if they are not assessed through the State significant infrastructure approval process. No water supply works are proposed as part of M7 Widening. If water supply works are required, appropriate approval would be obtained.

WaterNSW confirmed that the CSWMP incorporates all previous comments, considerations and WaterNSW requirements as requested. These comments specifically concerned erosion and sediment controls, no groundwater interference with the Upper Canal structure and surface water controls. As such, WaterNSW had no further comments on the CSWMP.

Blacktown City Council confirmed they had no comments on the CSWMP.

Fairfield City Council provided feedback that they would like to see more information on flood impacts and the Stream Erosion Index for discharge to receiving waters. This detailed information is related to operation stormwater management and is outside the scope of this CSWMP. Given the relatively small footprint of the project relative to the size of the creek catchments crossed by the project, it is unlikely that a SEI of 2.0 would be exceeded.

Liverpool City Council identified that the M7 Widening would increase impervious areas and resulting in increased stormwater runoff and pollution to receiving water bodies. This comment is related to operation stormwater management and as such is out of the scope of this Plan, however the design and operational stormwater infrastructure will be in accordance with project targets and objectives for both detention and water quality management. Water quality management measures, such as spill containment basins, will be retained or upgraded as part of the project.

The M12 East package components of this CSWMP have been written under, and are consistent with the M12 Motorway OSWMP and therefore no further external consultation was required for the

M12 East package components of this Plan, other than acceptance by WSO Co, TfNSW and the ER.

### 1.6.2 Consultation for preparation of the OCSWMP

The M12 Motorway OCSWMP and Overarching Construction Soil and Water Monitoring Program were prepared in consultation with the following government agencies and stakeholders in accordance with M12 CoA C4(e), C7, C11(b) and C11(c):

- DPE Water
- Sydney Water (where Sydney Water's assets are affected or where it is proposed to discharge groundwater into Sydney Water assets)
- Penrith City Council
- Liverpool City Council
- Fairfield City Council.

It is noted that although M12 CoA C4(e), C7, C11(b) and C11(c) requires consultation with DPE Water, consultation has been completed through Natural Resources Access Regulator (NRAR). This is deemed appropriate, as NRAR formed part of the NSW Government's reform of water management and is considered an independent regulator for compliance and enforcement of water management legalisation in NSW.

Key matters raised by stakeholders and how they have been addressed are outlined in the M12 Motorway OCSWMP including consultation evidence in accordance with M12 CoA C4 and A5. As stated in Section 1.6.1, no further consultation for the M12 East package components of this Plan is required.

### 1.6.3 Ongoing consultation during construction

During construction, changes may occur that potentially change the compliance status of this CSWMP with the OCEMP, or as a result of the review and improvement process in Section 8 of this Plan, which require this Plan to be updated. Where these changes are not considered 'minor' by the ER, further consultation with the relevant stakeholders will occur, if required.

Ongoing consultation between John Holland, WSO Co, TfNSW, the M12 Central package, other construction projects, and stakeholders, the community and relevant agencies regarding the management of soil and water impacts will be undertaken during the construction of the M7-M12 Integration project as required, including consultation with relevant agencies via the Environmental Review Group (ERG) in accordance with the requirements of G36. Consultation with appropriate specialists to assess the significance of unexpected finds and the development of management options for these finds will also be undertaken where required in accordance with G36 4.8 f(iii). The process for consultation is described in the M7-M12 Integration project Communication Management Plan. Consultation for the M12 East package components of the plan will be consistent with the M12 Motorway OCS.

John Holland will liaise with nearby residential or commercial property owners to determine any water discharge requirements (i.e. frequency of discharge, volumes, water quality criteria, etc.) and make allowances in the design and construction of the temporary waterway crossings or diversions for such requirements.

John Holland will adopt the requirements of the Complaints Management System, including reporting requirements, detailed in the Communication Management Plan and summarised in Section 6.5.5 of the CEMP.

# 2 Purpose and objectives

## 2.1 Purpose

The purpose of this CSWMP is to describe how John Holland will manage potential impacts on soil and water during construction of the M7-M12 Integration project.

## 2.2 Objectives

The key objective of the CSWMP is to ensure that soil and water impacts as a result of construction of the M7-M12 Integration project are minimised. To aid in achieving this objective, all CoA, REMMs and licence/permit requirements relevant to soil and water including water quality are described, scheduled and assigned responsibility as outlined in:

- M7 Widening EAD
- M7 Widening NSW Infrastructure Approval CoA (SSI-663-Mod-6)
- M12 EAD
- M12 Motorway NSW Infrastructure Approval CoA (SSI 9364) granted on 23 April 2021
- M12 Motorway Commonwealth CoA (EPBC 2018/8286) granted on 3 June 2021
- TfNSW specifications
- TfNSW Sustainability Plan 2021
- Environment Protection Licence
- TfNSW specifications
- All relevant legislation and other requirements described in Section 3.1 of this Plan.

## 2.3 Targets

Targets for the management of soil and water impacts during the M7-M12 Integration project include:

- Full compliance with relevant legislative requirements, CoA and REMMs
- Full compliance with EPL water quality discharge parameters for all planned basin discharges
- Manage potential downstream water quality impacts during the construction of the M7-M12 Integration project through the implementation of feasible and reasonable water quality management measures, such as those detailed in Section 6
- All construction personnel to undergo site induction training which will include detail on soil and water management during construction
- 100% achievement of water quality objectives i.e. all monitoring results are to demonstrate no adverse impact to environmental values described in this Plan as a result of project activities
- Manage complaints from the community and stakeholders regarding surface water, ground water and soil in accordance with the complaints management process detailed in the Communication Management Plan and summarised in Section 6.5.5 of the CEMP.

## 2.4 Performance objectives

Performance outcomes identified in Section 9.9 of the M7 Widening Modification Report that are relevant to soil and water management during construction of the M7 Widening are identified in Table 2-1. Performance outcomes relevant to soil and water management during the construction of the M12 East package identified in Table 4-1 of Appendix A of the M12 Motorway EIS are outlined in Table 2-2.

*Table 2-1: M7 Widening performance outcomes*

| Performance outcome | How performance outcome will be achieved | Source |
|---|---|---|
| FLOODING<br>• Flood risk would be present during construction, but is considered manageable<br>• Detailed construction planning will be undertaken to consider flood risk at construction sites<br>• The impact of the proposed modification on flood behaviour during operation will be confirmed during detailed design. This should include consideration of future climate change and a partial blockage of the stormwater drainage system. | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8.<br>Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B (Construction Soil and Water Quality Monitoring Program).<br>Options to improve the flood immunity of the shared path near Ash Road, Prestons will be provided as part of detailed design reporting in accordance with M7 REMM SW12. | Mod 6 Widening, Section 9.9, Table 9-11 |
| WATER – QUALITY AND HYDROLOGY<br>• Water Quality Objectives (WQOs) and criteria were based on the NSW WQOs and the Healthy Rivers Commission (HRC) WQOs.<br>• Surface water and groundwater interactions may be impacted in localised areas during construction activities due to specific areas of temporary dewatering and/ or due to the reshaping of waterways and embankments to accommodate the bridge works<br>• With the application of appropriate controls and measures (e.g. in accordance with the Blue Book), the potential impacts to surface water and groundwater are considered to be minor and manageable<br>• A Soils and Water Management Plan will be prepared to guide construction of the proposed modification. | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8.<br>Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B. | Mod 6 Widening, Section 9.9, Table 9-11 |

| Performance outcome | How performance outcome will be achieved | Source |
|---|---|---|
| SOILS AND CONTAMINATION<br>• Without mitigation measures applied, there Is potential for existing or new contamination to be caused<br>• Without mitigation measures applied, there is potential for existing or new contamination to be caused<br>• Mitigation measures including targeted Detailed Site Investigations (DSIs), implementation of a Soil and Water Management Plan (SWMP) and procedures for the management of saline soils and potential inland acid sulfate soils would minimise the risk of adverse impacts to ecological and human receptors during construction<br>• Any adverse impacts from contamination during operation would be managed by the implementation of an Operational Environmental Management Plan (OEMP) and assessment of redundant construction areas for future land uses | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8.<br>Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B. | Mod 6 Widening, Section 9.9, Table 9-11 |

*Table 2-2: M12 East package performance outcomes*

| Performance outcome | How performance outcome will be addressed | Source |
|---|---|---|
| FLOODING<br>• Meet flooding criteria determined during project detailed design<br>• Maintain the performance of the downstream drainage network during operation<br>• Existing upstream and downstream flooding conditions are not increased during construction or operation. | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8.<br>Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B (Construction Soil and Water Quality Monitoring Program). | EIS, Appendix A Table 4-1 |
| WATER - HYDROLOGY<br>• Cuttings and ground penetration are designed and constructed to minimise groundwater inflow<br>• Reuse of treated water during construction is maximised | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8. | EIS, Appendix A Table 4-1 |

| Performance outcome | How performance outcome will be addressed | Source |
|---|---|---|
| • The need to adjust creek lines is minimised and where required, sensitive riparian restoration of adjusted creek lines is implemented to protect ecological values and hydrological processes<br>• Changes to downstream flow characteristics of creeks and minor drainage lines (volume, velocity) do not result in adverse impacts on private property (such as farm dams). | Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B. | |
| WATER – QUALITY<br>• Existing water quality of watercourses impacted by the project is protected<br>• Water quality discharge criteria are established with consideration of NSW Water Quality Objectives<br>• Stormwater runoff from the project is effectively treated to meet water quality discharge criteria. | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8.<br>Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B. | EIS, Appendix A Table 4-1 |
| SOILS<br>• Erosion and sediment controls are implemented in accordance with relevant guidelines and standards<br>• Potential acid sulfate soils are managed in accordance with good practice measures<br>• Potentially contaminated lands are managed effectively.<br>• Contamination is managed to protect environmental values and human health. | Implement this CSWMP, particularly the soil and water management measures in Section 6 which have been developed to consider the requirements in Sections 3.1 to 3.8.<br>Undertake training, monitoring and inspections as summarised in Section 7.2, Section 7.4 and Appendix B. | EIS, Appendix A Table 4-1 |

# 3 Environmental requirements

In accordance with NSW M12 CoA A7 and M7 CoA 1G, references in the terms of this Plan to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of the Infrastructure Approval (SSI 663) unless otherwise approved by the Planning Secretary.

## 3.1 Relevant legislation and guidelines

### 3.1.1 Legislation

Legislation and regulations relevant to soil and water quality management include:

- *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*
- *Fisheries Management Act 1994*
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Work Health and Safety Act 2011* (WHS Act)
- *Contaminated Land Management Act 1997* (CLM Act)
- *Water Act 1912*.

Relevant provisions of the above legislation are identified in the register of legal requirements included in Appendix A1 of the CEMP.

### 3.1.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this CSWMP, including the Construction Soil and Water Quality Monitoring Program provided in Appendix B include:

- Acid Sulfate Soil Manual (ASSMAC, 1998)
- Acid Sulfate Soil and Rock – Victorian EPA Publication 655.1 – July 2009
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECC, 2008)
- AS/NZS 5667.1.1988 (R2016) Water quality -Sampling Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000)
- Bunding and Spill Management Guidelines contained within EPA Environmental Protection Manual for Authorised Officers (EPA, 1995)
- Code of Practice for Water Management - Road Development and Management (RTA, 1999)
- Department of Environment and Conservation (DEC): Bunding & Spill Management. Insert to the Environment Protection Manual for Authorised Officers - Technical section "Bu" November 1997
- Environmental Best Management Practice Guideline for Concreting Contractors (DEC, 2004)

- Environmental Direction: Management of Tannins from Vegetation Mulch, Roads and Maritime Services: Sydney (RMS, 2012)
- Erosion and Sediment Management Procedure – RTA Procedures PN 143P (RTA, 2009)
- Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries (Fairfull, 2003)
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings (Ref: NSWF – 1181) (NSW Fisheries, November 2003)
- Guideline for Construction Water Quality Monitoring (RTA, 2003)
- Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012)
- Guidelines for controlled activities on waterfront land – Riparian Corridors (NRAR, 2018)
- Guidelines for the Management of Acid Sulphate materials: Acid Sulphate Soils, Acid Sulphate Rock and Monosulphidic Black Ooze (RTA, 2005)
- Infrastructure Sustainability Council of Australia Technical Manual v1.2 (ISCA, 2016)
- Managing Urban Stormwater: Soils and Construction Volume 1, Landcom, (4th Edition) March 2004 (reprinted 2006) (the “Blue Book”)
- Managing Urban Stormwater: Soils and Construction Volume 2A Installation of Services (DECCW, 2008)
- Managing Urban Stormwater: Soils and Construction Volume 2C Unsealed Roads (DECCW, 2008)
- Managing Urban Stormwater: Soils and Construction Volume 2D Main Roads Construction (DECCW, 2008)
- NSW Aquifer Interference Policy (NSW DPI - Office of Water, 2012)
- Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013)
- Roads and salinity (Department of Infrastructure, Planning and Natural Resources (DIPNR, 2003)
- Roads and Maritime Environment Direction Management of Tannins from Vegetation Mulch (RMS, 2012)
- Roads and Maritime Management of Wastes on Roads and Maritime Services Land (RMS, 2014)
- Stockpile Site Management Guideline (RMS, 2011)
- Stockpile Site Management Procedures (RTA, 2011)
- Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005) (no longer in force but has been retained ‘for information’)
- Technical Guideline – Environmental Management of Construction Site De-watering (RMS, 2011)
- Technical Guideline: Temporary Stormwater Drainage for Road Construction (RMS, 2011)
- TfNSW Code of Practice for Water Management
- TfNSW Water Discharge and Reuse Guideline (TfNSW, 2016)
- TfNSW Specification G36 – Environmental Protection (Management System)
- TfNSW Specification G38 – Soil and Water Management
- TfNSW Specification G40 – Clearing and Grubbing
- TfNSW Specification R272 - Automatic Weather Stations.

TfNSW specifications are a key source of environmental protection management processes relevant to this CSWMP. The specifications set out environmental protection requirements, including Hold Points that must be complied during construction of the M7-M12 Integration project. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW. Refer to Section 7.5 for a list of Environmental Hold and Witness Points relevant to this Plan.

## 3.2 Minister's Conditions of Approval

The primary NSW M7 CoA and M12 CoA relevant to the development of this CSWMP are listed in Table 3-1 below. Secondary CoA relevant to this Plan have been listed in Appendix A. A cross reference is also included to indicate where the CoA is addressed in this CSWMP or other project management documents.

*Table 3-1: Primary CoAs*

| CoA No. | Condition requirement | Document reference |
|---|---|---|
| M7 Widening CoA | | |
| 1H | Where terms of the conditions identified in Condition 1B or in Schedule 2 require consultation to be undertaken, evidence of the consultation undertaken must be submitted to the Planning Secretary and ER (as relevant) with the corresponding documentation. The evidence must include: | Section 1.6.1 of this CSWMP<br>Consultation evidence |
| | (a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval; | |
| | (b) a log of the dates of engagement or attempted engagement with the identified party; | |
| | (c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations; | |
| | (d) outline of the issues raised by the identified party and how they have been addressed; and | |
| | (e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed. | |
| C2 | The CEMP must provide:<br>(h) a list of all the CEMP Sub-plans required in respect of construction, as set out in Condition C4. Where staged construction of Modification 6 is proposed, the CEMP must also identify which CEMP Sub-plan applies to each of the proposed stages of construction; | Section 3.3.1 of CEMP |
| | (k) for training and induction for employees, including contractors and sub-contractors, in relation to environmental and compliance obligations under the terms of this approval; | Section 6.4 of CEMP<br>Section 7.2 of this CSWMP |
| C4 | The following CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant CEMP Sub-plan, including copies of all correspondence from those agencies as required by Condition 1H of Schedule 1. | Section 1.6.2 of this CSWMP |
| | (d) Soil and Water – DPE Water, Water NSW and relevant council(s) | This CSWMP<br>CEMP Appendix B5 |
| | *Note: CEMP Sub-plan(s) may reflect the construction of the project through geographical activities, temporal activities or activity based staging.* | |

| CoA No. | Condition requirement | Document reference |
|---|---|---|
| C5 | The CEMP Sub-plans must state how:<br>(a) the environmental performance outcomes identified in the documents listed in Condition A1 of Schedule 1 will be achieved; | Section 2.4 of this CSWMP |
| | (b) the mitigation measures identified in the documents listed in Condition 1A of Schedule 1 will be implemented; | Section 3.3 and Section 6 and Appendix A of this CSWMP |
| | (c) the relevant terms of this approval will be complied with; and | Section 3.2 and Appendix A this CSWMP |
| | (d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles. | Section 1.4, Section 5.3, Section 6 and Section 8 of this CSWMP |
| C6 | Construction must not commence until the relevant CEMP(s) and CEMP Sub-plans have been approved by the Planning Secretary. | Section 1.5.1 of this CSWMP |
| C7 | The CEMP(s) and CEMP Sub-plans as approved, including any minor amendments approved by the ER, must be implemented for the duration of construction. | Section 1.4 of this CSWMP |
| C8 | The Soil and Water Management Plan (SWMP) must be prepared in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008) and be prepared by a suitably qualified person either certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme.<br>The SWMP must include, but not be limited to: | Section 1.5.1 and Section 3.1.2 of this CSWMP |
| | (a) the erosion and sediment control measures for areas of low contamination risk; | Section 4.1.6 and Section 6 of this CSWMP |
| | (b) the erosion and sediment control measures for areas of moderate to high contamination risk; | Section 4.1.6, Section 6 and Appendix D of this CSWMP |
| | (c) adopted assessment criteria for proposed discharges, and how these would be measured; | Section 6.8 and Appendix C of this CSWMP |

| CoA No. | Condition requirement | Document reference |
|---|---|---|
| | (d) a surface water monitoring program for areas of moderate to high contamination risk for contaminants of potential concern (CoPC), and | Appendix B of this CSWMP |
| | (e) a dewatering management plan (DMP), that identifies and manages water contamination risks and identifies licensed waste facilities where contaminated groundwater will be disposed. | Appendix C of this CSWMP |
| | *Note: If a NSW EPA accredited Site Auditor is required under Condition D68, the contamination aspects of the SWMP may need to be updated following any potential advice from the Site Auditor regarding the appropriateness of management measures.* | |
| C9 | The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of Modification 6 against the performance predicted in the documents listed in Condition 1A of Schedule 1 or in the CEMP: | Section 1.5.1 and Appendix B of this CSWMP |
| | (b) Surface Water Quality Program – DPE Water and relevant council(s) | Section 1.5.1 and Appendix B of this CSWMP |
| M12 Motorway CoA | | |
| A5 | Where the terms of this approval require a document or monitoring program to be prepared or a review to be undertaken and submitted to the Planning Secretary, and the terms of this approval require the document, monitoring program or review to be prepared/undertaken in consultation with identified parties, evidence of the consultation must be submitted to the Planning Secretary with the relevant document, monitoring program or review. The evidence must include: | OCSWMP – Appendix A<br>Table 1-1, Section 1.5 of OCSWMP |
| | (a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval; | OCSWMP – Appendix A<br>Table 1-1, Section 1.5 of OCSWMP |
| | (b) a log of the dates of engagement or attempted engagement with the identified party; | OCSWMP – Appendix A<br>Table 1-1, Section 1.5 of OCSWMP |
| | (c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations; | OCSWMP – Appendix A<br>Table 1-1, Section 1.5 of OCSWMP |
| | (d) outline of the issues raised by the identified party and how they have been addressed; and | OCSWMP – Appendix A<br>Table 1-1, Section 1.5 of OCSWMP |
| | (e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed. | OCSWMP – Appendix A<br>Table 1-1, Section 1.5 of OCSWMP |

| CoA No. | Condition requirement | Document reference |
|---|---|---|
| C2 | The CEMP must provide:<br>(h) a list of all the CEMP Sub-plans required in respect of construction, as set out in Condition C4 Where staged construction of the Critical State Significant Infrastructure (CSSI) is proposed, the CEMP must also identify which CEMP Sub-plan applies to each of the proposed stages of construction; | Table 3-1 of OCEMP<br>Section 3.3.1 of CEMP |
| | (k) for periodic review and update of the CEMP and all associated plans and programs. | Section 8.7 of CEMP<br>Section 8.1 to 8.3 of this CSWMP |
| C4 | The following CEMP Sub-plans must be prepared in consultation with the relevant government and other agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant CEMP Sub-plan, including copies of all correspondence from those agencies as required by Condition A5. | Section 1.6.2 of this CSWMP<br>CCLMP<br>OCSWMP – Appendix A |
| | (d) Soil and contamination – DPE Water, Water NSW and relevant council(s) | This CSWMP<br>CEMP Appendix B5 |
| | (e) Surface water and groundwater - DPE Water, Water NSW, Sydney Water (if there are discharges to its assets) and relevant council(s) | This CSWMP |
| | *Note: Nothing in this condition prevents the Proponent from combining any of the above CEMP Sub-plans.* | |
| C5 | The CEMP Sub-plans must state how: | |
| | (a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved; | Section 2.4 of this CSWMP |
| | (b) the mitigation measures identified in the documents listed in Condition A1 will be implemented; | Section 3.3 and Section 6 of this CSWMP<br>Appendix A of this CSWMP<br>Section 6 of OCSWMP |
| | (c) the relevant terms of this approval will be complied with; and | Section 3.2 and Appendix A of this CSWMP |
| | (d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART (Specific, Measurable, Achievable, Realistic and Timely) principles. | Section 1.4 and Section 5.3 of this CSWMP |

| CoA No. | Condition requirement | Document reference |
|---|---|---|
| C7 | The Surface Water and Groundwater CEMP Sub-Plan must be based on a detailed site investigation of contamination risk and include, but not be limited to: | Section 3.1.2 of this CSWMP |
| | (a) details of water pollution mitigation measures including measures to avoid and minimise discharges; | Section 6 and Section 7.1 of this CSWMP |
| | (b) identification of the relevant ambient water quality objectives for receiving waterways and water quality management criteria for achieving the objectives; and | Appendix B of this CSWMP |
| | (c) a Trigger Action Response Protocol for potential discharge waters, identifying alternative disposal options for water with contaminant concentrations exceeding water quality management criteria. | Section 6.8 and Appendix C of this CSWMP |
| C9 | Any of the CEMP Sub-plans may be submitted to the Planning Secretary for approval along with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before the commencement of construction. | Section 1.10 of OCSWMP |
| C10 | Construction must not commence until the CEMP and all CEMP Sub-plans have been approved, unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary, including any minor amendments approved by the ER 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 endorsed by the ER and approved by the Planning Secretary. | Section 1.10 and Section 2.3 of OCEMP<br>Section 1.5.1 of OCSWMP |
| C11 | The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP: | Section 1.6.2 and Appendix B of this CSWMP |
| | (b) Surface Water Monitoring Program - DPE Water, Sydney Water (if there are any discharges to their assets), relevant councils | Section 1.6.2 and Appendix B of this CSWMP<br>Section 3.2 and 4.1 of OCSWMP |
| | (c) Groundwater Monitoring Program - DPE Water | Section 1.6.2 and Appendix B of this CSWMP<br>Section 1.5 of Appendix C of OCSWMP<br>Appendix A OCSWMP |

## 3.3 Revised Environmental Management Measures

The primary M7 REMMs and M12 REMMs relevant to the development of this CSWMP are listed in Table 3-2 below. Secondary REMMs relevant to this CSWMP are listed in Appendix B. The primary REMMs relevant to the Construction Surface Water Quality Monitoring Program are included in Appendix B. A cross reference is also included to indicate where the REMM is addressed in this CSWMP or other project management documents.

*Table 3-2: Primary REMMs*

| ID | Measure/requirement | Timing | Document reference |
|---|---|---|---|
| M7 REMMs | | | |
| SW1 | A Soil and Water Management Plan (SWMP) will be prepared as part of the proposed modification. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land. The SWMP will include: | Prior to construction<br>During construction | This CSWMP |
| | Measures to minimise/manage erosion and sediment transport both within the construction footprint and offsite, including requirements for the preparation of erosion and sediment control plans (ESCP) for all progressive stages of construction | Prior to construction | Section 6.1 and Appendix D of this CSWMP |
| | Measures to manage runoff from spoil and waste storage areas | Prior to construction | Section 6.5 and Appendix G of this CSWMP<br>CWRMP |
| | Procedures to manage unexpected or previously unidentified contaminants | Prior to construction | Appendix M of this CSWMP<br>CWRMP |
| | Measures to manage stockpiles, including locations, separation of waste types, sediment controls and stabilisation | Prior to construction | Section 6.5 and Appendix G of this CSWMP<br>CWRMP |
| | Groundwater management measures to limit the risk of exposure to contaminated groundwater | Prior to construction | Sections 6.7 and 6.8, Appendix C of this CSWMP |
| | Controls to manage the risk posed to workers from exposure to contaminated groundwater (if encountered) | Prior to construction | CCLMP |

| ID | Measure/requirement | Timing | Document reference |
|---|---|---|---|
| | Processes for dewatering of water that has accumulated on site and from sediment basins, including relevant discharge criteria | Prior to construction | Sections 6.7 and 6.8, Appendix C of this CSWMP |
| | Measures to manage potential tannin leachate | Prior to construction | Section 6.6 and Appendix F of this CSWMP |
| | Measures to manage accidental spills, including the requirement to maintain materials such as spill kits | Prior to construction | Section 6.13 and Appendix K of this CSWMP |
| | Measures to manage potential saline soils | Prior to construction | Section 6.3 and Appendix L of this CSWMP |
| | Details of surface water and groundwater quality monitoring to be undertaken prior to, throughout, and following construction | Prior to construction<br>During construction | Sections 4.2, 4.3 and Appendix B of this CSWMP |
| | Enhanced sediment and erosion controls be implemented in areas where it is identified that contamination poses a risk to surface water quality. | During construction | Section 6.1 and Appendix D of this CSWMP |
| | Erosion and sediment control measures will be implemented and maintained at all work sites in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (DPIE, 2004) and Volume 2D (DECC, 2008a), commonly referred to as the 'Blue Book,' as well as relevant Transport Guidelines. | Prior to construction<br>During construction | Section 6.1 and Appendix D of this CSWMP |
| C1 | A Soil and Water Management Plan (SWMP) will be implemented during construction and incorporate the following measures: | During construction | This CSWMP |
| | Worker health and safety measures, waste management (including stockpiling) and tracking for contamination | During construction | Section 6.5, Appendix G and Appendix N of this CSWMP<br>CWRMP |
| | Register of known or suspected areas of contamination (from site investigations) and areas requiring remediation | During construction | Appendix L of this CSWMP |
| | An unexpected finds procedure to manage previously unidentified chemical or asbestos contamination | During construction | Appendix M of this CSWMP |
| | Asbestos Management Plan for areas where ACM and/or friable asbestos is likely to be encountered, with the plan including worker health and safety measures | During construction | Appendix N of this CSWMP |

| ID | Measure/requirement | Timing | Document reference |
|---|---|---|---|
| | Testing procedures to determine the actual presence of acid sulfate soils prior to ground disturbance activities | During construction | Appendix L of this CSWMP |
| | Testing procedures to determine the presence of saline soils prior to ground disturbance activities | During construction | Appendix B of this CSWMP |
| | Process for testing, treating and discharging water from site to meet applicable water quality limits. | During construction | Appendix C of this CSWMP<br>EPL |
| | Site-specific Erosion and Sediment Control Plan which will identify detailed measures and controls, that are consistent with the practices and principles in the current guidelines, to be applied to minimise erosion and sediment control risks. These include, but not necessarily limited to: runoff, diversion and drainage points; use of sediment basins and sumps; scour protection; stabilising disturbed areas as soon as possible, check dams, fencing and swales; and staged implementation arrangements | During construction | Appendix E and Appendix D of this CSWMP |
| | Appropriate management criteria and responses to identify and manage water pollution risks associated with potentially contaminated stormwater | During construction | |
| | Measures to avoid the discharge of contaminated runoff. The assessment criteria for discharges from contaminated areas would be based on applicable WQOs (refer Table 7.4 of the SWFIA in Appendix G). | During construction | Appendix D and Appendix B of this CSWMP |
| M12 REMMs | | | |
| SWH01 | A Construction Soil and Water Management Plan (CSWMP) will be prepared for the project. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land. The CSWMP will provide: | Prior to construction | This CSWMP |
| | Measures to minimise/manage erosion and sediment transport both within the construction footprint and offsite including requirements for the preparation of Erosion and Sediment Control Plans (ESCP) for all progressive stages of construction | Prior to construction | Section 6.1 and Appendix D of this CSWMP |
| | Measures to manage waste including the classification and handling of spoil | Prior to construction | CWRMP |

| ID | Measure/requirement | Timing | Document reference |
|---|---|---|---|
| | Procedures to manage unexpected contaminated finds including asbestos which would be outlined in the Contaminated Land Management Plan and asbestos management plan to be prepared for the Project | Prior to construction | CCLMP |
| | Measures to manage stockpiles including locations, separation of waste types, sediment controls and stabilisation | Prior to construction | Section 6.5 and Appendix G of this CSWMP<br>CWRMP |
| | Measures to manage groundwater de-watering and impacts including mitigation required | Prior to construction | Sections 6.7 and 6.8, Appendix C of this CSWMP |
| | Processes for de-watering of water that has accumulated on site and from sediment basins, including relevant discharge criteria | Prior to construction | Section 6.8 and Appendix C of this CSWMP |
| | Measures to manage potential tannin leachate | Prior to construction | Section 6.6 and Appendix F of this CSWMP |
| | Measures to manage accidental spills including the requirement to maintain materials such as spill kits | Prior to construction | Section 6.13 and Appendix K of this CSWMP |
| | Measures to manage potential saline soils | Prior to construction | Section 6.3 of this CSWMP |
| | Details of surface water and groundwater quality monitoring to be carried out before, throughout, and following construction | Prior to construction | Sections 4.2 and 4.3 and Appendix B of this CSWMP |
| | Controls for sensitive receiving environments including SEPP Coastal Wetlands which may include but not be limited to:<br>Designation of ‘no go’ zones for construction plant and equipment<br>Creation of catch/diversion drains and sediment fences at the downstream boundary of construction activities where practicable to ensure containment of sediment-laden runoff and diversion toward sediment sump treatment areas (not sediment basins) to prevent flow of runoff to the SEPP Coastal Wetland. | Prior to construction | Section 6 of this CSWMP, particularly:<br>Section 6.1<br>Section 6.17 |
| | Erosion and sediment control measures will be implemented and maintained at all work sites in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004) and Volume 2D (NSW Department of Environment, Climate Change | Prior to construction | Section 6.1 and Appendix D of this CSWMP |

| ID | Measure/requirement | Timing | Document reference |
|---|---|---|---|
| | and Water 2008), commonly referred to as the “Blue Book”, as well as relevant TfNSW Guidelines. | | |

## 3.4 Licences, permits and exemptions

### 3.4.1 Environment protection licence

The Project is subject to environment protection licence (EPL) no. 21829, approved 2 August 2023, as a Scheduled Activity for 'road construction'. The EPL prescribes water quality parameters to be measured and associated discharge criteria for licensed discharge points. John Holland will comply with the EPL during construction of the M7-M12 Integration project.

### 3.4.2 Water access licence

John Holland may use surface and ground water as part of the M7-M12 Integration project Water Reuse Strategy. No water will be taken from waterways or from groundwater without obtaining all required approvals and written approval from WSO Co/TfNSW.

### 3.4.3 Dredging or reclamation

NSW Department of Primary Industries (DPI) Fisheries will be notified in accordance with the Fisheries Management Act 1994 of any dredging or reclamation works including temporary watercourse crossings or in stream work platforms (refer to the Glossary/Abbreviations to this plan for the definitions of these terms).

In stream works associated with the M12 East package are limited to those in the footprint of the Ropes Creek Bridge, where a structure spanning the waterway will be constructed alongside the carriageways. A temporary watercourse crossing will be required to support vehicular movements between Ancillary Facility 9 (AF9) and Villiers Road. The EWMS for activities involving dredging or reclamation works will be prepared in consultation with DPI Fisheries. Augmentations to existing bridge structures at Maxwells Creek, Cabramatta Creek, Hinchinbrook Creek, Reedy Creek, Eskdale Creek will span the waterways and will not require in-stream works.

## 3.5 TfNSW Specifications

The TfNSW Specifications set out the minimum requirements for the detailed outcomes in terms of quality or performance expected in the finished product for construction projects and are relevant to various construction activities on work sites to minimise impacts to the environment.

This Plan incorporates the relevant requirements for soil and water management from the TfNSW Specifications prepared for the M7-M12 Integration project, including:

- TfNSW Specification G36 – Environmental Protection
- TfNSW Specification G38 – Soil and Water Management
- TfNSW Specification G40 – Clearing and Grubbing.

The specifications set out environmental protection requirements, including Hold Points and Witness Points that must be complied with during construction of the M7-M12 Integration Project package. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW. Witness Points are an identified point in the process where TfNSW request to, review, witness, inspect method and/or process of work. The activities, however, may

proceed. For processes under the CEMP, the request for release of Hold Points and Witness Points is to be made through the TfNSW ESM (or delegate).

Details of the hold points and witness points relevant to this Plan are outlined in Section 7.5. General hold points that are also relevant to this Plan are included in Section 8.6.3 of the CEMP.

Cross references to the hold points and witness points identified in Section 7.5are included in Table 7-3 and Appendix A, to indicate where the relevant TfNSW specifications have been addressed in this Plan.

## 3.6 Sustainability

John Holland is implementing the ISC technical manual and ensuring that best practice sustainability is embedded across all relevant works and environmental management practices. Soil and water will be managed under the relevant credits such as Dis-1 and Wat-1 and Wat-2 and will align with commitments made in the M7-M12 Sustainability Management Plan (M7-M12 SMP) (refer Section 1.3, Section 4.4 and Section 6.5 of the SMP).

Environmental management will be collaborative between the environment and sustainability teams, and evidence will be collated for the IS submission. Compliance with the requirements of relevant ISC credits and this Plan is summarised in Appendix J.

Some key goals and measures relevant to the above M7-M12 Integration project ISC targets are as follows:

- Minimise adverse impacts to receiving water quality values during construction and to also implement measures to ensure that there are no lasting impacts to receiving water quality values
- Monitoring of water discharges and receiving waters will be undertaken at appropriate intervals and at times of discharge during construction. Monitoring is described in further detail in Appendix B
- The M7-M12 Integration project will model water use and implement measures to reduce water use (Wat-1) and target replacement using non-potable water (Wat-2). This will also be closely monitored by the Sustainability Team. Further detail on water use reduction and non-potable water use is covered in Section 6.7 of this Plan, as well as the Sustainability Management Plan.

## 3.7 ANZECC requirements for construction

To achieve alignment with ANZECC requirements as required by ISC, John Holland will:

1. Identify the environmental values that are to be protected in a particular water body and the spatial designation of the environmental values (i.e. decide what values will apply where)
2. Identify management goals and then select the relevant water quality guidelines for measuring performance. Based on the guidelines, set water quality objectives (as relevant to flooding) that must be met to maintain the environmental values
3. Develop tactical monitoring programs focusing on the water quality objectives
4. Initiate appropriate management responses to attain (or maintain if already achieved) the water quality objectives.

## 3.8 ISC-specific Water Quality Objectives

John Holland will endeavour to reach 100% achievement of water quality objectives i.e. all monitoring results would demonstrate no adverse impact to environmental values, as specified in Section 2.1. If there are temporary or intermittent exceedances of these objectives, it must be demonstrated by the Environmental Team that there has been:

- No disruption or degradation of environmental values
- No exceedance of license limits, and
- Improvements to practices have been implemented to prevent recurrence.

If water quality objectives are exceeded, it must be demonstrated that this has not resulted in disruption to the regular uses or values of the receiving water.

At a high level, the preliminary sustainability requirements relevant to soil and water are shown in Table 3-3.

Table 3-3: Water quality-specific sustainability targets

| ISC Reference | Requirement | Document reference |
|---|---|---|
| Dis-1 | Measures to minimise adverse impacts to receiving water environmental values during construction and operation have been identified and implemented. | Table 6-2 of this CSWMP |
| Dis-1 | Monitoring of water discharges and receiving waters is undertaken at appropriate intervals and at times of discharge during construction. | SW11, SW25, SW42 in Table 6-2of this CSWMP<br>Appendix B<br>M12 CoA C17<br>M7 CoA C13<br>M12 REMM SWH01<br>M12 REMM SWH05<br>M12 REMM GW01<br>M7 REMM SW1<br>M7 REMM SW2<br>M7 REMM B8<br>TfNSW Specifications |
| Wat-1 | Monitoring and modelling of water use is undertaken | Section 6.7 of this SWMP<br>Sustainability Management Plan |
| Wat-1 | Monitoring and modelling demonstrates a reduction in water use compared to a base case footprint | Water model |

| ISC Reference | Requirement | Document reference |
|---|---|---|
| Wat-2 | Monitoring and Modelling Demonstrates that some portion of total water use is from non-potable sources (substitution for potable) | Section 6.7 of this SWMP<br>Sustainability Management Plan<br>Water Model |
| Wat-2 | Fractions of levels may be achieved on a sliding scale up to 100% for Level 3 | Water model |
| Lan-2 | Conservation of topsoil and subsoil has been considered | Section 6.5 of this SWMP |
| Lan-2 | 95% of all topsoil (by volume) retains its productivity and is beneficially re-used on or nearby to the project. | Section 6.5 of this SWMP |
| Lan-2 | Opportunities to improve topsoil productivity of previously disturbed areas have been identified and incorporated into the project | Section 6.5 of this SWMP |

# 4 Existing environment

This section summarises the existing soil and water conditions within and adjacent to the Project corridor, based on information contained in the M7 and M12 EAD. The information provided below comprises the baseline surface water and groundwater data used for the Surface Water Quality Monitoring Program (Appendix B).

The key reference documents relevant to the M12 East package are:

- Surface water quality and hydrology assessment (EIS Appendix I)
- Groundwater quality and hydrology assessment (EIS Appendix J)
- Soil and contamination assessment (EIS Appendix O)
- Surface water quality and hydrology supplementary technical memorandum (Amendment Report Appendix I)
- Groundwater quality and hydrology supplementary technical memorandum (Amendment Report Appendix J)
- Soils and contamination supplementary technical memorandum (Amendment Report Appendix K)
- Pre-construction surface and ground water monitoring reports including:
    - M12 Motorway Surface Water Monitoring Second Report 2 – April 2019 to March 2020 (GHD, 2020)
    - M12 Motorway Groundwater Monitoring Second Report 2– April 2019 to March 2020 (GHD, 2020)
    - M12 Motorway Surface Water Monitoring Report 3– April 2020 to September 2020 (GHD, 2021)
    - M12 Motorway Surface Water Monitoring Biannual Report 4 – October 2020 to March 2021 (GHD, 2021)
    - M12 Motorway Groundwater Monitoring Biannual Report 4 – October 2020 to March 2021 (GHD, 2021)
    - M12 Motorway Surface Water Monitoring Report 5 – April 2021 to September 2021 (GHD, 2021)
    - M12 Motorway Surface Water Monitoring Program Report 6 – October 2021 to March 2022 (GHD, 2022)
    - M12 Motorway Groundwater Monitoring Report 6 – October 2021 to March 2022 (GHD, 2022)
    - M12 Motorway Surface Water Monitoring Program Report 7 – April to September 2022 (GHD, 2022)
    - M12 Motorway Surface Water Monitoring Program Report 8 – October 2022 to March 2023 (GHD, 2023).

Key M7 Widening reference documents include:

- Surface Water and Flooding Impact Assessment (Modification Application Appendix G)
- Contamination Impact Assessment (Modification Application Appendix L)
- Pre-construction surface and ground water monitoring reports including:
  - Surface Water Quality Monitoring – June 2023 (EDP, 2023)
  - Surface Water Quality Monitoring – July 2023 (EDP, 2023).

## 4.1 Topography, geology and soil characteristics

### 4.1.1 Topography

The topography varies throughout the M7-M12 Integration project. Terrain between Elizabeth Hills and Eastern Creek is characterised by higher elevations and rolling hills where the topography typically comprises rounded hills with slopes of five degrees to 20 degrees, i.e. around 10 per cent to 35 per cent grade, and local relief of typically up to 10 metres to 30 metres. The elevation reaches a maximum of around 146 metres Australian Height Datum (AHD) just north of Elizabeth Drive in the Western Sydney Parklands (WSP). It is noted that the Ropes Creek floodplain intersects this general terrain type near the tie-in between the M7 Motorway and M12 East package.

At Prestons to Elizabeth Hills and from Eastern Creek to Dean Park the topography resembles flat and gently undulating, creek channels, and floodplain terrains. The elevation at its lowest level reaches 26 metres AHD near Prestons.

*Table 4-1: Summary of terrain and topography*

| Terrain Type | Location | M7 Widening | M12 Motorway | Topography |
|---|---|---|---|---|
| Rolling hills | Elizabeth Hills to Eastern Creek | ✓ | ✓ | Comprises rounded hills with slopes of five to 20 degrees. |
| Undulating hills to floodplains | Prestons to Elizabeth Hills<br>Eastern Creek to Dean Park | ✓ | - | Generally flat terrain characterised by floodplains and creek channels. |

### 4.1.2 Geology

Based on review of the Penrith 1:100,000 geological map (Clarke and Jones, 1991) and completed project geotechnical borehole logs, the M7-M12 Integration project intersects the Bringelly Shale bedrock surface geological unit as summarised in Table 4-2. The geology of the M7-M12 Interchange project area is generally shown in Figure 4-1 to Figure 4-6.

*Table 4-2: Summary of geological units*

| Geological unit | Location | Characteristics |
|---|---|---|
| Bringelly Shale bedrock (Twib) | Occurs throughout the Project area and is the dominant geological unit of the M12 East package around Cecil Hills | Upper member of the Wianamatta Group<br>Consists of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff |
| Quaternary alluvium (Qav) | Occurs throughout Prestons and Elizabeth Hills at the Project's southern extent and in some areas of Elizabeth Hills and Horsley Park | Medium grained sand, clay, and silt from the quaternary age |
| Recent sediments/fill (Qaf) | Occurs in portions of the project from Eastern Creek to Dean Park in the north of the Project footprint. | Fine grained sand, silt, and clay from the quaternary age |

Project boreholes in Bringelly Shale bedrock in the M12 East package footprint encountered siltstone, sandstone and interlaminated siltstone, and sandstone at typical depths of about one metre BGL to five metres BGL. Based on project boreholes from this area and regional experience, it is expected that where Bringelly Shale is present near the surface, ground conditions would comprise one metre to five metres of high plasticity, low permeability residual clays over highly weathered bedrock. Borehole investigations are planned under early works for the M7 Widening. Where available and required this CSWMP will be updated to include findings from borehole investigations for the M7 Widening.

No igneous intrusions are shown in the geological map, however based on previous experience with rail and road route studies throughout Sydney, it is anticipated that two to four igneous dykes/intrusions may be present.

The M12 East package may be crossed at one location by faulting or folding including the Rossmore Anticline. This feature is described as a structural high within the Wianamatta Group. The geological map shows this feature ending at Elizabeth Drive, just to the east of the intersection with Luddenham Road. However, this feature may extend further north, crossing the western end of the Project footprint. If this is the case, then bedrock bedding dips in the vicinity of such a feature could be altered and potentially dipping to the west on the western side of this structure.

The M7 Widening footprint intercepts a lineament about 500 metres south of the approved M12 East package. The M7 Widening footprint also intersects a fold for about 3.5 km starting north of the M7 Motorway intersection with the Great Western Highway up to the M7 Motorway intersection with Woodstock Avenue to the north.

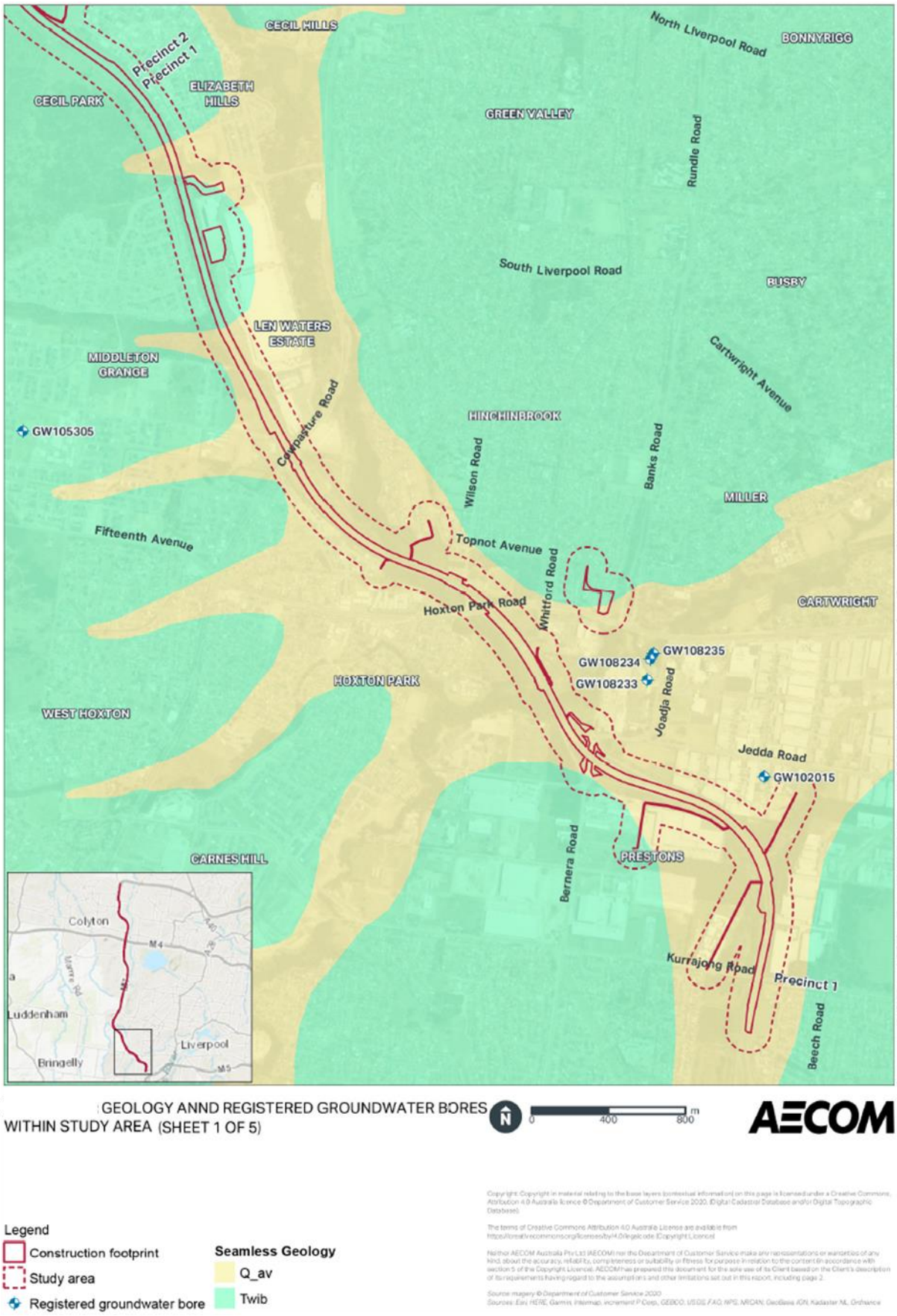



*Figure 4-1: Regional geology from Prestons to Elizabeth Hills*

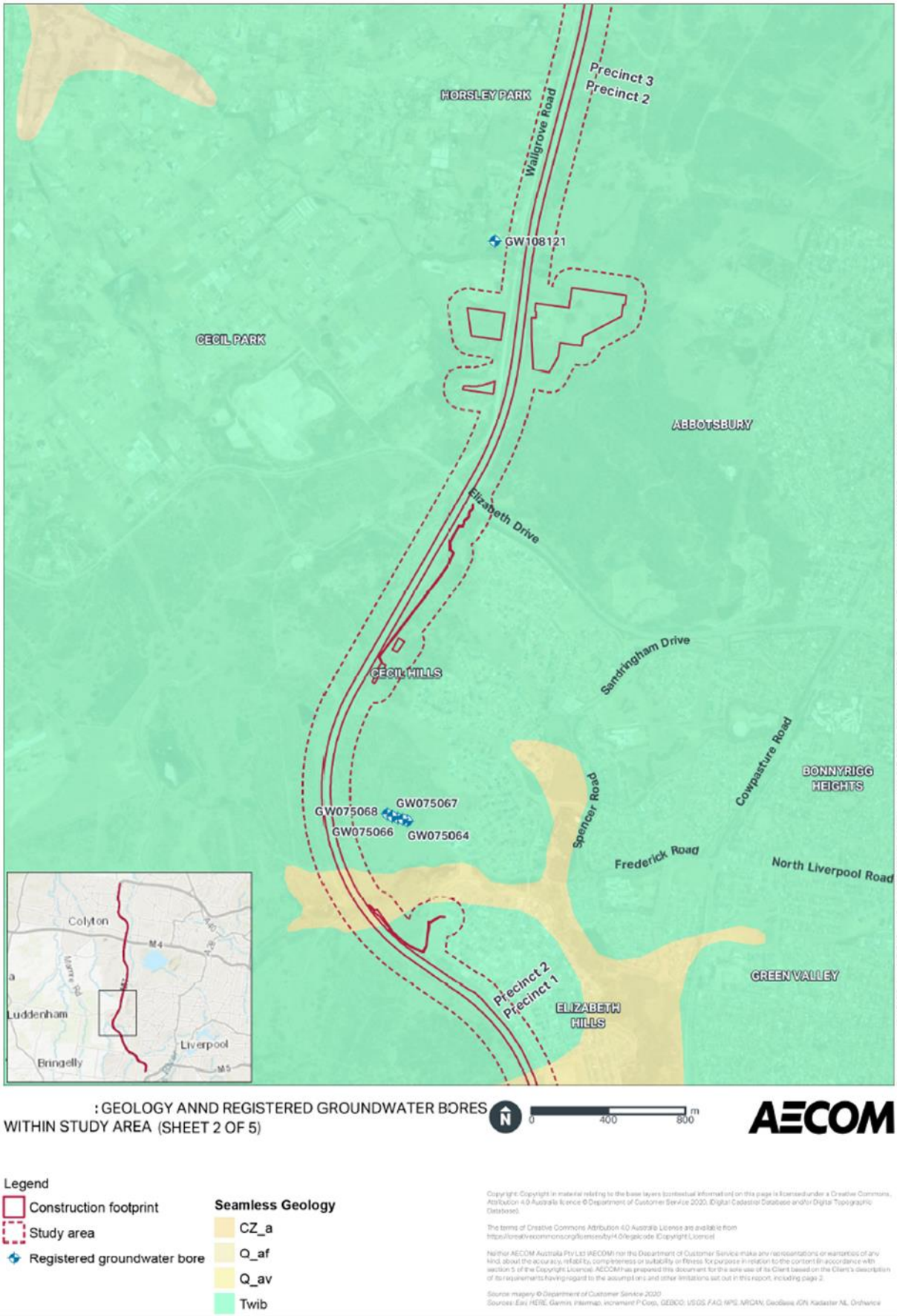



*Figure 4-2: Regional geology from Elizabeth Hills to Horsley Park*

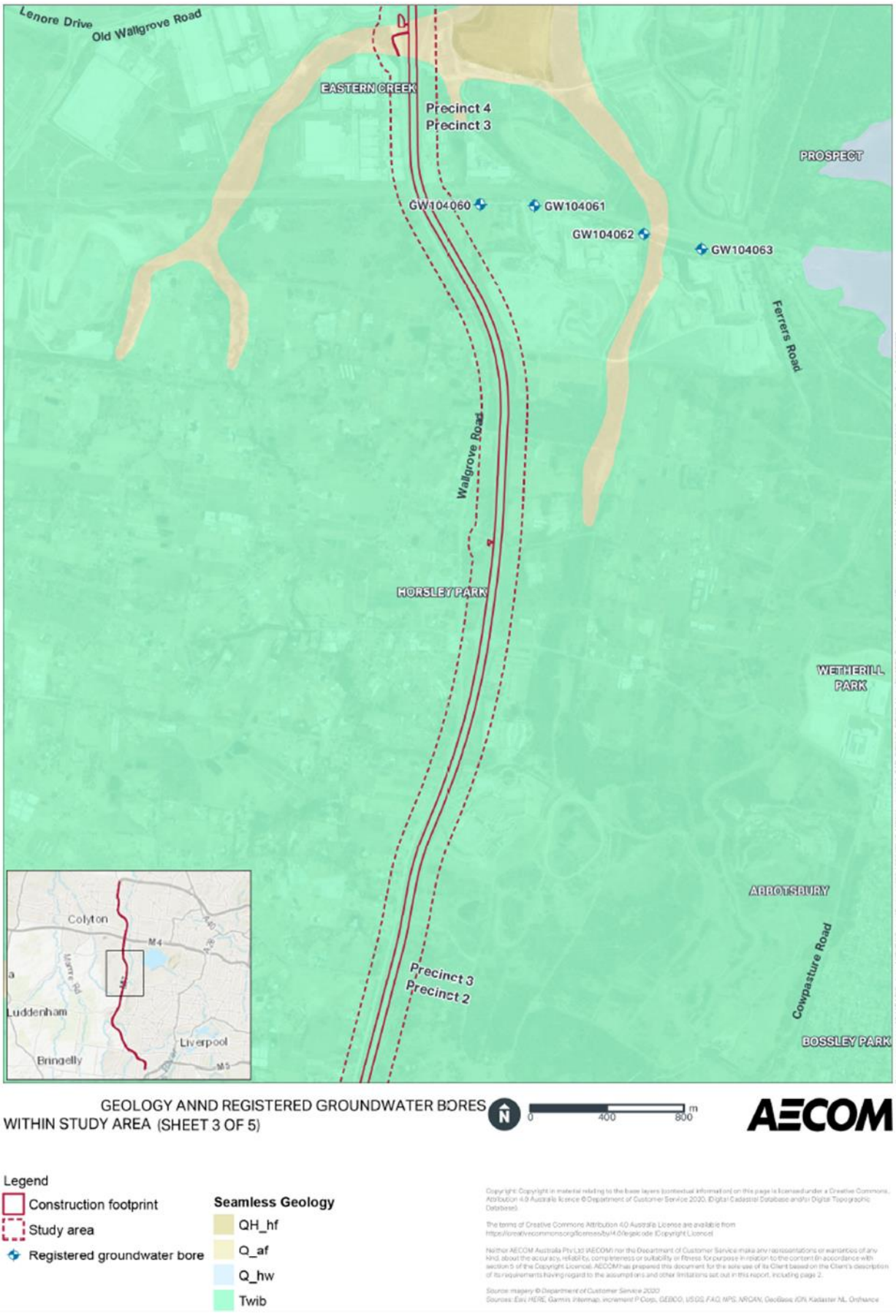



*Figure 4-3: Regional geology from Horsley Park to Eastern Creek*

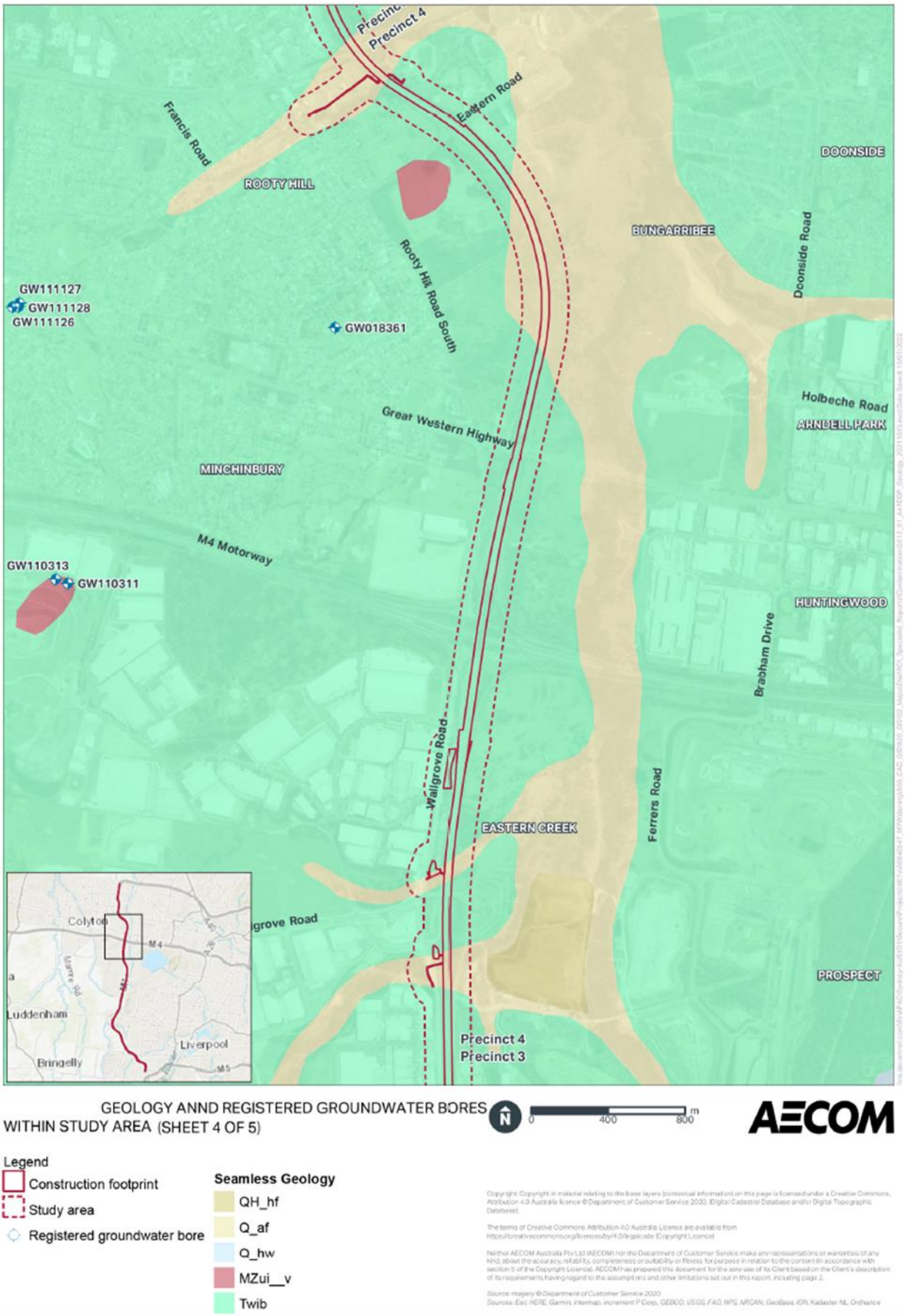



*Figure 4-4: Regional geology from Eastern Creek to Rooty Hill*

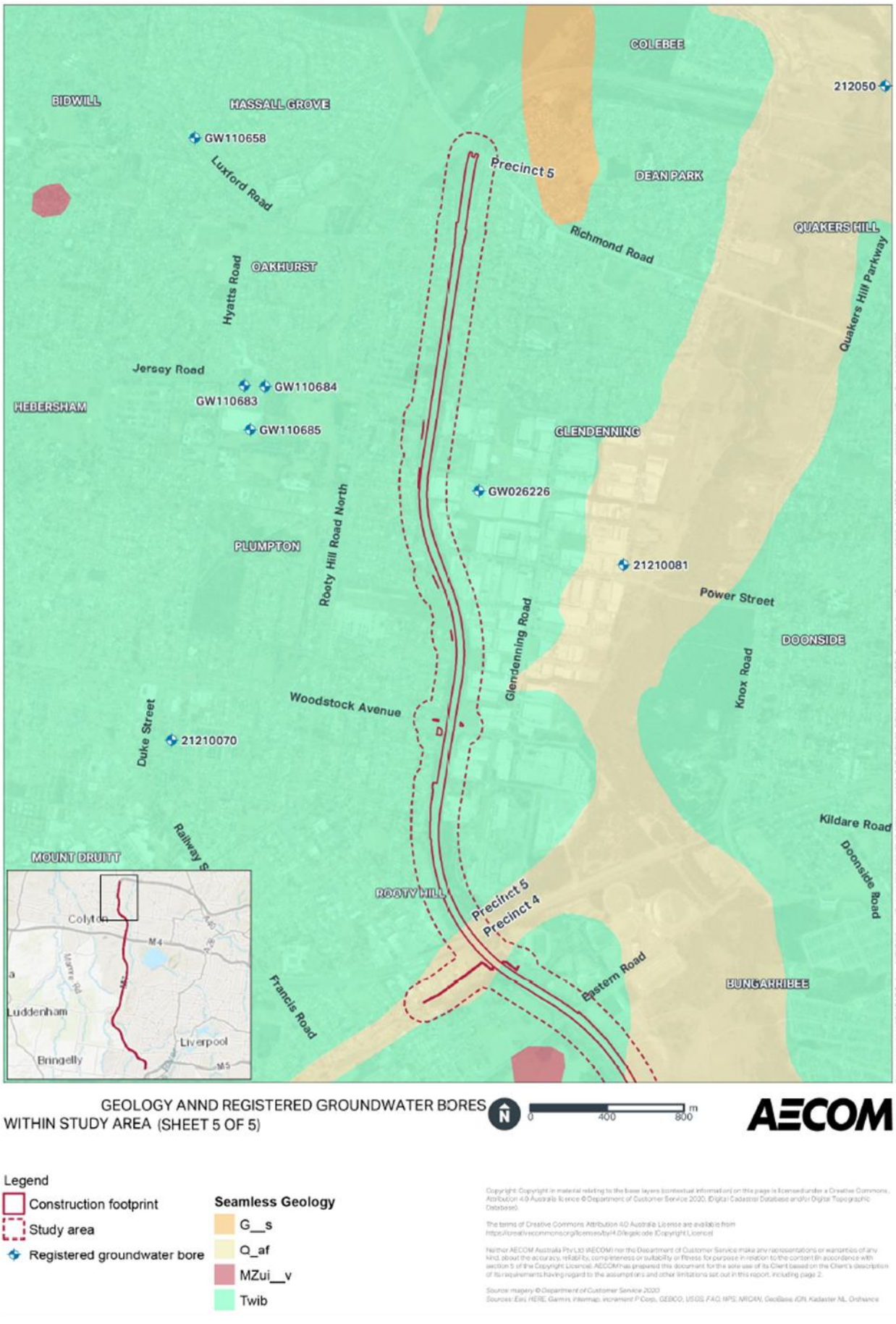



*Figure 4-5: Regional geology from Rooty Hill to Dean Park*

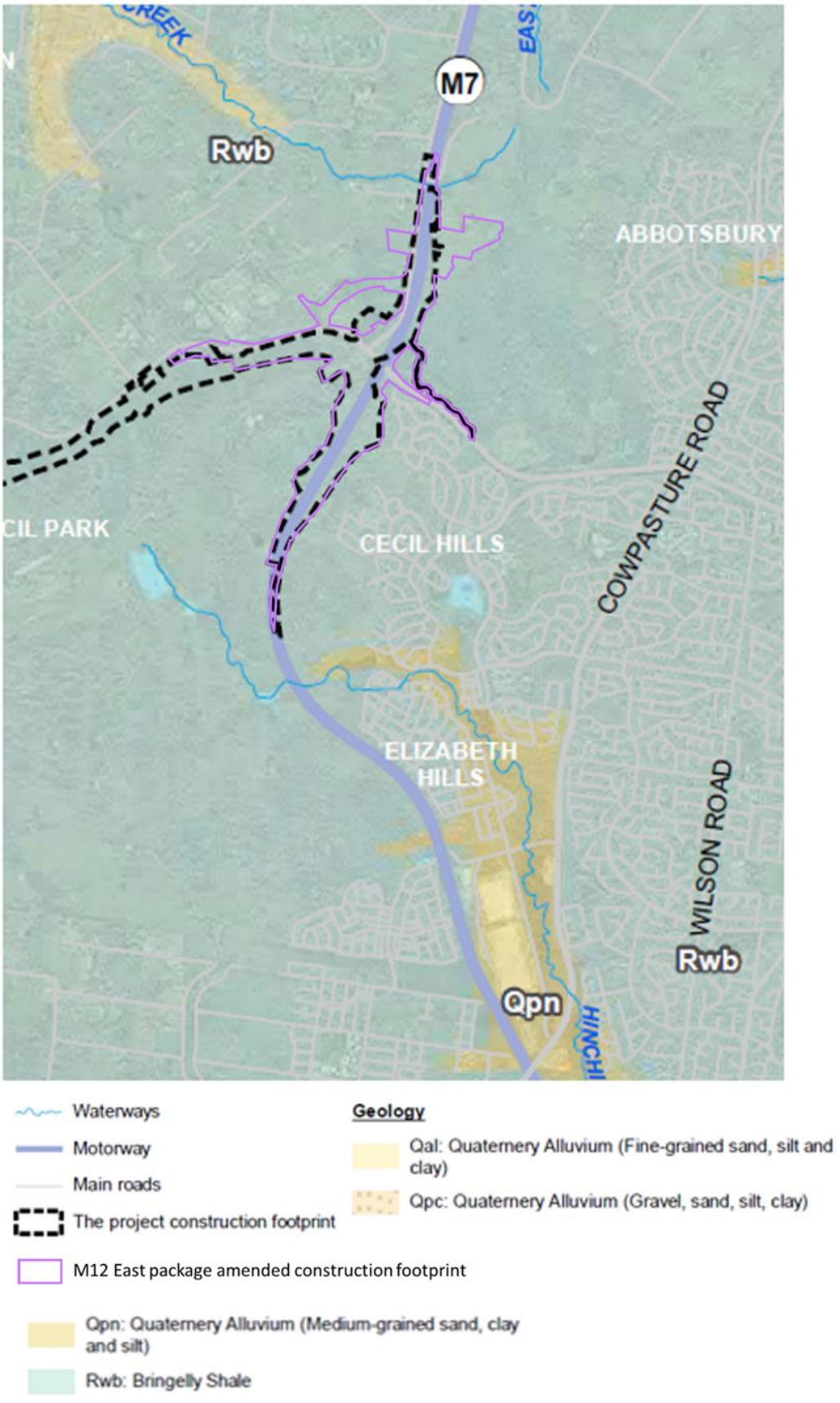



*Figure 4-6: Regional Geology of the M12 East package from Elizabeth Hills to Eastern Creek*

### 4.1.3 Soil landscape

Based on a review of the 1:100,000 scale Soil Landscape Map for Penrith (Bannerman and Hazelton 1990), the M7-M12 Interchange project is underlain by five soil landscapes as summarised in Table 4-3 and shown in Figure 4-7 to Figure 4-12.

*Table 4-3: Summary of soil landscapes*

| Soil landscape | Characteristics |
|---|---|
| Blacktown Residual (Rebt): Present in the south of the Project footprint and from Eastern Creek to Dean Park to the north of the M12 Interchange project. | • Occur on the low undulating hills on Wianamatta Group shales<br>• These soils are moderately reactive, highly plastic, and generally poorly drained |
| Disturbed Terrain (DTxx): Disturbed terrain intersects a small section of the Project footprint at Prestons | • Disturbed terrain occurs on level plain to hummocky terrain, extensively disturbed by human activity.<br>• This terrain is prone to mass movement hazards, unconsolidated low wet strength materials, impermeable soil, poor drainage, localised very low fertility and toxic materials (including asbestos). |
| Luddenham Erosional (ERlu): Residual soils located on the low rolling hills throughout most of the Project footprint. | • Derived from Bringelly Shales and is described shallow to moderately deep, typically comprising clays, and where Minchinbury Sandstone may be present sandy clays<br>• Moderately inclined slopes of 10 to 20 per cent are the dominant landform<br>• Development limitations included high erosion hazards, together with a high shrink-swell potential and low permeability and low fertility. |
| Picton Colluvial (COpn): Residual and colluvial soils located at the eastern end of the Project footprint, extending into the footprint centre south of Elizabeth Drive. Construction Ancillary Facility 9 in the north of the Project Footprint is also primarily comprised of Picton soils. | • Occurs on steep sided slopes over Wianamatta Group shales usually with a southern aspect and where there are slope gradients more than 20 per cent<br>• Described as shallow to deep residual and colluvial clays<br>• There is potential for mass movement and slope instability (i.e. land sliding). |
| South Creek Alluvial (ALsc): Alluvial soils occurring throughout the south and north ends of the Project footprint in flat areas with channels. | • Occurs on flood plains, valley flats, and along drainage depressions of channels on the Cumberland Plain and are usually flat laying with channels.<br>• These soils are prone to erosion hazards and frequent flooding is common in areas where they are identified. |

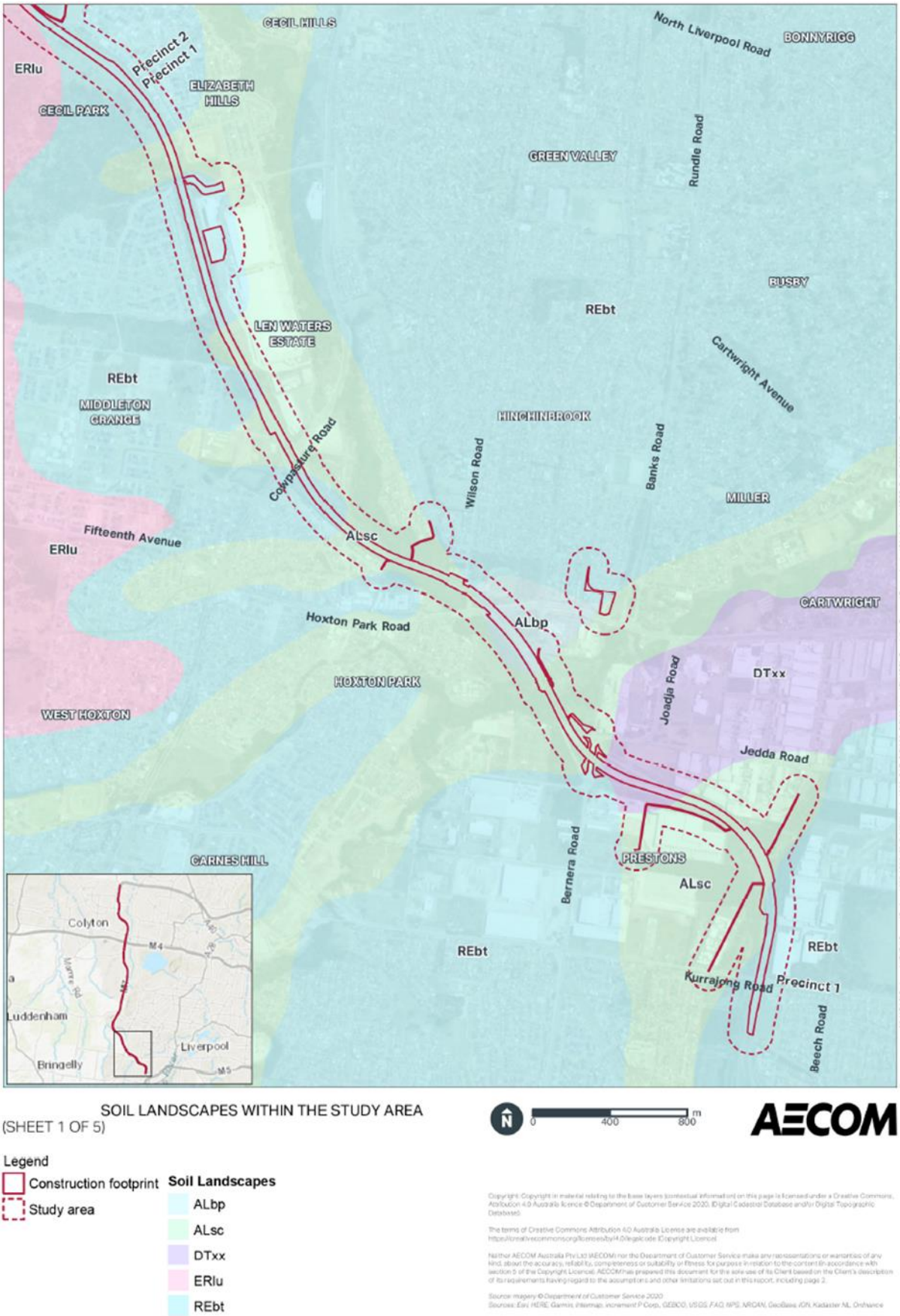



*Figure 4-7: Soil landscape from Prestons to Elizabeth Hills*

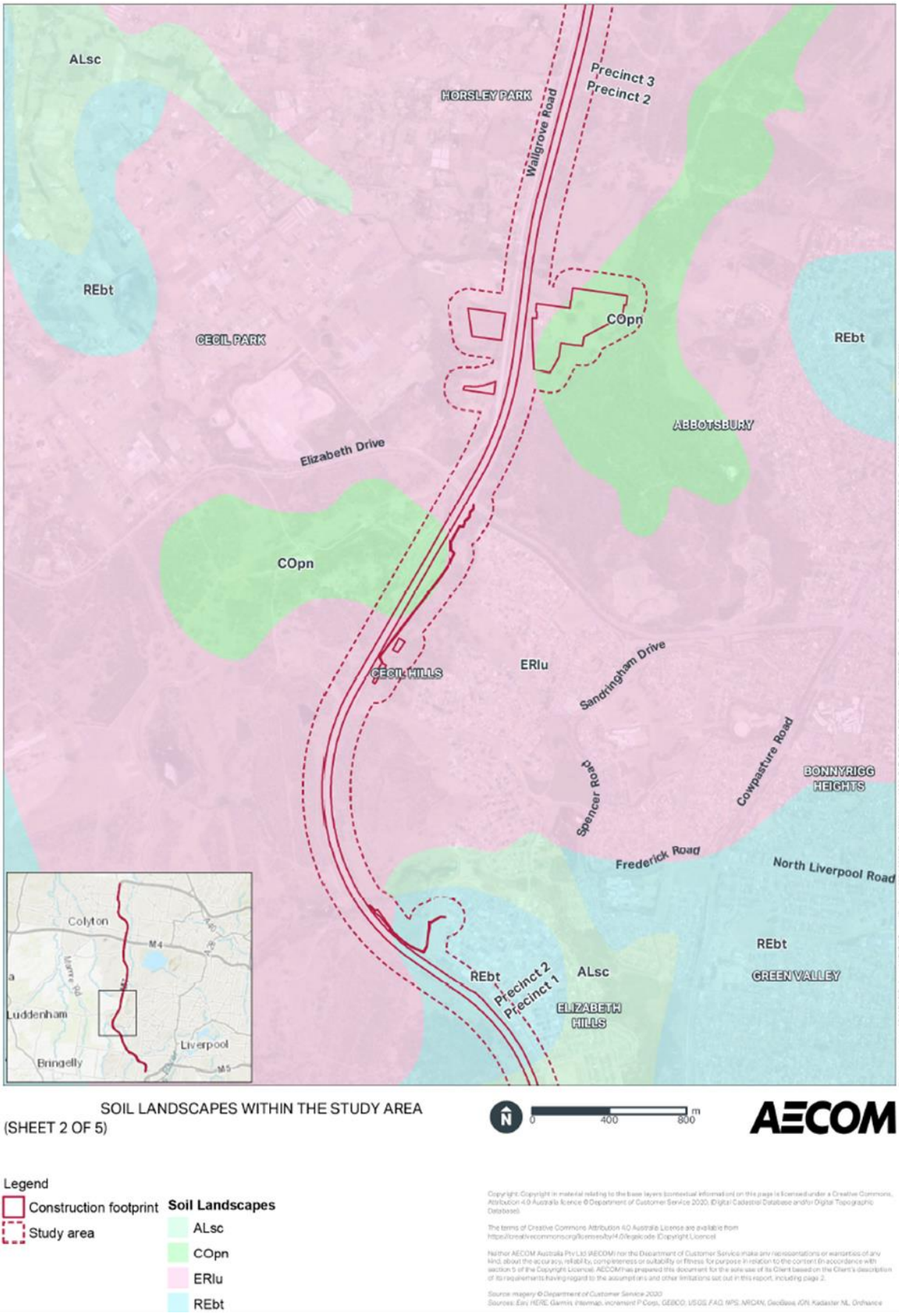



*Figure 4-8: Soil landscape from Elizabeth Hills to Horsley Park*

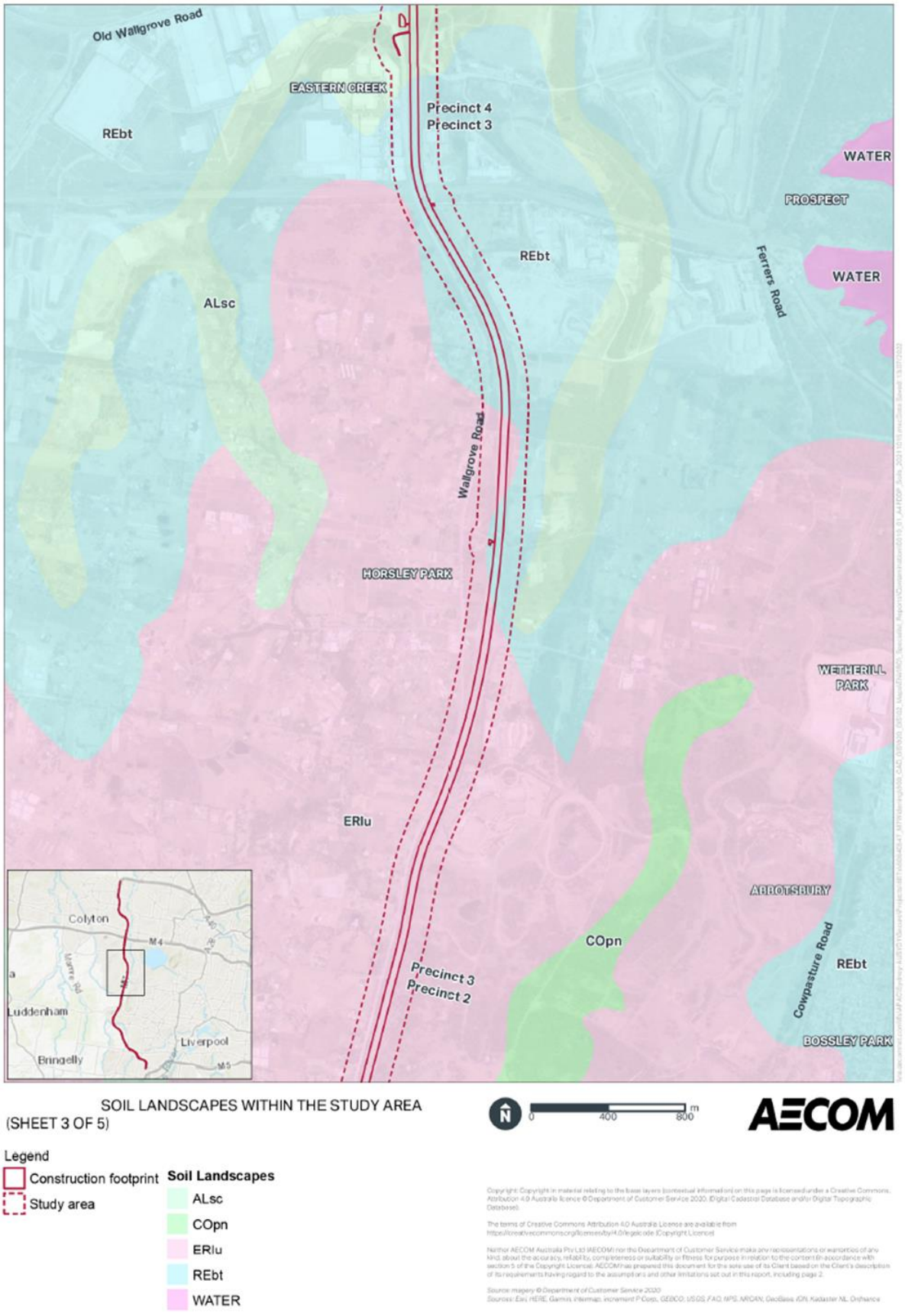



*Figure 4-9: Soil landscape from Horsley Park to Eastern Creek*

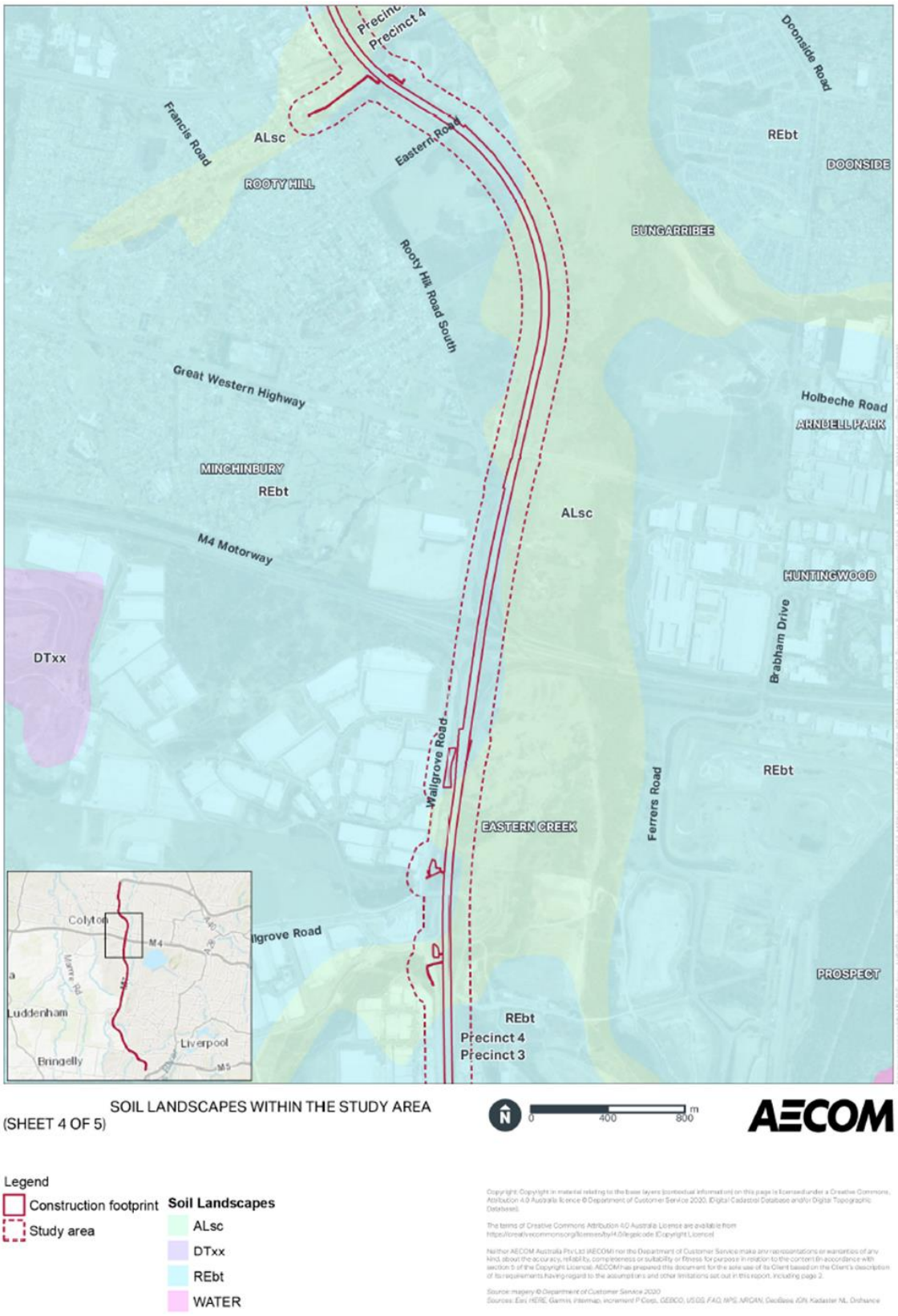



*Figure 4-10: Soil landscape from Eastern Creek to Rooty Hill*

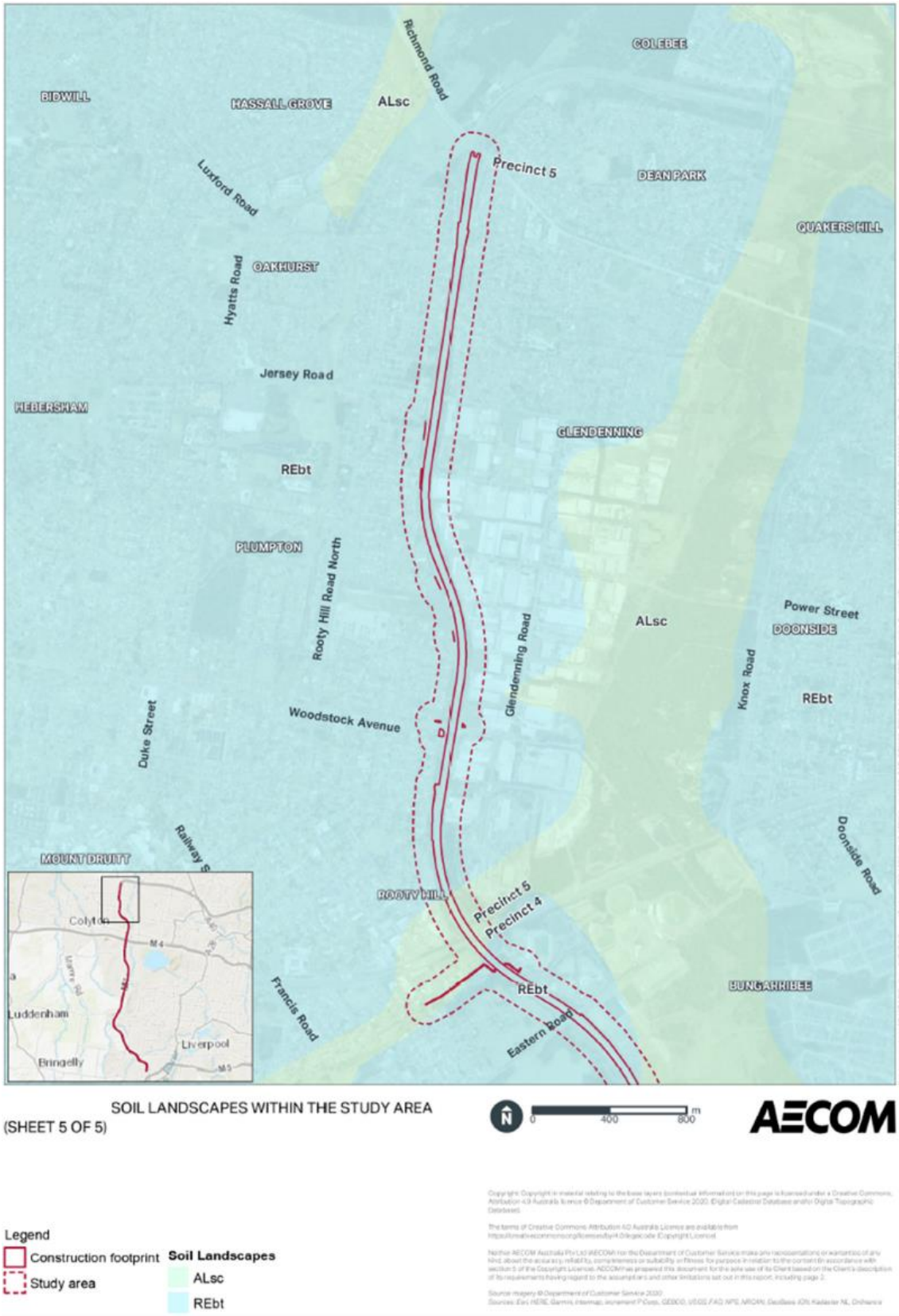



*Figure 4-11: Soil landscape from Rooty Hill to Dean Park*

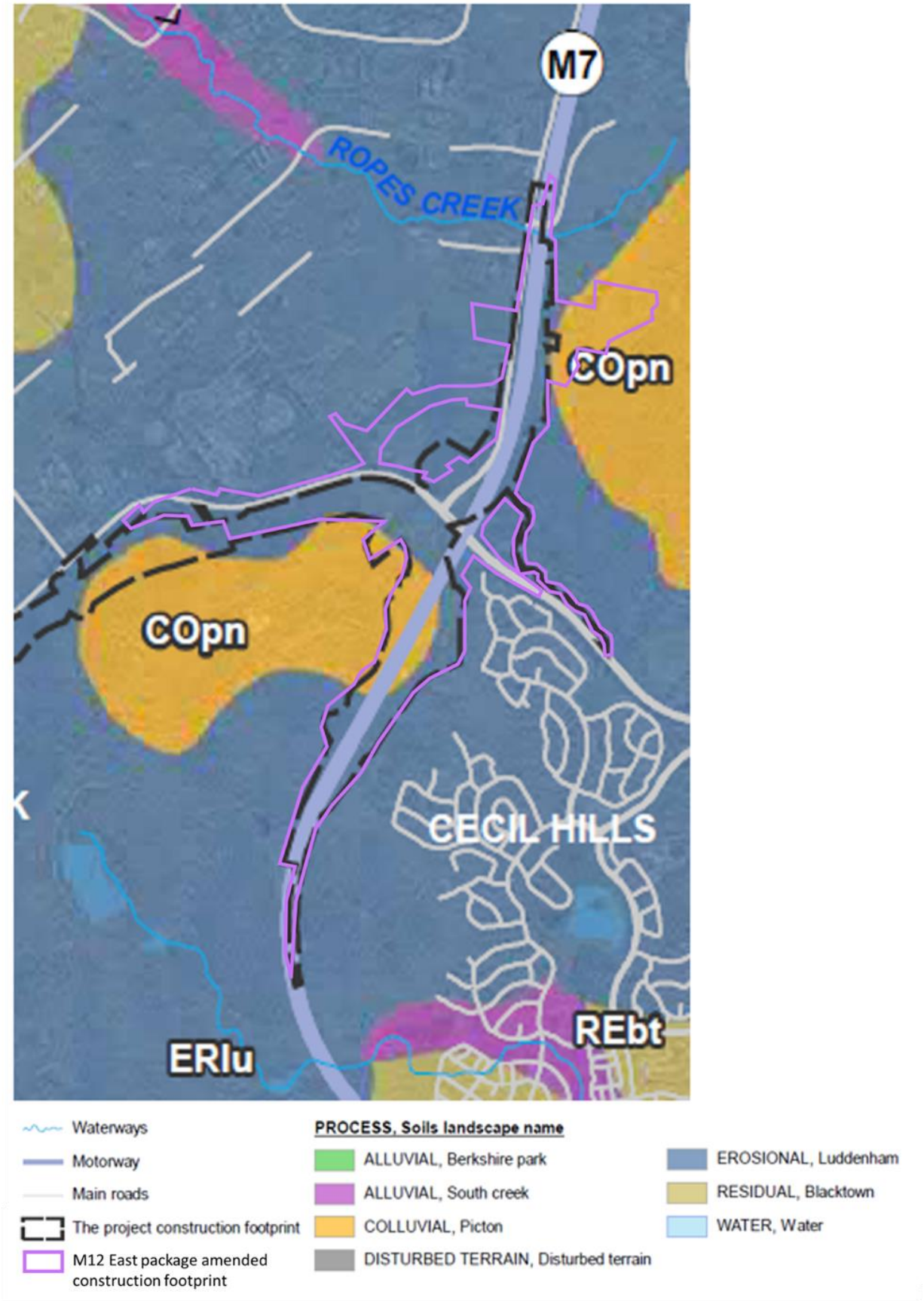



*Figure 4-12: Soil landscape of the M12 East package from Cecil Hills to Eastern Creek*

### 4.1.4 Soil salinity

The Salinity Potential in Western Sydney 2002 Map (DLWC, 2002b) indicates that soils within the M7-M12 Integration project footprint have a high to moderate salinity potential (refer to Figure 4-13 to Figure 4-17). The southern and northern extents of the M7-M12 Integration project area between Prestons and Elizabeth Hills and between Eastern Creek and Dean Park have a high hazard or risk from dryland salinity. High salinity potential has also been identified along Maxwells Creek, Cabramatta Creek, Hinchinbrook Creek, Reedy Creek and Eskdale Creek. There are also small areas of known soil salinity to the northwest of Elizabeth Drive, along Ropes Creek and east of Cecil Road.

Additional saline areas may be present which have not yet been identified or may occur if site conditions change adversely. Areas of current or potential soil salinity are expected along the Project footprint where there is alluvium, waterlogged ground or shallow groundwater.

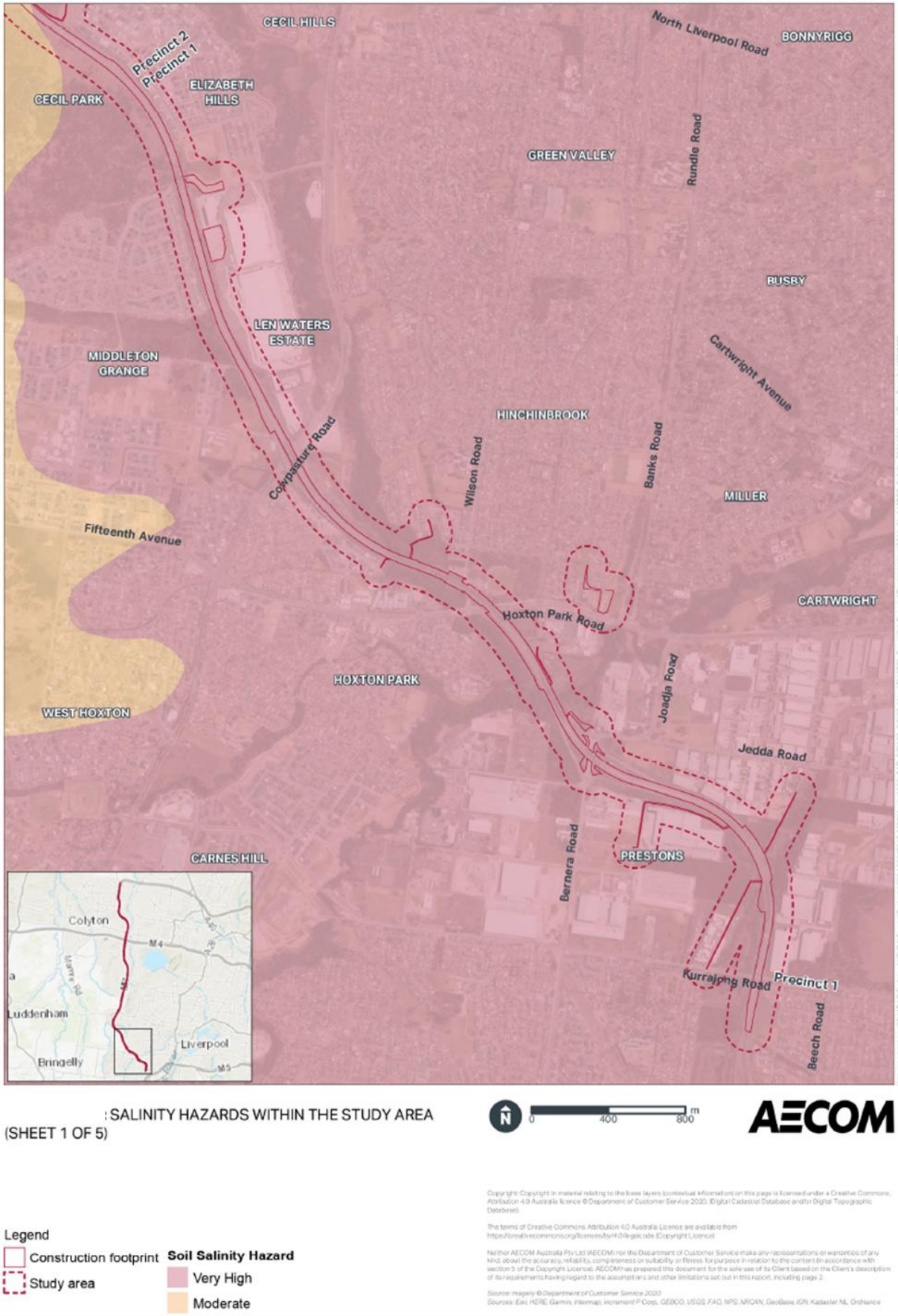



*Figure 4-13: Soil salinity risk map for Prestons to Elizabeth Hills*

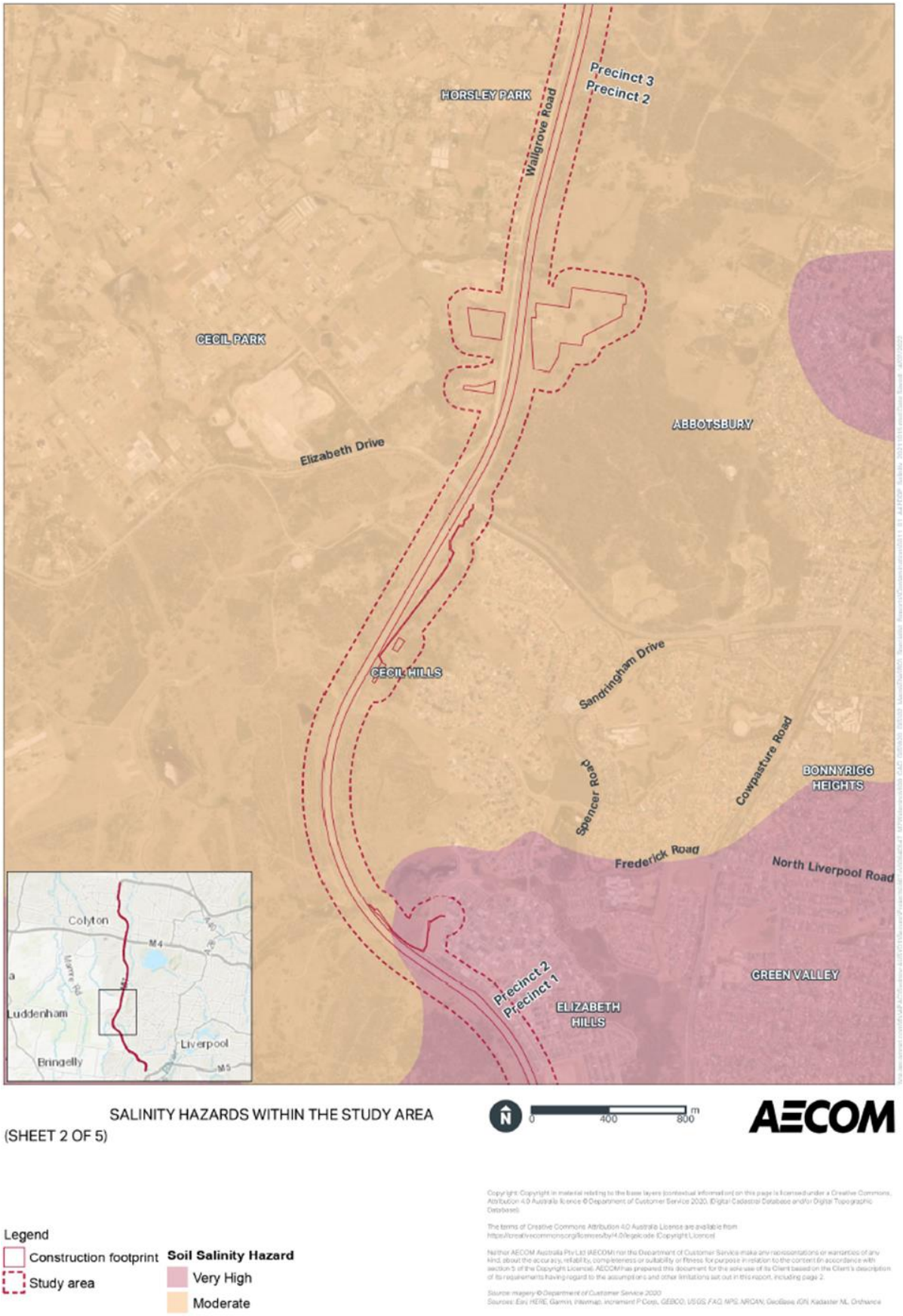



*Figure 4-14: Soil salinity risk map for Elizabeth Hills to Horsley Park*

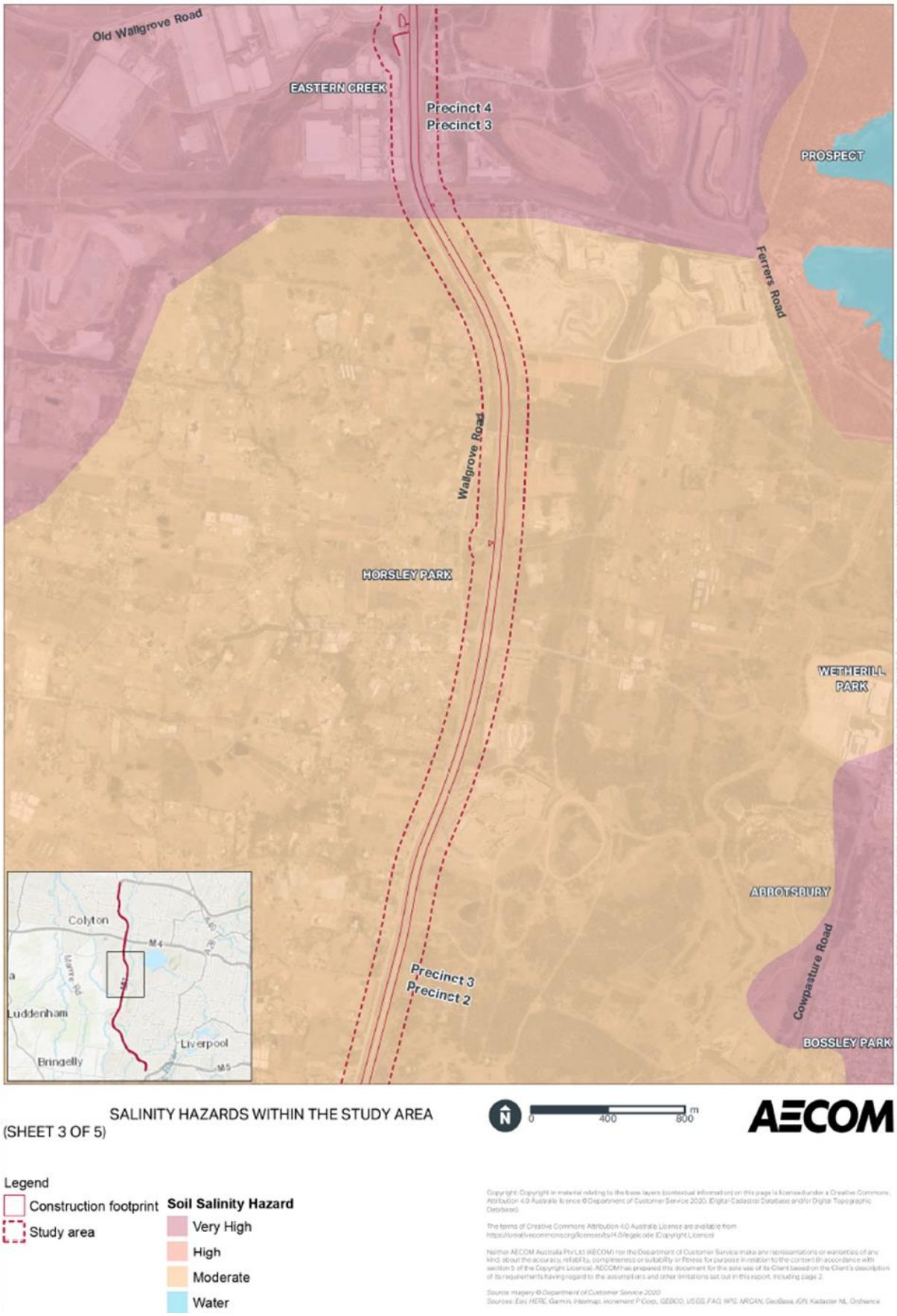



*Figure 4-15: Soil salinity risk map for Horsley Park to Eastern Creek*

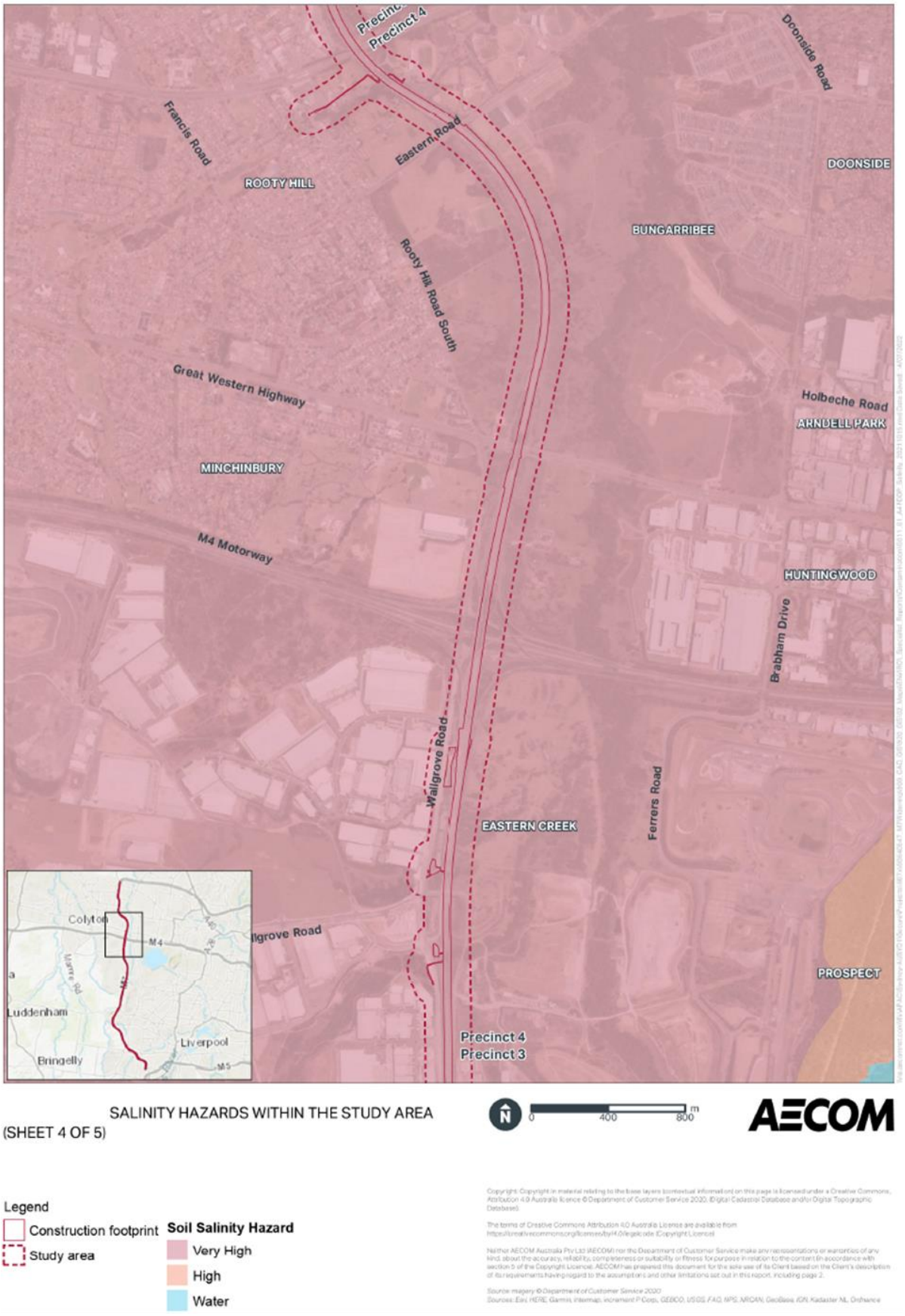



*Figure 4-16: Soil salinity risk map for Eastern Creek to Rooty Hill*

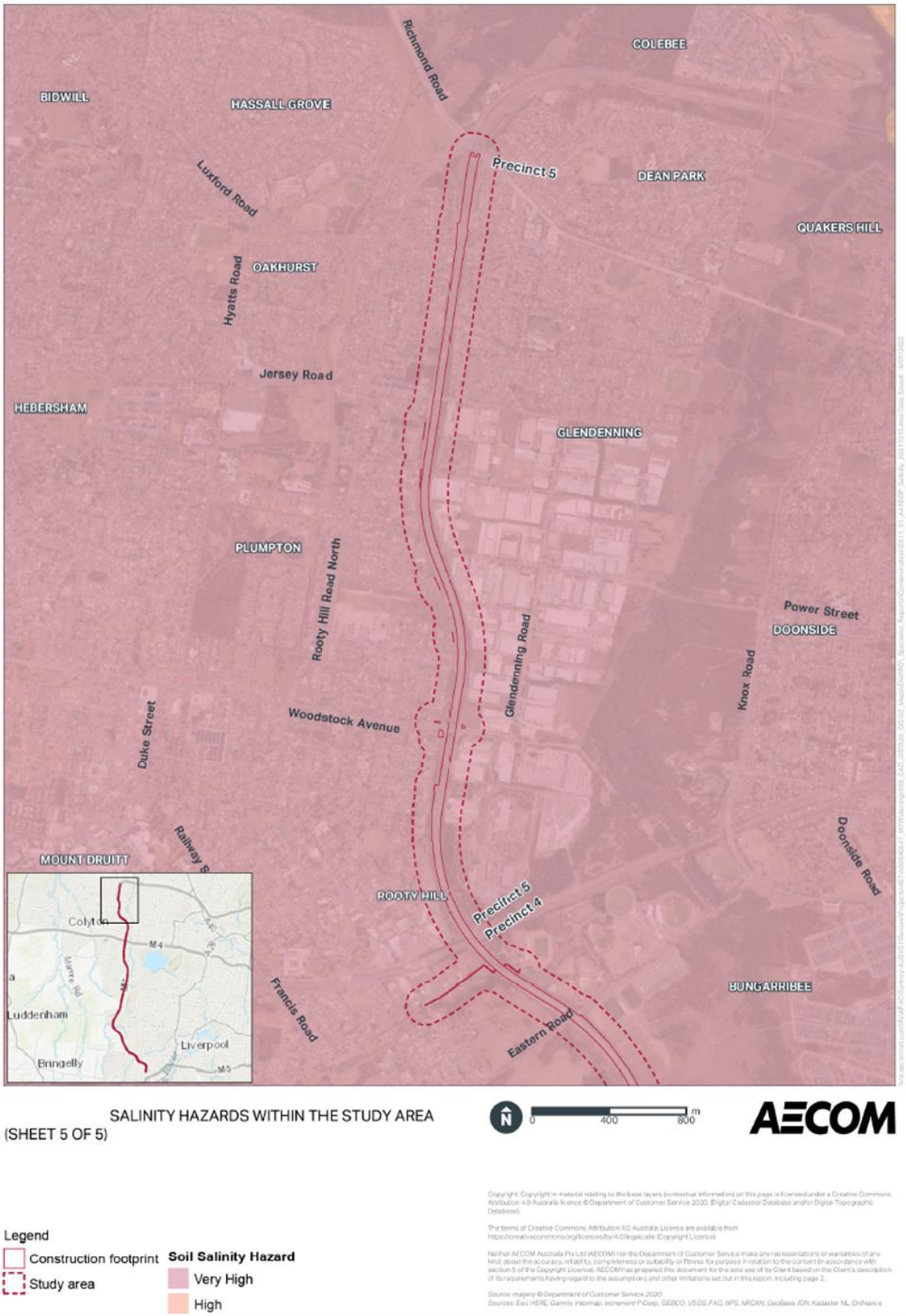



*Figure 4-17: Soil salinity risk map for Rooty Hill to Dean Park*

### 4.1.5 Acid sulfate soils

The Australian Soil Resource Information System's (ASRIS, 2018) online acid sulfate soils (ASS) risk map indicates the M7-M12 Integration project footprint is located within an area considered to have an extremely low probability of ASS occurrence. It indicates that there is no known or expected occurrence of ASS within the Project footprint.

A small, localised area of high probability of occurrence of acid sulfate soils (greater than 70 per cent) has been identified within an inland lake in Elizabeth Hills, about 100 metres east of the study area. Inland acid sulfate soils also have the potential to occur in creeks and drains within the study area.

A search was carried out within Fairfield Council (2013), Liverpool Council (2008) and Blacktown Council (2015) LEPs for ASS risk maps for the Project footprint to determine the probability of ASS occurrence. Council ASS risk maps typically categorise ASS in terms of Class (i.e. Class 1, 2, 3 or 4). The search found no ASS risk maps exist for the M12 East package construction footprint.

Geotechnical investigations have since been carried out in the M12 East package footprint as part of detailed design which have included testing for ASS. These investigations indicate that there is a moderate risk of encountering Potential Acid Sulfate Soils (PASS) during the proposed works in the vicinity of waterways and farm dams. Where available and required this CSWMP will be updated to include results from borehole investigations proposed under early works for the M7 Widening.

As described in Section 4.2, these areas are limited to the farm dam impacted by works and a small area in the northeast corner of the M12 East package, where the Project intersects Ropes Creek. Additional dams are also noted at AF9 which are to be protected under the Western Sydney Parklands lease agreement.

### 4.1.6 Contamination

Existing businesses or land uses which undertake potentially contaminating activities within, adjacent to, or immediately upgradient include service stations, dry cleaners, workshops, and industrial manufacturing sites as well as waste management facilities.

Due to the nature of the past cut and fill road construction works, contamination from historical sources could have been moved to other parts of the Westlink M7 and Elizabeth Drive road corridors. There is also the potential for illegal dumping of soil and building wastes containing asbestos (ACM and friable).

Historical potentially contaminating activities have been determined through a review of historical aerial photographs, historical maps, historical businesses, and historical title searches. Potentially contaminating land uses identified during the historical aerial photography review of the study area include:

- Historical agricultural land uses and features including scattered buildings, agricultural lands and rural roads, creeks, and reserves;
- Historical transport infrastructure including Hoxton Park Airport and the Cecil Hills Tunnel intersecting Elizabeth Drive;

- Historical and existing industrial land uses including fuel merchants, brickworks, Endeavour Energy substation, electricity production facilities (existing), potential quarry, cement plant, crane manufacturer, poultry dealers, motor garage, service stations and a steel manufacturing plant;
- Historical commercial land uses including market gardens near Wallgrove Road, Cecil Park and Woodstock Coursing (greyhound track and large agricultural property) in Plumpton.

In addition to the above, historical titles and observations revealed that the Westlink M7 at Cecil Park was potentially a metal works site; however, the appearance of the sheds indicates it may have also been livestock and/or horticultural activity.

Potential contamination activities related to former and existing land uses include:

- Degradation and demolition of structures containing hazardous building materials
- Historical and existing landfilling activities
- Isolated waste disposal and illegal dumping
- Buried waste materials
- Diffuse pesticide and herbicide use
- Chemical/fuel use and storage

Depending on proximity of the former or current contaminating activity, either within, adjacent or directly upgradient and the nature/significance of the activity, a low, moderate or high risk of contamination occurrence was determined. Additional contamination investigations (the DSI(s)) will be undertaken in accordance with M7 CoA D67 to confirm the current contamination risk within areas identified as moderate to high risk in the M7 Widening Modification Report.

## 4.2 Surface water

### 4.2.1 Catchments and waterways within or adjacent to the M7-M12 Integration project

The northern extent of the M7-M12 Integration project from Elizabeth Hills to Dean Park is located within the South Creek sub catchment in the Lower Nepean River Management Zone of the Hawkesbury-Nepean Catchment and traverses the Eastern Creek catchment and a small section of the Ropes Creek catchment. The southern extent of the Project from Elizabeth Hills to Preston is located within the Georges River catchment, intersecting Cabramatta Creek catchment.

**M7 Widening**

North of the M12 East package locality, the M7 Widening alignment intersects Eastern Creek catchment. which comprises medium density residential, industrial and commercial land uses. Western Sydney Parklands, Nurragingy Reserve and corridors of tributaries to Eastern Creek host vegetated or open spaces east of the M7 Motorway. Eastern Creek flows into Souths Creek which then flows north to join the Hawkesbury River at Windsor and is not intersected by the Project. Key tributaries of Eastern Creek intersected by the Project include Reedy Creek and Angus Creek. The corridors of Reedy Creek and Angus Creek are highly modified by urbanisation.

South of the M12 East package locality, the M7 Widening intersects Cabramatta Creek catchment. The catchment is highly modified by urbanisation and an industrial zone in Preston south of

Cabramatta Creek. The Project intersects Cabramatta Creek and its tributaries Maxwells Creek and Hinchinbrook Creek. An unnamed tributary of Hinchinbrook Creek is also traversed by a bridge waterway crossing to the north of Aviation Road.

**M12 East package**

The M12 East package intercepts Ropes Creek catchment, which has been extensively cleared of vegetation, other than around the waterways, for agricultural purposes. The catchment has a long history of flooding (BMT WBM, 2013). Ropes Creek drains into South Creek which then flows north to join the Hawkesbury River at Windsor. There are two farm dams identified in the M12 East package locality, at Elizabeth Drive Kemps Creek (ref 1111-1141) and WSP at Elizabeth Drive, Cecil Park (Dam 14) (Soil Conservation Service, Assessment of Dams M12 Motorway, August 2020).

Riparian vegetation immediately adjacent these creeks remains relatively untouched, however surrounding areas are highly disturbed.

The major hydrological features in the vicinity of the M7 Widening and M12 East package are shown in Figure 4-18 and Figure 4-19, respectively.

### 4.2.2 Geomorphology and river style

A description of the key watercourses and their geomorphological features at the point where the M7-M12 Integration project intersects them is provided in Table 4-4.

*Table 4-4: Summary of watercourse geomorphology*

| Catchment | Watercourse | Watercourse description | Geomorphological description |
|---|---|---|---|
| Ropes Creek Catchment within the South Creek sub catchment | Ropes Creek | Ropes Creek is an ephemeral first order tributary of South Creek that originates in south-western Sydney near Fairfield and confluences with South Creek | Ropes Creek is a highly modified drainage line transitioning to a laterally confined low gradient channel. The channel was completely dry upon inspection with minimal bank definition. No undercutting is apparent due to vegetation overgrowth and shallow depth. |
| Eastern Creek catchment within the South Creek sub catchment | Eastern Creek | Eastern Creek is a major tributary of Souths Creek. Its main tributaries are Reedy Creek, Angus Creek and Breakfast Creek. The creek originates adjacent to Ropes Creek in Horsley Park east of the Westlink M7 and confluences with south Creek at Vineyard. | Where Eastern Creek originates in Horsley Park it comprises a series of disconnected pools and sparsely vegetated parklands. Downstream (north) of Horsley Drive the riparian corridor is mostly vegetated along the remainder of the Project footprint. |
| | Reedy Creek | Reedy Creek crosses the M7 Motorway in a largely natural state as a second order stream, | Reedy Creek's riparian corridor is highly modified for industrial and |

| Catchment | Watercourse | Watercourse description | Geomorphological description |
|---|---|---|---|
| | | although sections of the waterway west and east of the motorway are modified. It confluences with Eastern creek 700 metres east of the M7 Motorway. | urban land uses upstream of the M7 Motorway to the west. |
| | Angus Creek | Angus Creek intersects the M7 Motorway in a significantly modified state where it is a first order stream. Angus Creek confluences Eastern Creek | The riparian corridor has been modified upstream of the M7. West of the M7 Motorway Angus Creek traverses Rooty Hill as a grass lined trapezoidal shaped channel. |
| | Bells Creek | Bells Creek originates in Plumpton 850 metres west of the M7 Motorway. It confluences with Eastern Creek around 5.2 kilometres downstream (north). | Bells Creek |
| Cabramatta Creek Catchment within the Georges River catchment | Cabramatta Creek | Cabramatta Creek crosses the M7 Motorway downstream of its confluence with Hinchinbrook Creek in a relatively natural state as a fourth order stream, and confluences with Georges River around eight kilometres northeast. | Cabramatta Creek has a vegetated riparian corridor both upstream and downstream of the M7 Motorway. |
| | Hinchinbrook Creek | Hinchinbrook Creek is intersected at two points by the Project:<br>• At its lower reach north of Hoxton Park road where it is a third order stream<br>• At its upper reach within the WSPs where it is a first order stream.<br>Hinchinbrook Creek confluences with Cabramatta Creek in Hoxton Park directly adjacent the M7 Motorway. | Hinchinbrook Creek is a highly modified drainage line consisting of a series of large, disconnected pools. The natural substrate consists of silty clays, with isolated sections of channel erosion and bank undercutting occurring at the channel meanders. The channel depth is greater than two metres. An artificial rock wall barrier augments the capacity of the creek at Cecil Hills to reduce flood impacts to residential areas. |
| | Maxwells Creek | Maxwells Creek crosses the M7 Motorway as a second order stream, originating in Prestons on the east side of the M7 Motorway and confluencing with Cabramatta Creek. | The riparian corridor is in a relatively natural state at its intersection with the M7 Motorway. Upstream of the M7 Motorway and downstream in the industrial estate at Prestons the creek has been realigned as a grass lined trapezoidal shaped channel. |

### 4.2.3 Sensitive receiving environments

A Sensitive Receiving Environment (SRE) is defined as having a high conservation or community value and/or supports ecosystems or human uses of water that are particularly sensitive to pollution or degradation of water quality. Sensitive receiving environments have been identified for the M7 Widening and M12 East package.

SRE's relevant to the M7-M12 Integration project alignment were based on, but not limited to:

- Key fish habitat field assessment in accordance with (DPI, 2013)
- Waterway classification (Fairfull and Witheridge, 2003)
- Key fish habitat mapping (DPI, 2018a)
- Threatened aquatic species under FM Act, TSC Act and EPBC Act
- Areas that contribute to aquaculture or commercial fishing
- Proximity to a drinking water catchment.

Waterways and other surface water features within 500m of the M7 Widening and M12 East package considered to be SREs are mapped on Figure 4-18 and Figure 4-19, respectively, and include:

- Lower Hinchinbrook Creek
- Upper Hinchinbrook Creek
- Unnamed tributary of Hinchinbrook Creek
- Doujon Lake
- State Environmental Planning Policy (SEPP) Coastal Wetlands (ID113 and ID114)
- Hinchinbrook Creek at the downstream SEPP coastal wetland ID276
- SEPP Coastal Wetland ID117
- Maxwells Creek
- Cabramatta Creek
- Reedy Creek.

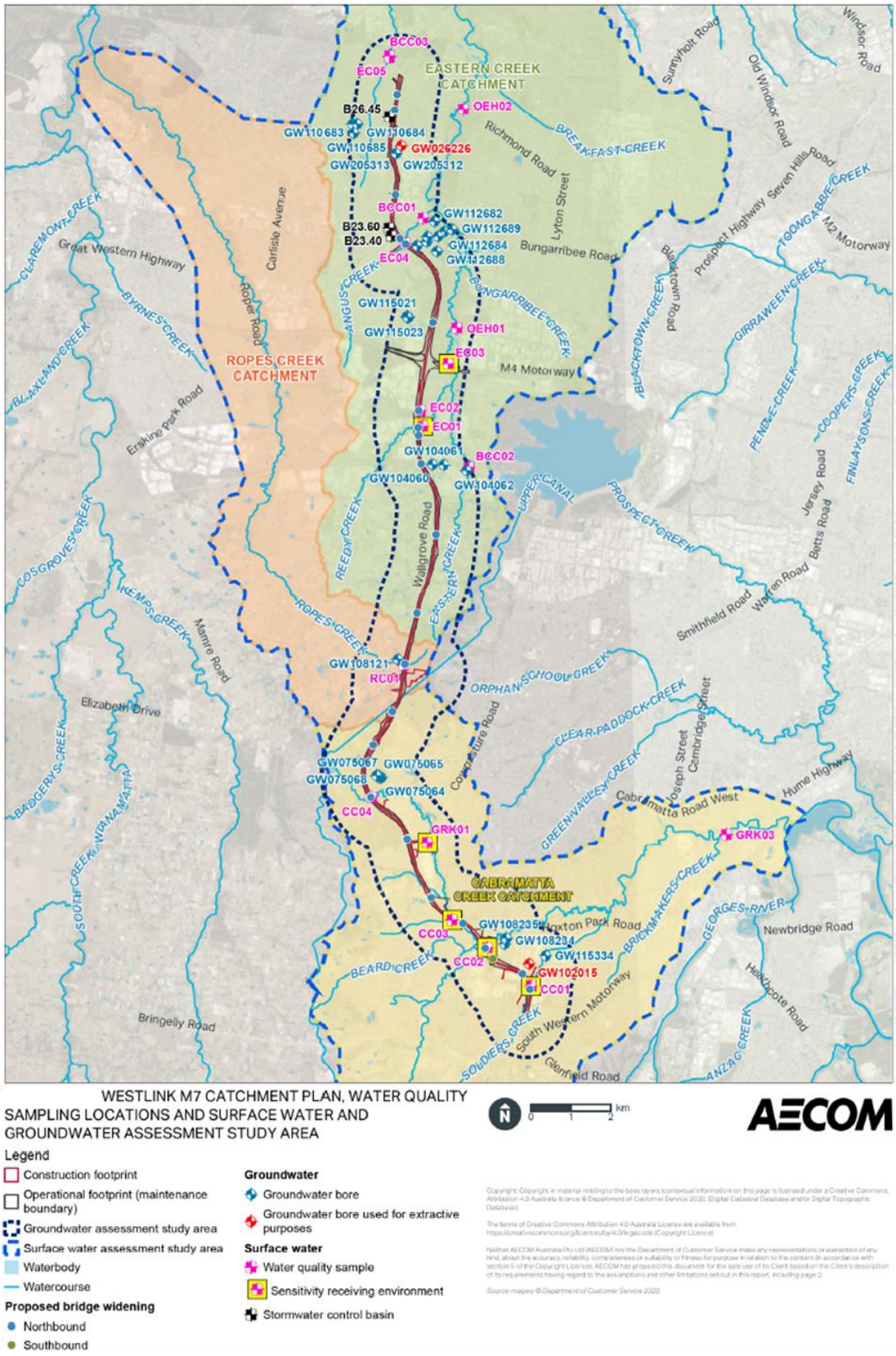



*Figure 4-18: Key waterways and sensitive receiving environments of the M7 Widening*

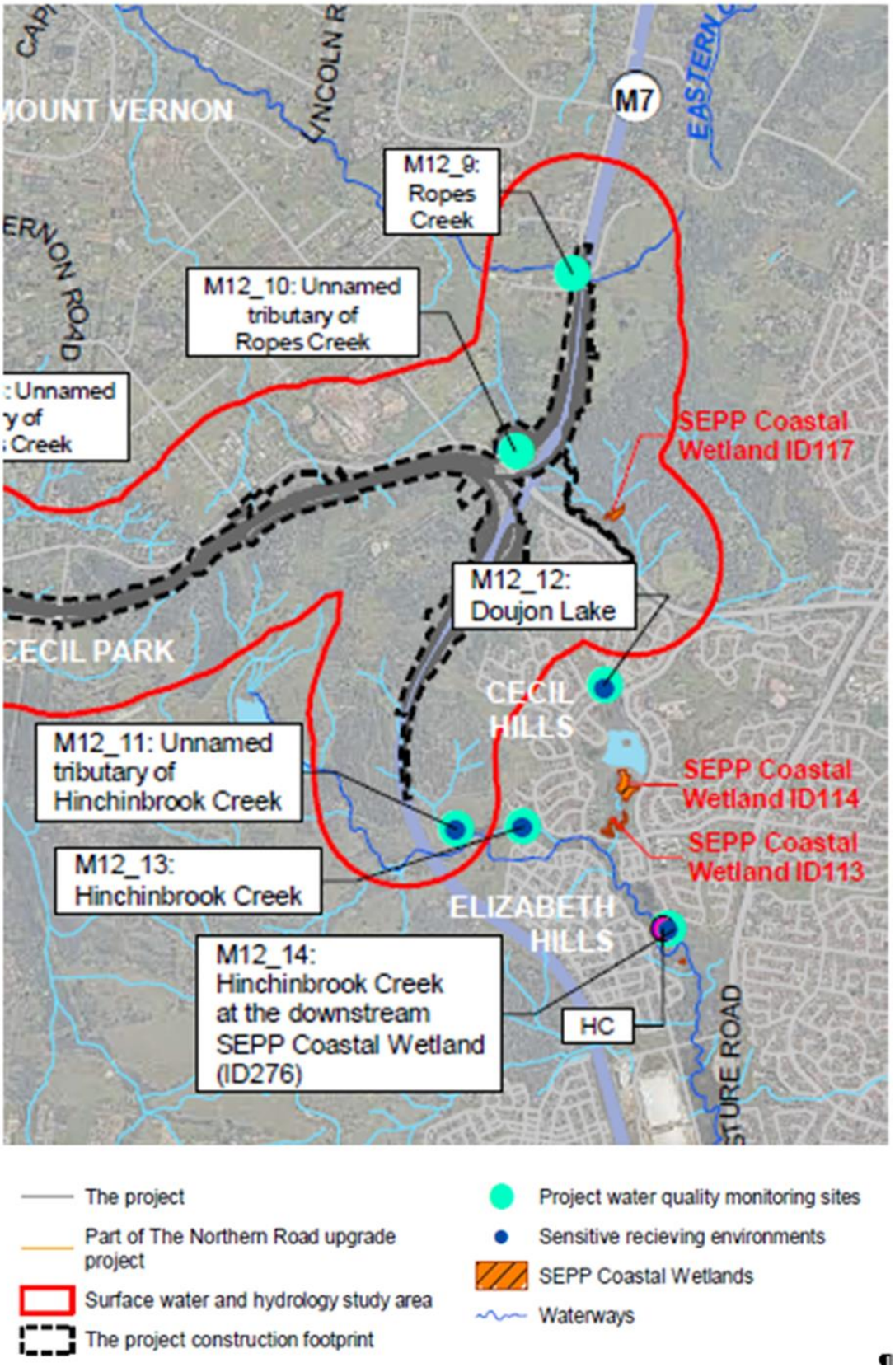



*Figure 4-19: Key waterways and sensitive receiving environments of the M12 East package*

### 4.2.4 Surface water quality

Monthly pre-construction surface water baseline monitoring was undertaken as part of the M7 Widening modification report from September 2021 to August 2022 at 10 locations which drain the Project along the M7 Widening alignment (Aecom, 2022). Findings from the Surface Water and Flooding Impact Assessment indicated degraded water quality at all locations, with nutrient levels in exceedance of ANZECC and ARMCANZ 2000 guideline values at all sampling sites. The sampling locations relevant to the M7 Widening are listed below.

- Reedy Creek
- Eskdale Creek
- Eastern Creek
- Angus Creek
- Bells Creek
- Ropes Creek
- Maxwells Creek
- Cabramatta Creek
- Lower Hinchinbrook Creek
- Upper Hinchinbrook Creek.

Monthly pre-construction surface water baseline monitoring has occurred since April 2019 at four surface water sites located upstream and downstream of the M12 East package locality. The locations relevant to the M12 East package are Ropes Creek and Hinchinbrook Creek.

The monitoring data confirms these creeks exhibit poor water quality, primarily due to elevated nutrients, turbidity and some metals. The detailed baseline monitoring locations and results up from April 2019 through to September 2022 is provided in Appendix B of this CSWMP.

## 4.3 Groundwater

Two groundwater systems have potential to interact with the M7-M12 Integration project area:

- Alluvial groundwater systems
- Semi confined groundwater systems within the bedrock.

Alluvial groundwater systems are unconfined (not under pressure) to semi confined (partially pressurised) associated with the watercourses identified in Section 4.2.

Bedrock groundwater systems are semi-confined and confined groundwater systems within or underlaying the bedrock (Bringelly Shale and Hawkesbury Sandstone).

Groundwater monitoring is not required during the construction phase of the M7 Widening under the M7 NSW CoA and will be limited to the M12 East package in accordance with M12 CoA C11. Groundwater monitoring was not undertaken as part of the M7 Widening Report and baseline conditions were established from monitoring undertaken prior to the construction of the Westlink M7 and following commencement of operation (refer to Section 4.3). Where required the maximum cut depth for the M7 is not expected to exceed two metres and interaction with groundwater sources is expected to be negligible.

### 4.3.1 Groundwater users

Two groundwater bores in the vicinity of the M7-M12 Integration project are registered for the use of 'exploration' only. A review of the Bureau of Meteorology (BoM) Australian Groundwater Explorer identified 32 registered groundwater bores in the vicinity of the M7-M12 Integration project, of which 29 were registered for the purpose of monitoring. Locations of groundwater bores are shown in Figure 4-1 to Figure 4-5.

### 4.3.2 Groundwater levels

**M7 Widening**

During the construction of Westlink M7 and two years following commencement of operation, groundwater monitoring indicated the standing water level ranged between 2.6 metres and 34 metres BGL. Geotechnical investigations indicated shallow groundwater depths at a minimum of 1.5 metres BGL (where present) between Abbotsbury Drive at Horsley Park and the M4 Motorway (Aecom, 2022).

**M12 East package**

Groundwater levels monitored during 2018 and 2019 for the M12 Motorway Project EIS identified that groundwater levels have been generally stable with some locations showing slightly declining trends. Groundwater level responses to individual rainfall events have been negligible. Monitoring bores on areas of Bringelly Shale (including associated overlying residual clay) indicated groundwater levels ranged from about one metre BGL to 19 metres BGL.

Based on the M12 East package's maximum cut depth (approximately 15 metres BGL), the Wianamatta Group's upper formation of Bringelly Shale is the only rock formation anticipated to be encountered by project excavations. As such and given the base of the Bringelly Shale formation is anticipated to be substantially lower than the Project's vertical alignment, groundwater flow systems within the Bringelly Shale are considered to be the main bedrock groundwater flow systems relevant to the Project.

Further assessment by WSP as part of the M12 Elizabeth Drive Connection design confirmed potential localised impacts at one location (cut 7) due to widening activities however, was likely to be less than one meter depth and less than 100m in length.

Groundwater flow directions are anticipated to be similar to a subdued version of the topographic surface. Current project groundwater monitoring bore data for the M12 East package indicates that the water table in the Bringelly Shale (including associated overlying residual clay) ranges from about one metre BGL to 19 metres BGL.

### 4.3.3 Groundwater quality

Groundwater monitoring was undertaken at 23 locations during the construction of the M7 Motorway and for two years following commencement of operation as part of the approved Westlink M7 project. Monitoring data and statistical summaries indicated that field water quality parameters including water levels, pH, acid sulfate soils and salinity were consistent during and following construction. Occurrence of acid sulfate soils was generally found to be low throughout the M7

Motorway footprint. Groundwater was found to be brackish, apart from localised low salinity at Baulkham Hills and high salinity at Quakers Hill and Eastern Creek.

Monthly pre-construction groundwater baseline monitoring for the M12 Motorway project has occurred at four boreholes since April 2019. One borehole (BH145) is located in the M12 East package footprint and three boreholes (BH104, BH107 and BH112) are located in M12 West.

The monitoring data and statistical summaries indicate that field water quality parameters, (including electrical conductivity (EC), redox (Reduction-oxidation), dissolved oxygen (DO), pH and temperature) vary throughout the year.

No data was available at BH145 after April 2021 due to the well experiencing insufficient levels of groundwater, however prior to that the eastern well (BH145) showed inverse trends, particularly for DO and EC.

The baseline monitoring locations and the detailed baseline results for M12 East package (and the entire Project) from April 2019 through to March 2022 are provided in Appendix B.

### 4.3.4 Groundwater dependent ecosystems

Groundwater Dependent Ecosystems (GDEs) are ecological communities that are dependent, either entirely or in part, on the presence of groundwater for their health or survival. A review of the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011 indicated that no High Priority GDEs (karst and wetlands) are mapped within 10 km of the Project.

A review of the BOM GDE Atlas (Australian Government BOM, 2018c) identified numerous areas for the M7-M12 Integration project that are of a moderate to high potential to be dependent on groundwater including several isolated areas away from the creeks – mapped as low to high potential terrestrial GDEs. No mapped aquatic GDE's are located in the vicinity of the Project.

The potential terrestrial GDEs within the Project's construction footprint are described as either Cumberland Shale Hills Woodland or Cumberland River Flat Forest. The location of GDEs in the vicinity of the M7 Widening are shown in Figure 4-20, and GDEs in the vicinity of the M12 East package are shown in Figure 4-21.

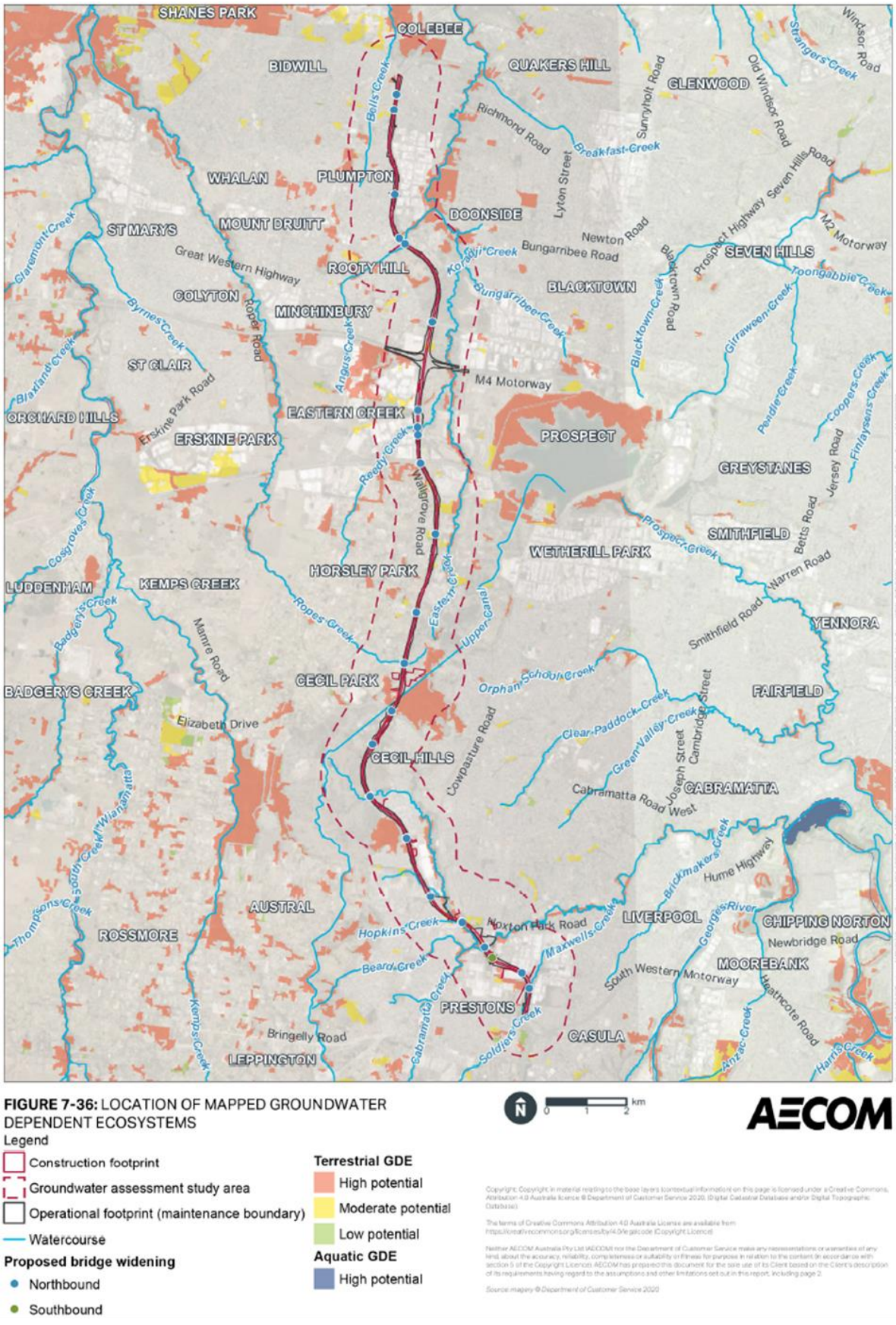



**FIGURE 7-36:** LOCATION OF MAPPED GROUNDWATER DEPENDENT ECOSYSTEMS

Legend

- Construction footprint
- Groundwater assessment study area
- Operational footprint (maintenance boundary)
- Watercourse

**Proposed bridge widening**

- Northbound
- Southbound

**Terrestrial GDE**

- High potential
- Moderate potential
- Low potential

**Aquatic GDE**

- High potential

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*Figure 4-20: Location of mapped GDEs in the vicinity of the M7 Widening package footprint*

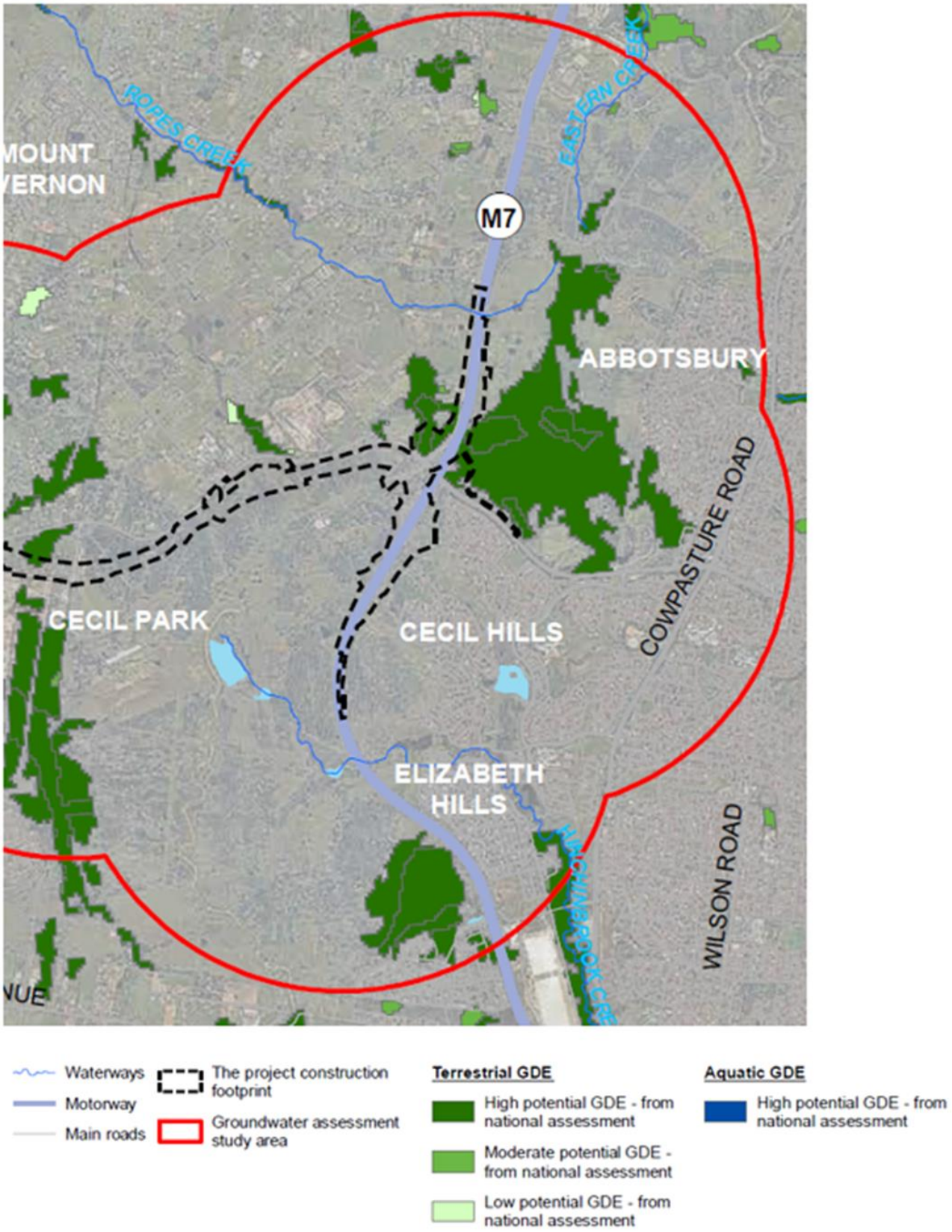



*Figure 4-21: Location of mapped GDEs in the vicinity of the M7 Widening package footprint*

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## 4.4 Rainfall and climate

The average yearly rainfall in the vicinity of the M7-M12 Integration project, based on data collected at the nearby Horsley Park Equestrian Centre (station 067119) is 771.1 millimetres. The wettest month is February, with an average rainfall of 118.3 millimetres, while the driest month is September with an average of 37.1 millimetres. The BoM reports the 2-year, 6-hour rainfall event as 9.24 mm/hr for Cecil Hills.

## 4.5 Rainfall erosivity and erosion hazard

The rainfall erosivity factor is a measure of the ability of rainfall to cause erosion (referred as “R” in the Revised Universal Soil Loss Equation (RUSLE)). The rainfall erosivity factor is used to determine the soil loss in tonnes per hectare over one year and is used in calculations when sizing construction sediment basins.

As soil loss in any catchment of the M7 Widening works are not expected to exceed 176 t/ha/yr due to staging of works limiting disturbed catchment areas to less than 1 ha, sediment basins are not required under Blue Book standards (refer to Primary Erosion and Sediment Control Plan, Appendix E). Table 4-5 describes parameters for the erosion hazard of the M7 Widening (refer to Appendix E).

Sediment basins will be required for the M12 East package. The M12 East package rainfall erosivity factor and other RUSLE parameters for the sizing of temporary sediment basins are summarised in Table 4-6.

*Table 4-5: RUSLE definitions and assumptions and typical values on the M7 Widening*

| Parameter | Definition | Typical values for the M7 Widening |
|---|---|---|
| A | Total calculated soil loss (t/ha/yr) | 176 t/ha/yr. |
| R | Rainfall erosivity factor | 2500 |
| K | Soil erodibility factor | 0.0456 |
| LS | Slope length and gradient factor | Ranges from 0.19 (80m, 1%) to 1.19 (80m, 5%) |
| P | Conservation practice factor | 1.3 (assume smooth and compacted) |
| C | Ground cover factor | 1.0 (assume no ground cover during construction) |

*Table 4-6: RUSLE definitions and assumptions and typical values on the M12 Motorway Package 3 – East Elizabeth Drive Connection*

| Parameter | Definition | Typical values for the M12 East package | | |
|---|---|---|---|---|
| | | Gentle slopes | Moderate slopes | Steeper slopes |
| A | Total calculated soil loss (t/ha/yr) | 176 t/ha/yr | 482 t/ha/yr | 759 t/ha/yr |
| R | Rainfall erosivity factor | 2500 | 2500 | 2500 |

| Parameter | Definition | Typical values for the M12 East package | | |
|---|---|---|---|---|
| | | Gentle slopes | Moderate slopes | Steeper slopes |
| K | Soil erodibility factor | 0.0456 | 0.0456 | 0.0456 |
| LS | Slope length and gradient factor | 5% and 80m (LS of 1.19) | 11% and 80m (LS of 3.25) | 20% and 50m (LS of 5.12) |
| P | Conservation practice factor | Maximum of 1.3 assumed | Maximum of 1.3 assumed | Maximum of 1.3 assumed |
| C | Ground cover factor | Maximum of 1.0 assumed | Maximum of 1.0 assumed | Maximum of 1.0 assumed |
| Erosion hazard (Landcom, 2004) | | Low | Moderate | Very high |
| Catchment size trigger for sediment basins | | 1.13ha | 0.41ha | 0.26ha |

*Table 4-7: M12 design criteria for sizing the temporary sediment basins (sourced from the M12 Motorway Package 3 – East Elizabeth Drive Connection Erosion and Sediment Management Reports)*

| Rainfall parameter | Value |
|---|---|
| Rainfall depth duration (days) | 5 day |
| Rainfall percentile | 85th |
| Rainfall depth (mm) – 5 day | 32.2mm (Liverpool) |
| Volumetric Runoff Coefficient, cv | 0.64 |
| Rainfall intensity for 2-year ARI, 6 hr duration | The BoM reports the 2-year, 6-hour rainfall event as 9.24 mm/hr for Cecil Hills. |

## 4.6 Flooding

Flood modelling was carried out to assess the existing flood conditions during stormwater events (TfNSW M12 Motorway EIS, 2018; TfNSW M7 Widening Modification, 2022). Further assessment was undertaken by WSP as part of the Elizabeth Drive detailed design process, including assessment of the tributaries of Ropes Creek. Modelling of operational flood behaviour of waterways that drain the M7 Widening area was undertaken by Aecom as part of the Westlink M7 Widening Modification Report (2022).

Table 4-8provides an overview of the modelled operational flood behaviour. Flood extent mapping is contained in Appendix B of the CFMP.

*Table 4-8: Existing flood conditions at creek crossings of the M7-M12 Interchange Project during the 100-year ARI flood event*

| Catchment | Flood conditions during the 100-year ARI flood event |
|---|---|
| Cabramatta Creek | The M7 Motorway carriageways are more than two metres above the peak 100-year ARI flood level where it crosses Cabramatta Creek at bridge BR9826/27. Surrounding residential and industrial areas developments upstream and downstream of the M7 Motorway experience inundation under 0.5 metres. A shared path section beneath bridge BR9826/27 would be updated to a depth of one metre during a 100-year ARI event.<br><br>Modelling of peak flow velocities of flood water at Cabramatta Creek during events of this magnitude does not exceed 1m/s in the vicinity of the Project. |
| Maxwells Creek | The M7 Motorway carriageways are more than two metres above the peak 100-year ARI flood level where it crosses Maxwells Creek. Storms exceeding 20-year ARI flood levels will inundate areas of the overbank at Maxwells Creek. During 100-year ARI flood events floodwater breaching the overbank of Maxwells Creek contributes to drainage flowing north of the creek line where industrial development is inundated up to one metre at several locations creating hazardous conditions for persons and property.<br><br>Modelling of peak flow velocity of flood water at Maxwells Creek during 100-year ARI flood events does not exceed 1m/s. |
| Hinchinbrook Creek | Where the M7 Motorway crosses the lower reaches of Hinchinbrook Creek the main carriageways are more than three metres above the peak 100-year ARI flood level where it crosses Hinchinbrook Creek at it's lower reaches. A section of shared pathway which runs beneath this bridge is inundated up to 0.5 metres. Hoxton Park Road is inundated where it runs beneath the main carriageways less than 0.5 metres over a length of 850 metres. Although floodwater<br><br>At the upper reaches of the creek both the main carriageways and shared pathway exceed the 100-year ARI flood level by more than three metres. Floodwaters reach up to 50 metres across parkland and vegetated areas.<br><br>Modelling of peak flow velocity of flood water at Hinchinbrook Creek during 100-year ARI flood events does not exceed 1m/s in the vicinity of the Project. |
| Ropes Creek | It is noted that although the Project traverses Ropes Creek near the tie-in to the existing M7 Motorway, flood modelling for the Ropes Creek Catchment was not undertaken as the design of the bridge at this location was developed to match the existing bridge (including bridge type, spans, piers and vertical alignment). The existing bridge deck is above the 2000-year ARI flood level, and the total opening and flood conveyance beneath the bridge provides capacity in excess of the 100-year ARI flood immunity requirement. The proposed bridge widening will maintain the same span widths and therefore total opening for flood conveyance would be the same and no changes to current flood conditions are expected.<br><br>There are discrete areas surrounding Ropes Creek and the unnamed tributary of Ropes Creek that are potentially impacted by flooding during rainfall events of 20% AEP and greater, including at AF9 and adjacent to Wallgrove Road, as well as some areas adjacent to Elizabeth Drive. These areas do not impact the road network or |

| Catchment | Flood conditions during the 100-year ARI flood event |
|---|---|
| | proposed AF9 site facilities and have low flow velocities of less than 1m/s and low durations of inundation. |
| Reedy Creek | The M7 Motorway carriageways are more than four metres above the peak 100-year ARI flood level where they traverse Reedy Creek, while its shared path is around two metres above the peak 100-year ARI flood level. Floods up to this magnitude are confined to the drainage reserve through which it runs to the west (upstream) of the M7 Motorway, however backwater flooding from the creek inundates a section of Wallgrove Road up to 0.7 metres.<br><br>Modelled peak flow velocities of flood water at Reedy Creek during a 100-year ARI flood event does not exceed 1m/s. |
| Eskdale Creek | During a 100-year ARI event, flooding is confined to the drainage reserve through which it runs to the west (upstream) of the M7 Motorway, however backwater flooding from the creek inundates a section of Old Wallgrove Road to shallow depths of 0.2 metres or less.<br><br>Modelled peak flow velocities of flood water at Eskdale Creek during a 100-year ARI flood event does not exceed 1m/s. |
| Angus Creek | Flooding at Angus Creek in the immediate vicinity of the M7 Motorway during 100-year ARI events surcharges the banks of its main channel but is mainly confined to undeveloped open space along it's riparian corridor. The main carriageways and the shared path of the M7 Motorway are over five metres above peak flood levels of this magnitude.<br><br>Modelled peak flow velocities of flood water at Angus Creek during a 100-year ARI flood event does not exceed 1m/s. |
| Cabramatta Creek | The M7 Motorway carriageways are more than two metres above the peak 100-year ARI flood level where it crosses Cabramatta Creek at bridge BR9826/27. Surrounding residential and industrial areas developments upstream and downstream of the M7 Motorway experience inundation under 0.5 metres. A shared path section beneath bridge BR9826/27 would be updated to a depth of one metre during a 100-year ARI event. |

## 4.7 Receiving water quality environmental values

As described in Section 4.2.1 of this Plan, the Hawkesbury River and Georges River are the main receiving water bodies downstream of the project, however the project intersects a number of smaller creeks and tributaries. Locations of SREs in the vicinity of the M7-M12 Interchange project are described in Section 4.2.3.

There are multiple environmental values associated with the Hawkesbury River Catchment, with leisure and recreation being of particular importance to the surrounding community (Pinto & Maheshwari, 2015). Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000) (referred to herein as the ANZECC water quality guidelines) define Environmental Values as Particular values or uses of *the environment that are important for a*

*healthy ecosystem or for public benefit, welfare, safety or health and that require protection from the effects of pollution, waste discharges and deposits*.

The southern end of the project located in the Georges River catchment drains to Cabramatta Creek and its various tributaries as described in Section 4.2. The Georges River catchment covers an area of 960 square kilometres and is one of the most highly urbanised catchments in Australia (GRCCC, 2019) with values similar to the Hawkesbury River. SEPP Coastal Wetlands ID113 and ID114 are located about 1.2 kilometres downstream of the construction footprint at the nearest point. SEPP Coastal Wetland ID117 is located about 100 metres northwest of Elizabeth Drive and 450 metres southeast of the M7 Motorway at the nearest points.

As described in Section 2.3.3 of the M12 Motorway EIS and Section 4.1.3 of Appendix G of the M7 Widening Modification Report, ANZECC water quality guidelines have been used to describe environmental values for receiving water environments of the M7-M12 Interchange project in accordance with the Using the ANZECC Guidelines and Water Quality Objectives in NSW (DECC, 2006) booklet. Appendix B describes the environmental value of receiving surface water and groundwater sites of the M7-M12 Interchange project. Pre-construction baseline data collected monthly since April 2019 for water bodies and waterways within the M12 East package area is evaluated against relevant criteria including the ANZECC water quality guidelines. Monthly surface water sampling undertaken from September 2021 to August 2022 across 10 locations as listed in Appendix B for water courses that drain the M7 Widening footprint (Aecom, 2022).

The EPL for the M7-M12 Interchange project prescribes the water quality parameters for the purposes of the monitoring and the setting of limits for discharges of pollutants to water. The concentration limits for pollutants discharged at a Licenced Discharge Point, or applied to that area, are described in Appendix B.

Further water quality control measures key to maintaining these environmental values are outlined in Sections 6.1 to 6.17.

# 5 Environmental aspects and impacts

## 5.1 Construction activities

Key aspects of the Project that could result in adverse impacts to soils and water include:

- Site establishment
- Vegetation clearing and grubbing
- topsoil stripping
- Site access
- Earthworks
- Demolition
- Transportation of cut or fill materials
- Removal of riparian vegetation
- Construction in areas of highly erodible soil, contaminated land or acid sulphate soils
- Culvert and drainage works
- Adjustment of waterways
- Temporary watercourse crossings and work platforms
- Bridge construction
- Material stockpiles
- Concrete activities
- Relocation of services and utilities
- Water use/extraction
- Construction discharges including surface water runoff and dewatering of sediment basins and farm dams
- Ancillary facility operation including fuel and chemical storage, refuelling and chemical handling
- Noxious weed treatment including herbicide spraying
- Finishing work and site restoration.

Refer also to the Environmental Risk Assessment included in Appendix A2 of the CEMP.

## 5.2 Impacts

Potential for impacts on soil and water depend primarily on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction include:

- Exposure of soils during vegetation clearing and earthworks, creating the potential for offsite transport of eroded sediments and pollutants
- Decline in water quality and generation of turbidity due to disturbance of sediments during in-stream or riparian zone works
- Scour in the receiving drainage lines at the downstream limit of the drainage works
- Damage to ancillary facilities (including flood damage) that could result in an export of pollutants to receiving waters

- Disturbance of asbestos-containing material from imported fill sites, historical dump sites or during demolition of structures
- Contamination of soils, and surface and groundwater from accidental spills or oil leaks that could pollute receiving waterbodies
- Contamination of surface and groundwater from disturbance of unknown in-situ contaminated soils (such as asbestos, hydrocarbons or chemical impacted soils)
- Disturbance of acid sulphate soils, creating the potential for oxidation of these soils and subsequent generation of acidic runoff
- Changes to hydrology have the potential to impact on artificial wetlands (farm dams, roadside drains, effluent treatment systems)
- Contamination or other impacts to underlying aquifers from dewatering associated with piling and utility relocation activities that occur in areas where the perched shallow water table is present and close to the ground surface
- Off-site discharge of water containing sediment from dewatering activities
- Groundwater drawdown with the potential to impact upon GDE
- Removal of riparian vegetation resulting in sediment release to adjoining watercourses, reducing water quality and affecting the health of aquatic ecosystems
- Soil loss from the erosion of spoil and topsoil stockpiles.

Some impacts on soil and water attributable to the M7-M12 Interchange project are anticipated. Relevant aspects and the potential for related impacts have been considered in a risk assessment in Appendix A2 of the CEMP. Section 6 of this CSWMP provides a suite of mitigation measures that will be implemented to avoid or minimise those impacts.

## 5.3 Cumulative impacts

The concurrent construction of various projects within the vicinity of the M7-M12 Interchange project gives rise to the potential for cumulative soil and water impacts. Projects within the vicinity of the M7-M12 Interchange project include, but are not limited to:

- M12 Motorway – M12 Central and other work packages, namely interaction between different earthwork fronts and sediment basin locations
- Upper South Creek – advanced water recycling centre
- Other potential road projects such as Elizabeth Drive upgrade and Outer Sydney Orbital
- Development land releases such as Southwest Growth Area and Western Sydney Employment Area
- Western Sydney International Airport
- Sydney Metro – Western Sydney Airport
- The Northern Road upgrade
- Western Sydney Aerotropolis.

It is noted that the scale of impact is dependent upon timing, location and type of construction activities. Although impacts are likely to be associated with soil erosion, soil management, salinity waterway contamination and spills, it is anticipated that these impacts will be short-term and minor as they will be limited to the construction phase and will be minimised through the implementation of management measures identified in Section 6.17.

Interagency communication between government departments undertaking work in the area is required to manage cumulative impacts with the aim of combining messages when possible and minimising impacts to the local community.

Regular interface meetings will be undertaken with government authorities, neighbouring Project packages, other projects, and stakeholders as detailed in Section 6.5.2 and 6.5.3 of the CEMP and within the M7 M12 Communication Management Plan.

# 6 Environmental mitigation and management measures

## 6.1 Erosion and sediment control

Temporary erosion and sediment control measures will be installed to protect water quality on the M7-M12 Integration project. The erosion and sediment control measures outlined herein are applicable to all areas deemed as low risk of contamination as defined in the M7 Widening Modification Report or subsequent DSI. The risk of finding areas of high to medium contamination is considered to be low as the identification of these areas was undertaken for the initial M7 construction, and much of the contaminated material was removed during this time, particularly in the median. In the event that areas of moderate to high-risk contamination identified in the M7 Widening Modification Report are confirmed by the Detailed Site Investigation, specialist advice will be sought from the Soil Conservationist, or an independent agronomist, to determine appropriate management actions including the development of site-specific Erosion and Sediment Control Plans.

**M7 Widening**

During detailed design for the M7 Widening, water quality objectives set out in the Modification Report will be reviewed and updated where required, with consideration of the Performance Criteria for Protecting and Improving the Blue Grid in the Wianamatta – South Creek Catchment (DPIE, 2022). Controls and management measures will be designed (stability, location, type and size), constructed, operated and maintained in accordance with Managing Urban Stormwater: Soils and Construction (Landcom, 2004) and Managing Urban Stormwater – Soils and Construction, Volume 2D, Main Road construction (DECC, 2008).

In accordance with M7 CoA D108, the Planning Secretary's approval is required to use local erosion and sediment controls to manage stormwater discharges in lieu of sediment retention basins or sumps where:

- Such measures would adequately manage the risk or erosion and sedimentation in accordance with Volume 1 and 2D of the Blue Book
- Contaminated soils do not pose a risk to water quality in receiving waterways.

The M7 Widening Contamination Impact Assessment, Appendix of the Modification Report, identified areas of moderate and high risk of contamination. John Holland is currently undertaking additional contamination investigations (by way of sampling) to confirm contamination risk ratings within the M7 Widening footprint. Earthworks that cause a risk of mobilising sediments will not be undertaken in areas identified in the Modification Report as having a moderate or high risk of soil contamination until such time as a detailed site investigation (DSI) has confirmed the contamination risk rating (M7 CoA D67).

The Planning Secretary's approval of the use of local erosion and sediment controls in accordance with M7 CoA D108 is being sought through the approval of this CSWMP for the following areas:

- areas not identified as moderate or high risk of contamination in the Modification Report

- areas that were identified as moderate or high risk of contamination in the Modification Report but which have subsequently been confirmed to be low risk of contamination through the DSI required to be undertaken prior to ground disturbance in accordance with M7 CoA D67
- areas that have been identified as containing contaminated soils that do not pose a risk to water quality in receiving waterways (e.g. asbestos).

In the event that areas are confirmed to be moderate or high risk of contamination, specific erosion and sediment controls will be developed in consultation with the Soil Conservationist to comply with M7 CoA D109 or through the Planning Secretary's approval in accordance with M7 CoA D110 through an update to this CSWMP or separate approval.

Prior to implementing the alternative local erosion and sediment control measures the Proponent must obtain approval from the Planning Secretary. The alternative local erosion and sediment control measures detailed within this CSWMP have been prepared to obtain this approval. This includes the Erosion and Sediment Control Procedure contained in Appendix D and the Concept Erosion and Sediment Control Plan contained in Appendix E.

**Erosion and sediment control plans**

Erosion and sediment control plans (ESCPs) are planning documents for managing erosion and sedimentation and show the site layout and the location of erosion and sediment control mitigation on-site. They cover all construction stages from initial vegetation clearing through to rehabilitation when erosion and sediment control are no longer required and are removed. Concept ESCPs were prepared for the M12 East package, presented as part of the M12 East package CSWMP (refer to Appendix E) and provided to the EPA for review as part of the EPL application process. ESCPs have also been prepared for the M7 Widening alignment.

Site-specific Progressive Erosion and Sediment Control Plans (PESCPs) will be prepared for each construction stage (as described in Appendix D) and will be document-controlled separately from this SWMP.

The ESCPs will identify erosion and sediment control risks and describe how these will be addressed during construction. The ESCPs will include details of the following where relevant:

- Erosion and sediment control measures required as construction progresses including:
  - Before clearing and grubbing
  - Before removal of topsoil and commencement of earthworks within a given catchment area.
- How clean upstream water will be managed and diverted around disturbed areas, so it is not polluted by the construction activities and to minimise potential discharges of dirty construction water
- Method of tree removal in intermittent watercourses, leaving grasses and small understorey species undisturbed wherever possible
- Scour protection measures for haul roads and access tracks when these are an erosion hazard due to either their steepness, soil erodibility or potential for concentrating runoff flow
- Measures for promptly stabilising disturbed areas and temporary drains
- Measures to minimise erosion during construction of embankments
- Measures to minimise erosion and control sedimentation from stockpiles
- Measures at site access and egress points to minimise mud tracking on roads

- Methods of constructing batters to assist the retention of topsoil on the batter slopes
- Measures to temporarily trap sediment in median areas at regular intervals
- Controls in runoff flow paths to reduce flow velocities and minimise the potential for erosion
- Measures for controlling wastewater discharge on or around the site from dewatering, surface washing, grit blasting, saw cutting, drilling, washing vehicles and plant and any other activities which add pollutants to water
- Measures to be put in place during an extended shut-down of the site or where more than a 50 per cent chance of 10 mm of rainfall or greater is predicted
- Inspection and maintenance of erosion and sediment control structures to restore their capacity following rainfall
- Inspection and auditing program for all erosion and sediment controls to ensure that no disturbed area is left without adequate erosion and sediment controls.

The ESCPs will include drawings showing all controls required to avoid erosion and sedimentation of the site, surrounding areas, watercourses, drainage systems, water bodies and wetlands. The drawings will be regularly updated as the site conditions change during construction.

The drawings will include all ancillary activities and/or areas and activities that may impact on water quality, such as:

- Access and haulage tracks
- Borrow pits
- Stockpile and storage areas
- Temporary work areas
- Materials processing areas
- Compound areas
- Concrete and asphalt batching areas and location(s) of concrete washouts
- Known (or discovered areas) of contamination.

The PESCPs will be prepared and reviewed by suitably qualified personnel accepted by WSO Co / TfNSW (refer to Section 7.4). Evidence of suitable qualifications must include completion of recognised training in Blue Books 1 and 2D and erosion and sedimentation control and have suitable on-site, hands-on experience in preparing such plans, including refresher training as appropriate.

The M7 Widening initial ESCP and M12 East initial ESCP must be signed and approved by the ESR and reviewed and signed by John Holland's Construction Superintendent, Project Manager and John Holland's Soil Conservationist and Certified Contamination Consultant before submitting the ESCP to WSO Co/TfNSW for review before disturbance occurs (refer to Section 7.5).

Prior to disturbance on the M7 Widening or M12 East package, other than for the installation of erosion and sediment capture measures, WSO Co/TfNSW must be provided with advice that the measures described in the ESCP and included on the drawing submitted progressively for that section of the Site including sediment basins and other water quality structures together with associated temporary or permanent connecting stormwater drainage lines and/or catch drains, have been implemented or the date by which implementation will be completed (refer to Section 7.4.1).

ESCPs will be revised progressively at key programme stages, when work methods change, or whenever work methods and control structures are found to be ineffective or no longer required.

The effectiveness of the ESCP must be reviewed following each rainfall event exceeding 10mm (refer to Section 6.17). Where the erosion and sedimentation control measures, stabilisation control measures and other soil and water control measures are found to be not effective to meet the objectives of this CSWMP, the PESCP must be reviewed and where required updated including review of design parameters used for Blue Book (Landcom, 2004) calculations. The Stockpile Management Procedure (Appendix G) must be updated where controls relating to stockpiles have not achieved the objectives of this CSWMP.

## 6.2 Sediment basin management

Temporary sediment basins will be required throughout the M7-M12 Integration project during construction. The number, location and size of the sediment basins will be further refined during detailed design from that detailed in the M7 Widening Modification Report and M12 Motorway EIS, with consideration of the:

- Guidelines in Managing Urban Stormwater: Soils and Construction (Landcom, 2004) (Blue Book)
- NSW EPA relevant EPL requirements
- Environmental values of the downstream receiving waterway.

Temporary sediment basins will be cleaned out whenever the accumulated sediment exceeds 60 per cent of the sediment storage zone. Accumulated sediment from sediment basins and traps will be removed in such a manner as not to damage the structures. Sediment removed from sediment basins will be appropriately managed. If sediment is disposed of, it must be classified and disposed of legally (refer to the CWRMP) (including potentially contaminated sediment) both during and immediately prior to completion of the M7-M12 Integration project.

Stormwater capacity of sediment basins must be re-established promptly after each rainfall event (routinely within 5 days but sooner if a major rainfall event substantially diminishes residual stormwater capacity, or otherwise to meet the EPL requirements). This may involve reuse of the water for dust suppression or discharging it after appropriate treatment of the water so that it meets specified requirements (refer to Section 6.8). In line with the requirements of Wat-2 and the targets described in the Sustainability Management Plan, the re-use of captured stormwater for construction activities such as dust suppression, will be targeted whenever possible, feasible and within environmental management provisions.

Temporary sediment basins will remain in place until upstream areas have been vegetated or otherwise stabilised in accordance with the Blue Book (Landcom, 2004).

**M7 Widening**

For the M7 Widening, sediment retention basins or sumps to control contaminated runoff will be appropriately sized to ensure risks identified in the DSI(s) are mitigated and managed outflows could occur only as a result of rainfall events that exceed the relevant design standard. This would be in accordance with M7 CoA D109.

Local erosion and sediment control measures may be used in lieu of sediment retention basins where approved in accordance with M7 CoA D108 (refer Section 6.1).

In areas of confirmed moderate to high risk of contamination along the M7 Widening alignment (to be confirmed by the findings of the DSI) where application of sediment retention basins is restricted by site constraints, and the outcomes of M7 CoA D109 cannot be met, alternative capture and treatment systems may only be used with approval from the Planning Secretary. Approval in accordance with M7 CoA D110 would be obtained through an update to this CSWMP or via separate approval. Earthworks that cause a risk of mobilising sediments will not proceed in an area identified as moderate to high risk contamination until such time as a DSI has confirmed contamination risk levels.

## 6.3 Saline soils

Construction within areas of moderate to high-risk saline soils will include:

- Ongoing groundwater monitoring of salinity as part of the water quality monitoring program
- Identification and management of saline discharge sites
- Progressive stabilisation and revegetation of exposed areas following disturbance as soon as is practicable
- Testing to confirm the presence of saline soils in areas of high salinity potential prior to disturbance.

Soil salinity management will also be carried out in accordance with the NSW Department of Primary Industries (2014) Salinity Training Handbook and measures described in Appendix L of this CSWMP. In the event that moderate to high-risk saline soils are identified and confirmed by the DSI, specialist advice will be sought from the Soil Conservationist, or an independent agronomist, to determine appropriate management actions.

## 6.4 Acid sulfate soils

Construction in the vicinity of waterways and farm dams (identified in Section 4.2) where there is a moderate risk of encountering PASS (identified in Section 4.1.5) (and any unexpected PASS finds) will be managed in accordance with measures described in Appendix L of this CSWMP and the Acid Sulfate Soil Manual (1998). The manual includes procedures for the investigation, handling, treatment and management of such soils. Management strategies will include:

- Avoid land where PASS occurs
- Avoid disturbing PASS if present on land
- Undertake shallow soil disturbance so as not to disturb PASS at depth
- Cover PASS with clean fill material
- Set aside or do not disturb PASS material and ensure there is no cross-contamination with topsoil or other clean material.

Where there is a moderate risk of encountering PASS, a Field pH Test and Peroxide Tests in accordance with the procedure in the NSW Acid Sulfate Soil Manual, ASSMAC 1998 will be completed at incremental depths through the soil profile to assess the distribution of ASS.

If the field pH test and peroxide tests indicates the presence of ASS, chemical analysis of samples are to be collected by a suitably qualified person at a representative locations and sampling density and analysed at a NATA accredited laboratory using methods recognised for the identification of acid sulfate soils (e.g. Chromium Reducible Sulfure (CRS) methodology and suspension peroxide oxidation combined acidity and sulfur (SPOCAS) methodology).

**M7 Widening**

As noted in Section 6.1, the M7 Widening may implement local erosion and sediment control measures where contaminated soils do not pose a risk to water quality in receiving waterways and pending approval from the Planning Secretary.

In the event that the DSI identifies moderate or high risk contamination for the M7 Widening component of the M7-M12 Integration project, an EPA accredited Site Auditor will be engaged to provide independent oversight for any work required in relation to areas of moderate or high risk contamination in accordance with M7 CoA D68.

## 6.5 Stockpile management

Stockpiles will be managed to minimise the potential for mobilisation and transport of dust and sediment in runoff in accordance with the Blue Book (Landcom, 2004) (refer Section 6.1), TfNSW Stockpile Sites Management Guideline (Roads and Maritime, 2015) and TfNSW Specification G38. This will include:

- Minimising the number of stockpiles, area used for stockpiles, and time that they are left exposed
- Locating stockpiles away from drainage lines, waterways and areas where they may be susceptible to wind erosion
- Stabilising stockpiles, establishing appropriate sediment controls and suppressing dust as required
- Locating stockpiles outside of the tree protection zone of trees or native vegetation identified for retention. The tree protection zone will be delineated in accordance with AS 4970 and to ensure a zone of at least 5 m from retained trees and outside the drip line
- Locate stockpiles at least 5 m from likely areas of concentrated water flows and at least 10 m from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline “Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings”
- Keeping stockpile heights to no greater than 2 m, unless otherwise approved by TfNSW, and slopes to no steeper than 2:1
- Covering, or otherwise protecting from erosion, stockpiles (including temporary stockpiles) that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind or water erosion, within 10 days of forming each stockpile
- Keeping topsoil that is not contaminated by noxious weeds in stockpiles for later spreading on fill batters and other areas. Other material may also be stockpiled but kept separated from the topsoil stockpiles
- Aiming for 95% topsoil (by volume) retention and beneficial reuse in line with Lan-2 and (where possible) will explore opportunities to improve topsoil productivity of previously disturbed areas
- Implementing measures to prevent the growth of weeds in topsoil stockpiles

- Inspect all stockpile sites at least weekly and rectify any non-conformances to erosion and sediment controls immediately
- Stockpile materials only in designated stockpile sites with appropriate erosion and sediment controls
- Locating stockpiles above 20-year flood levels
- Locating stockpiles, construction vehicles and other elements away from key views and visual receptors where possible, and using appropriate screening measures and practices if this is not possible
- Locating stockpiles outside of utility easement corridors
- Appropriately locating mulch stockpiles, with off-site water diversions and strategies for the management of leachate implemented to protect receiving waters.

A Stockpile Management Procedure (Appendix G) has been prepared to outline the requirements for stockpiles. Stockpile locations must be determined to comply with the Procedure and must be identified on PESCPs that have been approved by TfNSW prior to establishment. Since this CSWMP (CEMP Sub-plan) contains a stockpile management protocol (Appendix G), a material stockpile area located within the construction boundary is not considered to be an ancillary facility.

If any stockpile site is located on private land, approval will be obtained from the landholder under s.143 of the POEO Act prior to commencement of stockpiling. Spoil management is addressed in Appendix C of the CWRMP.

## 6.6 Tannin management

Tannins are naturally occurring plant compounds that can leach out of mulched vegetation stockpiled in areas that are subject to inundation. Tannin impacts may result in dark coloured water discharge from construction sites. This impact can be obvious and may raise the concern of the community and other stakeholders including regulatory authorities.

Once discharged to the environment, tannins may reduce visibility and light penetration, increase the biological oxygen demand (BOD) and change the pH of receiving waters. These impacts may affect aquatic ecosystems in receiving environments.

Stockpiles of mulched vegetation will be managed in accordance with the Tannin Management Procedure provided in Appendix F to reduce the risk of tannin leachate from mulch flowing into waterways. The Tannin Management Procedure has been prepared in accordance with the TfNSW Environmental Direction 25: Environmental Direction Management of Tannins from Vegetation Mulch (2012).

## 6.7 Water abstraction management

In accordance with the sustainability targets established for the M7-M12 Integration project, John Holland will target reductions in water use, in particular potable water, and increase reuse water (non-potable water) during construction including rainwater, stormwater, wastewater, and groundwater.

A Construction Water Reuse Strategy has been developed by TfNSW in accordance with M7 CoA D79, M7 REMM SW6 and M12 REMM SWH03. John Holland have developed a stage specific

construction water reuse strategy to reduce reliance on potable water (refer to Appendix I). The Strategy details:

- Considerations of the current and future demand of potable water within the M7-M12 Integration project
- Considers possible alternate water sources to be used for construction, where potable water may not be required
- Measures to avoid misuse of recycled water as potable water
- Consideration of the public health risks from water recycling
- Time frames for the implementation of preferred reuse options.

**M7 Widening**

For the M7 Widening, water use would largely be associated with dust suppression and the construction of the widened road pavement (e.g. compaction). Water would also be used during construction for a range of purposes, including but not limited to, wheel washing, machinery, curing structures and operation of the ancillary construction facility amenities (toilets, sinks, showers and drinking). Over the construction period about 280 ML of water would be used, equating to 93 ML per year of construction.

**M12 East package**

For the M12 East package component of the M7-M12 Integration project, around 302.5 ML of water would be required per year for construction. This would comprise of a core potable water demand of about 51.5 ML per year and recycled water of about 251 ML in total per year.

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Construction will be managed in accordance with the Construction Water Reuse Strategy and TfNSW Specification G38 with the aim of reducing use of potable water for construction and meeting targets for use of non-potable water (M7 CoA D79, M7 REMM SW6, M12 REMM SWH03).

Water may be extracted from construction sediment detention basins during construction, including farm dams located on the Site for construction purposes. Where water is proposed from farm dams, and EWMS must be prepared and the Farm Dam Dewatering Procedure provided in the CFFMP (Appendix G) implemented, to assess and manage impact to aquatic flora and fauna.

Where water extraction from local waterway is proposed a qualified aquatic ecologist will be engaged to assess if it is suitable for water abstraction and for when pumping should cease. Any pumps used in natural waterways should be screened with mesh no greater than 5mm.

John Holland will not draw water from waterways or from groundwater without obtaining all required approvals and written approval from TfNSW. For the M7 Widening component of the M7-M12 Integration project, any contaminated groundwater extracted from excavations during piling must be disposed of at a licensed waste facility, in accordance with M7 CoA D111. Under TfNSW QA Specification B59, temporary casings are to be used if groundwater is encountered during construction works. The use of temporary casings, where groundwater is encountered, will reduce the volume of water required to be dewatered. If the proposed source is other than a town water supply or natural water source, a monitoring procedure for regular testing to ensure that the water is suitable for the purpose and is not hazardous to health and the environment will be developed.

Table 6-1 provides a summary of the proposed reuse water sources for the M7-M12 Integration project and the associated approval and licence. The use of reclaimed water will comply with the requirements of TfNSW Environmental Direction 19: Use of Reclaimed Water.

*Table 6-1: Water reuse sources*

| Source | Licence and approvals |
|---|---|
| Farms dams within the construction footprint | EPL Conditions.<br>Exempt under the Water Management (General) Regulation 2018 (NSW) (Regulation). |
| Temporary sediment basins | EPL Conditions. |
| Western Sydney Airport recycled water sourced from a dedicated pipeline from Glenfield Water Recycling | Execution of Interface Agreement with WSA Co.<br>Site specific resource recovery order (order) and resource recovery exemption (exemption). |
| Sydney Metro's Western Sydney Airport tunnel water treatment plants | Execution of Interface Agreement with Sydney Metro.<br>Site specific resource recovery order (order) and resource recovery exemption (exemption). |
| Groundwater (installation of new groundwater bores on site)<br>(Note: this source is not included within or assessed by the Environmental Assessment Documentation as a source for construction water) | A consistency assessment to review the environmental impacts of the bore and to determine if a modification would be required.<br>An aquifer interference approval under Section 91 of the Water Management Act 2000. |
| River water local waterway | Schedule 4 of the Water Management (General) Regulation 2018 provides exemption for TfNSW to use water for dust suppression having considered the environmental impact of such an activity. |

## 6.8 Dewatering management

Dewatering is any activity that involves the removal of ponded stormwater or infiltrated groundwater from any location within the M7-M12 Integration project (including from sediment basins and dams) and the subsequent reuse or discharge of that water.

John Holland will plan to avoid and minimise discharges as much as practicable, while complying with the conditions of the EPL, and undertake dewatering activities in a manner to minimise erosion and pollution of the environment. The M7-M12 Integration project is subject to an EPL which includes discharge criteria for licenced discharge points.

TfNSW prepared a Water Quality Impact Assessment (Impact Assessment of Sediment Control Basin Discharges to Waterways (Doc Number M12CDD-GHDA-ML2-EV-RPT-000010)) for Elizabeth Drive Connection. This report included an assessment of the impacts of proposed construction- phase sediment basin discharge limits against the NSW Water Quality Objectives (WQOs) for the M12 East package location and has been further updated for the Project. It follows

the methodology outlined in the draft Guideline for assessing the Impacts of Treated Water Discharge from Water Quality Treatment Controls developed by TfNSW (TfNSW, 2020a).

Based on the recommendations of this assessment, the Project has specified the following discharge concentration limits from the licenced discharge points, which aligns with the concentration limits specified in the EPL, no. 21829, approved 2 August 2023 for the M7-M12 Integration project:

- Oil and grease – not visible
- Ph – 6.5 – 8.5
- Total suspended solids – 50 milligrams per litre.

A Dewatering Management Plan (Appendix C) has been prepared with a Trigger Action Response Protocol (TARP) to outline disposal options. The Dewatering Management Plan includes details on the treatment of water when a flocculant or coagulant is necessary to settle suspended sediments. Where a flocculant or coagulant other than gypsum is proposed to treat site water, the ESR will demonstrate that the proposed flocculant or coagulant is suitable for use and will submit the application using the TfNSW template “Alternative flocculants and coagulants – template to propose use”.

Runoff from the Westlink M7 is generally controlled by a series of on-site detention basins that are typically provided in combination with water quality basins. The on-site detention basins and water quality basins were typically designed with additional capacity to cater for a potential increase in runoff from additional paved areas due to the future widening of the M7 Motorway. Combined water quality and on-site detention basins function with the high-flow pit to limit the rate of discharge from the on-site detention part of the basin. Water quality monitoring during construction will be undertaken in accordance with the Construction Water Quality Monitoring Program (Appendix B) to demonstrate compliance with the nominated water quality objectives.

## 6.9 Work in waterways

**M7 Widening**

For the M7 Widening component of the M7-M12 Integration project, works on waterfront land will be carried out in accordance with Guidelines for controlled activities on waterfront land (NRAR, 2018), Controlled activities on waterfront land – Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012) and Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013).

**M12 East package**

For the M12 East package component of the M7-M12 Integration project, works on waterfront land will be carried out in accordance with controlled activity guidelines. These include:

- Guidelines for controlled activities on waterfront land – Riparian Corridors (NRAR, 2018)
- Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012)
- Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013).

**M7-M12 Integration project**

Where work is required within waterways, an EWMS for the work(s) will be prepared in consultation with DPI Fisheries and submitted to TfNSW prior to the commencement of the works for approval (refer to Section 7.4). The EWMS for work in waterways will detail the control measures to avoid or minimise erosion and any adverse impact on water quality and riparian fauna and flora, and include provision to:

- Plan work to avoid, where practicable, any activities in aquatic habitats and riparian zones
- Properly protect and signpost as environmentally sensitive areas all waterways in or adjacent to the site which are excluded from the work areas
- Minimise riparian vegetation removal where practicable, and restrict access to the waterways to the minimum amount of bank length required for the activity
- Retain stumps in riparian zones and aquatic habitats, where practicable, to reduce the potential for bank erosion
- Carry out any refuelling of plant and equipment, chemical storage and decanting at least 50 m away from aquatic habitats unless otherwise approved by TfNSW
- Flood risks and impacts on surrounding properties
- Provision of innovative all-weather haulage crossings methods that address the above clauses and minimise ongoing maintenance requirements during service.

The following measures will be carried out to manage activities within watercourses or on waterfront land:

- Work in waterways will be scheduled during periods of predicted low flow wherever possible.
- Implementing practices to minimise disturbance of banks
- Where possible, reclaim existing creek/riverbed material and utilise the material in the reconstruction of the creek/river.
- Undertaking bank stabilisation, channel reshaping and scour protection where required to mitigate the impact of additional bridge piers on scour and stability of the bed and banks of watercourses
- Progressively stabilise disturbed creeks/rivers to avoid potential scouring and sedimentation and permanent stabilisation measures implemented as soon as practicable.
- Maintaining minimum flows to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage
- Constructing instream crossings during low flows and design so that drainage off crossing does not contribute sediment load to the stream
- All drainage feature crossings (permanent and temporary watercourse crossings and stream diversions), drainage swales and depressions will be designed by a suitably qualified and experienced professional and will be designed and constructed in accordance with relevant guidelines, including but not limited to the former NSW Department of Industry's Guidelines for controlled activities on waterfront land (2018).

## 6.10 Temporary waterway crossings

John Holland will design, construct and maintain any temporary waterway crossings and maintain fish passage consistent with the following guidelines:

- Managing Urban Stormwater: Soils and Construction (Landcom, 2004) (Blue Book)

- DPI Fisheries guideline “Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.”
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings (Ref: NSWF – 1181) (NSW Fisheries, November 2003)
- Guidelines for controlled activities on waterfront land (NRAR, 2018).

If native fish become stranded as a result of temporary crossings, waterway diversions or dewatering activities they will be relocated by a qualified aquatic ecologist where feasible. Sediment/erosion booms will be placed so as not to obstruct fish passage where possible in accordance with M7 REMM B5.

Temporary waterway crossings and erosion and sediment controls will be managed by the ESR and designed by a suitably qualified and experienced person. The temporary water crossings and erosion and sediment control plan will be reviewed by the Soil Conservationist.

Temporary water crossings will use hard, sound, durable rock, free of fine particles and not contaminated with foreign materials to avoid erosion of fine sediment material entering the waterway.

Erosion and sediment controls will be implemented at the entry and exits points of temporary waterway crossings to minimise mud tracking on the crossing. All personnel must complete the training outlined in the Blue Book (Landcom, 2004) for erosion and sediment control.

## 6.11 Refuelling, washdown and chemical storage

All fuels, chemicals, and liquids will be stored in bunded areas on relatively flat land at least 50m away from waterways (including existing stormwater drainage systems) and flood prone areas.

The storage, handling and use of dangerous goods and hazardous substances will be in accordance with the Work Health and Safety Act 2011, Schedule 11 of the Work Health and Safety Regulation 2017, the EPA “Bunding and Spill Management Guidelines” contained within EPA Environmental Protection Manual for Authorised Officers, the TfNSW “Code of Practice for Water Management” and all relevant legislation and Australian standards. It is noted the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005) is no longer in force but has been retained ‘for information’

The Safety Manager (or delegate) will obtain Safety Data Sheets (SDS) for dangerous goods and hazardous substances prior to their arrival on site. SDS will be recorded in the Project SDS register. All hazardous substances will be transported in accordance with relevant legislation and codes, including the Dangerous Goods (Road and Rail Transport) Regulation 2022 and the ‘Australian Code for the Transport of Dangerous Goods by Road and Rail’ (National Transport Commission, 2022).

The refuelling and maintenance of plant and equipment, mixing of cutting oil with bitumen and any other activity which may result in spillage of chemical fuel or lubricant will be undertaken in a designated sealed bunded area where spill kits are available. Refuelling will not be undertaken within 50m of any waterway. Refuelling activities will be supervised at all times.

Designated impervious bunded washdown facilities for concrete trucks and other vehicles will be provided at least 100m from areas prone to flash flooding or 50m away from other natural and built drainage lines.

Plant and vehicle maintenance, including washdown, will be undertaken in designated areas to minimise the potential for offsite discharge and mud tracking.

## 6.12 Pollution incident response management

Pollution incidents will be managed in accordance with the M7-M12 Integration Project Pollution Incident Response Management Plan (PIRMP) (refer CEMP Appendix A9), as required by the EPL. The PIRMP will be prepared and tested in accordance with Environmental Guidelines: Preparation of Pollution Incident Response Management Plans (EPA, 2022).

The PIRMP includes a description and likelihood of hazards on site, including an inventory of potential pollutants, pre-emptive actions to be taken to minimise or prevent risk of pollution incidents and harm to site personnel, safety equipment available, a list of contact details for response or notification and community communication tools. The PIRMP will also set out detailed descriptions of the actions to be undertaken in the event of a pollution incident to reduce or control pollution, and training for staff in the use and implementation of the PIRMP.

## 6.13 Spill prevention and response

A Spill Response Procedure is included in Appendix K of this CSWMP, which is referenced in the Pollution Incident Response Management Plan (PIRMP) (refer to CEMP Section 7.3.2 and Appendix A9) to minimise impacts from spills. The Procedure details the requirements for managing, cleaning up and reporting of spills.

The CEMP Appendix A7 details the Projects Incident Classification and Reporting Procedure including the incident (including spills) response process (Figure 2-1 of Appendix A7).

Spill kits will be located to allow for timely response to uncontained spills including:

- Construction ancillary facilities compounds
- Each structures site (bridges and culverts) during structure construction works
- Within supervisors site vehicles.

All spills will be cleaned up and reported as an environmental incident. For the M7 Widening component of the M7-M12 Integration project, all spills are required to be cleaned up, with material removed as soon as practicable or within 24 hours, and report as an environmental incident.

As outlined in M7 REMM SW11, the adequacy of the existing spill containment measures along the M7 Widening corridor will be verified during detailed design. In the instance where existing spill containment measures cannot be demonstrated, additional spill containment mitigation measures will be identified, implemented and incorporated into existing maintenance procedures.

M7-M12 Integration project site inductions will include a briefing on the use of spill kits.

Procedures will also be prepared prior to the commencement of the following activities, as a minimum, to minimise the possibility of pollution of the site prior to the commencement of the associated activity and included in the work packs for that activity:

- Refuelling or maintenance and cleaning of plant and equipment including concrete agitators, bitumen spray bars and asphalt pavers
- On-site batching of concrete and asphalt
- Mixing of bitumen with cutting oil and additives
- Application of liquid membranes, including paint and thermoplastic, resin, emulsion, pre- coat agent and curing compound
- Bulk fuel or chemical deliveries
- Removal and disposal of excess chemicals and water used for washing down of equipment
- Pumping out of oil and grease collection pits
- Decanting operations such as for fuel, chemicals and bitumen.

The procedure(s) will include the following, as a minimum:

- Details of the management of the bunded areas including monitoring of the bunded areas, drainage requirements and measures to ensure that bund capacities are maintained
- Details of the management associated with the removal and transportation of chemical drums from bunded areas
- Routine maintenance requirements of machinery, pumps and other equipment to prevent and/or minimise leaks
- Installation of controls for the capture and filtering of all chemicals that may runoff in storm events, for example wax and hydrocarbon curing compounds, bitumen tack coat and saw cutting material.

Where related to an activity for which an EWMS is also required, the procedure will be submitted with the related EWMS under the TfNSW Specification G36 Hold Point 4.13 (refer to Section 7.5).

## 6.14 Impacts on water supply

In accordance with M12 CoA E24, properties where modelling in the M12 EAD predicts that the M12 Motorway East package will potentially reduce the available stormwater runoff yield to a farm dam, TfNSW must consult with the affected landowner, calculate the nature and extent of impacts on water supply. It is noted that this only applies to farm dams on land zoned as Primary Production (M12 CoA E24).

Two farm dams were identified in the EAD that would be impacted by the M12 East package:

- A farm dam on private property about 350m north of Project boundary is located within the EDC alignment and will be infilled
- Farm dam on Ancillary Facility AF9.

The changes in catchment area of the dams at AF9 is minor (3.0 per cent increase). The net effect on the water balance is also minor resulting in net increase in water supplied to the dams. It should be noted that a third dam in the alignment will be infilled with impacts from removal of this source managed as part of the acquisition process.

Works associated with the M7 Widening component of the M7-M12 Integration project is not expected to affect stormwater runoff yield to farm dams.

In the event that circumstances change, this Plan will be updated with measures agreed by John Holland with the potentially affected landowner at no cost to the landowner. The agreed measures will be implemented before and during construction of any works that may potentially affect the flow of water into the farm dams (M12 CoA E24).

In the event that John Holland and the landowner cannot agree on the measures to mitigate the impact, John Holland will engage a suitably qualified and experienced independent professional, approved by TfNSW and WSO Co, to advise and assist in determining appropriate mitigation measures on farm dam impacts from stormwater yields (M12 CoA E24).

## 6.15 Site stabilisation

A Site Stabilisation Sub-plan (Appendix H) will be implemented for the staged stabilisation of the Works throughout Construction. The Site Stabilisation Sub-plan includes:

- Site stabilisation objectives
- Identification and mapping of areas along the length of the proposal requiring stabilisation (to be updated progressively through the ESCPs)
- A risk assessment framework for disturbed areas and stockpiles
- Identification of timing for stabilisation
- Detailed description of methods for stabilisation
- Identification of areas and a program for progressive, permanent stabilisation such as implementation of landscaping
- A procedure for regularly monitoring and assessing the performance and effectiveness of your stabilisation control measures against the Site Stabilisation Sub-plan objectives and for implementing improvements
- A procedure to ensure all stabilisation risk areas would be stabilised within the periods listed in timeframes specified
- A process for identifying additional stabilisation methods.

Soil erosion and sediment control measures for any area must remain in place and be maintained at least until the new vegetation provides sufficient protection to keep erosion to a similar level to that of typical local natural bushland as agreed with WSO Co/TfNSW.

## 6.16 Wet weather preparation and review

Where a wet weather event is predicted, a review of site erosion and sediment controls must be undertaken. Wet weather events are defined as more than a 50 per cent chance of 10 mm of rainfall or greater triggering the requirement to prepare the site for wet weather. Wet weather sampling in accordance with monitoring program will occur when >22 mm rainfall occurs in a 24 hour period.

The erosion and sediment control review will be confirmed by the ESR (or delegate), and include:

- Inspection of the site to ensure that all erosion/sedimentation and stabilisation controls are in place and in effective working order
- Actions to be taken to prevent any environmental incidents such as potential pollution incidents
- Measures to be implemented to protect disturbed ground from erosion.

Pre-flood response actions as identified in the CFMP will begin on receipt of BOM advice, or when other evidence leads to an expectation of flooding.

Following a wet weather event, a post-wet weather inspection will be undertaken to review site performance and repair controls as required. Details regarding the timing and responsibilities of all inspections relevant to this Plan are included in Section 7.4.

## 6.17 Environmental management measures

Performance outcomes, commitments and management measures were identified in the EAD, the CoAs, REMMs and relevant TfNSW documents.

All specific measures and requirements to minimise and manage impacts on soil and water during construction of the M7-M12 Integration project are outlined in Table 6-2.

*Table 6-2: Soil and Water management and mitigation measures*

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| M7-M12 Integration project | | | | | |
| SW01 | ESCPs must be prepared as part of John Holland SWMPs and submitted for approval by TfNSW prior to the commencement of works in that area.<br>The ESCP must be prepared by a person with demonstrated skills and experience in preparing the ESCP in accordance with the Blue Book guidelines (Landcom, 2004) and TfNSW G38. | Prior to construction | John Holland ESR | M7 REMM C1<br>TfNSW G38 Section 1.2.7<br>Appendix D<br>Appendix E | ESCP<br>Hold point release |
| SW02 | ESCPs must be updated to reflect site conditions at the time of construction.<br>The ESCP must include a procedure for updating the drawings and keep a register of all such drawings with the dates of submission, approval, and commencement of work on that section. | During construction | John Holland ESR | M7 REMM C1<br>TfNSW G38 Section 2.2.3<br>Appendix D<br>Appendix E | ESCP |
| SW03 | Prior to commencement of Works resulting in ground disturbance at all work sites, erosion and sediment control measures will be implemented and maintained in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004) and Volume 2D (NSW Department of Environment, Climate Change and Water 2008), commonly referred to as the 'Blue Book', as well as relevant TfNSW Guidelines. | During construction | John Holland Superintendent / Foreman/Site Supervisor | M12 REMM SWH01<br>M7 REMM SW2<br>M12 CoA E84<br>M7 CoA D65<br>Appendix E | Inspection records |
| SW04 | A soil conservation specialist will be engaged by both TfNSW and John Holland for the duration of construction of the Project to provide advice on the planning and implementation of erosion and sediment control including review of ESCPs. | Prior to and during construction | TfNSW / John Holland ESR | M12 REMM SWH02<br>M7 REMM SW3<br>Appendix D | Soil conservation specialist engagement |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| SW05 | Construction will be carried out in a manner so as to either maintain the NSW Water Quality Objectives where they are being achieved as at 23 April 2021, and contribute towards achievement of the NSW Water Quality Objectives over time where they are not being achieved unless an EPL is in force in respect of the CSSI contains different requirements in relation to the NSW Water Quality Objectives, in which case those requirements must be complied with. | Detailed design<br>During construction and operation | Designers<br>John Holland ESR | M12 CoA E105<br>M7 CoA D105<br>Appendix B | Detailed design reports<br>EPL |
| SW06 | Controls for sensitive receiving environments including SEPP Coastal Wetlands will include but not be limited to:<br>• Designation of 'no go' zones for construction plant and equipment<br>• Creation of catch/diversion drains and sediment fences at the downstream boundary of construction activities where practicable to ensure containment of sediment-laden runoff and diversion toward sediment sump treatment areas (not sediment basins) to prevent flow of runoff to the SEPP Coastal Wetland. | During construction | John Holland Superintendent / Foreman/Site Supervisor | M12 REMM SWH01<br>M7 REMM SW1 | Appendix E ESCP<br>Inspection records |
| SW07 | Sediment basins must be designed and constructed in accordance with the Blue Book (Landcom 1994) and detailed within the ESCP. | Prior to and during construction | Designers<br>John Holland ESR | Blue Book | Appendix E ESCP<br>Detailed design |
| SW08 | Sediment basins must be cleaned out whenever the accumulated sediment exceeds 60% of the sediment storage zone.<br>Accumulated sediment from sediment basins and traps must be removed in such a manner as not to damage the structures and disposed of, or reused, in accordance with CWRMP. | During construction | John Holland Superintendent / Foreman/Site Supervisor | TfNSW G38 Section 3.2.4<br>Appendix E | Inspection records<br>Depth marker |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| SW09 | Provide and maintain suitable access to sediment basins and sediment traps to allow inspection, maintenance, monitoring and cleaning out in all weather conditions. | During construction | John Holland Superintendent / Foreman/Site Supervisor | TfNSW G38 Section 3.2.4<br>Appendix E | Detailed design |
| SW10 | Remove all construction sediment retention basins and sediment traps before completion, making all areas good, but not before all upstream areas have been vegetated or otherwise stabilised in accordance with the Blue Book (Landcom, 2004). | During construction | John Holland Superintendent / Foreman/Site Supervisor | TfNSW G38 Section 3.2.5<br>Appendix E | Inspection records |
| SW11 | Construction within areas of moderate to high-risk saline soils will be managed in accordance with the CSWMP. Specific measures will also include (but not be limited to):<br>• Ongoing groundwater monitoring of salinity as part of the water quality monitoring program<br>• Identification and management of saline discharge sites<br>• Progressive stabilisation and revegetation of exposed areas following disturbance as soon as is practicable<br>• Testing to confirm the presence of saline soils in areas of high salinity potential prior to disturbance.<br>• Soil salinity management will also be carried out in accordance with the NSW Department of Primary Industries (2014) Salinity Training Handbook. | During construction | John Holland ESR | M12 REMM SC01<br>M12 REMM SWH01<br>M7 REMM SW9<br>Appendix B<br>Appendix C<br>Appendix E | Inspection records<br>Monitoring records |
| SW12 | Construction in the vicinity of waterways and farm dams where there is a moderate risk of encountering PASS and any unexpected PASS finds and will be managed in accordance with the Acid Sulfate Soil Manual (1998). The manual includes procedures for the investigation, handling, treatment and management of such soils. Management strategies will include: | During construction | John Holland Superintendent / Foreman / Site Supervisor /ESR | Best practice | Inspection records<br>Monitoring records |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | • Avoid land where PASS occurs;<br>• Avoid disturbing PASS if present on land;<br>• Undertake shallow soil disturbance so as not to disturb PASS at depth;<br>• Cover PASS with clean fill material;<br>• Set aside or do not disturb PASS material. | | | | |
| SW13 | Stockpiles will be managed in accordance with TfNSW Technical Guideline EMS-TG-010: Stockpile Site Management and the Blue Book guidelines. Stockpiles will comply with the following:<br>• Locate stockpiles outside of the tree protection zone of trees or native vegetation identified for retention. Delineate the tree protection zone in accordance with AS 4970.<br>• Locate stockpiles at least 5 m from likely areas of concentrated water flows and at least 10 m from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline “Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings”.<br>• Keep stockpile heights to no greater than 2 m, unless otherwise approved by the Principal, and slopes to no steeper than 2:1.<br>• Cover, or otherwise protect from erosion, stockpiles that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind or water erosion, within 10 days of forming each stockpile.<br>• Keep topsoil that is not contaminated by noxious weeds in stockpiles for later spreading on fill batters and other areas. Other material may also be stockpiled but kept separated from the topsoil stockpiles. | During construction | John Holland Superintendent / Foreman / /Site Supervisor / ESR | TfNSW G38 Section 3.5<br>M12 REMM SWH01<br>M7 REMM SW1 and SW4<br>Appendix E<br>Appendix G | ESCP<br>Inspection records<br>s143 approved notice |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | • Implement measures to prevent the growth of weeds in topsoil stockpiles. | | | | |
| SW14 | Stockpiles will be managed to minimise the potential for mobilisation and transport of dust and sediment in runoff in accordance with TfNSW Stockpile Sites Management Guideline (Roads and Maritime, 2015). This will include:<br>• Minimising the number of stockpiles, area used for stockpiles, and time that they are left exposed<br>• Locating stockpiles away from drainage lines, waterways and areas where they may be susceptible to wind erosion<br>• Stabilising stockpiles, establishing appropriate sediment controls and suppressing dust as required. | During construction | John Holland Superintendent / Foreman / /Site Supervisor / ESR | M12 REMM SWH04<br>M12 REMM SHW01<br>M7 REMM SW4<br>M7 REMM AQ9<br>M7 REMM SW1<br>Appendix E | ESCP<br>Inspection records |
| SW15 | Prepare a procedure to manage the use and stockpiling of mulch on site and to reduce the risk of tannin leachate from mulch flowing into waterways and include this within the SWMP or ESCP. Prepare the procedure in accordance with TfNSW Environmental Direction 25: Management of Tannins from Vegetation Mulch. | Prior to construction | John Holland ESR | TfNSW G38 Section 3.6<br>M12 REMM SWH01<br>M7 REMM SW1<br>Appendix G<br>Appendix F | Procedure to manage the use and stockpiling of mulch |
| SW16 | The SWMP or ESCP will describe the proposed water source(s) intended for use for construction activities and obtain approval from relevant authority for the chosen source(s) before commencing extraction.<br>If the proposed source is other than a town water supply or natural water source, the SWMP or ESCP will include procedures for regular testing to ensure that the water is | Prior to construction | John Holland ESR | TfNSW G38 Section 3.8 | Water access licence |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | suitable for the purpose and is not hazardous to health and the environment.<br><br>The use of reclaimed water must comply with the requirements of TfNSW Environmental Direction 19: Use of Reclaimed Water. | | | | |
| SW17 | A Dewatering Management Plan will be prepared by John Holland as part of the CSWMP which will outline the dewatering methodology, testing requirements, supervision requirements, staff responsibilities and training, and approvals required before any de-watering activity begins.<br><br>The personnel responsible for approval and/or carrying out dewatering activities must be adequately trained and inducted on the use of the dewatering procedure. | Prior to construction | John Holland ESR | M12 REMMs SWH01 and SWH11<br><br>M7 REMM SW2<br><br>TfNSW G38 Sections 3.4.2 and 3.4.3<br><br>Appendix C | Dewatering Management Plan<br><br>Training records |
| SW18 | If it is proposed to discharge construction stormwater to waterways, a Water Pollution Impact Assessment will be required to inform licensing, consistent with section 45 of the POEO Act. Any such assessment must be prepared in consultation with the EPA and be consistent with the National Water Quality Guidelines, with the level of detail commensurate with the potential water pollution risk. | Prior to water discharge | John Holland ESR | M12 CoA E105<br><br>M7 CoA D105<br><br>Appendix C | Dewatering Management Plan<br><br>Permit to Discharge |
| SW19 | Water will only be discharged under a permit to discharge. A permit will only be issued once water quality criteria (in accordance with the EPL discharge criteria) have been met. | Prior to water discharge | John Holland ESR | M12 REMM SWH01 and SWH11<br><br>M7 REMM SW1 and SW2<br><br>TfNSW G38 Section 3.4.2 | Dewatering Management Plan<br><br>Permit to Discharge |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| | | | | Appendix C<br>EPL 21829 L2.1-2.7 | |
| SW20 | Where gypsum is proposed for use to settle suspended sediments, the appropriate application rate, as well as method of applying the gypsum will be determined and noted within the ESCP. | Prior to construction | John Holland ESR | TfNSW G38 Section 3.3.1<br>Appendix C | Dewatering Management Plan |
| SW21 | Where a flocculant or coagulant other than gypsum is proposed to treat site water, John Holland must demonstrate that the proposed flocculant or coagulant is suitable for use and submit the application using the TfNSW template “Alternative flocculants and coagulants – template to propose use” | Prior to construction | John Holland ESR | TfNSW G38 Section 3.3.2 | |
| SW22 | Apply the flocculant or coagulant (whether gypsum or another approved material) to settle suspended sediments within 24 hours of the conclusion of each rain event causing runoff. | During construction | John Holland Superintendent / Foreman /Site Supervisor / ESR | TfNSW G38 Section 3.3.3<br>Appendix E | Alternative flocculants and coagulants – template to propose use |
| SW23 | Prior to the commencement of dewatering, John Holland will inspect the entire system, including intakes and outlets, pumping and discharge locations.<br>Wherever possible, John Holland will supervise any dewatering activities directly.<br>If John Holland chooses not to directly supervise dewatering, a risk assessment must be carried out and mitigation measures implemented to eliminate the risks of pollution and to prevent the occurrence of the following:<br>• Intake suction placed within the deposited sediments resulting in discharge of sediment laden waters | Prior to construction | John Holland ESR | TfNSW G38 Section 3.4.4<br>Appendix C | Dewatering management plan |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | • Erosion at discharge locations and downstream areas<br>• Inadvertent or intentional controlled discharge of untreated waters. | | | | |
| SW24 | The following records will be kept in relation to dewatering:<br>• Dewatering procedure<br>• Date and time for each discharge at each location<br>• Water quality test results for each discharge<br>• Personnel approving the dewatering activities<br>• Evidence of discharge monitoring, or risk assessment and mitigation measures used to eliminate the risks of pollution or erosion<br>• Any other EPA licence requirements where issued. | Prior to construction | John Holland ESR | TfNSW G38 Section 3.4.5<br>Appendix C | Dewatering records |
| SW25 | Where work is required within waterways, an EWMS will be prepared for the work(s). The EWMS for work in waterways must detail the control measures and must include the following:<br>• Plan work to avoid, where practicable, any activities in aquatic habitats and riparian zones<br>• Properly protect and signpost as environmentally sensitive areas, all waterways areas in or adjacent to the site which are excluded from the work areas<br>• Minimise riparian vegetation removal where practicable, and restrict access to the waterways to the minimum amount of bank length required for the activity<br>• Retain stumps in riparian zones and aquatic habitats, where practicable, to reduce the potential for bank erosion<br>• Carry out any refuelling of plant and equipment, chemical storage and decanting at least 50 m away from aquatic habitats unless otherwise approved by the TfNSW | During construction | John Holland ESR | TfNSW G38 Section 3.7.1 | EWMS |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | • An Erosion and Sediment Control Plan (ESCP). | | | | |
| SW26 | The following measures will be carried out to manage activities within watercourses or on waterfront land:<br>• Implementing practices to minimise disturbance of banks<br>• Undertaking bank stabilisation, channel reshaping and scour protection where required to mitigate the impact of additional bridge piers on scour and stability of the bed and banks of watercourses<br>• Maintaining minimum flows to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage<br>• Constructing instream crossings during low flows and design so that drainage off crossing doesn't contribute sediment load to the stream<br>• All drainage feature crossings (permanent and temporary watercourse crossings and stream diversions), drainage swales and depressions will be designed by a suitably qualified and experienced professional and will be designed and constructed in accordance with relevant guidelines, including but not limited to the former NSW Department of Industry's Guidelines for controlled activities on waterfront land (2018). | During construction | John Holland ESR | M12 REMM SWH12<br>M7 REMM SW7 | Inspection records |
| SW27 | Temporary waterway crossings will consider the following:<br>• Design, construct and maintain the crossing in accordance with the requirements of the Blue Book (Landcom, 2004)<br>• Maintain fish passage in accordance with DPI Fisheries guideline "Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings"<br>• Use material that will not result in fine sediment material entering the waterway. Rock used must be hard, sound, | During construction | John Holland ESR | TfNSW G38 Section 3.7.2 | EWMS |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | durable rock, free of fine particles and not contaminated with foreign materials<br>• Provide erosion and sediment controls at entry/exits points of the crossing to minimise mud tracking on the crossing. | | | | |
| SW28 | Storage, handling and use of dangerous goods and hazardous substances must be in accordance with the Work Health and Safety Act 2011. | During construction | John Holland ESR | M12 REMM HS04<br>M7 REMM HR8 | Inspection records |
| SW29 | All fuels, chemicals, and liquids must be stored on slopes less than 1:10 and at least 50 m away from waterways (including existing stormwater drainage systems) and flood prone areas.<br>Secure, bunded areas must be provided around storage areas for oils, fuels and other hazardous liquids. | During construction | John Holland ESR | M12 REMM HS05<br>M7 REMM HR9<br>TfNSW Specifications | Inspection records |
| SW30 | SDS must be obtained for dangerous goods and hazardous substances stored onsite before their arrival. | During construction | John Holland ESR | M12 REMM HS06<br>M7 REMM HR10 | SDS |
| SW31 | All hazardous substances must be transported in accordance with relevant legislation and codes, including the Dangerous Goods (Road and Rail Transport) Regulation 2022 and the 'Australian Code for the Transport of Dangerous Goods by Road and Rail' (National Transport Commission, 2022). | During construction | John Holland ESR | M12 REMM HS07<br>M7 REMM HR11 | CTTMP |
| SW32 | Spill prevention and response will comply with:<br>• Relevant legislation and Australian Standards<br>• EPA "Bunding and Spill Management Guidelines" contained within "EPA Environmental Protection Manual for Authorised Officers"<br>• TfNSW "Code of Practice for Water Management". | During construction | John Holland ESR | TfNSW G36 Section 4.3 | Spill response procedure<br>PIRMP |
| SW33 | John Holland must not refuel or maintain plant and equipment, undertake plant/equipment washdown, mix cutting oil with | During construction | John Holland ESR | TfNSW G36 Section 4.3 | Refuelling procedure |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | bitumen, or carry out any other activity which may result in spillage of a chemical, fuel or lubricant at any location which drains directly to waters or environmentally sensitive areas, without the appropriate temporary bunding being provided. Refuelling operations must be attended. | | | | |
| SW34 | A spill response procedure will be prepared as part of the CEMP and PIRMP, to minimise the impact of spills. The procedure will include details on the requirements for managing, cleaning up and reporting of spills. | Prior to construction | John Holland ESR | TfNSW G36 Section 4.3 | Spill response procedure<br>PIRMP |
| SW35 | Spill kits will be located to allow for timely response to uncontained spills. Adequate quantities of suitable material to counteract spillage will be readily available. Site inductions will include a briefing on the use of spill kits. | During construction | John Holland ESR | M12 REMM B20<br>M12 REMM SWH01<br>M7 CoA 155TfNSW G36 Section 3.5 | Inspection records<br>Induction records |
| SW36 | John Holland will prepare a procedure(s) for the following activities, as a minimum, to minimise the possibility of pollution of the site:<br>• Refuelling or maintenance and cleaning of plant and equipment including concrete agitators, bitumen spray bars and asphalt pavers<br>• On-site batching of concrete and asphalt<br>• Mixing of bitumen with cutting oil and additives<br>• Application of liquid membranes, including paint and thermoplastic, resin, emulsion, precoat agent and curing compound<br>• Bulk fuel or chemical deliveries | Prior to construction | John Holland ESR | TfNSW G36 Section 4.3 | Procedures |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| | • Removal and disposal of excess chemicals and water used for washing down of equipment<br>• Pumping out of oil and grease collection pits<br>• Decanting operations such as for fuel, chemicals and bitumen. | | | | |
| SW37 | John Holland will install AWS and rainfall gauges to monitor on site weather conditions in accordance with TfNSW R272. | During construction | John Holland ESR | Blue Book<br>TfNSW G36 Section 4.4.1 | Weather records / Pre-starts |
| SW38 | Monitor upcoming weather conditions daily using the BOM website and / or on site AWS and prepare the site for potential rain events when there is more than a 50% chance of 10 mm of rainfall or greater | During construction | John Holland ESR | Blue Book | Weather records / Pre-starts |
| SW39 | Surface water monitoring must be undertaken in accordance with the Construction Soil and Water Monitoring Program and implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater. | During construction | TfNSW / John Holland | CoA C17<br>M12 REMM SWH01<br>M12 REMM SWH05<br>M12 REMM GW01<br>M7 REMM SW1<br>M7 REMM SW9<br>TfNSW G36 Section 3.9<br>Appendix B | Monitoring records |
| SW40 | Undertake pre and post rainfall event monitoring | Pre, during and post rainfall | John Holland ESR | Best Practice<br>Blue Book | Inspection records |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| M7 Widening-specific management measures | | | | | |
| SW41 | If a DSI identifies moderate or high-risk contamination, a NSW EPA- accredited Site Auditor will be engaged to provide independent oversight for any work required in relation to areas of moderate or high risk contamination is appropriately managed. | Prior to construction and during construction | John Holland | M7 CoA D68 | DSI<br>Site Auditor engagement |
| SW42 | If a DSI identifies that contamination of the specified land is to an extent to warrant a RAP, or the AMP requires encapsulation of asbestos on site, a RAP will be prepared and will:<br>• Be prepared (or reviewed and approved) by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme; and<br>• Be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997;<br>• Include measures to remediate the contamination at the site to ensure the site will be suitable for the proposed use and detail how the environmental and human health risks will be managed during the disturbance, remediation and/or removal of contaminated soil/sediment or groundwater; and<br>• Be reviewed by a NSW EPA-accredited Site Auditor. The Site Auditor must issue a Section B Site Audit Statement or interim audit advice which certifies that the Remedial Action Plan is appropriate to remediate identified contamination. | Prior to construction and during construction | John Holland | M7 CoA D70 | DSI<br>Remedial Action Plan |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
|---|---|---|---|---|---|
| | • Nothing in this condition prevents the preparation of individual Remedial Action Plans for separate sites. | | | | |
| SW43 | Before commencing remediation where a Remedial Action Plan is required, a copy of the Remedial Action Plan and the Section B Site Audit Statement, or interim audit advice, must be submitted to the Planning Secretary for information. | Prior to construction and during construction | John Holland | M7 CoA D71 | Remedial Action Plan |
| SW44 | Where a Remedial Action Plan is required, the Remedial Action Plan will be implemented and changes to the Remedial Action Plan must be approved in writing by the NSW EPA accredited Site Auditor. A copy of the revised Remedial Action Plan must be provided to the Planning Secretary for information.<br>Nothing in this condition prevents the Proponent from engaging the Site Auditor to prepare Site Audit Statements for separate sites. | Prior to construction and during construction | John Holland | M7 CoA D72 | Remedial Action Plan |
| SW45 | Where a Remedial Action Plan is required, contaminated land must not be used for the purpose approved under the terms of this approval until a Section A1 or A2 Site Audit Statement is obtained which states that the land is suitable for that purpose and any conditions on the Section A Site Audit Statement have been complied with. | Prior to construction and during construction | John Holland | M7 CoA D73 | Remedial Action Plan |
| SW46 | An Unexpected Finds Procedure for Contamination will be prepared before the commencement of Work. The procedure must:<br>• Be followed should unexpected contamination or asbestos (or suspected contamination) be excavated or otherwise discovered;<br>• Include details of who will be responsible for implementing the unexpected finds procedure and the roles and responsibilities of all parties involved; and | Prior to construction | John Holland | M7 CoA D75 | Unexpected contaminated land finds procedure |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| | • Be prepared, (or reviewed and approved), by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. | | | | |
| SW47 | The Unexpected Finds Procedure for Contamination will be implemented during Work. | During construction | John Holland | M7 CoA D76 | Unexpected contaminated land finds procedure |
| SW48 | A Water Reuse Strategy will be prepared outlining options for the reuse of collected stormwater during construction. The strategy will be prepared based on best practice in consultation with relevant agencies and qualified personnel as required. The Water Reuse Strategy will include:<br>• Evaluation of reuse options<br>• Details of preferred reuse option(s), including estimated reuse volumes, proposed reuse locations and/or activities, proposed treatment (if required), any additional licenses or approvals that may be required<br>• Measures to avoid misuse of recycled water as potable water<br>• Consideration of the public health risks from water recycling; and<br>• Time frames for the implementation of preferred reuse options. | Prior to construction and during construction | John Holland | M7 CoA D79 | Water reuse strategy |
| SW49 | Works on waterfront land and within watercourses must have regard to Guidelines for controlled activities on waterfront land | During construction | John Holland Superintendent / | M7 CoA E106 | EWMS |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| | (NRAR, 2018). This includes outlets and watercourse crossings. | | Foreman/Site Supervisor / ESR | | Inspection records |
| SW50 | Local erosion and sediment control measures to manage stormwater discharges will only be used in lieu of sediment retention basins or sumps where it is demonstrated that:<br>• Such measures would adequately manage the risk of erosion and sedimentation in accordance with Volume 1 and 2D of the Blue Book, and<br>• Contaminated soils do not pose a risk to water quality in receiving waterways.<br>Approval from the Planning Secretary will be obtained prior to implementing alternative local erosion and sediment control measures. | During construction | John Holland ESR | M7 CoA D108 | Approval documents<br>Appendix D<br>Appendix E ESCP |
| SW51 | Sediment retention basins or sumps will be used to control contaminated runoff from the construction of the proposed modification. Sediment retention basins used will be appropriately sized to ensure that:<br>• Risks identified in the detailed site investigation are mitigated; and<br>• Managed overflows could only occur as a result of large rainfall events. | During construction | John Holland Superintendent / Foreman/Site Supervisor / ESR | M7 CoA D109 | Appendix E ESCP |
| SW52 | For areas of moderate to high contamination risk (as identified in the CSWMP required by Condition C8 and confirmation following findings of any Detailed Site Investigations under M7 CoA D67), and where the application of sediment retention basins or sumps is restricted by site constraints and the outcomes of Condition D109 cannot be met, alternative capture and treatment systems will be used once approval from the Planning Secretary is obtained. | Prior to construction and during construction | John Holland ESR | M7 CoA D110 | Appendix E ESCP<br>Planning Secretary approval |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| SW53 | Any contaminated groundwater extracted from excavations during piling will be disposed of at a licensed waste facility in accordance with the CWRMP. | During construction | John Holland Superintendent / Foreman/Site Supervisor | M7 CoA D111 | CWRMP<br>EWMS<br>Inspection records<br>Waste Management Register |
| SW54 | A register and inventory of dangerous goods and hazardous substances will be kept at each storage location and will include SDSs for dangerous goods and hazardous substances. This register will be maintained as part of an incident response management plan developed for the proposed modification. | During construction | John Holland ESR | M7 REMM HR10 | Dangerous goods and hazardous substances register<br>SDS |
| SW55 | In the event of a spill, all material spilled will removed as soon as practicable or within 24 hours. | During construction | John Holland ESR | M7 CoA 155 | Inspection records<br>Waste Management Register |
| SW55.1 | All new or modified drainage systems associated with Modification 6 must be designed to:<br>• meet the capacity constraints of any council's drainage system to receive and convey the proposed flows from the Project, or otherwise upgrade council's drainage system at the Proponent's expense where it is identified that Modification 6 will have an adverse impact on the capacity of council's drainage system, in consultation with the relevant council(s); | Detailed design | John Holland Design | M7 CoA D112 | Design reports |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| | • minimise impacts on the receiving environment at the final outflow point resulting from any additional flow volume (including, but not limited to scour, flooding, water quality impacts, and impacts on riparian vegetation, aquatic ecology and property); and<br>• ensure mitigation measures are implemented where increased flows through cross drainage systems adversely impact on council or Sydney Water drainage infrastructure and the receiving environment. | | | | |
| M12 East package-specific management measures | | | | | |
| SW56 | A Water Reuse Strategy will be developed by John Holland to reduce reliance on potable water. | Prior to construction | John Holland ESR | M12 REMM SWH03<br>M7 REMM SW2<br>Appendix I | Water reuse strategy |
| SW57 | Work on waterfront land must have regard to the Guidelines for controlled activities on waterfront land – Riparian Corridors (NRAR, 2018), Controlled activities on waterfront land – Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012) and Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013). | Prior to construction | John Holland Superintendent / Foreman/Site Supervisor / ESR | M12 CoA E107 | EWMS<br>Inspection records |
| SW58 | John Holland will update the stage specific CSWMP and implement the measures agreed by TfNSW with the potentially affected landowner at no cost to the landowner. The agreed measures will be implemented before and during construction of any works that may potentially affect the flow of water into the farm dams. | Prior to any works that may potentially affect the flow of water into farm dams | TfNSW / John Holland | M12 CoA E24 | Consultation |
| SW59 | Prior to construction commencing, inflows within the first year of construction to Cut 7 will be estimated (including inflow from the | Prior to construction (EDC) | John Holland | EDC consistency report | Inspection records |

| ID | Management measures | When to implement | Responsibility for implementation | Reference or source | Evidence of implementation |
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| | base of the cuts) by the construction contractor, to identify if evaporation will mitigate the higher inflows expected early during construction.<br><br>This measure will utilise the latest maximum observed groundwater levels prior to construction.<br><br>If evaporation is determined not to be a sufficient mitigation measure, the construction contractor will identify and implement additional mitigation measures and these will be documented in the Construction Contractor's Construction Environment Management Plan and Construction Soil and Water Management Plan. | | | | |

# 7 Compliance management

## 7.1 Roles and responsibilities

The organisational structure for the M7-M12 Integration project and overall roles and responsibilities are outlined in Section 6.1 of the CEMP. Specific responsibilities for the implementation of soil and water management are detailed in Section 6 of this Plan.

### 7.1.1 Contractor Soil Conservationist

In accordance with M7 REMM SW3 and M12 REMM SWH02, John Holland have appointed an experienced soil conservation specialist for the duration of construction of the M7-M12 Integration project (referred to as the Soil Conservationist). A Soil Conservationist from SEEC, who is listed on the TfNSW list of registered contractors for erosion, sedimentation and soil conservation consultancy services, has been engaged for the Project.

The Soil Conservationist will review and advise on the CSWMPs, provide specialised training to relevant site personnel and provide advice on the planning and implementation of erosion and sediment control. For the full responsibilities of the Contractor's Soil Conservationist, refer to Section 6.1 of the CEMP.

The Soil Conservationist will complete inspections as required, but at least monthly (refer to Section 7.4). The Soil Conservationist must also be present for the following critical site activities:

- Prior to the disturbance of existing surface on a section of site, other than for the installation of erosion and sediment controls, to confirm the measures described in the ESCP have been implemented
- Prior to the commissioning of new sediment basins to confirm the inlet and outlet controls and connecting drainage have been constructed in accordance with design drawings
- Prior to commissioning of new temporary stormwater drainage or drainage diversions
- Prior to commissioning temporary waterway crossings or in-stream temporary work platforms
- During and following flooding events
- Following the failure of any erosion or sediment control measures that results in a reportable incident under the EPL or Planning Approval.

The responsibilities of John Holland's Soil Conservationist are detailed in Table 7-1.

*Table 7-1: Responsibilities of John Holland's Soil Conservationist*

| Soil Conservationist | |
|---|---|
| Authority | Appointed by the ESR. |
| Responsibility | • Review of all erosion, sediment and water pollution plans, controls and measures prior to installation<br>• Assistance in project training relating to erosion and sediment control issues<br>• Attend site for any critical and/or activities deemed high risk for erosion and sediment control management |

| Soil Conservationist | |
|---|---|
| | • Attend site inspections as required, but at least monthly and prepare a report detailing findings from these inspections. Issues identified in these inspection reports must be acted on and reported to TfNSW within 5 working days<br>• Work in partnership with the ESR to build environmental capabilities, drive cultural change, and achieve performance improvements<br>• Assist the ESR in implementing the environmental training program<br>• Assist John Holland staff with environmental inquires<br>• Assist in the implementation of site environmental controls<br>• Conduct environmental monitoring and inspections<br>• Assist the ESR in the investigation and close out of relevant complaints<br>• Advise and assist in determining the impact and relevant mitigation measures on farm dam impacts from stormwater yields during construction. |
| Lines of communication | • Functional reporting to the ESR<br>• Indirect reporting to the Construction Project Manager(s)<br>• Liaise with any soil conservationist appointed for the Project by TfNSW. |
| Minimum skill levels | A suitably experienced external Certified Practicing Erosion and Sediment Control Professional (CPESCP) as the Soil Conservationist approved under TfNSW at category S1 or higher. |

### 7.1.2 TfNSW's soil conservationist

TfNSW can, at their discretion, also engage a Project-wide suitably experienced soil conservation specialist to provide advice to TfNSW and John Holland. John Holland's soil conservationist will liaise on a regular basis with the TfNSW's soil conservationist appointed for the Project.

If appointed, the TfNSW soil conservationist will conduct regular inspections on the site during construction. John Holland will make appropriate personnel available to induct, guide and accompany the TfNSW soil conservationist on the inspections and to promptly rectify any deficiencies raised by the TfNSW soil conservationist.

John Holland will report to TfNSW the status of actions being taken, in accordance with the priorities nominated in TfNSW soil conservationist's Environmental Inspection Report. The report will state the priority of the rectification works. John Holland will rectify the actions listed within the inspection report within the timeframes included on the Environmental Inspection Report.

## 7.2 Training

To ensure that this Plan is effectively implemented, all site personnel (including sub-contractors) will undergo site induction training that includes construction soil and water management issues prior to construction commencing. The induction training will address elements related to soil and water management, including:

- Existence and requirements of the OCSWMP, this CSWMP and all plans and procedures prepared under the CSWMP relevant to the M7-M12 Integration project

- Responsibilities under the POEO Act, other relevant legislation, and EPL conditions for Site specific issues, including:
  - Erosion and sediment controls, water quality management and controls and sediment basin management
  - Groundwater and surface water
  - Location of spill kits
- Incident response, management and reporting
- Emergency response measures in high rainfall or flood events
- The Pollution Incident Response Management Plan (PIRMP)
- Mulch and tannin management
- Stockpile location criteria
- Complaints response and reporting
- Roles and responsibilities for soil and water management
- ERSED control installation methodology and maintenance
- Sediment basin construction and management
- Dewatering requirements
- Working near or in drainage lines and creeks (including temporary waterway crossings)
- Water quality management and protection measures
- Groundwater issues
- Spill response.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in soil and water management or those undertaking an activity with a high risk of environmental impact. Site personnel will undergo refresher training at not less than six monthly intervals. John Holland's Soil Conservationist will provide assistance in training in regard to erosion and sediment control issues.

The ER will review and approve the induction and training program prior to the commencement of construction and monitor implementation.

Daily pre-start meetings conducted by the Foreman/Site Supervisor (or delegate) will inform the site workforce of any environmental issues relevant to soil and water that could potentially be impacted by, or impact on, the day's activities.

Further details regarding staff induction and training are provided in Section 6.4 of the CEMP.

## 7.3 Communication

John Holland will adhere to the requirements as outlined in the Communication Management Plan developed for the M7-M12 Integration project. The Communication Management Plan was developed under and is consistent with the OCS and details the procedures and processes for community notification, consultation and complaints management during construction of the M7-M12 Integration project.

Soil and water management information will be communicated to the community and stakeholders in accordance with the principles and procedures outlined in the OCS and/or the Communication Management Plan where required.

Further detail about the OCS and the Communication Management Plan is provided in Section 6.5.3 and 6.5.4 of the CEMP.

## 7.4 Monitoring and inspection

### 7.4.1 Monitoring

Construction soil and water monitoring will be conducted in accordance with the Monitoring Program (Appendix B), with the M12 East package components of the monitoring program prepared in accordance with the Overarching Construction Soil and Water Monitoring Program and relevant TfNSW Specifications. The M7-M12 Integration project program addresses the requirements of the Minister's Conditions of Approval (M7 CoA) and M7 REMMs listed in the M7 Widening Modification Report and Submissions Report, as well as NSW M12 CoAs and M12 REMMs listed in the M12 Motorway EAD. Where monitoring detects a non-compliance, an incident report and corrective actions will be raised.

John Holland will measure and record rainfall at the premises. The measurements will be in millimetres per 24-hour period at the same time each day from the time that the site office associated with the activities is established.

John Holland will install an AWS on AF9 for the M12 East package component of the M7-M12 Integration project and will conform to BOM Observation Specification No. 2013.1 and TfNSW Specification R272 – Automatic Weather Stations for the design and location of such devices. AWS will be sited within a secured compound area (AF9) fully protected by fencing, and any instrumentation, communication or power cabling contained within conduits buried to a depth of at least 100 mm. In the event further AWS are required along the M7 Widening alignment, an Automatic Weather Station Location Report will be prepared in accordance with the requirements outlined in Section 3.1.1 of the Appendix B of the Construction Air Quality Management Plan (Appendix B7 of the CEMP). Details of the proposed monitoring is provided in the Construction Air Quality Management Plan. Inspections will include daily site inspections by Site Supervisors, and weekly site inspection by environmental personnel during construction as a minimum. The frequency of these inspections may be increased to reflect the risk associated with potential impacts during adverse weather conditions or during specific construction activities (e.g. instream works).

John Holland's Soil Conservationist will also undertake regular inspections of erosion and sediment control measures to ensure they are installed correctly and maintained thereafter.

Inspection and monitoring requirements relevant to soil and water are summarised in Table 7-2.

*Table 7-2: Inspections and monitoring relevant to soil and water*

| Inspection / monitoring | Frequency | Responsibility | Requirement |
|---|---|---|---|
| Inspect all plant and equipment daily for leakages of fuel, oil or hydraulic fluid.<br>Repair any leaks before using item of plant or equipment. | Daily | ESR<br>Foreman/ Site Supervisor | TfNSW G36 Section 4.3.1 |

| Inspection / monitoring | Frequency | Responsibility | Requirement |
|---|---|---|---|
| Maintain records of plant inspections | | | |
| Inspection of all erosion and sediment controls, stockpiles, disturbed areas, revegetated/ stabilised areas and bunded areas and undertake any works required to repair and/or maintain these controls<br>Inspect check dams and sediment fences plus stormwater entry points such as pits and inlets at least weekly and rectify any blockages immediately. | Daily site diary records<br>Weekly erosion and sediment inspections<br>Prior to wet weather event<br>Prior to site shutdown<br>Following rainfall events | Foreman/ Site Supervisor<br>ESR | TfNSW G38 Sections 3.9 and 4<br>Blue Book Section 8.2 |
| Inspection of all stockpiles | At least weekly | ESR / Foreman/ Site Supervisor | TfNSW G38 Section 4 |
| TfNSW environmental inspection including review of the implementation of the current ESCPs<br>SWC will ensure a copy of the current relevant ESCP is available at each TfNSW environmental inspection. | Fortnightly | Foreman/ Site Supervisor<br>ESR<br>TfNSW ESM (or delegate) | TfNSW G38 Section 4 |
| Soil Conservationist site inspections | As required, but at least monthly | Contractor's Soil Conservationist | TfNSW G38 Section 4 |
| Inspection of sediment basins | Monthly | ESR<br>Contractor's Soil Conservationist<br>Foreman/ Site Supervisor | TfNSW G38 Section 3.2.2 |
| Visually monitor water quality upstream and downstream of any temporary waterway crossings or diversions | Daily site diary records | Foreman/ Site Supervisor<br>ESR | TfNSW G38 Section 4 |
| Wet weather preparation inspections to ensure that all erosion/ sedimentation and stabilisation controls are in place and in effective working order (refer to Section 6.15) | When wet weather event is predicted (50%<br>chance of 10 mm of rainfall or greater) | Foreman/ Site Supervisor<br>ESR | OCSWMP Section 6.15 |
| Inspect all disturbed areas as soon as practicable but within 3 hours (work day) or 24 hours (non work) after the start of all rainfall events | As required | Foreman/ Site Supervisor<br>ESR | TfNSW G38 Section 4 |

| Inspection / monitoring | Frequency | Responsibility | Requirement |
|---|---|---|---|
| exceeding 10mm and during periods of prolonged rainfall | | | |
| Post-rainfall inspections to review the review the effectiveness of the ESCP following each rainfall event exceeding 10mm | As required | Foreman/ Site Supervisor<br>ESR | TfNSW G38 Section 4 |

An adaptive approach to soil and water management will be implemented. Mitigation measures can be amended and improved if they are found to not meet the required outcomes. Weather forecasts and observations will be assessed and communicated through pre-starts and other tools.

Site inspections will be recorded (along with actions and issues observed) and actioned appropriately within agreed timeframes. These inspections will be recorded as part of the Weekly Environmental Inspection Checklist and will also be used as a record of activities and observations related to soil and water which could be correlated to the monitoring activities. Additional requirements and responsibilities in relation to inspections are documented in Section 6.1 of the CEMP.

Weekly and other routine inspections by the TfNSW ESM (or delegate), the Environmental Review Group (ERG) representatives and the ER will also occur throughout construction. Detail on the nature and frequency of these inspections are documented in Section 8.1 of the CEMP.

If appointed, TfNSW's Soil Conservationist is to conduct regular inspections of the M7 Widening and M12 East package components during construction. TfNSW's Soil Conservationist will typically join the scheduled ER and TfNSW inspections, as required, based on the complexity and anticipated risks associated with the stage of construction. Inspections will be carried out in accordance with the TfNSW inspection procedure. John Holland will ensure appropriate site personnel are available to induct, guide and accompany TfNSW's Soil Conservationist on the inspections and to promptly rectify any deficiencies raised.

The ESR will advise the TfNSW ESM (or delegate) of actions being taken, in accordance with the priorities nominated in the TfNSW Soil Conservationist's Environmental Inspection Report. The report will state the priority of the rectification works. The actions listed within the inspection report will be rectified within the following priority timeframes:

- Immediate: on day of inspection
- High: within 24 hours of inspection
- Medium: within three working days of inspection
- Low: within one week of inspection.

Monitoring of fill material, topsoil, contaminated material and water use (both potable and non-potable) will also be carried out in close collaboration with the Sustainability Team who will be tracking against M7 Widening and M12 East package targets. Further detail is covered in the Sustainability Management Plan.

## 7.5 TfNSW hold points

TfNSW specifications set out environmental protection requirements and include hold point processes. Key Hold Points and Witness Points relevant to this CSWMP are identified in Table 7-3.

*Table 7-3: Hold Points and Witness Points relevant to this Plan*

| TfNSW Specification | Clause | Type | Description |
|---|---|---|---|
| G36 | 3.2.2 | Hold | Evidence of approvals, licences and permits obtained. |
| G36 | 3.2.4 | Hold | Submission of EWMS. |
| G36 | 3.1 | Hold | Submission of CEMP. |
| G36 | B1.1 | Hold | Submission of an Asbestos Management Sub-Plan (AMSP).<br>Details of each proposed location and method of encapsulation, including the exact type and extent of the encapsulation zone and applicable Statutory documentation, air monitoring and dust suppression methodology for management and treatment of ACM, and if a borrow pit option is proposed submit a Report from your Hydrogeologist confirming and certifying the suitability. |
| G36 | B1.1 | Hold | Excavation of Asbestos Contaminated Material. |
| G38 | 1.2.7 | Hold | Submission of evidence of appropriate Soil and Water Management Plan and Erosion and Sediment Control personnel. |
| G38 | 3.2.2 | N/A | Submission of construction sediment basin design drawings for acceptance with a report that lists design parameters, including confirmation by JHG's Soil Conservationist that construction sediment retention basin designs (and restoration and revegetation proposals) conform to the requirements of the TfNSW Specification G38. |
| G38 | 3.1 | Hold | Submission of an ESCP(s) and, where required, WQMP for a section of the Work Under the Contract. |
| G38 | 3.1 | Witness | Submission of written notice that measures set out in the ESCP for a section of the work have been installed. |
| G38 | 3.9 | Hold | Commencement of construction of any activities in flood prone areas. |

## 7.6 Licences, permits and exemptions

Prior to the activity, John Holland will provide TfNSW evidence of receipt of the approval, licence and/or permit from the relevant authority.

### 7.6.1 Water Access Licence

The SWMP or ESCP will describe the proposed water source(s) intended for use for construction activities and obtain approval from relevant authority and TfNSW for the chosen source(s) (i.e. creeks) before withdrawing water.

If the proposed source is other than a town water supply or natural water source, the SWMP or ESCP will include procedures for regular testing to ensure that the water is suitable for the purpose and is not hazardous to health and the environment.

The use of reclaimed water must comply with the requirements of TfNSW Environmental Direction 19: Use of Reclaimed Water.

### 7.6.2 Dredging or reclamation

John Holland will notify NSW Department of Primary Industries (DPI) Fisheries in accordance with the Fisheries Management Act 1994 of any dredging or reclamation works. Temporary waterway crossings also fall under this same requirement.

Permanent creek crossings associated with the M12 East package are limited to those in the footprint of the Ropes Creek Bridge, where a structure spanning the waterway will be constructed alongside the carriageways. Augmentations to existing bridge structures at Maxwells Creek, Cabramatta Creek, Hinchinbrook Creek, Reedy Creek, Eskdale Creek and Angus Creek will span the waterways and will not require in-stream works.

A temporary watercourse crossing will be required to support vehicular movements between Ancillary Facility 9 (AF9) and Villiers Road. The EWMS for activities involving dredging or reclamation works will be prepared in consultation with DPI Fisheries.

## 7.7 Weather monitoring

John Holland will measure and record rainfall at the premises. The measurements will be in millimetres per 24-hour period at the same time each day from the time that the site office associated with the activities is established.

John Holland will install an AWS on site and will conform to BOM Observation Specification No. 2013.1 and TfNSW Specification R272 – Automatic Weather Stations for the design and location of such devices. AWS will be sited within a secured compound area fully protected by fencing, likely to be at major site compounds, and any instrumentation, communication or power cabling contained within conduits buried to a depth of at least 100 mm.

## 7.8 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this CSWMP, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 6.2.1 of the M7-M12 Integration project CEMP.

## 7.9 Reporting

Reporting requirements relevant to soil and water are summarised in Table 7-4.

John Holland will be required to maintain accurate records substantiating all construction activities associated with the M7-M12 Integration project or relevant to the M7 and M12 CoA, including measures taken to implement this CSWMP.

*Table 7-4: Reporting requirements relevant to soil and water*

| Item | Frequency | Standards | External reporting | Responsibility |
|---|---|---|---|---|
| Monthly Environmental Report | Monthly | Reporting as required by TfNSW G36 Specification, Section 3.11.1.2, including:<br>All discharges from licensed points and any other dewatering activities includes dates, time, monitoring results and volumes released<br>All environmental monitoring data including but not limited to. rainfall and water quality. | TfNSW | ESR |
| Incident and non-compliance reports | At each occurrence | Reporting of incidents and non-compliances in accordance with CoA, EPL, PIRMP, G36 and the TfNSW Environmental Incident Classification and Reporting Procedure. | Appropriate authority dependant on nature of the incident (e.g. EPA, DPE) (see Section 7 of CEMP) | ESR |
| Complaint register | Daily (ER, EPA) as received<br>DPE as requested | Reporting of complaints, in accordance with the CoA, EPL and OCS, through the complaints register, to the ER and EPA for any complaints received (on the day they are received).<br>Communication, notification and complaints handling requirements regarding erosion and sedimentation matters will be managed through the Complaints Management System and the OCS.<br>Receipt of a complaint(s) in relation to surface or ground water is a trigger to carry out monitoring of surface water quality or groundwater. | ER (M7 CoA A21, M12 CoA A35)<br>EPA (in accordance with EPL conditions)<br>DPE (as requested by the Secretary) | ESR<br>Stakeholder and Engagement Manager |
| Construction Soil and Water Monitoring Results | Quarterly | Reporting as detailed in the Construction Soil and Water Monitoring Program (Appendix B) | TfNSW (as per 36) ER (as per NSW CoA) EPA (as per EPL)<br>DPE (as per NSW CoA) | ESR |
| Pollution monitoring data | Monthly | Reporting of monitoring data in accordance with the Environment Protection Licence requirements. | Published monthly (as per EPL) | ESR |

| Item | Frequency | Standards | External reporting | Responsibility |
|---|---|---|---|---|
| Soil Conservationist Inspection Report | As required, but at least monthly, within 5 working days of inspection | Inspections of erosion and sediment control measures to ensure they are installed correctly and maintained thereafter. | TfNSW<br>ER | ESR<br>Contractor's Soil Conservationist |
| Wet weather preparation inspection reports | Following rainfall events exceeding 10mm | Provide written and photographic evidence of the site's permanent and temporary erosion and sediment control works after each of these events. Keep a register of all inspections performed and of maintenance or repairs carried out. | TfNSW | ESR |
| Soil conservationist report of the site post restoration | Upon completion of use of land used for the Contractor's site facilities | Soil conservationist report of the site post restoration with verification that no erosion and sediment control issues are present as required under TfNSW Specification G36. | TfNSW | ESR<br>Contractor's Soil Conservationist |
| Erosion and Sediment Control Inspection and Maintenance Register | As required, but at least monthly | Maintain a register of inspection and maintenance of erosion control and sediment capture measures. | TfNSW | ESR<br>Contractor's Soil Conservationist |

# 8 Review and improvement

## 8.1 Continuous improvement

Continuous improvement of this CSWMP, Construction Soil and Water Monitoring Program (Appendix B) and Asbestos Management Plan (Appendix N) will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Identify environmental risks not already included in the risk register
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

The ESR is responsible for ensuring stage-specific environmental risks are identified and included in the M7-M12 Integration project risk register and appropriate mitigation measures implemented throughout the construction, as part of the continuous improvement process. The process for ongoing risk identification and management during construction is outlined in Section 4.1.2 of the CEMP.

## 8.2 Review by John Holland's Soil Conservationist

The CSWMP has been reviewed by a suitably qualified Soil Conservationist engaged by John Holland. John Holland will respond to the Soil Conservationist's review and incorporate any recommendations or justify decisions for not incorporating recommendations.

All erosion, sediment and water pollution plans, controls and measures will also be reviewed by the Soil Conservationist prior to installation.

## 8.3 CSWMP update and amendment

The processes described in Sections 8.1 to 8.7 of the CEMP may result in the need to update or revise this CSWMP. This will occur as needed. Any revisions to this CSWMP and other Sub-plans will be in accordance with the process outlined in Section 1.1 of the CEMP.

This Plan will also be reviewed, and updated where relevant, when erosion/sedimentation control measures, stabilisation control measures and other soil and water control measures are found to be not fully effective, including review of design parameters used for Blue Book (Landcom, 2004) calculations.

A copy of the updated CSWMP and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure (refer to Section 8.6.2 of the CEMP).

# Appendix A - Secondary CoA and REMMs

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix A: Secondary CoAs and REMMs

November 2023



# Document Control

| | |
|---|---|
| Date | November 2023 |
| Document No. | M712UDC-JHGRP-M7A-EN-PLN-000076 |
| Title | M7-M12 Integration project Construction Environmental Management Plan<br>Appendix B4 - Construction Soil and Water Management Sub-plan<br>Appendix A: Secondary CoAs and REMMs |
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# Document History and Status

| Rev | Rev Date | Description |
|---|---|---|
| A | 9/08/2023 | First draft for WSO Co / TfNSW review |
| B | 06/09/2023 | Second draft for WSO Co / TfNSW review |
| C | 29/09/2023 | Third draft for WSO Co / TfNSW review |
| D | 09/10/2023 | For ER endorsement |
| E | 02/11/2023 | Updated in response to DPE comments |
| F | 15/11/2023 | Up-revved in line with the CSWMP |
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| H | 21/11/2023 | Up-revved in line with the CSWMP |

# CoA

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| **M7 Widening CoA** | | |
| C9 | The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of Modification 6 against the performance predicted in the documents listed in Condition 1A of Schedule 1 or in the CEMP:<br>(b) Surface Water Quality – DPE Water and relevant councils | OCSWMP<br>Section 1.5 of Appendix B |
| C10 | Each Construction Monitoring Program (CMP) must have consideration of SMART principles and provide:<br>(a) details of baseline data available;<br>(b) details of baseline data to be obtained and when;<br>(c) details of all monitoring of the project to be undertaken;<br>(d) the parameters of the project to be monitored;<br>(e) the frequency of monitoring to be undertaken;<br>(f) the location of monitoring;<br>(g) the reporting of monitoring results and analysis results against relevant criteria;<br>(h) details of the methods that will be used to analyse the monitoring data;<br>(i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts; and<br>(j) any consultation to be undertaken in relation to the monitoring programs. | Section 5 of Appendix B<br>Attachment 1 and 2 of Appendix B |
| C11 | The CMP must be endorsed by the ER and then submitted to the Planning Secretary for approval no later than one month before the commencement of construction, or where construction is staged, no later than one month before the commencement of each stage. | Section 1.5.1 |
| C12 | Construction must not commence until the relevant CMP(s) have been approved by the Planning Secretary and all relevant baseline data for the specific construction activity has been collected. | Section 1.5.1 |

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| C13 | The CMP(s), as approved, including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater. | Section 1.4 of Appendix B |
| C14 | The results of the CMP(s) must be submitted to the Planning Secretary, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant CMP.<br>*Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan.* | Section 6.2 of Appendix B |
| D65 | Prior to the commencement of any Work that results in the disturbance of land in any particular area, erosion and sediment controls must be installed and maintained, as a minimum, in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book'. | Section 6.1<br>Section 6.5<br>Appendix G<br>Appendix H |
| D66 | A Sampling and Analysis Quality Plan (SAQP) must be prepared for medium and high risk sites as identified in the documents referred to in Condition 1A of Schedule 1 to ensure that field investigations and analyses will be undertaken in a way that enables the collection and reporting of reliable data to meet project objectives, including (where applicable) the relevant site characterisation requirements of the detailed or targeted site investigations. The SAQP must:<br>(a) be prepared (or reviewed and approved) by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme;<br>(b) be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997. | Appendix E of the CCLMP |
| D68 | If a Detailed Site Investigation identifies moderate or high-risk contamination, a NSW EPA accredited Site Auditor must be engaged to provide independent oversight for any work required in relation to areas of moderate or high risk contamination is appropriately managed. | Section 6.4<br>CCLMP |
| D70 | If remediation is required to make land suitable for the intended land use, a Remedial Action Plan must: | Section 6.17, Table 6-4 |

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| | (a) be prepared (or reviewed and approved) by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme; and<br>(b) be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997;<br>(c) include measures to remediate the contamination at the site to ensure the site will be suitable for the proposed use and detail how the environmental and human health risks will be managed during the disturbance, remediation and/or removal of contaminated soil/sediment or groundwater; and<br>(d) be reviewed by a NSW EPA-accredited Site Auditor. The Site Auditor must issue a Section B Site Audit Statement or interim audit advice which certifies that the Remedial Action Plan is appropriate to remediate identified contamination.<br>Nothing in this condition prevents the preparation of individual Remedial Action Plans for separate sites. | Appendix M – Unexpected Contaminated Land Finds Procedure<br>CCLMP |
| D71 | Before commencing remediation, a copy of the Remedial Action Plan and the Section B Site Audit Statement, or interim audit advice, must be submitted to the Planning Secretary for information. | Appendix N<br>CCLMP |
| D72 | The Remedial Action Plan must be implemented and changes to the Remedial Action Plan must be approved in writing by the NSW EPA accredited Site Auditor. A copy of the revised Remedial Action Plan must be provided to the Planning Secretary for information.<br>Nothing in this condition prevents the Proponent from engaging the Site Auditor to prepare Site Audit Statements for separate sites. | Appendix N<br>CCLMP |
| D73 | A Section A1 or A2 Site Audit Statement (accompanied by an Environmental Management Plan) and its accompanying Site Audit Report, which state that the contaminated land disturbed by the work has been made suitable or can be made suitable for the intended land use, must be submitted to the Planning Secretary and Council after remediation and before the commencement of operation of Modification 6.<br>Nothing in this condition prevents the Proponent from obtaining Section A Site Audit Statements for individual parcels of remediated land. | Appendix N<br>CCLMP |

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| D74 | Contaminated land must not be used for the purpose approved under the terms of this approval until a Section A1 or A2 Site Audit Statement is obtained which states that the land is suitable for that purpose and any conditions on the Section A Site Audit Statement have been complied with. | Appendix N<br>CCLMP |
| D75 | An Unexpected Finds Procedure for Contamination must be prepared before the commencement of Work. The procedure must:<br>(a) be followed should unexpected contamination or asbestos (or suspected contamination) be excavated or otherwise discovered;<br>(b) include details of who will be responsible for implementing the unexpected finds procedure and the roles and responsibilities of all parties involved; and<br>(c) be prepared, (or reviewed and approved), by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme.<br>*Note: Should any unexpected moderate to high risk contamination be identified during Work, the contamination process identified in the conditions above applies.* | Appendix N<br>CCLMP |
| D76 | The Unexpected Finds Procedure for Contamination must be implemented during Work. | Appendix N<br>CCLMP |
| D79 | A Water Reuse Strategy must be prepared, which sets out options for the reuse of collected stormwater during construction. The Water Reuse Strategy must include, but not be limited to:<br>(a) evaluation of reuse options;<br>(b) details of the preferred reuse option(s), including volumes of water to be reused, proposed reuse locations and/or activities, proposed treatment (if required), and any additional licences or approvals that may be required;<br>(c) measures to avoid misuse of recycled water as potable water;<br>(d) consideration of the public health risks from water recycling; and<br>(e) a time frame for the implementation of the preferred reuse option(s).<br>The Water Reuse Strategy must be prepared based on best practice and advice sought from relevant agencies, as required. The Strategy must be applied during construction of Modification 6. | Appendix I<br>CWRMP |

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| | Justification must be provided to the Planning Secretary if it is concluded that no reuse options prevail.<br>A copy of the Water Reuse Strategy must be made publicly available.<br>*Note: Contaminated groundwater must be disposed of in accordance with Condition D111* | |
| D105 | Modification 6 must be designed and constructed so as to maintain the NSW Water Quality Objectives (ANZG 2018) where they are being achieved as at the date of this approval, and contribute towards achievement of the NSW Water Quality Objectives over time where they are not being achieved as at the date of this approval, unless an EPL in force in respect of Modification 6 contains different requirements in relation to the NSW Water Quality Objectives, in which case those requirements must be complied with.<br>*Note: If it is proposed to discharge construction stormwater to waterways, a Water Pollution Impact Assessment will be required to inform licensing, consistent with section 45 of the POEO Act. Any such assessment must be prepared in consultation with the EPA and be consistent with the National Water Quality Guidelines, with the level of detail commensurate with the potential water pollution risk.* | Section 2.3<br>Section 2.4<br>Section 3.7<br>Section 3.8<br>Section 6.8<br>Section 6.17<br>Appendix B<br>Section 3.3.3 of Appendix C |
| D106 | Works on waterfront land and within watercourses must have regard to Guidelines for controlled activities on waterfront land (NRAR, 2018). This includes outlets and watercourse crossings. | Section 6.9 |
| D108 | Local erosion and sediment control measures to manage stormwater discharges can only be used in lieu of sediment retention basins or sumps where it is demonstrated that:<br>(a) such measures would adequately manage the risk of erosion and sedimentation in accordance with Volume 1 and 2D of the Blue Book, and<br>(b) contaminated soils do not pose a risk to water quality in receiving waterways.<br>The Proponent must obtain approval from the Secretary before implementing the alternative local erosion and sediment control measures.<br>*Note: Approval from the Planning Secretary as required by Condition D108 may be sought through the Soil and Water Management Plan (as required by Condition C8).* | Section 6.1<br>Section 6.4<br>Appendix D |

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| D109 | Sediment retention basins or sumps must be used to control contaminated runoff from the construction of the proposed modification. Any sediment retention basin used must be appropriately sized to ensure that:<br>(a) risks identified in the detailed site investigation are mitigated; and<br>(b) managed overflows could only occur as a result of large rainfall events.<br>*Note: Existing stormwater quality control systems and ponds cannot accept contaminated runoff.* | Section 6.2 |
| D110 | For areas of moderate to high contamination risk (as identified in the SWMP required by Condition C8 and any Detailed Site Investigations under Condition D67), and where the application of sediment retention basins or sumps is restricted by site constraints and the outcomes of Condition D109 cannot be met, alternative capture and treatment systems may only be used with approval from the Planning Secretary.<br>*Note: Approval from the Planning Secretary as required in this Condition may be sought through the approval of the Construction Soil and Water Management Sub Plan (as required by Condition C8).* | Section 6.2 |
| D111 | Any contaminated groundwater extracted from excavations during piling must be disposed of at a licensed waste facility. | Section 6.7<br>CWRMP |
| D112 | All new or modified drainage systems associated with Modification 6 must be designed to:<br>(a) meet the capacity constraints of any council's drainage system to receive and convey the proposed flows from the Project, or otherwise upgrade council's drainage system at the Proponent's expense where it is identified that Modification 6 will have an adverse impact on the capacity of council's drainage system, in consultation with the relevant council(s);<br>(b) minimise impacts on the receiving environment at the final outflow point resulting from any additional flow volume (including, but not limited to scour, flooding, water quality impacts, and impacts on riparian vegetation, aquatic ecology and property); and<br>(c) ensure mitigation measures are implemented where increased flows through cross drainage systems adversely impact on council or Sydney Water drainage infrastructure and the receiving environment. | Section 6.17<br>M712UDC-JHGRP-M7W-SD-RPT-101001<br>M712UDC-JHGRP-M7W-SD-RPT-102001 |
| 155 | In the event of a spill, the Proponent shall ensure that all material spilled is removed as soon as practicable and at least within 24 hours. | Section 6.13<br>Appendix K this CSWMP |

| CoA No. | Condition Requirement | Document reference |
|---|---|---|
| **M12 Motorway CoA** | | |
| C11 | The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP:<br>(a) Surface Water Monitoring program – DPE Water, Sydney Water (if any Sydney Water assets are affected), relevant councils<br>(b) Groundwater Monitoring Program - DPE Water | OCSWMP<br>Section 1.5 of Appendix B |
| C12 | Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant Construction Monitoring Programs, including copies of all correspondence from those agencies as required by Condition A5. | OCSWMP<br>Section 1.5 of Appendix B |
| C13 | Each Construction Monitoring Program must provide:<br>(a) details of baseline data available<br>(b) details of baseline data to be obtained and when<br>(c) details of all monitoring of the CSSI to be undertaken<br>(d) the parameters of the CSSI to be monitored<br>(e) the frequency of monitoring to be undertaken<br>(f) the location of monitoring<br>(g) the reporting of monitoring results and analysis of results against the relevant criteria<br>(h) details of methods that will be used to analyse monitoring data<br>(i) procedures to identify and implement additional mitigation measures where results of monitoring indicate unsatisfactory CSSI impacts;<br>(j) a consideration of SMART principles;<br>(k) any consultation to be undertaken in relation to the monitoring programs; and | Section 5 of Appendix B<br>Attachment 1 and 2 of Appendix B |

| CoA No. | Condition Requirement | Document reference |
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| | (l) any specific requirements as required by Condition C14. | |
| C15 | The Construction Monitoring Programs must be endorsed by the ER and then submitted to the Planning Secretary for approval at least one (1) month before the commencement of construction. | Section 1.5.1 |
| C16 | Unless otherwise agreed with the Planning Secretary, construction must not commence until all of the relevant Construction Monitoring Programs have been approved by the Planning Secretary, and all relevant baseline data for the specific construction activity has been collected. | Section 1.5.1 |
| C17 | The Construction Monitoring Programs, as approved by the Planning Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater. | Section 1.4 of Appendix B |
| C18 | The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, and relevant government agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program.<br>*Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan.* | Section 6.2 of Appendix B |
| E24 | For property/ies zoned primary production and where hydrologic modelling predicts that the CSSI will potentially reduce and adversely affect the available stormwater runoff yield to a farm dam, the Proponent must, in consultation with the affected landowner:<br>(a) calculate the nature and extent of impacts on water supply;<br>(b) determine what measures may be implemented to prevent, mitigate, compensate or offset a loss in water supply; and<br>(c) implement the measures agreed with the landowner at no cost to the landowner.<br>The agreed measures must be implemented prior to undertaking any works that would directly affect the flow of water into a landowner's farm dam.<br>In the event that the Proponent and landowner cannot agree on the measures to mitigate the impact, the Proponent shall engage a suitably qualified and experienced independent person to advise and assist in determining appropriate mitigation measures. | Section 6.14 |

| CoA No. | Condition Requirement | Document reference |
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| E84 | All reasonably practicable erosion and sediment controls must be installed and appropriately maintained to minimise water pollution. When implementing such controls, any relevant guidance in the Managing Urban Stormwater, Soils and Construction Vol.1 (Landcom, 2004) and Vol. 2D Main Road Construction (DECC, 2008) must be considered. | Section 6.1<br>Section 6.5<br>Appendix G<br>Appendix H |
| E85 | Prior to the commencement of any Work that would result in the disturbance of potential or contaminated soils, materials, groundwater or sediments, a Detailed Site Investigation Report(s) must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The Detailed Site Investigation Report(s) must be prepared in accordance with guidelines made or approved under section 105 of the Contaminated Land Management Act 1997.<br>*Note: Where Preliminary and Detailed Site Investigations have already been undertaken for contaminated soils, materials, groundwater or sediments they do not need to be undertaken again for the purposes of this condition.* | CCLMP |
| E86 | The Detailed Site Investigation Report(s) must provide details on:<br>(a) primary sources of contamination, for example potentially contaminating activities, infrastructure (such as underground storage tanks, fuel line, sumps or sewer lines) or site practices;<br>(b) contaminant dispersal in air, hazardous ground gases, surface water, groundwater, soil vapour, separate phase contaminants, sediments, infrastructure (e.g. concrete), biota, soil and dust;<br>(c) contaminant characterisation and behaviour (volatility, leachability, speciation, degradation products and physical and chemical conditions on-site which may affect how contaminants behave);<br>(d) potential effects of contaminants on human health, including the health of occupants of built structures (for example arising from risks to service lines from hydrocarbons in groundwater, or risks to concrete from acid sulphate soils) and the environment;<br>(e) potential and actual contaminant migration routes including potential preferential pathways;<br>(f) the adequacy and completeness of all information available for use in the assessment of risk and for making decisions on management requirements, including an assessment of uncertainty;<br>(g) the review and update of the conceptual site model from the preliminary and detailed site investigations; | CCLMP |

| CoA No. | Condition Requirement | Document reference |
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| | (h) nature and extent of any existing remediation (such as impervious surface cappings); and/or<br>(i) whether the land is suitable (for the intended final land use) or can be made suitable through remediation. | |
| E87 | Should remediation be required to make land suitable for the final intended land use, a Remediation Action Plan must be prepared. Prior to commencing with the remediation, the Proponent must submit to the Planning Secretary for information, the Remediation Action Plan and an Interim Audit Advice or a Section B Site Audit Statement from a NSW EPA accredited Site Auditor that certifies that the Remediation Action Plan is appropriate and that the site can be made suitable for the proposed use.<br>The Remediation Action Plan must be implemented and any changes to the Remediation Action Plan must be endorsed in writing by the EPA-accredited Site Auditor. | CCLMP |
| E88 | A Section A1 or Section A2 Site Audit Statement (accompanied by an Environmental Management Plan) and the accompanying Site Audit Report, which states that the contaminated land disturbed by the works has been made suitable for the intended land use, must be submitted to the Planning Secretary and relevant council(s) for information after remediation and no later than one (1) month before the commencement of operation. Contaminated land must not be used for the purpose approved under the terms of this approval until a Section A1 or Section A2 Site Audit Statement is obtained which states that the land is suitable for that purpose and any conditions on the Section A1 or Section A2 Site Audit Statement have been complied with.<br>Nothing in the conditions prevents the Proponent from obtaining Section A Site Audit Statements for individual parcels of remediated land. | CCLMP |
| E89 | An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared before the commencement of Work and must be followed should unexpected contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during Work. The procedure must include details of who will be responsible for implementing the unexpected finds procedure and the roles and responsibilities of all parties involved. | Appendix N |
| E90 | The Unexpected Contaminated Land and Asbestos Finds Procedure must be implemented throughout the duration of Work. | Appendix N |
| E105 | The CSSI must be designed, constructed and operated so as to maintain the NSW Water Quality Objectives where they are being achieved as at the date of this approval, and contribute towards achievement of the NSW Water Quality Objectives 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 NSW Water Quality Objectives, in which case those requirements must be complied with.<br>*Note: If it is proposed to discharge construction stormwater to waterways, a Water Pollution Impact Assessment will be required to inform licensing, consistent with section 45 of the POEO Act. Any such assessment must be prepared in consultation with the EPA* | Section 2.3<br>Section 2.4<br>Section 3.7<br>Section 3.8 |

| CoA No. | Condition Requirement | Document reference |
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| | *and be consistent with the National Water Quality Guidelines, with the level of detail commensurate with the potential water pollution risk.* | Section 6.8<br>Section 6.17<br>Appendix B |
| E106 | Drainage feature crossings (permanent and temporary watercourse crossings and diversions) and drainage swales and depressions must be carried out in accordance with relevant guidelines and designed by a suitably qualified and experienced person. | Section 6.9<br>Section 6.10 |
| E107 | Work on waterfront land must have regard to the Guidelines for controlled activities on waterfront land – Riparian Corridors (NRAR, 2018), Controlled activities on waterfront land – Guidelines for watercourse crossings on waterfront land (NSW Office of Water, 2012) and Policy and Guidelines for Fish Habitat Conservation and Management (DPI Fisheries, 2013). | Section 6.9 |
| E108 | The Proponent must consult DPI Fisheries and EES during the detailed design of the watercourse crossings. The consultation must include:<br>(a) design of bridges;<br>(b) design of scour protection; and<br>(c) details of riparian revegetation. | Section 6.9 (Note: Only DPI Fisheries is required to be consulted with for temporary crossings)<br>EES and DPI Fisheries have been consulted for permanent crossings during detailed design for M12 West and Central. M12 East will be undertaken as design progresses. |

# REMMs

| ID | Condition Requirement | Timing | Document reference |
|---|---|---|---|
| M7 Widening REMMs | | | |
| AQ9 | Earthworks and exposed areas/ soil stockpiles will be re-vegetated or stabilised as soon as practicable | During construction | Section 5.7 of Appendix D<br>Section 4.1.2 and 4.1.3 of Appendix G<br>Appendix E |
| FL2 | Activities that may affect existing drainage systems during construction will be carried out so that existing hydraulic capacity of these systems is maintained where practicable. | During construction | Appendix D |
| SW2 | A dewatering management plan will be prepared and included in the SWMP that sets out the procedures for the discharge of surface water runoff that is retained in sediment controls and exposed excavations. The dewatering management plan will be prepared in accordance with the Technical Guideline – Environmental Management of Construction Site Dewatering (Transport, 2011) and will include consideration of the following: | Prior to construction | Appendix C |
| | • Identification of water quality criteria for the discharge of on-site water and the treatment techniques required to meet these criteria | Prior to construction | Section 3.3 and Section 3.4 of Appendix C |
| | • Methods for achieving the WQOs for any site discharge through best practice erosion and sediment control measures and/or treatment of water through flocculation prior to discharge from sediment retention sumps | Prior to construction | Section 3.3 and Section 3.4 of Appendix C |
| | • Reuse of stormwater where feasible within the scope of construction activities | Prior to construction | Section 3.3.1 of Appendix C<br>Appendix I |
| | • Selection of suitable locations for the discharge of captured runoff utilising existing drainage paths where it cannot be reused on site | Prior to construction | Section 6.8<br>Appendix C |
| | • Procedures for the rectification of sediment controls or site practices should the water quality parameters experience exceedances. | Prior to construction | Appendix D this CSWMP |

| ID | Condition Requirement | Timing | Document reference |
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| SW3 | A soil conservation specialist will be engaged for the duration of construction of the proposed modification to provide advice on the planning and implementation of erosion and sediment control measures, including review of Erosion and Sediment Control Plans (ESCPs). | Prior to and during construction | Section 7.1.1 |
| SW4 | Stockpiles will be managed to minimise the potential for mobilisation and transport of dust and sediment in runoff in accordance with Stockpile Site Management Guideline (Roads and Maritime Services, 2015d). This will include:<br>• Minimising the number of stockpiles, the area used for stockpiles and the time that they are left exposed<br>• Locating stockpiles away from drainage lines, waterways, and areas where they may be susceptible to wind erosion<br>• Stabilising stockpiles, establishing appropriate sediment controls, and suppressing dust as required. | During construction | Section 6.5<br>Appendix G |
| SW6 | A water reuse strategy will be developed for the construction of the proposed modification to reduce reliance on potable water. This strategy will be prepared during the detailed design stage and will outline the construction water requirements and potential water sources to supply the water demand in consultation with Sydney Water. Alternative water supply options to potable water will also be investigated, with the aim of reusing water using recycled water where feasible. This includes sourcing non-potable water from construction sediment sumps where it is feasible to reuse. | Detailed design, prior to construction and during construction and operation | Section 6.7<br>Appendix I |
| SW7 | The following measures will be undertaken to manage activities within watercourses, especially works to widen of bridges:<br>• Disturbance of banks and extent of vegetation removal will be minimised<br>• Implementing bank stabilisation, channel reshaping and scour protection where required to mitigate the impact of additional bridge piers on scour and stability of the bed and banks of watercourses<br>• Maintenance of minimum surface water flows to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage<br>• Construction of temporary creek crossings during low flows and design so that drainage of these crossings does not contribute sediment load to the stream | Prior to construction and during construction and operation | Section 6.9<br>Section 6.10 |

| ID | Condition Requirement | Timing | Document reference |
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| | • Taking into consideration the former NSW Department of Industry's Guidelines for controlled activities on waterfront land (2018) in the design and construction of works within watercourses. | | |
| SW8 | The performance of the stormwater quality controls that are set out in the Modification Report (comprising the existing stormwater quality control basins and gross pollutant traps along the Westlink M7 corridor) will be verified at detailed design stage to ensure that for waterways that receive runoff from the proposed modification, and to the extent that the proposed modification can influence:<br>• The WQOs continue to be met at waterways where they are currently being achieved, or<br>• Existing water quality is improved at waterways where the WQOs are not being met.<br>In the instance during detailed design that it cannot be demonstrated that the water quality controls are effective in mitigating potential impacts in accordance with the above requirements, a review of measures will be undertaken to improve water quality outputs from the Westlink M7 over time, including an assessment of the potential benefits and feasibility or reasonableness of converting a select number of existing water quality control ponds to bioretention basins, in consultation with NSW EPA. | Detailed design<br>Construction<br>Operation | Section 2.4<br>Section 6.8<br>Appendix B<br>OEMP (Operational Surface Water Quality Monitoring Program) |
| SW9 | A construction water quality monitoring program will be developed and included in the SWMP for the proposed modification to establish baseline conditions, observe any changes in surface water and groundwater during construction, and inform appropriate management responses. Baseline monitoring will be undertaken monthly for a minimum of 12 months prior to the commencement of construction, inclusive of the monitoring that is presented in Section 5.6 of Appendix G (Surface water and flooding assessment). As a minimum, this will include three wet weather sampling events over six months where feasible.<br>Sampling locations and monitoring methodology to be undertaken during construction will be further developed in detailed design in accordance with the Guidelines for Construction Water Quality Monitoring (RTA, 2003) and the Water Quality Guidelines (ANZECC/ ARMCANZ, 2000). This will include the monitoring of surface water quality at or near moderate to high contamination risk areas for relevant contaminants during work in those locations (when/if these areas are confirmed during detailed design).<br>The monitoring will include collection of samples for analysis from sedimentation control discharge points, visual monitoring of other points of release of construction waters and monitoring of | Detailed design, prior to construction and during construction and operation | Appendix B<br>Appendix C |

| ID | Condition Requirement | Timing | Document reference |
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| | downstream waterways. The frequency of monitoring will be confirmed during detailed design and will be a minimum of once every month at all sites, as well as additional monitoring following wet weather events.<br><br>Should the results of monitoring identify that the water quality management measures are not effective in adequately mitigating water quality impacts, additional mitigation measures will be identified and implemented as required. | | |
| SW10 | Further water quality assessment will be undertaken during detailed design to determine whether additional site-specific discharge criteria are required to meet the objective of maintaining existing water quality in the receiving watercourses. | Detailed design | Appendix B this CSWMP |
| SW11 | The adequacy of the existing spill containment measures along the Westlink M7 corridor, will be verified during the detailed design of the proposed modification to ensure that they are suitable for the capture of spills from the widened road pavement. In the instance during detailed design that it cannot be demonstrated that spill control from the widened road pavement cannot be achieved with existing spill containment measures, then additional spill containment mitigation measures will be identified, implemented, and incorporated into existing maintenance procedures. | Detailed design | Section 6.13 |
| SW12 | Investigate ways to improve the flood immunity of the shared path near Ash Road, Prestons. | Detailed design | Table 2-1, Section 2.4 |
| SW13 | During the development of the detailed design, the water quality objectives that are set out in the Modification Report are to be reviewed and updated where required to include consideration of the Performance Criteria for Protecting and Improving the Blue Grid in the Wianamatta – South Creek Catchment (DPIE, 2022). | Detailed design | Section 6.1 |
| B5 | If sediment/ erosion booms are used, they are placed so they do not obstruct fish passage, where possible | During construction | Section 6.9<br><br>Section 6.10 |
| B6 | Design of temporary waterway crossings and diversions are consistent with Managing Urban Stormwater: Soils and construction – Volume 1 and 2D (DPIE, 2004) and Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013) and Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull, 2003) | During construction | Section 3.1.2<br><br>Section 6.9<br><br>Section 6.10 |

| ID | Condition Requirement | Timing | Document reference |
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| B7 | Relocation of native fish by a trained aquatic ecologist if they become stranded as a result of waterway diversions, temporary crossings, or dewatering activities. | During construction | Section 6.10<br>CFFMP |
| B8 | A detailed water monitoring program will be implemented during construction, where site observations are recorded by a suitably qualified person, and will include: | During construction | Appendix B<br>CFFMP |
| | • Routine inspections of temporary waterway crossings, waterway diversions and dewatering activities | During construction | Appendix B<br>Section 3.5.2 of Appendix C |
| | • Rapid geomorphic survey, including aquatic macrophyte mapping, bank erosion, channel stability and sediment deposition | During construction | Appendix B<br>CFFMP |
| | • Stormwater discharges into the receiving watercourses, including an estimate of flows, visual appearance, and water quality (handheld meter) testing on an opportunistic basis | During construction | Section 4.1.2 of Appendix B |
| | • Visual and olfactory observation of pollution (e.g., oil sheens, coarse debris, odours) | During construction | Section 4.1.4 of Appendix B |
| | • Opportunistic observations of aquatic fauna (e.g. stranded fish). | During construction | Appendix B<br>CFFMP |
| B10 | Monitoring and maintenance of all established erosion and sedimentation controls | During construction | Section 5.8 of Appendix D |
| C2 | A Sampling, Analysis and Quality Plan will be prepared ahead of detailed site investigations, focusing on potential source areas of potential contamination where the likelihood risk of contamination is moderate to high, and additional areas to give further understanding of potential contamination impacts. The results from the site investigations will be assessed against criteria contained within the National Environment Protection (Assessment of Site Contamination) Measure (2013) and other applicable NSW statutory guidelines to assess whether remediation is required or other management measures during construction. | Prior to construction | Attachment 3 of Appendix B |

| ID | Condition Requirement | Timing | Document reference |
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| C3 | Remediation will be undertaken where assessed as required based on the outcome of DSIs. Works will be performed in accordance with the hierarchy of preferred strategies in the Guidelines for the NSW Site Auditor Scheme (NSW EPA, 2017c) and CRC CARE Pty Ltd (CRC, CARE, 2020) National Remediation Framework. Where practical, remediation works will be integrated with excavation and development works performed during construction and address requirements of SEPP 55 | Prior to construction | CCLMP |
| C4 | Contamination within the Westlink M7 lease area will be managed in accordance with the existing or updated Operational Environmental Management Plan (OEMP). Pre-construction contamination condition surveys will be undertaken on all sites intended to be used as construction ancillary facilities. Post-construction contamination condition surveys will be undertaken on all ancillary facilities and any contamination caused by the use of the site as a construction ancillary facility remediated to a standard suitable for the identified land use. Remediation will be undertaken by the construction contractor prior to operation of the modification. | During construction | Section 5 of Appendix L<br>CCLMP |
| C5 | Prior to ground disturbance in areas of potential inland acid sulfate soil occurrence, testing will be carried out to determine the actual presence of acid sulfate soils. This measure is especially appliable to areas on waterbodies where disturbance of sediments and surrounding soil is to occur. If acid sulfate soils are encountered, they will be managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998) and Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze (NSW Roads and Traffic Authority 2005b). | During construction | Appendix L<br>CCLMP |
| C6 | Prior to ground disturbance in high probability salinity areas, testing will be carried out to determine the presence of saline soils. If salinity is encountered, excavated soils will not be reused, and will be managed in accordance with Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC, 2008c). Erosion controls will be implemented in accordance with the Managing Urban Stormwater: Soils and Construction Volume 1 (DPIE, 2004). | During construction | Section 6.1 and 6.3, and Appendix L and Appendix D<br>CCLMP<br>CWRMP |
| C7 | Post-construction contamination condition surveys will be undertaken on all ancillary facilities and may be required by lease agreements. Any contamination caused by the use of the site as a construction ancillary facility for the widening works will be remediated to a standard suitable for the identified land use. Remediation will be undertaken by the construction contractor prior to operation of the modification. | Prior to operation | CCLMP |

| ID | Condition Requirement | Timing | Document reference |
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| HR8 | Storage, handling and use of dangerous goods and hazardous substances will be in accordance with the Work Health and Safety Act 2011 and the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005). | During construction and operation | Section 6.11 |
| HR9 | Storage areas for oils, fuels and other hazardous liquids will be located outside of identified floodprone areas identified in Section 6.2.1 of Appendix G (Surface water and flooding assessment). Secure, bunded areas will be provided around storage areas. | During construction and operation | Section 6.11 |
| HR10 | A register and inventory of dangerous goods and hazardous substances will be kept at each storage location. This register will be maintained as part of an incident response management plan developed for the proposed modification. The register will include Safety Data Sheets which will be obtained for dangerous goods and hazardous substances prior to their delivery onsite and stored in an accessible place. | During construction | Section 6.11 |
| HR11 | All hazardous substances will be transported in accordance with relevant legislation and codes, including the Dangerous Goods (Road and Rail Transport) Regulation 2014 and the 'Australian Code for the Transport of Dangerous Goods by Road and Rail' (National Transport Commission, 2020). | During construction | Section 6.11 |
| M12 Motorway REMMs | | | |
| B20 | Spill kits will be located to allow for timely response to uncontained spills. Site inductions will include a briefing on the use of spill kits. | During construction | Section 6.13 |
| SWH02 | A soil conservation specialist will be engaged by both TfNSW and the Construction Contractor for the duration of construction of the Project to provide advice on the planning and implementation of erosion and sediment control including review of ESCPs. | Prior to and during construction | Section 7.1.1 |
| SWH03 | A water reuse strategy will be developed for both construction and operational phases of the Project to reduce reliance on potable water. This strategy will be prepared during the detailed design stage and implemented throughout the Project and will outline the construction and operational water requirements and potential water sources to supply the water demand in consultation with Sydney Water. Alternative water supply options to potable water will be investigated, with the aim of reusing water using recycled water where feasible. | Detailed design, prior to construction and during construction and operation | Section 6.7<br>Appendix I |

| ID | Condition Requirement | Timing | Document reference |
|---|---|---|---|
| SWH04 | Stockpiles will be managed to minimise the potential for mobilisation and transport of dust and sediment in runoff in accordance with TfNSW Stockpile Sites Management Guideline (Roads and Maritime, 2015). This will include:<br>• Minimising the number of stockpiles, area used for stockpiles, and time that they are left exposed<br>• Locating stockpiles away from drainage lines, waterways and areas where they may be susceptible to wind erosion<br>• Stabilising stockpiles, establishing appropriate sediment controls and suppressing dust as required. | During construction | Section 6.5<br>Appendix G |
| SWH05 | A construction water quality monitoring program will be developed and included in the CSWMP for the Project to establish baseline conditions, observe any changes in surface water and groundwater during construction, and inform appropriate management responses.<br>The program will be based on the water quality monitoring methodology, water quality indicators and the monitoring locations identified in the Surface water and hydrology assessment report (Appendix M of the EIS) and supplementary memo (Appendix I of this amendment report), and Groundwater quality and hydrology assessment report (Appendix N of the EIS) and supplementary memo (Appendix J of this amendment report).<br>Baseline monitoring will be carried out monthly for a minimum of 12 months before the start of construction. As a minimum this will include three wet weather sampling events over six months where feasible.<br>Sampling locations and monitoring methodology to be carried out during construction will be further developed in detailed design in accordance with the Guideline for Construction Water Quality Monitoring (RTA 2003) and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018). It will include collection of samples for analysis from sedimentation basin discharge points, visual monitoring of other points of release of construction waters and monitoring of downstream waterways. | Prior to construction and during construction and operation | Appendix B |
| SWH11 | A de-watering management plan will be prepared as part of the CSWMP which will outline the de-watering methodology, supervision requirements, staff responsibilities and training, and approvals required before any de-watering activity begins. | During construction | Section 6.8<br>Appendix C |

| ID | Condition Requirement | Timing | Document reference |
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| SWH12 | The following measures will be carried out to manage activities within watercourses or on waterfront land:<br>• Implementing practices to minimise disturbance of banks<br>• Undertaking bank stabilisation and installing instream structures<br>• Maintaining minimum flows to assist in maintaining the viability of aquatic communities and preventing barriers to fish passage<br>• Constructing instream crossings during low flows and design so that drainage off crossing doesn't contribute sediment load to the stream<br>• All drainage feature crossings (permanent and temporary watercourse crossings and stream diversions), drainage swales and depressions will be designed by a suitably qualified and experienced professional and will be designed and constructed in accordance with relevant guidelines. | Prior to construction and during construction and operation | Section 6.9<br>Section 6.10 |
| GW01 | Groundwater monitoring will be carried out as part of the construction water quality monitoring program for the Project. The groundwater monitoring will be based on the water quality monitoring methodology, water quality indicators and the monitoring locations shown in Appendix N of the EIS and Table 7-1 in the groundwater supplementary technical memorandum (Appendix J of this amendment report).<br>Baseline groundwater monitoring will be carried out at least monthly for at least six months before construction. Monitoring will also be carried out at least monthly during construction and will continue for at least six months of operation to verify that there are no groundwater impacts, and that management measures are adequate. | Prior to construction and during construction | Appendix B |
| GW07 | Prior to construction commencing, the Construction Contractor will use their earthworks methodology to estimate the potential groundwater inflows that are expected in the first year of construction in order to confirm the inflows expected and if the proposed mitigation measures are sufficient to manage higher inflows that are likely during early earthworks activity. The estimate of groundwater inflows is to be undertaken for Cut 9 and at the Sydney Water culvert excavations. The estimate is to include groundwater inflow from both the walls and base of the cuts, and will take into account the construction methodology and staging for each cut. In addition, the estimate will utilise the maximum observed groundwater levels (as sourced from M12 Central groundwater monitoring data). The Construction Contractor will assess the results of the estimated groundwater inflows to confirm whether evaporation | Construction | Section 4.3 |

| ID | Condition Requirement | Timing | Document reference |
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| | will be sufficient to mitigate the potentially higher inflows likely to be expected during early earthwork activities.<br><br>If evaporation is determined not to be a sufficient mitigation measure, the Construction Contractor will identify and implement additional mitigation measures and these will be documented in the Construction Contractor's CEMP and Construction Soil and Water Management Plan. | | |
| GW08 | During construction, the construction contractor will visually monitor groundwater inflows during Utility crossing excavations to ensure that inflows can be appropriately managed in accordance with Stage specific Construction Soil and Water Management Plan. If groundwater inflows cannot be managed in accordance with the Stage-specific Construction Soil and Water Management Plan, works will stop in the affected Utility Crossing and the construction methodology would be reviewed | Construction | Section 4.3 |
| GW09 | During construction, the construction contractor will visually monitor groundwater inflows during Utility crossing excavations to ensure that inflows can be appropriately managed in accordance with Stage specific Construction Soil and Water Management Plan. If groundwater inflows cannot be managed in accordance with the Stage-specific Construction Soil and Water Management Plan, works will stop in the affected Utility Crossing and the construction methodology would be reviewed | Construction | Section 4.3 |
| SC01 | Construction within areas of moderate to high-risk saline soils will be managed in accordance with the CSWMP. Specific measures will also include (but not be limited to):<br>• Ongoing groundwater monitoring of salinity as part of the water quality monitoring program<br>• Identification and management of saline discharge sites<br>• Progressive stabilisation and revegetation of exposed areas following disturbance as soon as is practicable<br>• Testing to confirm the presence of saline soils in areas of high salinity potential prior to disturbance.<br>• Soil salinity management will also be carried out in accordance with the NSW Department of Primary Industries (2014) Salinity Training Handbook. | Prior to construction and during construction | Section 6.3<br>Appendix L |
| SC02 | Testing will be carried out to confirm the presence of saline soils in areas of high salinity potential and to confirm the presence of ASS around creeks prior to disturbance. | Prior to construction | CCLMP |

| ID | Condition Requirement | Timing | Document reference |
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| SC05 | Detailed site (contamination) investigations will be carried out in accordance with the NSW EPA (1995) Sampling Design Guidelines and other NSW EPA endorsed guidance including the NEPM (2013) guidelines within the following AEI locations to confirm the presence of contamination before the start of construction at these locations:<br><br>Further soil investigations will be required in areas of the refined construction footprint located adjacent to the following two AEIs to confirm the presence of contamination before the start of construction at these locations:<br><br>• Within AEI 6: PGH Bricks and Pavers<br>• Within AEI 9: Sydney Recycling Park/ Wanless Recycling and Former Kari & Ghossayn Pty Ltd (Solid Waste Landfill)<br>• AEI 10: SUEZ Kemps Creek Resource Recovery Park.<br><br>Additional soil and groundwater investigations will be required in the areas of additional cut around the airport interchange northern cut and airport interchange southern cut to further assess the potential impacts to the amended project.<br><br>Depending on results of the investigations, or if remediation is deemed required at any site within the refined construction footprint, a Remedial Action Plan will be prepared before the construction. | Prior to construction | CCLMP |
| SC06 | Further intrusive asbestos investigations throughout the construction footprint will be carried out to assess asbestos risks before the start of construction. The investigations are to include visual assessments and ground truthing along the length of the Project. | Prior to construction | CCLMP |
| HS04 | Storage, handling and use of dangerous goods and hazardous substances would be in accordance with the Work Health and Safety Act 2011. It is noted that the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW, 2005) is no longer in force but has been retained 'for information'. Schedule 11 of the Work Health and Safety Regulation 2017 should be referred to. | During construction and operation | Section 6.11 |
| HS05 | Secure, bunded areas will be provided around storage areas for oils, fuels and other hazardous liquids. | During construction | Section 6.11 |
| HS06 | Safety Data Sheets will be obtained for dangerous goods and hazardous substances stored onsite before their arrival. | During construction | Section 6.11 |

| ID | Condition Requirement | Timing | Document reference |
|---|---|---|---|
| HS07 | All hazardous substances will be transported in accordance with relevant legislation and codes, including the Dangerous Goods (Road and Rail Transport) Regulation 2022 and the 'Australian Code for the Transport of Dangerous Goods by Road and Rail' (National Transport Commission, 2022). | During construction | Section 6.11 |

# Appendix B - Construction Soil and Water Quality Monitoring Program

# M7-M12 Integration project

## Construction Soil and Water Management Sub-plan

### Appendix B: Construction Soil and Water Monitoring Program

November 2023



# Document Control

| | |
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# Acronyms and Abbreviations

| Term | Expanded text |
|---|---|
| ADWG | Australian Drinking Water Guidelines |
| AHD | Australian Height Datum |
| AIP | NSW Aquifer Interference Policy |
| ARSR | Amendment Report Submissions Report |
| ANZECC | Australian and New Zealand Environment Conservation Council |
| ANZ | Australian and New Zealand Guideline |
| As | Arsenic |
| ARMCANZ | Agriculture and Resource Management Council of Australia and New Zealand |
| AWS | Automatic Weather Station |
| BoM | Bureau of Meteorology |
| BTEX | Benzene, Toluene, Ethylbenzene Xylene and Naphthalene |
| CCLMP | Construction Contaminated Land Management Sub-plan |
| CEMP | Construction Environmental Management Plan |
| CoA | Conditions of Approval |
| CoC | Chain of Custody |
| Construction | Includes all activities required to construct the M7-M12 Integration project:<br>• as described in the documents listed in Infrastructure Approval SSI-663-Mod-6 Condition 1A, including commissioning trials of equipment and temporary use of any part of Modification 6 (M7 Widening), but excluding low impact work which is carried out or completed prior to approval of the CEMP<br>• as described in the documents listed in Infrastructure Approval SSI 9364 (M12 Motorway) Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out to complete prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, demolition of acquired residential houses, structures and sheds, and works specified in Appendix B of the M12 Motorway Infrastructure Approval which have been approved under an environmental management plan in accordance with M12 Motorway Condition A24. |
| CSSI | Critical State Significant Infrastructure |
| CSWMP | Construction Soil and Water Management Sub-plan |
| CSW – Monitoring Program | Construction Soil and Water Monitoring Program |
| CWRMP | Construction Waste and Resource Management Sub-plan |
| DPE | The Department of Planning and Environment |

| Term | Expanded text |
|---|---|
| EAD | Environmental Assessment Documentation |
| EIS | Environmental Impact Statement |
| Environmental Assessment Documentation, M7 EAD, M12 EAD | The set of documents that comprise the Division 5.2 Approval of the M7 Widening:<br>• Transport for NSW (August 2022) Westlink M7 Widening Modification Report<br>• Transport for NSW (November 2022) Westlink M7 Widening Submissions report.<br>The set of documents that comprise the Division 5.2 Approval of the M12 Motorway:<br>• Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS)<br>• Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report)<br>• Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR)<br>• Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR)<br>• Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment)<br>• WSP (October, 2021) M12 Motorway – West Package Detailed Design: Proposed changes between east of Badgerys Creek and The Northern Road Consistency Assessment<br>• GHD (October, 2021) M12 Motorway – Central Package Detailed Design: Design and boundary changes between Cecil Park and east of Badgerys Creek Consistency Assessment<br>• Arcadis (June, 2022) M12 Motorway – West and Central Package Sydney Water Pipeline Crossings: Proposed Sydney Water pipelines crossings for M12 West and Central Consistency Assessment<br>• Arcadis (July, 2022) M12 Motorway – Design Boundary Changes: Proposed construction and operational design boundary changes for the M12 Project Consistency Assessment<br>• Arcadis (August, 2022) M12 Central Boundary Changes: Proposed construction design boundary changes for M12 Central – Minor Change Consistency Assessment<br>• WSP (September, 2023) Proposed construction and operational design boundary changes for the M12 Project (East) Consistency Assessment |

| Term | Expanded text |
|---|---|
| | • John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Laydown Area Adjacent to Cecil Road<br>• John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Power supply to AF9<br>• John Holland (October, 2023) Minor consistency assessment for proposed change to the M12 Motorway Project (M12 East) – Temporary construction signage.<br>The documents that comprise the EPBC referral:<br>• Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW<br>• Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286. |
| EPA | Environmental Protection Authority |
| EPL | Environmental Protection Licence |
| ER | Environmental Representative |
| ESM | TfNSW Environment and Sustainability Manager |
| ESR | John Holland's Environmental Site Representative |
| HIN | Hinchinbrook Creek |
| mg/L | Milligrams per litre |
| mV | Millivolt |
| M7 CoA | Minster's Conditions of Approval for the M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) |
| M7 Widening | M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) |
| M7-M12 Integration Project, the Project, the Project | The M7-M12 Integration project incorporates the following:<br>• M7 Motorway (Mod 6 Widening) (SSI 663 Mod 6) – modification (mod) to the M7 Motorway approved on 17 February 2023 under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act)<br>• M12 Motorway (CSSI 9364) – approved on 23 April 2021 under Division 5.2 of the EP&A Act and split into separate stages or packages of work (West, Central (main construction), Central (temporary roundabout) and East). The M12 Motorway is also subject to a federal approval under the Environment Protection and Biodiversity Conversation Act 1999. The M7-M12 Integration project incorporates the M12 East package only. |
| M12 CoA | Minister's Conditions of Approval for the M12 Motorway (CSSI 9364) |
| M12 East package | M12 Motorway – East package |

| Term | Expanded text |
|---|---|
| NATA | National Association of Testing Authorities |
| NRAR | Natural Resources Access Regulator |
| NTU | Nephelometric Turbidity Units |
| OC | Organochlorine |
| OCEMP | Overarching Construction Environmental Management Plan |
| OCSWMP | Overarching Construction Soil and Water Management Sub-Plan |
| OP | Organo-phosphorus |
| PAH | Poly-cyclic Aromatic Hydrocarbon |
| PCB | Polychlorinated Biphenyls |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| QA | Quality Assurance |
| RAP | Remedial Action Plan |
| REMM | Revised Environmental Management Measures |
| ROP | Ropes Creek |
| SMART | Specific, Measurable, Achievable, Realistic and Timely |
| SOP | Standard Operating Procedures |
| SWL | Standing Water Level |
| TDS | Total dissolved solids |
| TfNSW | Transport for New South Wales |
| TSS | Total Suspended Solids |
| µg/L | Micrograms per litre |
| µS/cm | Microsiemens per centimetre |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |
| WSIA | Western Sydney International Airport |
| WQ | Water Quality |

# 1 Introduction

## 1.1 Background

The M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) (M7 Widening) and the M12 East package of the M12 Motorway Project (SSI 9364) will be delivered together under what is referred to as the M7-M12 Integration project by Western Sydney Orbital Company (WSO Co) and John Holland.

The M7 Widening and M12 East package have a complex interface in the vicinity of Cecil Hills and Cecil Park where the M7-M12 interchange is proposed.

Due to construction programming and development of the M12 Motorway project Overarching Construction Environmental Management Plan (OCEMP), the Construction Environmental Management Plan (CEMP) and Sub-plans have been prepared in a two-step process:

- M12 East package CEMP and Sub-plans: prepared under the OCEMP and Sub-plans and endorsed by the Environmental Representative (ER)
- M7-M12 Integration project CEMP and Sub-plans (including this Construction Soil and Water Monitoring Program): endorsed by the ER and approved by the Planning Secretary (where required). Once approved, the M7-M12 Integration project documents supersede the M12 East package CEMP and Sub-plans.

Appendix B of the Construction Soil and Water Management Sub-plan (CSWMP) forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project and will be endorsed by the ER and approved by the Planning Secretary. This Monitoring Program addresses the following requirements for the M7 Widening and the M12 East package:

- M7 Widening:
  - Minister's Conditions of Approval (CoA) for M7 Widening (SSI-663-Mod-6) (M7 CoA)
  - Updated Environmental Management Measures listed in the Westlink M7 Modification Report (August 2022) and the Submissions Report (November 2022) (M7 REMMs)
- M12 Motorway:
  - Commonwealth CoA for M12 Motorway Project (EPBC 2018/8286) (Commonwealth M12 CoA)
  - CoA for M12 Motorway Project (SSI 9364) (NSW M12 CoA)
  - Revised Environmental Management Measures listed in M12 Motorway Environmental Impact Statement (EIS) (October 2019), the Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 REMMs)
  - Overarching Construction Environmental Management Plan (OCEMP)
  - Relevant consistency assessments.
- Applicable legislation
- Transport for NSW (TfNSW) specifications.

### 1.1.1 M7 Widening

The Westlink M7 (formerly called the Western Sydney Orbital (WSO)) is an existing 39-kilometre-long toll road connecting the M5 Motorway at Prestons, the M4 Motorway at Eastern Creek and The Hills M2 Motorway at Baulkham Hills (the approved project).

TfNSW sought a modification to the approval granted for the Westlink M7 (Department of Planning and Environment (DPE) reference number SSI-663 M7 Motorway (Modification 6 Widening)) under the Environmental Planning and Assessment Act 1979 (EP&A Act). This modification will enable widening of part of the motorway in response to current and projected traffic growth, and to address reduced motorway efficiency while enhancing safety.

The modification will enable the construction and operation of an additional lane in both directions within the existing median of the Westlink M7 for approximately 26 kilometres (km). Works will occur from about 140 metres (m) south of the Kurrajong Road overhead bridge at Prestons (southern end) to the Richmond Road interchange at Oakhurst/Glendenning (northern end), excluding widening through the Westlink M7/M4 Motorway (Light Horse) Interchange.

The modified portion of the Westlink M7 is herein referred to as M7 Widening. A detailed M7 Widening project description is provided in Section 5.1 of the CEMP.

### 1.1.2 M12 Motorway

Transport for New South Wales (TfNSW) are constructing and will operate the M12 Motorway to provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network. The M12 Motorway will run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for about 16 kilometres (km) and is expected to be opened to traffic prior to opening of the WSIA.

The M7-M12 Integration project will be constructed in separate stages or work packages:

- M12 West – between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek
- M12 Central – between about 250 metres east of Badgerys Creek and the Western Sydney Parklands at Duff Road, Cecil Park
- M12 Central temporary roundabout installation (package delivered by TfNSW Sydney Roads Performance Contractor)
- M12 East as part of the M7-M12 Integration project (the subject of this Plan):
    - Elizabeth Drive connections (EDC) – connections between the M12 Motorway and Elizabeth Drive at Cecil Park
    - the M7/M12 interchange – a grade-separated motorway-to-motorway connection between the M7 and M12 Motorways.

The M12 Motorway packages of work are being delivered under separate contracts on behalf of the proponent, TfNSW. There will be periods during which the works associated with the M12 Central and M12 East packages will overlap. John Holland and the contractors of the M12 Central package will coordinate to manage cumulative impacts.

## 1.2 Purpose of the program

The purpose of this Soil and Water Monitoring Program (this Monitoring Program) is to describe the water monitoring activities required to be undertaken as part of the M7-M12 Integration project.

Specifically, this Monitoring Program:

- Provides procedures to monitor surface water and groundwater impacts during construction of the M7-M12 Integration project
- Meets the requirements of the relevant conditions of approval for the M7 Widening and M12 East package
- Meets any relevant legal and other requirements and Environment Protection Licence (EPL) requirements for the M7-M12 Integration project.

A copy of this Monitoring Program will be kept on the premises for the duration of construction.

## 1.3 Scope of the program

This Monitoring Program is an appendix of the CSWMP. It describes the water monitoring activities required to be undertaken as part of the M7-M12 Integration project. The M12 East package components of this Monitoring Program have been prepared under, and are consistent with the M12 Motorway Overarching Construction Environmental Management Plan (OCEMP), in particular the Overarching Construction Soil and Water Management Sub-plan (OCSWP) and associated Monitoring Program.

This program is applicable to a to address the requirements of the Minister's Conditions of Approval (M12 CoA), Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report, and Amendment Report Submissions Report (ARSR), ARSR Biodiversity Amendment and all Consistency Assessments, all applicable legislation, Transport for New South Wales (TfNSW) Specifications.

The SMART (Specific, Measurable, Achievable, Realistic and Timely) principles have been considered in the preparation of this Monitoring Program. This Monitoring Program is applicable to all activities during the construction of the M7-M12 Integration project, including all areas where physical works will occur or areas that may otherwise be impacted by the construction works and under the control of John Holland. All John Holland staff and sub-contractors are required to operate fully under the requirements of this Plan and CSWMP.

This Monitoring Program has been updated to incorporate the relevant information and requirements to consider the M7 Motorway (Modification 6 Widening) (M7 Widening). The re-branded M7-M12 Integration project Monitoring Program has been prepared to also address the requirements of the M7 Widening Minister's Conditions of Approval (M7 CoA) and the Revised Environmental Management Measures (REMMs) listed in the Westlink M7 Widening Modification Report and Westlink M7 Widening Submissions Report.

Due to construction programming and development of the OCEMP, the CEMP and sub-plans (and monitoring programs) have been prepared in a two-step process:

- M12 East package CEMP, sub-plans and monitoring programs (including this Monitoring Program)

- M7-M12 Integration project CEMP, sub-plans and monitoring programs.

Once this M7-M12 Integration project Monitoring program is approved, the M12 East package Monitoring program will be superseded.

## 1.4 Responsibilities

Site personnel or sub-consultants with suitable experience and qualifications will undertake the monitoring outlined in this Monitoring Program. An overview of monitoring aspects and responsibilities is provided in Table 1-1.

*Table 1-1:Monitoring responsibilities*

| Monitoring Aspect | M7 Widening | M12 East package |
|---|---|---|
| Routine receiving surface water quality monitoring | John Holland ESR or delegate | John Holland or appointed consultant (during construction) |
| Routine receiving groundwater quality monitoring at borehole ID BH145 | Not applicable (refer to Section 3.2) | TfNSW appointed consultant (pre-construction)<br>John Holland ESR or delegate (during construction) |
| Discharge monitoring | John Holland ESR or delegate | John Holland ESR or delegate |
| Climate and weather monitoring | John Holland ESR or delegate | John Holland ESR or delegate |

The TfNSW appointed consultant have undertaken receiving surface water monitoring (Section 4.1) where required as described in Table 4-1and all groundwater monitoring (Section 4.2). John Holland will be responsible for implementing any actions required in response to any exceedances identified in the monitoring results of receiving surface water and groundwater that are related to construction impacts on water quality. John Holland will support the surface water and groundwater monitoring as required including by providing the TfNSW appointed consultant with access to monitoring locations where construction is occurring.

John Holland's responsibilities under this Monitoring Program also include monitoring of water discharges (Section 4.3) and climate data (Section 4.4). John Holland's Construction Managers are also responsible for ensuring that EPL conditions relevant to the discharge of water are met.

## 1.5 Approval, review and modification

The CEMP, Sub-plans and monitoring programs for the M7-M12 Integration project will be developed in a two-step process (refer to Section 1.2 of the M7-M12 Integration project CEMP for additional detail regarding the CEMP delivery strategy):

- Construction of the M12 East package did not commence until the M12 East package CSWMP and Monitoring Program were endorsed by the ER and provided to the Planning Secretary for information. The M12 East package Construction Soil and Water Monitoring Program will be superseded by this Monitoring Program

- Construction of the M7 Widening will not commence until the M7 Widening components of this M7-M12 Integration project Soil and Water Monitoring Program are reviewed for consistency with the M7 Widening approval, endorsed by the ER and approved by the Planning Secretary in accordance with M7 CoA C11. This Monitoring Program as approved, including any minor amendments approved by the ER, will be implemented for the duration of construction and any longer period set out in this Monitoring Program or as specified by the Planning Secretary, whichever is the greater.

As part of the CEMP this Monitoring Program will be reviewed and updated as required and in accordance with Section 1.12 of the CEMP.

Any amendments to the Monitoring Program will be documented in subsequent revisions of this Monitoring Program. A copy of the updated Monitoring Program and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure outlined in the CEMP. Site personnel with responsibilities relevant to soil and water monitoring will be informed of any amendments to the Monitoring Program with appropriate training provided, where relevant.

**M7 Widening components**

This Monitoring Program has been prepared, to satisfy the M7 CoA and REMMs in relation to soil and water impacts during construction of the M7-M12 Integration project, particularly M7 CoA C9(b). The M7 Widening components of this plan will be prepared in consultation with DPE Water and relevant council(s), reviewed and endorsed by the ER once this Plan is confirmed to be consistent with the M7 CoA (M7 CoA A20(d)), approved by the Planning Secretary and provided to the Environmental Protection Authority (EPA) for information.

**M12 East package components**

The M12 East package components of this Monitoring Program have been developed under, and were considered by WSO Co, TfNSW ESM (or delegate) and the ER to be consistent with the DPE-approved M12 Motorway Overarching CSWMP (OCSWMP) and Monitoring Program, and were provided to the Planning Secretary for information. The M12 East package CSWMP and Monitoring Program were prepared to satisfy the NSW M12 CoA in relation to the management of soil and water impacts during construction of the M12 East package component of the M7-M12 Integration project, particularly NSW CoA M12 C4(d), C4(e), C11(b) and C11(c), and were subsequently approved by the Planning Secretary.

No further approvals for the M12 East package components of this Monitoring Program are required. Revisions or updates to this Plan, including for the M7 Widening or M12 East package components are addressed in the M7-M12 Integration project CEMP Section 1.4.3.

## 1.6 Consultation

As described in Section 1.2, the CEMP is being developed in a two-step process. This Monitoring Program incorporates the relevant information and requirements of the M7 Widening and M12 East package.

M7 Widening components of the M7-M12 Integration project CEMP, Sub-plans and Monitoring Programs are subject to the consultation requirements as identified in M7 CoA C4 and C9.

In accordance with M7 CoA C9, the M7 Widening components of this Monitoring Program will be prepared in consultation with DPE Water and the below relevant councils:

- Blacktown City Council
- Fairfield City Council
- Liverpool City Council.

In accordance with TfNSW specification G38, consultation will also be undertaken with WaterNSW and Sydney Water (if there are any discharges to their assets).

The M12 East package components of this Monitoring Program have been written under, and are consistent with, the M12 Motorway OCSWMP and Monitoring Program and therefore no further external consultation was required for the M12 East package components of this Plan, other than acceptance by WSO Co, TfNSW and the ER.

### 1.6.1 Consultation for preparation of the Overarching Monitoring Program

The M12 Motorway OCSWMP and overarching Construction Soil and Water Monitoring Program were prepared in consultation with government agencies and stakeholders in accordance with M12 CoA C4(e), C7, C11(b) and C11(c).

Key matters raised by stakeholders and how they have been addressed are outlined in the M12 Motorway OCSWMP including consultation evidence in accordance with M12 NSW CoA C4 and A5. As stated above, no further consultation for the M12 East package components of this Plan is required.

### 1.6.2 Ongoing consultation during construction

During construction, changes may occur that potentially change the compliance status of the CEMP, or as a result of the Review and Improvement Process in the CSWMP, which require this Monitoring Program to be reviewed and updated. Where these changes are not considered ‘minor’ by the ER, further consultation with the relevant stakeholders will occur.

Ongoing consultation between TfNSW, John Holland, the M12 Central package, other construction projects, and stakeholders, the community, and relevant agencies regarding the management of soil and water impacts will be undertaken during the construction of the M7-M12 Integration Project as required. The process for the community consultation will be consistent with the OCS and as described in the M7-M12 Integration Project Communication Management Plan.

# 2 Environmental Requirements

## 2.1 Minister's Conditions of approval

The NSW M7 CoA and M12 CoA relevant to this Monitoring Program and their applicability to each stage of the M7-M12 Integration project are listed in Table 2-1 and Table 2-2. A cross-reference is also included to indicate where the condition is addressed in this Monitoring Program or other project management documents.

*Table 2-1: NSW M7 CoA relevant to this Monitoring Program*

| CoA No. | Condition Requirement | Document Reference |
|---|---|---|
| C8 | The Soil and Water Management Plan (SWMP) must be prepared in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008) and be prepared by a suitably qualified person either certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme.<br>The SWMP must include, but not be limited to:<br>(d) a surface water monitoring program for areas of moderate to high contamination risk for contaminants of potential concern (CoPC), and | This Plan |
| C9 | The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of Modification 6 against the performance predicted in the documents listed in Condition 1A of Schedule 1 or in the CEMP:<br>(b) Surface Water Quality - DPE Water and relevant council(s) | Section 1.6 |
| C10 | Each Construction Monitoring Program (CMP) must have consideration of SMART principles and provide:<br>• details of baseline data available;<br>• details of baseline data to be obtained and when;<br>• details of all monitoring of the project to be undertaken;<br>• the parameters of the project to be monitored;<br>• the frequency of monitoring to be undertaken;<br>• the location of monitoring;<br>• the reporting of monitoring results and analysis results against relevant criteria;<br>• details of the methods that will be used to analyse the monitoring data;<br>• procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts; and | Section 1.2<br>Section 1.3<br>Section 1.4<br>Section 1.6<br>Section 3<br>Section 4<br>Section 4.5<br>Attachments 1 and 2 |

| CoA No. | Condition Requirement | Document Reference |
|---|---|---|
| | • any consultation to be undertaken in relation to the monitoring programs. | |
| C11 | The CMP must be endorsed by the ER and then submitted to the Planning Secretary for approval no later than one month before the commencement of construction, or where construction is staged, no later than one month before the commencement of each stage. | Section 1.4<br>Section 3.1<br>Section 3.2 |
| C12 | Construction must not commence until the relevant CMP(s) have been approved by the Planning Secretary and all relevant baseline data for the specific construction activity has been collected. | Section 1.5<br>Attachment 1<br>Attachment 2 |
| C13 | The CMP(s), as approved, including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater. | Section 1.5 |
| C14 | The results of the CMP(s) must be submitted to the Planning Secretary, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant CMP.<br><br>Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan. | Section 6.2 |

*Table 2-2: NSW M12 CoA relevant to this Monitoring Program*

| CoA No. | Condition Requirement | Document Reference |
|---|---|---|
| C11 | The following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies.<br>identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP:<br>(b) Surface Water Monitoring Program - DPIE Water, Sydney Water (if there are any discharges to their assets), relevant councils<br>(c) Groundwater Monitoring Program - DPIE Water | Section 1.6 |
| C12 | Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant Construction Monitoring Programs, including copies of all correspondence from those agencies as required by Condition A5. | Section 1.6 |
| C13 | Each Construction Monitoring Program must provide:<br>(a) details of baseline data available | Section 5<br>Attachment 1<br>Attachment 2 |
| | (b) details of baseline data to be obtained and when | Section 5<br>Attachment 1<br>Attachment 2 |
| | (c) details of all monitoring of the CSSI to be undertaken<br>(d) the parameters of the CSSI to be monitored<br>(e) the frequency of monitoring to be undertaken | (c) Section 4<br>(d) Section 4<br>(e) Section 4 |

| CoA No. | Condition Requirement | Document Reference |
|---|---|---|
| | (f) the location of monitoring<br>(g) the reporting of monitoring results and analysis of results against the relevant criteria<br>(h) details of methods that will be used to analyse monitoring data<br>(i) procedures to identify and implement additional mitigation measures where results of monitoring indicate unsatisfactory CSSI impacts<br>(j) a consideration of SMART principles<br>(k) any consultation to be undertaken in relation to the monitoring programs. | (f) Section 4<br>(g) Section 3<br>Section 4<br>(h) Section 4<br>(i) Section 4.5<br>(j) Section 1.3<br>Section 4<br>(k) Section 1.6 |
| C15 | The Construction Monitoring Programs must be endorsed by the ER and then submitted to the Planning Secretary for approval at least one month (1) before the commencement of construction. | Section 1.5 |
| C16 | Unless otherwise agreed with the Planning Secretary, construction must not commence until all of the relevant Construction Monitoring Programs have been approved by the Planning Secretary, and all relevant baseline data for the specific construction activity has been collected. | Section 1.5 |
| C17 | The Construction Monitoring Programs, as approved by the Planning Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater. | Section 1.5 |
| C18 | The results of the Construction Monitoring Programs must be submitted to the Planning Secretary, and relevant government agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant Construction Monitoring Program. | Section 6.2 |

## 2.2 Revised Environmental Management Measures

The REMMs relevant to this CSW-Monitoring Program and their applicability to each stage of the M7-M12 Integration project are listed in Table 2 3 and Table 2 4. A cross reference is also included to indicate where the condition is addressed in this CSW-Monitoring Program or other project management documents.

*Table 2-3:M7 REMMs relevant to this Monitoring Program*

| CoA No. | Condition Requirement | Timing | Document Reference |
|---|---|---|---|
| SW1 | A Soil and Water Management Plan (SWMP) will be prepared as part of the proposed modification. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land.<br>The SWMP will include:<br>• Groundwater management measures to limit the risk of exposure to contaminated groundwater | Prior to construction and during construction | This Monitoring Program |

| CoA No. | Condition Requirement | Timing | Document Reference |
|---|---|---|---|
| | • Controls to manage the risk posed to workers from exposure to contaminated groundwater (if encountered)<br>• Details of surface water and groundwater quality monitoring to be undertaken prior to, throughout, and following construction | | |
| SW9 | A construction water quality monitoring program will be developed and included in the SWMP for the proposed modification to establish baseline conditions, observe any changes in surface water and groundwater during construction, and inform appropriate management responses.<br>Baseline monitoring will be undertaken monthly for a minimum of 12 months prior to the commencement of construction, inclusive of the monitoring that is presented in Section 5.6 of Appendix G (Surface water and flooding assessment). As a minimum, this will include three wet weather sampling events over six months where feasible.<br>Sampling locations and monitoring methodology to be undertaken during construction will be further developed in detailed design in accordance with the Guidelines for Construction Water Quality Monitoring (RTA, 2003) and the ANZECC Water Quality Guidelines (ANZECC/ ARMCANZ, 2000).<br>This will include the monitoring of surface water quality at or near moderate to high contamination risk areas for relevant contaminants during work in those locations (when/if these areas are confirmed during detailed design).<br>The monitoring will include collection of samples for analysis from sedimentation control discharge points, visual monitoring of other points of release of construction waters and monitoring of downstream waterways. The frequency of monitoring will be confirmed during detailed design and will be a minimum of once every month at all sites, as well as additional monitoring following wet weather events.<br>Should the results of monitoring identify that the water quality management measures are not effective in adequately mitigating water quality impacts, additional mitigation measures will be identified and implemented as required. | Prior to construction and during construction | This Monitoring Program<br>Section 4.5<br>Section 5.1<br>Section 3.1<br>Section 4.1<br>Section 5.1<br>Section 4.2.1 |

*Table 2-4:M12 REMMs relevant to this Monitoring Program*

| CoA No. | Condition Requirement | Timing | Document Reference |
|---|---|---|---|
| SWH05 | A construction water quality monitoring program will be developed and included in the CSWMP for the project to establish baseline conditions, observe any changes in | Prior to construction and during construction | This Monitoring Program<br>Section 4.5 |

| CoA No. | Condition Requirement | Timing | Document Reference |
|---|---|---|---|
| | surface water and groundwater during construction, and inform appropriate management responses.<br>The program will be based on the water quality monitoring methodology, water quality indicators and the monitoring locations identified in the Surface water and hydrology assessment report (Appendix M of the EIS) and supplementary memo (Appendix I of this amendment report), and Groundwater quality and hydrology assessment report (Appendix N of the EIS) and supplementary memo (Appendix J of this amendment report).<br>Baseline monitoring will be carried out monthly for a minimum of 12 months before the start of construction. As a minimum this will include three wet weather sampling events over six months where feasible.<br>Sampling locations and monitoring methodology to be carried out during construction will be further developed in detailed design in accordance with the Guideline for Construction Water Quality Monitoring (RTA 2003) and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018). It will include collection of samples for analysis from sedimentation basin discharge points, visual monitoring of other points of release of construction waters and monitoring of downstream waterways. | and operation | Section 5.1<br>Section 3.1<br>Section 4.1<br>Section5.1<br>Section 4.2.1 |
| GW01 | Groundwater monitoring will be carried out as part of the construction water quality monitoring program for the Project. The groundwater monitoring will be based on the water quality monitoring methodology, water quality indicators and the monitoring locations shown in Appendix N of the EIS and Table 7-1 in the groundwater supplementary technical memorandum (Appendix J of this amendment report).<br>Baseline groundwater monitoring will be carried out at least monthly for at least six months before construction. Monitoring will also be carried out at least monthly during construction and will continue for at least six months of operation to verify that there are no groundwater impacts, and that management measures are adequate | Prior to construction and during construction. | This Monitoring Program<br>Section 3.2<br>Section 4.2<br>Section 5.2<br>Section 6.2<br>Operational water monitoring program |

## 2.3 Environmental Protection Licence

The M7-M12 Integration project is subject to EPL no. 21829, approved 2 August 2023, as a Scheduled Activity for ‘road construction’. The EPL prescribes water quality parameters to be measured and associated discharge criteria for licensed discharge points. The EPL also details the monitoring and analytical requirements by reference to authority publications (e.g., Approved Methods for Sampling and Analysis of Water Pollutants in NSW EPA, 2004).

# 3 Monitoring criteria

## 3.1 Receiving surface water

### 3.1.1 M7 Widening receiving surface water criteria

Pre-construction surface water quality has been conducted by WSO Co consultant Aecom for the M7 Widening (August 2021 – September 2022) and assessed against the NSW Water Quality Objectives (NSW WQOs) set out in the values and long term goals for protecting and enhancing surface waters in NSW (DECCW, 2006). Indicator values of water quality have been derived from the following criteria:

- Australian and New Zealand Environment Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) water quality guidelines (2000, updated in 2018) including:
    - Trigger values for south-eastern Australian lowland rivers for the protection of slightly to moderately disturbed aquatic ecosystems as set out in the guidelines.

The default values are used in the absence of local data for a particular watercourse. Site-specific baseline surface water quality trigger values are assessed against the above criteria in Attachment 1.

### 3.1.2 M12 Widening receiving surface water criteria

Pre-construction surface water quality has been conducted by TfNSW consultant GHD (April 2019 – March 2023) for the M12 East package and assessed against the following criteria:

- ANZECC and ARMCANZ water quality guidelines (2018) including:
    - Trigger values for south-eastern Australian lowland river ecosystems
    - Stock watering criteria where lowland river criteria is not present.
- National Health and Medical Research Council (NHMRC) and Natural Resource Management Ministerial Council (NRMMC) (2011, v3.6 updated in 2021) criteria, including:
    - Australian Drinking Water Guidelines (ADWG) value for protective of human health.
- Australia New Zealand Guidelines (ANZG) (2018) Freshwater – 95% level of species protection (slightly to moderately disturbed systems) criteria
- PFAS National Environmental Management Plan (NEMP) (HEPA, 2013) criteria, including:
    - Recreational species protection criteria
    - Drinking water criteria
    - 95% species protection criteria for slightly to moderately disturbed systems.

The default values are used in the absence of local data for a particular watercourse. Site-specific baseline surface water quality trigger values are assessed against the above criteria in Attachment 1.

### 3.1.3 Receiving Water Trigger Values

Pre-construction surface water baseline monitoring for the M7 Widening and M12 East package (further described in 5.1) of the waterbodies and waterways within the M7-M12 Interchange project area has enabled the identification of site-specific trigger values. The site-specific surface water trigger values are provided in Attachment 1 of this Monitoring Program. The surface water monitoring locations are identified in Section 4.1 and shown on Figure 4-1.

Data collected during the construction phase of the M7-M12 Interchange project will be compared to the site-specific trigger values derived from the baseline data to assist in determining whether construction and operation is impacting receiving surface waters as described in Section 6.2 in accordance with M7 CoA D105 and M12 CoA E105.

## 3.2 Groundwater

As discussed in Section 4.3 of the CSWMP, findings from the Westlink M7 Widening Modification Report indicated limited potential for impacts to groundwater quality associated with the M7 Widening due to the shallow maximum cut depth constrained primarily to within the median. A groundwater monitoring program is not required for the M7 Widening. The following section is only applicable for the M12 East package area.

### 3.2.1 Groundwater quality

Groundwater quality will be compared to the following criteria:

- ANZECC and (ARMCANZ) water quality guidelines (2000, updated in 2018) including:
  - Trigger values for south-eastern Australian lowland river ecosystems
- ANZG (2018) Freshwater – 95 per cent level of species protection (slightly to moderately disturbed systems) criteria
- National Environmental Protection (Assessment of Site Contamination) Amendment Measure (NEPM) National Environment Protection Council (NEPC) (NEPC, 2013), including:
  - Health screening levels (HSL) for petroleum hydrocarbons for commercial/industrial land use (HSL D)
- NHMRC and NRMMC (2011, v3.6 updated in 2021), including:
  - ADWG as the screening criteria protective of human health.

The listed criteria values for the parameters monitored are as presented in Attachment 2.

Pre-construction groundwater baseline monitoring (further described in Section 5.2) has enabled the identification of site-specific trigger values, which have been provided in Attachment 1 of this Monitoring Program. The groundwater monitoring locations are identified in Section 4.2 and shown on Figure 4-2.

Data collected during the construction phase of the M12 East package will be compared to the site-specific trigger values derived from the baseline data to assist in determining whether construction and operation is impacting receiving surface waters.

## 3.3 Site discharge

The EPL for the Project (EPL 21829) prescribes the water quality parameters for the purposes of the monitoring and the setting of limits for discharges of pollutants to water. The limits for discharges of pollutants set in the EPL only apply to the licensed monitoring and discharge points. The licensed monitoring and discharge points, along with and all sediment basins, must be identified in the map(s) and in a schedule submitted to, and approved in writing by, the EPA.

The concentration of a pollutant discharged at a Licenced Discharge Point, or applied to that area, must not exceed the concentration limits specified for that pollutant in Table 3-1

*Table 3-1:Water and/or land concentration limits*

| Pollutant | Unit of measure | Concentration limit (100 percentile) |
|---|---|---|
| Oil and Grease | Visible | Not visible |
| pH | pH | 6.5-8.5 |
| Turbidity | Total Suspended solids | 50 mg/l |

Exceeding the limits specified in Table 3-1 for discharges from licensed discharge points is only permitted when:

- The discharge occurs solely as a result of rainfall measured at the premises exceeding the design 5-day rainfall depth value (32.2mm) and.
- The sediment basins and other erosion and sediment controls corresponding to the discharge point(s) have been designed, constructed, operated and maintained in accordance with Managing Urban Stormwater – Soils and Construction, Volume 2D, Main Road Construction (DECC, 2008), to be read and used in conjunction with Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom, 2004).

In all other circumstances, John Holland must comply with section 120 of the Protection of the Environment Operations Act 1997.

### 3.3.1 Groundwater level

The Environmental Assessment Documentation assessed potential groundwater impacts and identified that impacts meet the minimal impact considerations outlined in the NSW Aquifer Interference Policy (AIP). The AIP includes consideration of water table and water pressure.

Groundwater level for the M12 East package will be monitored during construction by TfNSW at BH145 to review compliance with the assessment during the environmental assessment. This includes monitoring to validate that the M12 East package will satisfy:

- Less than or equal to 10 per cent cumulative variation in the water table (allowing for typical climatic “post-water sharing plan” variations)
- A cumulative pressure head decline of not more than a two-metre decline.

## 3.4 Soil and contamination criteria

If required, criteria for contaminated soil will be provided in Remedial Action Plans (RAPs) (refer the Construction Contaminated Land Management Plan (CCLMP) (Appendix B5 of the CEMP)). Criteria

for the classification and disposal of soil are provided in the Construction Waste and Resource Management Plan (CWRMP) (Appendix B9 of the CEMP).

# 4 Monitoring methodology and procedures

## 4.1 Receiving surface water quality

### 4.1.1 Routine sampling

Surface water monitoring sites were selected on the basis of having persistent water flow and at locations upstream and downstream of receiving waterways that might be impacted by the construction activities. Refer Section 4.1.3 for further description of the surface water monitoring sites.

Ongoing monitoring of the sites will be carried out by the John Holland ESR or delegate on a monthly basis during construction to detect any changes in water quality compared to baseline conditions that might be attributable to M7 Widening or M12 East package activities. Further discussion on baseline conditions is provided in Section 5.1 and Attachment 1.

**M7 Widening sampling**

Surface water sites across the M7 Widening area were sampled as part of the M7 Widening Modification Report from September 2021 to August 2022 at 10 locations of discharge into major watercourses that drain the M7 Widening project corridor.

**M12 East package sampling**

Four surface water sites in the M12 East package area were sampled from April 2019 to May 2023 in the vicinity of the M12 Motorway project by the TfNSW appointed consultant to establish baseline conditions for the receiving waters. Further pre-construction monitoring of these sites by the TfNSW appointed consultant has been ongoing from June 2023.

Construction surface water monitoring by the John Holland ESR (or delegate) of the M12 East package commenced from August 2023.

### 4.1.2 Wet weather sampling

In addition to routine sampling, wet weather sampling was undertaken by the TfNSW appointed consultant during the pre-construction and will be undertaken by John Holland during construction phases in accordance with the Guideline for Construction Water Quality Monitoring (RTA 2004). Data from wet weather samples will demonstrate the variability in pollutant concentrations at each of the sample sites under wet weather conditions. During construction, this data will assist in providing an assessment of the impacts of the road construction on adjacent waterways and also the effectiveness of construction mitigation measures.

Wet weather sampling events are defined as 22 millimetres or more of rain within 24 hours recorded at the Horsley Park Equestrian Centre AWS Bureau of Meteorology (BoM) gauge (#067119). The trigger is designed to capture one wet weather sampling event per 6-month period. Sampling will occur within the following 24 hours of the rain event where safe to do so. If rainfall events are

regularly less than 22 millimetres, opportunistic wet weather monitoring would be undertaken to ensure that some wet weather data is collected. Opportunistic observations will identify aquatic fauna and any stranded fish which may require relocation by the Project Ecologist.

### 4.1.3 Sampling locations

The M7 Widening and the M12 East package surface water monitoring sites are listed in Table 4-1 and Table 4-2 and their locations shown on Figure 4-1 and Figure 4-2.

Monitoring locations as listed in Table 4-1 will be reviewed throughout construction and locations to be updated based on safe access, landowner permission and accessibility. Any change will be as close to the original location as practicable. It is anticipated that once TfNSW take possession of land and have improved access, refined monitoring locations may be proposed which are closer to the M7-M12 Integration project alignment. Locations will be reviewed with the intention of identifying sites that most accurately identify water quality changes due to the M7-M12 Integration project itself, rather than external influences in the catchment (especially in downstream samples). Monitoring locations and changes to the number of locations may also be refined based on monitoring results and adaptive management outcomes (refer to Section 4.5). Where required, this Monitoring Program will be updated following Detailed Site Investigations to include additional sampling locations for confirmed areas of moderate to high contamination risk for contaminants of potential concern (CoPC) in accordance with M7 CoA C8(d).

Sampling will be undertaken as close to the identified monitoring locations coordinates as is reasonably possible due to safe access. Any changes to individual monitoring locations and/or number of monitoring locations will be approved by the ER, undertaken in accordance with the EPL and identified in future revisions of the CSWMP.

It should be noted, the monitoring sample location of HINUS (upstream) is usually a dry creek bed and does not appear connected to HINDS (downstream). While the ponds are likely to be connected during or following rainfall, they can be observed as a series of standalone ponds during dry periods.

The location of HINUS on Table 4-1 has been moved adjacent to the creek bed as the run-off during rainfall events is considered similar to other tributaries in M12 East package and therefore is a preferred location for monitoring.

The locations at Bells Creek and Eastern Creek do not have an upstream and downstream sample sites as the project does not cross these creeks. These sites have been left in for comparison against the baseline data.

*Table 4-1:M7 Widening surface water monitoring locations*

| Site ID | Watercourse | Coordinates | Description and location details | Project Stage |
|---|---|---|---|---|
| WQ01 | Maxwell Creek (DS) | -33.939, 150.879 | Along M7 motorway alignment (downstream of the works) | M7 Widening |
| WQ01.1 | Maxwell Creek (US) | -33.940, 150.878 | Along M7 motorway alignment (upstream of the works) | M7 Widening |
| WQ02 | Cabramatta Creek (DS) | -33.930, 150.867 | Along M7 motorway alignment (downstream of the works) | M7 Widening |

| Site ID | Watercourse | Coordinates | Description and location details | Project Stage |
|---|---|---|---|---|
| WQ02.1 | Cabramatta Creek (US) | -33.933, 150.859 | Along M7 motorway alignment (upstream of the works) | M7 Widening |
| WQ03 | Hinchinbrook Creek (DS) | -33.924, 150.858 | Along M7 motorway alignment (downstream of the works) | M7 Widening |
| WQ03.1 | Hinchinbrook Ck (US) | -33.922, 150.857 | Along M7 motorway alignment (downstream of the works) | M7 Widening |
| WQ04 | Hinchinbrook Creek (DS) | -33.895, 150.837 | Along M7 motorway alignment (downstream of works) | M7 Widening |
| WQ04.1 | Hinchinbrook Creek (US) | -33.891 150.829 | Along M7 motorway alignment (upstream of works) | M7 Widening |
| WQ05 | Ropes Creek (US) | -33.866, 150.847 | Along M7 motorway alignment (upstream of works) | M7 Widening |
| WQ05.1 | Ropes Ck (DS) | -33.866, 150.846 | Along M7 motorway alignment (downstream of works) | M7 Widening |
| WQ06 | Reedy Creek (DS) | -33.813, 150.852 | Along M7 motorway alignment (downstream of works) | M7 Widening |
| WQ06.1 | Reedy Ck (US) | -33.828, 150.835 | Along M7 motorway alignment (upstream of works) | M7 Widening |
| WQ07 | Eskdale Creek (DS) | -33.809, 150.852 | Along M7 motorway alignment (downstream of works) | M7 Widening |
| WQ07.1 | Eskdale Creek (US) | -33.810, 150.846 | Along M7 motorway alignment (upstream of works) | M7 Widening |
| WQ08 | Eastern Creek | -33.798, 150.860 | Along M7 motorway alignment | M7 Widening |
| WQ09 | Angus Creek (DS) | -33.771, 150.850 | Along M7 motorway alignment (downstream of works) | M7 Widening |
| WQ09.1 | Angus Creek (US) | -33.773, 150.845 | Along M& motorway alignment (upstream of works) | M7 Widening |
| WQ10 | Bells Creek | -33.730, 150.847 | Along M7 motorway alignment | M7 Widening |

*Table 4-2:M12 East package surface water monitoring locations*

| Site ID | Watercourse | Coordinates | Description and location details | Project Stage |
|---|---|---|---|---|
| ROPUS | Ropes Creek | 301094E 6250602N | Upstream of motorway alignment | M12 East |
| ROPDS | Ropes Creek | 300773E 6250601N | Downstream of motorway alignment | M12 East |
| HINUS | Hinchinbrook Creek | 298606E 6248359N | Upstream of motorway alignment | M12 East |
| HINDS | Hinchinbrook Creek | 300448E 6247491N | Downstream of motorway alignment | M12 East |

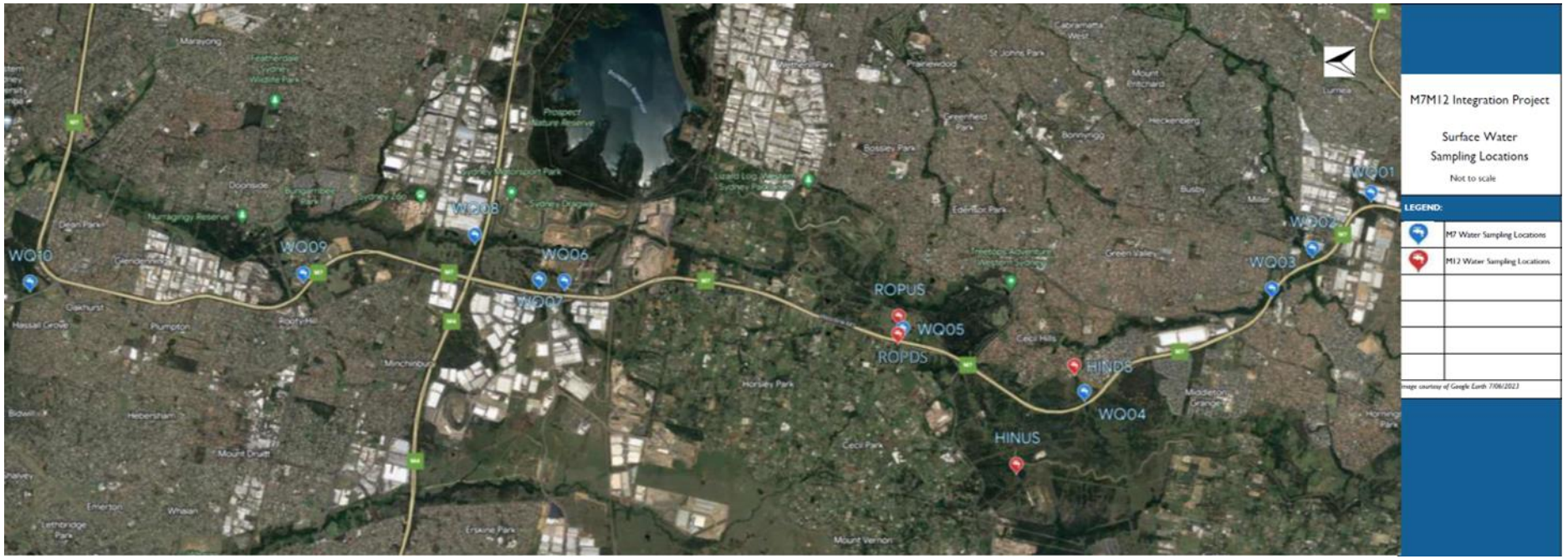
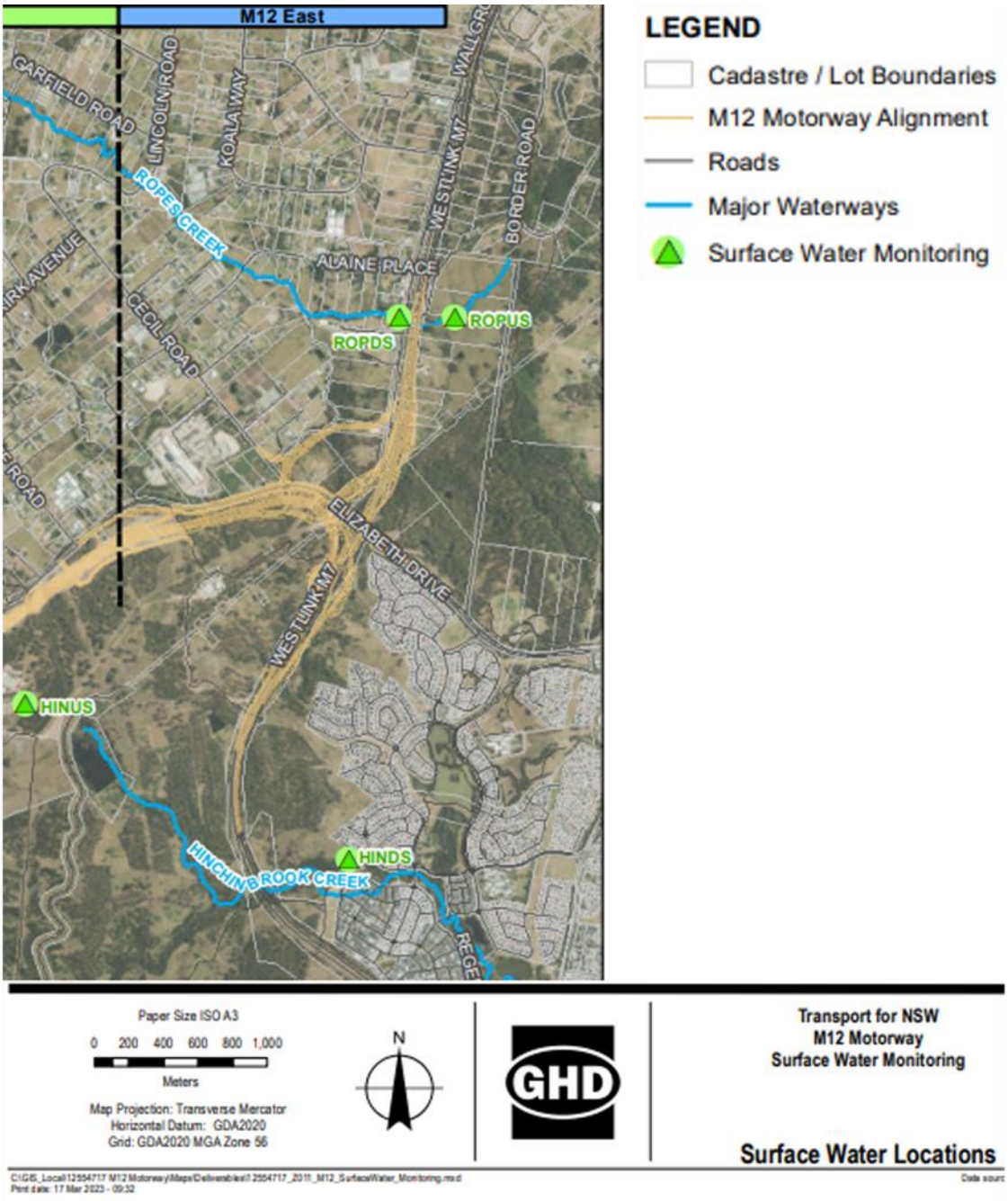



*Figure 4-1:M7 Widening Surface water monitoring locations*




*Source: M12 Motorway Surface Water Monitoring Program Report 8 – October to March 2023 (GHD, 2022).*

*Figure 4-2:M12 East package Surface water monitoring locations*

### 4.1.4 Sampling methodology

Water quality sampling will be conducted in accordance with:

- Australian Standard 5667:1998 Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS/NZS 5667.1:1998)
- Australian Standard 5667:1998 Water Quality – Sampling, Part 6: Guidance on sampling of rivers and streams (AS/NZS 5667.6:1998)
- ANZECC & ARMCANZ (2000) guidelines and the NSW EPA's Approved Methods for the Sampling and Interpretation of Results of Water Pollutants (NSW EPA, 2004)

- TfNSW appointed consultant standard operating procedures (SOP) for surface water quality sampling, which complies with procedures detailed in the ANZECC & ARMCANZ (2000) guidelines and the NSW EPA's Approved Methods for the Sampling and Interpretation of Results of Water Pollutants (NSW EPA, 2004).

In situ water quality parameters will be recorded and grab samples collected from each site for laboratory analysis.

### 4.1.5 In situ water quality measurement

In situ field measurements of water quality are taken at all sites during each monthly site visit by suitably trained and experienced personnel. Physic-chemical measurements are taken using a fully calibrated multi-parameter water quality meter for:

- TDS (TDS)2 - M7 Widening sampling locations only
- Redox potential (Er) - M7 Widening sampling locations only
- Temperature (°C)
- pH (pH units)
- Electrical Conductivity (µS/cm)
- Dissolved Oxygen (mg/L and % saturation) and
- Turbidity (NTU).

Relevant site descriptions and notes are taken for each site and visual observations made of:

- Visual oil and grease
- Occurrence of algal scum
- Streamflow
- Water clarity
- Water colour, odour, and any other notable observations.

Photos are taken to record the visual appearance of each water quality sample site at the time of sampling. Where appropriate, photos of the stream bank are also taken to provide a record of bank stability, geomorphology, and riparian vegetation condition.

### 4.1.6 Surface Water Sampling

Grab samples are collected near the in-situ monitoring point to ensure representative sampling. At each site, several sub-samples are taken from 100 - 200 mm depth below the surface using a long-handled sampling pole and bottle. The sub-samples are combined in a bucket to form a 'composite' sample from which the sample bottles for analyses are filled. The bucket and the sampling bottle are washed between sampling sites to prevent cross contamination.

Water quality samples are transported in ice in an esky to a National Association of Testing Authorities (NATA) accredited laboratory, under Chain of Custody (CoC) requirements. Samples are analysed for the following:

**M7 Widening sampling locations:**

- Water quality indicators:
  - Nutrients (NO3, TKN, TN, TP, (nutrient indicators that are attributable to runoff impacts))
  - TSS (sediment runoff indicator)
  - Oil and grease (associated with runoff from construction activities related to roads)
  - Physio-chemical parameters (DO, turbidity, redox potential, salinity, pH, pH Redox, EC)

**M12 East package sampling locations:**

- Microbiological public health indicator:
  - Thermotolerant Coliforms
- Water quality indicators:
  - TSS (sediment runoff indicator)
  - Nutrients (NH3, NO2, NO3, TKN, TN, TP, SRP (Soluble Reactive Phosphorus) (nutrient indicators that are attributable to runoff impacts)
  - Chlorophyll-a (algal indicator; algae proliferate in water if enriched by nutrients)
  - Oil and grease (associated with runoff from construction activities related to roads)
- Major urban pollutants: including ultra-trace Polychlorinated Biphenyls (PCBs); organochlorine (OC) and organo-phosphorus (OP) pesticides; fumigants; halogenated aliphatic and aromatic compounds; BTEXN (Benzene, Toluene, Xylene, Naphthalene); phenols and poly-cyclic aromatic hydrocarbons (PAHs). These pollutants are associated with runoff from construction activities in relation to roads and certain landscapes
- Heavy metals: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni) and Zinc (Zn). These metals are associated with runoff from construction activities from certain peri-urban landscapes such as the M12 East package area.

## 4.2 Groundwater

### 4.2.1 Sampling locations

The M12 East package groundwater monitoring sites that are to be monitored during construction are listed in Table 4-3 and their locations shown on Figure 4-2.

Groundwater borehole BH145 will be monitored by TfNSW during construction.

In accordance with REMM GW06 GW07 and new measure GW09 (developed as part of the Elizbeth Drive consistency assessment), John Holland will estimate the potential groundwater inflows that are expected in the first year of construction in order to confirm if evaporation will sufficiently mitigate potentially higher inflows. If upon assessment it is determined that evaporation will not be sufficient to manage inflows, the John Holland ESR will identify and implement additional mitigation measures, which will be documented in the CEMP and CSWMP.

Additionally, groundwater inflows will be visually monitored by the John Holland ESR for the utility crossing excavations. This will be managed in accordance with the CSWMP.

*Table 4-3:Groundwater monitoring locations*

| Site ID | Sampling type | Frequency | Responsibility |
|---|---|---|---|
| **Construction monitoring locations** | | | |
| BH145 | Groundwater quality and level | Monthly | TfNSW |

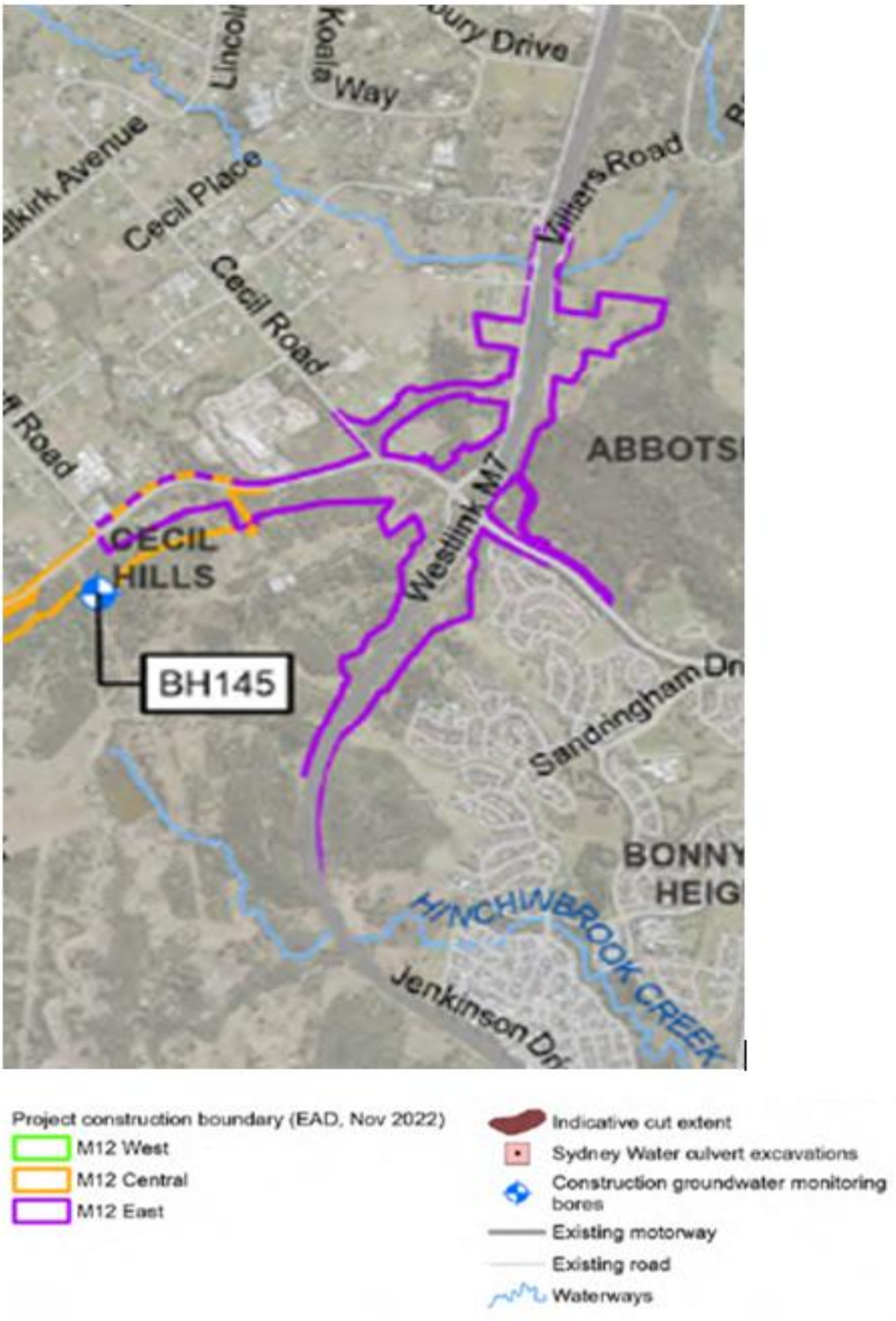



*Figure 4-3:M12 East package Groundwater monitoring locations*

### 4.2.2 Sampling methodology

#### 4.2.2.1 Technical guidance

Groundwater within the monitoring program applicable for M12 East package area will be sampled in accordance with:

- Australian Standard 5667:1998 Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS 5667.1:1998)
- Australian Standard 5667:1998 Water Quality – Sampling, Part 11: Guidance on the Sampling of Groundwaters (AS 566.11:1998)
- The TfNSW appointed consultants standard operating procedure for BH 145.

#### 4.2.2.2 Groundwater levels

Manual groundwater level monitoring by dip meter will be undertaken concurrently with the monthly data logger downloading.

Based on the M12 East package's maximum cut depth (approximately 15 metres BGL), the Wianamatta Group's upper formation of Bringelly Shale is the only rock formation anticipated to be encountered by project excavations. As such and given the base of the Bringelly Shale formation is anticipated to be substantially lower than the Project's vertical alignment, groundwater flow systems within the Bringelly Shale are considered to be the main bedrock groundwater flow systems relevant to the Project.

Further assessment by WSP as part of the M12 Elizabeth Drive Connection design confirmed potential localised impacts at one location (cut 7) due to widening activities however, was likely to be less than one meter depth and less than 100m in length.

Groundwater flow directions are anticipated to be similar to a subdued version of the topographic surface. Current project groundwater monitoring bore data indicates that the water table in the Bringelly Shale (including associated overlying residual clay) ranges from about one metre BGL to 19 metres BGL.

#### 4.2.2.3 Sampling

Groundwater quality samples will be collected in laboratory supplied containers made of the appropriate material and suitably preserved for the required analytes, according to well-established analytical standards.

All sample containers will be clearly labelled with:

- Sample ID
- Job number
- Sampler name
- Date and time.

All samples will be placed in an insulated storage container (esky) containing ice for transport to the laboratory, along with a chain of custody form describing the sample identification details and required analysis.

Exceptions to this methodology include when water quality (WQ) parameters do not stabilise over a long period of time (for example, greater than one hour of purging) and samples are collected prior to stabilisation.

Another exception is when a well is low-yielding and has poor recovery, in which case the standing water level (SWL) may not stabilise, and samples may need to be collected to ensure collection of a sample prior to the well pumping dry.

In each of these cases, comprehensive field notes detail the rationale for collecting samples when stabilisation of WQ parameters and/or SWL are not attained.

#### 4.2.2.4 Analytical suite

All samples will be analysed by a NATA accredited laboratory for the following indicators:

- Field parameters (electrical conductivity, pH, turbidity, dissolved oxygen, temperature, and redox conditions)
- Major cations and anions (calcium, sulphate, sodium, potassium, magnesium, carbonate, and bicarbonate)
- Total dissolved solids (TDS)
- Total suspended solids (TSS)
- Nutrients (including NH3, nitrate, nitrite, total nitrogen, total phosphorus, soluble reactive phosphorus)
- Total recoverable hydrocarbons (TRH)
- Benzene, toluene, ethylbenzene, xylene, and naphthalene (BTEXN)
- Polycyclic aromatic hydrocarbons (PAH)
- Phenols
- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc).

## 4.3 Site discharge

Treatment and water sampling of captured stormwater will be undertaken within 24 hours prior to water being discharged from site in accordance with the M7-M12 Integration project EPL requirements.

For each discharge, monitoring (by sampling and obtaining results by analysis) the concentration of each pollutant specified in the Dewatering Management Plan (Appendix C of the CSWMP) and the EPL 21829 will be undertaken and recorded.

Testing and sampling will be undertaken in accordance with Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA, 2004) unless another method has been approved by the EPA in writing before any tests are conducted.

## 4.4 Climate monitoring

John Holland will measure and record rainfall at the construction sites in millimetres per 24-hour period at 9 am each day from the time that the site office is established. John Holland will install an Automatic Weather Stations (AWS) and manual rainfall gauges at representative locations throughout the M7-M12 Integration project area. The AWS will record hourly rainfall, temperature, relative humidity, wind speed, wind direction and bathometric pressure. Manual rainfall gauges will also be used across the M7-M12 Integration project to assist with assessment of rainfall data accuracy.

The data collected from the AWS and rainfall gauges will:

- Provide a more detailed early understanding of potential rainfall and other adverse weather impacts
- Provide a proactive and early inspection and maintenance regime response to erosion and sedimentation and the effects of other adverse climatic conditions before pollution occurs
- Trigger weather alarms and messages to relevant site personnel to take action where appropriate
- Assess and validate the performance of installed erosion and sediment control measures against the design performance criteria
- Provide compliance data for statutory monitoring on-site.

The AWS will conform to Bureau of Meteorology Observation Specification No. 2013.1 and TfNSW Specification R272 – Automatic Weather Stations for the design and location of such devices. The AWS will be situated on land owned by WSPT and within a secure compound area fully protected by fencing (AF9). Refer to Section 3.3.1, Appendix B of the CAQMP for detailed information for the proposed AWS.

Prior to establishment of AWS, John Holland will prepare an Automatic Weather Station Location Report identifying suitable locations for AWS in consultation with a suitably qualified person with experience installing and operating AWS in accordance with BoM OS 2013.1. The TfNSW ESM (or delegate) will review the proposed locations for climate monitoring devices for consistency with the TfNSW specification and this Monitoring Program.

Data from the AWS will be accessible via SMS alarms or queries to a mobile phone and be fully downloadable. SMS queries and alarms will be sent to the John Holland ESR, Project Manager TfNSW ESM (or delegate) and TfNSW Project Manager, as necessary. Data will be accessible at all times by the TfNSW ESM (or delegate) and TfNSW Project Manager. Data will be downloaded to the TfNSW online weather station page to allow live views of weather data by authorised users.

In accordance with normal standard construction practices, weather forecasts will be used to guide work activities undertaken on-site. John Holland will review the weather forecasts at the start of each day and prior to undertaking new work activities that may be affected by rainfall or adverse weather. Where weather forecasts predict conditions that may pose an environmental risk, site environmental controls will be inspected and secured to reduce erosion and sediment control impacts. Contingency planning to prevent spills will also involve monitoring for predicted flood events and the removal of fuels and chemicals from flood prone areas.

## 4.5 Adaptive management

Should soil, water or contamination monitoring results identified as being directly attributable to the M7-M12 Integration project exceed the criteria set out in Section 3 of this CSW-Monitoring Program or the relevant site-specific trigger values identified in Attachments 1 and 2 (whichever is relevant), the following steps will be undertaken:

- Analysis of the results by the ESR, in consultation with the TfNSW appointed consultant and TfNSW, in more detail with a view of determining possible causes for the exceedance, including identifying the Project stage (or stages) responsible for the issue
- Site inspection by the ESR
- Advising relevant personnel of the problem
- Identifying and agreeing on actions and/or additional mitigation measures to resolve or mitigate the exceedance

- Implementing actions to rectify or mitigate the exceedance, including stop work arrangements where necessary or if directed by the ER
- Identifying and implementing additional mitigation measures.

Where criteria are exceeded and attributed to the project, the ESR (in consultation with the TfNSW appointed consultant and TfNSW if applicable) will identify the source of the exceedance and implement any additional measures available to reduce the impacts on the receiving environment. Mitigation measures and preventative/corrective actions will be developed in accordance with TfNSW specifications and the procedure for dealing with noncompliance with environmental management controls outlined in Section 7 of the CEMP. The ESR will verify and document the effectiveness of any management measures or preventative/corrective actions implemented to avoid further exceedances.

The ESR will communicate regularly with the other packages of the M12 Motorway project, Sydney Water, Western Sydney Parklands and TfNSW to ensure plans are co-ordinated and cumulative soil and water quality impacts are minimised. The M7-M12 Integration project Communication Management Plan provides details on the requirements for coordination and communication between the contractors M12 Motorway package stages in accordance with the Overarching Communication Strategy. The timing for any improvement will be agreed between the relevant John Holland Engineer/Superintendent and TfNSW Project Manager and ESM (or delegate) based on the level of risk or reoccurrence.

# 5 Monitoring results

## 5.1 Surface water quality

### 5.1.1 Pre-construction surface water monitoring

**M7 Widening pre-construction monitoring**

Pre-construction baseline data for the M7 Widening was collected monthly from September 2021 – August 2022. The sampling locations for surface water sites are shown on Figure 4-1. These sites are located upstream and downstream of points of discharge into major watercourses. The baseline data has been compiled into the following reports:

- Memorandum: Westlink M7 Surface Water Assessment (Sampling Events 1 - 12) (Aecom, 2022)

Summary statistics from baseline surface water monitoring are assessed against NSW WQOs in Attachment 1. A summary of the performance of the baseline data against the NSW WQOs is provided below in Table 5-1. As all water bodies exceed NSW WQOs site-specific trigger values will be used to identify exceedances.

*Table 5-1:Summary of site-specific trigger values performance against NSW WQOs at M7 Widening locations*

| Location | Water body | Exceeds criteria | Satisfies criteria |
|---|---|---|---|
| WQ01 | Maxwells Creek | ✓ | - |
| WQ02 | Cabramatta Creek | ✓ | - |
| WQ03 | Hinchinbrook Creek | ✓ | - |
| WQ04 | Hinchinbrook Creek | ✓ | - |
| WQ05 | Ropes Creek | ✓ | - |
| WQ06 | Reedy Creek | ✓ | - |
| WQ07 | Eskdale Creek | ✓ | - |
| WQ08 | Eastern Creek | ✓ | - |
| WQ09 | Angus Creek | ✓ | - |
| WQ10 | Bells Creek | ✓ | - |

**M12 Widening pre-construction monitoring**

Pre-construction baseline data for the M12 East package was collected monthly from April 2019 – March 2023. The sampling locations for surface water sites are shown on Figure 4-1. These sites are located upstream and downstream on Ropes Creek (ROP) and Hinchinbrook Creek (HIN). The baseline data has been compiled into the following reports:

- M12 Motorway Surface Water Monitoring Second Report – April 2019 to March 2020 (GHD, 2020)
- M12 Motorway Surface Water Monitoring Report for monitoring period of April 2020 to September 2020 (GHD, 2020)
- M12 Motorway Surface Water Monitoring Biannual Report 4 – October 2020 to March 2021 (GHD, 2021)

- M12 Motorway Surface Water Monitoring Program Report 6 – October 2021 to March 2022 (GHD, 2022)
- M12 Motorway Surface Water Monitoring Program Report 7 – April to September 2022 (GHD, 2022)
- M12 Motorway Surface Water Monitoring Program Report 8 – October to March 2023 (GHD, 2023)
- Surface Water Quality Monitoring – June 2023 (EDP, 2023).

Summary statistics from baseline surface water monitoring are assessed against NSW WQOs in Attachment 1. A summary of the performance of the baseline data against the adopted criteria is provided below in Table 5 2. All water bodies exceed the NSW WQOs criteria, site-specific trigger values will be used to identify exceedances.

*Table 5-2:Summary of site-specific trigger values performance against NSW WQOs at M12 East package locations*

| Location | Water body | Exceeds criteria | Satisfies criteria |
|---|---|---|---|
| ROPUS | Maxwells Creek | ✓ | - |
| ROPDS | Cabramatta Creek | ✓ | - |
| HINUS | Hinchinbrook Creek | ✓ | - |
| HINDS | Hinchinbrook Creek | ✓ | - |

### 5.1.2 Construction surface water monitoring

Monthly construction surface water monitoring of the M12 East package commenced August 2023 at the same sampling sites used to establish baseline conditions (Table 4-2). Surface water sampling for M7 will commence once the M7-M12 Integration project CEMP is approved and will be undertaken monthly at the locations defined in Table 4-1. Sampling of M7 and M12 surface water monitoring locations will be undertaken monthly until during construction. Sampling methodologies for M7 Widening and M12 East package sampling locations will be consistent with methodologies applied in ascertaining baseline data.

## 5.2 Groundwater

### 5.2.1 Groundwater quality

The M12 East package pre-construction baseline data has been collected monthly since April 2019. The sampling locations for groundwater include four boreholes (BH) located within the vicinity of the M12 East package. The sampling locations for groundwater BH are shown on Figure 4-2. The baseline data has been compiled into the following reports:

The baseline data has been compiled into the following reports:

- M12 Motorway Groundwater Monitoring Report 2 – April 2019 to March 2020 (GHD, 2020)
- M12 Motorway Groundwater Monitoring Six Monthly Report 3 - April 2020 to September 2020 (GHD, 2020)
- M12 Motorway Groundwater Monitoring Biannual Report 4 – October 2020 to March 2021 (GHD, 2021)
- M12 Motorway Groundwater Monitoring Report 6 – October 2021 to March 2022 (GHD, 2022).

Summary statistics from the baseline groundwater monitoring for the period April 2019 to March 2022 is provided in Attachment 2. General observations on the baseline groundwater quality in the vicinity of the M12 East package (BH104, BH107, BH112 and BH145) are summarised in Table 5-2.

### 5.2.2 Groundwater level

General groundwater level observations as presented in the Environmental Assessment Documentation in the vicinity of the M12 East package include:

- Excluding post purging trends, groundwater levels appear to be generally stable or exhibiting a declining groundwater level trend at monitoring bore. This is attributed to low rainfall over the monitoring period
- BH145 exhibited a gradual increasing trend throughout the data period (in 2018), which is interpreted to represent slow post purging recovery due to low hydraulic conductivity. BH145 groundwater level is interpreted to not yet have recovered from purging. BH145 is a key bore for the Project because it is in area of relatively deep cut. The groundwater level at BH145 at the end of the available data period represents the maximum level monitored by data logger and was 99.19 metres AHD.

# 6 Reporting

## 6.1 Environmental report

The ESR will prepare Monthly Environmental Reports for the duration of the M7-M12 Integration project for incorporation in the Monthly Reports and submission to the TfNSW ESM (or delegate) and TfNSW Project Manager for review. Information to be detailed in the reports includes:

- Results summary and analysis of the environmental monitoring for soil and contamination
- Performance of the applicable aspects of this Monitoring Program
- Summary of monthly rainfall data and/or significant rainfall and storm events
- Summary of any complaints received that are related to water, soils, or contamination.

Reporting on groundwater quality monitoring will be undertaken by the TfNSW appointed consultant on behalf of TfNSW, as outlined in Section 6.2.

## 6.2 Surface water and groundwater monitoring reporting

Data for the monitored parameters will be analysed by John Holland for construction monitoring and presented in the Monthly Environmental Report. The reports will provide the following information:

**M7 Widening reporting requirements:**

- The rainfall data for the reporting period
- As the NSW WQOs were not being met prior to construction, a comparison of the monitoring parameters to the site-specific trigger values derived from the baseline data (Attachment 1) and, where site-specific trigger values are not available, default trigger values (refer Section 3.1 and Section 3.2) and identification of any exceedances
- Discussion and analysis of the results and recommendations arising from the monitoring.

**M12 East package reporting requirements:**

- The rainfall data for the reporting period
- Summary statistics of the monitored parameters including number of samples, minimum, maximum, mean, median, 20th percentile (where a lower limit is applicable), 80th percentile, standard deviation for the monitored analytes
- Comparison of the statistics to the site-specific trigger values derived from the baseline data (Attachments 1 and 2) and, where site-specific trigger values are not available, default trigger values (refer Section 3.1 and Section 3.2) and identification of any exceedances
- 'Box and Whisker plots' of the monitored parameters, where the 'box' represents 50% of the dataset (20th and 80th percentile), the 'whiskers' extend to the minimum and maximum values and the median value is shown as a line within the box. Outliers and extreme data points, which may indicate significant deviances resulting from in extreme events, are also identified on these plots
- Discussion and analysis of the results and recommendations arising from the monitoring.

In accordance with NSW M7 CoA C14 and NSW M12 CoA C18, the Construction Surface Water and Groundwater Monitoring Program Reports collated by TfNSW and John Holland will be provided to the Planning Secretary and relevant government agencies monthly until operation commences.

## 6.3 Reporting on non-conformances and exceedances

In the event that the adopted surface water quality criteria identified in Section 3 or site-specific trigger values (whichever is relevant) are exceeded and attributed to construction activities associated with the M7-M12 Integration project, John Holland (and/or the TfNSW appointed consultant if applicable) will report the exceedance to the TfNSW Project Manager, ESM (or delegate), WSO Co and ER within seven days of identification of the exceedance. Details of exceedances will be provided in the Monthly Environmental Reports and Monitoring Reports.

Where an exceedance attributed to construction activities associated with the M7-M12 Integration project has caused, is causing or is likely to cause, material harm to the environment, the environmental incident notification and reporting procedures detailed in Section 7.3 of the CEMP and the Environmental Incident Classification and Reporting Procedure (refer to Appendix A7 of the CEMP) will apply. The ESR is responsible for reporting on incidents.

The ESR will immediately notify the TfNSW Project Manager, ESM (or delegate), WSO Co and the EPA (via the EPA environmental line) of any exceedance attributed with construction activities associated with the M7-M12 Integration project that has caused, is causing or is likely to cause, material harm to the environment. TfNSW will provide the Secretary with a record of any such notification immediately after becoming aware of an incident, as required by NSW M7 CoA A32 and NSW M12 CoA A44. Written notification will be given to the Secretary in accordance with Appendix A of the NSW M7 and M12 CoA.

Where required the ESR will provide a written report of the event to the EPA within seven days of the date on which the event occurred. The report will identify:

- The cause, time, and duration of the event
- The type, volume and concentration of every pollutant discharged as a result of the event
- The name, address, and business hours telephone number of the John Holland personnel who witnessed the event
- The name, address, and business hours telephone number of other witnesses to the event
- Action taken by John Holland in relation to the event, including any follow-up contact with any complainants
- Details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event and
- Any other relevant matters.

The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by John Holland. John Holland will provide such further details to the EPA within the time specified in the request. John Holland will also complete an incident form for submission to the TfNSW Project Manager and ESM (or delegate) within three business days of the occurrence of the event.

## 6.4 Environmental Protection License reporting

John Holland's ESR will prepare a summary of site discharge water quality monitoring results, including a statement of compliance with the relevant EPL conditions, a summary of complaints received related to water quality issues will be included in the annual EPL return. EPL annual returns will be prepared for M7-M12 Integration project and submitted to the EPA within 60 days of the anniversary of the EPL for the duration of construction.

# Attachment 1. Baseline Surface Water Data

### M7 Widening

Baseline surface water quality monitoring results from Aecom between September 2021 to August 2022 of watercourses that drain the M7 Widening project corridor are provided in Table A1-2 and Table A1-3 below and assessed against relevant NSW WQOs. The locations of the surface water monitoring sites are shown on Figure 4-1 and described in Table 4-1.

### M12 East package

Baseline surface water quality monitoring results from TfNSW for the M12 East package from April 2019 to July 2023 are provided in Tables A1-4 – A1-5 below and assessed against criteria described in Section 3.1.2. The locations of the surface water monitoring sites are shown on Figure 4-2 and described in Table 4-2.

### Site-specific trigger values

The adopted trigger values are based on the 20th percentile value (lower limit trigger value if applicable) and/or 80th percentile value (upper limit trigger value) of the analysed baseline data.

Table A1-1 provides a list of the baseline parameters presented in this Attachment.

*Table A1-1:Baseline Parameters*

| Table | Parameter |
|---|---|
| **M7 Widening** | |
| A1-2: M7 Widening site-specific trigger values and NSW WQOs | Field parameters including EC, TDS, pH, DO, redox potential (Er), redox potential (Eh)[3], temperature |
| A1-3: M7 Widening site-specific trigger values and NSW WQOs | Laboratory analysis of oils and grease, nutrients (including nitrogen and phosphorus), physio-chemical parameters (including turbidity and pH) and inorganics (including TDS and TSS) |
| **M12 East package** | |
| A1-4: M12 East package baseline data site-specific trigger values – Field parameters | Field parameters and nutrients (pH, EC, DO, Turbidity, Total suspended solids, Ammonia, Reactive phosphorus, Total phosphorus, Chlorophyll-a, Arsenic) |
| A1-5: M12 East package baseline data site-specific trigger values – Metals | Metals |

*Table A1-2:M7 Widening baseline data field measurement results (Aecom, 2022) – site-specific trigger values and NSW WQOs*

| | | | Field Measurements | | | | |
|---|---|---|---|---|---|---|---|
| | | | Electrical Conductivity Field measurement | Total Dissolved Solids (TDS)[2] | pH Field measurement | Dissolved oxygen Field measurement | Redox Potential (Er) Field Measurement |
| | | Units | uS/cm | mg/L | pH units | mg/L | mV |
| | | NSW WQOs | 200-300 | <500 | 6.5-8.5 | 85-110%* | - |
| Location | Water body | Percentile | | | | | |
| WQ01 | Maxwells Creek | 20th Percentile values | 530.60 | | 7.28 | 4.51 | 43.90 |
| | | 80th Percentile values | 857.8 | 514.68 | 7.58 | 7.46 | 132.76 |
| WQ02 | Cabramatta Creek | 20th Percentile values | 473.14 | | 7.24 | 4.63 | 50.72 |
| | | 80th Percentile values | 843 | 505.80 | 7.62 | 6.93 | 140.84 |
| WQ03 | Hinchinbrook Creek | 20th Percentile values | 400.16 | | 7.28 | 4.22 | 45.02 |
| | | 80th Percentile values | 813.6 | 488.16 | 7.65 | 7.61 | 142.74 |
| WQ04 | Hinchinbrook Creek | 20th Percentile values | 219.00 | | 6.90 | 3.40 | 36.80 |
| | | 80th Percentile values | 785 | 471.00 | 7.62 | 7.74 | 119.70 |
| WQ05 | Ropes Creek | 20th Percentile values | 375.36 | | 7.43 | 4.08 | 26.76 |
| | | 80th Percentile values | 2535.4 | 1521.24 | 7.67 | 8.70 | 133.28 |
| WQ06 | Reedy Creek | 20th Percentile values | 523.20 | | 7.25 | 4.77 | 62.16 |
| | | 80th Percentile values | 1018 | 610.80 | 7.64 | 7.76 | 141.42 |
| WQ07 | Eskdale Creek | 20th Percentile values | 426.70 | | 6.78 | 3.07 | 56.76 |
| | | 80th Percentile values | 771 | 462.60 | 7.57 | 7.95 | 193.52 |
| WQ08 | Eastern Creek | 20th Percentile values | 526.60 | | 7.17 | 4.43 | 49.96 |
| | | 80th Percentile values | 782.2 | 469.32 | 7.68 | 9.05 | 139.68 |
| WQ09 | Angus Creek | 20th Percentile values | 432.76 | | 7.23 | 4.16 | 48.00 |
| | | 80th Percentile values | 1496.8 | 898.08 | 7.77 | 6.81 | 151.70 |
| WQ10 | Bells Creek | 20th Percentile values | 430.80 | | 6.46 | 4.19 | 60.00 |
| | | 80th Percentile values | 2114.4 | 1268.64 | 7.09 | 6.51 | 175.56 |

Baseline data exceeds NSW WQOs

Summary data derived from the Westlink M7 Surface Water Assessment Memorandum, field sampling events 1-12 from September 2021-August 2022.

* Trigger values for disolved oxygen will be converted from mg/l to %

20th percentile trigger values are not provided where lower limits are not applicable

*Table A1-3:M7 Widening baseline data lab results (Aecom, 2022 )– site-specific trigger values and NSW WQOs*

| | | | Hydro- carbons | Nutrients | | | | Physico-Chemical Parameters | | | | | | | Inorganics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Parameter | Oil and Grease | Total Kjeldahl Nitrogen | Nitrite + Nitrate as N | Total Nitrogen (as N) | Phosphorus | DO | Turbidity | Redox Potential | Salinity | pH (Lab) | pH Redox | Electrical conductivity (lab) | Total Dissolved Solids | Total Suspended Solids |
| | | Units | µg/L | mg/L | mg/L | mg/L | mg/L | mg/L | NTU | mV | mg/L | pH Units | pH Unit | µS/cm | mg/L | mg/L |
| | | Laboratory Limit of Reporting | 5000 | 0.1 | 0.01 | 0.1 | 0.01 | 0.1 | 0.1 | 0.1 | 10 | 0.01 | 0.01 | 1 | 10 | 5 |
| | | **NSW WQOs** | | - | - | **0.35** | **0.025** | **85-110%*** | **6-50** | - | - | **6.5-8.5** | - | **200-300** | **<500** | **<50** |
| Location | Water Body | Percentile | | | | | | | | | | | | | | |
| W Q01 | Maxwells Creek | 20th percentile | <5000 | | | 0.8 | | 7.5 | 22.48 | 126.6 | 220 | 7.638 | 7.462 | 554.8 | | |
| | | 80th percentile | <5000 | 2.32 | 0.21 | 2.6 | 0.512 | 9.6 | 203 | 151.8 | 474 | 8.108 | 7.706 | 969 | 559.6 | 188.6 |
| W Q02 | Cabramatta Creek | 20th percentile | <5000 | | | 0.7 | | 8.44 | 8.74 | 148.2 | 192 | 7.708 | 7.5 | 499.6 | | |
| | | 80th percentile | <5000 | 0.6 | 0.358 | 1 | 0.098 | 9.98 | 33.24 | 190 | 502 | 8.064 | 7.768 | 1015.4 | 634 | 15.8 |
| W Q03 | Hinchinbrook Creek | 20th percentile | <5000 | | | 0.6 | | 8.12 | 26.42 | 144.6 | 270 | 7.544 | 7.406 | 559.4 | | |
| | | 80th percentile | <5000 | 1.24 | 0.268 | 1.38 | 0.202 | 9.48 | 91.46 | 192.4 | 460 | 8.036 | 7.702 | 938.4 | 595.2 | 228 |
| W Q04 | Hinchinbrook Creek | 20th percentile | <5000 | | | 1.36 | | 8.36 | 34.7 | 135.8 | 122 | 7.534 | 7.418 | 265.2 | | |
| | | 80th percentile | <5000 | 2.84 | 0.078 | 2.84 | 0.42 | 9.78 | 146.8 | 185.4 | 472 | 8.084 | 7.762 | 951.6 | 726.8 | 111.2 |
| W Q05 | Ropes Creek | 20th percentile | <5000 | | | 0.7 | | 7.86 | 12.8 | 142 | 442 | 7.992 | 7.628 | 906 | | |
| | | 80th percentile | <5000 | 8.94 | 0.056 | 8.96 | 2.23 | 9.96 | 507 | 195.6 | 2108 | 8.188 | 7.986 | 3986 | 2480 | 1728 |
| W Q06 | Reedy Creek | 20th percentile | <5000 | | | 1.72 | | 9.22 | 11.18 | 136 | 302 | 7.866 | 7.67 | 631.2 | | |
| | | 80th percentile | <5000 | 1.6 | 1.96 | 3.4 | 0.738 | 10 | 52.78 | 177.4 | 574 | 8.088 | 7.886 | 1160 | 701.2 | 44 |
| W Q07 | Eskdale Creek | 20th percentile | <5000 | | | 0.44 | | 9.4 | 9.42 | 149.2 | 158 | 7.482 | 7.504 | 332.6 | | |
| | | 80th percentile | <5000 | 0.68 | 0.17 | 0.78 | 0.058 | 9.8 | 47.58 | 175.2 | 442 | 7.97 | 7.708 | 900.4 | 558 | 72.6 |
| W Q08 | Eastern Creek | 20th percentile | <5000 | | | 1.4 | | 9 | 25.98 | 144.4 | 312 | 7.8 | 7.624 | 646.6 | | |
| | | 80th percentile | <5000 | 1.18 | 0.768 | 1.8 | 0.416 | 10.1 | 83.58 | 177.8 | 496 | 7.984 | 7.906 | 1001.8 | 625.6 | 94.6 |
| W Q09 | Angus Creek | 20th percentile | <5000 | | | 0.84 | | 9.2 | 1.36 | 139 | 260 | 7.85 | 7.672 | 739.4 | | |
| | | 80th percentile | <5000 | 0.9 | 0.84 | 1.56 | 0.12 | 10.08 | 7.16 | 178 | 888 | 8.144 | 8.096 | 1756 | 1093.6 | 11.2 |
| W Q10 | Bells Creek | 20th percentile | <5000 | | | 1.44 | | 7.3 | 9.4 | 129.8 | 224 | 7.392 | 7.372 | 604.4 | | |
| | | 80th percentile | <5000 | 1.48 | 0.89 | 3.54 | 0.684 | 9.8 | 142.86 | 184.6 | 1232 | 7.852 | 7.878 | 2406 | 1424 | 464 |

Baseline data exceeds NSW WQOs

Note: WQ05 was not analysed for turbidity and total suspended solids during Event 1 due to insufficient sample volume (Aecom, 2022)

Baseline data from the Westlink M7 Surface Water Assessment Memorandum, lab analysis of sampling events 1-12 from September 2021-August 2022.

* Results for disolved oxygen (DO) will be converted from mg/l to %

20th percentile trigger values are not provided where lower limits are not applicable

*Table A1-4:M12 East package baseline data site-specific trigger values – Field parameters*

| Parameters | | | | Electrical Conductivity (Field) | Turbidity (Field) | pH (Field) | Dissolved Oxygen (Field) | Total Suspended Solids (TSS) | Total dissolved solids (TDS) | Ammonia | Oxidised nitrogen (NOx) | Reactive Phosphorus | Total Phosphorus | Total nitrogen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | uS/cm | NTU | pH units | % | mg/L | mg/L | mg/L | mg/L | (mg/L) | (mg/L) | mg/L |
| ANZECC Guidelines | | | | 125-2200 | 6-50.0 | 6.5-8.5 | 85-110 | | | | | | | |
| ANZECC and ARMCANZ 2000 | | | | | | | | 6 | | | 0.04 | 0.008 | 0.025 | 0.35 |
| ADWG palatability limit | | | | | | | | | 600 | | | | | |
| ANZG 2018 | | | | | | | | | | 0.9 | | | | |
| ADWG (2011) | | | | | | | | | | | | | | |
| Location | Water Body | Coordinates | Sample ID | | | | | | | | | | | |
| ROPUS | Ropes Creek | 301094E 6250602N | 20th %ile | 969 | 2.4 | 7.55 | 57.2 | 0 | 652.4 | 0.016 | 0.03 | 0.016 | 0.04 | 0.4 |
| | | | 80th %ile | 3909 | 21.3 | 8.1 | 85.5 | 24.2 | 1726 | 0.106 | 0.09 | 0.05 | 0.172 | 1.54 |
| ROPDS | Ropes Creek | 300773E 6250601N | 20th %ile | 871 | 2.1 | 7.52 | 56.2 | 0 | 607.6 | 0.004 | 0.04 | 0.06 | 0.09 | 0.5 |
| | | | 80th %ile | 1458 | 11.1 | 7.89 | 79.9 | 15.6 | 864.8 | 0.052 | 0.148 | 0.156 | 0.258 | 0.8 |
| HINUS | Hinchinbrook Creek | 298606E 6248359N | 20th %ile | 300 | 10.1 | 7.3 | 56.8 | 0 | 196.6 | 0.02 | 0 | 0 | 0.062 | 1.44 |
| | | | 80th %ile | 2395 | 30.1 | 7.72 | 119.6 | 44.8 | 308 | 0.144 | 0.1 | 0 | 0.218 | 2.84 |
| HINDS | Hinchinbrook Creek | 300448E 6247491N | 20th %ile | 191 | 3.6 | 7.54 | 65.8 | 0 | 147 | 0 | 0 | 0 | 0.06 | 1.2 |
| | | | 80th %ile | 943 | 12.5 | 9.97 | 119.7 | 10.8 | 204.6 | 0.088 | 0.108 | 0.038 | 0.124 | 1.6 |

Coloured cells denote exceedances of the adopted receiving surface water quality criteria.

*Table A1- 5:M12 East package baseline data site-specific trigger values – Metals*

| Parameters | | | | Chlorophyll-a | Arsenic | Cadmium | Chromium | Copper | Iron | Lead | Manganese | Mercury | Nickel | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| ANZECC Guidelines | | | | | | | | | | | | | | |
| ANZECC and ARMCANZ 2000 | | | | 0.003 | | | | | | | | | | |
| ADWG palatability limit | | | | | | | | | | | | | | |
| ANZG 2018 | | | | | 0.013 | 0.0002 | 0.001 | 0.0014 | 0.3 | 0.034 | 1.9 | 0.0006 | 0.011 | 0.008 |
| ADWG (2011) | | | | | 0.01 | 0.002 | | 2 | | 0.01 | 0.5 | 0.001 | 0.02 | |
| Location | Water Body | Coordinates | Sample ID | | | | | | | | | | | |
| ROPUS | Ropes Creek | 301094E 6250602N | 20th %ile | 0.6 | 0 | 0 | 0 | 0.002 | 0.114 | 0 | 0.0882 | 0 | 0 | 0.006 |
| | | | 80th %ile | 31.8 | 0 | 0 | 0.001 | 0.0074 | 0.434 | 0.0004 | 0.324 | 0 | 0.002 | 0.0336 |
| ROPDS | Ropes Creek | 300773E 6250601N | 20th %ile | 0 | 0 | 0 | 0 | 0 | 0.294 | 0 | 0.122 | 0 | 0 | 0 |
| | | | 80th %ile | 6.2 | 0.001 | 0 | 0 | 0.002 | 0.396 | 0 | 0.2528 | 0 | | 0.006 |
| HINUS | Hinchinbrook Creek | 298606E 6248359N | 20th %ile | 2 | 0.0002 | 0 | 0 | 0 | 3.566 | 0 | 0.2414 | 0 | 0 | 0 |
| | | | 80th %ile | 15.4 | 0.002 | 0 | 0.018 | 0.002 | 6.852 | 0.0018 | 0.193 | 0 | 0.0028 | 0.0134 |
| HINDS | Hinchinbrook Creek | 300448E 6247491N | 20th %ile | 2.2 | 0.0006 | 0 | 0 | 0 | 2.228 | 0 | 0.1896 | 0 | 0 | 0 |
| | | | 80th %ile | - | 0.002 | 0 | 0 | 0.002 | 3.086 | 0 | 0.7622 | 0 | | 0 |

Coloured cells denote exceedances of the adopted receiving surface water quality criteria.

# Attachment 2. Baseline Groundwater Data

Baseline groundwater quality monitoring results for the M12 East package between April 2019 and March 2021 are provided in Tables A2-2 – A2-7. The locations of the groundwater monitoring sites are shown on Figure 4-2.

The site-specific trigger value for each parameter/analyte for each monitoring location is shown in in Tables A2-2 – A2-7 below. The adopted trigger values are based on the 20th percentile value (lower limit trigger value if applicable) and/or 80th percentile value (upper limit trigger value) of the analysed baseline data.

Table A2-1 provides a list of the baseline parameters presented in this Attachment.

*Table A2-1:Baseline Parameters*

| Table | Parameter |
|---|---|
| AN2-2 | Field parameters (DO, EC, pH, Temp, Redox) |
| AN2-3 | Sulfate |
| AN2-4 | Nutrients |
| AN2-5 | Metals |
| AN2-6 | Total dissolved solids |
| AN2-7 | Total suspended solids |

*Table A2- 2:Baseline data – Field parameters (April 2019 to March 2021)*

| | DO (mg/L) | | EC (µS/cm) | | pH | | Temp. (°C) | | Redox (mV)* | |
|---|---|---|---|---|---|---|---|---|---|---|
| ANZECC (2000) guideline | 85 – 110% | | 125 - 2200 | | 6.5 – 8.5 | | - | | - | |
| Well | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile |
| BH104 | 0.428 | 1.796 | 12243 | 17151 | 6.038 | 6.586 | 19.14 | 20.88 | 94.5 | 269.8 |
| BH107 | 0.67 | 1.91 | 8853 | 9607 | 6.57 | 6.85 | 18.9 | 21.9 | 190.3 | 270.98 |
| BH112 | 0.716 | 1.518 | 11691 | 12778 | 6.316 | 6.592 | 19.46 | 21.22 | 205 | 279.24 |
| BH145 | 0.316 | 1.284 | 3519 | 6321 | 6.078 | 6.62 | 17.18 | 19.86 | 205 | 276.78 |

* Corrected for standard hydrogen electrode (SHE) by adding 205 mV to redox values collected in the field

*Table A2- 3:Baseline data – Sulfate (April 2019 to March 2021)*

| Well | Sulfate (mg/L) | |
|---|---|---|
| | 20th percentile | 80th percentile |
| BH104 | 468.8 | 759.6 |
| BH107 | 437.0 | 498 |
| BH112 | 548.0 | 628 |
| BH145 | 139.0 | 212 |

*Table A2- 4:Baseline data – Nutrients (April 2019 to March 2021)*

| | Ammonia (mg/L) | | Nitrate (mg/L) | | Nitrite (mg/L) | | NOx (mg/L) | | TN (mg/L) | | TP (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile |
| BH104 | 0.032 | 0.298 | 0.03 | 0.12 | 0 | 0.028 | 0.03 | 0.12 | 0.4 | 1.26 | 0.02 | 0.104 |
| BH107 | 0.04 | 0.06 | 0.05 | 0.112 | 0 | 0 | 0.05 | 0.11 | 0 | 0.56 | 0.02 | 0.17 |
| BH112 | 1.58 | 2.07 | 0.08 | 0.48 | 0.006 | 0.048 | 0.1 | 0.48 | 2.3 | 3.2 | 0.13 | 0.44 |
| BH145 | 1.24 | 3 | 8.24 | 28.3 | 0.28 | 6.28 | 10.2 | 36.3 | 15.7 | 38 | 0.18 | 1.16 |

*Table A2- 5:Baseline data – Metals (April 2019 to March 2021)*

| | Cadmium (mg/L) | | Chromium (mg/L) | | Copper (mg/L) | | Iron (mg/L) | | Lead (mg/L) | | Manganese (mg/L) | | Nickel (mg/L) | | Zinc (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile | 20th %ile | 80th %ile |
| BH104 | 0 | 0.0001 | 0.001 | 0.0016 | 0.0036 | 0.0404 | 0 | 0.826 | 0 | 0.0012 | 0 | 0.6664 | 0.0548 | 0.1074 | 0.025 | 0.1336 |
| BH107 | 0 | 0.00026 | 0.006 | 0.006 | 0.0066 | 0.087 | 0 | 0.15 | 0.0006 | 0.003 | 0 | 0.543 | 0.037 | 0.068 | 0.026 | 0.122 |
| BH112 | 0 | 0.0002 | 0.011 | 0.05 | 0.0036 | 0.086 | 0 | 0.096 | 0.0008 | 0.0022 | 0 | 0.267 | 0.048 | 0.101 | 0.0374 | 0.16 |
| BH145 | 0.0001 | 0.0002 | 0.009 | 0.086 | 0.0088 | 0.0828 | 0 | 24.1 | 0 | 0.002 | 0 | 1.48 | 0.019 | 0.082 | 0.0542 | 4.236 |

*Table A2- 6:Baseline data – Total dissolved solids (April 2019 to March 2021)*

| Well | TDS (mg/L) 20th %ile | TDS (mg/L) 80th %ile |
|---|---|---|
| BH104 | 6,840 | 9,818 |
| BH107 | 5,782 | 6,300 |
| BH112 | 8,132 | 8,382 |
| BH145 | 2,492 | 3,952 |

*Table A2- 7:Baseline data – Total suspended solids (April 2019 to March 2021)*

| Well | TSS (mg/L) 20th %ile | TSS (mg/L) 80th %ile |
|---|---|---|
| BH104 | 17 | 49.6 |
| BH107 | 24 | 65.6 |
| BH112 | 246.4 | 422.6 |
| BH145 | 453.2 | 2,258 |

# Appendix C - Dewatering Management Plan

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix C: Dewatering Management Plan

November 2023



# Document Control

| | | |
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# Document History and Status

| Rev | Rev Date | Description |
|---|---|---|
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| B | 06/09/2023 | Second draft for WSO Co / TfNSW review |
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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| AR | Amendment Report |
| ARSR | Amendment Report Submissions Report |
| CEMP | Construction Environmental Management Plan |
| CFFMP | Construction Flora and Fauna Management Sub-plan |
| CoA | Conditions of Approval |
| CSWMP | Construction Soil and Water Management Plan |
| Dewatering | Any activity that involves the removal of ponded stormwater or infiltrated groundwater from any location on Site and the subsequent reuse or discharge of that water |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Authority |
| EPL | Environmental Protection Licence |
| ER | Environmental Representative |
| ESCP | Erosion and Sediment Control Plan |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representative |
| EWMS | Environmental Work Method Statement |
| NTU | Nephelometric Turbidity Unit |
| OCEMP | Overarching Construction Environmental Management Plan |
| POEO Act | Protection of the Environment Operations Act 1997 |
| REMMs | Revised Environmental Management Measures |
| SDS | Safety Data Sheet |
| SR | Submissions Report |
| TARP | Trigger Action Response Protocol |
| TfNSW | Transport for New South Wales |
| TSS | Total Suspended Solids |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Boar |

# 1 Introduction

## 1.1 Purpose

The purpose of this Dewatering Management Plan (this Plan) is to provide guidance to ensure that site dewatering activities are completed in a manner that does not cause harm to the environment.

During completion of the M7-M12 Integration project, processes of dewatering of ponded stormwater, infiltrated groundwater, and farm dams will occur. Ecological processes for the dewatering of farm dams are included in the Construction Flora and Fauna Management Sub-plan (CFFMP).

A copy of the Dewatering Management Plan will be kept on the premises for the duration of construction.

## 1.2 Scope of the Plan

This Plan is an appendix of the Construction Soil and Water Management Sub-plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project.

This Plan has been prepared to address the requirements of the Minister's Conditions of Approval (M7 CoA) and Updated Environmental Management Measures (herein referred to as REMMs) listed in the Westlink M7 Modification Report, the Minister's Conditions of Approval (M12 CoA) and Revised Environmental Management Measures (REMMs) listed in Environmental Impact Statement (EIS), Submissions Report (SR), Amendment Report, Amendment Report Submissions Report (ARSR), ARSR Amendment Report Biodiversity Amendment and subsequent consistency assessments, all applicable legislation, and Transport for New South Wales (TfNSW) specifications.

This Plan is applicable to all activities conducted by site personnel (including sub-contractors) that have the potential to require transfer, movement or dewatering on-site during construction of the M7-M12 Integration project.

### 1.2.1 M7-M12 Integration Project

This management plan has been updated to incorporate the relevant information and requirements to consider the M7 Motorway (Modification 6 Widening) (M7 Widening), following approval of the M12 East package CEMP, Sub-plans and monitoring programs. This re-branded M7-M12 Integration project Monitoring Program has been prepared to also address the requirements of the M7 Widening Minister's Conditions of Approval (M7 CoA) and the Updated Environmental Management Measures (UEMMs) listed in the Westlink M7 Widening Modification Report and Westlink M7 Widening Submissions Report.

Due to construction programming and development of the OCEMP, the CEMP and sub-plans (and monitoring programs) have been prepared in a two-step process:

- M12 East package CEMP, sub-plans and monitoring programs
- M7-M12 Integration project CEMP, sub-plans and monitoring programs.

Once this M7-M12 integration project management plan is approved, the M12 East package management plan will be superseded.

## 1.3 Objective

The objectives of this Plan include:

- Ensure compliance with environmental requirements of the M7 Widening and M12 East package
- Implement industry standard methods for dewatering
- Provide a clear methodology for the management of water discharges from the M7 Widening and M12 East package sites
- Ensure that water discharges from M7 Widening and M12 East package sites are compliant with the:
  - Project Environmental Protection Licence (EPL)
  - Overarching CSWMP for the M12 East package footprint
  - Westlink M7 Widening Modification Report.

## 1.4 Responsibilities, inductions, and training

The Environmental Site Representative (ESR) is responsible for ensuring this Plan is effectively implemented, and all site personnel are aware of the requirements of this Plan.

The ESR is responsible for ensuring that water quality criteria for discharge waters are met prior to discharge.

All site personnel (including sub-contractors) involved in the dewatering activities will be trained and inducted on the requirements of this Plan.

An Environmental Work Method Statement (EWMS) will be prepared by John Holland prior to the commencement of any onsite dewatering activities. This EWMS will be used to manage and control dewatering activities in a manner that does not cause harm to the environment, including where construction water may be discharged into natural waterways (refer to Section 3.5). Training will include inductions, toolbox talks, pre-starts and targeted training as required.

## 1.5 Approval, review and modification

This Management Plan will be reviewed by WSO Co, TfNSW Environment and Sustainability Manager (ESM) (or delegate), John Holland's Soil Conservationist and the Environmental Representative (ER) prior to commencement of construction.

The Management Plan will be implemented for the duration of construction and for any longer period set out in this Management Plan or as specified by the Planning Secretary, whichever is the greater. As part of the CEMP this Management Plan will be reviewed and updated as required and in accordance with Section 1.12 of the CEMP.

# 2 Environmental requirements

## 2.1 Legislation and guidelines

This Plan has been developed with consideration of the following key legislation and guidelines:

- Protection of the Environment Operations Act 1997 (POEO Act)
- Managing Urban Stormwater Soils and Construction (Landcom, 2004) (Blue Book)
- TfNSW Water Discharge and Reuse Guideline (TfNSW, 2016)
- TfNSW Specification G38 – Soil and Water Management
- TfNSW Technical Guideline EMS-TG-011: Environmental Management of Construction Site Dewatering (RTA, 2011).

The POEO Act is the key piece of environment protection legislation in NSW, administered by the NSW Environmental Protection Authority (EPA). The M7-M12 Integration project is subject to EPL no. 21829 approved 2 August 2023 as a Scheduled Activity for road construction. The EPL prescribes water quality parameters to be measured and associated discharge criteria for licensed discharge points.

## 2.2 Environmental requirements

The applicable NSW CoA, REMMs and TfNSW Specifications relevant to the development of this Plan are listed in Table 2-1, as identified in the CSWMP.

*Table 2-1: Dewatering requirements*

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| M7 CoA and REMMs for dewatering requirements | | |
| M7 CoA C8 | The Soil and Water Management Plan (SWMP) must be prepared in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) and Volume 2D (DECC, 2008) and be prepared by a suitably qualified person either certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme.<br>The SWMP must include, but not be limited to:<br>(c) adopted assessment criteria for proposed discharges, and how these would be measured;<br>(e) a dewatering management plan (DMP), that identifies and manages water contamination risks and identifies licensed waste facilities where contaminated groundwater will be disposed. | This Plan<br>Section 3.3 |
| M7 REMM B7 | Relocation of native fish by a trained aquatic ecologist if they become stranded as a result of waterway diversions, temporary crossings, or dewatering activities. | Section 3.2<br>CFFMP |
| M7 REMM B8 | A detailed water monitoring program will be implemented during construction, where site observations are recorded by a suitably qualified person, and will include:<br>• Routine inspections of temporary waterway crossings, waterway diversions and dewatering activities | Section 3.5.2 |
| M7 REMM SW1 | A Soil and Water Management Plan (SWMP) will be prepared as part of the proposed modification. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land. The SWMP will include:<br>• Processes for dewatering of water that has accumulated on site and from sediment basins, including relevant discharge criteria | This Plan<br>Section 3 |
| M7 REMM SW2 | A dewatering management plan will be prepared and included in the SWMP that sets out the procedures for the discharge of surface water runoff that is retained in sediment controls and exposed excavations. The dewatering management plan will be prepared in accordance with the Technical Guideline – Environmental Management of Construction Site Dewatering (Transport, 2011) and will include consideration of the following: | This Plan |
| | • Identification of water quality criteria for the discharge of on-site water and the treatment techniques required to meet these criteria | Section 3.3 and 3.4 |

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| | • Reuse of stormwater where feasible within the scope of construction activities | Section 3.3.1 and Appendix I |
| | • Selection of suitable locations for the discharge of captured runoff utilising existing drainage paths where it cannot be reused on site | Section 3.3.3<br>EPL 21829 |
| | • Methods for achieving the WQOs for any site discharge through best practice erosion and sediment control measures and/or treatment of water through flocculation prior to discharge from sediment retention sumps | Section 3.4.2, 3.4.3 and 3.4.4<br>Appendix D |
| M12 CoA and REMMs for dewatering requirements | | |
| M12 CoA C7 | The Surface Water and Groundwater CEMP Sub-Plan must be based on a detailed site investigation of contamination risk and include, but not be limited to:<br>(c) a Trigger Action Response Protocol for potential discharge waters, identifying alternative disposal options for water with contaminant concentrations exceeding water quality management criteria. | CSWMP<br>Section 3.5.3 |
| M12 REMM SWH01 | A Construction Soil and Water Management Plan (CSWMP) will be prepared for the Project. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land.<br>The CSWMP will provide:<br>• Measures to manage groundwater de-watering and impacts including mitigation required<br>• Processes for de-watering of water that has accumulated on site and from sediment basins, including relevant discharge criteria. | This Plan<br>Section 3 |
| M12 REMM SWH11 | A de-watering management plan will be prepared as part of the CSWMP which will outline the de-watering methodology, supervision requirements, staff responsibilities and training, and approvals required before any de-watering activity begins. | This Plan |
| M7-M12 Integration project EPL (21829) dewatering requirements | | |
| Environmental Protection Licence/s | The Project is subject to EPL as a Scheduled Activity for 'road construction'. The EPL typically prescribes water quality parameters to be measured and associated discharge criteria for licensed discharge points. | Section 2.1 |
| TfNSW Specifications | | |

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| G36 | Environmental Protection | This Plan |
| G38 | Soil and Water Management | This Plan |

# 3 Procedure

## 3.1 Environmental Work Method Statement

A Construction Site Dewatering EWMS will be prepared in order to manage and control dewatering activities in a manner that does not cause harm to the environment, including where construction water may be discharged into natural waterways.

The EWMS will be prepared by the ESR and reviewed by the TfNSW Project Manager, TfNSW ESM (or delegate) and Environmental Representative (ER) before commencement of the dewatering activity.

EWMS encompass suitable controls and mitigation measures, including those identified in relevant Sub-plans. The EWMS also specifies any key procedures to be used concurrently with the EWMS. EWMS are designed to communicate requirements, actions, processes, and controls to construction personnel using plans, diagrams and simply written instructions.

A template EWMS is provided in Appendix A8 of the CEMP. Appendix A8 also contains a template EWMS register and template EWMS training register.

## 3.2 Approach

The approach to dewatering will generally follow the below hierarchy:

- Investigate any opportunities for onsite reuse. This may include applications such as dust suppression, earthworks compaction, vegetation establishment/rehabilitation, and plant/vehicle wash-down
- Investigate any opportunities of discharging water to land to allow the water to infiltrate into the ground, thus avoiding direct discharge to, or pollution of, waters
- Discharge offsite. Onsite reuse or land discharge may be limited by climatic or site conditions (i.e. saturated ground) and water may need to be discharged to meet the sediment basins requirements (i.e. reinstating capacity) identified in the Blue Book (Landcom, 2004)
- If groundwater inflows are observed from the cuts, the groundwater quality from the cut is to be sampled to determine representative water quality. Any groundwater emanating from cuts will flow in surface drains to downslope construction sediment basins. It will be tested prior to discharge in accordance with Section 3.3.3.
- Sydney Water protocols may also need to be followed when it relates to dewatering of a Sydney Water Asset. Prior to dewatering, the Project would consult with Sydney Water on any specific requirements.

## 3.3 Water quality criteria

### 3.3.1 Water Reuse

On-site reuse will be deemed permissible only if:

- There is no visible oil or grease

- No erosion is caused from the discharge
- Any runoff generated by the reuse is controlled entirely within the site boundary and appropriate sediment controls are installed and maintained in accordance with the Blue Book (Landcom, 2004)
- pH levels are between 6.5 – 8.5.

If all criteria above are met, then the water may be authorised for reuse by the ESR.

If the criteria are not met, treatment of water will occur in accordance with Section 3.4 or the water will be disposed of at an appropriately licenced waste facility.

### 3.3.2 Discharge to land

Discharge to land within the site boundary will only occur if:

- There is no visible oil or grease
- No surface runoff will be generated from the discharge, additionally that there is no potential for discharged water to reach any watercourse (within or outside the site)
- No erosion is caused from the discharge and appropriate erosion and sediment control are installed in accordance with the Blue Book (Landcom, 2004)
- Under a water discharge permit approved by the ESR.

In addition to the above, discharges to land:

- Over landscaped areas will only occur if pH levels are between 6.5 – 8.5
- Outside the site boundary will only occur if consultation has been undertaken with the landowner. Otherwise, all discharge water must be wholly contained within the site boundary.

If water is going to be re-used on site for dust suppression or construction purposes and will drain back into sediment capture measures no treatment is required except pH which must be 6.5-8.5 (although agree should be no visible oil/grease).

If the criteria are not met, treatment of water will occur in accordance with Section 3.4.

### 3.3.3 Discharge to waters

If it is proposed to discharge construction stormwater to waterways, a Discharge Impact Assessment has been developed to inform licensing, consistent with Section 45 of the POEO Act. The assessment must be prepared in consultation with the EPA and be consistent with the National Water Quality Guidelines, with the level of detail commensurate with the potential water pollution risk.

The concentration of a pollutant discharged at a Licenced Discharge Point, or applied to that area, must not exceed the concentration limits specified for that pollutant in Table 3-1. Water quality testing will be undertaken less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge or when rainfall causes runoff to the source of water under controlled discharge. Before any water can be discharged offsite, it must meet the water quality parameter limits for discharges of pollutants to water set out in EPL 21829, specifically criteria in Table 3-1. If the criteria are met, the water is suitable for discharge. If the criteria are not met, treatment of water will occur in accordance with Section 3.4.

This Plan will be updated to include selected discharge locations once they have been added to EPL premises maps and a discharge schedule submitted and approved in writing by the EPA.

*Table 3-1: Discharge water quality criteria*

| Parameter | Unit of measurement | Concentration Limit (100 percentile) |
|---|---|---|
| Oil and grease | Visible | Not visible |
| pH | pH | 6.5-8.5 |
| Total suspended solids (TSS) | Milligrams per litre | 50 |

Exceeding the limits specified in Table 3-1 for discharges from licensed discharge points is only permitted when:

- The discharge occurs solely as a result of rainfall measured at the premises exceeding the design 5-day rainfall depth value (32.2mm) and,
- The sediment basins and other erosion and sediment controls corresponding to the discharge point(s) have been designed, constructed, operated and maintained in accordance in accordance with Managing Urban Stormwater – Soils and Construction, Volume 2D, Main Road Construction (DECC, 2008), to be read and used in conjunction with Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom, 2004). In all other circumstances, John Holland must comply with Section 120 of the POEO Act.

In accordance with EPL 21829 L2.6, turbidity (NTU) may be used in place of TSS to determine compliance with the discharge concentration limits. The discharge water quality criteria will be included in this Plan once sufficient data is collected to determine a statistical correlation between NTU and TSS.

## 3.4 Water treatment

The EWMS will identify the methods for treating water if the water does not meet the discharge criteria. This will include measures for treatment of pH, a flocculation procedure to manage total suspended solids (TSS), and methods to remove petroleum hydrocarbons, metals or other pollutants.

Prior to water treatment activities, the ESR will demonstrate that the proposed flocculant or coagulant is suitable for use and submit the application using the TfNSW template “Alternative flocculants and coagulants – template to propose use” to the TfNSW ESM (or delegate) for approval.

Where flocculation is necessary to settle suspended sediments in the basins, the proposed flocculant or coagulant will be applied as the flocculating agent to settle the sediments within 24 hours of the conclusion of each rain event causing runoff. An appropriate amount of flocculating agent, suitable for the volume to be treated, the sediment type and the rainfall event conditions will be calculated.

The ESR (or delegate) will ensure that flocculants and other water treatment chemicals are appropriately stored on site. Bulk flocculants will be covered and positioned within erosion and sediment controls away from areas with the potential for water runoff. All treatment chemicals will be stored in appropriately bunded and covered locations that are locked to prevent unauthorised access. Requirements of the Safety Data Sheets will be followed.

### 3.4.1 pH

Method for treating water if the water does not meet the discharge criteria for pH.

1. Test water with appropriately calibrated pH meter
2. No action if pH reading between 6.5 and 8.5
3. Lime to be added if pH below 6.5
4. Hydrochloric Acid (32% Muriatic) or Sulfuric Acid to be added if pH above 8.5
5. Determine volume of water in basin or excavation
6. Bucket Test. Determine percentage of lime or acid required by taking a 10 litre sample of basin or excavation water and adding a known amount of lime or acid (initially 0.004%). If the pH is still not acceptable, vary the amount of lime or acid until within the limits
7. Once the required percentage has been determined, calculate the actual amount of lime or acid to be added by multiplying the volume of water in the basin or excavation by the determined percentage
8. Add the required amount of lime or acid to the basin or excavation
9. Mix the water in the sediment basin or excavation by pumping water to recirculate
10. Treat for pH prior to NTU.

*Note: Refer to SDS for Hydraulic or Sulfuric Acid prior to handling. The following PPE must be worn at all times when handling Hydrochloric or Sulfuric Acid:*

- *Safety glasses with side shields, chemical goggles or full-face shields.*
- *Impervious PVC or butyl rubber gloves.*
- *PVC overalls/jacket/apron and butyl rubber Wellington boots.*
- *If handling indoors, approved respirator with replaceable vapour/mist filter.*

*Note: Refer to SDS for Lime prior to handling. The following PPE must be worn at all times when handling Lime:*

- *Safety glasses.*
- *If handling indoors, approved P2 face mask.*

### 3.4.2 Total Suspended Solids (TSS)

To settle suspended sediments from water gypsum (calcium sulphate) may be added as a flocculant. This causes colloidal particles to clump together and either settle in a reasonable time or be filtered from the water.

If and alternative to gypsum is to be used as a flocculant or coagulant it must be accepted for use by TfNSW in accordance with Section 3.3 of Specification G38. To propose the use of alternative to gypsum the TfNSW template “Alternative flocculants and coagulants – template to propose use” should be completed and submitted to TfNSW.

The application of the flocculant or coagulant to settle suspended sediments within 24 hours of the conclusion of each rain event causing runoff.

### 3.4.3 Turbidity (NTU)

Method for treating water if the water does not meet the discharge criteria for Turbidity (NTU).

1. Collect a sample of basin or excavation water using a laboratory supplied container (an appropriately calibrated water quality probe will be used to measure the NTU level
2. If the NTU result is below nominated criteria dewatering can commence. If NTU is above nominated criteria, the water should be treated with a flocculent
3. If basin or excavation require flocculation, gypsum (Calcium Sulphate) within 24 hours of the conclusion of each rain event causing runoff. I Allow 36 – 48 hours for flocculation to occur.

*Note: Alternative flocculants may only be used subject to approval from the TfNSW Representative in using the TfNSW Alternative flocculants procedure. Alternative flocculants must be applied at the manufacturers recommended dosage.*

1. Methods of application to include:
   a. Broadcast by shovels recommended dosage is 30kg – 50kg/100 cubic meters. Spreading powder evenly and thinly (i.e. “dusting”) is recommend
   b. Mixing in a drum with water and pumping through a hose on large basins or excavations (i.e. >200m$^3$)
   c. When spraying flocculants the mixture must hit the water at between 10 to 20 degrees to increase surface areas exposure to the water column
   d. When using liquid gypsum or liquid flocculants, the solution must be mixed before use to ensure the product is evenly suspended throughout mixture. To be applied as per manufacturer instructions
2. Basins or excavations should be monitored and recorded daily after flocculation until desired turbidity is achieved and to assist in determination of optimal dosage levels.

*Note: Refer to SDS for Gypsum prior to handling. The following PPE must be worn at all times when handling Gypsum:*

- *Safety glasses with side shields, chemical goggles.*
- *If handling indoors, approved P2 face mask.*

### 3.4.4 Oil and Grease, Metals or other pollutants

Method for treating water if the water does not meet the discharge criteria for oil and grease, metals or other pollutants.

1. Examine surface of water for evidence (e.g. sheen, discoloration)
2. No action if no visual contamination
3. Oil absorbent material to be removed if there is contamination with absorbent materials (e.g. Xtrasorb, floating booms, pads and socks) and/or an oil/water separator. This task can be undertaken concurrently as flocculation occurs.
4. Leave basins to compensate for 24 to 48 hours

5. Where metals or other pollutants are encountered specific treatment or disposal methods must be agreed with TfNSW.

## 3.5 Discharging water

### 3.5.1 Testing

All water must meet the water quality parameter limits for discharges of pollutants to water set out in Section 3.3, prior to being discharged. If the criteria are met, the water is suitable for discharge. If the criteria are not met, treatment of water will occur in accordance with Section 3.4.

Water quality testing will be conducted in accordance with:

- Australian Standard 5667:1998 Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS/NZS 5667.1:1998)
- Australian Standard 5667:1998 Water Quality – Sampling, Part 6: Guidance on sampling of rivers and streams (AS/NZS 5667.6:1998)
- Approved Methods for Sampling and Analysis of Water Pollutants in NSW (EPA, 2022).

In situ water quality parameters will be recorded and grab samples collected for laboratory analysis (as required). Water quality testing will be undertaken less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge or when rainfall causes runoff to the source of water under control discharge.

### 3.5.2 Discharge, inspection and monitoring

Water discharge will only occur following approval by the ESR who will issue a Permit to Discharge.

Prior to the commencement of dewatering, the ESR (or delegate) will inspect the entire system, including intakes and outlets, pumping and discharge locations.

The dewatering activities will be directly supervised by personnel trained in this Plan and the EWMS.

If the ESR is not available to directly supervise dewatering, supervision by a John Holland trained site representative (e.g. labourer, leading hand) will be carried out and mitigation measures implemented to eliminate the risks of pollution and to prevent the occurrence of the following:

- Intake suction placed within the deposited sediments resulting in discharge of sediment laden waters
- Erosion at discharge locations and downstream areas
- Inadvertent or intentional controlled discharge of untreated waters.
- If native fish become stranded as a result of dewatering activities, they are to be relocated by a qualified aquatic ecologist where feasible.

Dewatering will cease immediately if any negative environmental impact such as flooding, erosion or dirty water discharge is observed.

### 3.5.3 Trigger Action Response Plan

In accordance with NSW M12 CoA C7(c), the following Trigger Action Response Protocol (TARP) will be followed to manage potential discharge waters (refer to Figure 3-1). The TARP is based on the dewatering hierarchy identified in Section 3.2 and includes disposal options in the event that water quality criteria is exceeded.

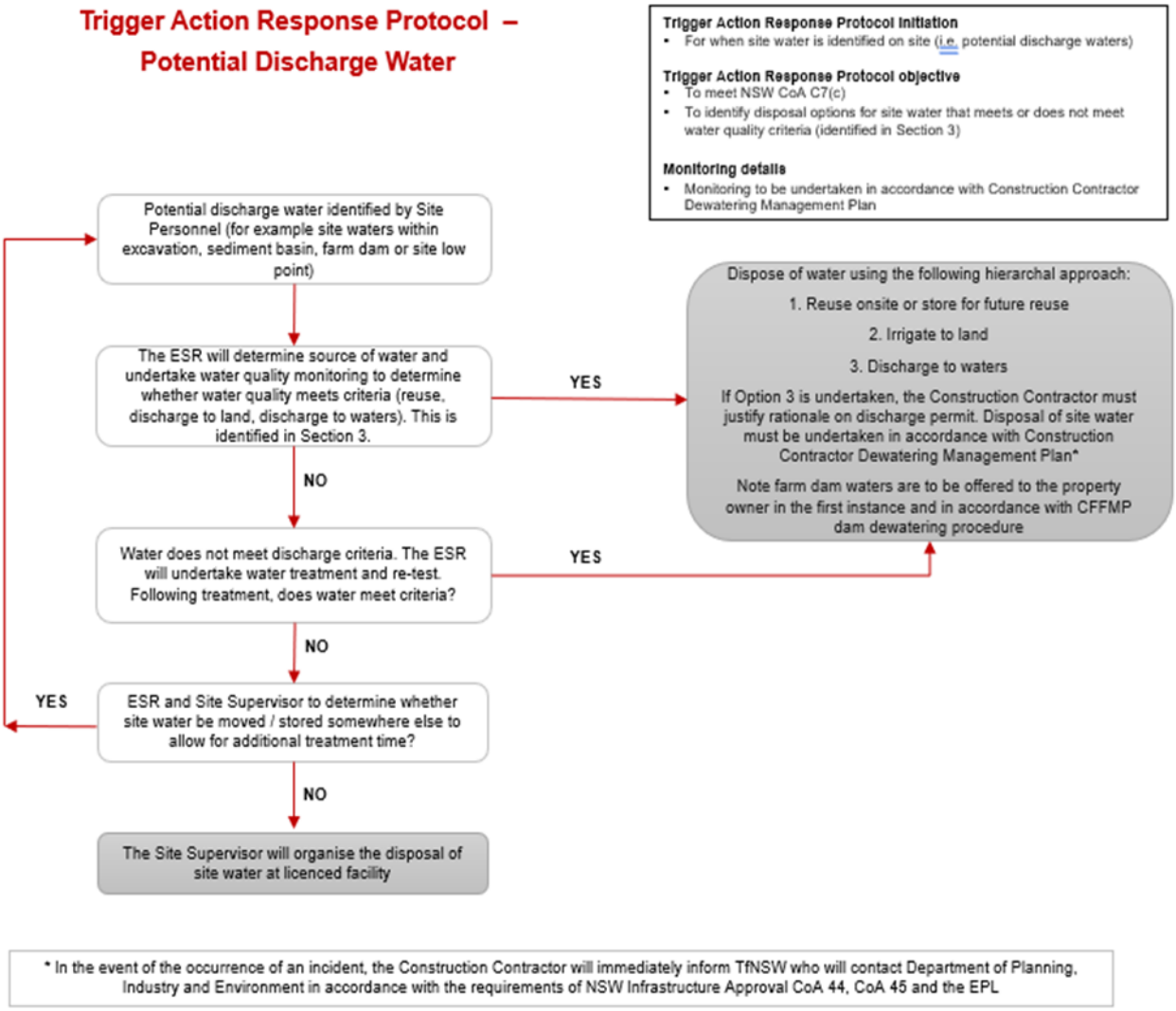



*Figure 3-1: Trigger Action Response Protocol*

## 3.6 Farm dam discharge

In addition to the discharge requirements outlined in Section 3.5 for the discharge of water (including farm dam waters), the discharge of waters from farm dams will require:

- Preparing the dam for dewatering
- Aquatic fauna capture
- Relocation of captured aquatic fauna
- Management of pest species and pathogens.

Refer to the CFFMP for the fauna steps required for farm dam discharge. The reuse of farm dam water onsite or discharge of farm dam water will be authorised by the ESR. The above process will be used in instances where the farm dam refills with water.

## 3.7 Sydney Water infrastructure dewatering

In addition to the discharge requirements outlined in Section 3.5 for the discharge of water, if the dewatering of Sydney Water infrastructure (i.e. decommissioning and dewatering of pipes, followed by commissioning), it must be undertaken in accordance with the Sydney Water Discharge Protocols which outlines measure for erosion control, discharge rate, chlorination and monitoring. This may apply to planned isolations of trunk mains (potable or recycled water mains) to prevent water quality contamination.

Typical activities that include isolations of trunk mains include:

- Discharge of drinking water (e.g. maintenance or construction work on a water main, pumping station or reservoir)
- Cleaning water mains (e.g. flushing, swabbing and scouring)
- Disinfecting water mains (e.g. new mains, existing mains following main breaks) or water supply reservoirs
- Discharge of water from excavation pits.

## 3.8 Disposal of contaminated water

As detailed in Section 3.5.3, if onsite water is unable to be treated to meet the criteria for application to land, discharge to waterways or discharge to a Sydney Water asset it must be disposed of at an appropriately licensed facility. Facilities licensed to receive this material are listed in table 3-2 below.

*Table 3-2: Facilities licensed to receive liquid waste.*

| Organisation | Location | EPL |
|---|---|---|
| Cleanaway Operations Pty Ltd | Corner of Pondage Link & Hill Rd, Homebush Bay | 4560 |
| Demast Pty Ltd | 7 Long Street, Smithfield | 20875 |
| Cleanaway Pty Ltd | 40 Christie Street, St Marys | 2997 |

If unexpected, contaminated groundwater is encountered during the works the Unexpected Contaminated Lands Finds Protocol contained in Appendix N of CSWMP must be followed.

# 4 Records

The ESR will maintain records of relevant data, including records of water quality management and water discharge (Permit to Discharge).

A record will be maintained for each discharge that will include:

- Date and time for each discharge at each location
- Water quality test results for each discharge
- Personnel approving the dewatering activities
- Evidence of discharge monitoring, or risk assessment and mitigation measures used to eliminate the risks of pollution or erosion
- Details of aquatic fauna captured and relocated after dam dewatering has occurred
- Any other EPA licence requirements.

The ESR will report on site discharge monitoring results in the Soil and Water Monitoring Reports to be prepared for the M7-M12 Integration project including the EPL monitoring data. Details of the reporting are outlined in the Construction Soil and Water Monitoring Program (refer Appendix B of the CSWMP).

M7–M12 Integration Project

# WATER DISCHARGE PERMIT

| Section 1: PERMIT DETAILS | Permit Number: |
|---|---|
| External Permit Required? Yes / No | If yes, specify external permit number: |
| Location (Sediment Basin No. / Chainage / GPS Coordinates): | Site Environmental Plan (SEP) number: |
| Proposed Start Date / Time: _____ | Proposed Completion Date / Time: _____ |
| Receiving Water Body: | |

| Section 2: WATER QUALITY RECORD (to be completed by authorised water quality monitoring personnel only) | | |
|---|---|---|
| Parameter | Water to be Discharged | Receiving Water |
| Date / Time | | |
| Turbidity: (ADD NTU) | | |
| Conductivity: (ADD uS/cm) | | |
| pH: 6.5-8.5 | | |
| Oil and Grease present: | | |
| Comments: | | |

**Section 3: PERMIT CONDITIONS / APPROVAL**

**Mandatory Permit Conditions:**

- Float the foot valve to ensure it does not sit in mud at the base of the sediment basin.
- Ensure that the water discharge point is located so that it will not cause erosion and re-suspension of sediment.
- Check the discharge regularly to ensure it remains clear of visible sediment and appears clean. The person issuing this permit must test water quality in the receiving water on an hourly basis
- Cease dewatering immediately if water quality in the receiving waterway is adversely affected or if a turbidity plume is visible.

**(Hand write any additional conditions / instructions below)**

M7–M12 Integration Project

# WATER DISCHARGE PERMIT

| | |
|---|---|
| | |
| I understand and accept the permit conditions detailed above.<br>**Supervisor / Engineer / Subcontractor**<br>Name: ..... Signature:..... | |
| **Permit Issuer / Project Environment Representative:**<br>Name: .....<br>Signature:.....<br><br>Does risk assessment need to be undertaken if supervision not proposed?<br>**Yes / No** | **Issue Date: ___/___/___**<br>**Expiry Date: ___/___/___**<br>*Note: This permit is no longer valid after a rain event following the issue date and time.* |
| **Time and Date of Discharge** | |

| **Section 4: PERMIT CLOSURE** |
|---|
| I confirm all work for which this permit was issued has been completed. |
| **Supervisor / Engineer / Subcontractor:**<br>Name: ..... Signature:..... Date: ..... |
| I confirm all work for which this permit was issued has been completed and verified. |
| **Permit Issuer / Environmental Site Representative:**<br>Name: ..... Signature:..... Date: ..... |

# Appendix D - Erosion and Sediment Control Procedure

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix D: Erosion and Sediment Control Procedure

November 2023



# Document Control

| | | |
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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| BoM | Bureau of Meteorology |
| CEMP | Construction Environmental Management Plan |
| CSWMP | Construction Soil and Water Management Sub-plan |
| EIS | Environmental Impact Statement |
| EPA | NSW Environmental Protection Authority |
| EPL | Environmental Protection Licence |
| ESCP | Erosion and Sediment Control Plan |
| EWMS | Environmental Work Methods Statement |
| POEO Act | Protection of the Environment Operations Act 1997 |
| PESCP | Progressive Erosion and Sedimentation Control Plans |
| TfNSW | Transport for New South Wales |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |

# 1 Introduction

## 1.1 Purpose of the procedure

This Erosion and Sediment Control Procedure has been prepared to provide an outline of the strategic approach to the management of Erosion and Sediment risks for the M7-M12 Integration project. The information in this document will guide the implementation of erosion and sedimentation management and form part of the Construction Soil and Water Management Sub-plan (CSWMP) for the M7-M12 Integration project.

## 1.2 Impacts of erosion and sedimentation

Construction activities to be undertaken on the M7-M12 Integration project have the potential to impact on soil and water resources during bulk earthworks across known contaminated areas and potentially contaminated areas from historical agricultural land uses.

Generally, soil particles eroded by stormwater runoff are transported downslope, usually settling in rivers, watercourses, lakes, dams and wetlands etc (i.e. sedimentation). This may result in many adverse environmental impacts including:

- Reduction in water quality, increased turbidity and nutrient enrichment of water bodies
- Contamination of waterways
- Minor damage to vegetation communities
- Disturbance to aquatic flora and fauna
- Increased potential for flooding
- Reduction in recreational values
- Reduction in aesthetic values
- Increased maintenance costs
- Promotion of weed growth.

Additionally, erosion may be caused by wind moving unprotected soil particles. This action may result in adverse impacts including:

- Reduction in water quality, increased turbidity and nutrient enrichment of water bodies
- Contamination of waterways.

This strategy will form the initial ‘part of the chain’ to minimise on-site erosion and offsite sedimentation and therefore reduce adverse environmental impacts.

Where exceedances in water quality parameters are experienced on the M7 Widening component of the M7-M12 Integration project rectification procedures of sediment controls or site practices will be undertaken, in accordance with M7 REMM SW2.

For the M7 Widening component of the M7-M12 Integration project, testing will be carried out prior to ground disturbance in high probability salinity areas in accordance with M7 REMM C6. If salinity is encountered, excavated soils will not be reused and will be managed in accordance with Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC, 2008c). Erosion controls

will be implemented in accordance with the Managing Urban Stormwater: Soils and Construction Volume 1 (DPIE, 2004).

# 2 Scope of this strategy

This document describes the intentions and fundamental principles to be used for the duration of the M7-M12 Integration project.

The strategy will be complimented during construction by the preparation of a series of detailed Site Specific or Progressive Erosion and Sedimentation Control Plans (PESCPs) for:

The different stages of construction (e.g. earthworks, cuttings, stockpiling; vegetation clearing and mulching; drainage and surface road works)

Specific work areas (e.g. bridges, culverts, offices and compounds, etc)

The PESCP's will identify risks and be prepared prior to the construction activity generally using drainage or general arrangement drawings and indicate (where relevant):

- Catchment areas
- Construction boundaries
- Areas of contamination (e.g. low, moderate or high risk areas)
- Exclusion zones and sensitive areas
- Contours and drainage paths
- Access points and tracks (e.g. haulage)
- Compounds and storage areas
- Stockpile sites
- Temporary work areas
- Material processing areas
- Permanent and temporary controls (including order of implementation).

In some instances, more than one PESCP may be required for an activity due to:

- Staging rendering the process complicated
- Change in the construction process, scope of work or work method
- Controls are found to be ineffective following rainfall.

Progressive ESCPs will be prepared jointly by the environmental team in consultation with the M7-M12 Integration project Soil Conservationist and will include input from field personnel to formulate practical documents for field implementation. Additionally, PESCPs will be developed in consideration of other environmental aspects (e.g. sensitive vegetation communities, works within or adjacent to waterways etc) where relevant.

Where required, PESCPs will be developed jointly with Environmental Work Method Statements for complex construction areas (e.g. major drainage structures, bridges).

The PESCPs, including older versions, will be maintained on SharePoint in order to ensure historical versions are accessible if required. A register of PSCEPs is included in Appendix E to track erosion and sediment control.

# 3 Supporting documentation

This Erosion and Sedimentation Control Strategy is based on the requirements and guidelines contained in the following manuals/documents:

- *Protection of the Environmental Operations Act 1997* (POEO Act)
- Managing Urban Stormwater: Soils and Construction (Landcom, 2004) (i.e. Blue Book)
- TfNSW Specification D&C G38 – Soil and Water Management
- TfNSW Technical Guidelines EMS-TG-011: Environmental Management of Construction Site Dewatering (RTA, 2011)
- Environment Protection License (EPL) - reference 21829.

The strategies and techniques detailed in the above documents are appropriate for the protection of the adjacent environment of this project.

# 4 Erosion and sedimentation hazard

It is expected a high erosion and sedimentation hazard will be created during the construction of this project due to a combination of factors including:

- Large scale disturbance from bulk earthworks (e.g. cut and fill sections in relation to road construction)
- Disturbance of contaminated soils
- Proximity to water courses, in particular tributaries of the Hawksbury River including Ropes Creek
- Soil types present on the M7-M12 Integration project as summarised in Section 4.1 of the CSWMP
- Weather conditions as summarised in Section 4.4 of the CSWMP
- Limited ability to undertake early revegetation
- Site constraints restricting available land for controls (e.g. sediment basins)

The erosion hazard will be calculated for each catchment area within the M7-M12 Integration project and detailed within the PESCP in accordance with Section 4.4.1 and 4.4.2 of the Blue Book. The PESCP's will be updated regularly to reflect changing site conditions, and the erosion hazard, within the catchment.

# 5 Key management strategies

The following list outlines principles and control measures that will be implemented on this project for minimising erosion and sedimentation. They have been identified as key issues and techniques to control erosion and sedimentation on many construction projects over the last 30 years. These points collectively fulfil the principles of sound soil conservation practice as detailed in the previously mentioned manuals/documents. This will ensure a 'preventative' rather than a 'cosmetic or remedial' approach to erosion and sediment control.

Refer to general requirements and PESCP's in Appendix E of the CSWMP for further details and site-specific requirements.

## 5.1 Professional expertise

The engagement of a professional Soil Conservationist (Andrew MacLeod from SEEC) with extensive experience who will co-ordinate and assist in the implementation of all erosion and sediment control aspects during construction.

## 5.2 Training

Training in key aspects of soil conservation will be implemented in the following way:

- Highlighting the importance of soil conservation issues will be included during site inductions.
- Scheduling half-day awareness seminars early in the project for all personnel involved in construction.

The program will cover:

- Environmental impacts
- Relevant legislation
- Principles of erosion and sediment control
- Techniques of erosion and sediment control.

Advanced training programs may be rolled out for relevant personnel and will include:

- Flocculation techniques and water quality
- Management of water quality treatment infrastructure
- Preparation of PESCP's.

Additionally, ongoing training will be provided to continually address relevant matters at regular 'toolbox' pre-start and other meetings. Post rainfall toolbox sessions will be carried out, as required, with construction personnel to review and assess the efficacy of existing controls and consider potential improvements.

## 5.3 Minimising extent and duration of disturbance

Key aspects to manage the extent of disturbance are:

- Installation of flagging or survey tape to delineate clearing limits
- Ensure all controls are located within the clearing limits
- Staging of clearing operations where possible
- Establishment of site access/exit points
- Minimising disturbance of vegetation along access roads and other construction sites (e.g. Site Compounds), with special emphasis on management of construction activities adjacent to watercourses
- Minimise disturbance at any one time to only what is necessary for safe and efficient construction. Do not disturb new areas when rain is imminent unless appropriate controls can be implemented prior to rain occurring
- Sweep local roads as required to remove any tracked sediment or rocks.

## 5.4 Control of Stormwater Flow onto, through and from the site

Key aspects to manage stormwater flows are:

- Separating ‘clean’ run-on water from ‘dirty’ (eg turbid) construction area run-off
- Constructing drainage structures including:
- Sediment fences or mulch/earth bunds
- Sediment basins and traps
- Culverts and associated inlet and outlet protection (eg dissipators)
- Maximising the diversion of turbid construction runoff into sediment basins
- Diverting formation run-off through sediment traps and into pits and the stormwater drainage system as soon as practical to reduce surface flow lengths and velocities.

## 5.5 Erosion control measure to limit on-site erosion

The strategies to be used to control erosion on incomplete section of works are:

- Constructing a range of erosion controls within the various sub catchments to reduce flow velocities and to compliment and increase the effectiveness and efficiency of sediment controls in the lower areas (e.g. weir type structures, diversion banks, progressive revegetation)
- Using geotextile or similar linings to provide temporary surface protection in areas of concentrated flows (e.g. batter drains, culvert construction, temporary drains etc). Rock armouring of construction sediment basin outlets
- Siting stockpiles of soil material in low-hazard areas clear of watercourses (i.e. at least 50 metres). Additional protection to be afforded with temporary vegetation, upslope diversion banks and downslope sediment control measures, if required. Stockpile material to be located away from drainage line, waterways and outside tree protection zones of native vegetation identified for retention
- Stockpiles no greater than two metres in height with batters no steeper than 2:1.

## 5.6 Sediment control long-term measures to prevent off-site sedimentation

The strategies to be used to control offsite impacts from works are:

- Construct control measures as close to potential sources of sediment as possible and use of alternative controls where end of line basins are not possible
- Ensuring sediment basin management of turbid water within 24 hours after rain with one or a combination of:
    - Flocculation with gypsum (or approved alternative flocculant);
    - Pump-out for construction purposes or dust control
- Water not to be released from sediment basins prior to achieving acceptable water quality standards
- Preferential re-use of water in construction sediment basins
- Managing water quality during de-watering activities (eg dust suppression, filtering techniques, flocculation with gypsum, pumping for treatment into a sediment basin)

- Controlling the deposition of mud and soil material onto local roads
- Dust suppression via water carts, restricting plant and vehicle movements to designated routes and limiting vehicle speeds etc.

## 5.7 Stabilisation and revegetation

Key aspects to manage successful rehabilitation of disturbed areas to be implemented are:

- Ensuring the success of the later revegetation program through implementation of a robust topsoil testing and management program
- Keying-in of topsoil to batters with a suitable depth in accordance with the specifications
- Undertake progressive stabilisation of lands through revegetation utilising appropriate species
- Temporary stabilisation of disturbed areas with a soil stabiliser, cover crops or similar
- Leaving temporary erosion and sediment controls in place until construction in disturbed catchments are completed and have over 70% vegetation cover
- Controlling dust through progressive revegetation techniques.

## 5.8 Inspection and maintenance

To ensure the implementation of all aspects of soil conservation the following tasks will be undertaken:

- Ensuring the progressive and continual implementation of temporary erosion and sediment controls (eg sediment fences, diversion banks, diversion drains, sediment traps)
- Initiating a program to ensure regular maintenance of all erosion and sediment control measures. Sediment cleaned from structures, including sediment basins, to be deposited in a secure location where further pollution will not occur
- The soil conservationist must inspect and review all erosion and sediment controls on a monthly basis, or as otherwise agreed by RMS Representative, until the Date of Construction Completion and prepare reports on these inspections. Issues identified in these inspection reports must be acted on and reported to the soil conservationist and RMS Representative within five (5) working days. The project soil conservationist must assist in project training in regard to project erosion and sediment control issues.
- Additional inspections will be conducted by project personnel:
    - During significant rainfall events exceeding 10mm and during prolonged rainfall to monitor the functioning of controls (i.e. within 3 hours during normal work hours and days, or within 24 hours outside normal work hours and days).
    - Within 24 hours of cessation of a rainfall event causing runoff to occur on or from the project.

## 5.9 Documentation and recording

Implementation of this procedure will generate the following records and reports:

- Rainfall / climatic records, using Bureau of Meteorology and project Automatic Weather Station information
- Monitoring weather forecasts for planning and site ‘securing’ purposes

- PESCPs
- Inspection reports completed by the project Soil Conservationist. The report will include sections for location, control, recommendations/comment, action and ‘close-out’.
- Register for Inspections and Maintenance to include volumes of sediment removed, surface water captured, treated, reused or disposed of and the method of disposal etc.
- Site notes distributed internally between environmental and construction personnel
- Dewatering procedure and records
- Meeting minutes
- Formal correspondence (e.g. Client, Environment Protection Authority)
- Water quality monitoring results (e.g. sediment basins, upstream and downstream) in accordance with the Surface Water Monitoring Program.

# 6 Sediment basins

The ‘Concept Sediment and Control Plan’ for the M12 East package component of the M7-M12 Integration project prepared by SEEC (12 June 2023) identified the sites for 17 potential sediment basins, as shown in Appendix E of the CSWMP.

Four sites within the M12 East Construction footprint (Catchment ID’s 1220E, 1210E, 1200E, and 990E as detailed in Sheet 2 of the Concept ERSED plan) were not considered practical to construct sediment basins due to space constraints with existing and/or proposed structures. During construction, batters and steep slopes (>10 per cent) at these catchments must be temporarily covered or sprayed with a soil binder whenever the weather forecast suggests a greater than 70 per cent chance of 10 millimetres or more rain within the next 24 hours. The application of a soil binder reduces the erosion potential by around 90% by reducing the RUSLE C-factor from 1.0 (bare soil) to 0.1. This is consistent with Blue Book clause 6.3.4 (g) which states ‘Where space does not permit the use of [sediment basin] structures designed for the 80th percentile or larger x-day rainfall depths and these are desirable, additional erosion controls can be considered instead’.

The ‘Over-arching Erosion and Sediment Control Plan’ for the M7 Widening component of the M7-M12 Integration project prepared by SEEC (25 July 2023) identified local stormwater pits along the M7 Widening alignment, in conjunction with sediment control measures, as shown in Appendix E of the CSWMP.

In accordance with M7 CoA D109, sediment retention basins or sumps must be used and appropriately sized to control contaminated runoff from the M7 Widening. The Planning Secretary’s approval is required to deviate from this requirement by one of two avenues:

- Approval via M7 CoA D108
- Approval via M7 CoA D110.

## 6.1 Sediment basin alternatives

M7 Widening works are to be staged with the disturbed catchments expected to be limited to less than 1ha, with the potential catchment soil loss being 176t/year. Under Blue Book standards, a sediment basin is required if the soil loss in any catchment is greater than 200t/year. Therefore, there is no requirement for sediment basins for M7 Widening under the Blue Book.

In accordance with M7 CoA D108, the Planning Secretary's approval is required to use local erosion and sediment controls to manage stormwater discharges in lieu of sediment retention basins or sumps where:

- Such measures adequately manage the risk of erosion and sedimentation in accordance with Volume 1 and 2D of the Blue Book
- Contaminated soils do not pose a risk to water quality in receiving waterways.

Use of existing drainage systems along the M7 Widening alignment during construction will be carried out so that the existing hydraulic capacity of these systems is maintained where practicable, in accordance with M7 CoA FL2.

In areas of confirmed moderate to high risk of contamination along the M7 Widening alignment (to be confirmed by the findings of the detailed site investigations required in accordance with M7 CoA D67), where application of sediment retention basins or sumps is restricted by site constraints and the outcomes of M7 CoA D109 cannot be met, alternative capture and treatment systems may be used only with approval from the Planning Secretary in accordance with M7 CoA D110.

# 7 Conclusion

The strategies presented are considered appropriate to address all issues relevant to erosion and sediment control and to minimise potential impact. Forward planning, adherence to a system of documentation and training will be key elements to ensure sound performance in the field

# Appendix E - Concept Erosion and Sediment Control Plan

SEEC



# Primary Erosion and Sediment Control Plan

# M7 Widening

**Prepared for John Holland**

**Revision B**

**Date 29 September 2023**

Strategic Environmental & Engineering Consulting

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## Document Certification

This plan has been developed based on agreed requirements as understood by SEEC at the time of investigation. It applies only to a specific task on the nominated lands. Other interpretations should not be made, including changes in scale or application to other projects.

Any recommendations contained in this report are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, subject to the limited scope and resources available. Within the confines of the above statements and to the best of my knowledge, this plan does not contain any incomplete or misleading information.

Andrew Macleod B.Sc (Hons) CPESC CPSS
Director and Principal Soil Conservationist
SEEC

29 September 2023

## Version Register

| Version | Date | Author | Reviewer | Notes | Other |
|---|---|---|---|---|---|
| Rev A | 24/07/23 | AM | LO | Draft issue to JH | |
| Rev B | 29/09/23 | AM | LO | Minor updates | |
| | | | | | |

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# 1 INTRODUCTION

## 1.1 Context and Purpose

This Primary Erosion and Sediment Control Plan (ESCP) details the erosion and sediment control strategies and commitments that John Holland will implement during the construction works for the widening of the M7 Motorway between Richmond Road and Prestons (SSI-663-Mod-6; "the project"). This Primary ESCP has been prepared as part of addressing the requirements of the Consolidated Approval for the project and Transport for NSW QA G38 Specification (Soil and Water Management, hereafter referred to simply as "G38 Specification") and all relevant legislation.

Construction activities expose lands to erosion by wind, water and human activity. Soil particles eroded from a construction site can be transported downslope to offsite lands and waterways, where they can cause environmental harm. By implementing a series of recognised best-practice erosion and sediment controls, John Holland can minimise the potential impact to downslope lands and waterways. This Primary ESCP provides the proposed strategies and commitments to be employed.

## 1.2 ESCP Preparation

This Primary ESCP was prepared by Andrew Macleod from Strategic Environmental and Engineering Consulting (SEEC) Pty Ltd for John Holland. A CV for Andrew Macleod is included in Appendix A, demonstrating appropriate skills and experience in accordance with G38 Specification.

## 1.3 Relationship to Other Plans

This Primary ESCP is a sub-plan of the Soil and Water Management Plan (SWMP), which itself is a sub-plan of the Construction Environment Management Plan (CEMP).

Details of all environmental documentation are in the CEMP.

## 1.4 Primary Vs Progressive ESCPs

This Primary ESCP is accompanied by a set of Over-arching drawings (OESCP) showing the principal setup of major erosion and sediment controls (Appendix C). In addition to this Primary ESCP and the OESCP, a series of Progressive ESCPs will be prepared during construction. Each Progressive ESCP will:

- Address the required erosion and sediment controls for a specific portion or stage of work.
- Be considerate of the controls shown on the OESCP drawings and the safeguards in this Primary ESCP.

- Be reviewed or prepared by the project soil conservationist or a similarly-experienced site representative.
- Include a drawing showing the location for nominated erosion and sediment controls to be installed onsite.
- Include instructions for the staging, implementation and management of the nominated erosion and sediment controls.
- Include details of other management controls for that portion or stage of work.
- Be updated as required to ensure it is relevant to the current and upcoming scope of work.

## 1.5 Guidelines and Legislation

This Primary ESCP has been prepared in accordance with the guidelines and standards in:

- Landcom (2004). *Managing Urban Stormwater: Soils and Construction.* Volume 1, 4th Edition.
- DECC (2008). *Managing Urban Stormwater: Soils and Construction.* Volume 2D: Main Road Construction.

This Primary ESCP has been prepared as part of compliance with the NSW *Protection of the Environment Operations Act, 1997,* and the relevant CoAs for the project.

All legislation relevant to this Primary ESCP is included in the CEMP and so is not repeated here.

# 2 PROJECT DESCRIPTION

WSO Co has engaged John Holland Group Pty Ltd to construct Stage 3 of M7 Motorway (Mod 6 Widening) Project which involves the construction of approximately 26km of additional traffic lanes in both directions between the M5 interchange, approximately 140 metres south of the Kurrajong Road overhead bridge at Prestons and the M7 Motorway bridge at Richmond Rd in Oakhurst/Glendenning. The additional lanes are to be constructed within the existing median and will include the widening of numerous bridges. Once completed, the M7 will have three traffic lanes in each direction and will connect with the new M12 Motorway at Cecil Hills.

The project will help to ease congestion by increasing road network capacity, reducing travel time, as well as improving road safety and will help manage future impacts of planned growth areas in Western Sydney including the new Western Sydney International Airport.

The project will improve efficiency on the M7 Motorway and will typically consist of:

- Two 3.5m traffic lanes in each direction
- 2m shoulder (dedicated bicycle lane).
- 10m verge containing a 3m shared pedestrian/cycle path.
- A 0.5m offside shoulder (in the median of the bridges).

The project will require the following activities:

- Clearing of vegetation.
- Widening of 43 existing bridges at 23 different locations both within the centre median and on the outside of existing bridges.
- Temporary waterway crossings and diversions to allow for bridge construction.
- Construction and modification to the existing M7 cycleway and shared paths.
- Construction of temporary pad areas for construction in the river corridor.
- Construction of temporary and permanent drainage basins for sediment and pollution control.
- Construction of spill-through and reinforced soil wall abutments.
- Construction of two sets of piers founded on pad footings.
- Cut and fill for levelling and construction of the road.
- Removal of existing and installation of new electricity, gas and communications conduits.
- New water and sewer pipelines with enabling connections to adjoining future urban developments.

Construction is expected to take about three years after commencement.

An overview of the project is included in Figure 1. A detailed project description is in the CEMP.




**Figure 1: Project overview**

# 3 SITE CONDITIONS

## 3.1 Land Use and Topography

The Project site is located in a highly modified landscape that is primarily in the median of M7 Motorway. Medians are generally gently graded, and include median drains, long, gentle batters and other man-made drainage features.

## 3.2 Climate

Bureau of Meteorology (BoM) rainfall statistics for nearby Prospect Reservoir (station 067019) are contained in Table 1. These are based on over 130 years' worth of data. Significant rainfall can occur at any time of year.

**Table 1: Monthly rainfall statistics for Prospect Reservoir (BoM station 067019)**

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Ann-ual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rainfall (mm) | 95.1 | 99.2 | 103.6 | 75.5 | 68.9 | 75.9 | 58.2 | 50.3 | 46.5 | 60.2 | 72.8 | 75.5 | 878.6 |
| Mean no of days with rain >1mm | 8.1 | 8.2 | 8.6 | 7.0 | 6.4 | 7.0 | 5.7 | 5.7 | 6.1 | 6.9 | 7.3 | 7.6 | 84.6 |

## 3.3 Soils

The soils across the Project site have been previously modified as a result of construction of the M7 Motorway. The most common Soil Landscape along the M7 Motorway alignment is the Blacktown Soil Landscape (based on NSW Government eSpade mapping), so it is presumed that soil materials from this Soil Landscape were re-used as part of the original rehabilitation of the M7 Motorway.

A description of the typical soil and landscape conditions within the Blacktown Soil Landscape is included in Table 2. Also included is a description of Disturbed Terrain, which notes the potential for contamination to occur. It is assumed that soils within the Project alignment will primarily be a combination of these two Soil Landscapes.

**Table 2: Soil Landscape Descriptions (from NSW Government eSpade portal, accessed June 2023).**

| Parameter | Blacktown Soil Landscape | Disturbed Terrain |
|---|---|---|
| **Soil landscape description** | Broad rounded crests and ridges with gently inclined slopes and undulating rises on Wianamatta Group shales. Local relief to 30 m and slopes usually >5%. | Level to hummocky terrain, extensively disturbed by human activity, including complete disturbance, removal or burial of soil.<br>Local relief is highly variable.<br>Original vegetation completely cleared |

| | | |
|---|---|---|
| **Typical soil conditions** | Red and brown duplex soils on crests and midslopes, grading to yellow duplex soils on lower slopes and around drainage lines. | Variable and unpredictable. Can include soil, rock, building and waste materials. |
| **Common soil and landscape constraints** | Localised impermeable highly plastic subsoil.<br>Moderately reactive soils.<br>Low wet strength soils.<br>Low plant-available waterholding capacity.<br>Low permeability soils.<br>Low fertility subsoils.<br>Localised dispersive (sodic) subsoils.<br>Highly acidic topsoils with aluminium toxicity potential.<br>Localised salinity. | Variable, unpredictable soils.<br>Potential contamination.<br>Variable permeability and waterholding capacity.<br>Potential dispersive (sodic or magnesic) soils.<br>Generally low fertility. |

## 3.4 Surface Water and Sensitive Receiving Environments

The Project traverses numerous tributaries of both the Georges River and Hawkesbury-Nepean River. Major creeks crossed by the Project include:

- Angus Creek (Hawkesbury-Nepean River catchment)
- Reedy Creek (Hawkesbury-Nepean River catchment)
- Ropes Creek (Hawkesbury-Nepean River catchment)
- Hinchinbrook Creek (Georges River catchment)
- Cabramatta Creek (Georges River catchment)
- Maxwells Creek (Georges River catchment).

All of the above waterways, plus the numerous smaller tributaries crossed by the Project, have been significantly impacted by urbanisation and by historic construction of the M7 Motorway.

As noted in the EIS for the Project (Transport for NSW, 2022) "The quality of water in the watercourses that receive runoff from study area is heavily impacted due the urban and industrial surrounding land uses and historical processes of urbanisation. Processes such as historical land clearing, agricultural practices and the transition from rural to urban land uses have increased sediment loads and nutrients in waterways."

## 3.5 Groundwater

As the Project site occurs in an area that has been previously reshaped for the initial M7 Motorway construction, groundwater is not expected to be encountered except where bridge or culvert works occur adjacent to and within the riparian corridor of waterways.

## 3.6 Flooding

As noted in Landcom (2004), sediment controls such as sediment basins should generally not be sited below the 2-year Average Recurrence Interval (ARI) flood level. This has been taken into account when determining safeguards in this Primary ESCP and the accompanying OESCP drawings.

## 3.7 Erosion Hazard

An evaluation of the erosion hazard is required for each sub-catchment to be disturbed for construction. This should follow the approach in Chapter 4 of the Blue Book (Landcom, 2004), based on the Revised Universal Soil Loss Equation (RUSLE) as follows:

$$A = R \times K \times LS \times P \times C$$

Table 3 provides a summary of the RUSLE factors to be used for this Project.

**Table 3: Erosion hazard for the project (based on Landcom, 2004).**

| Parameter | Definition | Project-specific requirements |
|---|---|---|
| A | Total calculated soil loss (t/ha/yr) | Ranges from 29 t/ha/yr to 176 t/ha/yr |
| R | Rainfall erosivity factor | 2500 (Based on R-factor map from the Blue Book (Landcom – Appendix B, 2004) |
| K | Soil erodibility factor | 0.0456 (0.038 (Blacktown Soil Landscape) x 20% where dispersive soils are known to occur) |
| LS | Slope length and gradient factor | Ranges from 0.19 (80m, 1%) to 1.19 (80m, 5%) |
| P | Conservation practice factor | 1.3 (assume smooth and compacted) |
| C | Ground cover factor | 1.0 (assume no ground cover during construction) |

## 3.8 Constraints

Project and site constraints that influence the selection or positioning of erosion and sediment controls include (but are not limited to):

- The narrow project corridor and large volume of traffic, which limits space for erosion and sediment controls.
- Proximity to sensitive receiving environments (Angus Creek, Reedy Creek, Ropes Creek, Hinchinbrook Creek, Cabramatta Creek and Maxwells Creek).

# 4 ENVIRONMENTAL IMPACTS

## 4.1 General Impacts of Erosion and Sedimentation

Land that has been disturbed or cleared of protective ground cover is potentially subject to erosion as a result of stormwater runoff. Soil particles that are eroded in such a way are transported down-slope, usually settling in watercourses, wetlands and lakes.

Erosion and sedimentation may result in many adverse environmental impacts including:

- Reduction in water quality
- Increased turbidity in receiving waters
- Nutrient enrichment of water bodies
- Damage to vegetation communities
- Disturbance to aquatic flora and fauna
- Increased potential for flooding
- Restrictions to navigation
- Reduction in recreational values
- Reduction in aesthetic values
- Increased maintenance costs
- Promotion of weed growth

(based on Landcom, 2004 and IECA, 2008).

As detailed in Section 1, this plan aims to minimise on-site erosion and off-site sedimentation, and therefore reduce adverse environmental impacts.

## 4.2 Project Impact Assessment

Table 4 provides a summary of potential environmental impacts from various activities on this project.

**Table 4: Summary of potential impacts during construction.**

| Proposed activity | Potential impact(s) |
|---|---|
| Vegetation clearing and grubbing | Increased erosion as a result of loss of ground cover. Potential offsite sedimentation impacts.<br>Potential for sediment-laden runoff into existing stormwater system or receiving waters.<br>Accidental disturbance outside of clearing limits. |

| Proposed activity | Potential impact(s) |
|---|---|
| Earthworks - general | Increased erosion due to exposure of soils. Potential offsite sedimentation impacts.<br>Potential for sediment-laden runoff into existing stormwater system or receiving waters.<br>Disturbance of areas outside the Project footprint.<br>Potential for rocks or sediments to be tracked onto public roads.<br>Potential for dust to be blown offsite, impacting neighbours. |
| Works in and adjacent to waterways. | Sediment impacts during piling, rock placement or filling.<br>Mobilisation of existing sediment.<br>Flows and floods could scour active or completed works.<br>De-watering risks (see below). |
| Earthworks or piling works below the alluvial water table | Potential groundwater ingress, leading to the need for de-watering (see below).<br>Potential for pollution of groundwater. |
| Earthworks in areas prone to flooding | Potential for floods to inundate active work areas, causing erosion.<br>Potential for construction activities to impact flood heights and flowpaths. |
| Loading and transport of materials | Potential for sedimentation impacts in receiving waters.<br>Potential for rocks or sediments to be tracked onto public roads, leading to traffic safety issues and pollution of stormwater systems and receiving waters.<br>Potential for dust to be blown from trucks or plant, impacting neighbours. |
| Stockpiling of materials | Potential for sediment-laden runoff to wash offsite into waterways or stormwater systems.<br>Potential for dust to be blown offsite, impacting neighbours. |
| De-watering of groundwater inflows into excavations | Potential for polluted water to be accidentally discharged offsite. |
| Construction or modification of stormwater drainage systems | Potential for accidental discharge of sediment-laden runoff into waterways or drainage systems.<br>Risk of flows in stormwater systems flooding or damaging unfinished works.<br>Potential for construction activities to modify flowpaths. |

## 4.3 Machinery

Expected plant, machinery and vehicles onsite includes (but is not limited to):

- Excavators
- Rollers (smooth drum and padfoot)
- Piling rigs
- Graders
- Crane(s) for bridge decks, culverts and pipes
- Heavy combination truck and trailers
- Body trucks
- Light vehicles.

# 5 EROSION AND SEDIMENT CONTROL STRATEGY

## 5.1 Safeguards

Table 5 contains a series of safeguards for the management of erosion and sediment control on this project. As previously noted, these safeguards adopt a focus on erosion control to avoid the need to install bird-attracting structures such as sediment basins.

**Table 5: Erosion and sediment control safeguards for this project.**

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| **General** | | | |
| G1 | Progressive ESCPs will be prepared for each specific stage or parcel of work prior to commencing construction in consultation with construction staff. These will be prepared in accordance with this table of safeguards and in consideration of the Over-arching drawings in Appendix C. | Environment manager<br>Construction manager<br>Project engineers | Prior to construction |
| G2 | A register of Progressive ESCPs will be maintained in the Project office, along with copies of all current Progressive ESCPs. | Environment manager | During construction |
| G3 | Progressive ESCPs will be approved for use by the Environment Manager (or their representative). | Environment manager<br>Construction manager | Prior to construction |
| G4 | Proposed water sources for construction activities will be determined by the Environment Manager. All necessary approvals and licences will be obtained before commencing extraction. | Environment manager | During construction |
| G5 | Groundwater must not be extracted unless approval is obtained from the ACT EPSDD and the Principal. | Environment manager | During construction |
| G6 | All erosion and sediment controls will be designed and installed in accordance with best-practice guidelines such as with the Blue Book Volumes 1 and 2D (Landcom, 2004 and DECC, 2008) or the ACT (2022) guidelines. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| G7 | Weather forecasts will be monitored daily and relevant information passed onto construction personnel to allow for adequate planning for significant rain events. | Environment manager | During construction |
| G8 | Daily rainfall will be recorded in a register in the Project office. | Environment manager | During construction |
| G9 | Relevant documentation and systems for recording environmental activities will be implemented including:<br>• Environmental inspection checklist;<br>• Progressive ESCP updates and amendments. | Environment manager | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| G10 | Key management structures such as sediment basins and clean water diversions will be installed as early works to assist in effective site management. (i.e. prior to clearing and stripping) wherever practicable. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| G11 | Sufficient supplies of erosion and sediment control materials/products will be stored on site at all times. Storage locations will be provided in suitable location/s within the site compound(s). | Environment manager<br>Construction manager | During construction |
| G12 | Environmental incidents where pollution is caused or threatened will be managed in accordance with the CEMP. | Environment manager<br>Construction manager | During construction |
| G13 | Tannins from cleared vegetation are to be minimised and managed following the Tannin Management Plan. | Environment manager | During construction |
| G14 | Environmental performance will be monitored and this Primary ESCP (and subsequent Progressive ESCPs and procedures) will be reviewed, updated and amended in accordance with the schedule in Section 6 of this Primary ESCP. | Environment manager | During construction |
| **Training and Resources** | | | |
| B1 | Erosion and sediment control aspects will be included in the site induction process for this project. | Environment manager<br>Construction manager | Prior to and during construction |
| B2 | An erosion and sediment control specialist (soil conservationist) will be engaged and retained for the Project duration to provide advice on erosion and sediment control. | Environment manager | Prior to and during construction |
| B3 | Erosion and sediment control training will be provided to relevant project staff in accordance with Section 5.2. | Environment manager | Prior to and during construction |
| **Erosion Control – Ground Cover** | | | |
| E1 | Disturbance will be minimised to only that necessary for the upcoming works. | Environment manager<br>Construction manager<br>Project engineers | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| E2 | Progressive ESCPs will include a distinct focus on source control to minimise the generation of sediment from the Project. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| E3 | Temporary ground covers (e.g. geofabric, soil binders, tarps or similar) will be used to provide temporary surface protection prior to rainfall on batters. Rainfall forecast triggers are to be included in Progressive ESCPs, based on the relative risk of erosion on each batter. | Environment manager<br>Construction manager | During construction |
| E4 | Construction works will be planned to allow for timely and progressive stabilisation and rehabilitation of completed surfaces. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| **Sediment Control (Including Sediment Basins)** | | | |
| S1 | Turbid construction runoff from terrestrial construction areas will be directed into sediment retention devices (e.g. sediment basins, silt fences, mulch bunds etc). | Environment manager<br>Construction manager | During construction |
| S2 | In-stream sediment controls such as floating silt curtains must be fit for purpose and installed and maintained as per the manufacturer's recommendations. Refer to item W2 in this table. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| S3 | Sediment controls will only be removed after appropriate stabilisation (to 70% minimum ground cover) of the upslope catchment is achieved or if catchment conditions dictate that they are no longer required. | Environment manager<br>Construction manager | During construction |
| S4 | Stormwater pit protection will be used as necessary, taking care not to create traffic or flooding impacts. | Environment manager<br>Construction manager | During construction |
| S5 | Sediment basin settling zones are to be designed for the 5-day, 85$^{th}$ percentile rainfall depth of 32.2mm, with a sediment storage zone designed for not less than 2 months' soil loss. | Environment manager<br>Project engineers | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| S6 | Sediment basins are to have a stable spillway (designed for stability in a 100-year ARI event), lined inlet point(s), and a marker showing the top of the sediment storage zone and 60% capacity of the sediment storage zone. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| S7 | Sediment basins are to be maintenance-cycled within 5 days of the cessation of rainfall so that the basin is empty, ready for the next rain event. Note that rainfall (sufficient to cause runoff) within the 5 day maintenance period will reset the 5 day timeframe. | Environment manager<br>Construction manager | During construction |
| S8 | Water detained in sediment basins that is to be discharged from the Project must achieve the water quality requirements detailed in the John Holland Dewatering Procedure.<br>Water that will be reused for onsite purposes does not require treatment. | Environment manager<br>Construction manager | During construction |
| S9 | Sediment controls are to be de-silted if more than 60% of their storage capacity is full. Sediment removed from basins is to be added to an active stockpile or blended with site spoil. | Environment manager<br>Construction manager | During construction |
| S10 | Construction-phase sediment basins are not to be decommissioned or converted to permanent (operational-phase) sediment basins until their contributing catchment is rehabilitated or stabilised to at least 70% ground cover. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| **Access and Sediment Tracking** | | | |
| A1 | All vehicles leaving site will be required to ensure tyres, guards and drawbars are clear of excess sediment. | Environment manager<br>Construction manager | During construction |
| A2 | Use stabilised access points (including rumble grids or wheel washes) where vehicles exit onto public roads from unsealed work areas. | Environment manager<br>Construction manager | During construction |
| A3 | Use berms or speed humps at gates to keep ‘clean’ offsite water out and ‘dirty’ onsite water in (as required). | Environment manager<br>Construction manager | During construction |
| A4 | Use street sweepers and broom trucks as required on public sealed roads. | Environment manager<br>Construction manager | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| A5 | Cover loads to minimise soil loss during transport. | Environment manager<br>Construction manager | During construction |
| A6 | Vehicle movements from site will be minimised during wet weather if the tracking of mud may become an issue. Haul roads will be stabilised if they become a significant source of sediment using chemical sealers (e.g. Vital HR), or similar. | Environment manager<br>Construction manager | During construction |
| A7 | Clearly delineate access tracks, boundaries, exclusion zones and sensitive environmental areas using flagging, tape or similar. | Environment manager<br>Construction manager | Prior to and during construction |
| **Drainage Control** | | | |
| D1 | As much as possible, separate 'clean' (offsite) run-on water from 'dirty' (onsite) construction area runoff. | Environment manager<br>Construction manager | During construction |
| D2 | Maximise the diversion of sediment-laden construction runoff into sediment controls. Use berms, bunds, sandbags, drains, pipes etc to achieve this. | Environment manager<br>Construction manager | During construction |
| D3 | Control runoff during the construction of batters (e.g. temporary windrows and batter chutes) to minimise the risk of scour. | Environment manager<br>Construction manager | During construction |
| D4 | Areas subject to concentrated flow (e.g. diversion and catch drains, batter chutes, piling platforms) are to be lined to minimise the risk of erosion. | Environment manager<br>Construction manager | During construction |
| D5 | Outlets of culverts/pipes are to include appropriate energy dissipation structures (e.g. scour rock). | Environment manager | During construction |
| **Works in Waterways or Stormwater Systems** | | | |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| W1 | Environmental Work Method Statements (EWMS) incorporating erosion and sediment controls are to be prepared for all works within 40m of the waterway.<br>EWMS are to indicate the specific controls to be used when working in and around the river and will include (but are not limited to):<br>• Monitoring weather forecasts and taking appropriate action prior.<br>• Monitoring flows to aid with access.<br>• Minimising the extent of work and the amount of time of disturbance.<br>• Using clean rock, sheeting, steel plates, sheet piling or similar measures to isolate work areas from natural flows.<br>• Wherever practical, use of temporary ground covers to minimise erosion of exposed soils during rainfall or high flows.<br>• Permanent scour protection and stabilisation measures required for the operational phase will be installed early, where practical. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| W2 | If floating sediment curtains are used they must be fit for purpose and installed and maintained as per the manufacturer's recommendations. | Environment manager<br>Construction manager<br>Project engineers | Prior to construction |
| W3 | Where possible, sheet piling or shoring will be used to create piling or crane platforms in or around the waterway to minimise the footprint of disturbance. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| W4 | Clean rock will be used in waterways as required to form dissipaters, piling platforms, create crossing points or line channels. Work platforms or access tracks required in the vicinity of waterways will be constructed of large clean rock material wrapped or underlain with geofabric. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| W5 | Any working platforms in a waterway will extend only as far as is necessary for safe and efficient construction, and must maximise the remaining width of the channel. | Environment manager<br>Construction manager | Prior to and during construction |
| W6 | Stabilisation of drainage lines is to be commenced immediately after the completion of any works within these areas. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| W7 | Any temporary waterway crossings that span the full width of a waterway are to maintain fish passage through the use of pipes (or similar) | Environment manager<br>Construction manager<br>Project engineers | During construction |
| W8 | Any temporary waterway crossings will include diversion humps or dips either side of the crossing to minimise the risk of dirty site water washing onto the crossing. | Environment manager<br>Construction manager | During construction |
| W9 | Works to replace or re-route stormwater pipes will be staged to minimise the exposure time, and will be scheduled for dry weather wherever possible. Stores of temporary ground covers (e.g. geofabric) will be kept onsite to stabilise open trenches or exposed sections should rain occur during works. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| W10 | As much as possible, temporary flowpaths will be maintained while stormwater pipes are being replaced or re-routed. If temporary diversion is not possible, pipe flows can be dammed and pumped around work areas but only for short periods. | Environment manager<br>Construction manager<br>Project engineers | Prior to and during construction |
| **Stockpiling and Soil Management** | | | |
| P1 | Stockpiles are to be located and managed as per the Stockpile Management Plan. | Environment manager<br>Construction manager | Prior to and during construction |
| **Dust Control** | | | |
| U1 | Dust suppression will be carried out whenever necessary to minimise sediments becoming air borne due to wind erosion. | Environment manager<br>Construction manager | During construction |
| U2 | Wherever possible, water detained onsite will be re-used for dust control. | Environment manager<br>Construction manager | During construction |
| U3 | Cover dust-creating loads while in transit on public roads. | Environment manager<br>Construction manager | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| U4 | Monitor weather forecasts to identify hot, windy and/or dry conditions when dust rise might be significant. On days when the risk of dust rise is determined to be high, this will be communicated to all relevant personnel onsite and included in the work planning for the day. | Environment manager<br>Construction manager | During construction |
| U5 | Visually monitor dust rise on unsealed laydown and storage areas. | Environment manager<br>Construction manager | During construction |
| **Clearing and Stripping** | | | |
| L1 | Relevant erosion and sediment control measures will be implemented in accordance with the Blue Book (Landcom, 2004) for each particular section of works as part of initial vegetation clearing and before stripping or earthworks (other than works required to install such controls). | Environment manager<br>Construction manager | Prior to and during construction |
| L2 | Clearing limits and work boundaries will be established and clearly defined prior to any construction, clearing or stripping works commencing. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| L3 | All vegetation that is to be maintained will be clearly delineated. | Environment manager<br>Construction manager | During construction |
| L4 | Land clearing will occur progressively and for the areas associated with the current section/stage of works only. | Environment manager<br>Construction manager<br>Project engineers | During construction |
| L5 | As much as possible, tree removal in waterways will involve cut stump method, leaving grasses and small understorey species undisturbed | Environment manager<br>Construction manager<br>Project engineers | During construction |
| **De-Watering and Water Harvesting** | | | |
| M1 | Wherever possible, water detained onsite will be re-used for dust control and other non-potable uses. This includes surface water accumulating within any sort of excavation, trap, trench or low point on site (but not groundwater inflows). | Environment manager<br>Construction manager | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| M2 | Dewatering is to be conducted in accordance with the Dewatering Procedure in the SWMP. | Environment manager<br>Construction manager | During construction |
| M3 | If Turbidity (NTU) is to be used instead of TSS (mg/L), a statistical correlation is to be developed based on at least six samples of each. The correlation is to be reviewed after each 4th discharge event to confirm ongoing accuracy, or to review the appropriate adjustment of the NTU limit equivalent to 50mg/L. | Environment manager | During construction |
| **Wet Weather Preparedness and Response** | | | |
| R1 | Prior to forecast rainfall events of 10mm or more, end-of-day controls will be considered to help reduce erosion and control sediment. These might include one or more of the following:<br>• Check dams<br>• Slope breaks<br>• Batter chutes<br>• Fill windrows<br>• Temporary ground covers.<br>This will be detailed on Progressive ESCPs. | Environment manager<br>Construction manager | During construction |
| R2 | Prior to forecast heavy rainfall (more than 10mm forecast), the Environment manager or their representative will inspect active work areas and note any areas requiring additional management measures. Refer to the section on Site Inspection in this table. | Environment manager | During construction |
| **Site Inspection** | | | |
| I1 | The Environment Manager (or their representative) will inspect erosion and sediment controls measures across the site:<br>• at least fortnightly; and<br>• prior to forecast rainfall of 10mm or more;<br>• within 3 hours (during work hours) or 24 hours (outside of work hours) of rainfall exceeding 10mm commencing; and<br>• if safe to do so, following rainfall of 10mm or more.<br>Inspections will include checks of drainage, erosion and sediment controls and site discharge points to determine effectiveness and maintenance requirements. Inspections will consider issues such as:<br>- Sediment transport and or deposition either on or off site;<br>- Evidence of excessive erosion;<br>- Any additional controls required;<br>- Temporary stabilisation;<br>- Any updates required to Progressive ESCPs;<br>- Maintenance, treatment and or de-watering requirements; and<br>- Stability of reinstatement, rehabilitation and revegetation works. | Environment manager | During construction |
| I2 | Records will be kept of all inspections (logs, reports, photos etc.) along with recommendations, actions and close-outs. | Environment manager | During construction |

| Item | Detail | Responsibility | Timing |
|---|---|---|---|
| I3 | Corrective maintenance to address any damage to erosion and sediment controls is to be scheduled and completed as necessary (i.e. prior to rainfall events). | Environment manager<br>Construction manager | During construction |
| **Stabilisation and Rehabilitation** | | | |
| V1 | Stabilisation and rehabilitation is to be undertaken in accordance with the Site Stabilisation Plan and/or Landscaping Plans. | Environment manager<br>Construction manager | During construction |

## 5.2 Erosion and Sediment Control Training

Erosion and sediment control training will include (but not be limited to) the following topics:

- Environmental legislation
- The environmental impacts of erosion and sedimentation from construction sites
- Principles of erosion and sediment control
- Techniques for erosion and sediment control
- Inspecting and maintaining erosion and sediment controls
- Dewatering.

# 6 PERFORMANCE TRACKING AND DOCUMENT REVIEW

## 6.1 Reporting

Reporting is required as part of the CEMP. Refer to that document for relevant requirements.

A requirement for inspection of erosion and sediment controls is included in Table 5 in Section 5, along with a requirement to document those inspections (Item I2).

## 6.2 Record Keeping

All documents and records referred to within and required to implement this Primary ESCP (including relevant Progressive ESCPs) will be maintained according to the Project's QA and record management system. Refer to the CEMP for details.

## 6.3 Non-Conformance, Corrective and Preventative Actions

Environmental inspection, observation and monitoring results are interpreted to identify actual and potential non-conformances with this Primary ESCP and events that may result in nuisance, environmental harm or unacceptable loss of amenity or community complaints.

Refer to the relevant John Holland process relating to non-conformance as detailed in the CEMP. All incidents and non-conformances and their corresponding actions will be entered into John Holland's internal tracking system and then closed out.

## 6.4 Document Review

Continual improvement is achieved through constant measurement and evaluation, audit and review of the effectiveness of the plan, and adjustment and improvement of the CEMP and relevant sub-plans.

This Primary ESCP will be updated as required:

- To take into account changes to the environment or generally accepted environmental management practices, new risks to the environment, or changes in law;
- Where required by the client, the EPSDD or any other regulatory authority; or
- In response to internal or external audits or regular management reviews.

The updated plan must be endorsed and approved internally by the Environment Manager.

Minor changes do not require approval. Minor changes would typically include those that:

- Are editorial in nature (e.g. staff or name changes);
- Do not increase the magnitude of impacts on the environment when considered individually or cumulatively;
- Do not compromise the ability of the Project to meet approval or legislative requirements.

Preparation of Progressive ESCPs as required by this Primary ESCP does not warrant updating this Primary ESCP unless one of the above update triggers occurs as part of preparing the Progressive ESCP.

# 7 REFERENCES

DECC (2008). *Managing Urban Stormwater: Soils and Construction.* Volume 2D: Main Road Construction. NSW Government, Sydney.

IECA (2008). *Best Practice Erosion and Sediment Control.* IECA Australasia, Picton NSW.

Landcom (2004). *Managing Urban Stormwater: Soils and Construction.* Volume 1. NSW Government, Sydney.

OEH NSW Government eSpade web portal. www.espade.environment.nsw.gov.au

# 8 APPENDIX A: CV FOR ANDREW MACLEOD

Overpage



# Andrew Macleod

B.Sc (Hons.) CPSS CPESC

Director and Principal Scientist

SEEC

Strategic Environmental and Engineering Consulting

Andrew is an expert in all aspects of soil and water management. He is a recognised industry leader in construction-phase erosion and sediment control and conducts regular training, consulting and expert witness services in this field.

Andrew has worked on a wide range of sites including mines, gas projects, major infrastructure projects (road and rail), pipelines and subdivisions. He was also President of the International Erosion Control Association (IECA) in Australasia, a position he held for 8 years.

Andrew is a Director of SEEC and one of our Principal Environmental Scientists. He is a Certified Professional in Erosion and Sediment Control (CPESC) and a Certified Professional Soil Scientist (CPSS).

## Qualifications

- Bachelor of Science (Applied Physical Geography) with Honours. UNSW (1999)
- Certified Professional in Erosion and Sediment Control (CPESC #3678)
- Director, International Erosion Control Association (IECA) Australasian Chapter 2011 to present
- Certified Professional Soil Scientist (CPSS # 1152)
- President, International Erosion Control Association (IECA) Australasian Chapter 2012 to 2018, and 2019 to 2021
- Director, Bowral Cricket Club 2011 to 2019
- Member of the Australian Society of Soil Science Incorporated (ASSSI)
- Member of the International Erosion Control Association (IECA)

## Awards

- IECA Presenter of the Year 2021. “Down Under Erosion and Sediment Control.” IECA EC21 Global Conference
- Kevin Bennet Memorial award for the Best Paper: “MUSIC Calibration Based on Soil Conditions.” Stormwater Industry Association (SIA) NSW and Qld Joint Annual Conference, 2008.
- Merit Commendation for Education or Innovation: SEEC Half-Day Erosion and Sediment Control Workshop, Stormwater Industry Association Awards, 2010

## Areas of Technical Expertise

- Construction site erosion and sediment control
- Water sensitive urban design
- Soil survey/soil landscape/land capability mapping
- Water quality modelling and surface water management
- Site rehabilitation and revegetation
- Research projects and field trials
- Dryland salinity (rural and urban)
- Fluvial and landscape geomorphology
- Onsite wastewater management
- Environmental impact assessment
- Presentation of seminars/workshops on soil and water management
- Water treatment, sediment and nutrient control

## Recent Project Experience

| Dates | Client | Project | Services provided |
|---|---|---|---|
| 2018 to 2023 | CPB, John Holland, Dragados JV | WestConnex 3B Rozelle Interchange, Sydney | Contractor-appointed soil conservationist. Services include preparation of ESCPs, input into project plans and documentation, site inspections and review of onsite erosion and sediment controls. |
| 2021 to present | Suburban Land Agency (SLA) | Whitlam, ACT | Provide auditing and advice to SLA regarding erosion and sediment control for major urban land releases in the ACT. |
| 2020 to present | Seymour Whyte | Nelligen Bridge, NSW | Contractor-appointed soil conservationist. Services include preparation of ESCPs, input into project plans and documentation, site inspections and review of onsite erosion and sediment controls. |
| 2021 to present | CPB Downer JV | Warringah Freeway Upgrade | Preparation of construction water quality discharge assessment for EPL. |
| 2018 to 2020 | TfNSW | Coffs Harbour Bypass, NSW | Preparation of ESMR including ESCPs. Input to the Discharge Impact Assessment to assist with EPA requirements for issue of an EPL. |
| 2017 to 2020 | CPB | Mackay Ring Road, Qld | Independent erosion and sediment control audits including peer-review of third-party ESCPs. |
| 2013 to 2019 | JKC Australia | Ichthys Project, NT | Preparation of wet-season ESCPs for Ichthys Onshore site. Provide training and independent review/audit services during and post construction. |
| 2018 to present | Fulton Hogan | Nowra Bridge, NSW | Contractor-appointed soil conservationist. Services include compliance monitoring, ongoing advice plus review and CPESC sign off of ESCPs. |
| 2020 to 2021 | GHD | M12 Motorway Central | Preparation of ESMR including ESCPs during design phase to meet TfNSW specifications. Preparation of construction water quality discharge assessment for EPL. |
| 2020 to 2021 | WSP | M12 Motorway West and Elizabeth Drive | Preparation of ESMRs including ESCPs during design phase to meet TfNSW specifications. |
| 2016 to 2021 | NSW DPIE | Various | Expert witness in the NSW Land and Environment Court on erosion and sediment control and water quality issues, numerous projects. |
| Ongoing | Centre for Environmental Training | Erosion and sediment control workshops | Teaching comprehensive 4-day workshops about erosion and sediment control on construction sites. Recent workshops run over four days have been conducted in Sydney, Brisbane and Melbourne |
| 2019 to 2021 | CPB Downer JV | Parramatta Light Rail | Provide expert soil conservationist expertise and advice during construction. |
| 2017 to 2021 | JHCPBG JV | Sydney Metro 2 | Provide expert soil conservationist expertise and advice before and during construction, plus provide half-day ESC training. |
| 2018 to present | Leed and FGJV | Snowy 2.0 | |
| 2020 | Bathurst Council | Bathurst Regional Kart Track | Preparation of an ESCP for construction of a new kart track on Mount Panorama. |

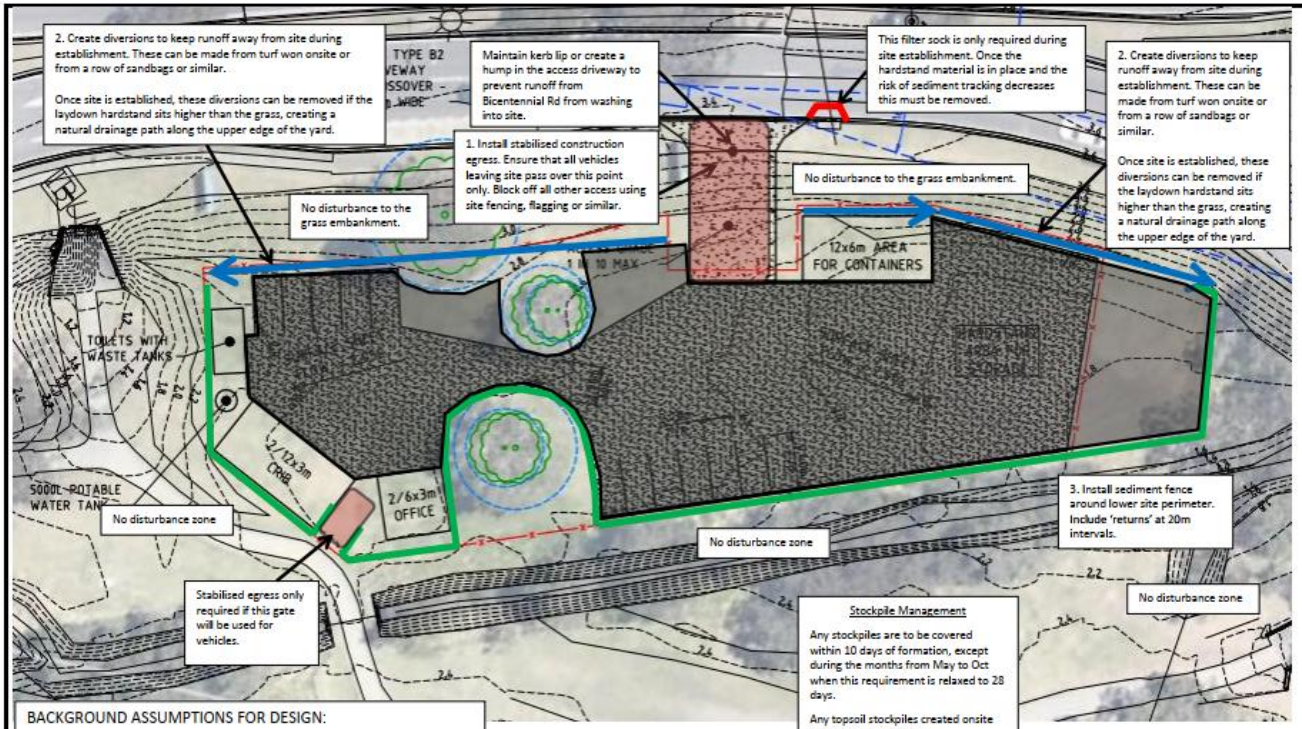
## Contact Details


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# 9 APPENDIX B: EXAMPLE PROGRESSIVE ESCP

Overpage. Note that the Progressive ESCP shown is not for this project, but shows the typical inclusions in a Progressive ESCP.

**PROGRESSIVE EROSION AND SEDIMENT CONTROL PLAN:** _____




BACKGROUND ASSUMPTIONS FOR DESIGN:

RUSLE: R x K x LS x P x C
- R: 4420
- K: 0.05 (assumed)
- LS: 0.19 (1% slope, 80m length)
- P: 1.3
- C: 1.0

RUSLE = 55 t/ha/yr

Install rain gauge near site offices. Record daily totals.

Sweep roads as necessary to remove rocks or excess sediment.

Monitor the filter sock around the existing stormwater pit on Bicentennial Road to ensure it does not impede the safe egress of water into the pit, nor the safety of vehicles.

INSTRUCTIONS

1. Install stabilised construction egress (see detail)
2. Install basic diversion berms in the locations shown.
3. Install sediment fences. Refer to detail.
4. Only once all erosion and sediment controls are in place can stripping and earthworks occur.
5. Wherever possible, remove topsoil from site to minimise the need for stockpiling (reduces the erosion hazard).
6. Dust suppression using water carts will be undertaken as necessary to minimise the risk of dust rise.
7. Sweep local roads as necessary to remove soil/rocks.
8. All erosion and sediment control measures will be monitored and cleaned out or replaced as necessary.
9. Stormwater will only be pumped from site when it has achieved the required water quality:
   - 50mg/L TSS (up to rain of 33.9 mm in 5 days)
   - No visible oils and greases
   - No visible wastes or litter
10. All erosion and sediment control measures will be inspected weekly and the following items documented:
    - Date of the inspection; and
    - Predicted weather for the week; and
    - Expected work to be done during the week; and
    - Risk of work/weather impacts; and
    - Any clean out of ESC devices required.
11. Rehabilitate and/or stabilise disturbed areas as soon as practicable.

LEGEND

| | |
|---|---|
| | Stabilised site egress. Refer to standard detail Exit-01 and 02. |
| | Sediment fence (Type 3 control). Refer to standard detail SF-01 and 02. |
| | Clean water diversion, made from turf won onsite or from sandbags (or similar). |
| | Pit protection filter sock (refer to detail FS-01). |
| | FCR hardstand area (approximate). |

This plan is designed to meet best-practice requirements for this project and the works detailed herein.

| Hold Point for Erosion and Sediment Control | Hold Point for Discharge or Reuse of Site Water |
|---|---|
| Erosion and Sediment Control Plans (ESCPs) will be developed for each area prior to the commencement of works and will be approved by the Site Superintendent prior to use. | Reuse or de-watering of any detained water onsite (from sediment basins or elsewhere) requires a Permit to Pump (reference!) in accordance with the Dewatering SOP (reference!). This is to be signed off by the Environment Manager (or delegate). |

| SIGNATURE | NAME | ROLE |
|---|---|---|
| | Andrew Macleod CPESC 3678 | Soil conservationist |
| | | Project engineer |
| | | Environment Representative |

| | | | |
|---|---|---|---|
| LOCATION: | Bicentennial Road Site Facility | | |
| DESCRIPTION OF WORKS: | Temporary site facility | | |
| DRAWING: | 01 | VERSION: | 00 |
| DATE: | 12 Nov 2015 | | |

# 10 APPENDIX C: OVER-ARCHING ESCP DRAWINGS AND TYPICAL SET-UP

Overpage.

# GENERAL REQUIREMENTS

## BACKGROUND

This is a Over-Arching Erosion and Sediment Control Plan (OESCP). It is for the M7 Widening works and shows the locations for erosion and sediment controls to be implemented for those works. Progressive ESCPs are to be prepared for each section or parcel of work in accordance with the OESCP. Progressive ESCPs are to take into account the controls shown in this OESCP. This OESCP has been prepared following the guidelines and standards in the NSW Blue Book Volumes 1 (Landcom, 2004) and 2D (DECC, 2008).

## EROSION HAZARD ASSESSMENT

**A = R x K x LS x C x P**

The following values have been used:

R : 2,500 (Based on R-factor map from the Blue Book - Appendix B, 2004)
K : 0.0456 (0.038 (Blacktown Soil Landscape) x 20% where dispersive soils are known to occur)
LS : ranges from 0.19 (80m, 1%) to 1.19 (80m, 5%)
C : 1.0 (Construction stage - i.e. no soil surface protection or ground cover applied)
P : 1.3 (for general construction areas)

Based on the above data, the potential soil loss at this site ranges from approx. 29 t/ha/yr to 176 t/ha/yr (Soil Loss Class 1 - 2: very low to low).

M7 Widening works are to be staged with the disturbed catchmets expected to be limited to less than 1 ha, with the potential catchment soil loss being 176 t/yr. Under Blue Book standards, a sediment basin is required if the soil loss in any catchment is >200 t/yr, therefore sediment basins are not required for these works.

## GENERAL INSTRUCTIONS

1. This plan is to be read in conjunction with other relevant environmental documentation for the project (e.g. CEMP, SWMP etc.)
2. Weather forecasts are to be monitored daily and the site prepared to minimise erosion, control drainage, and maximize sediment capture during rain events. Erosion and sediment controls removed or damaged during construction are to be repaired or reinstated prior to forecast rain.
3. Numbering on ESCP02-54 indicates the order that works are to be undertaken (i.e. 1 then 2, then 3 etc).
4. The M7 widening works are to be staged as much as possible to minimise the amount of disturbed areas at any one time.
5. Erosion and sediment controls are to be implemented as part of initial site works, except as noted in this plan.
6. Minimise disturbance at any one time to only what is necessary for safe and efficient construction. Do not disturb new areas when rain is imminent unless appropriate controls can be implemented prior to rain occurring.
7. Establish stockpile areas and manage stockpiles in accordance with Blue Book Standard Drawing SD 4-1 on ESCP58.
   7.1. Inactive stockpiles are to be stabilised by spraying with a biodegradable polymer or covering with geofabric, jute matting or equivalent ground cover to achieve at least 60% ground cover.
8. Undertake dust suppression as required to minimise dust rise.
9. Regular site inspections are to be conducted by the site environment manager (or their representative) of temporary controls and general site conditions and records of all such inspections are to be retained onsite. Inspections are to be undertaken:
   9.1. At least fortnightly; and
   9.2. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours); and
   9.3. Within 3 hours (during work hours) or 24 hours (outside of work hours) of rainfall exceeding 10mm commencing; and
   9.4. if safe to do so, following rainfall of 10mm or more.
10. Undertake progressive stabilisation of lands as final earthworks are completed in each area (rather than waiting until the completion of works).
    10.1. Final rehabilitation is to achieve the C-factors (ground cover) detailed below:
       10.1.1. C-factor of 0.1 (>= 60% ground cover) within 20 days; and
       10.1.2. C-factor of 0.05 (at least 70% ground cover) within 2 months/at completion of works.
    10.2. Areas to be revegetated are to be topsoiled first. Refer to Blue Book Standard Drawing SD 4-2 on ESCP58.
11. 10.3. Appropriate seedbed preparation should be carried out when revegetating lands (See Blue Book Standard Drawing SD 7-1 on ESCP59).
12. As areas are completed (i.e. at least 90% of any finished area has at least 70% final ground cover), temporary sediment and drainage controls can be decommissioned and removed.
13. Ensure all controls are located within the Clearing limits.
14. Progressive ESCPs are to be prepared for each section or parcel of work in accordance with the OESCP. Progressive ESCPs are to take into account the controls shown in this Over-arching ESCP.

## PRIOR TO FORECAST RAINFALL

Prior to forecast rainfall, erosion and sediment controls are to be inspected and the following implemented:

1. Check that pit protection is provided around all existing and proposed stormwater pits within the work area.
2. Check that earth banks are provided in the locations shown to form artificial sag points around existing/proposed stormwater pits.
3. Check that clean upslope water is diverted around disturbed areas via hotmix/coldmix/concrete/timber or similar bund, or has a lined, stable pathway across the work zone or directed into stormwater pits within the work area via temporary pipe or chutes. Ensure that dirty site water does not mix with the clean upslope water.
4. Check that dirty water is directed to stormwater pits with pit protection installed. Install temporary drains or bunds as required to ensure this.
5. Ensure that checks dams or contour berms/slope breaks are installed as shown on ESCP02-54.

## DE-WATERING AND DIRTY WATER TREATMENT REQUIREMENTS

De-watering and treatment of dirty water is to be undertaken in accordance with the Project SWMP or the below:

- Any active discharge of water from the project (i.e. where water is moved offsite via direct action such as pumping rather than flowing off the project as a result of heavy rainfall) is to achieve:
  - 50 NTU or less (or as required in the EPL); and
  - pH 6.5 to 8.5; and
  - <10mg/L oil and grease and no visible trace.
- Flocculation can be achieved by using gypsum at a rate of approximately 32kg/100 $m^3$ of stormwater. Refer to manufacturers guidelines for dosage details for alternative flocculants/coagulants. Note alternative flocculants/ coagulants require TfNSW approval prior to use.
- These de-watering requirements apply to dirty water accumulating in any sort of excavation, sump, or other ponded water body on the project.
- If the water is going to be used within the construction site for dust-suppression or construction purposes and will drain back into the sediment capture system it does not require treatment (except for pH, which must be between 6.5 and 8.5).

DRAFT

## DOCUMENT CERTIFICATION

This plan has been developed based on agreed requirements as understood by SEEC at the time of engagement. It applies only to a specific task on the nominated lands. Other interpretations should not be made, including changes in scale or application to other projects. Changes to the project scope or extent might impact on the validity of this plan.

Any recommendations contained in this plan are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, or as advised to us. Such recommendations are potentially subject to the limited scope and resources available. Within the confines of the above statements and to the best of my knowledge, this plan does not contain any incomplete or misleading information.

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

DRAFT

North

CLIENT: JOHN HOLLAND

SEEC
Suites 7 & 8, 68-70 Station Street
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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING ESCP BACKGROUND AND GENERAL INSTRUCTIONS – SHEET 1 OF 59

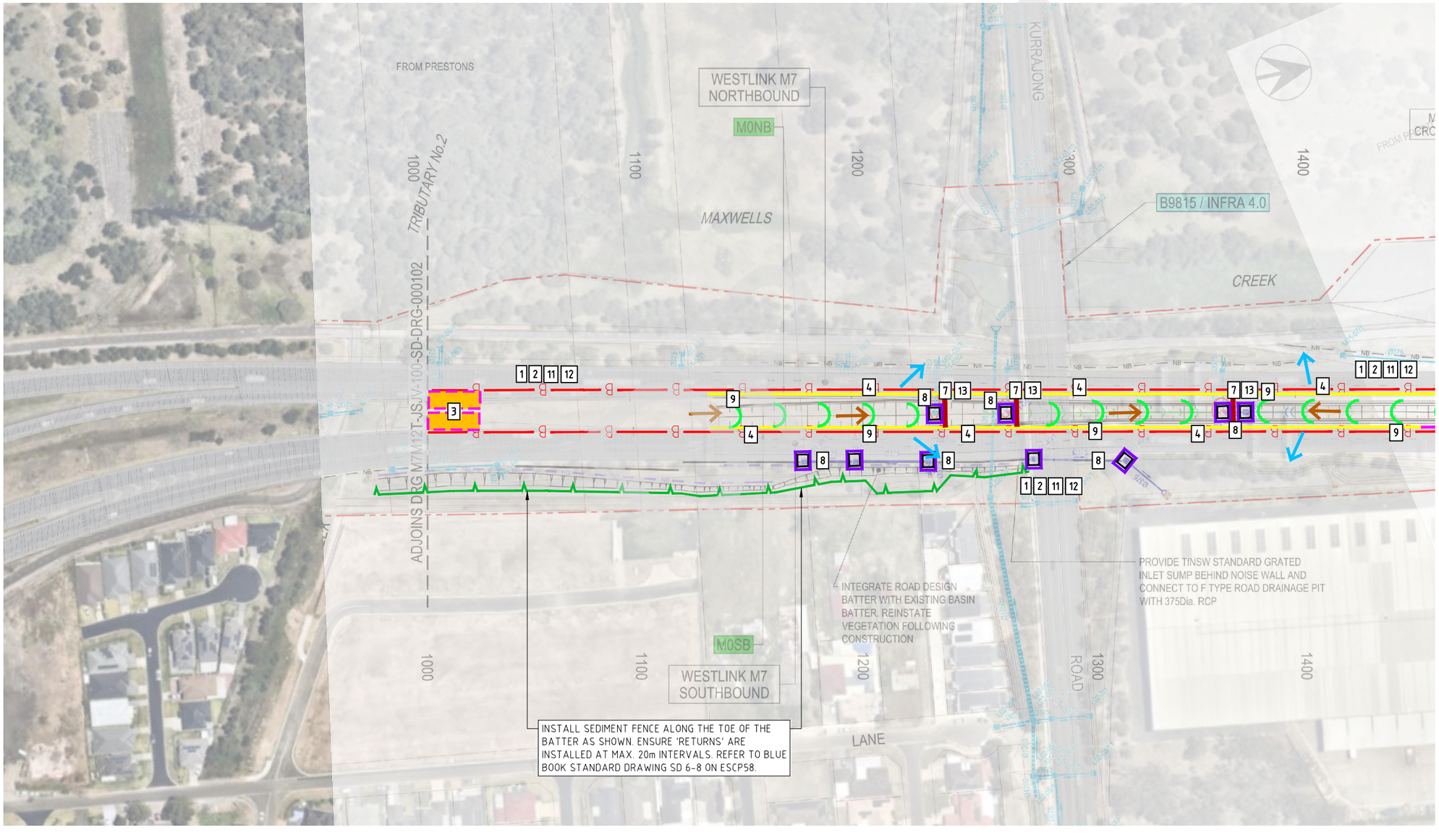
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP01 | A |

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Plot Date: Tuesday, 25 July 2023 10:11:51 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 2 OF 59

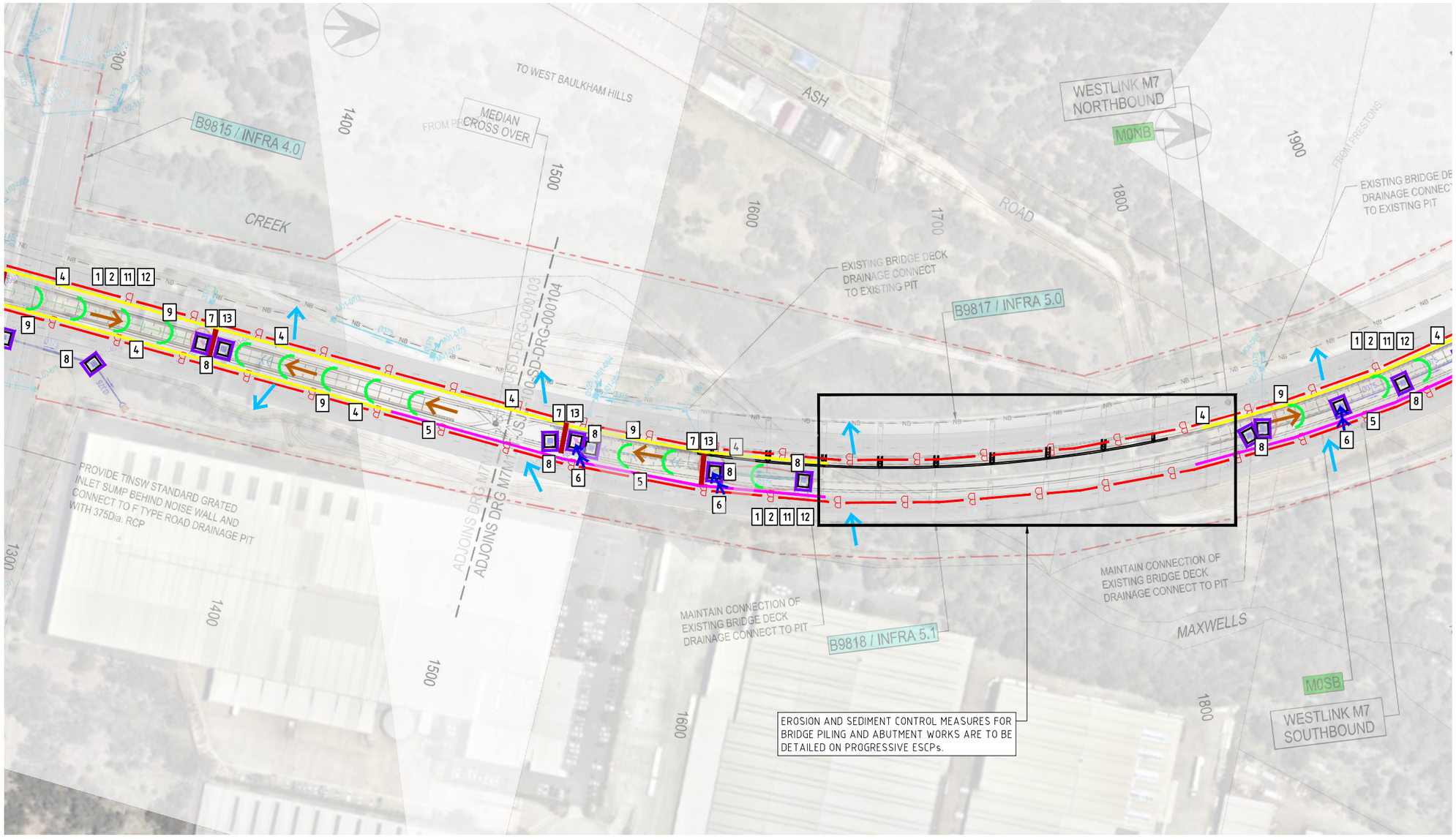
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP02 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
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| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND


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PROJECT TITLE: M7 WIDENING WORKS

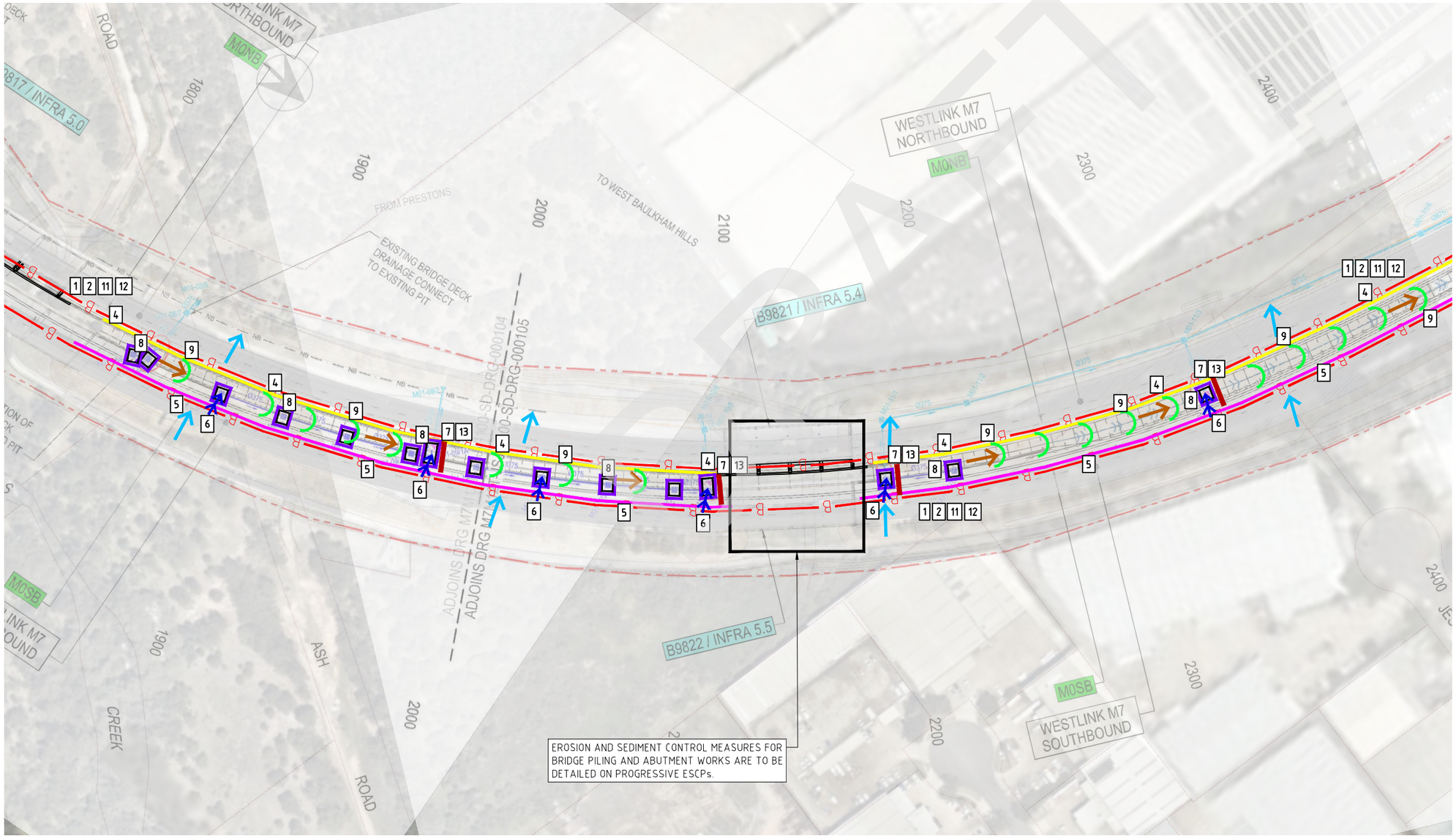
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 3 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP03 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
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   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
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### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 4 OF 59

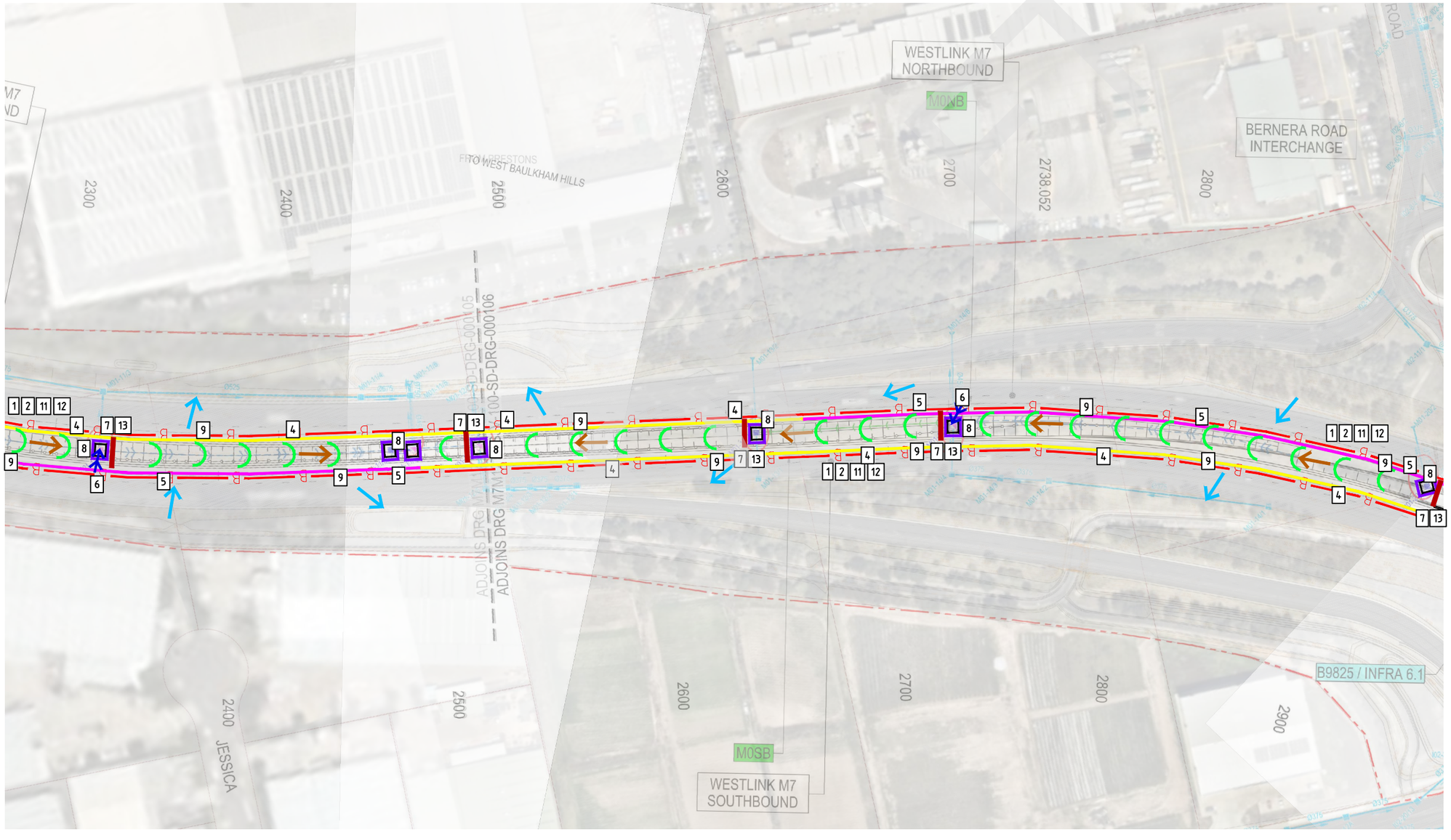
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP04 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
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## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

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|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 5 OF 59

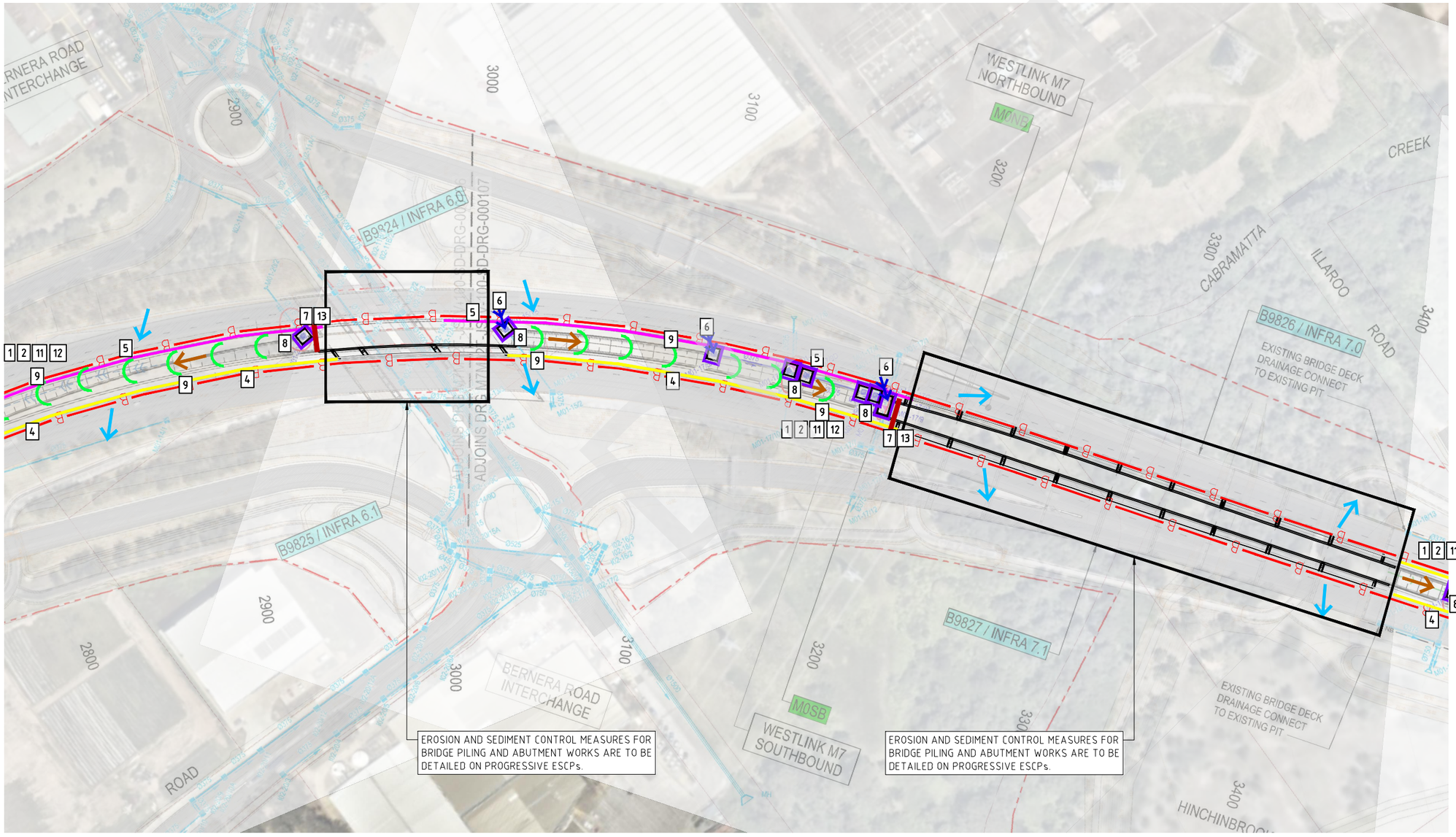
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
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| 23000072 | P03 | ESCP05 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

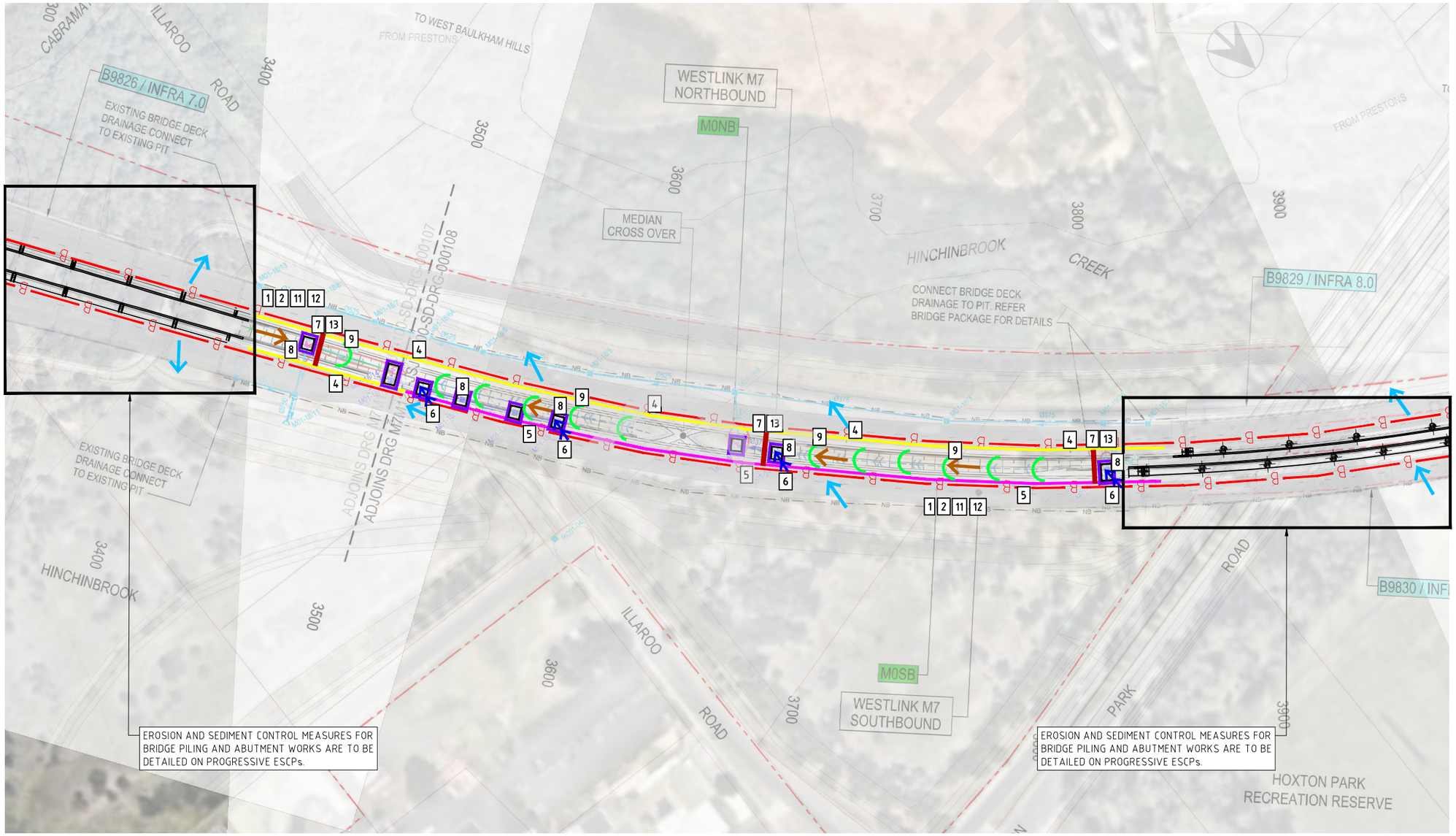
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 6 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP06 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
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   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 7 OF 59

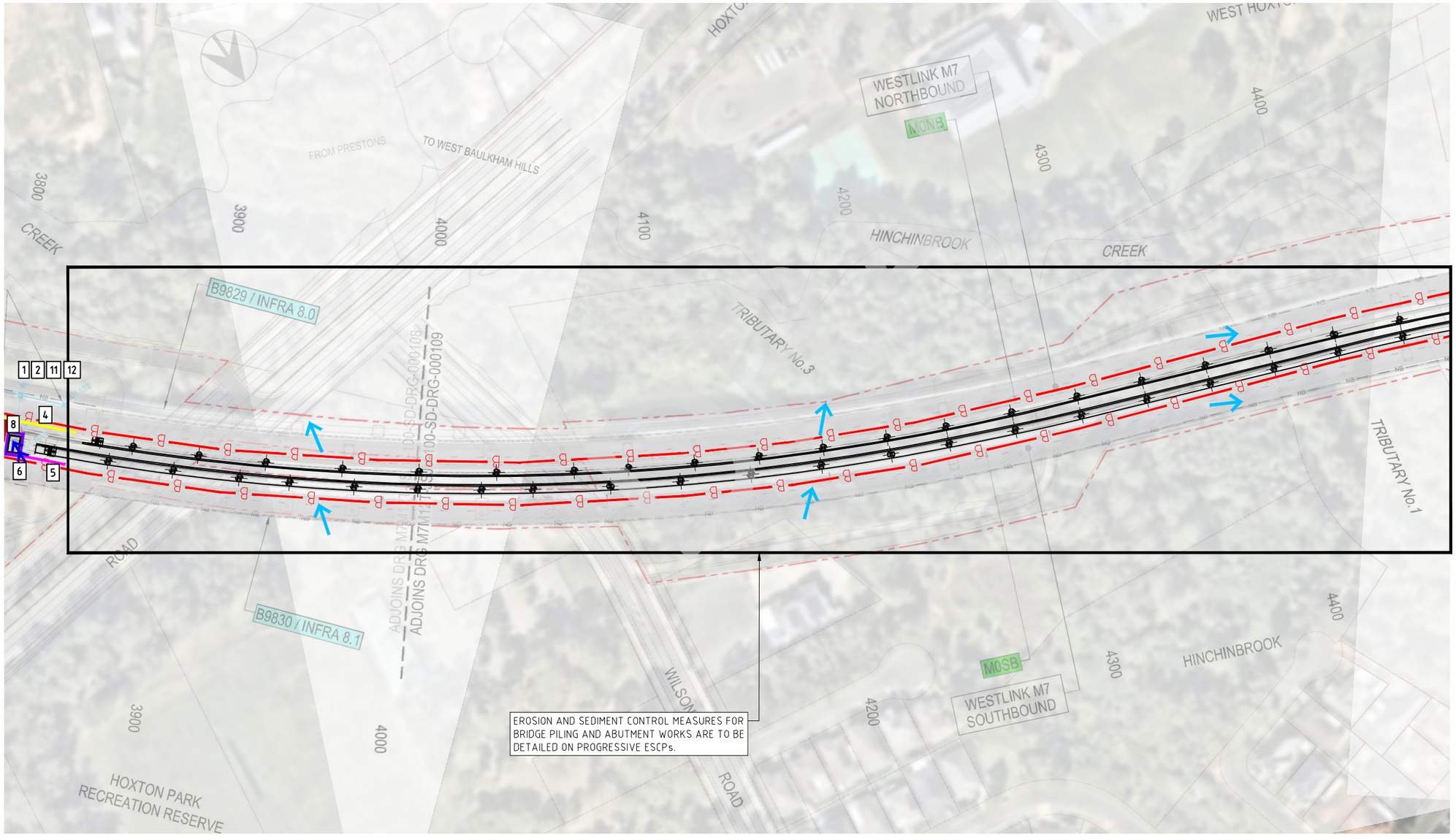
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP07 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 8 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP08 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
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   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
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### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
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- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 9 OF 59

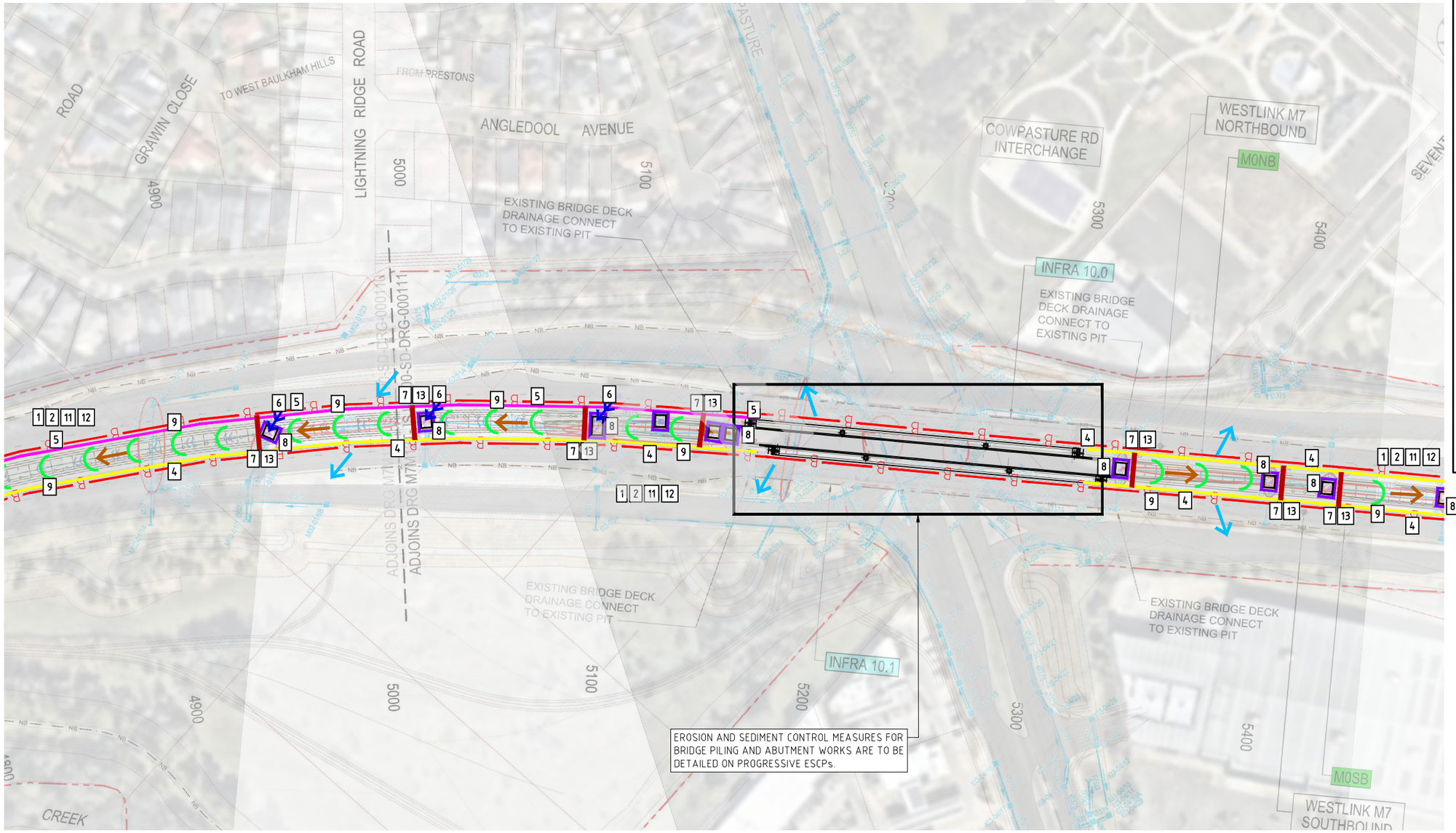
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP09 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
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   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 10 OF 59

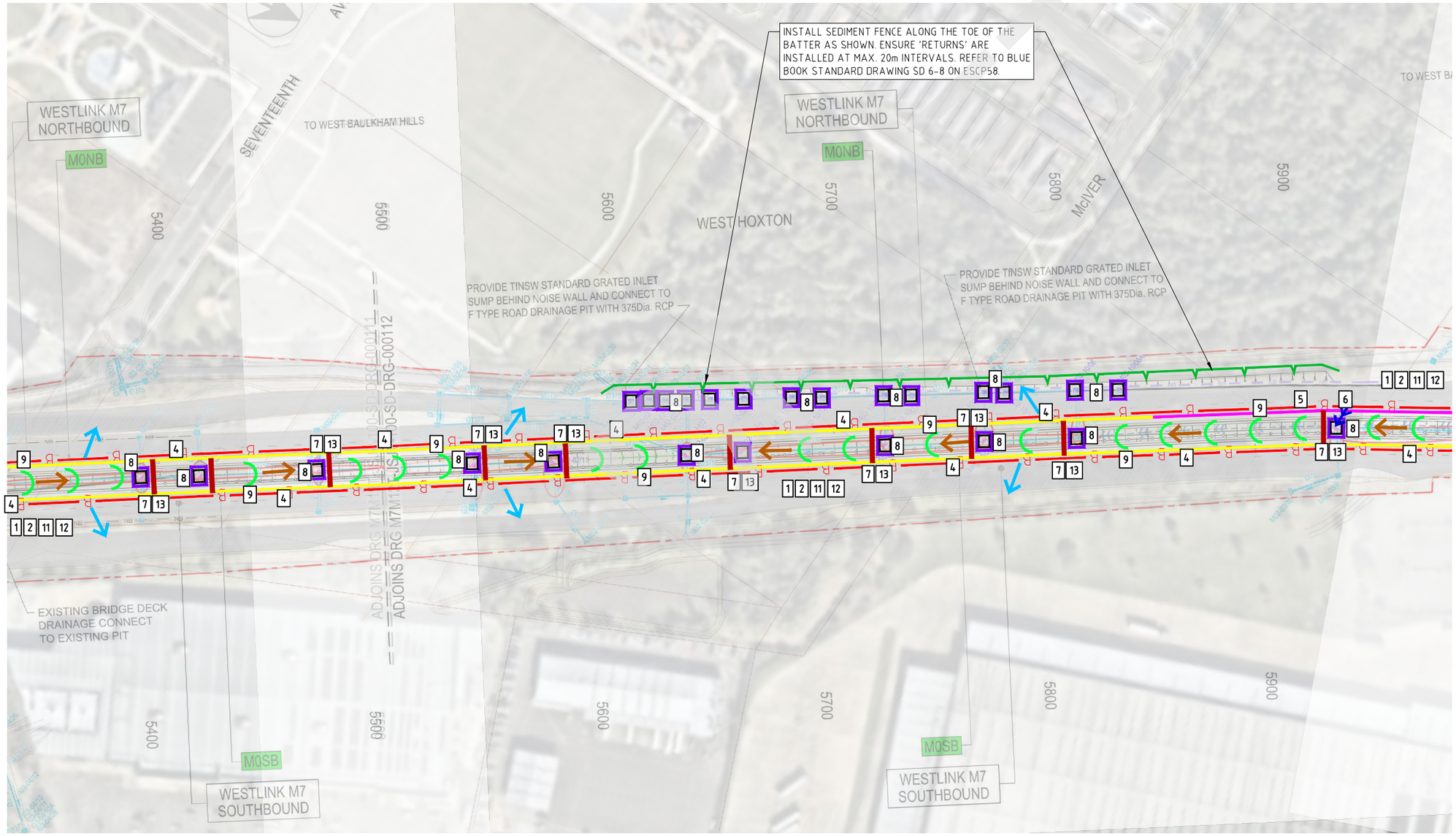
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP10 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 11 OF 59

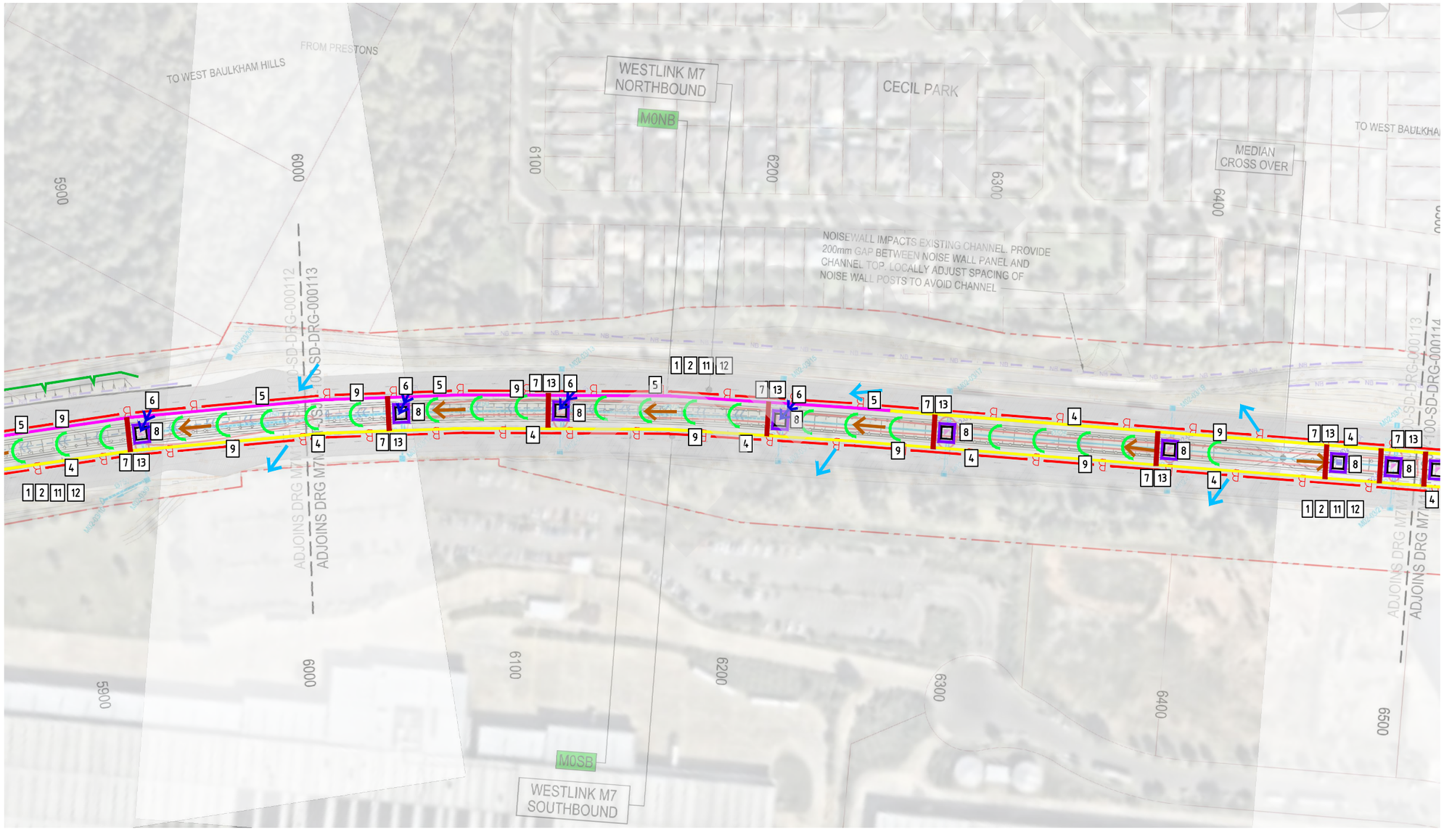
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|---|---|---|---|
| 23000072 | P03 | ESCP11 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 12 OF 59

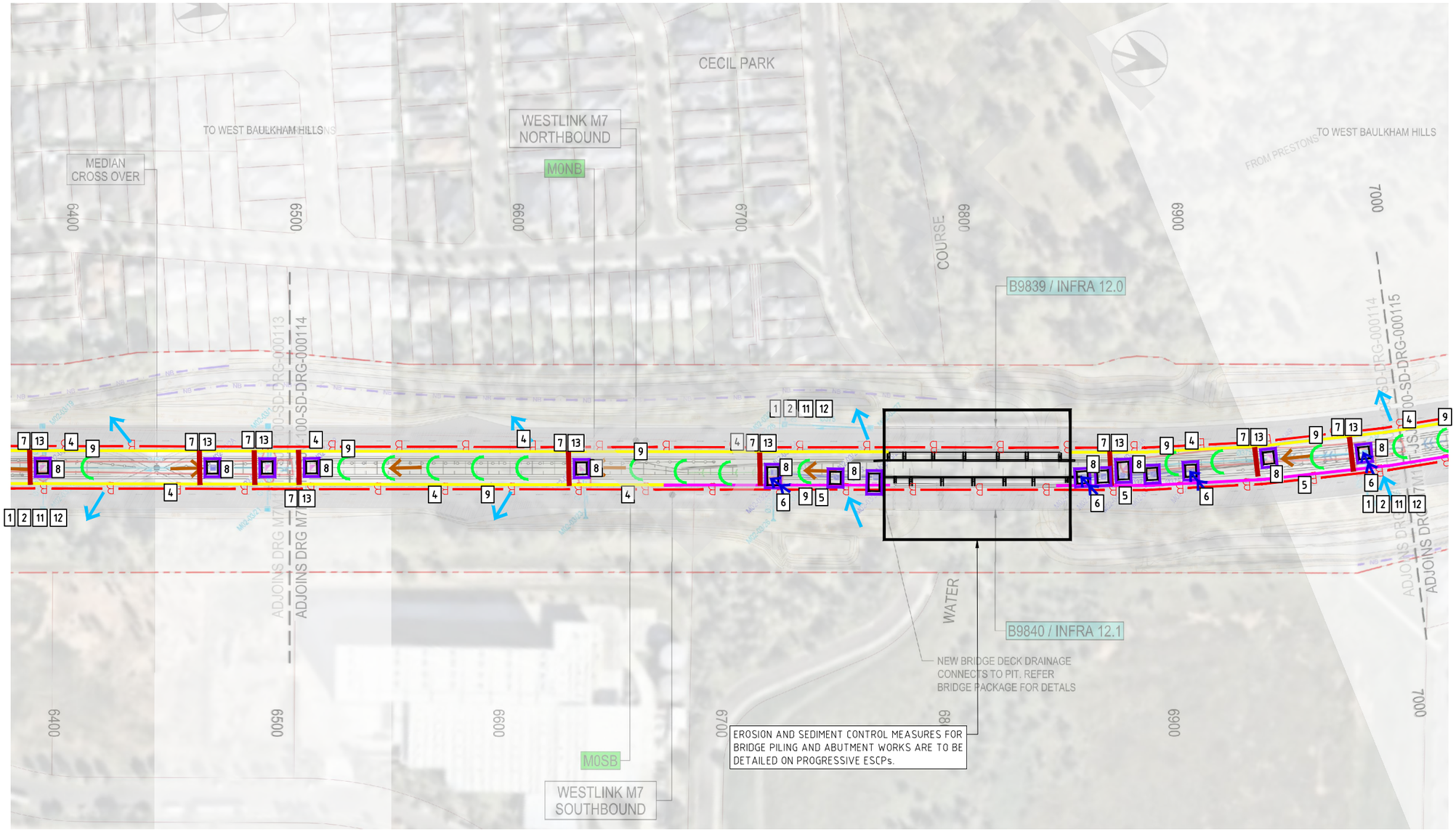
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP12 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 13 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP13 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
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9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
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    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 14 OF 59

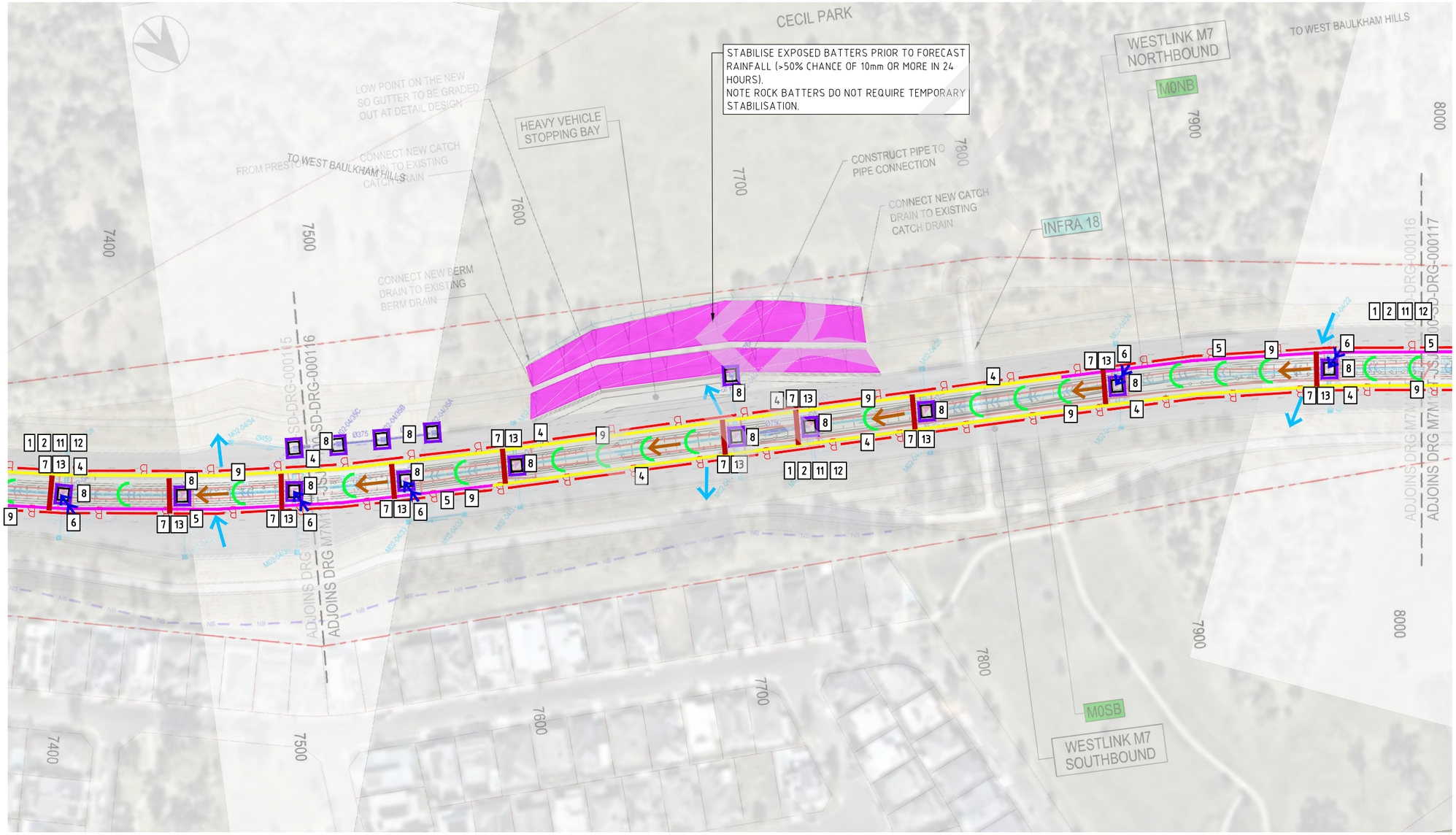
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP14 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

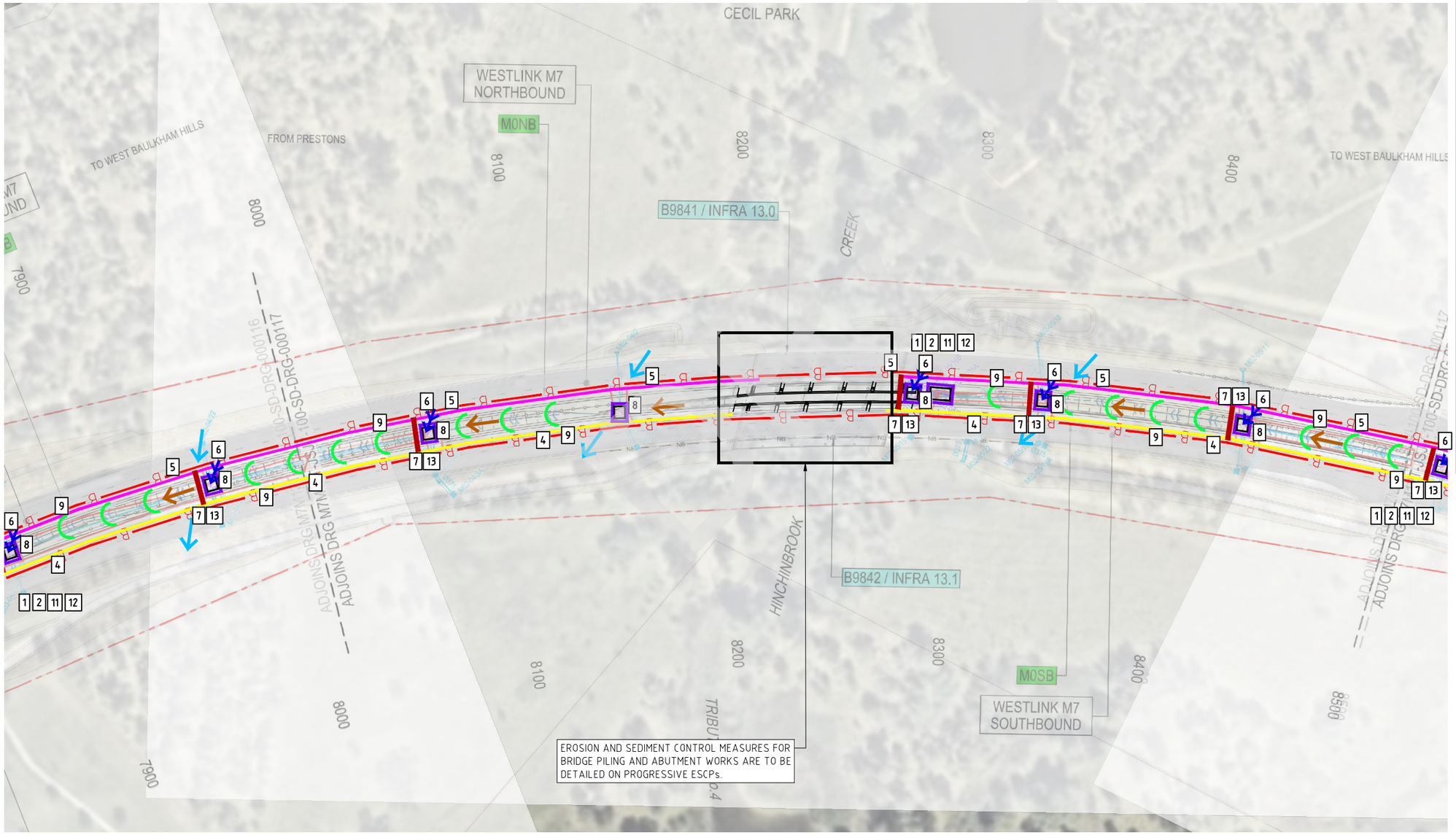
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 15 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP15 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
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     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
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7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
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13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 16 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP16 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
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   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
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   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
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**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 17 OF 59

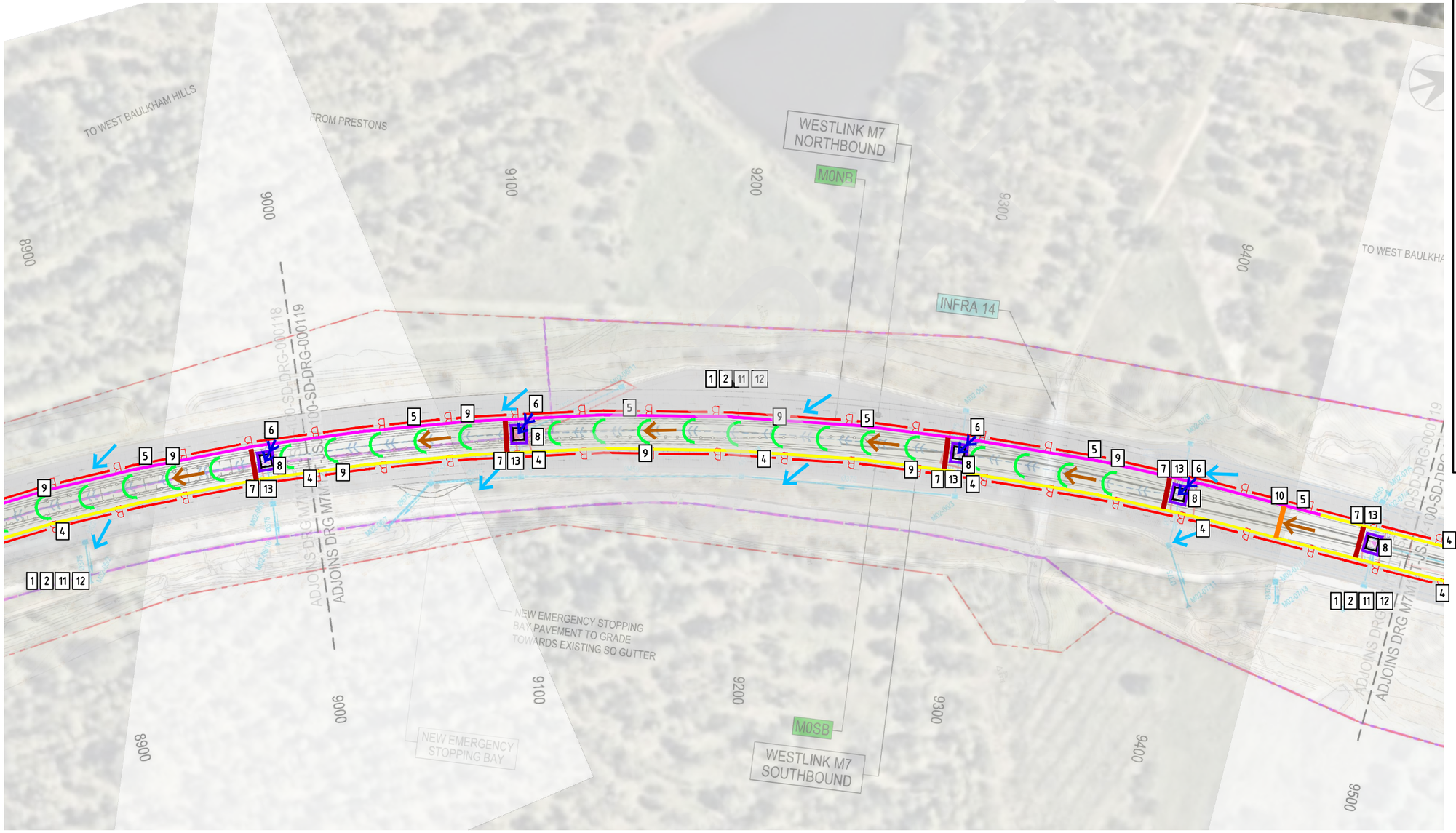
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP17 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
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- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 18 OF 59

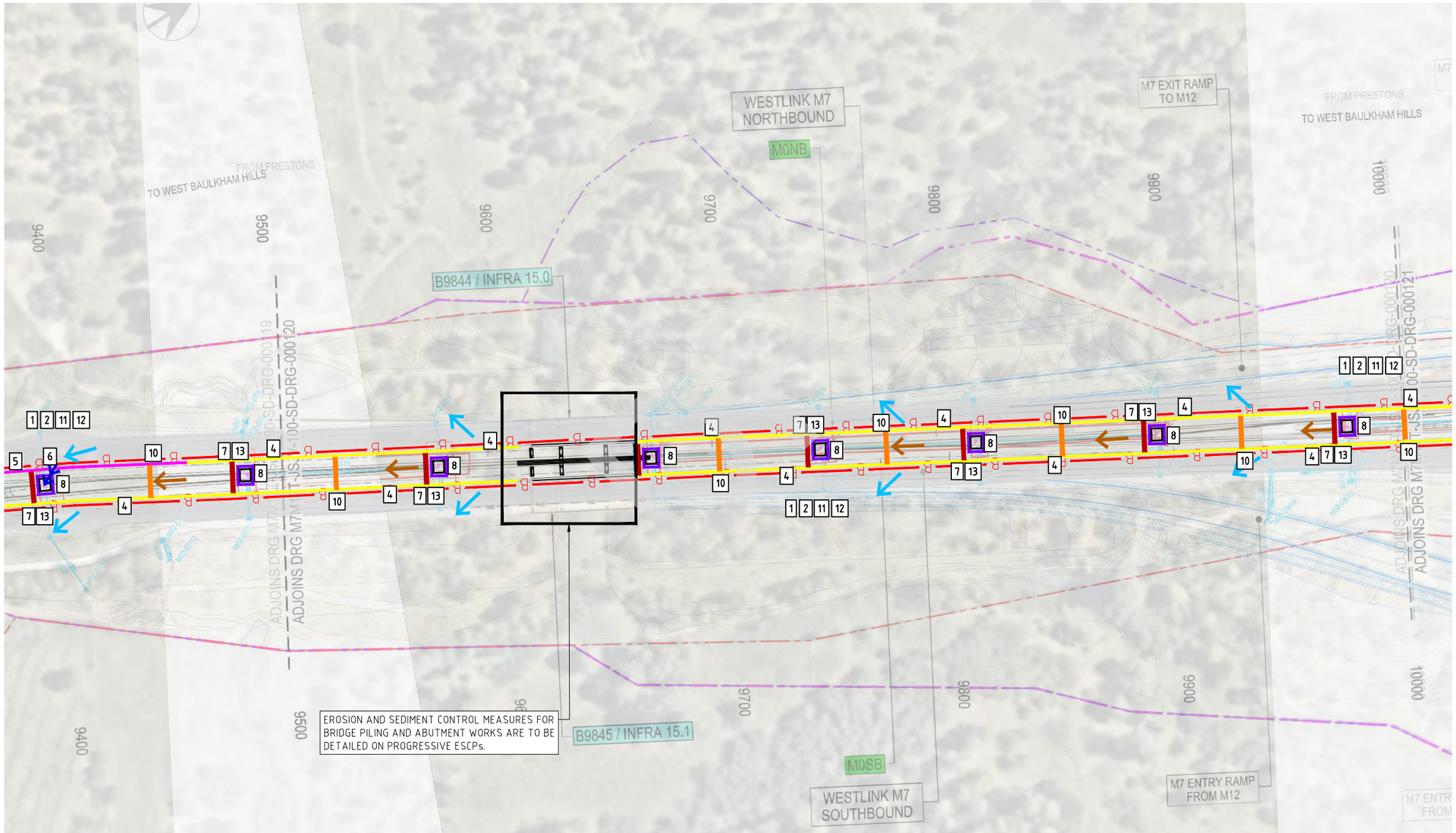
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP18 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 19 OF 59

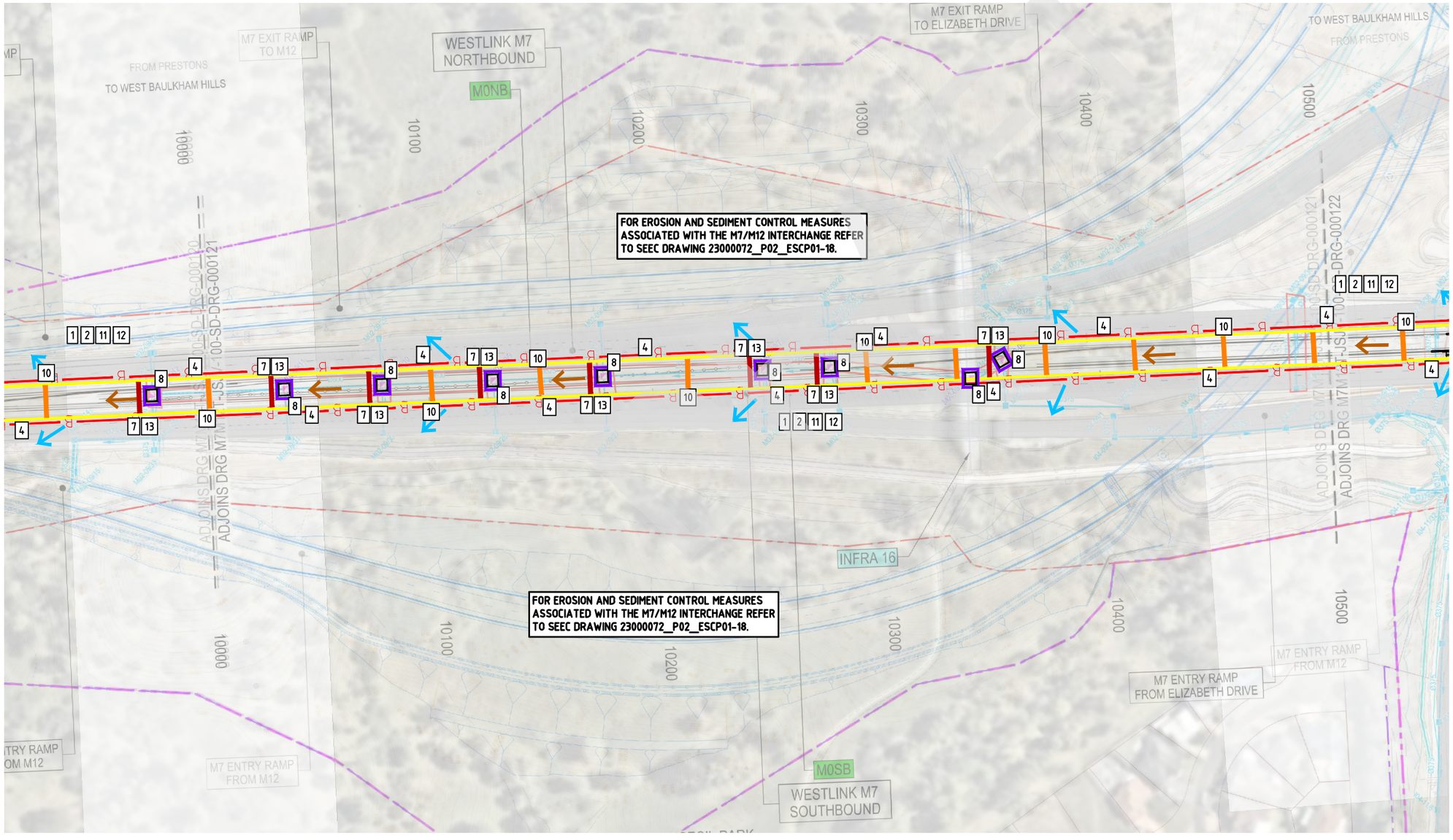
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP19 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




FOR EROSION AND SEDIMENT CONTROL MEASURES ASSOCIATED WITH THE M7/M12 INTERCHANGE REFER TO SEEC DRAWING 23000072_P02_ESCP01-18.

### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 20 OF 59

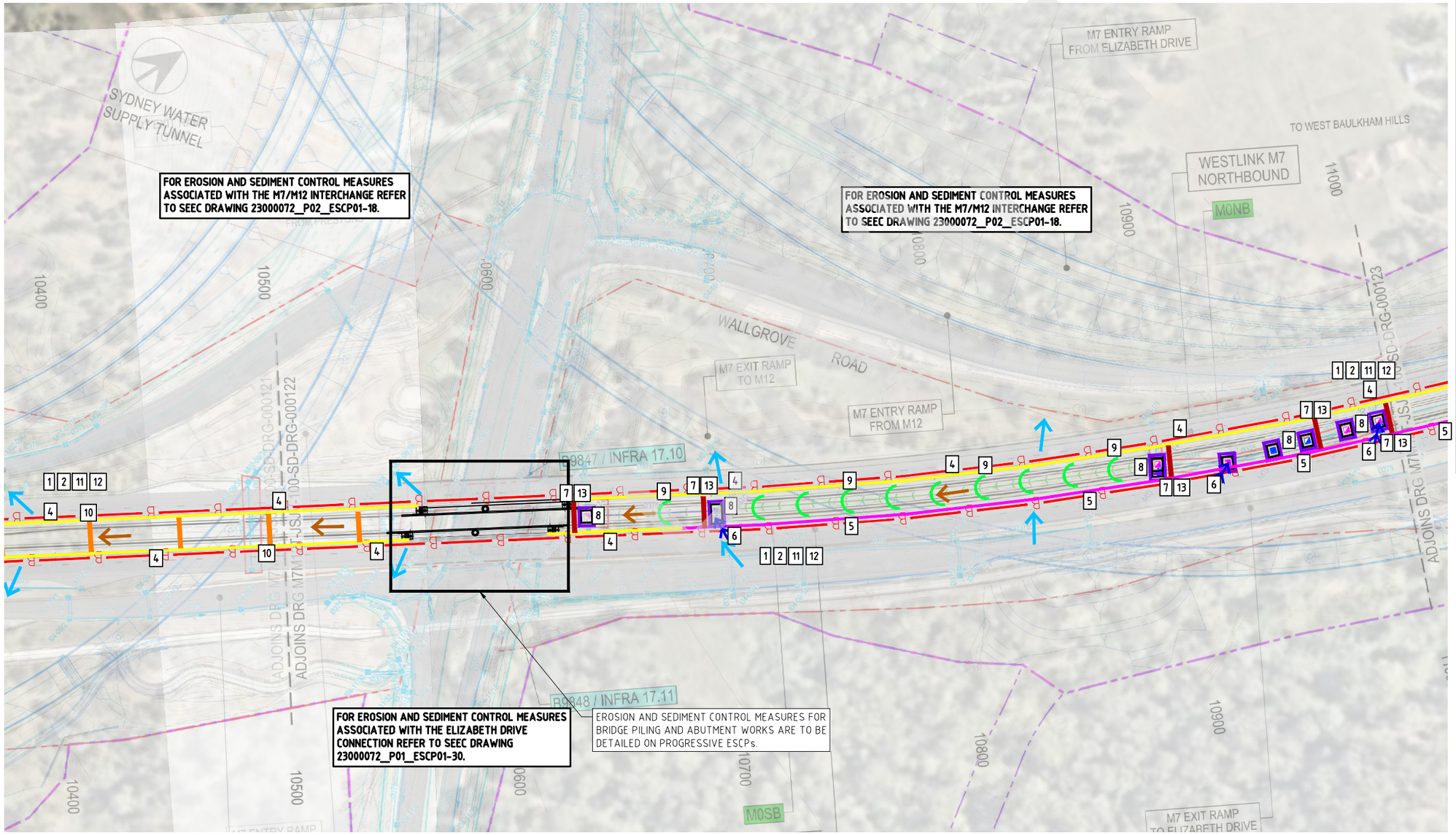
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP20 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 21 OF 59

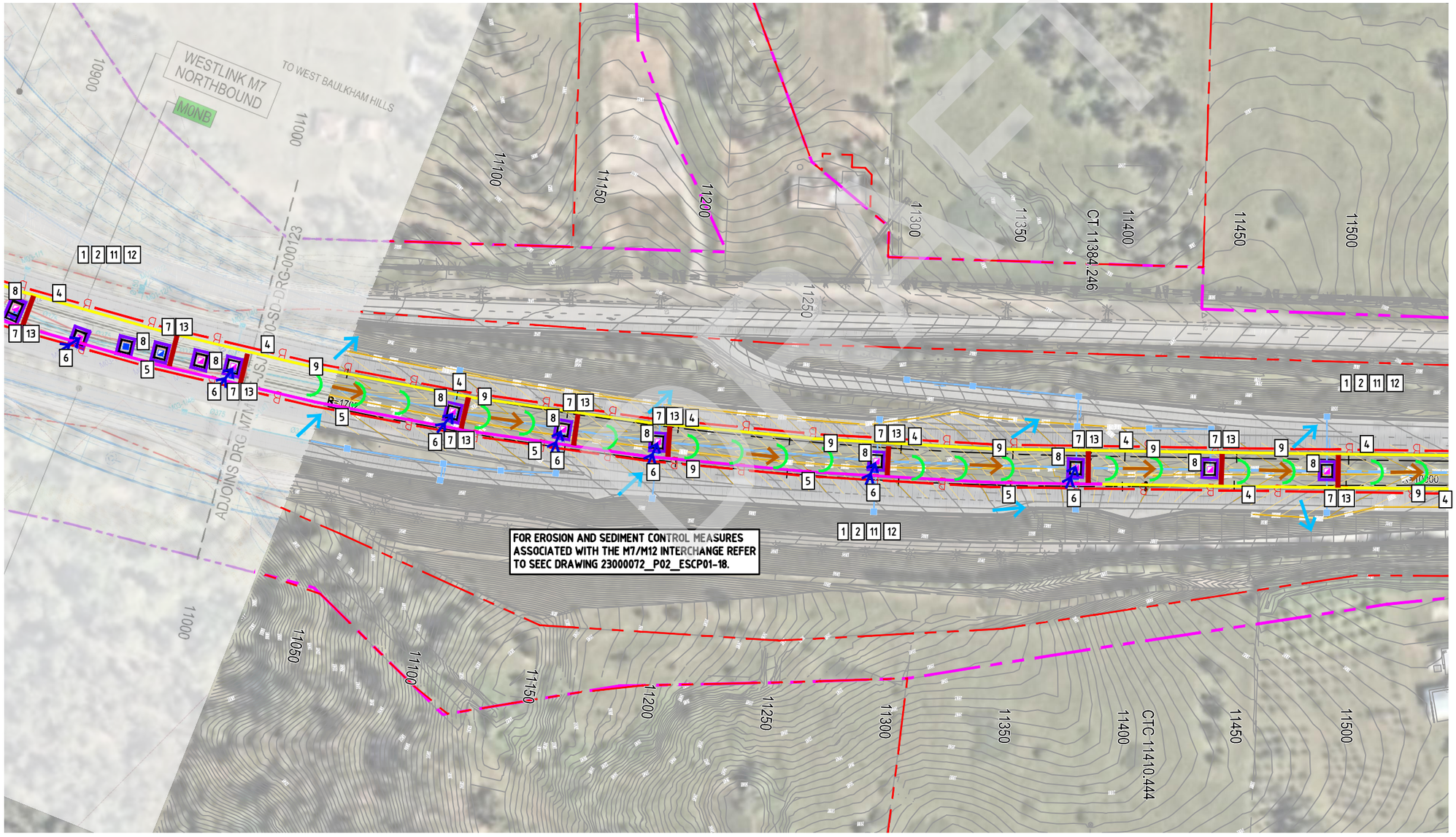
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP21 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
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### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
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- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 22 OF 59

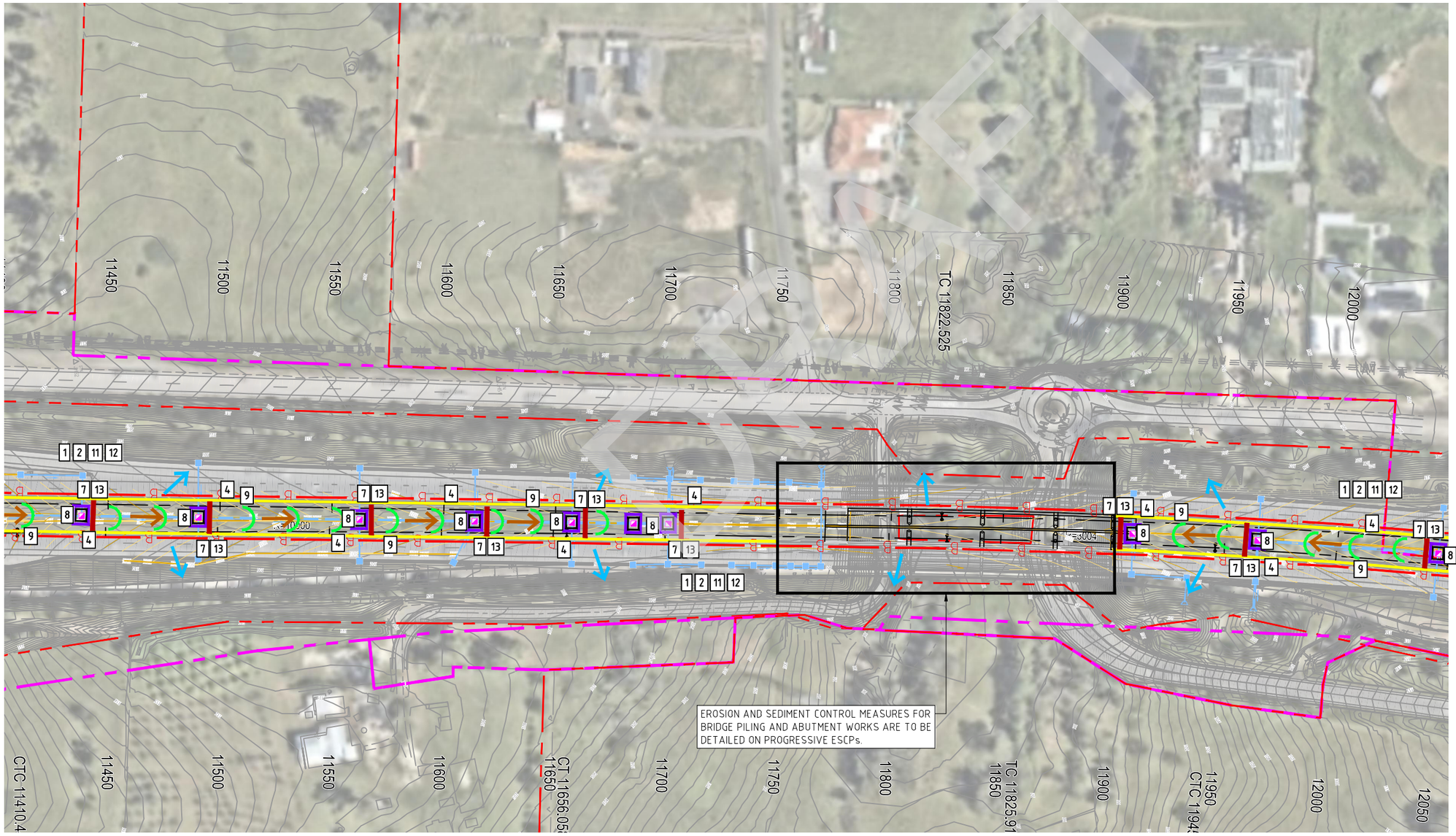
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP22 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

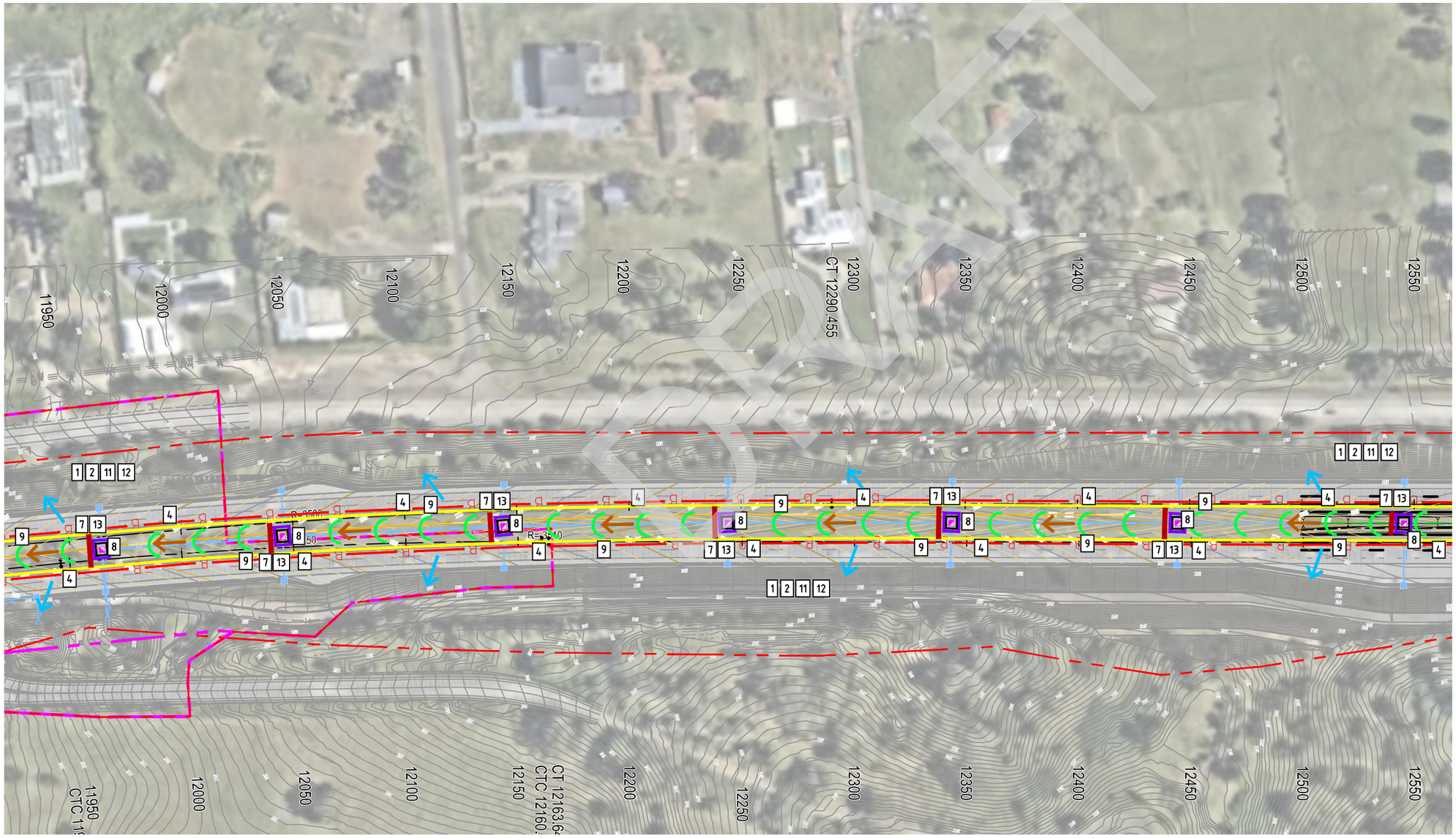
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 23 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP23 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 24 OF 59

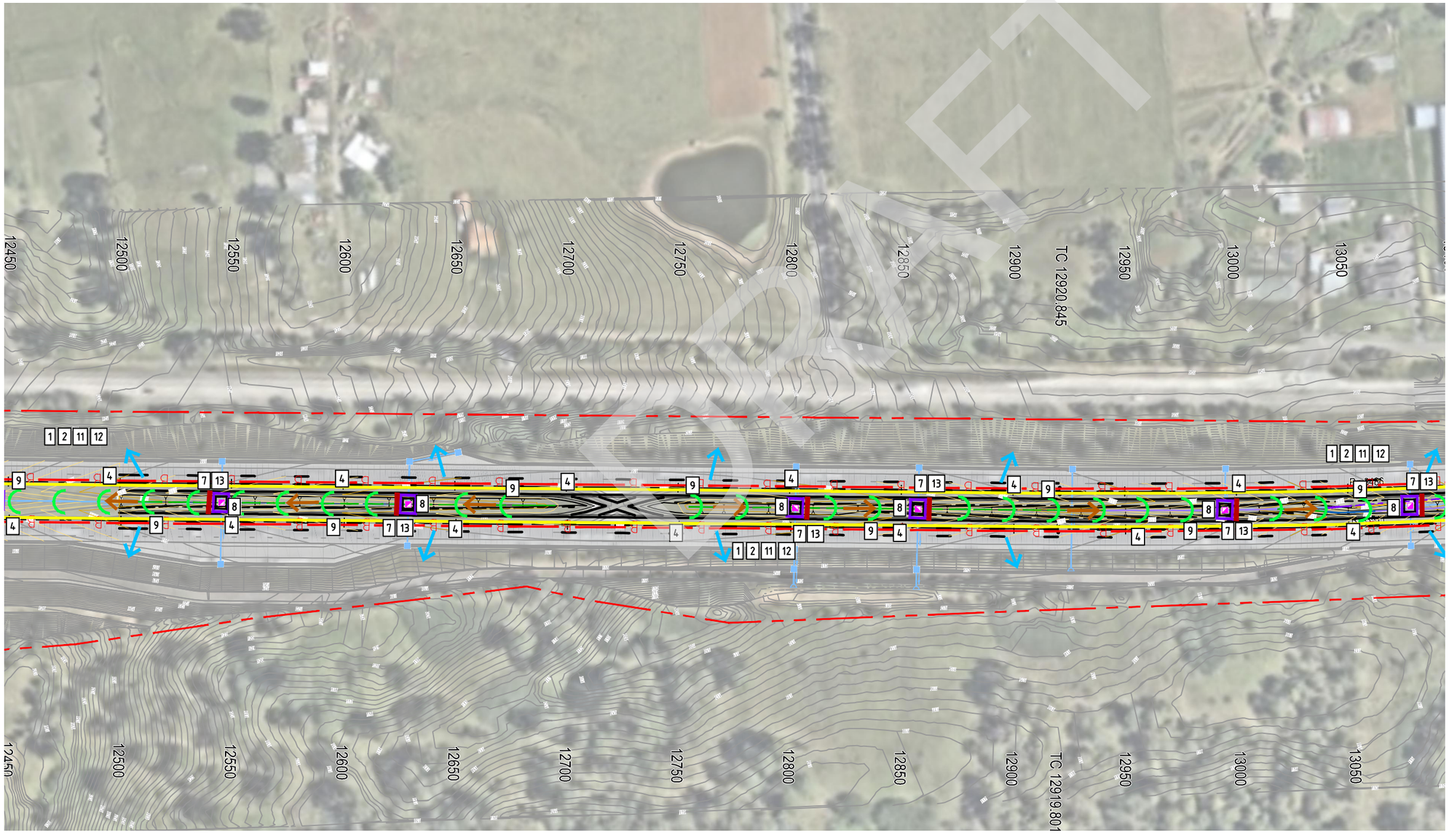
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP24 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 25 OF 59

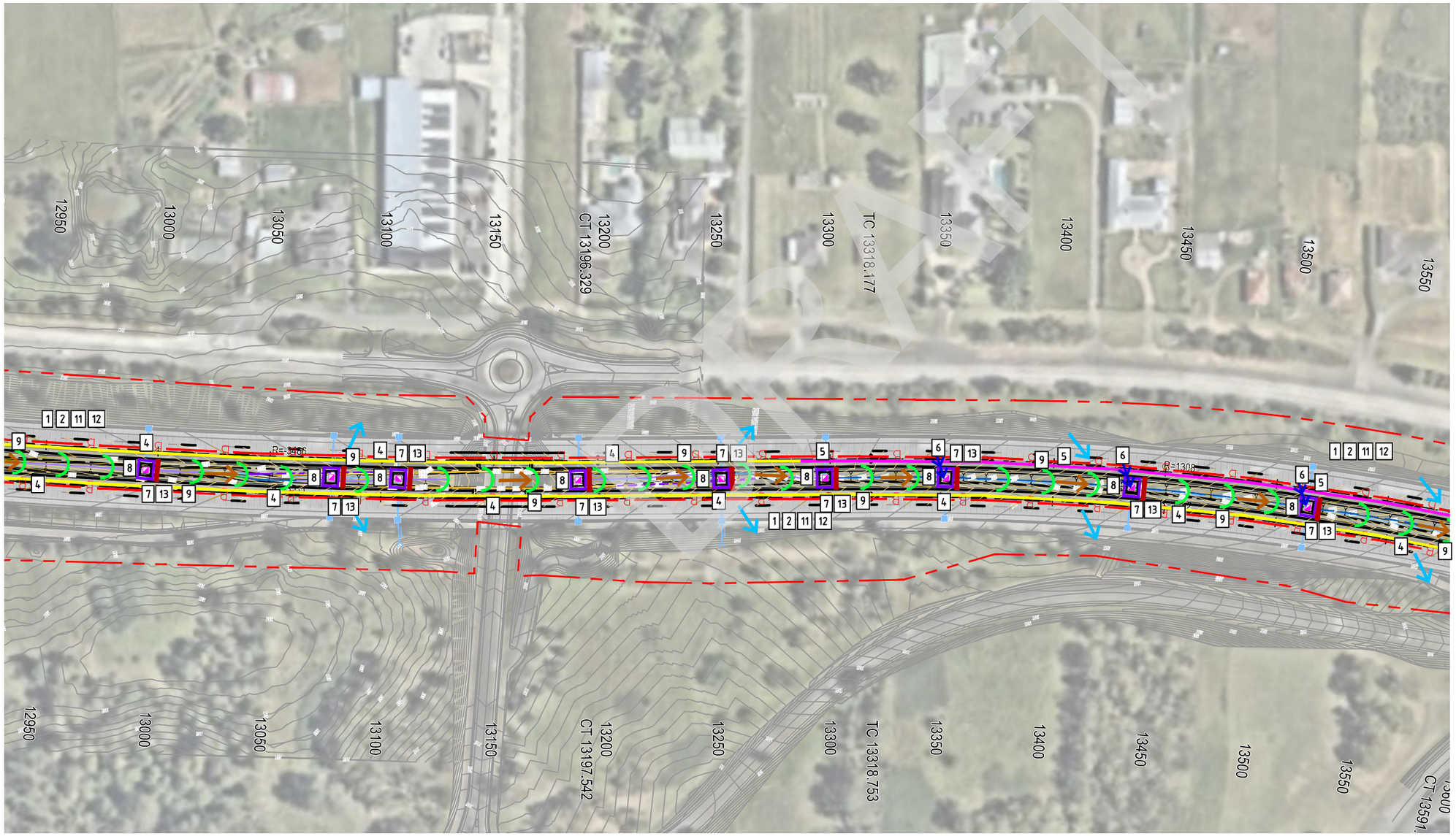
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP25 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
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### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
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- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 26 OF 59

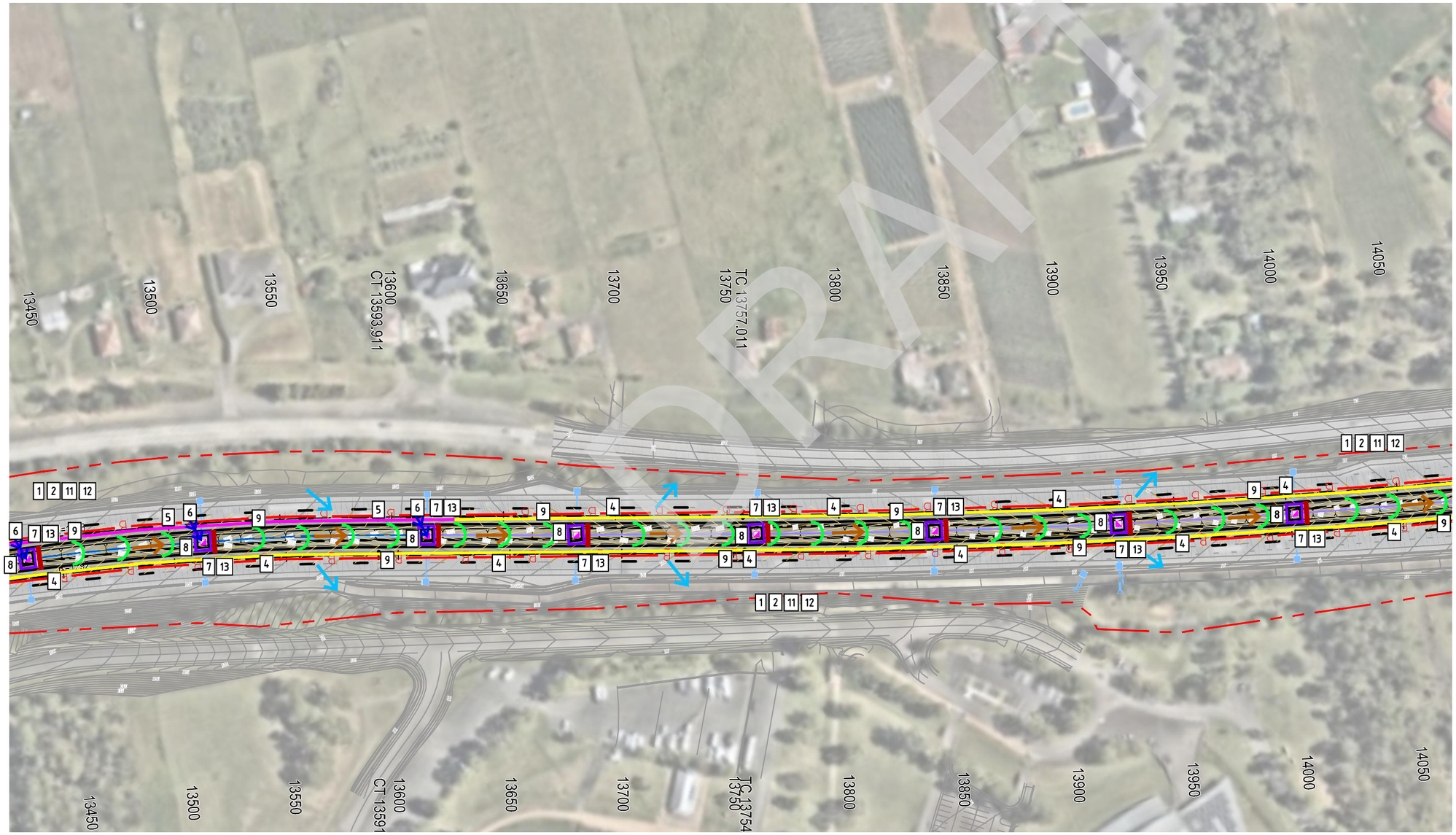
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP26 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




DRAFT

**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 27 OF 59

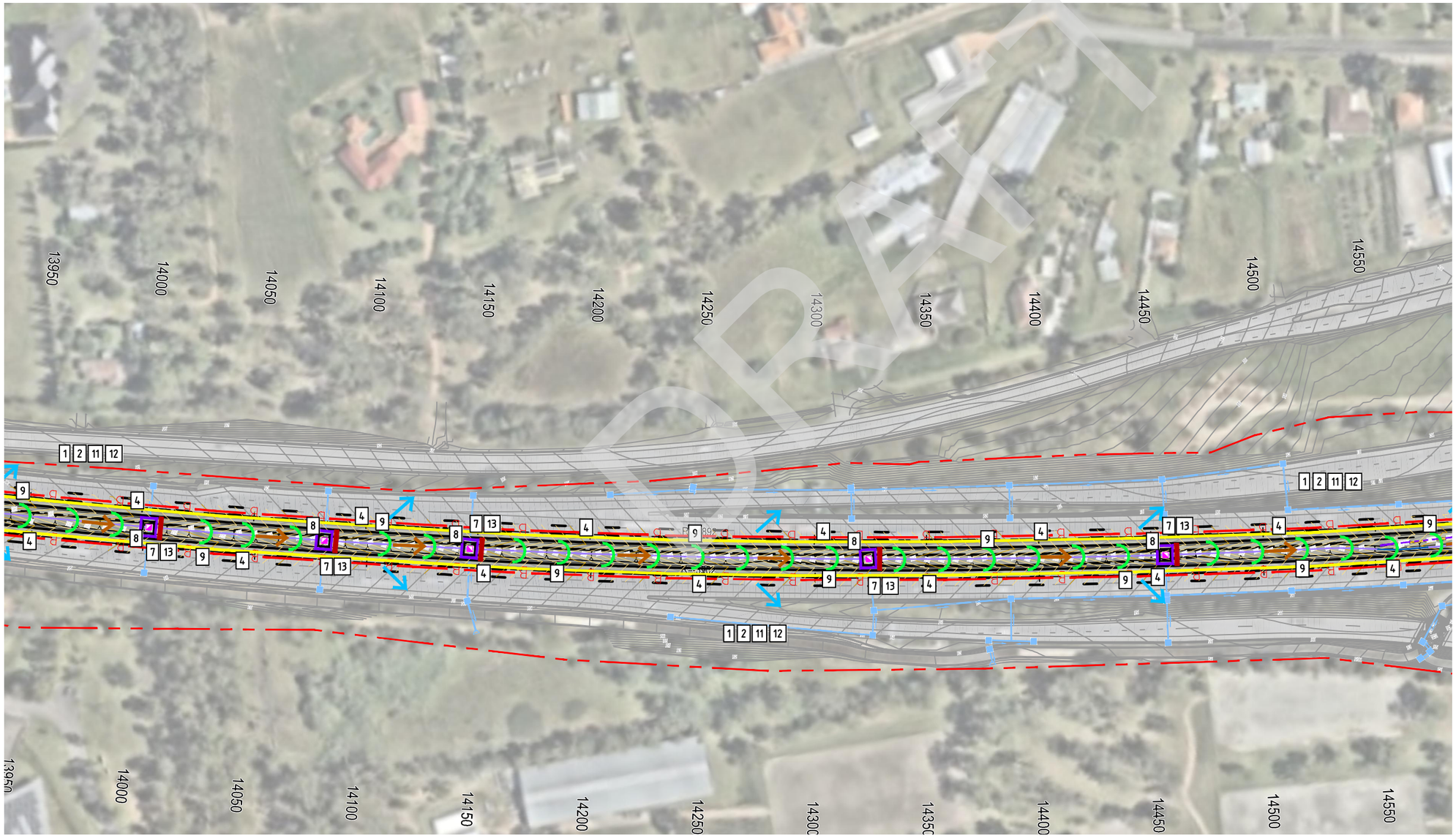
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP27 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 28 OF 59

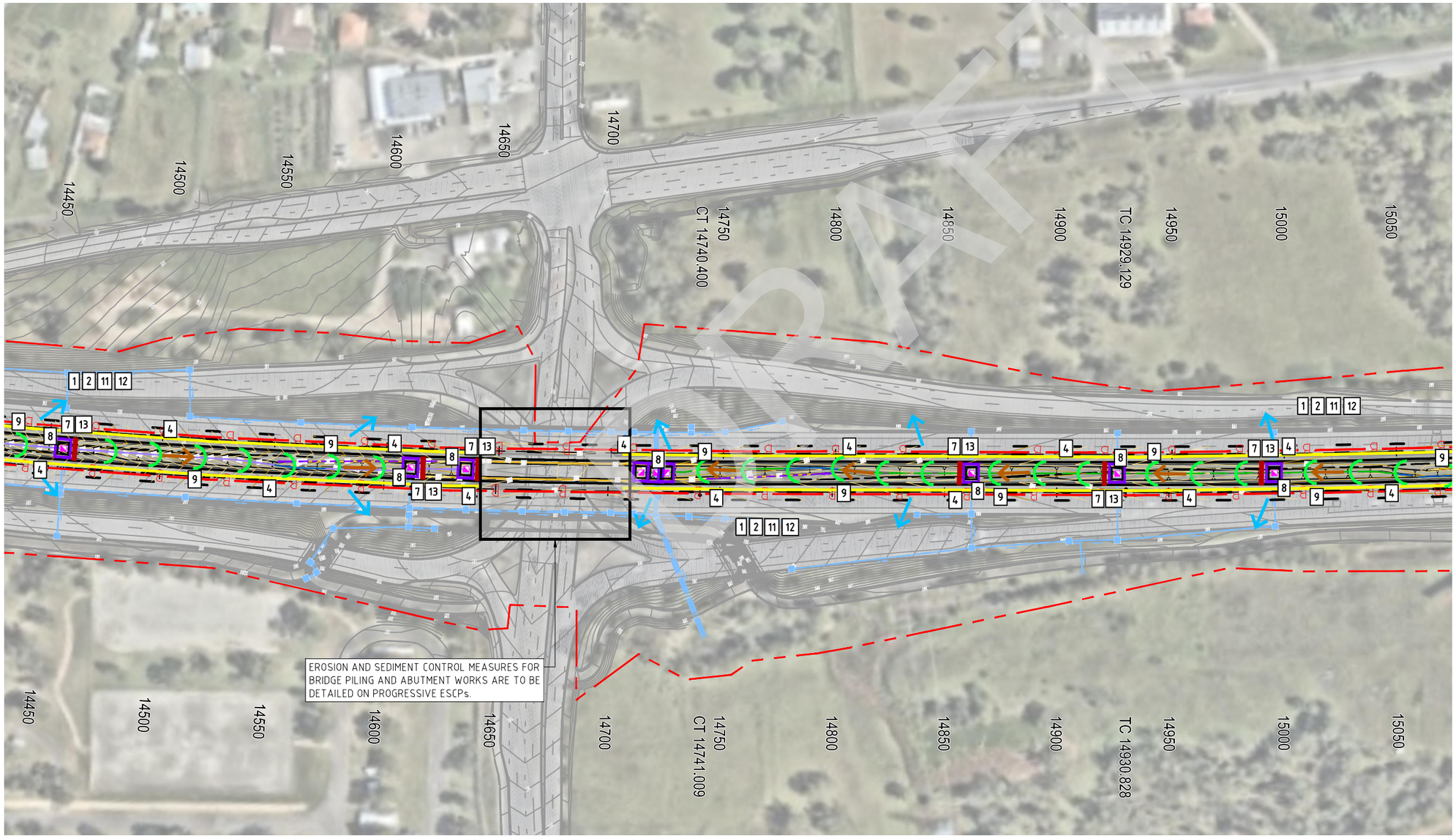
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP28 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 29 OF 59

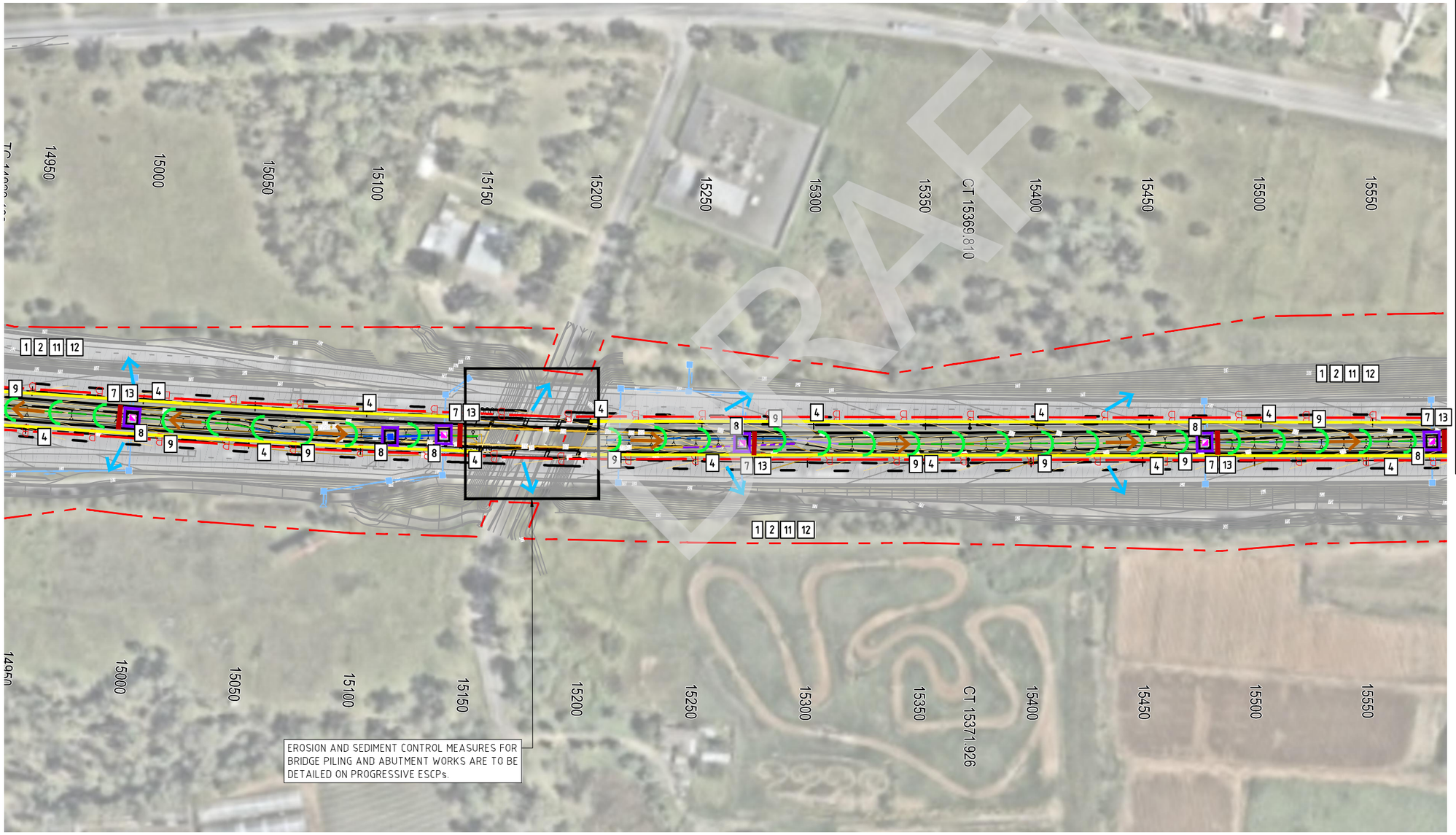
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP29 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
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### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 30 OF 59

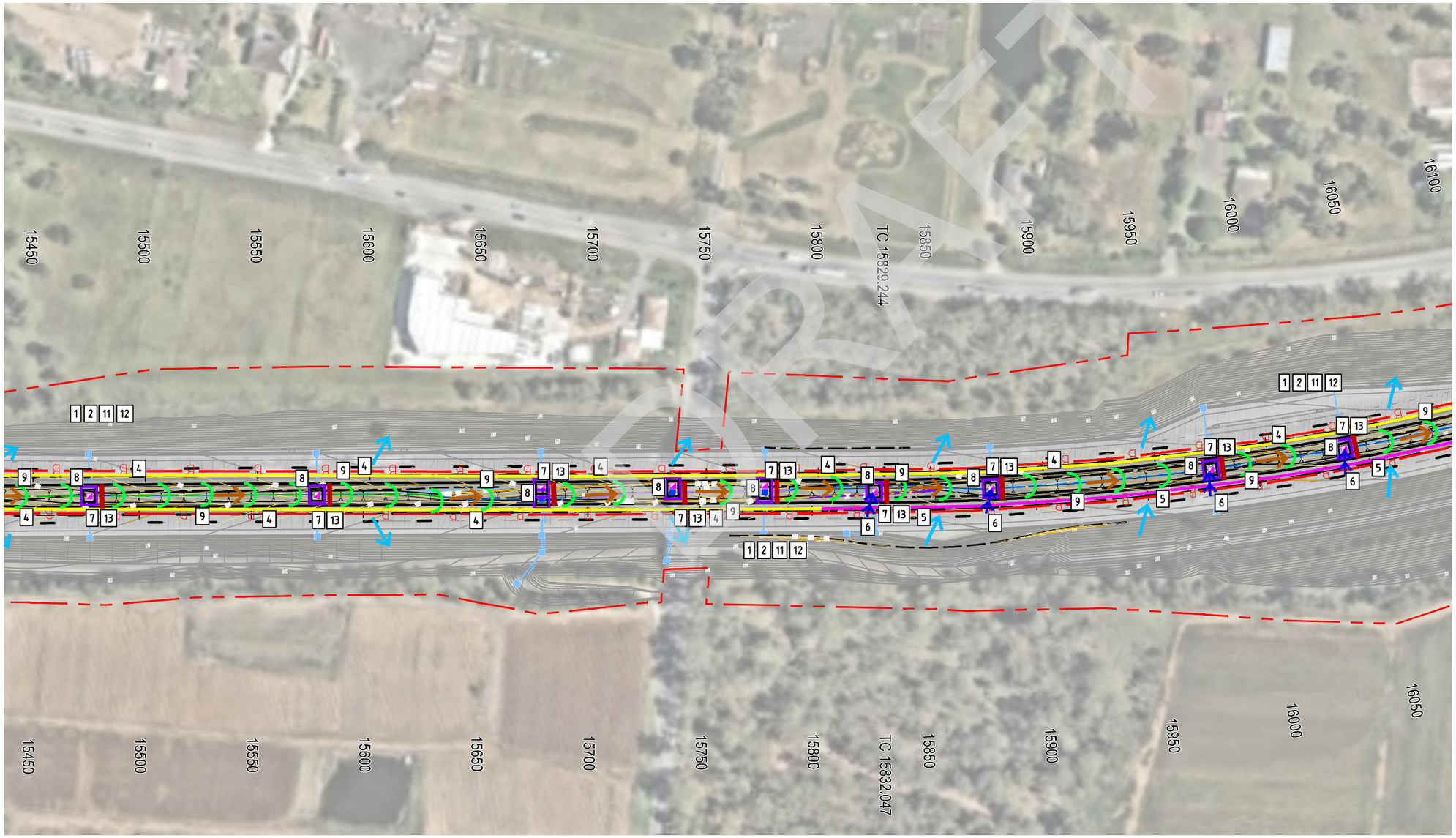
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP30 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

North

CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 31 OF 59

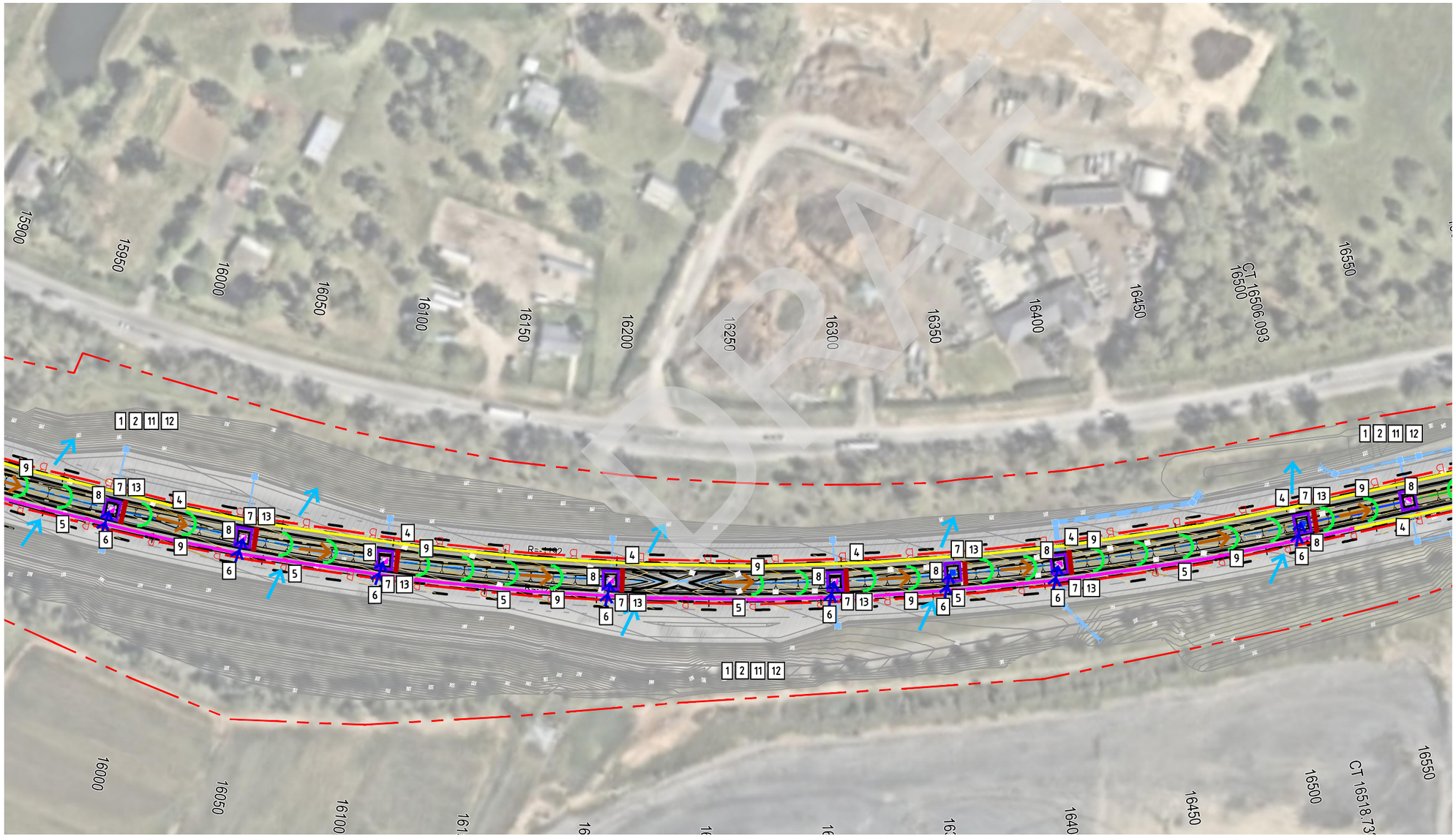
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP31 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 32 OF 59

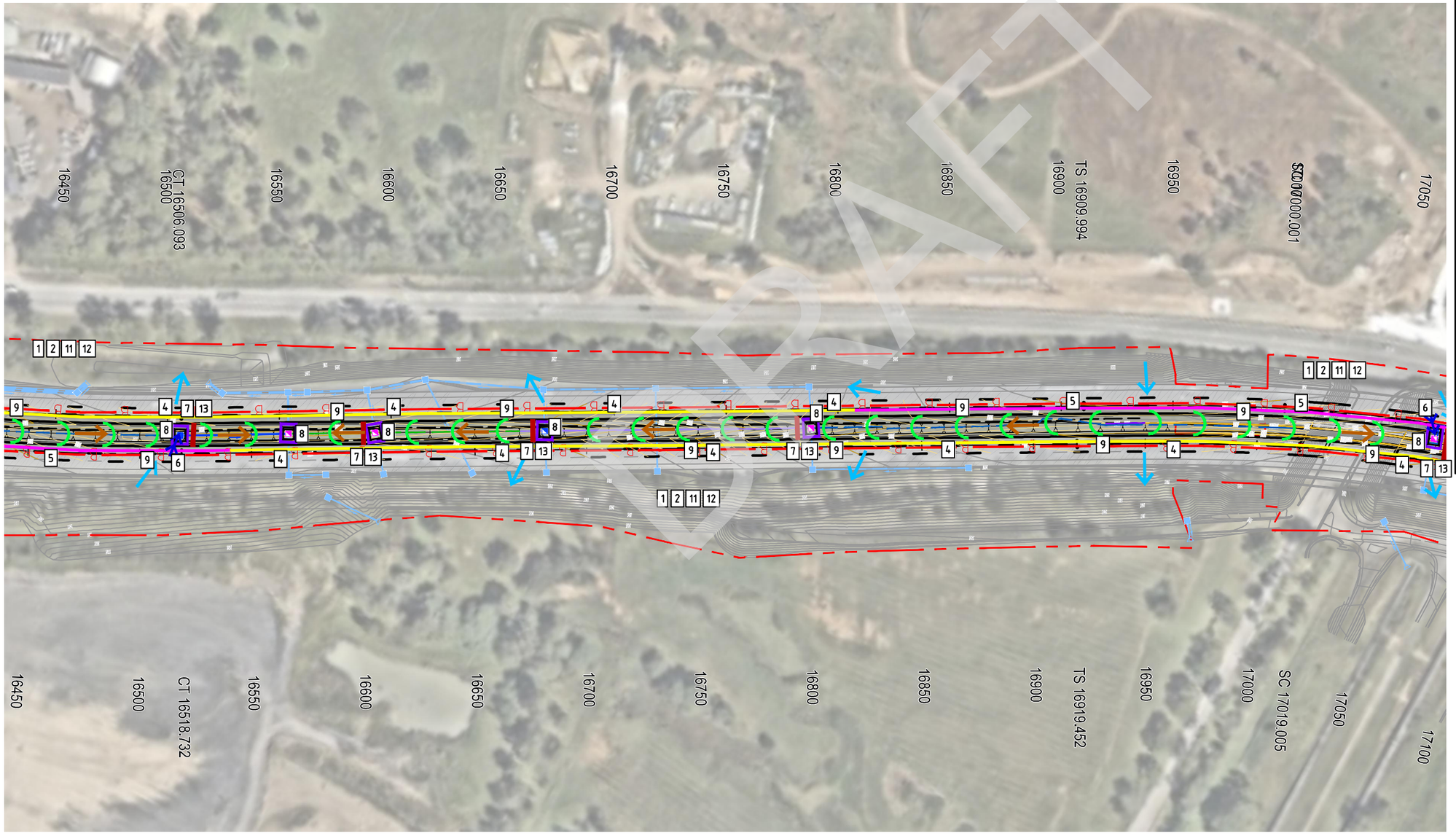
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP32 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 33 OF 59

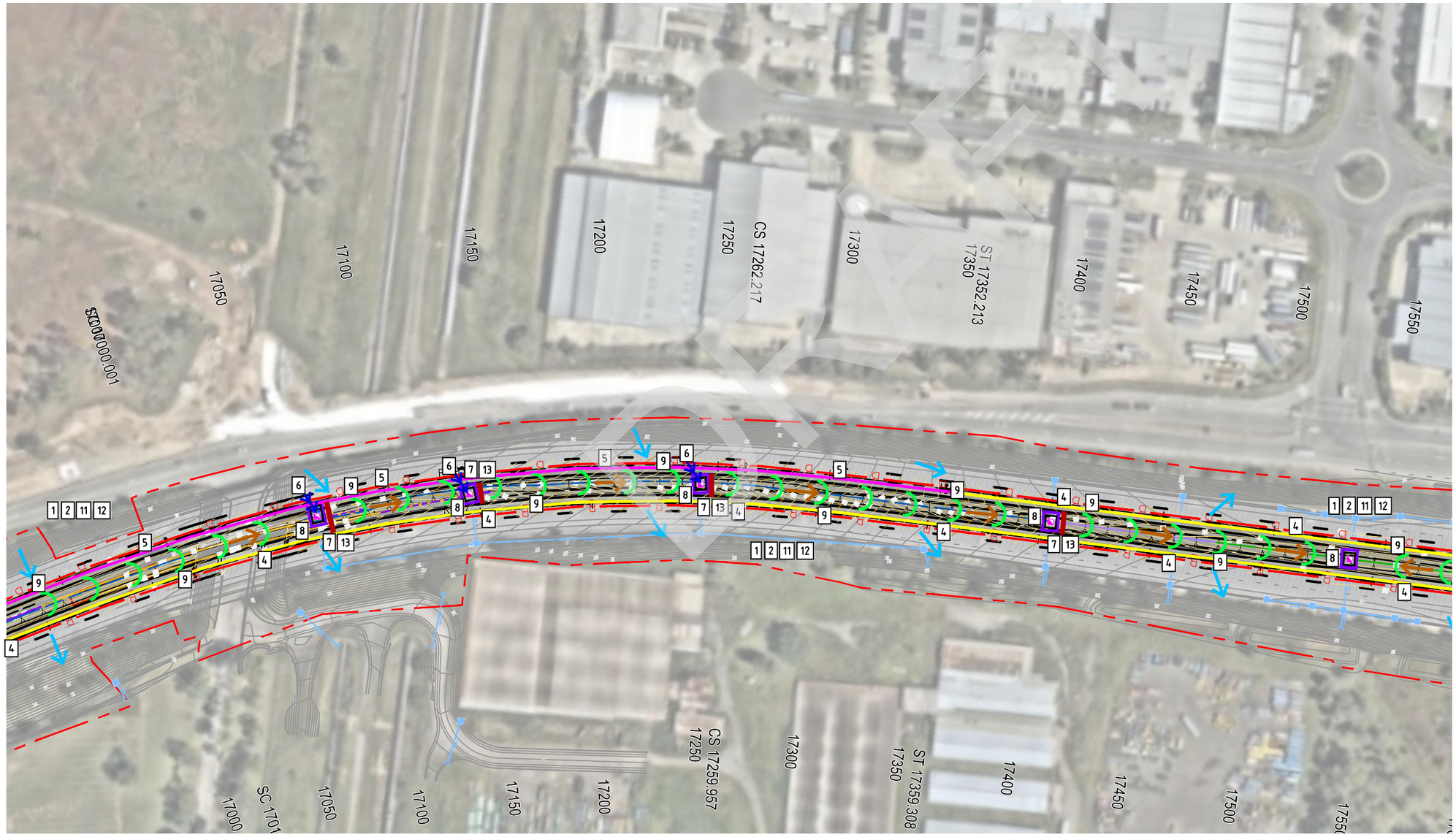
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP33 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
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- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 34 OF 59

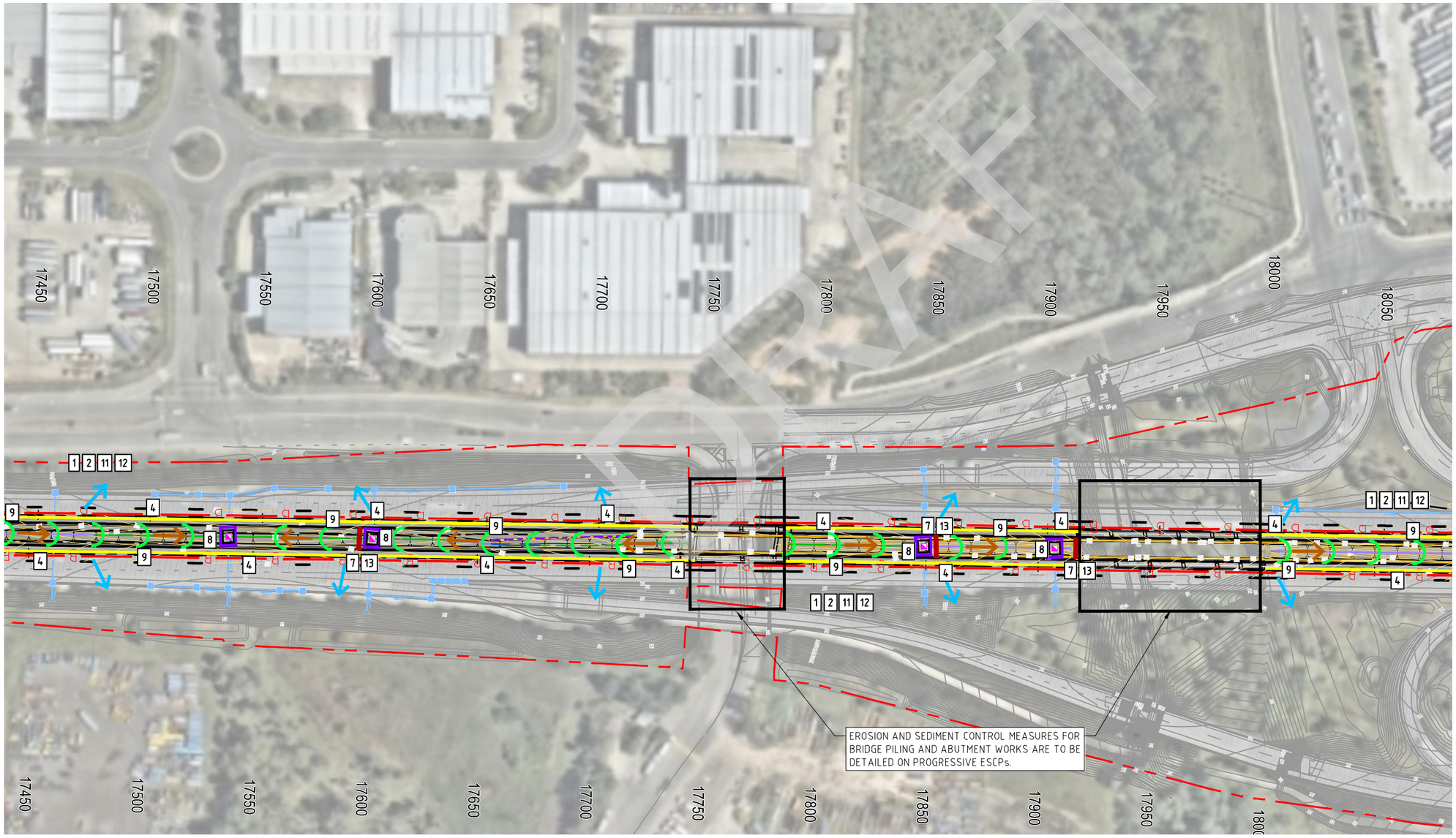
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP34 | A |

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Plot Date: Tuesday, 25 July 2023 10:31:36 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

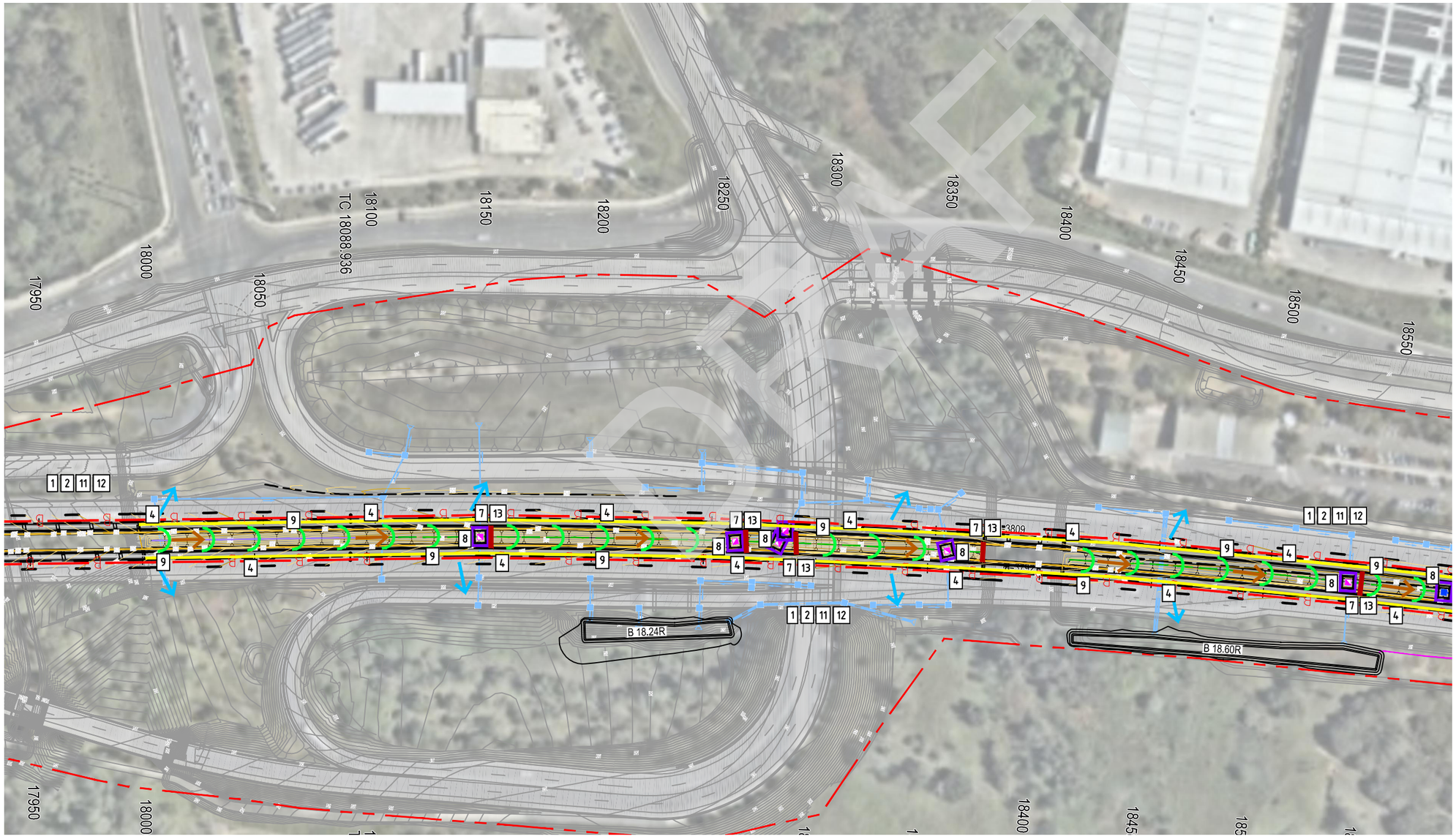
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 35 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP35 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 36 OF 59

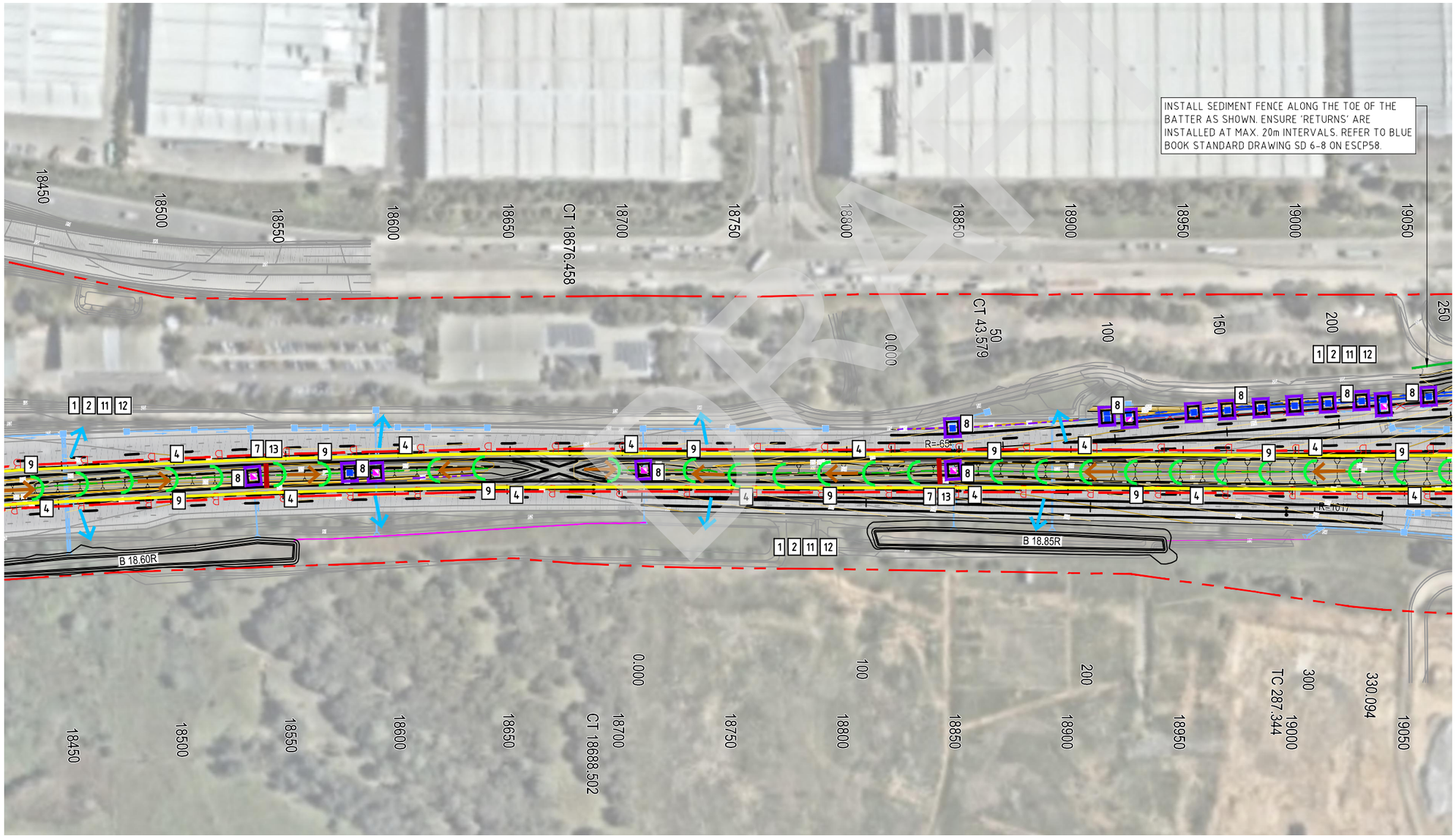
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP36 | A |

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Plot Date: Tuesday, 25 July 2023 10:33:25 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
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   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
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| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 37 OF 59

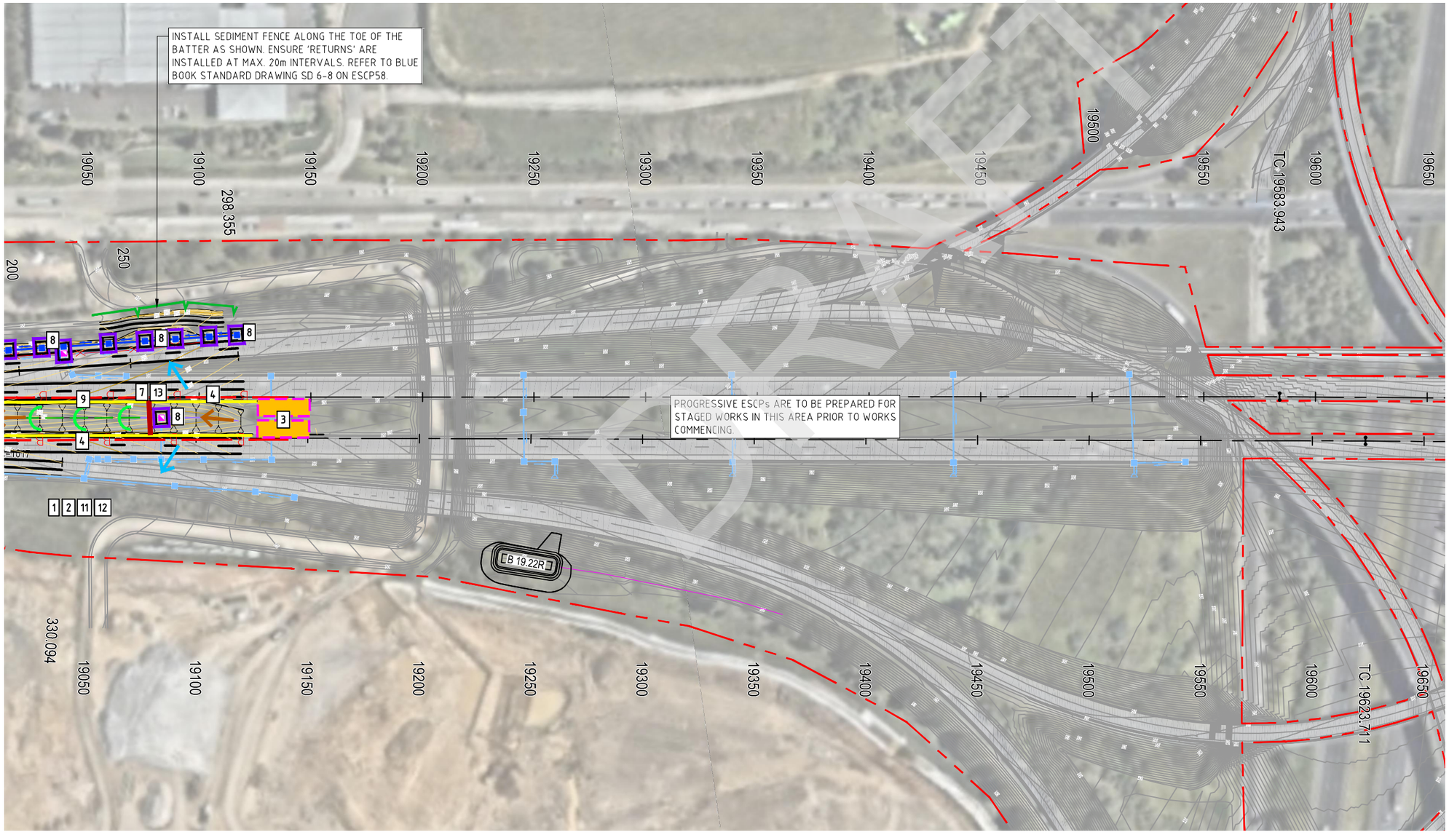
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP37 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
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- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 38 OF 59

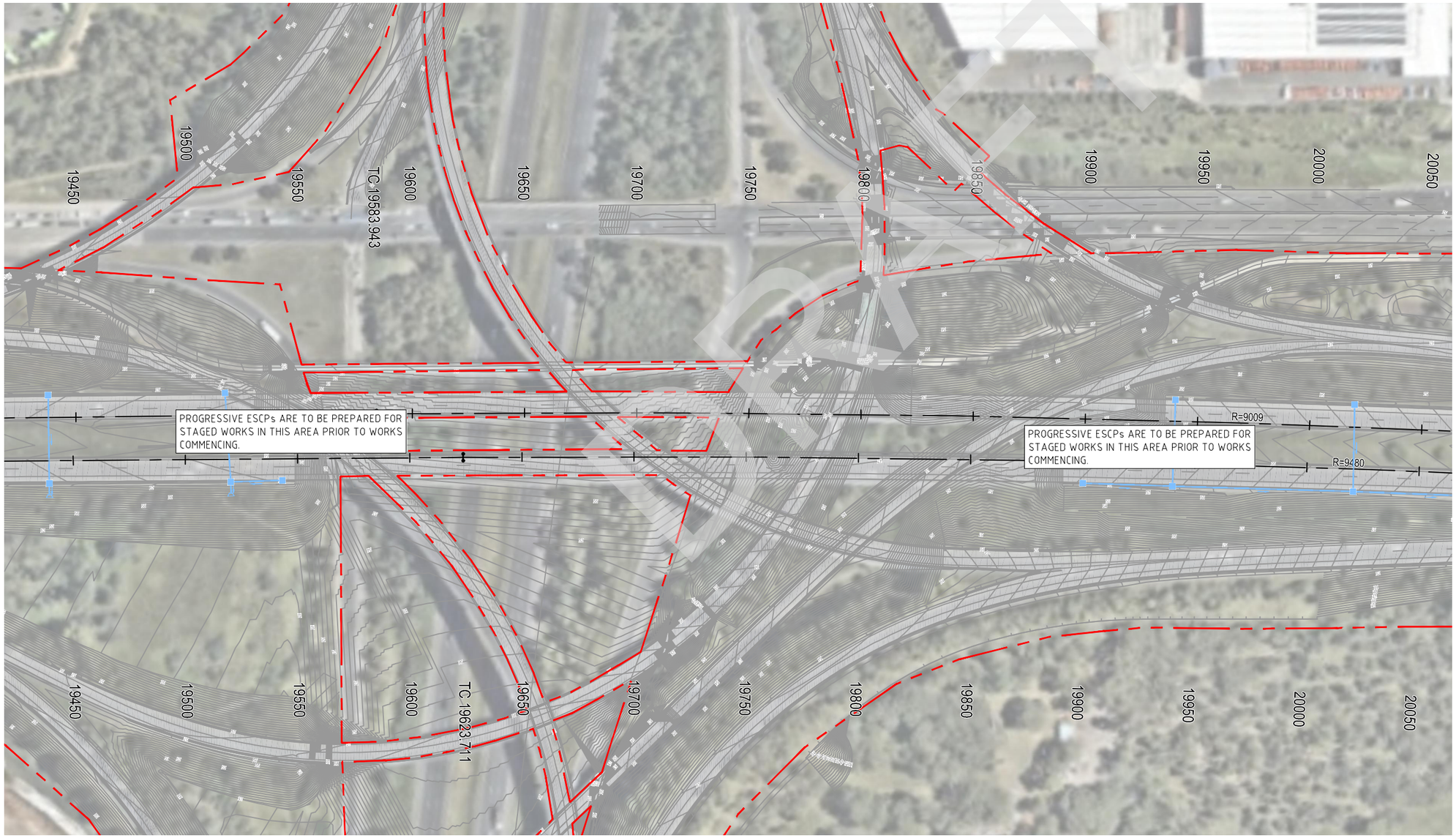
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP38 | A |

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Plot Date: Tuesday, 25 July 2023 10:35:21 AM
CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 39 OF 59

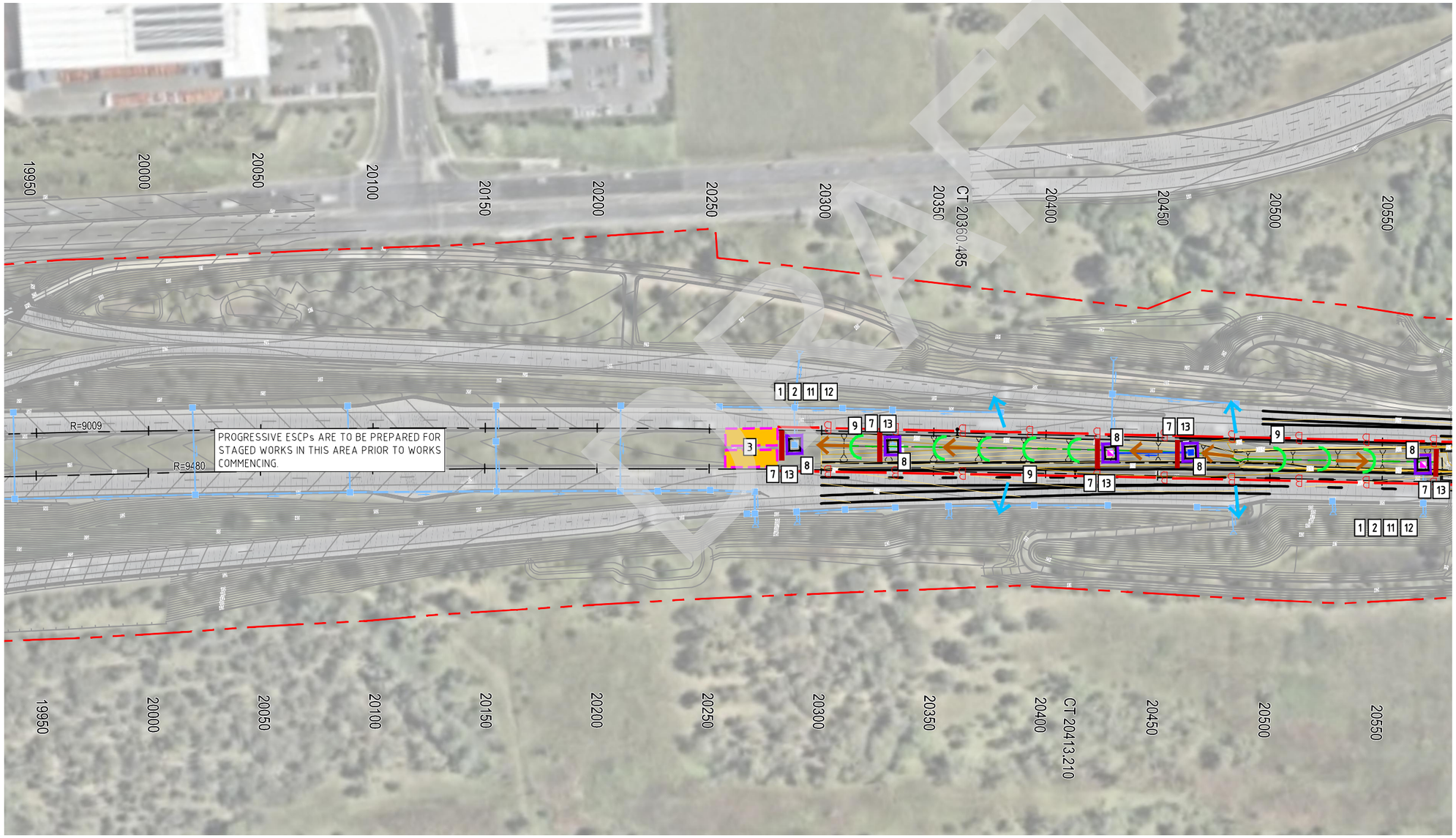
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP39 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

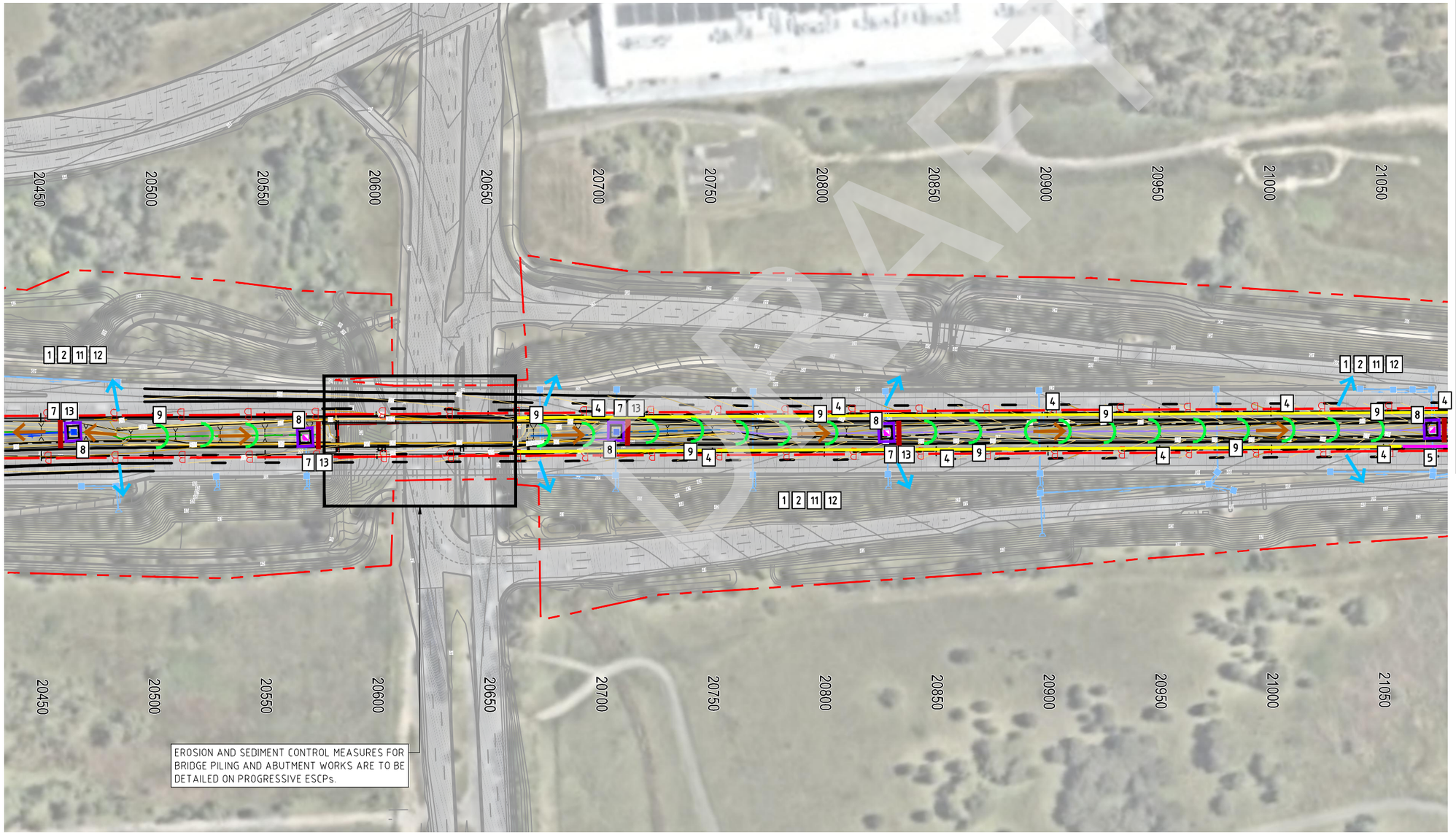
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 40 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP40 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
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8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

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|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 41 OF 59

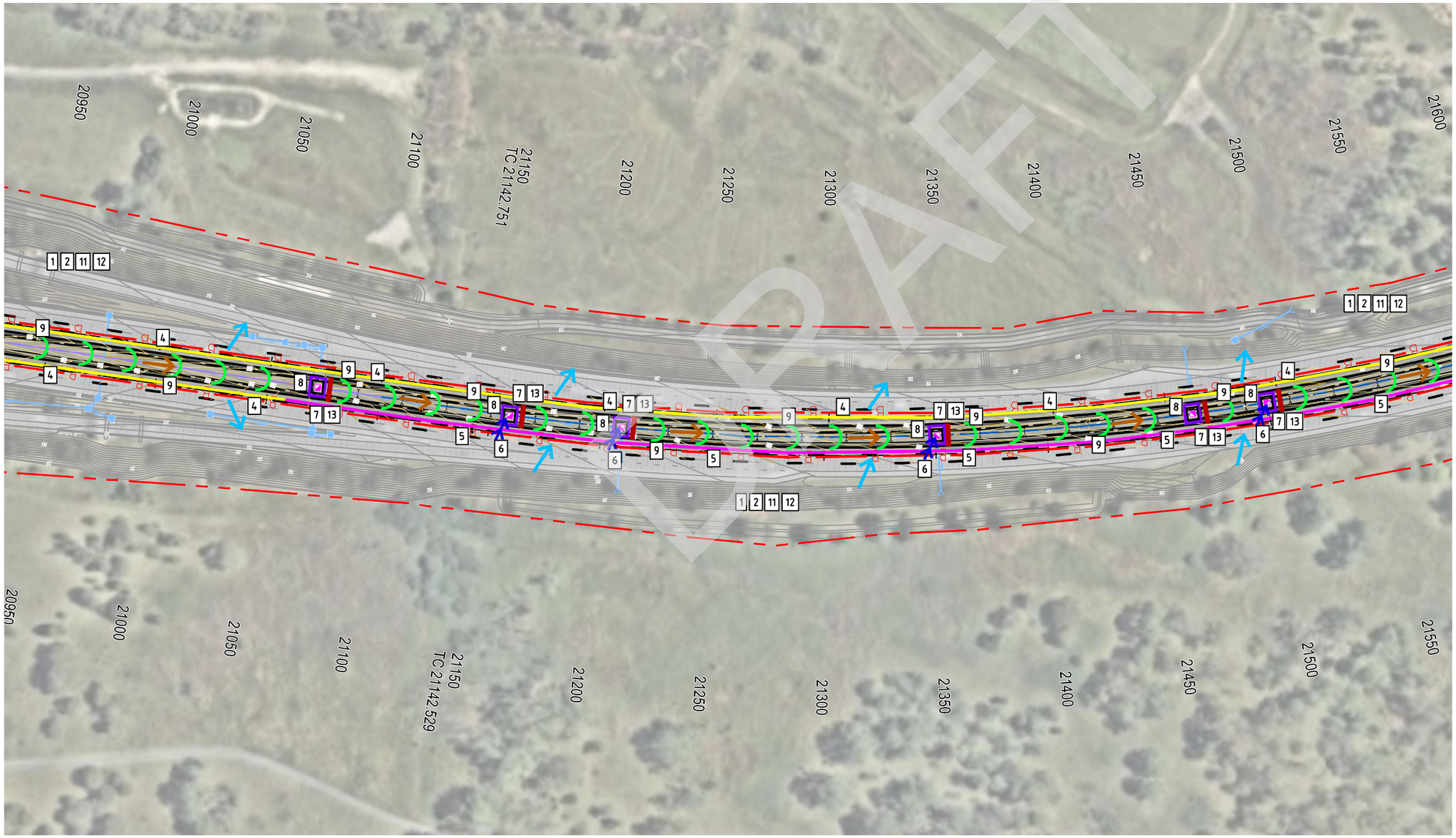
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP41 | A |

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Plot Date: Tuesday, 25 July 2023 10:38:05 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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DRAFT

### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
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| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 42 OF 59

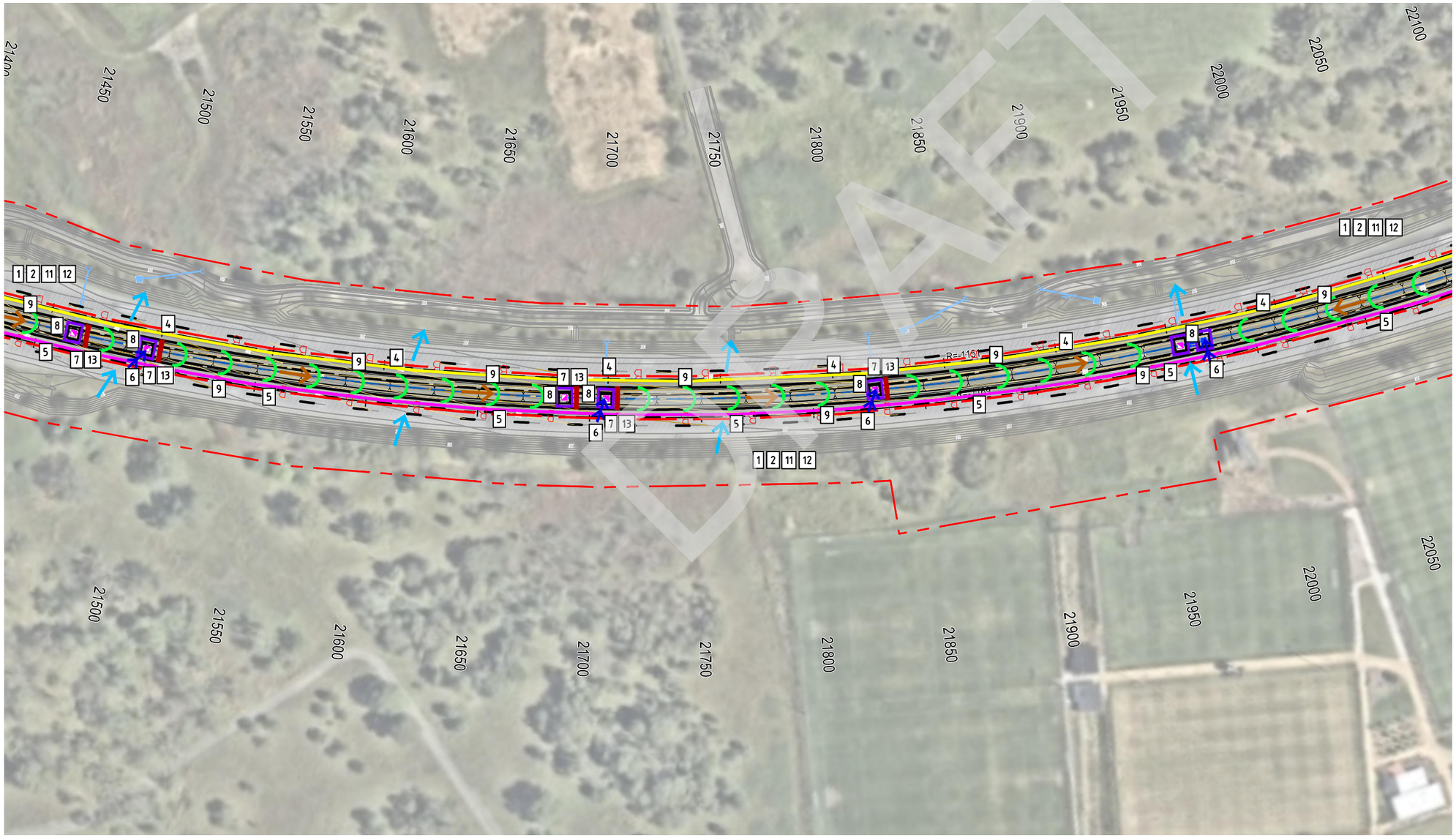
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP42 | A |

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Plot Date: Tuesday, 25 July 2023 10:39:01 AM
CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 43 OF 59

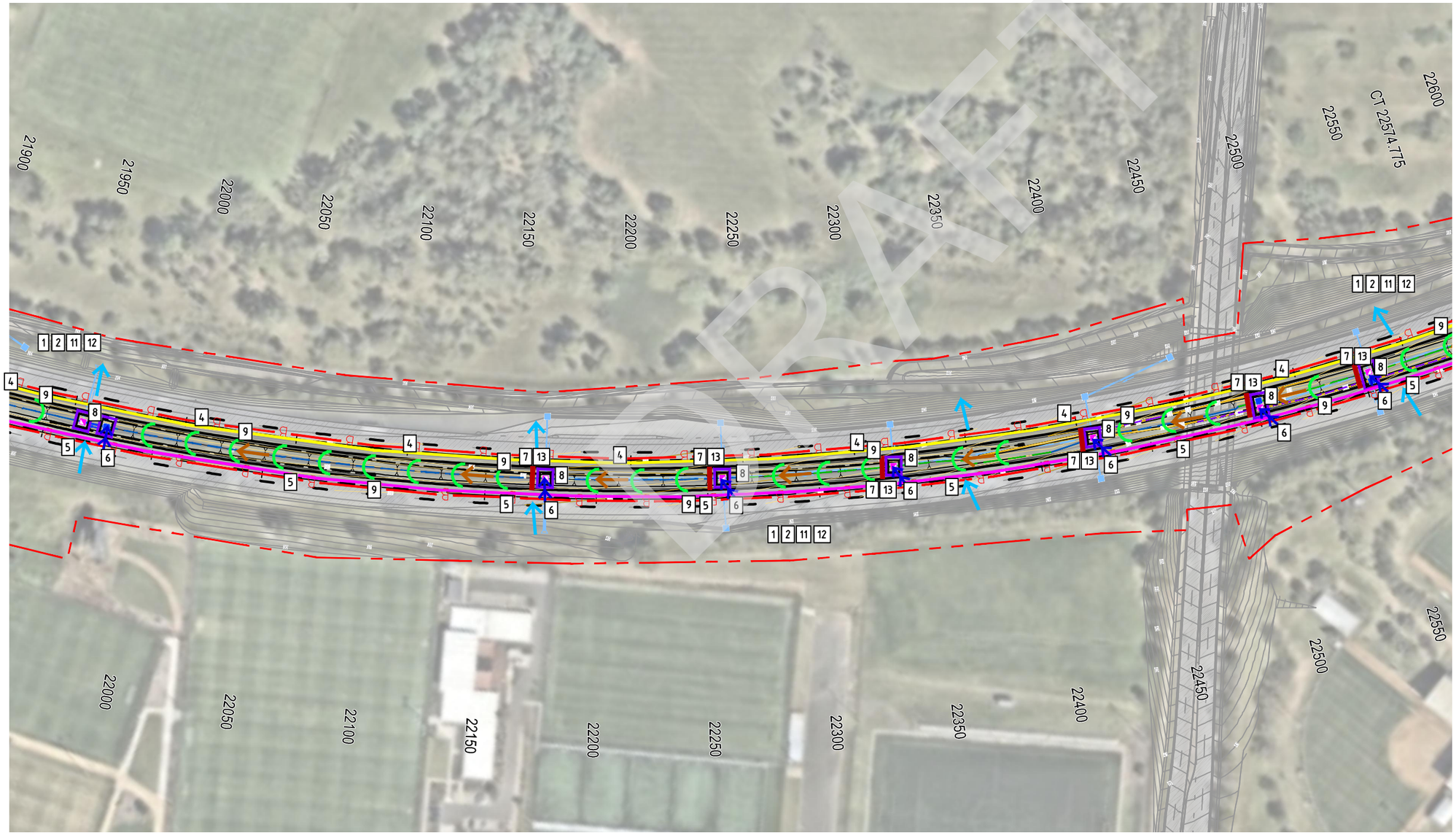
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP43 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 44 OF 59

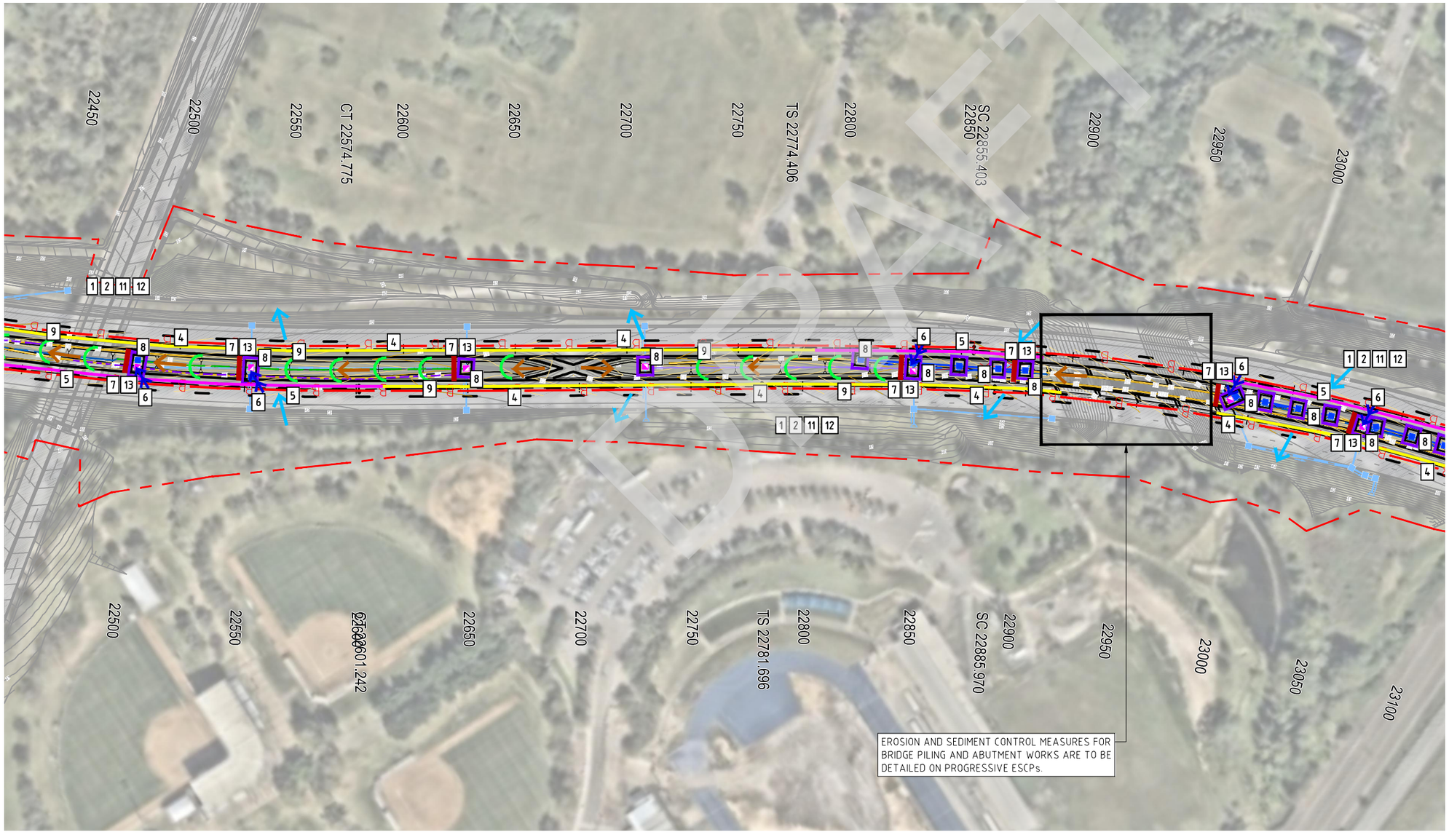
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP44 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 45 OF 59

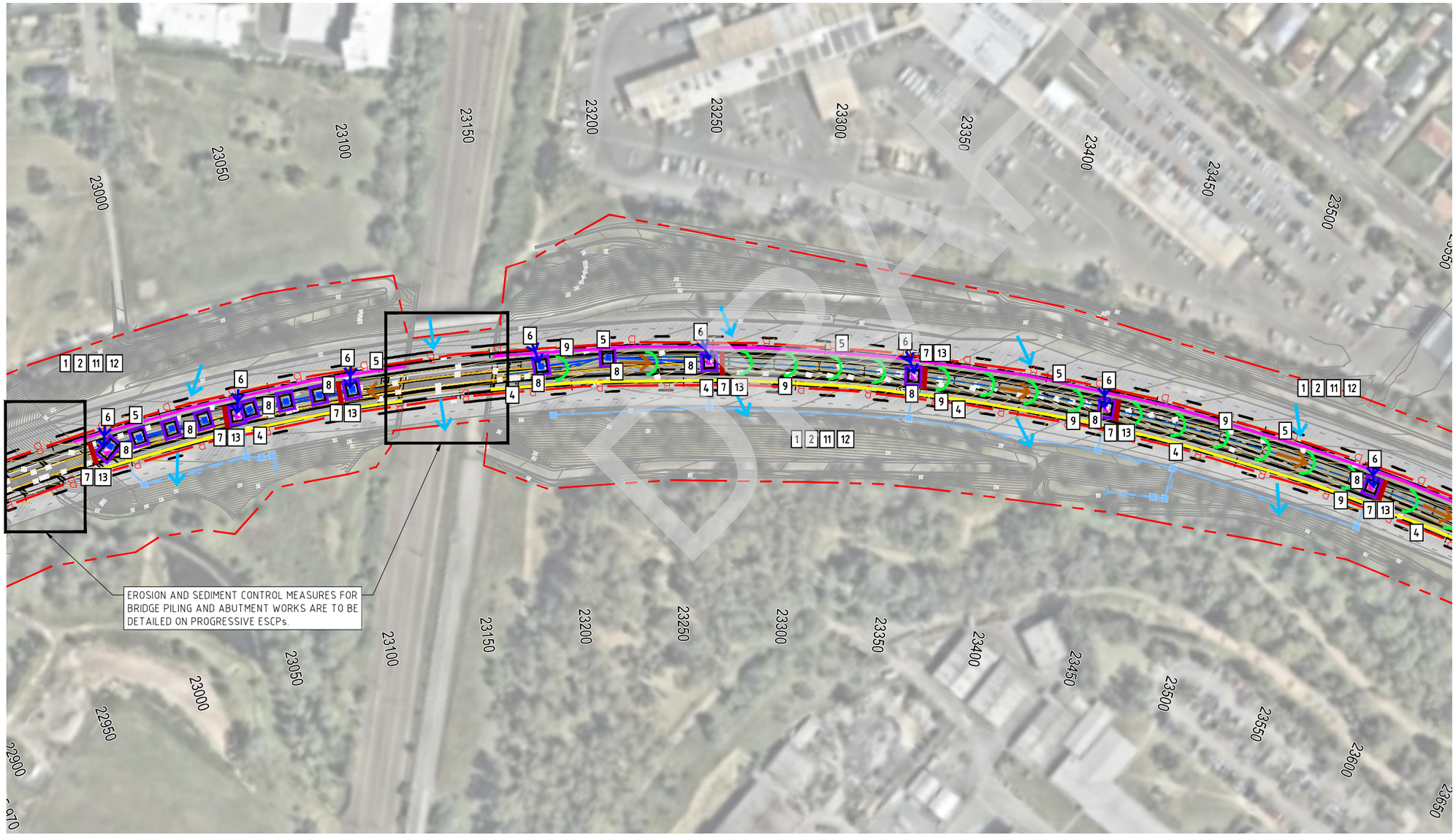
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP45 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
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   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
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   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 46 OF 59

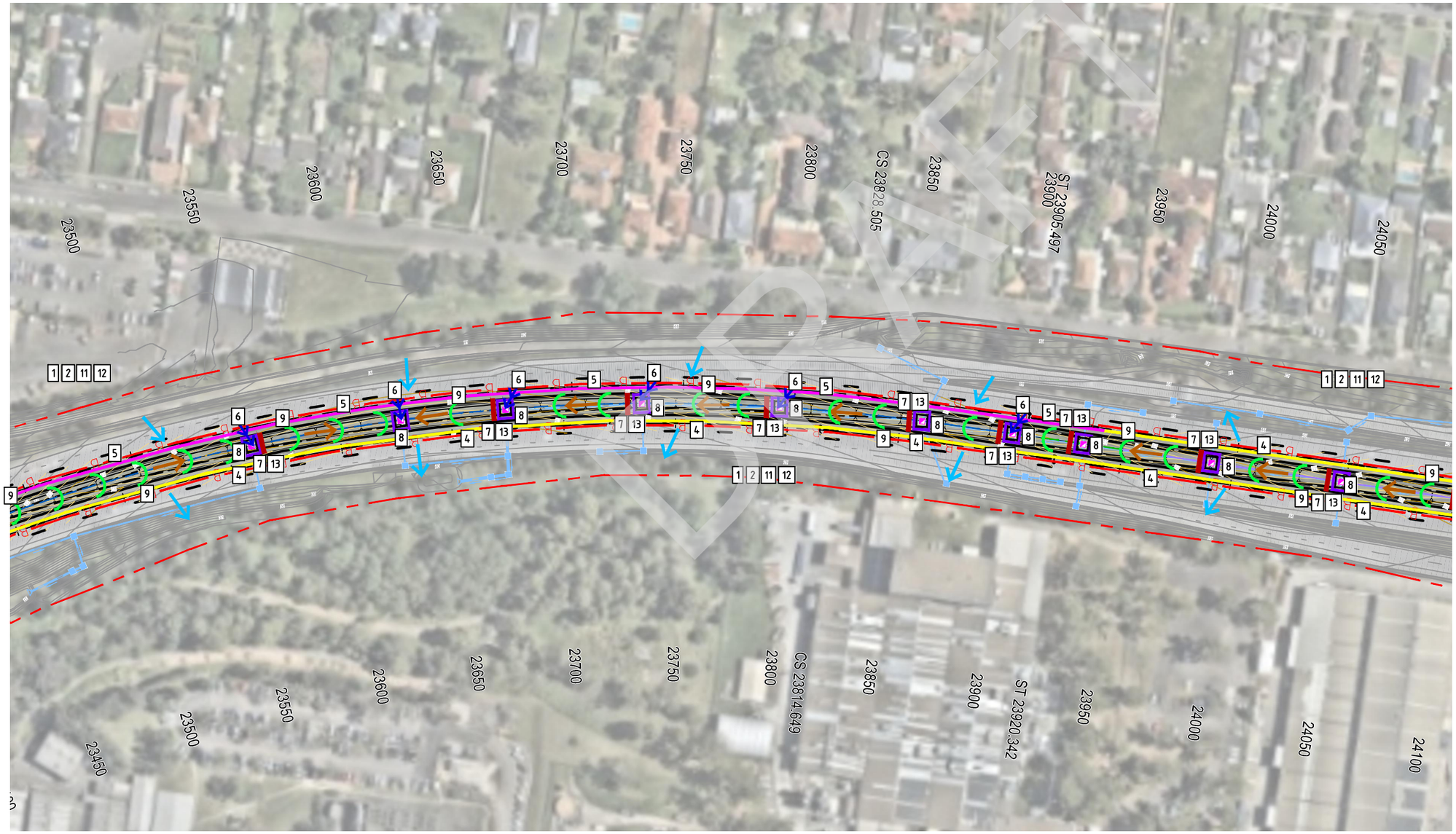
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP46 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 47 OF 59

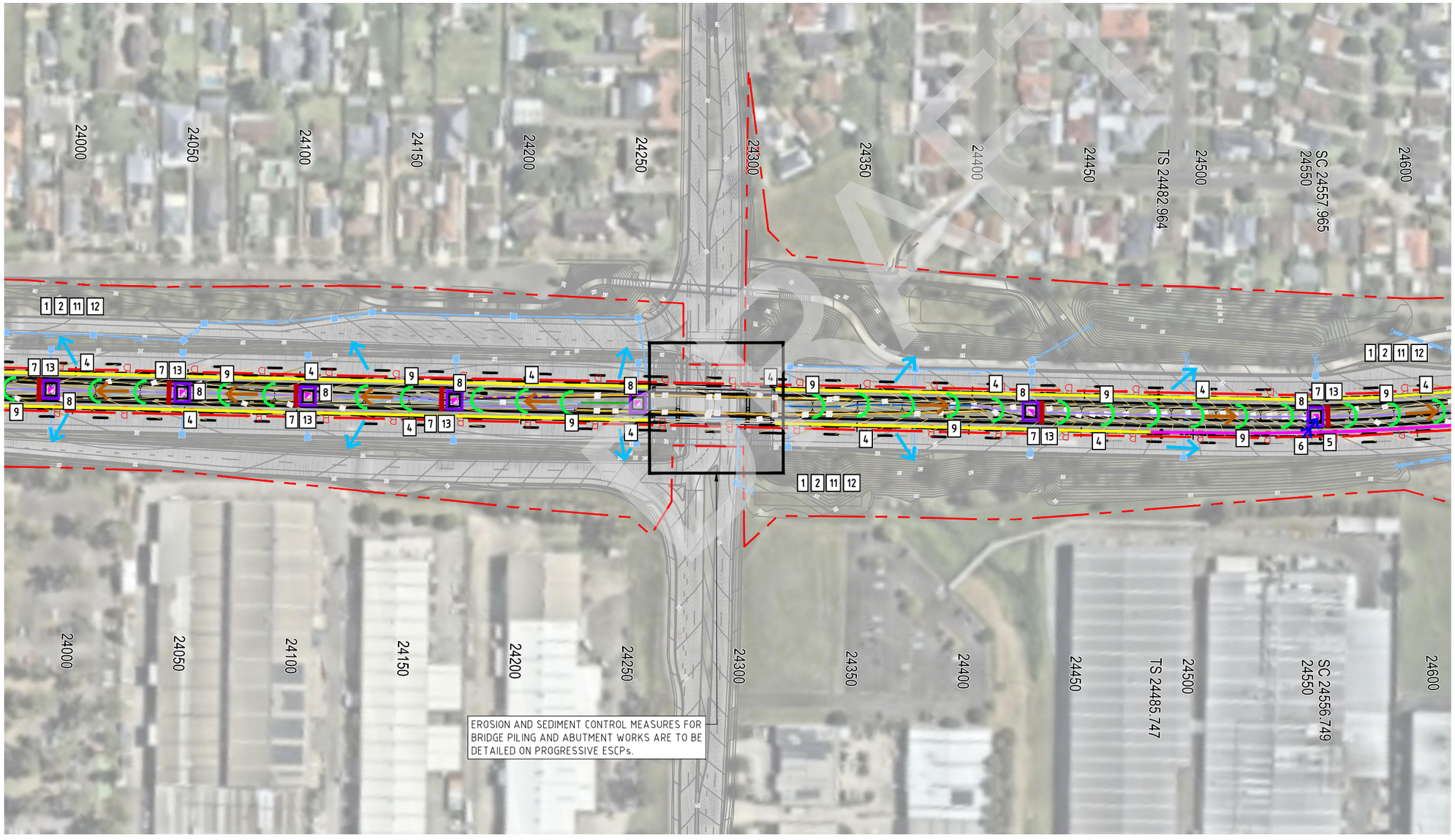
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP47 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| DRAFT | |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 48 OF 59

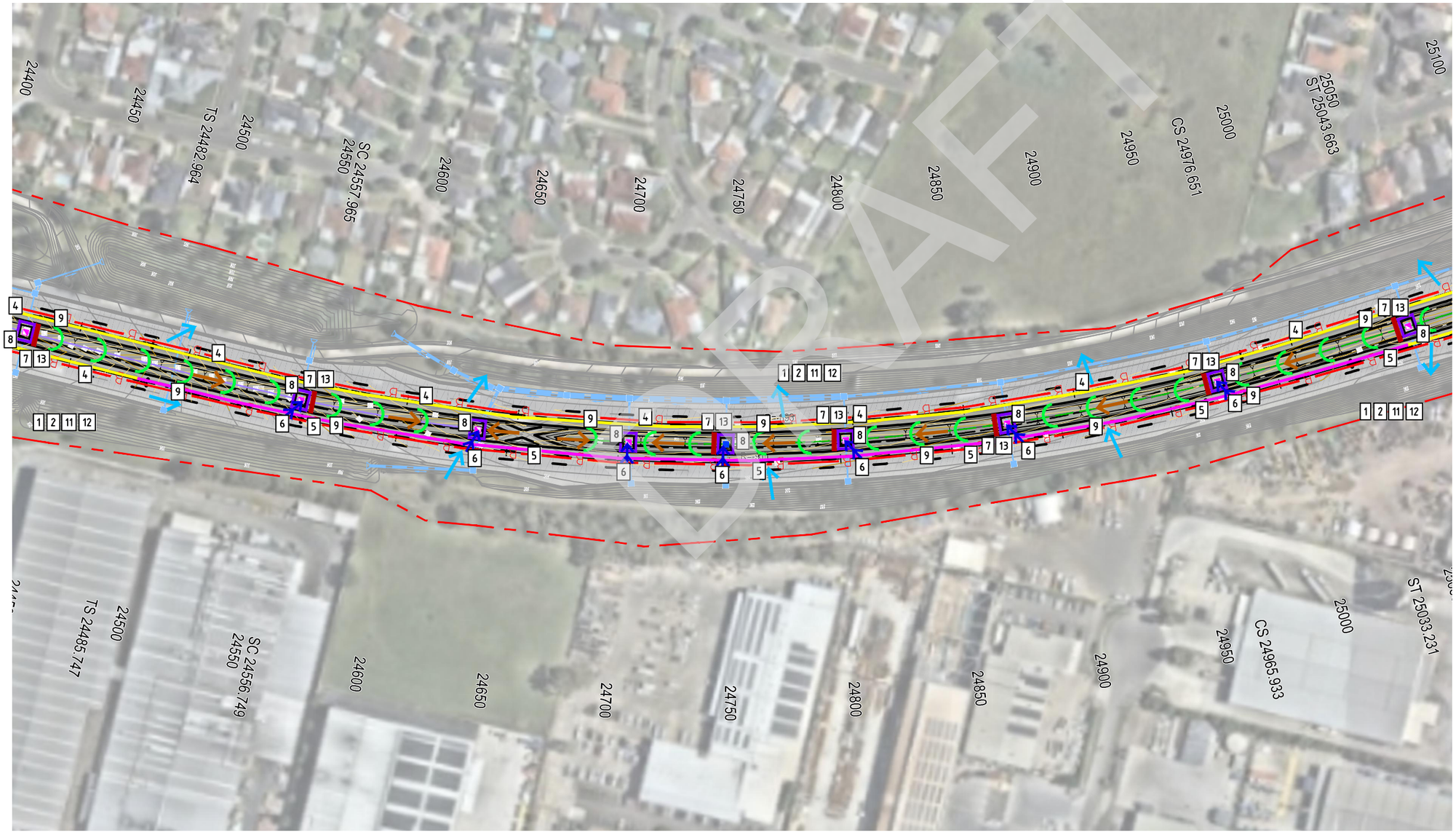
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP48 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P03_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 49 OF 59

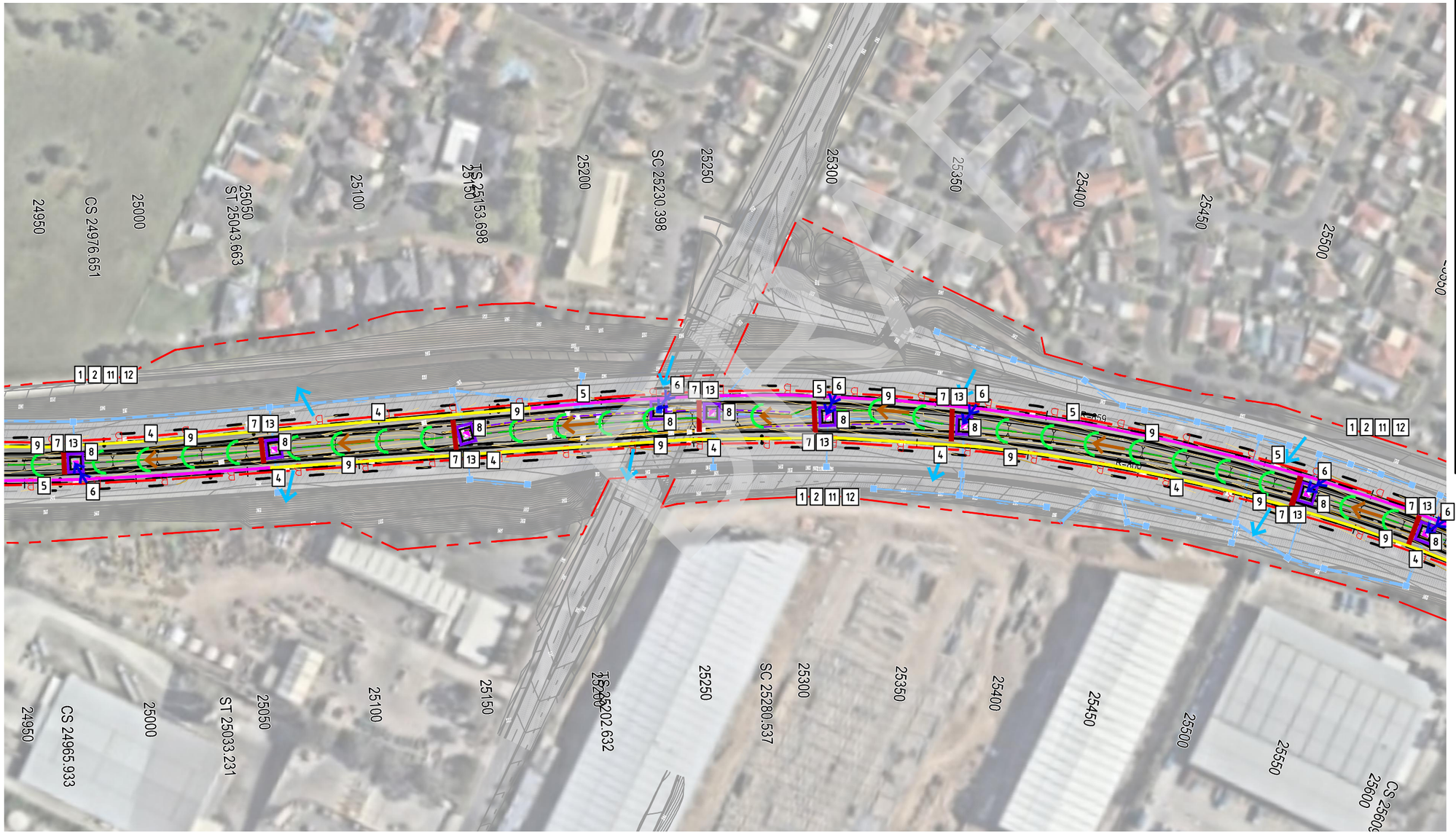
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP49 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
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7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
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   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
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9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

DRAFT

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PROJECT TITLE: M7 WIDENING WORKS

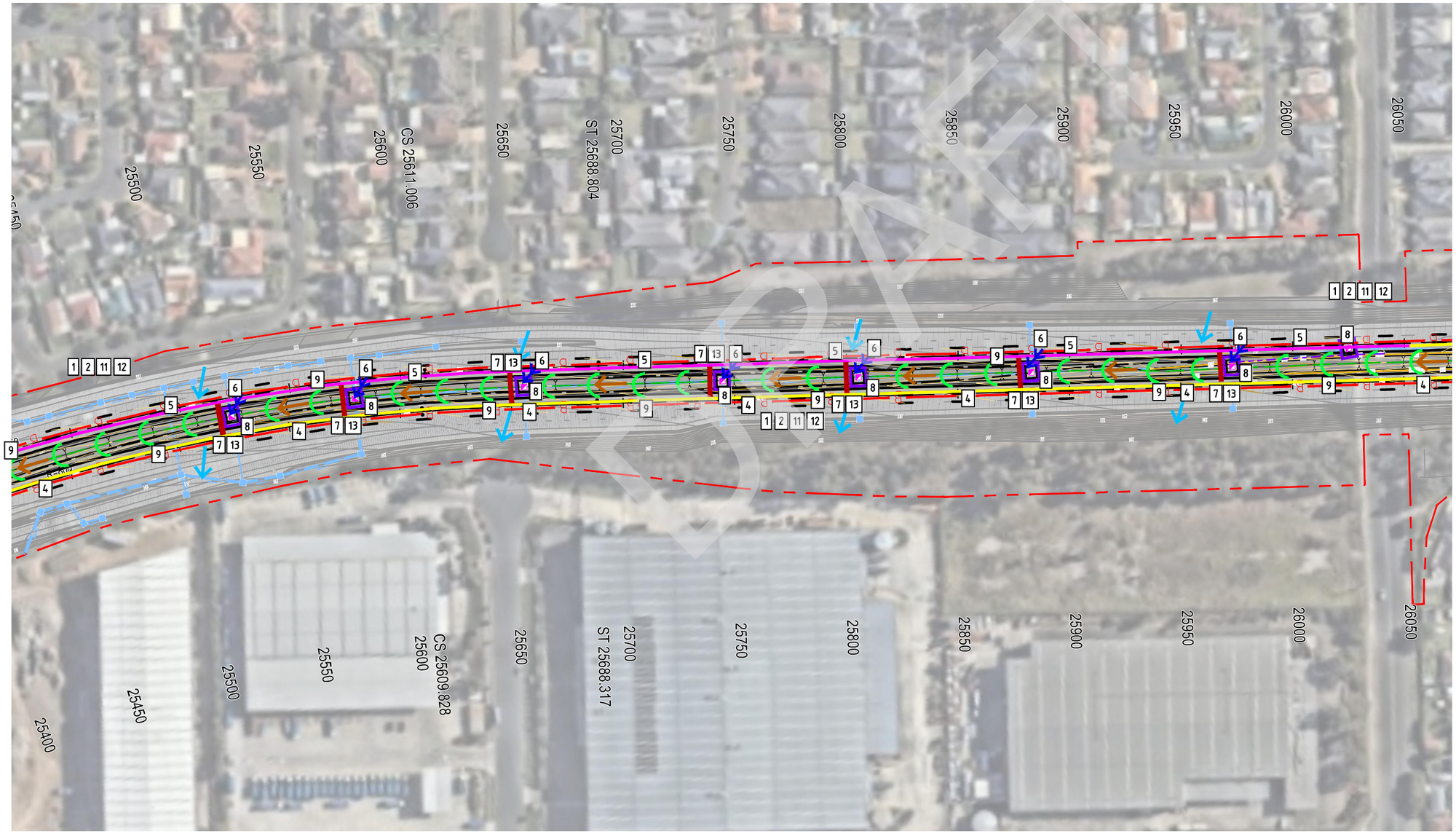
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 50 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP50 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
      3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
6. Provide temporary pipes or chutes to direct clean water into stormwater pits. Refer to Photo 7 on ESCP55 and Details 3 and 4 on ESCP56.
   6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




**LEGEND:**

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 51 OF 59

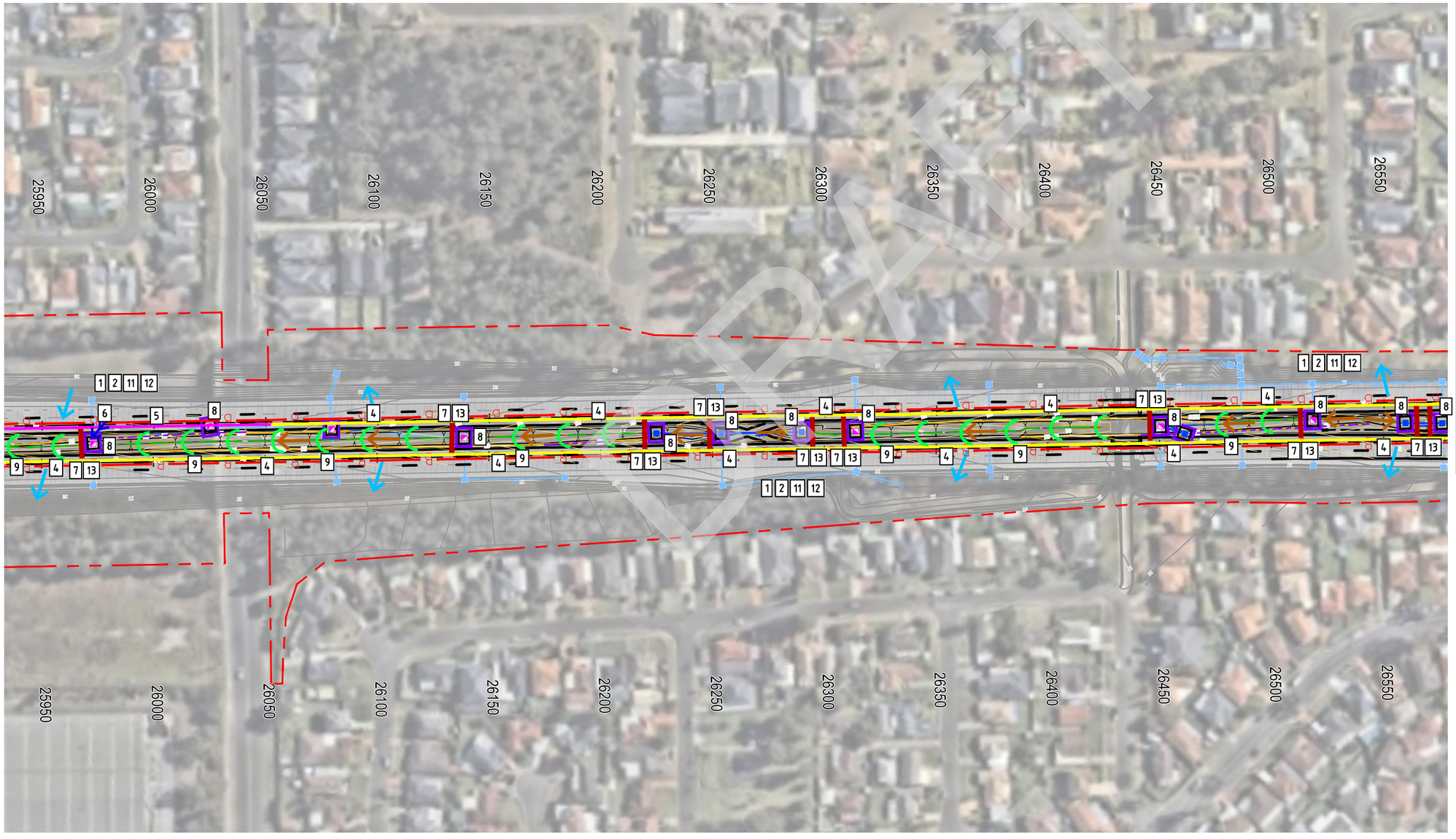
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|---|---|---|---|
| 23000072 | P03 | ESCP51 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
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   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
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- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
- TIGHTLY ABUTTING/ADJOINING COIR LOGS/SANDBAGS, CONCRETE SEAL OR SIMILAR ALONG INSIDE OF TRAFFIC BARRIERS TO MINIMISE DIRTY WATER EGRESS (SEE PHOTO 5 ON ESCP55)
- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
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| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

DRAWING STATUS

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 52 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP52 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
     - 3.1.1. Alternatively, establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP59 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Install tightly abutting/adjoing coir logs, sandbags or similar along inside of traffic barriers downslope of active work areas to minimise the risk of dirty water egress.
   - 4.1. Alternatively use concrete to seal gaps in concrete barriers to minimise the risk of dirty water egress. Refer to Photo 5 on ESCP55.
5. Install hotmix/coldmix/concrete/timber strips or similar just inboard of the traffic barriers to minimise the risk of clean water ingress in the locations shown. Refer to Photos 1 - 4 and Details 1 and 2 on ESCP55-06.
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   - 6.1. Note temporary pipes or chutes are not required during active works, but MUST be in place prior to end of shift or when rain is imminent.
   - 6.2. Clean water MUST flow directly into the stormwater pits, not into sediment controls.
7. Provide an earthen bund (min. 400mm high) around the low side of the stormwater pits to create an artificial sag point and allow ponding of water around sediment traps at each pit. Refer to Detail 5 on ESCP57.
8. Stormwater Drainage Works - As much as possible:
   - Schedule the stormwater drainage works for a period of little to no rainfall and complete as quickly as possible;
   - Limit the amount of open trenches/excavations at any one time;
   - Ensure trench/excavation spoil and stockpiled materials are not located where they are likely to fall or wash onto roads or into gutters or drains;
   - Close trenches/excavations ASAP following pit/pipe laying;
   - Ensure that new pits and pipes are onsite and ready to be installed prior to opening trenches/excavatoions (to minimise the time trenches/excavations are open if deliveries are delayed);
   - Install pit protection around all existing and new stormwater pits within the work area. Refer to Details 5, 6 and 7 on ESCP57; and
   - Water accumulating within trenches/excavations is to be de-watered in accordance with instruction 13 below.
9. Place check dams (sandbags or coir logs) at max. 20m intervals within the median swale drain prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer Blue Book Standard Drawing SD 5-4 on ESCP58.
10. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 10.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
11. Progressively stabilise all disturbed areas as each section of works is completed.
12. Sweep local roads as required to remove any tracked sediment or rocks.
13. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
- STORMWATER PIT
- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
- HOTMIX, COLDMIX, CONCRETE, TIMBER OR EQUIVALENT CLEAN WATER DIVERSION LOCATED JUST INSIDE TRAFFIC BARRIERS (SEE PHOTO 1 - 4 AND DETAILS 1 & 2 ON ESCP55-56).
- EARTH BUND IN MEDIAN INVERT TO CREATE ARTIFICIAL SAG POINT AND ALLOW PONDING OF WATER AROUND SEDIMENT TRAPS AT EACH PIT (SEE DETAIL 5 ON ESCP57)
- TEMPORARY PIPE OR CHUTE TO DIRECT CLEAN WATER INTO PITS. ONLY REQUIRED AT END-OF-DAY OR WHEN RAIN IS IMMINENT (SEE PHOTO 7, DETAILS 3 AND 4 ON ESCP55-56)
- CHECK DAM (SANDBAGS, COIR LOGS, WRAPPED EARTH, MULCH OR SIMILAR) (BLUE BOOK SD 5-4 ON ESCP58)
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- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP58)
- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
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| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M7 WIDENING WORKS

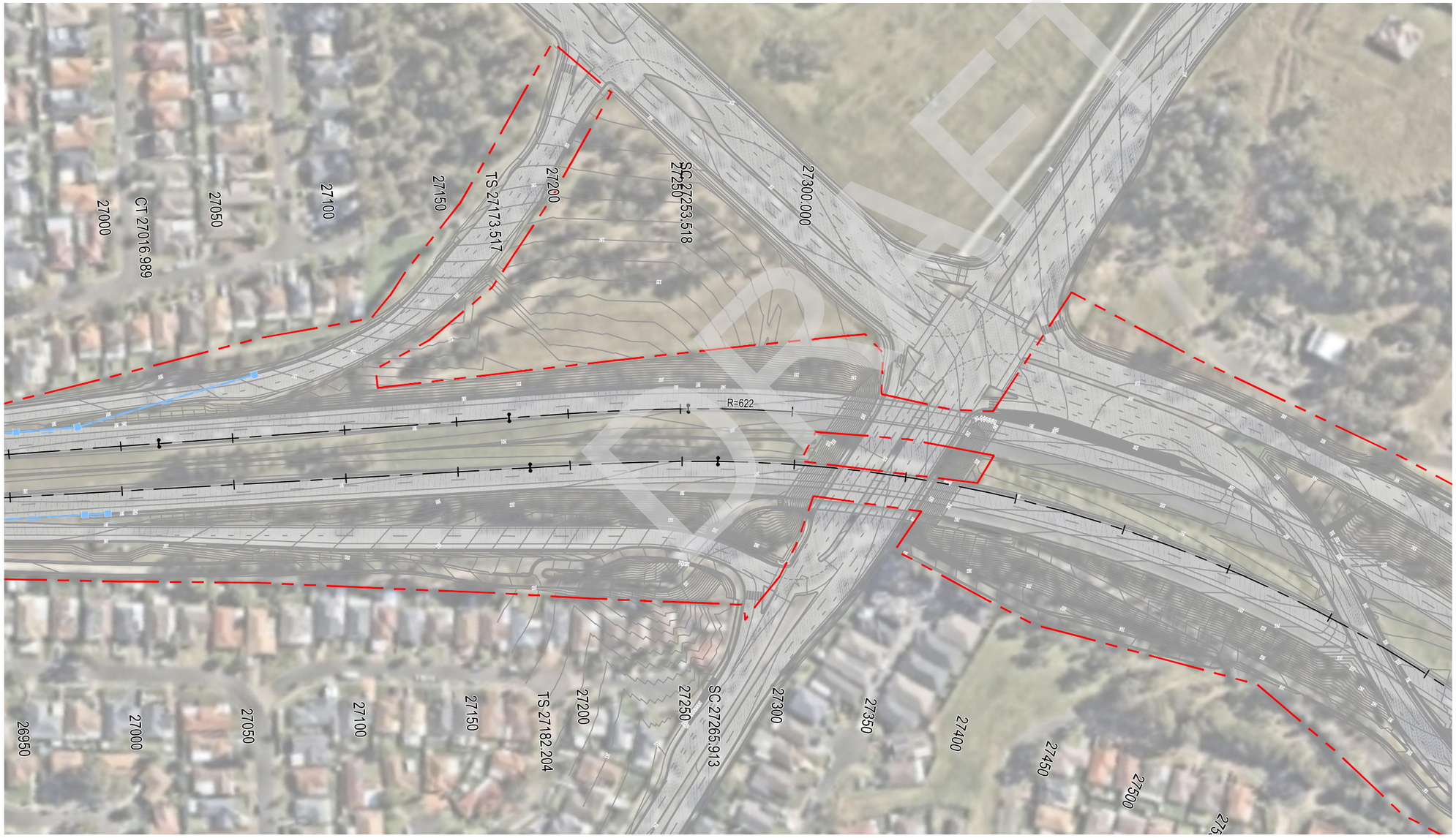
DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 53 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP53 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Utilise existing asphalt for site entry/exit points.
   - 3.1. Clean or hose down exiting vehicles as required to minimise the risk of sediment/mud tracking onto local roads.
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### LEGEND:

- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP59)
- CROSS FORMATION SLOPE BREAKS (ONLY REQUIRED AT END-OF-DAY WHEN RAIN IS FORECAST OR WHEN RAIN IS IMMINENT
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- PIT PROTECTION (REFER TO PHOTO 6 ON ESCP55 AND DETAILS 5 -7 ON ESCP57)
- B — TRAFFIC BARRIER (INDICATIVE LOCATION SHOWN)
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- STABILISE EXPOSED BATTER WHEN RAIN IS IMMINENT

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

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DRAWING STATUS

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING EROSION AND SEDIMENT CONTROL PLAN SHEET 54 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP54 | A |

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PHOTO 1: EXAMPLE OF A CONCRETE EDGE-OF-PAVEMENT AS OFFSITE CLEAN WATER DIVERSION.



PHOTO 2: EXAMPLE OF A TIMBER EDGE-OF-PAVEMENT OFFSITE CLEAN WATER DIVERSION.



PHOTO 3: EXAMPLE OF AN ASPHALT EDGE-OF-PAVEMENT OFFSITE CLEAN WATER DIVERSION, INCLUDING PIPE INTO EXISTING PIT



PHOTO 4: EXAMPLE OF A COLDMIX EDGE-OF-PAVEMENT OFFSITE CLEAN WATER DIVERSION. NOTE FABRIC-WRAPPED CHECK DAMS USED TO MANAGED ONSITE DIRTY WATER.



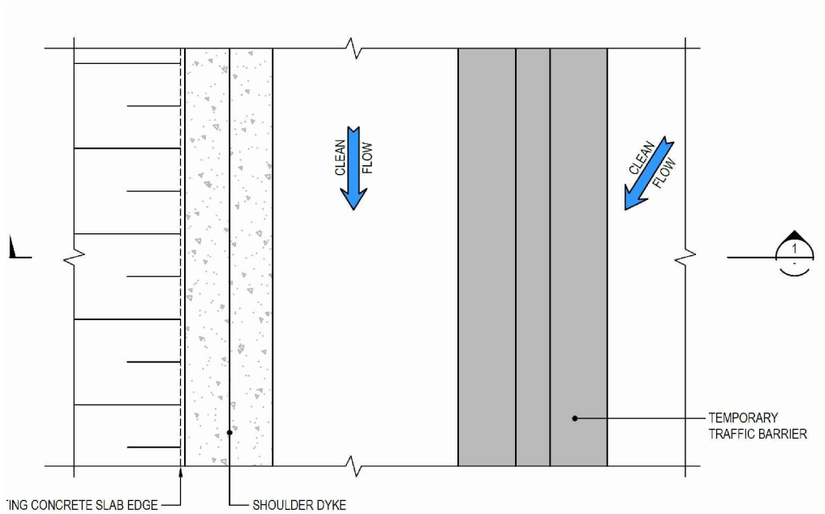

PHOTO 5: EXAMPLE OF A CONCRETE SEAL TO STOP ONSITE DIRTY WATER LEAKING UNDER TRAFFIC BARRIERS.



PHOTO 6: EXAMPLE OF MEDIAN PIT PROTECTION.



PHOTO 7: EXAMPLE OF TEMPORARY OFFSITE CLEAN WATER DIVERSION PIPED ACROSS WORK AREA. ONLY REQUIRED WHEN RAIN IS IMMINENT.




SHOULDER DYKE
NTS

DETAIL 1: SHOULDER DYKE (i.e. HOTMIX/COLDMIX/CONCRETE/TIMBER OR SIMILAR BUND).

DRAFT

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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CLIENT

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PROJECT TITLE

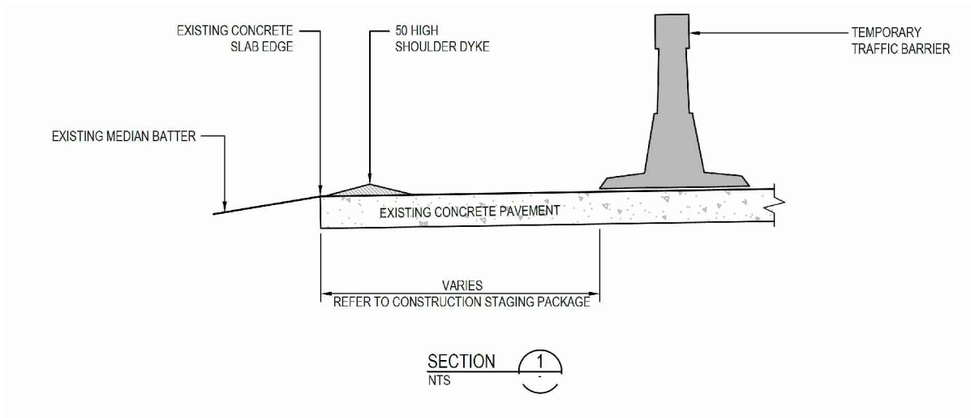
M7
WIDENING WORKS

DRAWING TITLE

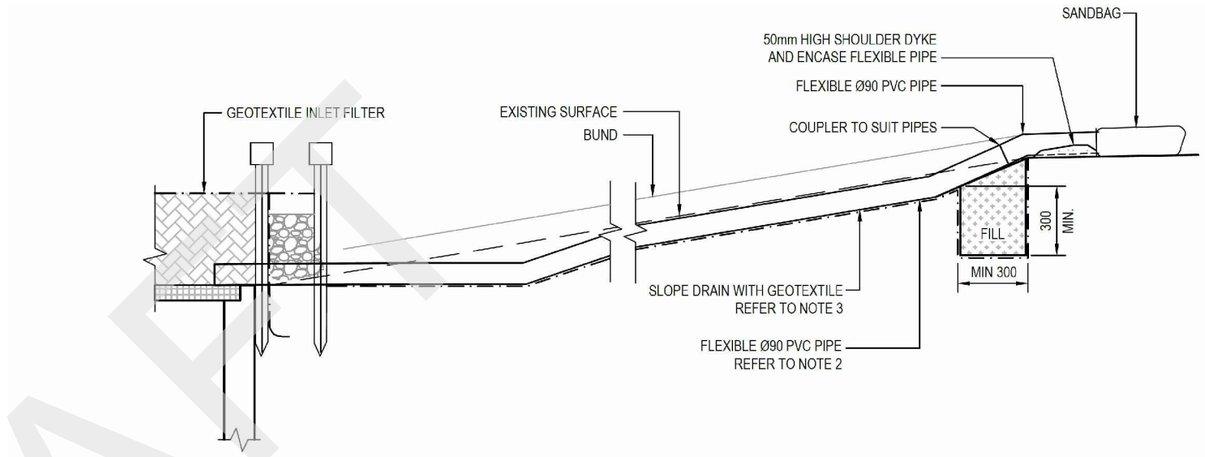
OVER-ARCHING ESCP
PHOTOS 1 – 7 & DETAIL 1
SHEET 55 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP55 | A |

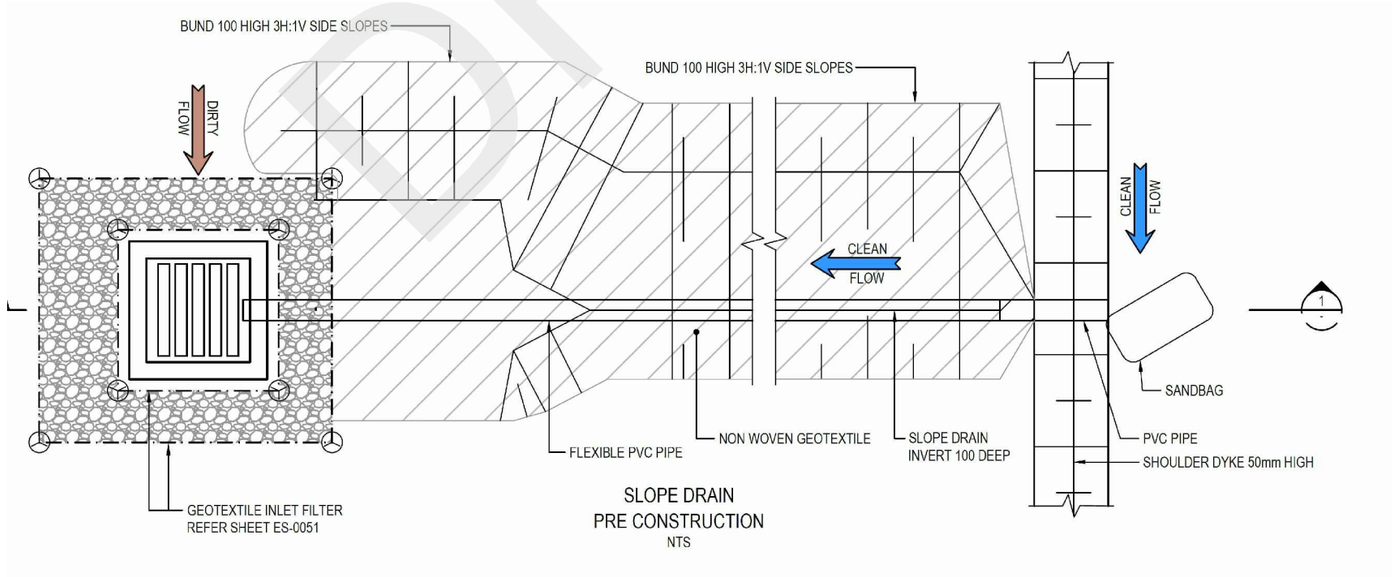
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DETAIL 2: SHOULDER DYKE (i.e. HOTMIX/COLDMIX/CONCRETE/TIMBER OR SIMILAR BUND).




DETAIL 3: EDGE-OF-PAVEMENT OFFSITE CLEAN WATER SYSTEM.




DETAIL 4: EDGE-OF-PAVEMENT OFFSITE CLEAN WATER SYSTEM.

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

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| SCALE: (on A3 Original) | N.T.S. |

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CLIENT: JOHN HOLLAND

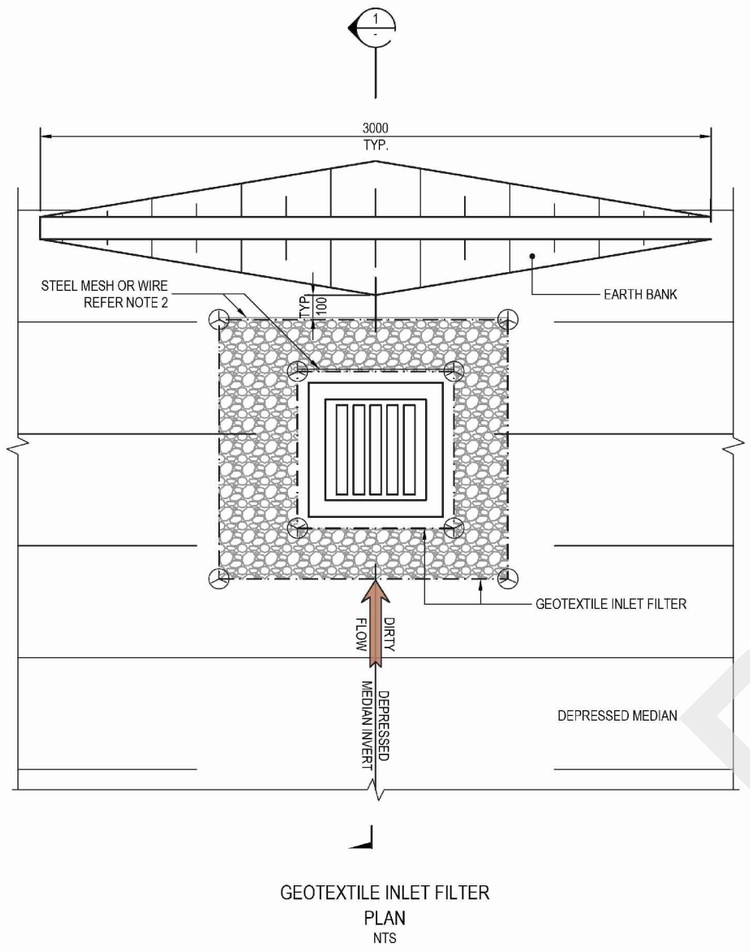
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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING ESCP DETAILS 2, 3 & 4 SHEET 56 OF 59

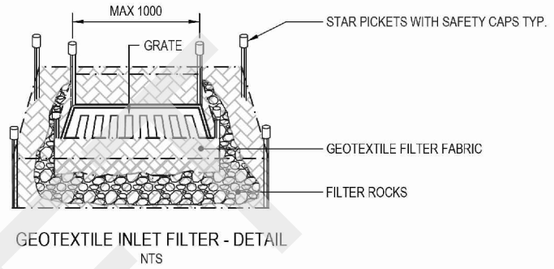
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|---|---|---|---|
| 23000072 | P03 | ESCP56 | A |

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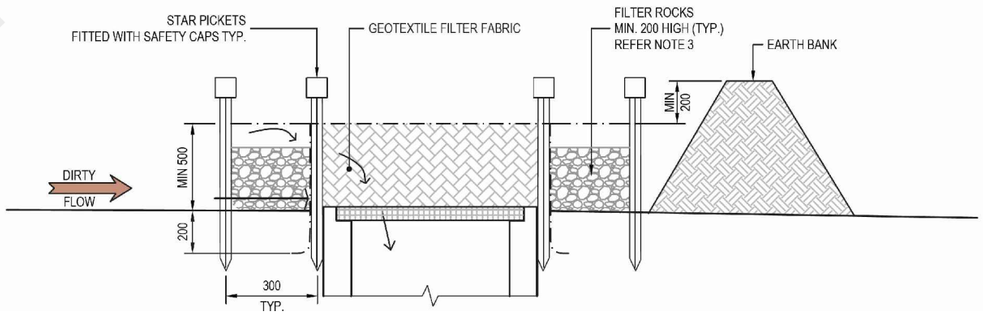

GEOTEXTILE INLET FILTER
PLAN
NTS

**DETAIL 5: MEDIAN INLET FILTER AND EARTH BANK/BUND.**




GEOTEXTILE INLET FILTER - DETAIL
NTS

**DETAIL 6: MEDIAN INLET FILTER (PIT PROTECTION).**




**DETAIL 7: MEDIAN INLET FILTER (PIT PROTECTION AND EARTH BUND/BANK).**

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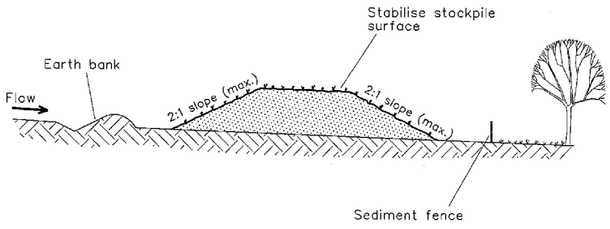
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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER–ARCHING ESCP DETAILS 5 – 7 SHEET 57 OF 59

| PROJECT NO. | SUB–PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP57 | A |

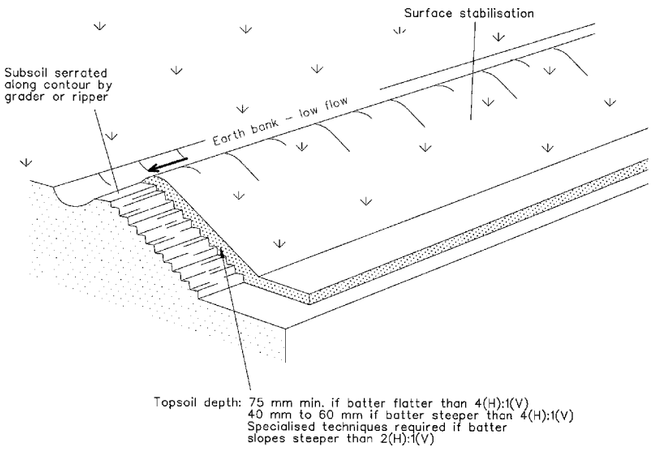
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## Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

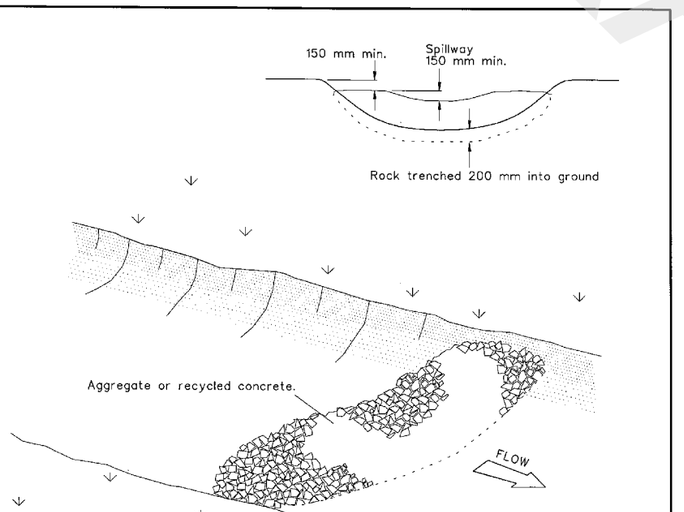
## STOCKPILES — SD 4-1




## Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

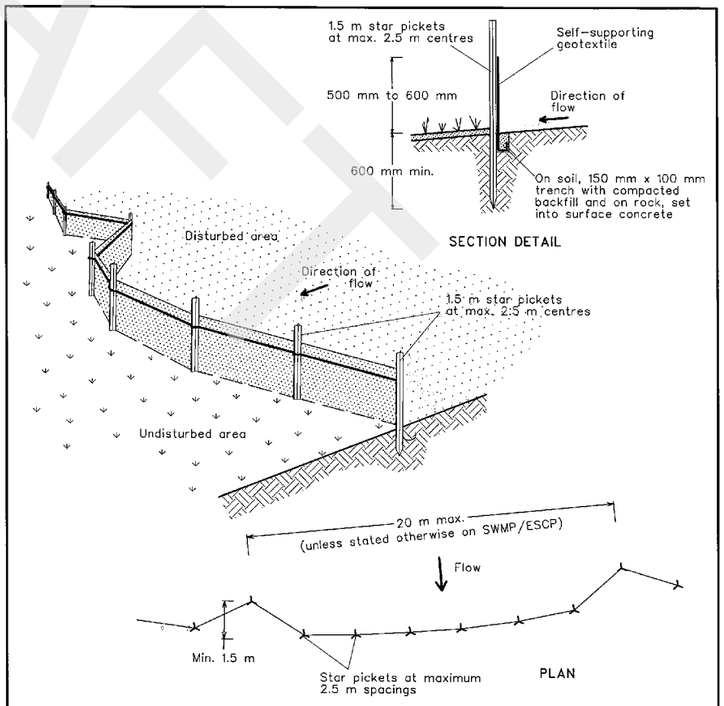
## REPLACING TOPSOIL — SD 4-2




## Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

## ROCK CHECK DAM — SD 5-4




## Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

## SEDIMENT FENCE — SD 6-8

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|---|---|---|---|---|---|
| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS: DRAFT
DESIGN BY: L.O.
DRAWN BY: L.O.
FINAL APPROVAL: A.M.
SCALE: N.T.S. (on A3 Original)

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PROJECT TITLE: M7 WIDENING WORKS

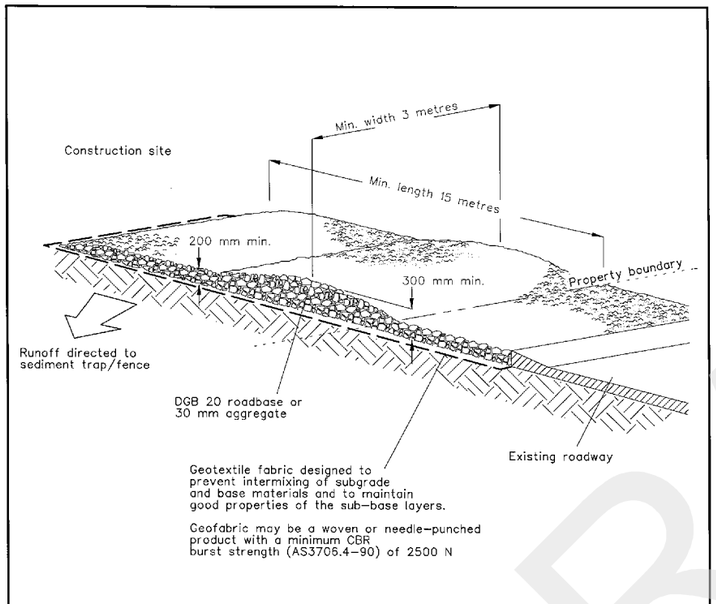
DRAWING TITLE: OVER-ARCHING ESCP BLUE BOOK STANDARD DRAWINGS – SHEET 58 OF 59

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|---|---|---|---|
| 23000072 | P03 | ESCP58 | A |

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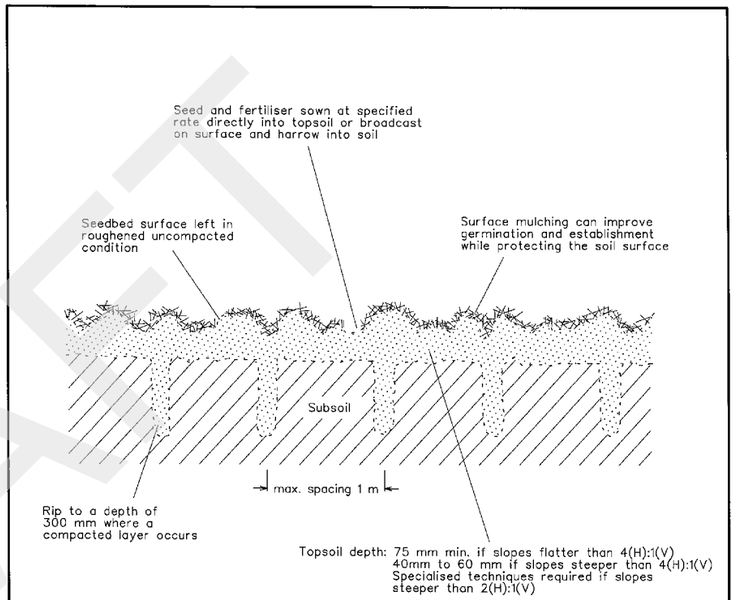
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## Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

**STABILISED SITE ACCESS** **SD 6-14**




## Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

**SEEDBED PREPARATION** **SD 7-1**

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| A | 25/07/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE: M7 WIDENING WORKS

DRAWING TITLE: OVER-ARCHING ESCP BLUE BOOK STANDARD DRAWINGS SHEET 59 OF 59

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P03 | ESCP59 | A |

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# Primary Erosion and Sediment Control Plan for M12 East package:

- M7-M12 Interchange
- Elizabeth Drive Connection

# GENERAL REQUIREMENTS

## BACKGROUND

This is a Primary Erosion and Sediment Control Plan (PESCP). It is for the M7/M12 Interchange works and shows the locations for erosion and sediment controls to be implemented for those works. Progressive ESCPs are to be prepared for each section or parcel of work in accordance with the Primary ESCP. Progressive ESCPs are to take into account the controls shown in this Over-arching ESCP. This ESCP has been prepared following the guidelines and standards in the NSW Blue Book Volumes 1 (Landcom, 2004) and 2D (DECC, 2008).

## EROSION HAZARD ASSESSMENT

Refer to ESCP02 for the erosion hazard assessment in each disturbed catchment.

## SEDIMENT BASIN DESIGN ASSUMPTIONS

- Sediment basin design rainfall depth: 5-day, 85th percentile rainfall depth = 32 .2 mm
- Volumetric runoff coefficient (Cv) = 0.64 (assuming hydrologic group D runoff coefficient - low infiltration, high runoff)
- Sediment basin storage zone design = 2 months for all basins

## GENERAL INSTRUCTIONS

1. This plan is to be read in conjunction with other relevant environmental documentation for the project (e.g. CEMP, SWMP etc.)
2. Weather forecasts are to be monitored daily and the site prepared to minimise erosion, control drainage, and maximize sediment capture during rain events. Erosion and sediment controls removed or damaged during construction are to be repaired or reinstated prior to forecast rain.
3. Numbering on ESCP03-10 indicates the order that works are to be undertaken (i.e. 1 then 2, then 3 etc).
4. The M7/M12 interchange works are to be staged as much as possible to minimise the amount of disturbed areas at any one time.
5. As much as possible, construct permanent drainage structures early and utilise them for clean/dirty water management during construction. Refer to ESCP03-10 for locations.
6. Erosion and sediment controls are to be implemented as part of initial site works, except as noted in this plan.
7. Minimise disturbance at any one time to only what is necessary for safe and efficient construction. Do not disturb new areas when rain is imminent unless appropriate controls can be implemented prior to rain occurring.
8. Establish stockpile areas and manage stockpiles in accordance with Blue Book Standard Drawing SD 4-1 on ESCP14.
   - 8.1. Inactive stockpiles are to be stabilised by spraying with a biodegradable polymer or covering with geofabric, jute matting or equivalent ground cover to achieve at least 60% ground cover.
9. Undertake dust suppression as required to minimise dust rise.
10. Regular site inspections are to be conducted by the site environment manager (or their representative) of temporary controls and general site conditions and records of all such inspections are to be retained onsite. Inspections are to be undertaken:
    - 10.1. At least weekly during normal construction hours; and
    - 10.2. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours); and
    - 10.3. Daily during rain events (if safe to do so); and
    - 10.4. Within 24 hours of the cessation of a rain event that causes runoff (if safe to do so).
11. Undertake progressive stabilisation of lands as final earthworks are completed in each area (rather than waiting until the completion of works).
    - 11.1. Final rehabilitation is to achieve the C-factors (ground cover) detailed below:
      - 11.1.1. C-factor of 0.1 (>= 60% ground cover) within 20 days; and
      - 11.1.2. C-factor of 0.05 (at least 70% ground cover) within 2 months/at completion of works.
    - 11.2. Areas to be revegetated are to be topsoiled first. Refer to Blue Book Standard Drawing SD 4-2 on ESCP14.
12. 10.3. Appropriate seedbed preparation should be carried out when revegetating lands (See Blue Book Standard Drawing SD 7-1 on ESCP17).
13. As areas are completed (i.e. at least 90% of any finished area has at least 70% final ground cover), temporary sediment and drainage controls can be decommissioned and removed.
14. Ensure all controls are located within the Clearing limits.
15. Progressive ESCPs are to be prepared for each section or parcel of work in accordance with the Primary ESCP. Progressive ESCPs are to take into account the controls shown in this Over-arching ESCP.

## PRIOR TO FORECAST RAINFALL

Prior to forecast rainfall, erosion and sediment controls are to be inspected and the following implemented:

1. Check that all mulch/earth bunds or silt fences have returns at max. 20m intervals, and fabric-lined spillways in all low points along the mulch/earth bunds.
2. Check that clean upslope water is diverted around disturbed areas, or has a lined, stable pathway across the work zone. Ensure that dirty site water does not mix with the clean upslope water.
3. Check that dirty water is directed to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install temporary drains or bunds as required to ensure this.
4. Ensure indicated batter are stabilised (sprayed or covered) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours).
5. Ensure that all sediment basins/traps have adequate capacity for the forecast rain. De-water and/or de-silt all traps as required.

## SEDIMENT BASIN OPERATION AND MAINTENANCE

1. Each sediment basin is to be maintenance-cycled following rainfall. Within 5-days after rainfall of 5mm or more (i.e. sufficient to cause runoff):
   - 1.1. De-water the sediment basins following the project de-watering procedure in the SWMP (or in accordance with the 'De-watering and Dirty Water Treatment Requirements' notes below;
   - 1.2. Check the level of accumulated sediment in the basins. If it exceeds the sediment storage storage zone volume on ESCP02, de-silt the basin. Material removed from the basin must be taken to an active stockpile or spoil dump.
   - 1.3. Note that if rainfall (sufficient to cause runoff) occurs within 5 days of the previous rainfall event, the 5-day maintenance requirement is reset.
2. After each rainfall event, inspect the sediment basins to ensure spillway and inlet points are stable and free from scour. Repair as required.

## DE-WATERING AND DIRTY WATER TREATMENT REQUIREMENTS

De-watering and treatment of dirty water is to be undertaken in accordance with the Project SWMP or the below:

- Any active discharge of water from the project (i.e. where water is moved offsite via direct action such as pumping rather than flowing off the project as a result of heavy rainfall) is to achieve:
  - 50 NTU or less (or as required in the EPL); and
  - pH 6.5 to 8.5; and
  - <10mg/L oil and grease and no visible trace.
- Flocculation can be achieved by using gypsum at a rate of approximately 32kg/100 $m^3$ of stormwater. Refer to manufacturers guidelines for dosage details for alternative flocculants/coagulants. Note alternative flocculants/ coagulants require TfNSW approval prior to use.
- These de-watering requirements apply to dirty water accumulating in any sort of excavation, sump, or other ponded water body on the project.
- If the water is going to be used within the construction site for dust-suppression or construction purposes and will drain back into the sediment capture system it does not require treatment (except for pH, which must be between 6.5 and 8.5).

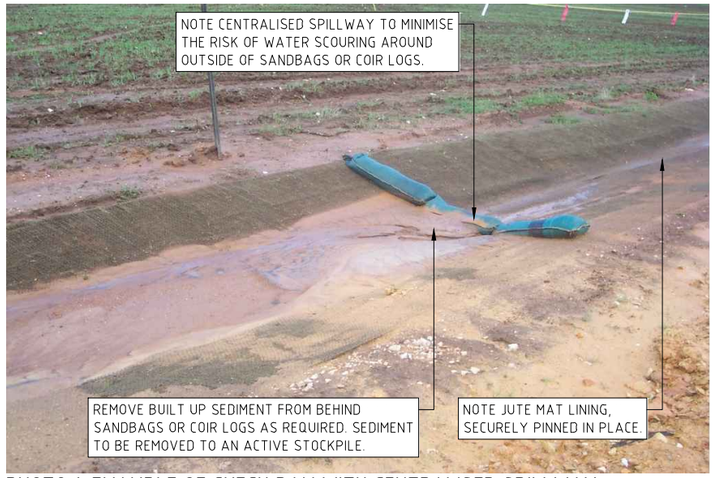



PHOTO 1: EXAMPLE OF CHECK DAM WITH CENTRALISED SPILLWAY.



PHOTO 2: EXAMPLE OF SILT FENCE WRAPPED UP AND BEHIND HEAD WALL.

## DOCUMENT CERTIFICATION

This plan has been developed based on agreed requirements as understood by SEEC at the time of engagement. It applies only to a specific task on the nominated lands. Other interpretations should not be made, including changes in scale or application to other projects. Changes to the project scope or extent might impact on the validity of this plan.

Any recommendations contained in this plan are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, or as advised to us. Such recommendations are potentially subject to the limited scope and resources available. Within the confines of the above statements and to the best of my knowledge, this plan does not contain any incomplete or misleading information.

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

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| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |
| FINAL | |

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP BACKGROUND AND GENERAL INSTRUCTIONS – SHEET 1 OF 18

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP01 | 00 |

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| CATCHMENT AND BASIN ID | Catchment area total (ha) * | Catchment area disturbed (ha) | LS-factor | Soil loss (t/ha/yr) | Catchment soil loss (t/yr) | Is a basin required? Y/N | Is a sediment basin feasible? (Y/N) Refer to Plan for details | Sediment basin storage (soil) volume ($m^3$) | Sediment basin settling (water) volume ($m^3$) | Total sediment basin volume ($m^3$) | Spillway Q100 event ($m^3/s$) | Spillway min. Crest Width (m) | Spillway Depth (inc. freeboard) (m) | Comments or recommendations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 320EO | 3.19 | 3.19 | 3.70 | 549 | 1750.2 | Y | Y | **224** | **657** | **881** | 2.032 | 5 | 0.7 | Note the catchment shown on ESCP03-04 assumes M12 Central and M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 2115W | 0.51 | 0.51 | 0.80 | 118 | 60.3 | N | - | - | - | - | - | - | - | |
| 2080E | 1.99 | 1.99 | 1.44 | 213 | 424.8 | Y | Y | **54** | **410** | **464** | 1.325 | 3.5 | 0.65 | Note the catchment shown on ESCP03-04 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1910W | 0.17 | 0.17 | 1.13 | 167 | 28.4 | N | - | - | - | - | - | - | - | |
| 1900E | 0.35 | 0.35 | 1.75 | 259 | 90.7 | N | - | - | - | - | - | - | - | |
| 1900W | 0.12 | 0.12 | 1.13 | 167 | 20.1 | N | - | - | - | - | - | - | - | |
| 1770E | 1.71 | 1.71 | 1.70 | 252 | 431.2 | Y | Y | **55** | **352** | **407** | 1.138 | 3 | 0.65 | Note the catchment shown on ESCP004 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1770W | 0.05 | 0.05 | 0.96 | 142 | 7.1 | N | - | - | - | - | - | - | - | |
| 1760E | 0.9 | 0.9 | 1.19 | 176 | 158.3 | N | - | - | - | - | - | - | - | |
| 1760W | 0.37 | 0.37 | 0.96 | 142 | 52.5 | N | - | - | - | - | - | - | - | |
| 1590E | 2.06 | 2.06 | 2.05 | 304 | 626.3 | Y | Y | **80** | **425** | **505** | 1.371 | 3.5 | 0.65 | Note the catchment shown on ESCP04-05 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1590W | 0.02 | 0.02 | 0.96 | 142 | 2.8 | N | - | - | - | - | - | - | - | |
| 1550E | 1.4 | 1.4 | 2.81 | 416 | 582.3 | Y | Y | **75** | **289** | **364** | 0.932 | 3 | 0.65 | Note the catchment shown on ESCP04-05 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1550W | 0.03 | 0.03 | 0.96 | 142 | 4.3 | N | - | - | - | - | - | - | - | |
| 1400E | 1 | 1 | 1.31 | 194 | 194.1 | N | - | - | - | - | - | - | - | |
| 1390E | 1.72 | 1.72 | 3.98 | 590 | 1014.3 | Y | Y | **130** | **354** | **484** | 1.145 | 3 | 0.65 | Note the catchment shown on ESCP05 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1390W | 0.84 | 0.84 | 3.33 | 493 | 414.0 | Y | Y | **53** | **173** | **226** | 0.583 | 2.5 | 0.6 | |
| 1220E | 0.88 | 0.88 | 2.81 | 416 | 366.0 | Y | N | ***47*** | ***181*** | ***228*** | 0.611 | 2.5 | 0.6 | A sediment basin is theorectically required in this catchment due to the assessed erosion hazard. However, a sediment basin cannot feasibly be provided within this catchment due to space constraints to existing/proposed structures. During construction, batters and steep slopes (>10%) in this catchment must be temporarily covered or sprayed with a soil binder whenever the weather forecast suggests a greater than 70% chance of 10mm or more rain in the next 24 hours. |
| 1210E | 2.48 | 2.48 | 2.81 | 416 | 1031.6 | Y | Y | **132** | **511** | **643** | 1.580 | 4 | 0.65 | Note the catchment shown on ESCP05 & ESCP08 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1210W | 0.75 | 0.75 | 3.70 | 549 | 411.5 | Y | N | ***53*** | ***155*** | ***208*** | 0.521 | 2.5 | 0.6 | A sediment basin is theorectically required in this catchment due to the assessed erosion hazard. However, a sediment basin cannot feasibly be provided within this catchment due to space constraints to existing/proposed structures. During construction, batters and steep slopes (>10%) in this catchment must be temporarily covered or sprayed with a soil binder whenever the weather forecast suggests a greater than 70% chance of 10mm or more rain in the next 24 hours. |
| 1200E | 0.9 | 0.9 | 1.76 | 261 | 234.6 | Y | N | ***30*** | ***185*** | ***215*** | 0.625 | 2.5 | 0.6 | A sediment basin is theorectically required in this catchment due to the assessed erosion hazard. However, a sediment basin cannot feasibly be provided within this catchment due to space constraints to existing/proposed structures. During construction, batters and steep slopes (>10%) in this catchment must be temporarily covered or sprayed with a soil binder whenever the weather forecast suggests a greater than 70% chance of 10mm or more rain in the next 24 hours. |
| 1200W | 0.35 | 0.35 | 3.33 | 493 | 172.5 | N | - | - | - | - | - | - | - | |
| 990E | 0.77 | 0.77 | 2.31 | 342 | 263.2 | Y | N | ***34*** | ***159*** | ***193*** | 0.535 | 2.5 | 0.6 | A sediment basin is theorectically required in this catchment due to the assessed erosion hazard. However, a sediment basin cannot feasibly be provided within this catchment due to space constraints to existing/proposed structures. During construction, batters and steep slopes (>10%) in this catchment must be temporarily covered or sprayed with a soil binder whenever the weather forecast suggests a greater than 70% chance of 10mm or more rain in the next 24 hours. |
| 700E | 3.61 | 2.85 | 5.89 | 872 | 2485.9 | Y | Y | **319** | **744** | **1063** | 2.299 | 5 | 0.7 | |
| 650W | 2.3 | 2.3 | 5.15 | 763 | 1754.8 | Y | Y | **225** | **474** | **699** | 1.531 | 4 | 0.65 | |
| 480E | 1.25 | 1.25 | 4.13 | 612 | 764.6 | Y | Y | **98** | **258** | **356** | 0.868 | 3 | 0.65 | |
| 480W | 2.51 | 2.51 | 4.64 | 688 | 1727.4 | Y | Y | **221** | **517** | **738** | 1.599 | 4.2 | 0.65 | SB480W may need to be a casacading series of connected basins due to space and the existing steep topography. |
| 450W | 0.26 | 0.26 | 5.89 | 872 | 226.8 | N | - | - | - | - | - | - | - | |
| 50N | 0.13 | 0.13 | 5.89 | 872 | 113.4 | N | - | - | - | - | - | - | - | |
| 100N | 2.41 | 2.41 | 4.64 | 688 | 1658.6 | Y | Y | **213** | **497** | **710** | 1.535 | 4 | 0.65 | Note the catchment shown on ESCP08 assumes M7/M12 interchange works will occur concurrently with the Elzabeth Drive Connection works. |
| 1400N | 0.55 | 0.55 | 1.08 | 161 | 88.4 | N | - | - | - | - | - | - | - | Note works in this catchment will likely be staged to maintain live traffic. |
| 1600S | 2.14 | 1 | 1.08 | 161 | 160.7 | N | - | - | - | - | - | - | - | Note works in this catchment will likely be staged to maintain live traffic. |

A composite LS-factor has been adopted, which has been determined based on variable catchment slope gradients and slope lengths.
R factor is 2500 for all basins
K factor is 0.0456 for all basins
P factor is 1.3 for all basins
C factor is 1.0 for all basins

**Spillway Notes:**

Spillway invert levels to be set above total basin volume and freebaord to be provided above the top of the spillway rock lining.

Dissipater structures to be provided at base of basin spillway and inlet points. Surface treatment - Gypsum treat ground surfaces at 1.5 $kg/m^2$ and line with geotextile (bidim A34 min.) and interlocking rock (D50 = 200mm).

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE

M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE

PRIMARY ESCP
CATCHMENT AND BASIN ANALYSIS
TABLE – SHEET 2 OF 18

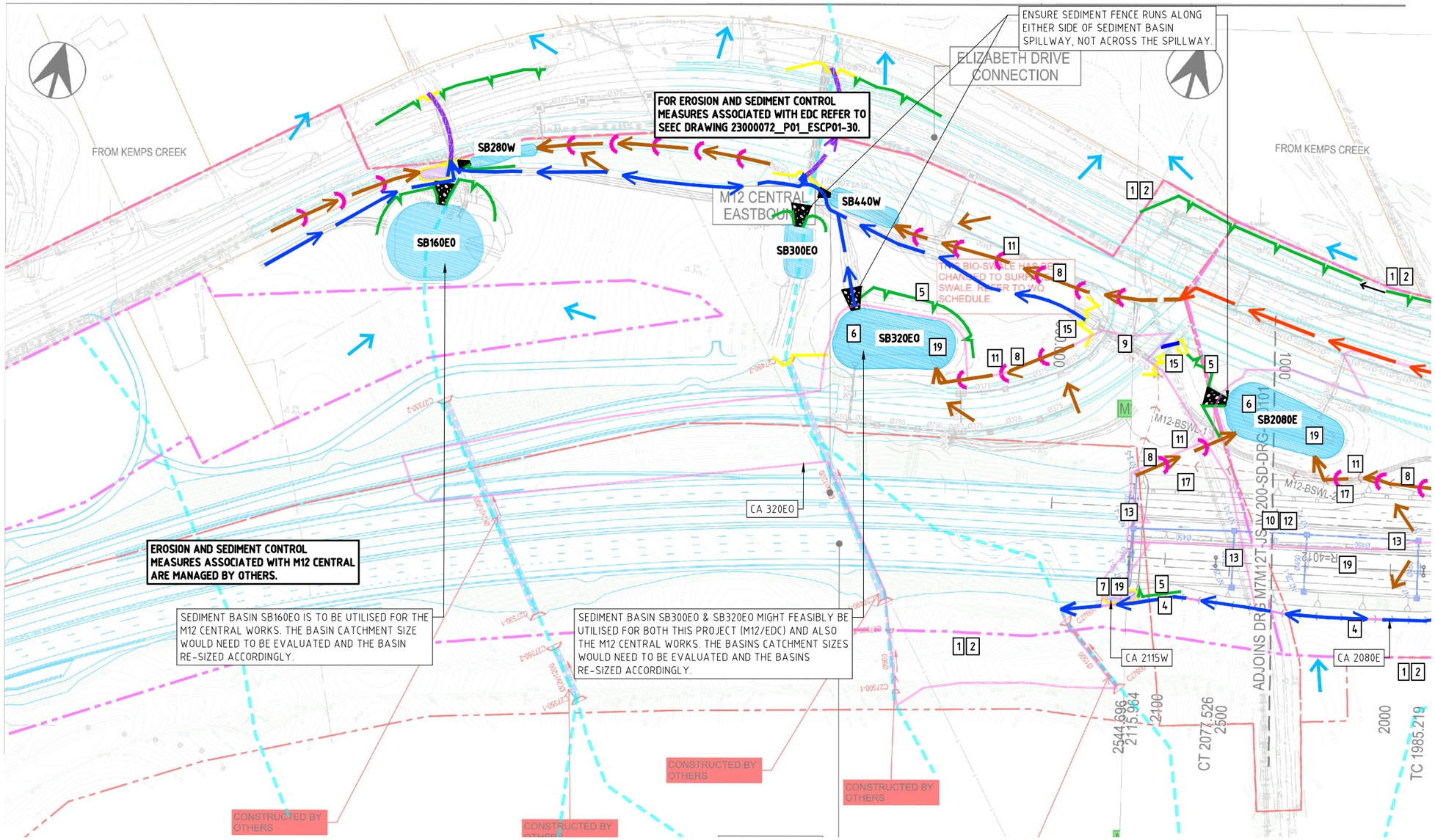
| PROJECT NO. | SUB–PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP02 | 00 |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP15.
7. Construct sediment traps in the locations shown. Refer to Detail 8 on ESCP16 for sediment traps.
8. Construct dirty water diversions in the locations shown. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP18.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
    - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP16) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON ESCP17)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP15 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON ESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- B — INDICATIVE SITE BOUNDARY
- NO GO ZONE. NO GROUND DISTURBANCE
- TEMPORARY WATER CROSSING (BLUE BOOK SD 5-1 ON ESCP15)
- BAFFLE FORMED USING STAR POSTS AND SILT FENCE OR PLYWOOD

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

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|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 3 OF 18

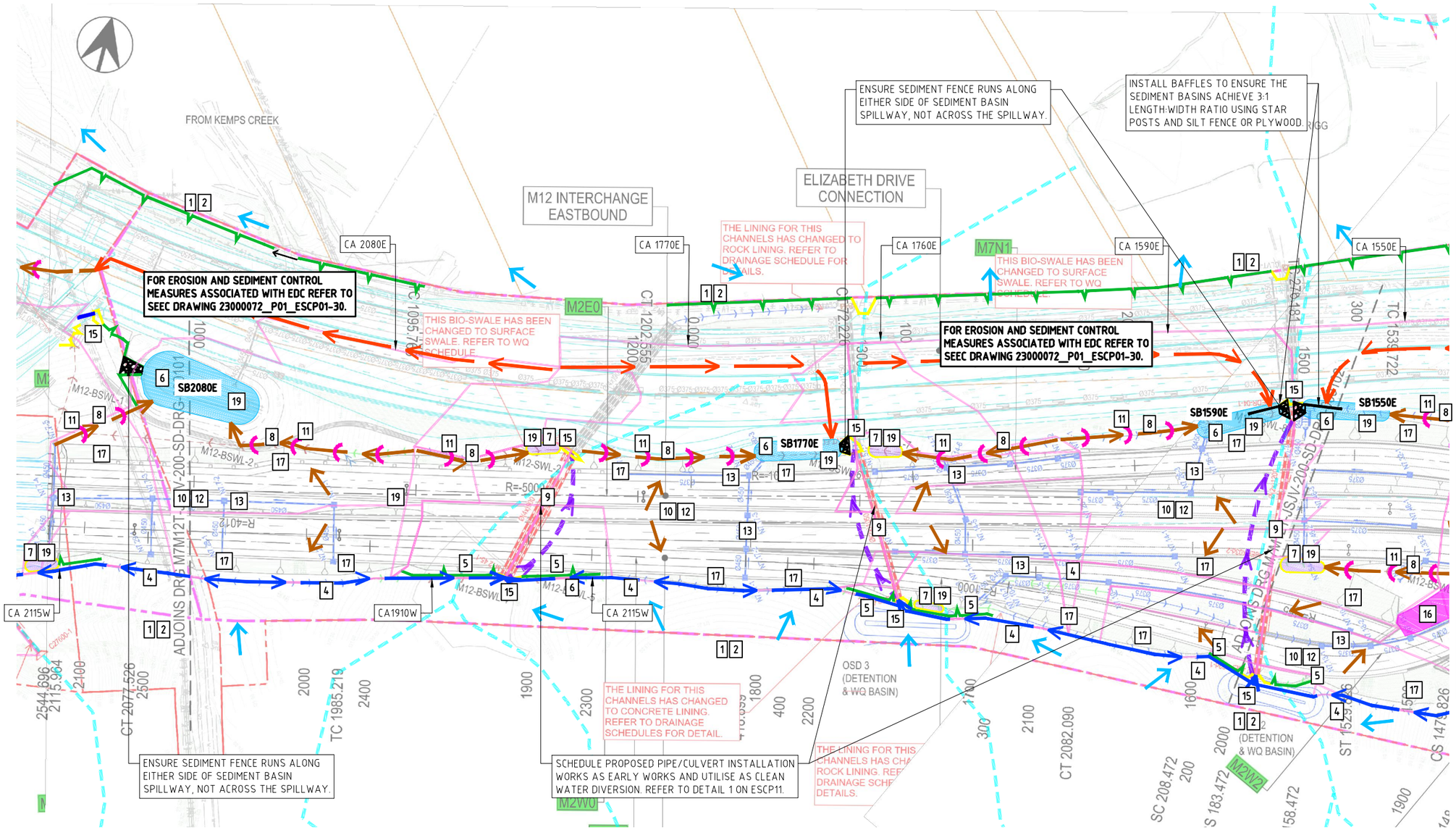
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP03 | 00 |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP15.
7. Construct sediment traps in the locations shown. Refer to Detail 8 on ESCP16 for sediment traps.
8. Construct dirty water diversions in the locations shown. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP18.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
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    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP16) OR HOLDING POND
- WINDROW/BUND
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- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP15 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
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- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON ESCP01)
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- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
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- TEMPORARY DIRTY PIPE
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| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |
| FINAL | |

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 4 OF 30

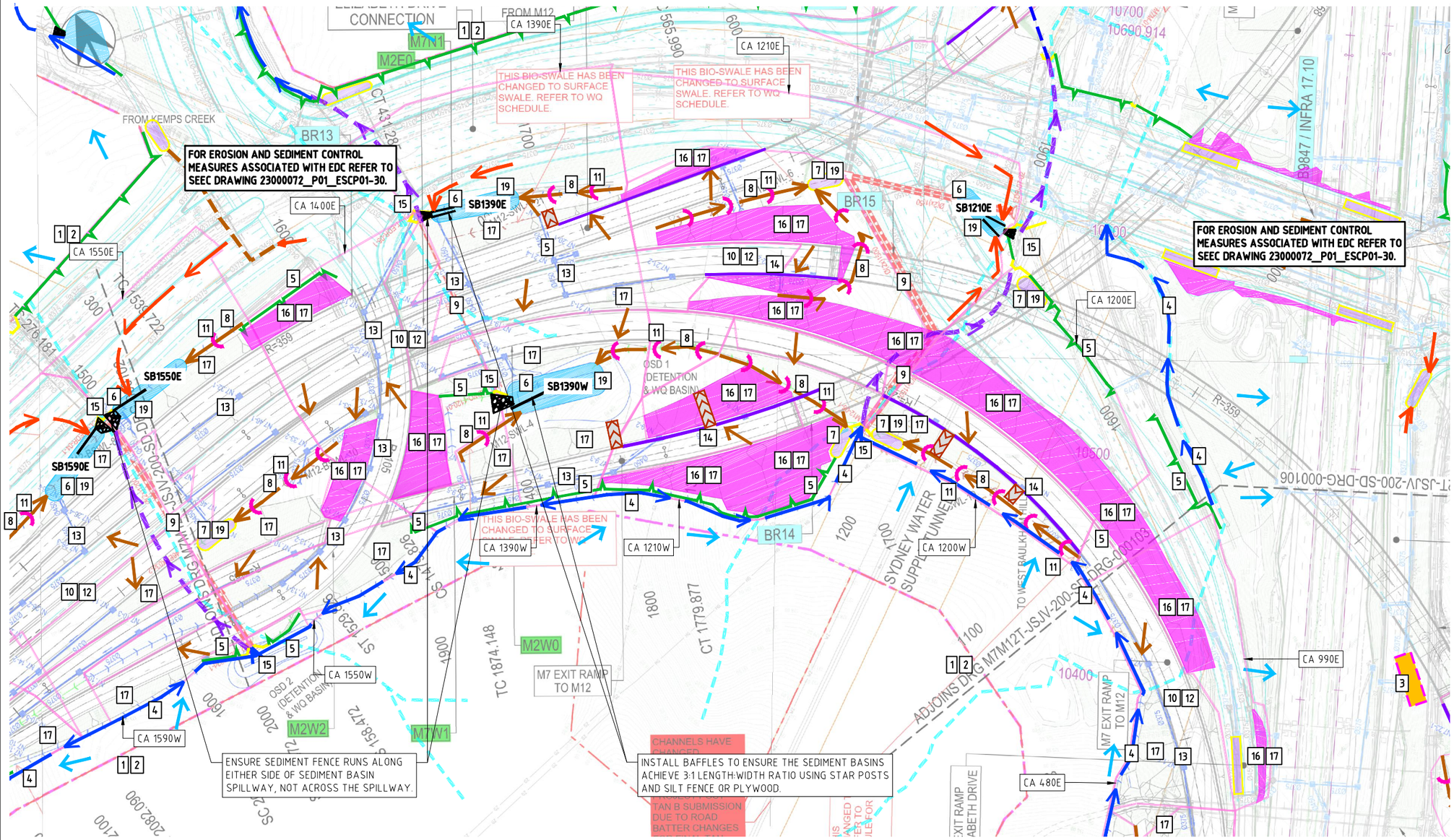
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
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| 23000072 | P02 | ESCP04 | 00 |

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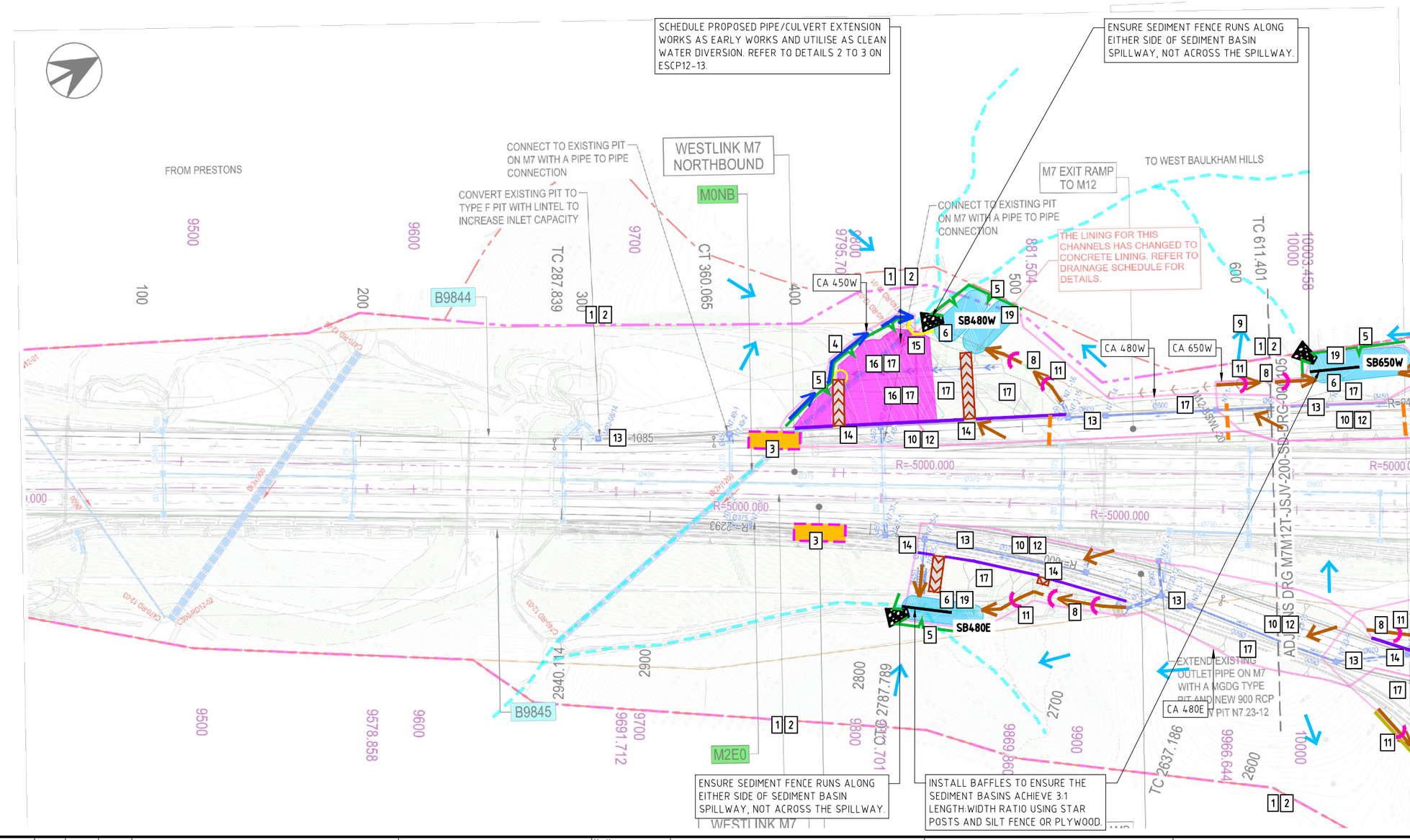
## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

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    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
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17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.


FOR EROSION AND SEDIMENT CONTROL MEASURES ASSOCIATED WITH EDC REFER TO SEEC DRAWING 23000072_P01_ESCP01-30.
FOR EROSION AND SEDIMENT CONTROL MEASURES ASSOCIATED WITH EDC REFER TO SEEC DRAWING 23000072_P01_ESCP01-30.
THIS BIO-SWALE HAS BEEN CHANGED TO SURFACE SWALE. REFER TO WQ SCHEDULE.
THIS BIO-SWALE HAS BEEN CHANGED TO SURFACE SWALE. REFER TO WQ SCHEDULE.
ENSURE SEDIMENT FENCE RUNS ALONG EITHER SIDE OF SEDIMENT BASIN SPILLWAY, NOT ACROSS THE SPILLWAY.
INSTALL BAFFLES TO ENSURE THE SEDIMENT BASINS ACHIEVE 3:1 LENGTH:WIDTH RATIO USING STAR POSTS AND SILT FENCE OR PLYWOOD.
CHANNELS HAVE CHANGED
TAN B SUBMISSION DUE TO ROAD BATTER CHANGES
OSD 1 DETENTION & WQ BASIN
OSD 2 (DETENTION & WQ BASIN)
SB1550E
SB1590E
SB1390W
SB1390E
SB1210E
CA 1550E
CA 1400E
CA 1390E
CA 1210E
CA 1590W
CA 1550W
CA 1390W
CA 1210W
CA 1200W
CA 1200E
CA 990E
CA 480E
BR13
BR14
BR15
M7N1
M2E0
M2W0
M2W2
M7W1
FROM KEMPS CREEK
FROM M12
M7 EXIT RAMP TO M12
TO WEST RAULKHAM HILL
SYDNEY WATER SUPPLY TUNNEL
ADJOINS DRG M7M12T-JSJV-200-SD-DRG-000103
M7T-JSJV-200-SD-DRG-000106
M12-SWL-4
M12-SWL-5
M7W1-SWL-1
M7T-JSJV-200-SD-DRG-000104
M7T-JSJV-200-SD-DRG-000105
M7T-JSJV-200-SD-DRG-000107
M7T-JSJV-200-SD-DRG-000108
M7T-JSJV-200-SD-DRG-000109
M7T-JSJV-200-SD-DRG-000110
M7T-JSJV-200-SD-DRG-000111
M7T-JSJV-200-SD-DRG-000112
M7T-JSJV-200-SD-DRG-000113
M7T-JSJV-200-SD-DRG-000114
M7T-JSJV-200-SD-DRG-000115
M7T-JSJV-200-SD-DRG-000116
M7T-JSJV-200-SD-DRG-000117
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M7T-JSJV-200-SD-DRG-000119
M7T-JSJV-200-SD-DRG-000120
M7T-JSJV-200-SD-DRG-000121
M7T-JSJV-200-SD-DRG-000122
M7T-JSJV-200-SD-DRG-000123
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M7T-JSJV-200-SD-DRG-000131
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M7T-JSJV-200-SD-DRG-000133
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M7T-JSJV-200-SD-DRG-000136
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M7T-JSJV-200-SD-DRG-000140
M7T-JSJV-200-SD-DRG-000141
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M7T-JSJV-200-SD-DRG-000143
M7T-JSJV-200-SD-DRG-000144
M7T-JSJV-200-SD-DRG-000145
M7T-JSJV-200-SD-DRG-000146

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP15.
7. Construct sediment traps in the locations shown. Refer to Detail 8 on ESCP16 for sediment traps.
8. Construct dirty water diversions in the locations shown. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP18.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP16) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON ESCP17)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP15 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON ESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- B — INDICATIVE SITE BOUNDARY
- NO GO ZONE. NO GROUND DISTURBANCE
- TEMPORARY WATER CROSSING (BLUE BOOK SD 5-1 ON ESCP15)
- BAFFLE FORMED USING STAR POSTS AND SILT FENCE OR PLYWOOD

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 6 OF 30

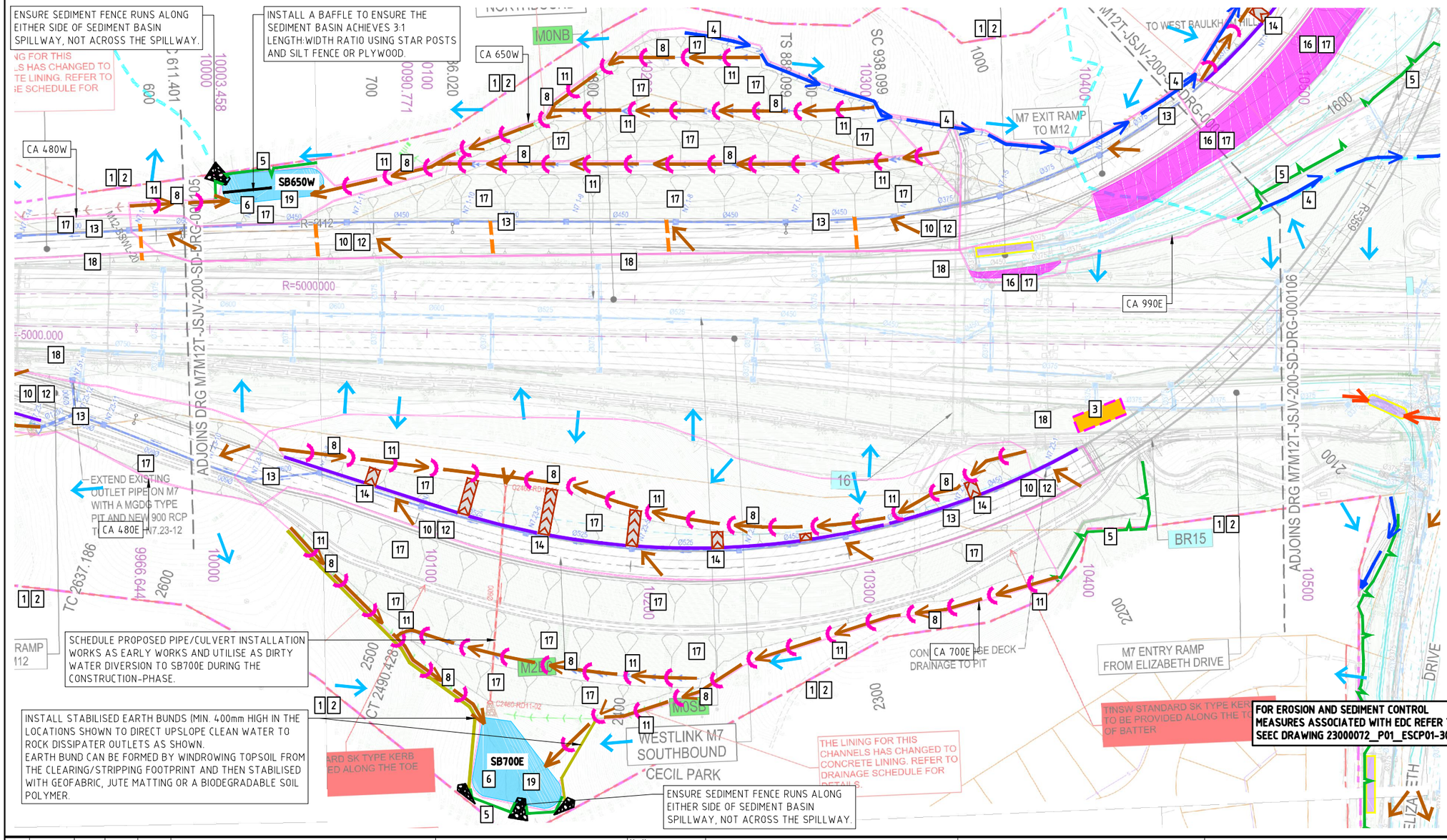
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP06 | 00 |

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Plot Date: Monday, 19 June 2023 8:45:53 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P02_ESCP_REV 00.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
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8. Construct dirty water diversions in the locations shown. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP18.
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    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
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    - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP16) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON ESCP17)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP15 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON ESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- B — INDICATIVE SITE BOUNDARY
- NO GO ZONE. NO GROUND DISTURBANCE
- TEMPORARY WATER CROSSING (BLUE BOOK SD 5-1 ON ESCP15)
- BAFFLE FORMED USING STAR POSTS AND SILT FENCE OR PLYWOOD

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**FOR EROSION AND SEDIMENT CONTROL MEASURES ASSOCIATED WITH EDC REFER TO SEEC DRAWING 23000072_P01_ESCP01-30.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

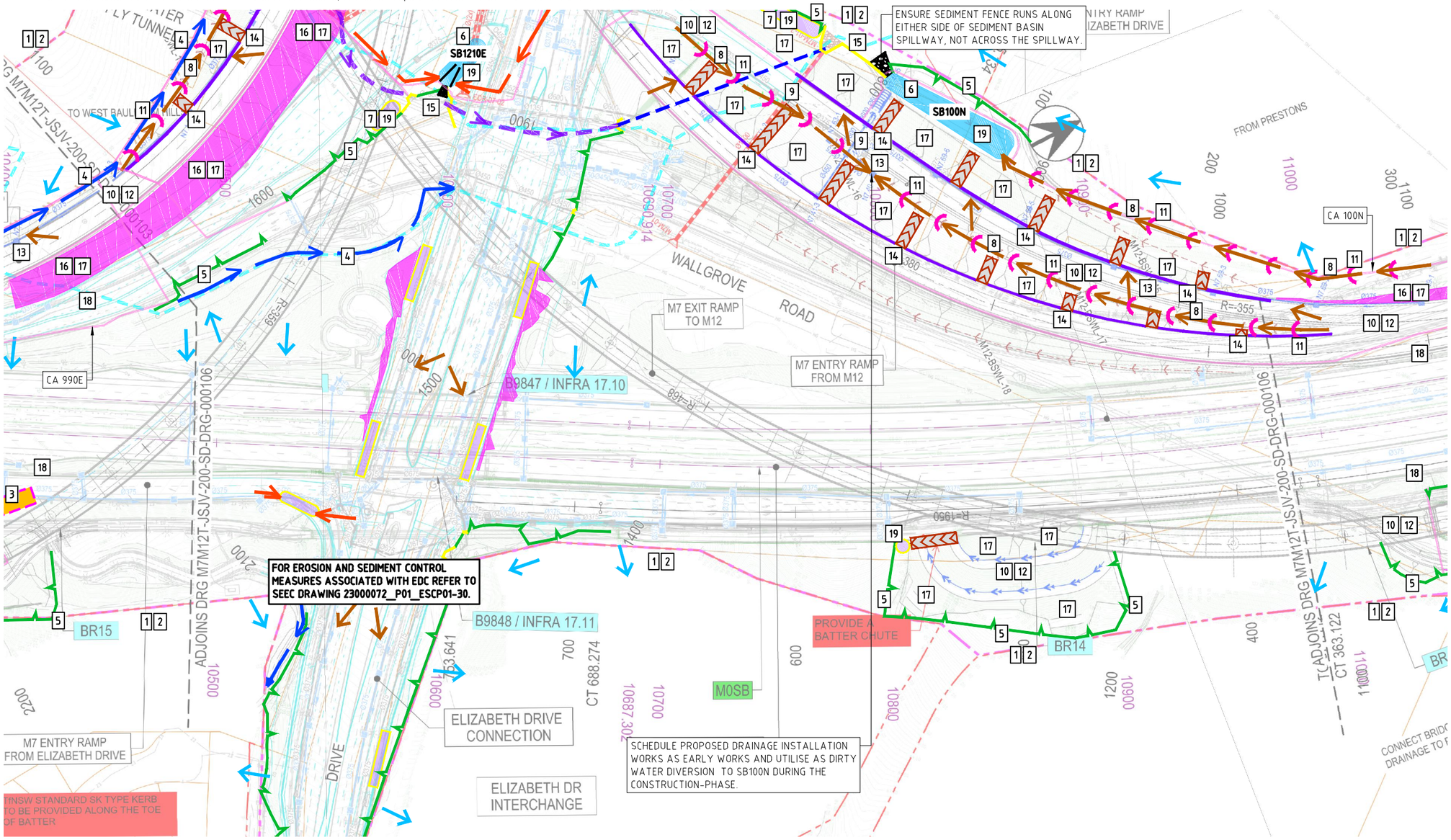
DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 7 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP07 | 00 |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP15.
7. Construct sediment traps in the locations shown. Refer to Detail 8 on ESCP16 for sediment traps.
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9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
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11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
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14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP16) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON ESCP17)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP15 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON ESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- B — INDICATIVE SITE BOUNDARY
- NO GO ZONE. NO GROUND DISTURBANCE
- TEMPORARY WATER CROSSING (BLUE BOOK SD 5-1 ON ESCP15)
- BAFFLE FORMED USING STAR POSTS AND SILT FENCE OR PLYWOOD

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| 00 | 19/06/23 | L.O. | L.O. | A.M. | FINAL ISSUE |
| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 8 OF 30

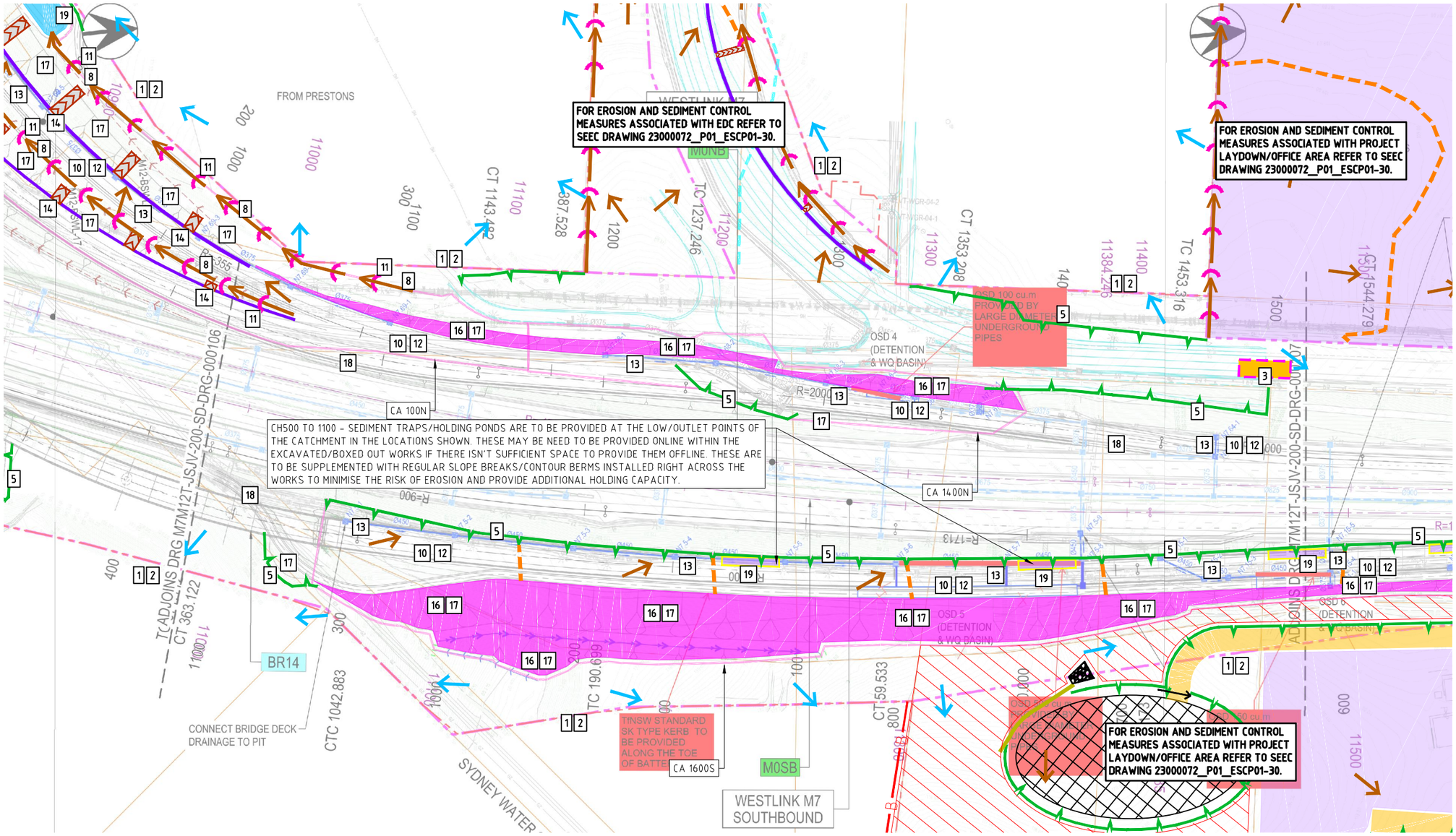
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP08 | 00 |

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Plot Date: Monday, 19 June 2023 8:46:04 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P02_ESCP_REV 00.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
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5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP15.
7. Construct sediment traps in the locations shown. Refer to Detail 8 on ESCP16 for sediment traps.
8. Construct dirty water diversions in the locations shown. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP18.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP16) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON ESCP17)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP15 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON ESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- B — INDICATIVE SITE BOUNDARY
- NO GO ZONE. NO GROUND DISTURBANCE
- TEMPORARY WATER CROSSING (BLUE BOOK SD 5-1 ON ESCP15)
- BAFFLE FORMED USING STAR POSTS AND SILT FENCE OR PLYWOOD

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

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Scale: 1:2000 (A3 SHEET)

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| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE - FOR CONSULTATION |

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 9 OF 30

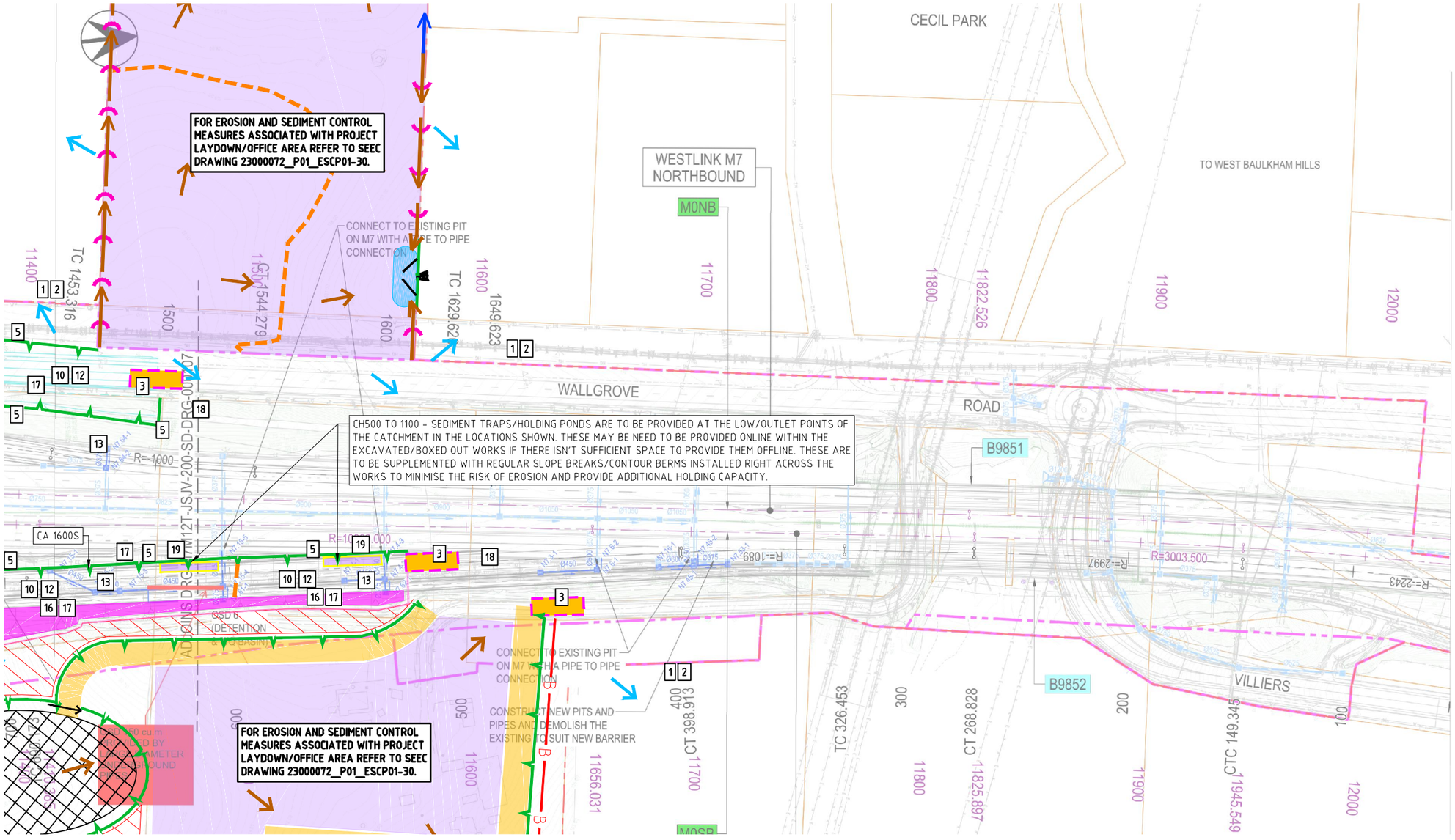
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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP17 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP15 or Detail 7 and IECA Standard Drawing MB-01 on ESCP16 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP15.
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8. Construct dirty water diversions in the locations shown. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP11-14.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01 and Blue Book Standard Drawing SD 5-4 on ESCP15.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP18.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP17. Lined batter chutes to include a velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment controls where chute discharges.
    - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on ESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP15) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP16)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP17)
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- CATCHMENT BOUNDARY
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- BAFFLE FORMED USING STAR POSTS AND SILT FENCE OR PLYWOOD

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

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| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

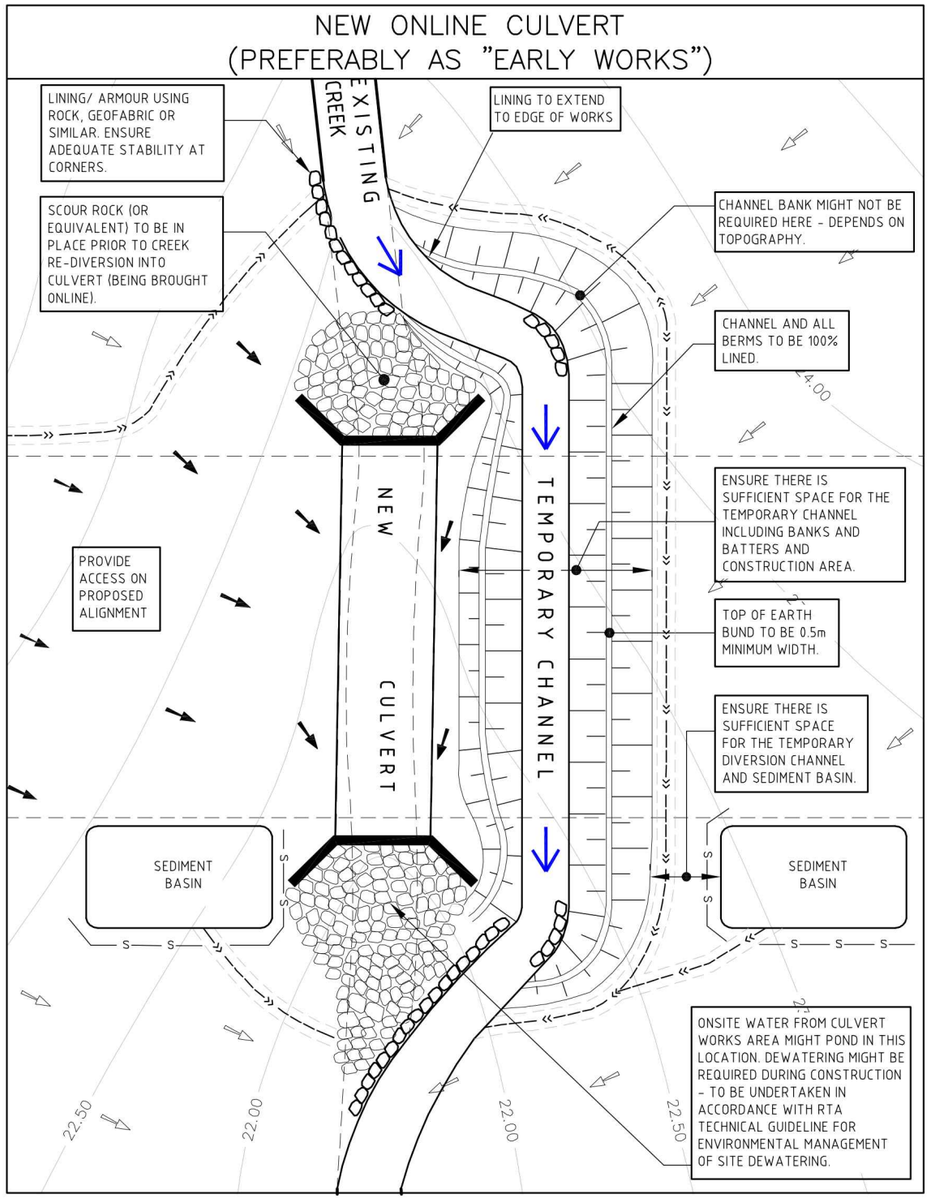
DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 9 OF 30

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# DETAIL 1




SWMP – ONLINE CULVERT CONSTRUCTION AND CREEK STABILISATION WORKS

## NEW ONLINE CULVERT - CONSTRUCTION NOTES

**THESE STEPS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW.**

Stage 1: Temporary Channel Construction
- Establish diversion drains for offsite water.
- Construct and line the temporary channel including rock armouring at the existing creek and temporary channel junctions.
- Construct and line temporary earth bunds.
- Divert creek flows into this channel. Work downstream to upstream.

Stage 2: Culvert Construction Works
- Construct the new culvert including the stabilised culvert inlet and outlets.
- Stabilise the culvert construction works area once culvert construction works are complete.

Stage 3: Final diversion and Rehabilitation Works
- Divert creek flows into new culvert.
- Temporary channel and bunds to be decommissioned without allowing sediment downstream to creek and the disturbed area stabilised.
- Diversion drains for offsite water can be redirected to inlet of new culvert on upstream site or can be removed and rehabilitated.

**OTHER NOTES**

1. This design assumes that culvert construction is part of the 'early works' for the site.
2. Temporary channel to be sized and lined as per the requirements in Table 6.1 (DECC, 2008) and Table 5.2 (Landcom, 2004).
3. Ideally schedule works to periods when rainfall erosivity is low (Refer to Table 4.3 - Landcom, 2004)
4. Only undertake in-stream works (e.g. placement of rock) during periods of zero or very low flow and only when the 24 hour weather forecast suggests a significant rain event is not likely.
5. Ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils within in-stream locations if an unexpected rain or flow event occurs.
6. No culvert works are to occur until creek flows are successfully diverted into the stabilised temporary channel.
7. Culverts are to be completed before being allowed to convey flows. This includes all inlet and outlet protection, wingwalls etc.
8. Stabilisation, as defined by the Blue Book, means achieving:
- For concentrated flows- At least 70% vegetation cover (or equivalent) within 10 days AND using only materials that are suitable in concentrated flow conditions (refer to Tables A3 and D1 in the Blue Book for suitability).
- For all other areas- At least 60% vegetation cover (or equivalent) in 20 days AND 70% in 2 months.

9. A management regime should be in place to address the risk of these works creating a flooding issue due to constriction of the channel during construction.
10. If temporary access is required across the existing creek or a diversion channel, use a temporary water crossing - see standard drawing 5-1 in Blue Book Vol 1 (Landcom, 2004).
11. Minimise the time that soil is exposed to erosion.

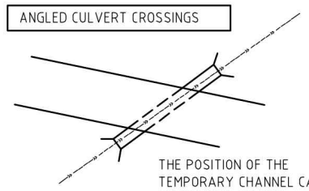
**STANDARD DRAWINGS FROM VOL 1 OF THE BLUE BOOK (LANDCOM, 2004) USED HERE:**

Sediment fence: SD 6-8
High flow earth bank (diversion drain): SD 5-6
Energy dissipater: SD 5-8
Temporary waterway crossing: SD 5-1

AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER

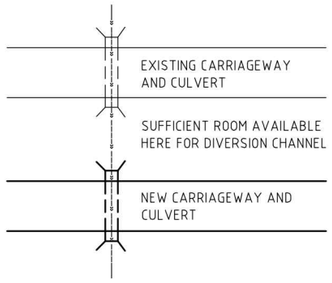
## THIS SCENARIO ALSO APPLIES TO:

ANGLED CULVERT CROSSINGS



THE POSITION OF THE TEMPORARY CHANNEL CAN BE DETERMINED BY THE PREVAILING TOPOGRAPHY

DIVIDED CULVERT EXTENSION




THE APPLICATION OF THIS SCENARIO TO DIVIDED CULVERT EXTENSIONS IS DEPENDENT ON WHETHER THERE IS ENOUGH AVAILABLE SPACE. IF SPACE IS LIMITED PART OF THE TEMPORARY CHANNEL CAN BE CONSTRUCTED OUT OF SHEET PILING OR SIMILAR OR ALTERNATIVELY THE SITE SHOULD BE STABILISED AS FOR A CONTINUOUS ONLINE CULVERT EXTENSION

## LEGEND

- S—— S—— S SEDIMENT FENCE (SD 6-8)
- –»– – – – »– – DIVERSION DRAIN FOR 'OFFSITE' WATER (SD 5-6)
- SURFACE CONTOURS
- 'ONSITE' FLOWS
- 'OFFSITE' FLOWS
- CREEK/CHANNEL FLOWS
- CUT/FILL BATTER
- ROCK DISSIPATION/ STABILISATION STRUCTURES (SD 5-8)

NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.

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PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP
DETAIL 1
SHEET 11 OF 18

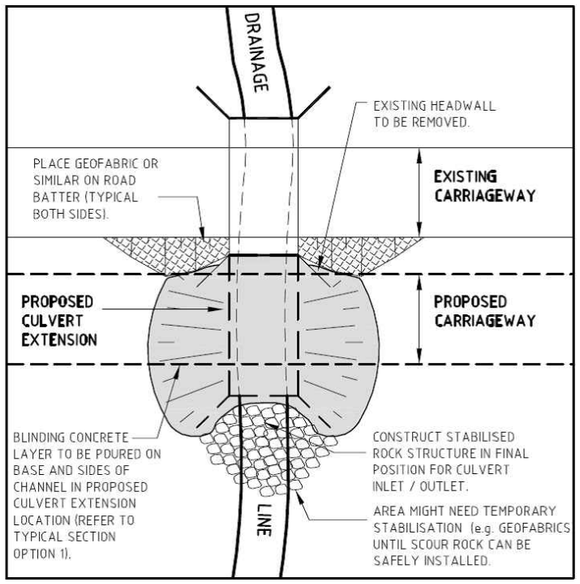
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## DETAIL 2

# CONTINUOUS CULVERT EXTENSION (ONLINE)
# OPTION 1




SITE STABILISATION PROCEDURE

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

Prior to undertaking any construction or earthworks ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils if an unexpected rain or flow event occurs.

1. Watch the weather forecast for a dry period (a period longer than the time required to complete earthworks up to the required level).
2. When a dry period is forecast, undertake earthworks quickly (preferably in less than three days).
3. Pour blinding concrete layer and lay rock inlet / outlet.
4. Lay geofabric (or similar) on existing road batter.

(Ensure steps 2, 3 and 4 occur within the forecast period of dry weather and no flow)

5. Complete culvert construction works over the top of the blinding concrete layer.
6. Maintain the blinding layer until the culvert extension is complete and stabilised. once flows are secure within the new culverts, excess blinding can be removed if desired.

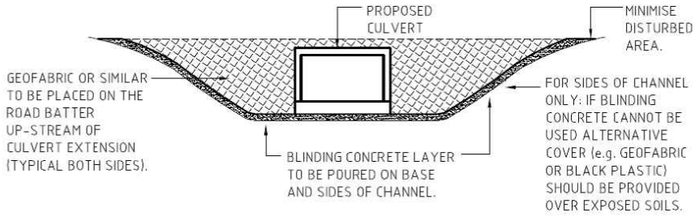
At any time during steps 1 – 4 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

**ENSURE THAT 'OFFSITE' CREEK FLOWS DO NOT COME INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

**NOTE: MAINTAIN OR INSTALL TEMPORARY GROUND COVER THROUGH FLOW AREA ANYTIME FLOWS ARE IMMINENT.**

### OTHER NOTES

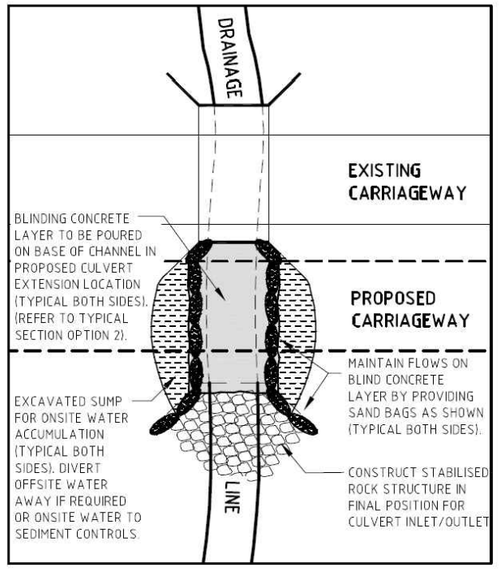
- For divided culvert extensions this stabilisation method could also be applied or alternatively the flows could be diverted as for a new online culvert.
- Note that this method is not suitable for perennial creeks unless additional measures (e.g. pumping or coffer dams) can be reliably included as well.
- This method might not be appropriate where there is a significant depth of unsuitable soil material to be removed.
- For systems with very minor flows in dry periods, temporary damming of flows might be required to hold water back for the nominated work period until the blinding concrete layer and rock is placed.
- Note that not all onsite water management and sediment controls are shown here.




TYPICAL SECTION – OPTION 1

## DETAIL 3

# CONTINUOUS CULVERT EXTENSION (ONLINE)
# OPTION 2




SITE STABILISATION PROCEDURE

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

Prior to undertaking any construction or earthworks ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils if an unexpected rain or flow event occurs.

1. Watch the weather forecast for a dry period (a period longer than the time required to complete earthworks up to the required level).
2. When a dry period is forecast, undertake earthworks quickly (preferably in less than three days).
3. Pour blinding concrete layer and lay rock inlet / outlet.
4. Position sand bags on the blind concrete layer.

(Ensure steps 2, 3 and 4 occur within the forecast period of dry weather and no flow)

5. Complete culvert construction works over the top of the blinding concrete layer. Take care not to disturb the integrity of the blinding layer.
6. Maintain the sandbag walls on the base slab if a flow event occurs.

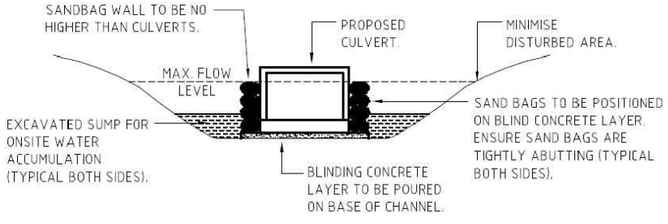
At any time during steps 1 – 4 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

**ENSURE THAT 'OFFSITE' CREEK FLOWS DO NOT COME INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

**NOTE: MAINTAIN OR INSTALL TEMPORARY GROUND COVER THROUGH FLOW AREA ANYTIME FLOWS ARE IMMINENT.**

### OTHER NOTES

- For divided culvert extensions this stabilisation method could also be applied or alternatively the flows could be diverted as for a new online culvert.
- Note that this method is not suitable for perennial creeks unless additional measures (e.g. pumping or coffer dams) can be reliably included as well.
- This method might not be appropriate where there is a significant depth of unsuitable soil material to be removed.
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- Note that not all onsite water management measures and sediment controls are shown here.




TYPICAL SECTION – OPTION 2

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PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP DETAILS 2 & 3 SHEET 12 OF 18

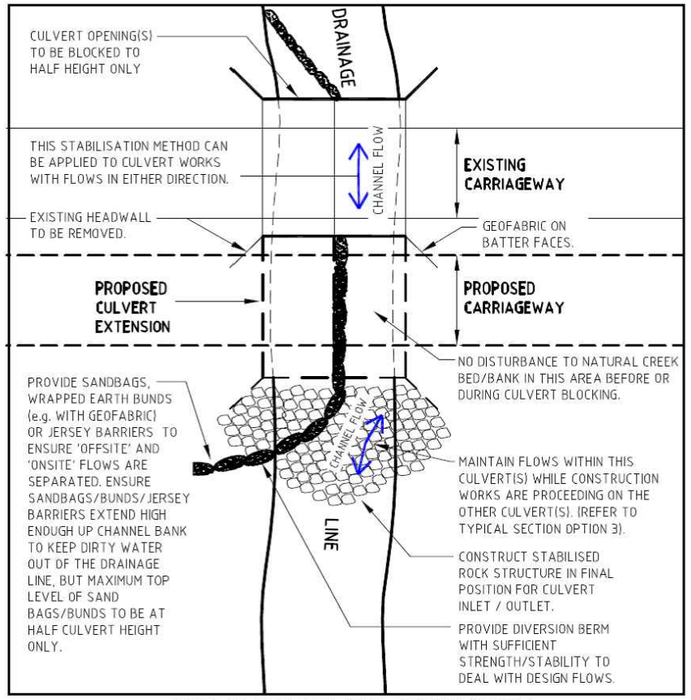
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DETAIL 4

# CONTINUOUS CULVERT EXTENSION (ONLINE) OPTION 3




**OTHER NOTES**

- This option will only work when existing ground surface level can be maintained in at least one culvert cell. Therefore this method might not work for deep excavations requiring benching.
- Suitable for use in perennial streams providing in-stream works are conducted when flows are minimal.
- However, regardless of scheduling and timing the adopted controls need to be considerate of the risk of significant flows at any time.
- Note that not all water management and sediment controls are shown here.

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

## SITE STABILISATION PROCEDURE

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

Prior to undertaking any construction or earthworks ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils if an unexpected rain or flow event occurs.

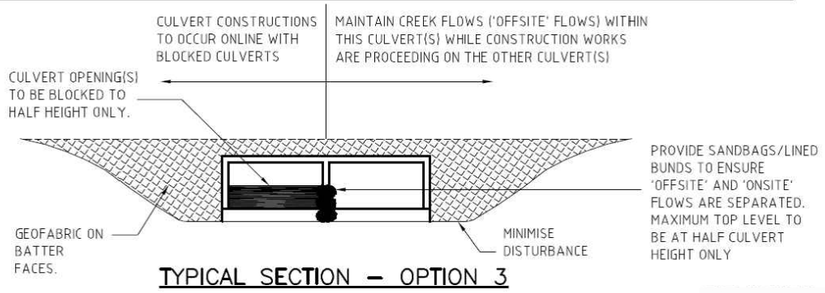
**Stage 1.**

1. Monitor creek flows ensuring flows levels are not too high.
2. Position sandbags/bunds around culvert works area and block existing culvert end to half culvert height only.
3. Undertake culvert extension construction works only on the blocked side of the culvert(s).
4. Complete inlet/outlet protections.

**Stage 2**

5. Divert the creek flows into the newly constructed culvert extension by blocking off the alternate side using a half-height wall/bund.
6. Complete the culvert extension on the other side including the stabilised inlet/outlet.

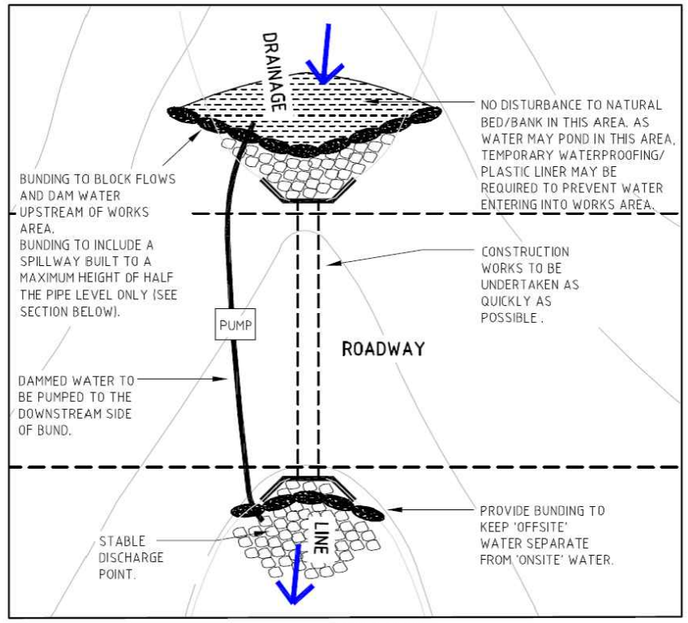
At any time where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.




## TYPICAL SECTION – OPTION 3

DETAIL 5

# ONLINE PIPE REPLACEMENT/INSTALLATION – SMALL INTERMITTENT DEPRESSIONS ONLY (PUMP OPTION)




## SITE STABILISATION

**THIS METHOD IS ONLY SUITABLE FOR SIMPLE DEPRESSIONS WITH INTERMITTENT FLOWS. TO BE IN PLACE FOR NO MORE THAN 3 MONTHS.**

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

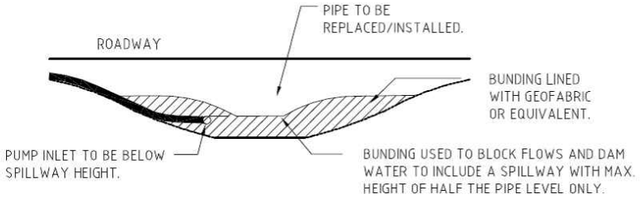
1. Ensure suitable temporary groundcover materials (e.g. geofabric, blankets) are located on site.
2. Ensure a suitable pump is available.
3. Watch the weather forecast to ensure rainfall is not forecast and monitor creek flows ensuring flows are minimal.
4. Position the bunding and line if required.
5. Undertake construction works (including inlet and outlet stabilisation) as quickly as possible. Drainage line to be blocked for no more than 3 months.

At any time during steps 4 – 5 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

### LEGEND

- OFFSITE WATER DIVERSION DRAIN (SD 5-6)
- ONSITE WATER DRAINS (SD 5-6)
- SURFACE CONTOURS
- ROCK STABILISED OUTLET (SD 5-8)
- CREEK/PIPE FLOW ROUTE
- SEDIMENT FENCE (SD 6-8)
- BUNDS

**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**




## SECTION THROUGH BUNDING LOCATION

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

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PROJECT TITLE: M12 MOTORWAY M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP DETAILS 4 & 5 SHEET 13 OF 18

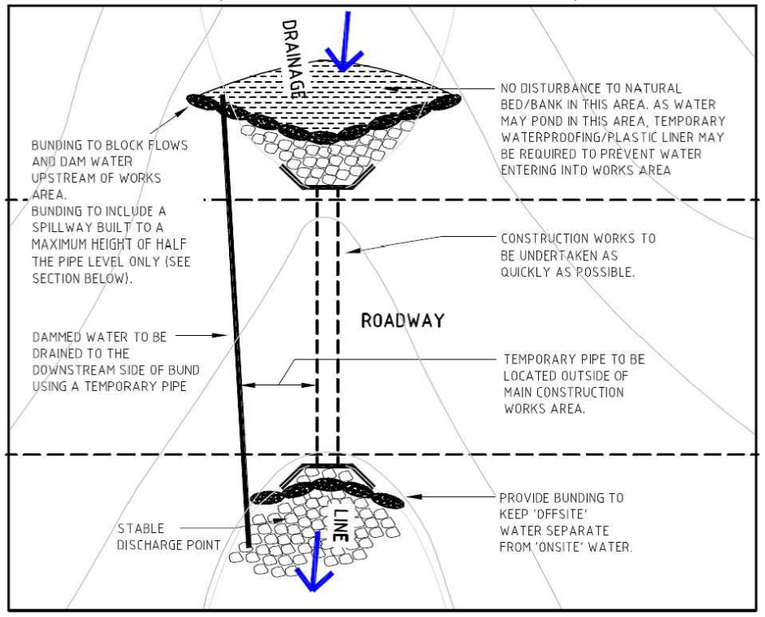
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DETAIL 6

# ONLINE PIPE REPLACEMENT/INSTALLATION – SMALL INTERMITTENT DRAINAGE LINES (TEMPORARY PIPE OPTION)




## SITE STABILISATION

THIS METHOD IS ONLY SUITABLE FOR SMALL CHANNELS WITH INTERMITTENT FLOWS.

TEMPORARY PIPE TO BE SIZED TO AT LEAST HALF THE PERMANENT PIPE.
e.g. – PERMANENT: 600Φ
– TEMPORARY: MINIMUM 300Φ

THIS METHOD (TEMPORARY PIPE SYSTEM) WILL NOT BE SUITABLE IN STEEP LOCATIONS WHERE TEMPORARY PIPE CANNOT BE LOCATED OUTSIDE OF WORKS AREA.

### LEGEND

- OFFSITE WATER DIVERSION DRAIN (SD 5-6)
- ONSITE WATER DRAINS (SD 5-6)
- SURFACE CONTOURS
- ROCK STABILISED OUTLET (SD 5-8)
- CREEK/PIPE FLOW ROUTE
- SEDIMENT FENCE (SD 6-8)
- BUNDS

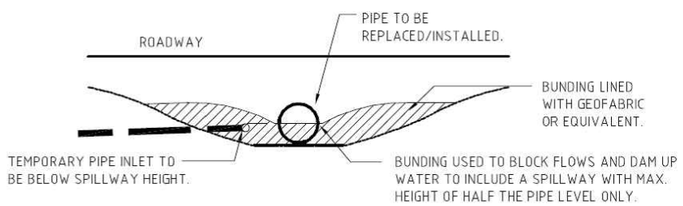
### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

1. Ensure suitable temporary groundcover materials (eg. geofabric, blankets) are located on site.
2. Ensure a temporary pipe is available. Install temporary pipe to ensure flow, preferably by providing continuous fall.
3. Watch the weather forecast to ensure rainfall is not forecast and monitor creek flows ensuring flows are minimal.
4. Position the bunding within the channel to secure the site.
5. Undertake construction works (including inlet outlet stabilisation) as quickly as possible.

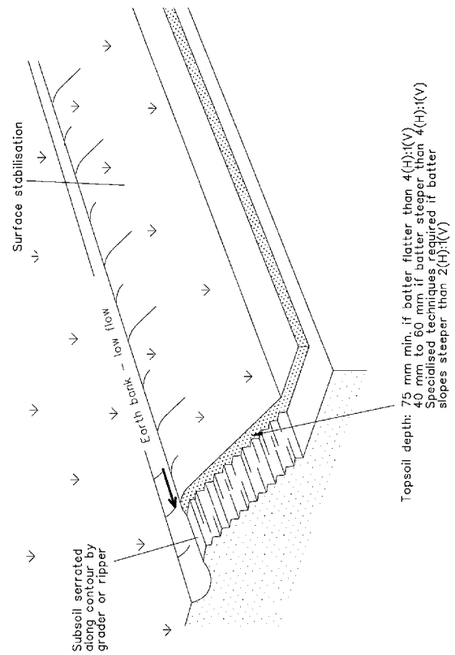
At any time during steps 4 – 5 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**




**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

## SECTION THROUGH BUNDING LOCATION

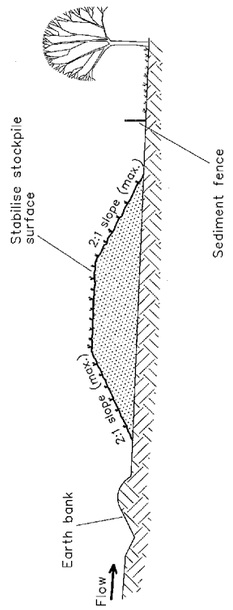



### Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

**SD 4-2**

## REPLACING TOPSOIL




### Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

**SD 4-1**

## STOCKPILES

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| SCALE: (on A3 Original) | N.T.S. |

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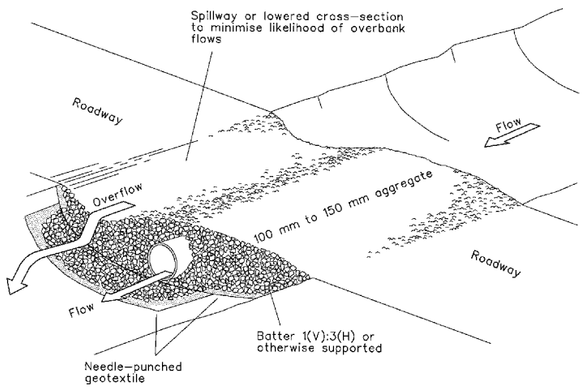
PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP
DETAIL 6 & BLUE BOOK STANDARD DRAWINGS – SHEET 14 OF 18

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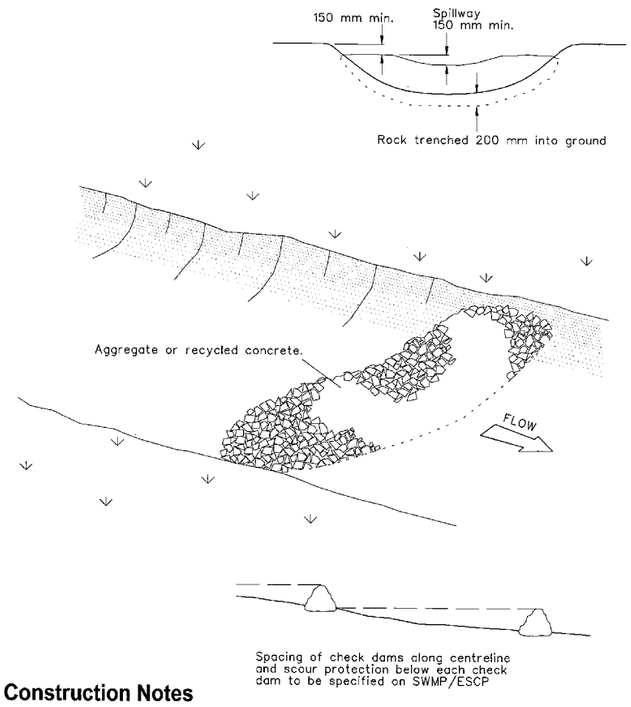
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## Construction Notes

1. Prohibit all traffic until the access way is constructed.
2. Strip any topsoil and place a needle-punched textile over the base of the crossing.
3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre wide carriageway with sufficient length of culvert pipe to allow less than a 3(H): 1 (V) slope on side batters.
5. Install a lower section to act as an emergency spillway in greater than design storm events.
6. Ensure that culvert outlets extend beyond the toe of fill embankments.

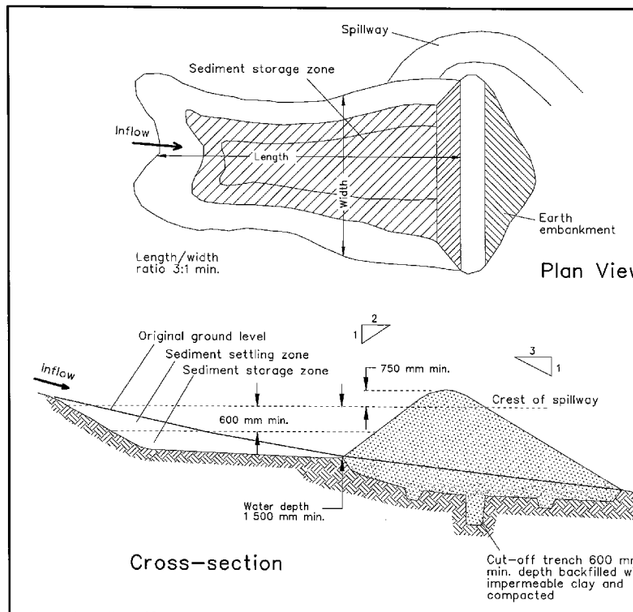
## TEMPORARY WATERWAY CROSSING — SD 5-1




## Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

## ROCK CHECK DAM — SD 5-4

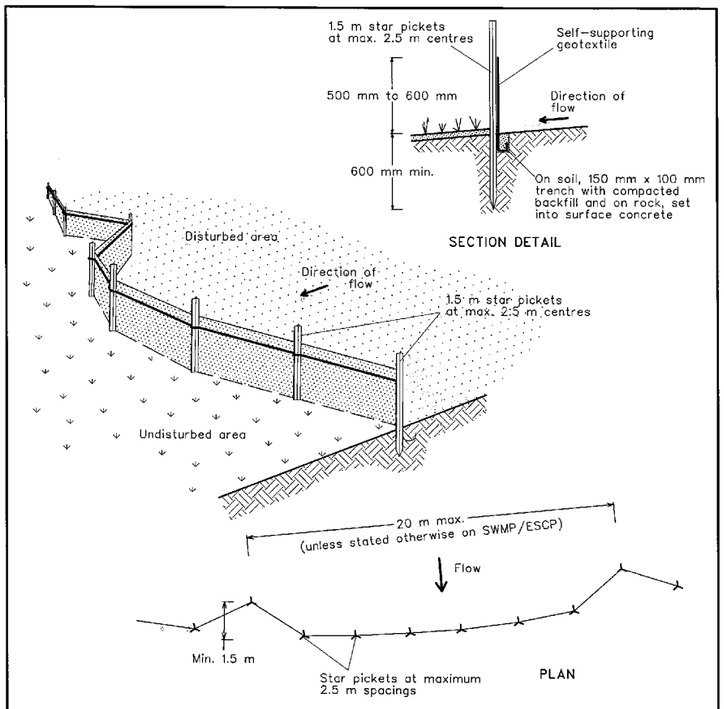



## Construction Notes

1. Remove all vegetation and topsoil from under the dam wall and from within the storage area.
2. Construct a cut-off trench 500 mm deep and 1,200 mm wide along the centreline of the embankment extending to a point on the gully wall level with the riser crest.
3. Maintain the trench free of water and recompact the materials with equipment as specified in the SWMP to 95 per cent Standard Proctor Density.
4. Select fill following the SWMP that is free of roots, wood, rock, large stone or foreign material.
5. Prepare the site under the embankment by ripping to at least 100 mm to help bond compacted fill to the existing substrate.
6. Spread the fill in 100 mm to 150 mm layers and compact it at optimum moisture content following the SWMP.
7. Construct the emergency spillway.
8. Rehabilitate the structure following the SWMP.

## EARTH BASIN - WET — SD 6-4

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)




## Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

## SEDIMENT FENCE — SD 6-8

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DRAWN BY: L.O.
FINAL APPROVAL: A.M.
SCALE: (on A3 Original) N.T.S.

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PROJECT TITLE

M12 MOTORWAY
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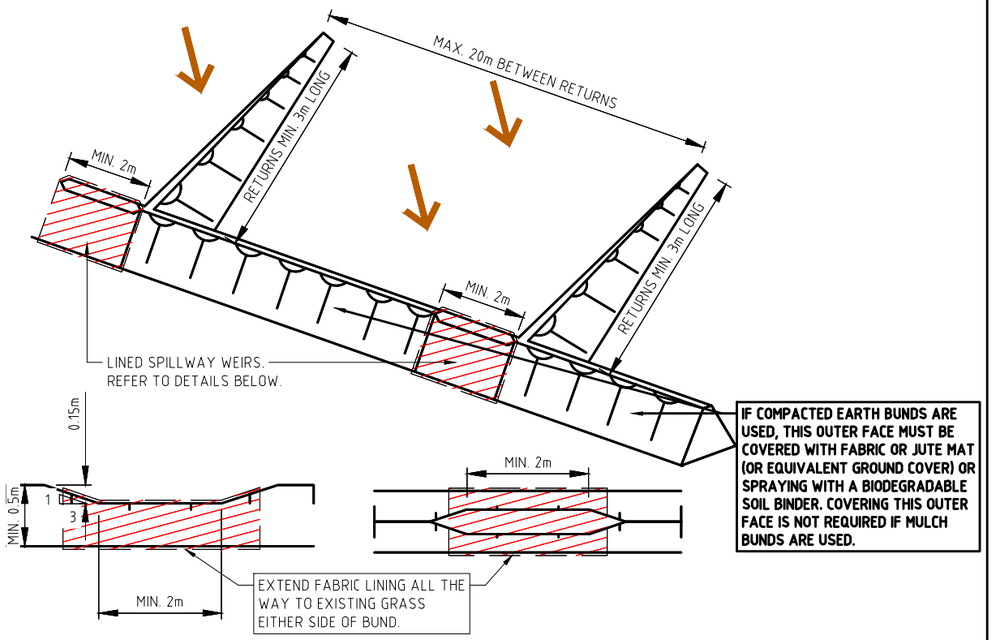
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BLUE BOOK STANDARD DRAWINGS
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## DETAIL 7 - TYPICAL MULCH/EARTH BUND

**MATERIALS**

(i) MULCH MUST COMPLY WITH THE REQUIREMENTS OF AS4454.

(ii) MAXIMUM SOLUBLE SALT CONCENTRATION OF 5dS/m.

(iii) MOISTURE CONTENT OF 30 TO 50% PRIOR TO APPLICATION.

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN SELECTING THE LOCATION OF A MULCH FILTER BERM, TO THE MAXIMUM DEGREE PRACTICAL, ENSURE THE BERM IS LOCATED:

(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;

(ii) ALONG A LINE OF CONSTANT ELEVATION (PREFERRED, BUT NOT ALWAYS PRACTICAL);

(iii) AT LEAST 1m, IDEALLY 3m, FROM THE TOE OF A FILL EMBANKMENT;

(iv) AWAY FROM AREAS OF CONCENTRATED FLOW.

3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE BERM, OR THE UNDESIRABLE DISCHARGE OF WATER AROUND THE END OF THE BERM.

4. ENSURE THE BERM HAS BEEN PLACED SUCH THAT PONDING UP-SLOPE OF THE BERM IS MAXIMISED.

5. ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TURNED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM.

6. ENSURE 100% CONTACT WITH THE SOIL SURFACE.

7. WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VEGETATE THE BERM.

**MAINTENANCE**

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL BERMS AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR 1/3 THE HEIGHT OF THE BERM.

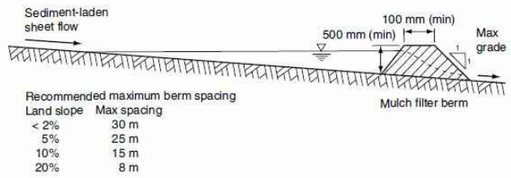
5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

**REMOVAL (IF REQUIRED)**

1. WHEN DISTURBED AREAS UP-SLOPE OF THE BERM ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE BERM MAYBE REMOVED.

2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.




Recommended maximum berm spacing

| Land slope | Max spacing |
|---|---|
| < 2% | 30 m |
| 5% | 25 m |
| 10% | 15 m |
| 20% | 8 m |

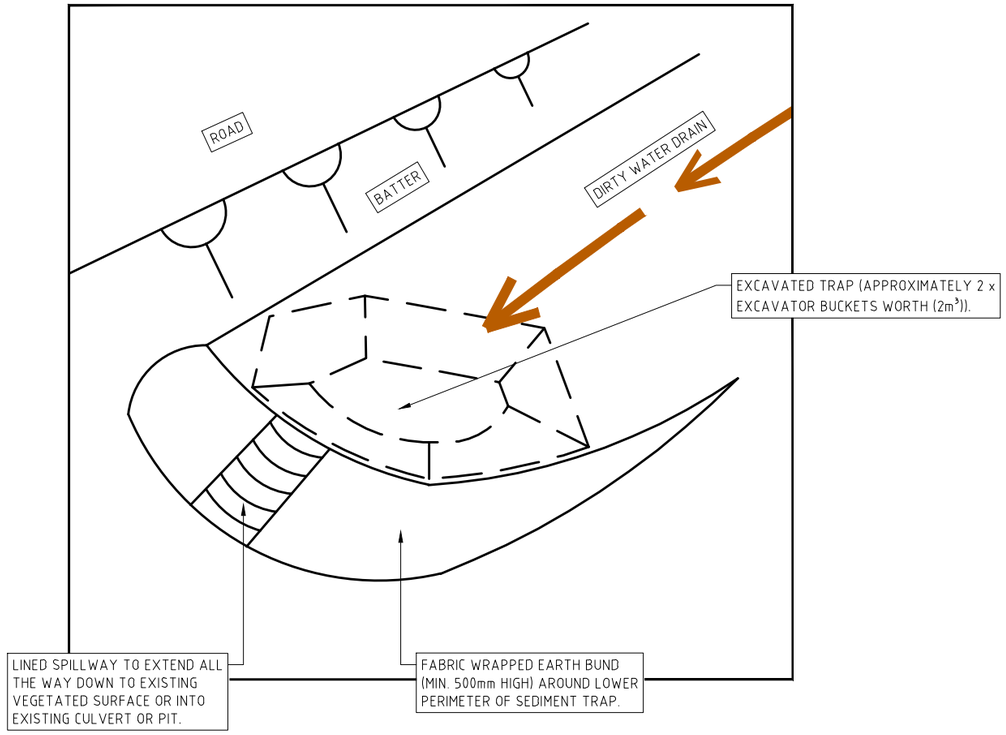
**Figure 1 - Typical placement of mulch filter berm**

Catchments & Creeks Pty Ltd

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|---|---|---|---|
| GMW | Apr-10 | Mulch Filter Berms | MB-01 |

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## DETAIL 8 - SEDIMENT TRAP




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| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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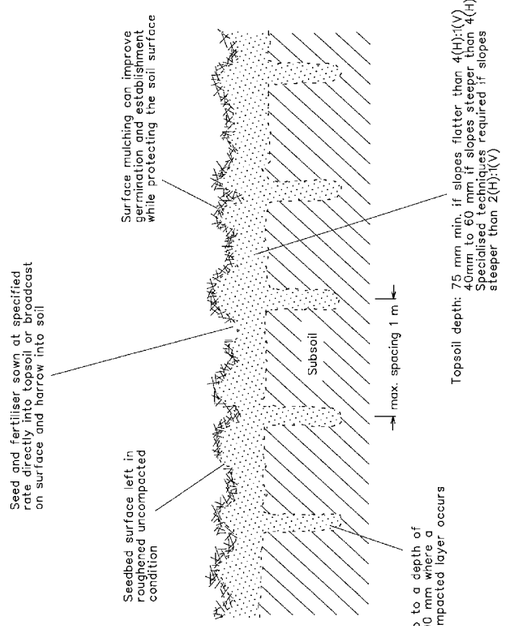
PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP
DETAILS 7 & 8 – IECA STANDARD
DRAWNGS – SHEET 16 OF 18

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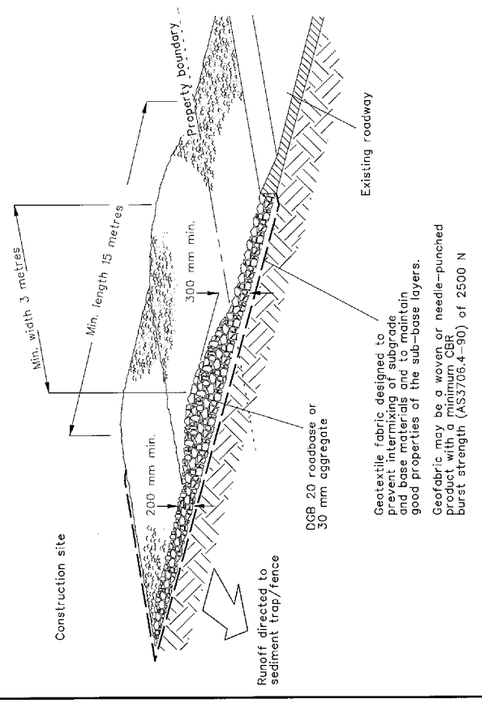
## SEEDBED PREPARATION — SD 7-1




### Construction Notes

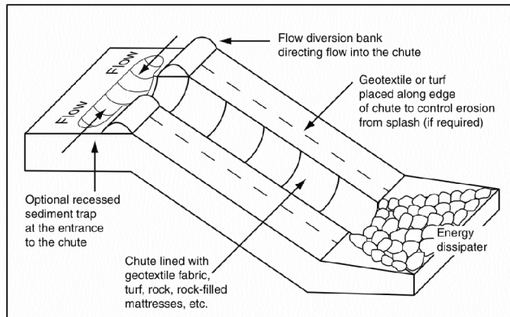
1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

## STABILISED SITE ACCESS — SD 6-14

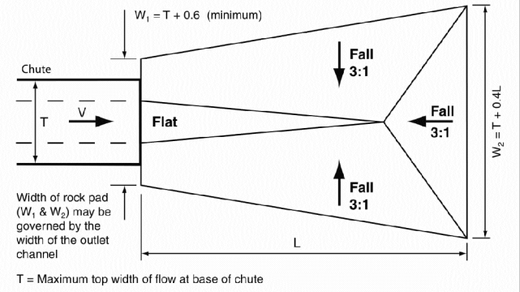



### Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

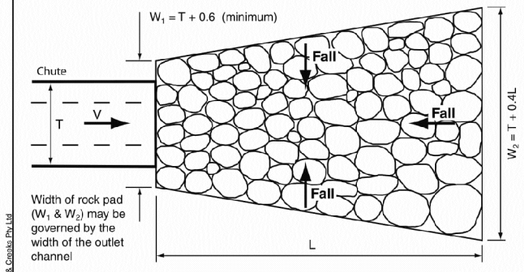



**(a) Temporary drainage chute with rock pad outlet structure**

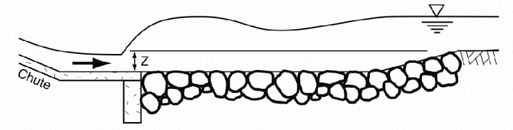



T = Maximum top width of flow at base of chute

**(b) Typical layout of an outlet energy dissipater for a drainage chute**




**(c) Typical layout of a rock pad outlet structure for a drainage chute**




**(d) Typical profile of a rock pad outlet structure for a drainage chute**

**Notes:**
1. Drawings applicable to temporary drainage chutes, **not** basin spillways.
2. A rock pad outlet structure is just one option for the design of the outlet energy dissipater.

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Chutes - General | CH-01 |

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### CHUTES - GENERAL SPECIFICATIONS

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CONSTRUCT THE SUBGRADE TO THE ELEVATIONS SHOWN ON THE PLANS. REMOVE ALL UNSUITABLE MATERIAL AND REPLACE WITH STABLE MATERIAL TO ACHIEVE THE DESIRED FOUNDATIONS.

3. IF THE CHUTE IS TEMPORARY, THEN COMPACT THE SUBGRADE TO A FIRM CONSISTENCY. IF THE CHUTE IS INTENDED TO BE PERMANENT, THEN COMPACT AND FINISH THE SUBGRADE AS SPECIFIED WITHIN THE DESIGN PLANS.

4. IF THE CHUTE IS TO BE LINED WITH ROCK, THEN AVOID COMPACTING THE SUBGRADE TO A CONDITION THAT WOULD PREVENT THE ROCK LINING FROM ADEQUATELY BEDDING INTO THE SUBGRADE.

5. ENSURE THE SUBGRADE IS FIRM ENOUGH TO MINIMISE WATER SEEPAGE.

6. ON FILL SLOPES, ENSURE THAT THE SOIL IS ADEQUATELY COMPACTED FOR A WIDTH OF AT LEAST ONE METRE EACH SIDE OF THE CHUTE TO MINIMISE THE RISK OF SOIL EROSION, OTHERWISE PROTECT THE SOIL WITH SUITABLE SCOUR PROTECTION MEASURES SUCH AS TURF OR EROSION CONTROL MATS.

7. PLACE AND SECURE THE CHUTE LINING AS DIRECTED.

8. IF CONCRETE IS USED AS A LINING, THEN KEEP THE SUBGRADE MOIST AT THE TIME CONCRETE IS PLACED. FORM, CUT-OFF WALLS AND ANCHOR BLOCKS AS DIRECTED IN THE APPROVED PLANS.

9. INSTALL AN APPROPRIATE OUTLET STRUCTURE (ENERGY DISSIPATER) AT THE BASE OF THE CHUTE (REFER TO SEPARATE SPECIFICATIONS).

10. ENSURE WATER LEAVING THE CHUTE AND THE OUTLET STRUCTURE WILL FLOW FREELY WITHOUT CAUSING UNDESIRABLE PONDING OR SCOUR.

11. APPROPRIATELY STABILISE ALL DISTURBED AREAS IMMEDIATELY AFTER CONSTRUCTION.

**MAINTENANCE**

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL CHUTES PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORM EVENTS, OR OTHERWISE ON A WEEKLY BASIS. MAKE REPAIRS AS NECESSARY.

2. CHECK FOR MOVEMENT OF, OR DAMAGE TO, THE CHUTE LINING, INCLUDING SURFACE CRACKING.

3. CHECK FOR SOIL SCOUR ADJACENT THE CHUTE. INVESTIGATE THE CAUSE OF ANY SCOUR, AND REPAIR AS NECESSARY.

4. WHEN MAKING REPAIRS, ALWAYS RESTORE THE CHUTE TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED.

**REMOVAL**

1. TEMPORARY CHUTES SHOULD BE REMOVED WHEN AN ALTERNATIVE, STABLE, DRAINAGE SYSTEM IS AVAILABLE.

2. REMOVE ALL MATERIALS AND DEPOSITED SEDIMENT, AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA IN PREPARATION FOR STABILISATION, THEN STABILISE THE AREA AS SPECIFIED IN THE APPROVED PLAN.

**ADDITIONAL SPECIFICATIONS FOR ROCK PAD OUTLET STRUCTURE AT BASE OF CHUTE:**

**MATERIALS:**

**ROCK:** HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE AND SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. SPECIFIC GRAVITY TO BE AT LEAST 2.5.

**GEOTEXTILE FABRIC:** HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM BIDIM A24 OR EQUIVALENT.

**INSTALLATION (ROCK OUTLET PADS)**

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. THE DIMENSIONS OF THE OUTLET STRUCTURE MUST ALIGN WITH THE DOMINANT FLOW DIRECTION.

3. EXCAVATE THE OUTLET PAD FOOTPRINT TO THE SPECIFIED DIMENSION SUCH THE WHEN THE ROCK IS PLACED IN THE EXCAVATED PIT THE TOP OF THE ROCKS WILL BE LEVEL WITH THE SURROUNDING GROUND, UNLESS OTHERWISE DIRECTED.

4. IF THE EXCAVATED SOILS ARE DISPERSIVE, OVER-EXCAVATED THE ROCK PAD BY AT LEAST 300mm AND BACKFILL WITH STABLE, NON-DISPERSIVE MATERIAL.

5. LINE THE EXCAVATED PIT WITH GEOTEXTILE FILTER CLOTH, PREFERABLY USING A SINGLE SHEET. IF JOINTS ARE REQUIRED, OVERLAP THE FABRIC AT LEAST 300mm.

6. ENSURE THE FILTER CLOTH IS PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION OF THE FABRIC AND THE ROCK. REPAIR ANY DAMAGE BY REMOVING THE ROCK AND PLACING WITH ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA OVERLAPPING THE EXISTING FABRIC A MINIMUM OF 300mm.

7. ENSURE THERE ARE AT LEAST TWO LAYERS OF ROCKS. WHERE NECESSARY, REPOSITION THE LARGER ROCKS TO ENSURE TWO LAYERS OF ROCKS ARE ACHIEVED WITHOUT ELEVATING THE UPPER SURFACE ABOVE THE PIPE INVERT.

8. ENSURE THE ROCK IS PLACED IN A MANNER THAT WILL ALLOW WATER TO DISCHARGE FREELY FROM THE PIPE.

9. ENSURE THE UPPER SURFACE OF THE ROCK PAD DOES NOT CAUSE WATER TO BE DEFLECTED AROUND THE EDGE OF THE ROCK PAD.

10. IMMEDIATELY AFTER CONSTRUCTION, APPROPRIATELY STABILISE ALL DISTURBED AREAS.

**MAINTENANCE**

1. WHILE CONSTRUCTION WORKS CONTINUE ON THE SITE, INSPECT THE OUTLET STRUCTURE PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING RAINFALL, AND ON AT LEAST A WEEKLY BASIS.

2. REPLACE ANY DISPLACED ROCK WITH ROCK OF A SIGNIFICANTLY (MINIMUM 110%) LARGER SIZE THAN THE DISPLACED ROCK.

**REMOVAL**

1. TEMPORARY OUTLET STRUCTURES SHOULD BE COMPLETELY REMOVED, OR WHERE APPROPRIATE, REHABILITATED SO AS NOT TO CAUSE ONGOING ENVIRONMENTAL NUISANCE OR HARM.

2. FOLLOWING REMOVAL OF THE DEVICE, THE DISTURBED AREA MUST BE APPROPRIATELY REHABILITATED SO AS NOT TO CAUSE ONGOING ENVIRONMENTAL NUISANCE OR HARM.

3. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Chutes - General | CH-02 |

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| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

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| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP
BLUE BOOK & IECA STANDARD
DRAWNGS – SHEET 17 OF 18

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
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| 23000072 | P02 | ESCP17 | 00 |

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Plot Date: Monday, 19 June 2023 8:46:48 AM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P02_ESCP_REV 00.dwg

**INSTALLATION**

*THE FOLLOWING A GENERAL INSTALLATION REQUIREMENTS. OPERATORS SHOULD OBTAIN INSTALLATION INSTRUCTIONS FROM THE GULLY BAG MANUFACTURER OR DISTRIBUTER.*

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

4. ENSURE THAT NO SEDIMENT-LADEN INFLOW IS ALLOWED TO BYPASS THE GULLY BAG UNTIL THE BAG IS EITHER FULL OF SEDIMENT, OR THE INFLOW EXCEEDS THE HYDRAULIC CAPACITY OF THE BAG.

5. INSTALL APPROPRIATE SEDIMENT AND/OR FLOW CONTROLS ON THE SIDE-ENTRY SLOT (IF ANY).

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

**MAINTENANCE**

1. INSPECT ALL SEDIMENT TRAPS DAILY AND IMMEDIATELY AFTER RUNOFF-PRODUCING RAINFALL. MAKE REPAIRS AS NEEDED.

2. REMOVE AND REPLACE THE GULLY BAG WHEN IT IS EITHER FULL OF SEDIMENT, OR IS LIKELY TO BE FULL OF SEDIMENT BEFORE THE NEXT INSPECTION, OR THE HYDRAULIC CAPACITY OF THE FILTER BAG IS EXCESSIVELY REDUCED.

3. DISPOSE OF THE SEDIMENT AND FILTER BAG IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

4. ENSURE SEDIMENT DOES NOT ENTER THE STORMWATER DRAIN DURING DE-SILTING OPERATIONS AND MAINTENANCE OF THE TRAP.

5. SEDIMENT ON THE ROAD MUST BE REMOVED IMMEDIATELY IF IT REPRESENTS A SAFETY HAZARD.

**REMOVAL**

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

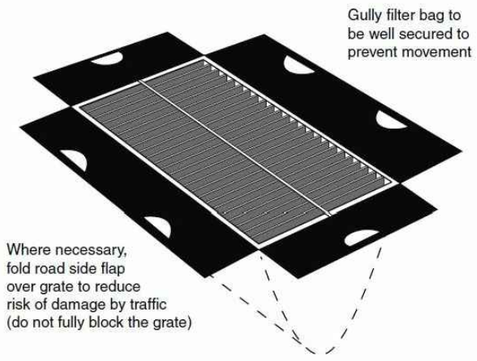



**Figure 1 - Gully filter bag**

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Gully Filter Bag | GB-01 |

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH STANDARD DRAWING SUPPLIED WITH THE APPROVED PLAN, OR AS DIRECTED BY THE SITE SUPERVISOR.

4. ENSURE THE SEDIMENT TRAP FULLY ENCLOSES THE KERB INLET. USE APPROPRIATE SPACERS TO ENSURE THE SEDIMENT TRAP DOES NOT BLOCK THE SIDE-ENTRY INLET.

5. IF NECESSARY, INSTALL ADDITIONAL 'ON-GRADE KERB INLET SEDIMENT TRAPS' UP-SLOPE OF THE SAG INLET TO ADEQUATELY RETAIN THE EXPECTED QUANTITY OF SEDIMENT RUNOFF.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

**MAINTENANCE**

1. INSPECT ALL SEDIMENT TRAPS DAILY AND IMMEDIATELY AFTER RUNOFF-PRODUCING RAINFALL. MAKE REPAIRS AS NEEDED.

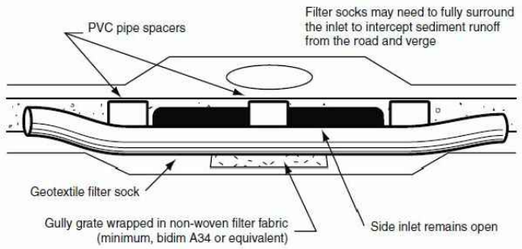
2. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. ENSURE SEDIMENT DOES NOT ENTER THE STORMWATER DRAIN DURING DE-SILTING OPERATIONS AND MAINTENANCE OF THE TRAP.

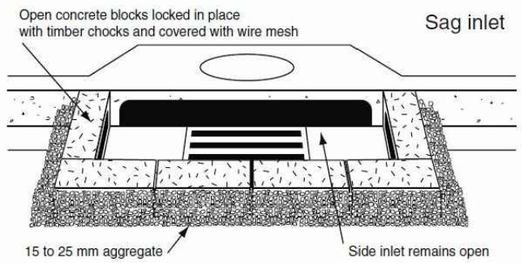
4. SEDIMENT ON THE ROAD SHALL BE REMOVED IMMEDIATELY IF IT REPRESENTS A SAFETY HAZARD.

**REMOVAL**

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.




**(a) Filter sock sediment trap on a sag inlet**




**(b) Block and aggregate type sediment trap on a sag inlet**

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Sag Kerb Inlet Sediment Trap | SA-01 |

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**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH STANDARD DRAWING SUPPLIED WITH THE APPROVED PLAN, OR AS DIRECTED BY THE SITE SUPERVISOR.

4. ENSURE THE SEDIMENT TRAP IS CONSTRUCTED UP-SLOPE OF AN ON-GRADE KERB INLET. THE SEDIMENT TRAP MUST NOT SURROUND THE KERB INLET UNLESS SPECIFICALLY DIRECTED BY THE SITE SUPERVISOR.

5. IF NECESSARY, INSTALL ADDITIONAL SEDIMENT TRAPS UP-SLOPE OF THE KERB INLET TO ADEQUATELY RETAIN THE EXPECTED QUANTITY OF SEDIMENT RUNOFF.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

**MAINTENANCE**

1. INSPECT ALL SEDIMENT TRAPS DAILY AND IMMEDIATELY AFTER RUNOFF-PRODUCING RAINFALL. MAKE REPAIRS AS NEEDED.

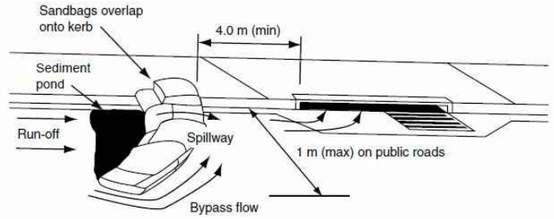
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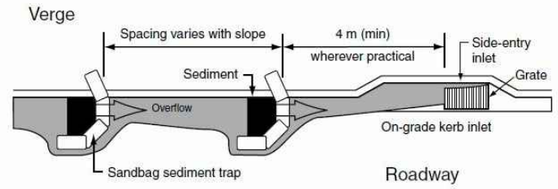
4. SEDIMENT ON THE ROAD MUST BE REMOVED IMMEDIATELY IF IT REPRESENTS A SAFETY HAZARD.

**REMOVAL**

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.




**(a) Sandbag sediment collection dam**




**(b) Typical layout of on-grade kerb inlet sediment traps**

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| GMW | Dec-09 | On-Grade Kerb Inlet Sediment Trap | OG-01 |

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| A | 13/06/23 | L.O. | L.O. | A.M. | DRAFT ISSUE – FOR CONSULTATION |

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| DRAWN BY | L.O. |
| FINAL APPROVAL | A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE: M12 MOTORWAY
M7/M12 INTERCHANGE

DRAWING TITLE: PRIMARY ESCP
IECA STANDARD DRAWINGS
SHEET 18 OF 18

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P02 | ESCP18 | 00 |

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# GENERAL REQUIREMENTS

## BACKGROUND

This is a Primary Erosion and Sediment Control Plan (ESCP). It is for the M12/Elizabeth Drive Connection (EDC) works and shows the locations for erosion and sediment controls to be implemented for those works. This ESCP has been prepared following the guidelines and standards in the NSW Blue Book Volumes 1 (Landcom, 2004) and 2D (DECC, 2008).

## EROSION HAZARD ASSESSMENT

Refer to ESCP02 for the erosion hazard assessment in each disturbed catchment.

## GENERAL INSTRUCTIONS

1. This plan is to be read in conjunction with other relevant environmental documentation for the project (e.g. CEMP, SWMP etc.)
2. Weather forecasts are to be monitored daily and the site prepared to minimise erosion, control drainage, and maximize sediment capture during rain events. Erosion and sediment controls removed or damaged during construction are to be repaired or reinstated prior to forecast rain.
3. Numbering on ESCP03-22 indicates the order that works are to be undertaken (i.e. 1 then 2, then 3 etc).
4. The M12 EDC works are to be staged as much as possible to minimise the amount of disturbed areas at any one time.
5. As much as possible, construct permanent drainage structures early and utilise them for clean water management during construction.
6. Erosion and sediment controls are to be implemented as part of initial site works, except as noted in this plan.
7. Minimise disturbance at any one time to only what is necessary for safe and efficient construction. Do not disturb new areas when rain is imminent unless appropriate controls can be implemented prior to rain occurring.
8. Establish stockpile areas and manage stockpiles in accordance with Blue Book Standard Drawing SD 4-1 on ESCP26.
   8.1. Inactive stockpiles are to be stabilised by spraying with a biodegradable polymer or covering with geofabric, jute matting or equivalent ground cover to achieve at least 60% ground cover.
9. Undertake dust suppression as required to minimise dust rise.
10. Regular site inspections are to be conducted by the site environment manager (or their representative) of temporary controls and general site conditions and records of all such inspections are to be retained onsite. Inspections are to be undertaken:
    10.1. At least weekly during normal construction hours; and
    10.2. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours); and
    10.3. Daily during rain events (if safe to do so); and
    10.4. Within 24 hours of the cessation of a rain event that causes runoff (if safe to do so).
11. Undertake progressive stabilisation of lands as final earthworks are completed in each area (rather than waiting until the completion of works).
    11.1. Final rehabilitation is to achieve the C-factors (ground cover) detailed below:
      11.1.1. C-factor of 0.1 (>= 60% ground cover) within 20 days; and
      11.1.2. C-factor of 0.05 (at least 70% ground cover) within 2 months/at completion of works.
    11.2. Areas to be revegetated are to be topsoiled first. Refer to Blue Book Standard Drawing SD 4-2 on ESCP26.
12. 10.3. Appropriate seedbed preparation should be carried out when revegetating lands (See Blue Book Standard Drawing SD 7-1 on ESCP29).
13. As areas are completed (i.e. at least 90% of any finished area has at least 70% final ground cover), temporary sediment and drainage controls can be decommissioned and removed.
14. Ensure all controls are located within the Clearing limits.
15. Progressive ESCPs are to be prepared for each section or parcel of work in accordance with the Primary ESCP. Progressive ESCPs are to take into account the controls shown in this Over-arching ESCP.

## PRIOR TO FORECAST RAINFALL

Prior to forecast rainfall, erosion and sediment controls are to be inspected and the following implemented:

1. Check that all mulch/earth bunds or silt fences have returns at max. 20m intervals, and fabric-lined spillways in all low points along the mulch/earth bunds.
2. Check that clean upslope water is diverted around disturbed areas, or has a lined, stable pathway across the work zone. Ensure that dirty site water does not mix with the clean upslope water.
3. Check that dirty water is directed to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install temporary drains or bunds as required to ensure this.
4. Ensure indicated batter are stabilised (sprayed or covered) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours).
5. Ensure that all sediment basins/traps have adequate capacity for the forecast rain. De-water and/or de-silt all traps as required.

## SEDIMENT BASIN OPERATION AND MAINTENANCE

1. Each sediment basin is to be maintenance-cycled following rainfall. Within 5-days after rainfall of 5mm or more (i.e. sufficient to cause runoff):
   1.1. De-water the sediment basins following the project de-watering procedure in the SWMP (or in accordance with the 'De-watering and Dirty Water Treatment Requirements' notes below;
   1.2. Check the level of accumulated sediment in the basins. If it exceeds the sediment storage storage zone volume on ESCP02, de-silt the basin. Material removed from the basin must be taken to an active stockpile or spoil dump.
   1.3. Note that if rainfall (sufficient to cause runoff) occurs within 5 days of the previous rainfall event, the 5-day maintenance requirement is reset.
2. After each rainfall event, inspect the sediment basins to ensure spillway and inlet points are stable and free from scour. Repair as required.

## DE-WATERING AND DIRTY WATER TREATMENT REQUIREMENTS

De-watering and treatment of dirty water is to be undertaken in accordance with the Project SWMP or the below:

- Any active discharge of water from the project (i.e. where water is moved offsite via direct action such as pumping rather than flowing off the project as a result of heavy rainfall) is to achieve:
  - 50 NTU or less (or as required in the EPL); and
  - pH 6.5 to 8.5; and
  - <10mg/L oil and grease and no visible trace.
- Flocculation can be achieved by using gypsum at a rate of approximately 32kg/100 $m^3$ of stormwater. Refer to manufacturers guidelines for dosage details for alternative flocculatns/coagulants. Note alternative flocculants/coagulants require TfNSW approval prior to use.
- These de-watering requirements apply to dirty water accumulating in any sort of excavation, sump, or other ponded water body on the project.
- If the water is going to be used within the construction site for dust-suppression or construction purposes and will drain back into the sediment capture system it does not require treatment (except for pH, which must be between 6.5 and 8.5).

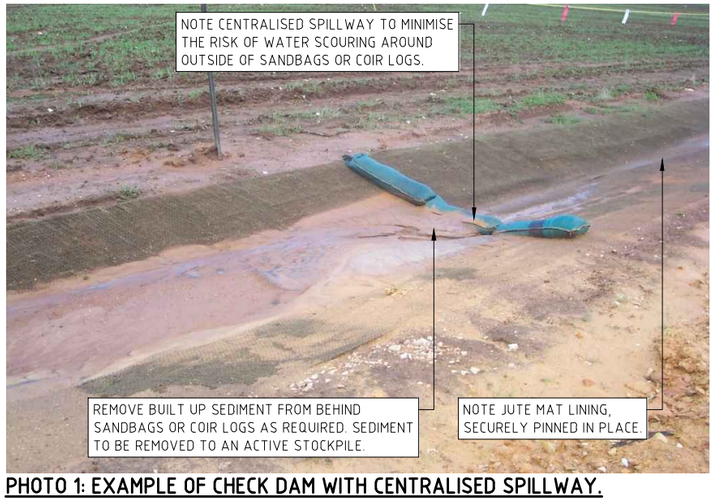



PHOTO 1: EXAMPLE OF CHECK DAM WITH CENTRALISED SPILLWAY.



PHOTO 2: EXAMPLE OF SILT FENCE WRAPPED UP AND BEHIND HEAD WALL.

## DOCUMENT CERTIFICATION

This plan has been developed based on agreed requirements as understood by SEEC at the time of engagement. It applies only to a specific task on the nominated lands. Other interpretations should not be made, including changes in scale or application to other projects. Changes to the project scope or extent might impact on the validity of this plan.

Any recommendations contained in this plan are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, or as advised to us. Such recommendations are potentially subject to the limited scope and resources available. Within the confines of the above statements and to the best of my knowledge, this plan does not contain any incomplete or misleading information.

DRAFT

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP BACKGROUND AND GENERAL INSTRUCTIONS – SHEET 1 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP01 | A |

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| ALIGNMENT | CATCHMENT AND BASIN ID | Catchment area total (ha)* | Catchment area disturbed (ha) | LS-factor | Soil loss (t/ha/yr) | Catchment soil loss (t/yr) | Is a basin required? Y/N | Is a sediment basin feasible? (Y/N) Refer to Plan for details | Sediment basin storage (soil) volume ($m^3$) | Sediment basin settling (water) volume ($m^3$) | Total sediment basin volume ($m^3$) | Spillway Q100 event ($m^3/s$) | Spillway min. Crest Width (m) | Spillway Depth (inc. freeboard) (m) | Comments or recommendations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MCX2 | 260W | 0.3 | 0.3 | 1.52 | 225 | 67.6 | N | - | - | - | - | - | - | - | |
| | 280W | 1.09 | 1.09 | 2.18 | 323 | 352.2 | Y | Y | 45 | 225 | 270 | 0.757 | 2.5 | 0.6 | SB280W will need to be excavated deep enough that the inlet point of the basin is lower than the toe of the fill. |
| | 420E | 0.04 | 0.04 | 0.81 | 120 | 4.8 | N | - | - | - | - | | - | - | |
| | 420W | 0.16 | 0.16 | 3.69 | 547 | 87.5 | N | - | - | - | - | - | - | - | |
| | 440E | 0.46 | 0.46 | 0.80 | 119 | 54.5 | N | - | - | - | - | - | - | - | |
| | 440W | 1.82 | 1.82 | 1.76 | 261 | 474.7 | Y | Y | 61 | 375 | 436 | 1.211 | 3.0 | 0.65 | SB440W will need to be excavated deep enough that the inlet point of the basin is lower than the toe of the fill. |
| | 600E | 0.78 | 0.78 | 1.27 | 188 | 146.8 | N | - | - | - | - | - | - | - | |
| | 640W | 0.86 | 0.86 | 1.44 | 213 | 183.5 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. The proposed operational bio-retention basin can be utilised as a sediment basin during construction. |
| | 960E | 0.58 | 0.58 | 0.69 | 102 | 59.3 | N | - | - | - | - | - | - | - | |
| | 960W | 0.84 | 0.84 | 0.96 | 142 | 119.5 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 980E | 0.21 | 0.21 | 0.70 | 104 | 21.8 | N | - | - | - | - | - | - | - | |
| | 980W | 0.23 | 0.23 | 0.97 | 144 | 33.1 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 1140E | 1.23 | 1.23 | 0.39 | 58 | 71.1 | N | - | - | - | - | - | - | - | |
| | 1140W | 1.06 | 1.06 | 0.53 | 79 | 83.3 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 1170E | 0.34 | 0.34 | 1.06 | 157 | 53.4 | N | - | - | - | - | - | - | - | |
| | 1170W | 0.42 | 0.42 | 0.73 | 108 | 45.4 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 1190E | 0.91 | 0.91 | 1.06 | 157 | 143.0 | N | - | - | - | - | - | - | - | |
| | 1200E | 0.6 | 0.6 | 0.73 | 108 | 64.9 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 1320E | 1.01 | 1.01 | 1.31 | 194 | 196.1 | N | - | - | - | - | - | - | - | |
| | 1330W | 0.61 | 0.61 | 2.81 | 416 | 254.0 | Y | Y | 33 | 126 | 159 | 0.445 | 1.8 | 0.6 | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and the size of sediment basin SB1330W would need to increase accordingly to accommodate the additional catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity.<br>SB1330W will need to be excavated deep enough that the inlet point of the basin is lower than the toe of the fill. |
| | 1640W | 0.98 | 0.98 | 2.81 | 416 | 408.1 | Y | Y | 52 | 202 | 254 | 0.680 | 2.5 | 0.6 | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and the size of sediment basin SB1640W would need to increase accordingly to accommodate the additional catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 1800E | 0.65 | 0.25 | 4.64 | 688 | 171.9 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the size of this catchment will increase However, works in this catchment will likely be staged to maintain live traffic and therefore it is unlikely a sediment basin would be required. |
| | 1800W | 0.5 | 0.22 | 4.64 | 688 | 151.3 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the size of this catchment will increase However, works in this catchment will likely be staged to maintain live traffic and therefore it is unlikely a sediment basin would be required. |
| | 1830W | 0.15 | 0.15 | 0.83 | 123 | 18.5 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the size of this catchment will increase However, works in this catchment will likely be staged to maintain live traffic and therefore it is unlikely a sediment basin would be required. |
| | 1840E | 0.25 | 0.25 | 0.83 | 123 | 30.8 | N | - | - | - | - | - | - | - | Note works in this catchment will likely be staged to maintain live traffic. |
| | 2120W | 0.3 | 0.3 | 1.76 | 261 | 78.2 | N | - | - | - | - | - | - | - | Note works in this catchment will likely be staged to maintain live traffic. |
| | 2160E | 0.9 | 0.33 | 1.76 | 261 | 86.1 | N | - | - | - | - | - | - | - | Note works in this catchment will likely be staged to maintain live traffic. |
| | 2160W | 1.41 | 0.94 | 1.31 | 194 | 182.5 | N | - | - | - | - | - | - | - | Note works in this catchment will likely be staged to maintain live traffic. |
| MCE0 | 160EO | 3.79 | 3.79 | 2.81 | 416 | 1578.3 | Y | Y | 202 | 781 | 983 | 2.316 | 5 | 0.7 | Note the catchment shown on ESCP101 assumes M12 Central works will occur concurrently with the Elzabeth Drive Connection works. |
| | 300EO | 1.26 | 1.26 | 3.70 | 548 | 690.9 | Y | Y | 89 | 260 | 349 | 0.875 | 2.5 | 0.65 | Note the catchment shown on ESCP101 assumes M12 Central works will occur concurrently with the Elzabeth Drive Connection works. |
| | 320EO | 3.19 | 3.19 | 3.70 | 548 | 1749.2 | Y | Y | 224 | 657 | 881 | 2.032 | 5 | 0.7 | Note the catchment shown on ESCP101 assumes M12 Central works will occur concurrently with the Elzabeth Drive Connection works. If M12 Central and M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. If the M12/M7 interchange works occur concurrently with M12 Central and M12 EDC works, the size of this catchment will increase and the size of sediment basin SB320EO would need to increase accordingly to accommodate the additional catchment. |
| MC90 | 100N | 0.64 | 0.64 | 4.43 | 657 | 420.2 | Y | Y | 54 | 132 | 186 | 0.466 | 1.8 | 0.60 | |
| | 110N | 0.55 | 0.55 | 1.58 | 234 | 128.8 | N | - | - | - | - | - | - | - | |
| | 150N | 0.35 | 0.35 | 1.07 | 159 | 55.5 | N | - | - | - | - | - | - | - | |
| | 200N | 1.42 | 1.42 | 2.81 | 416 | 591.3 | Y | Y | 76 | 293 | 369 | 0.945 | 2.5 | 0.65 | |
| | 200S | 0.49 | 0.49 | 1.64 | 243 | 119.1 | N | - | - | - | - | - | - | - | |
| | 210S | 0.26 | 0.26 | 0.98 | 145 | 37.8 | N | - | - | - | - | - | - | - | |
| | 320N | 1.81 | 1.81 | 2.81 | 416 | 753.8 | Y | Y | 97 | 373 | 470 | 1.205 | 3.0 | 0.65 | |
| | 410S | 0.26 | 0.26 | 1.14 | 169 | 43.9 | N | - | - | - | - | - | - | - | |
| | 440S | 0.41 | 0.41 | 1.52 | 225 | 92.4 | N | - | - | - | - | - | - | - | |
| | 480N | 2.21 | 2.21 | 3.70 | 548 | 1211.8 | Y | Y | 155 | 455 | 610 | 1.471 | 4 | 0.65 | |
| | 600S | 1.06 | 1.06 | 1.47 | 218 | 230.9 | Y | Y | 30 | 218 | 248 | 0.736 | 2.5 | 0.6 | |
| | 960N | 0.3 | 0.3 | 0.61 | 90 | 27.1 | N | - | - | - | - | - | - | - | |
| | 960S | 0.5 | 0.5 | 1.09 | 162 | 80.8 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the size of this catchment will increase However, works in this catchment will likely be staged to maintain live traffic and therefore it is unlikely a sediment basin would be required. |
| | 1000S | 1.63 | 1.63 | 1.19 | 176 | 287.5 | Y | Y | 37 | 336 | 373 | 1.085 | 3.0 | 0.65 | |
| | 1150S | 1.19 | 1.19 | 1.90 | 282 | 335.1 | Y | Y | 43 | 245 | 288 | 0.826 | 3 | 0.65 | |
| MCB0 | 140S | 1.78 | 1.78 | 2.05 | 304 | 540.8 | Y | Y | 69 | 367 | 436 | 1.185 | 3.0 | 0.65 | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and the size of sediment basin SB140S would need to increase accordingly to accommodate the additional catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 150N | 0.48 | 0.48 | 1.47 | 218 | 104.6 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 180S | 0.36 | 0.36 | 3.33 | 494 | 177.7 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 190N | 1.2 | 1.2 | 1.47 | 218 | 261.4 | Y | Y | 34 | 247 | 281 | 0.833 | 2.5 | 0.6 | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and the size of sediment basin SB190N would need to increase accordingly to accommodate the additional catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 310N | 0.15 | 0.15 | 3.31 | 491 | 73.6 | N | - | - | - | - | - | - | - | |
| | 420S | 0.31 | 0.31 | 2.48 | 368 | 113.9 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the size of this catchment will increase However, works in this catchment will likely be staged to maintain live traffic and therefore it is unlikely a sediment basin would be required. |
| MC81 | 110E | 0.45 | 0.45 | 2.77 | 411 | 184.7 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| | 280E | 0.64 | 0.64 | 1.47 | 218 | 139.4 | N | - | - | - | - | - | - | - | If M12/M7 interchange works occur concurrently with the M12 EDC works, the offsite (clean) water drain shown upslope can be deleted. The size of this catchment will increase and will most likely necessitate a sediment basin in this catchment. Note it is unlikely that sufficient space would be available to construction a sediment basin to the anticipated capacity. |
| Compound | SC1 | 1.56 | 0.8 | 1.47 | 218 | 174.3 | N | - | - | - | - | - | - | - | |
| | SC2 | 1.1 | 0.65 | 1.76 | 261 | 169.5 | N | - | - | - | - | - | - | - | |

A composite LS-factor has been adopted, which has been determined based on variable catchment slope gradients and slope lengths.
R factor is 2500 for all basins
K factor is 0.0456 for all basins
P factor is 1.3 for all basins
C factor is 1.0 for all basins
Cv is 0.64 for all basins
x-day, y-percentile rainfall event is 32.2mm for all basins
The sediment storage zone has been designed for 2 months for all basins.
**Spillway Notes:**
Spillway invert levels to be set above total basin volume and freebaord to be provided above the top of the spillway rock lining.
Dissipater structures to be provided at base of basin spillway and inlet points. Surface treatment - Gypsum treat ground surfaces at 1.5 kg/$m^2$ and line with geotextile (bidim A34 min.) and interlocking rock (D50 = 200mm).

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| DRAWN BY | L.O. |
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PROJECT TITLE

M12 MOTORWAY
ELIZABETH DRIVE CONNECTION

DRAWING TITLE

PRIMARY ESCP
CATCHMENT AND BASIN ANALYSIS
TABLE – SHEET 2 OF 30

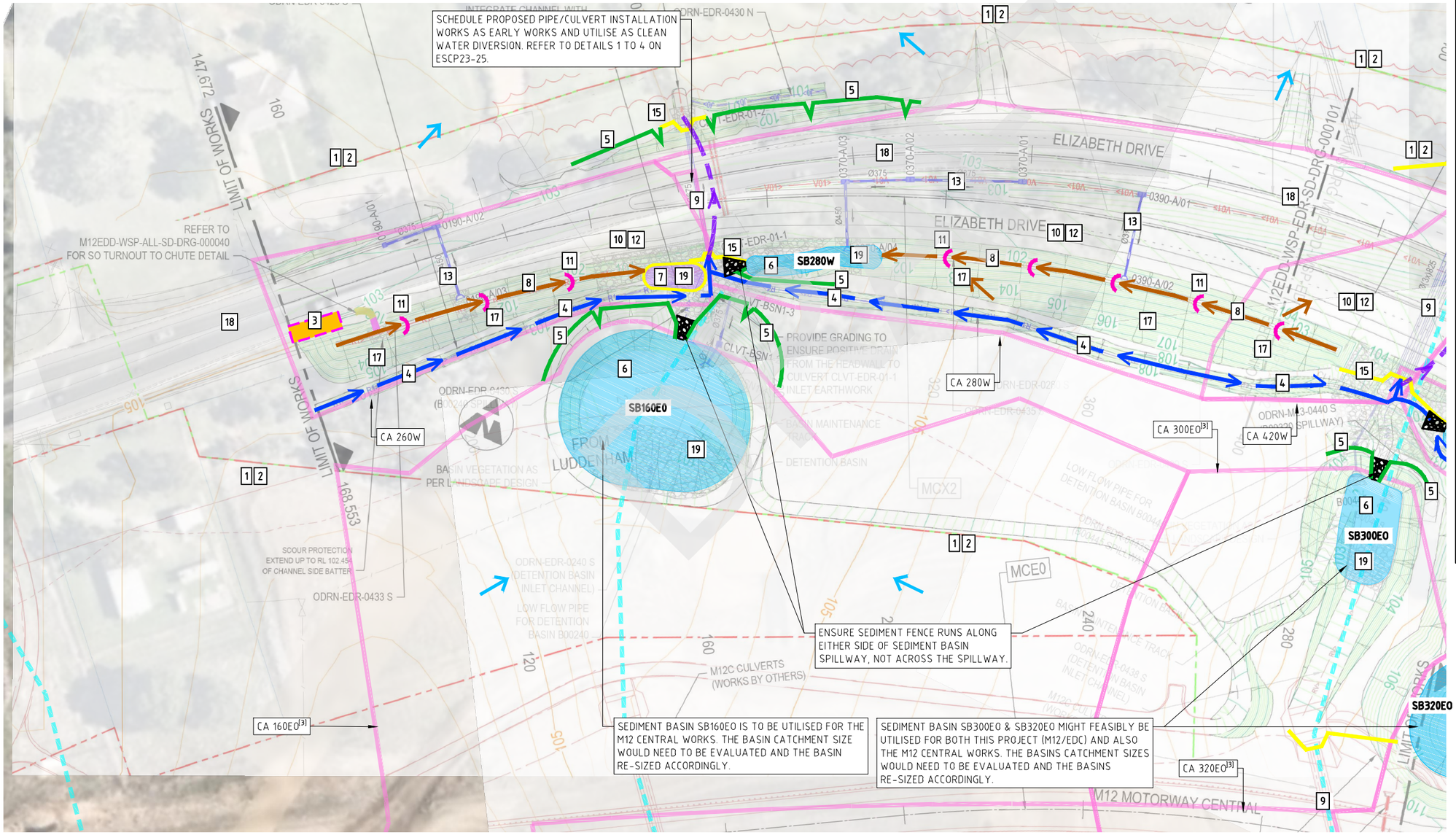
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| 23000072 | P01 | ESCP02 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

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| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 3 OF 30

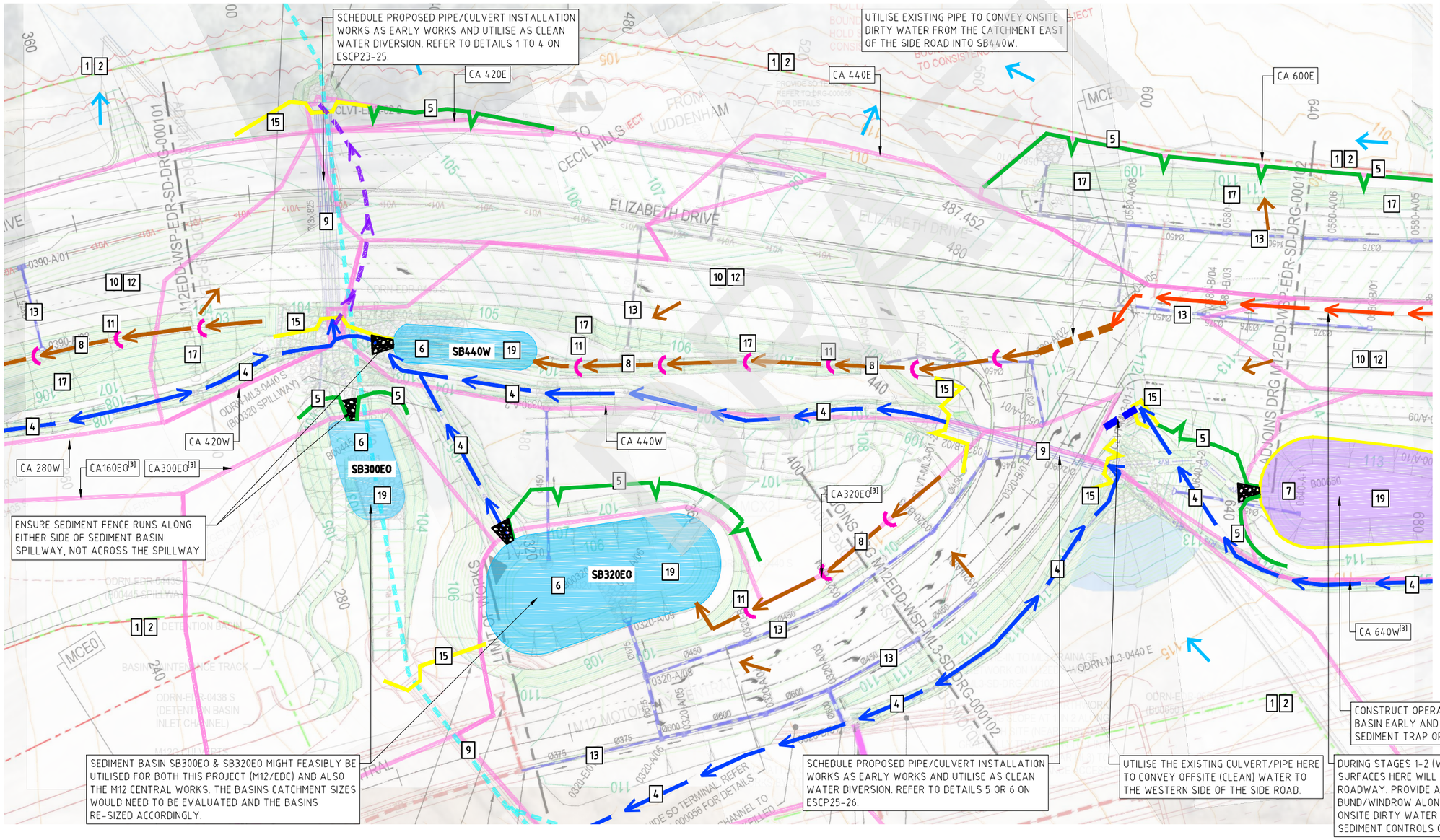
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP03 | A |

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Plot Date: Friday, 19 May 2023 3:09:51 PM
CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 4 OF 30

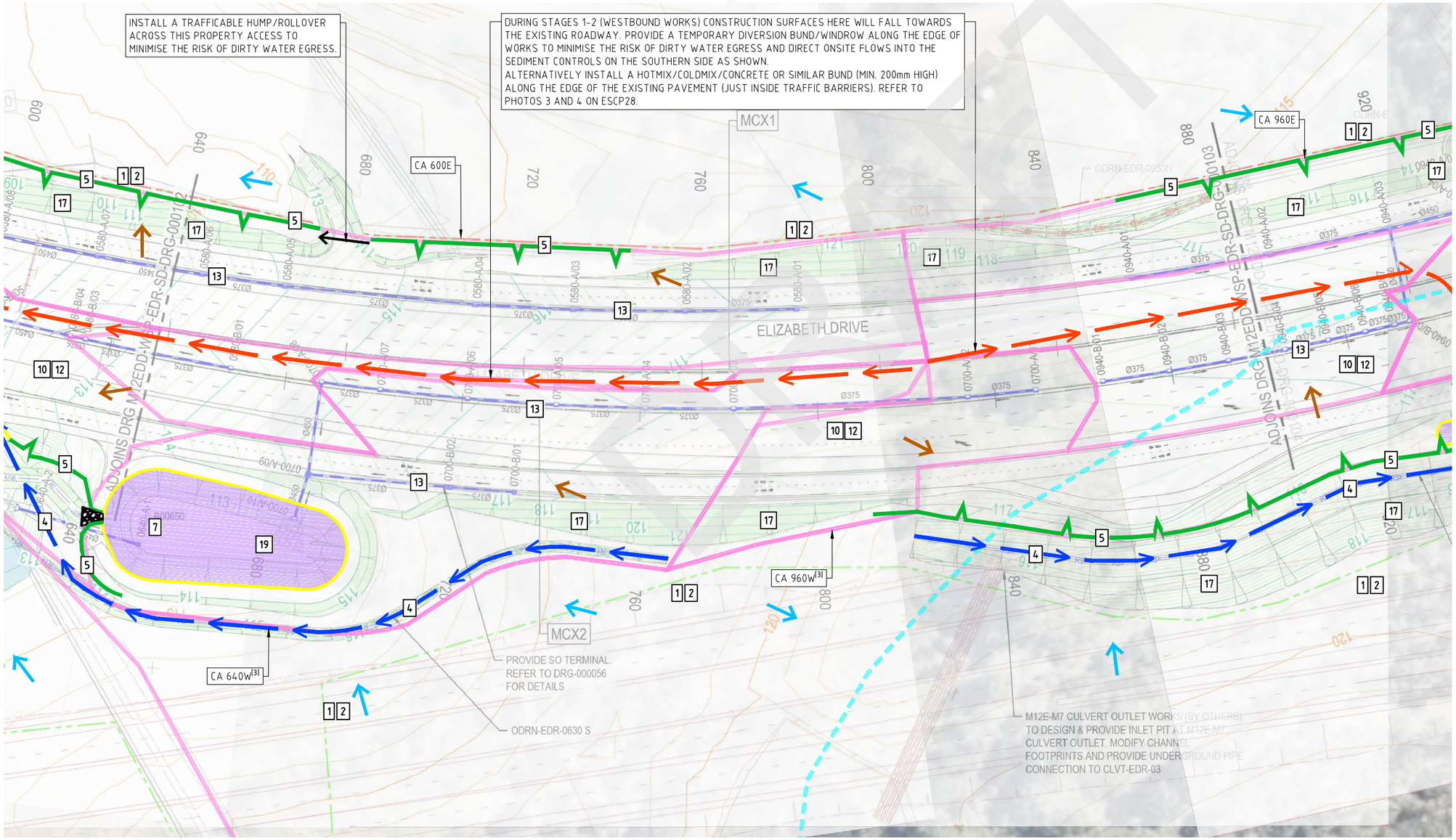
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP04 | A |

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Plot Date: Friday, 19 May 2023 3:10:01 PM
CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 5 OF 30

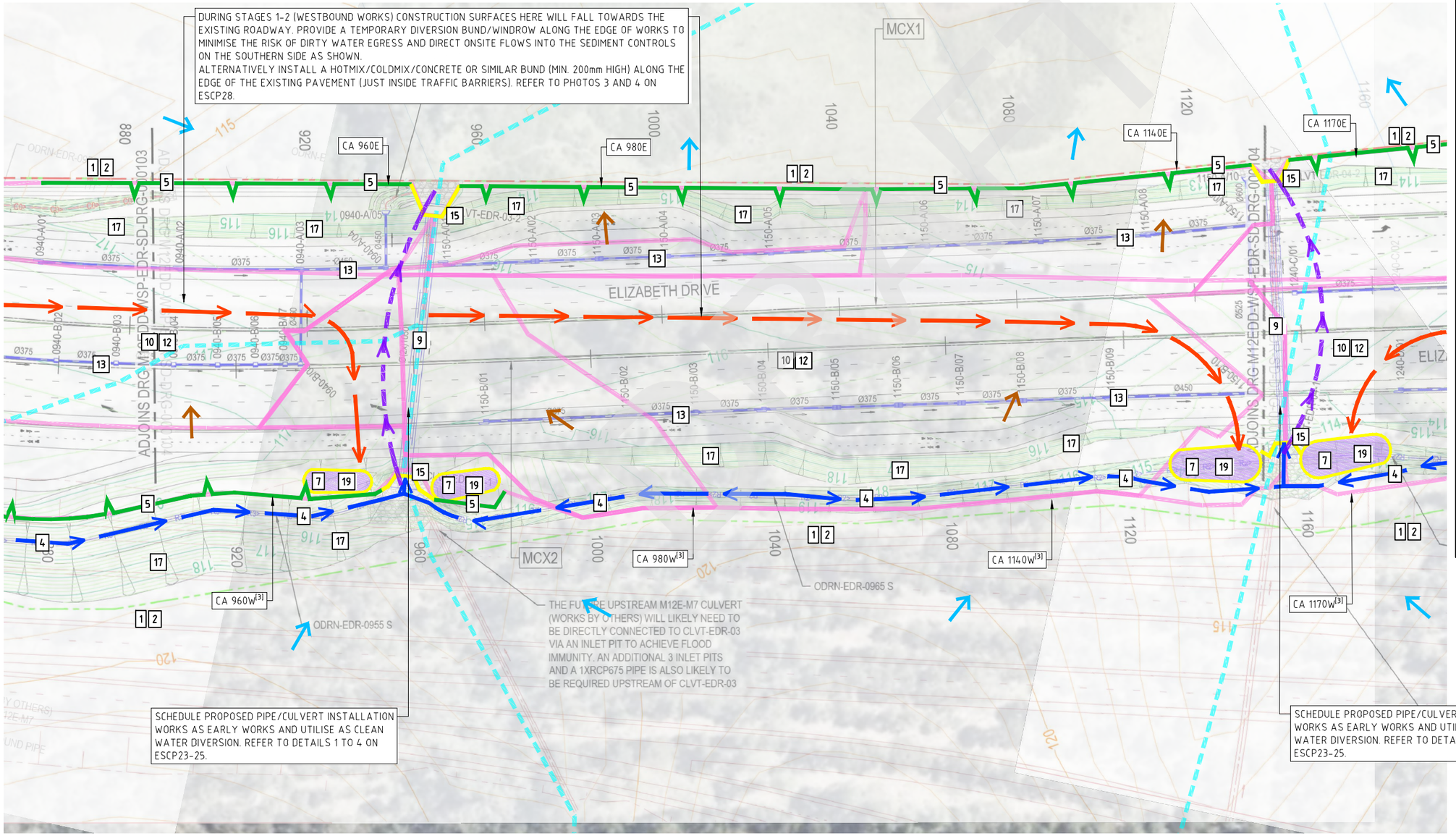
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|---|---|---|---|
| 23000072 | P01 | ESCP05 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
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9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

North

CLIENT: JOHN HOLLAND

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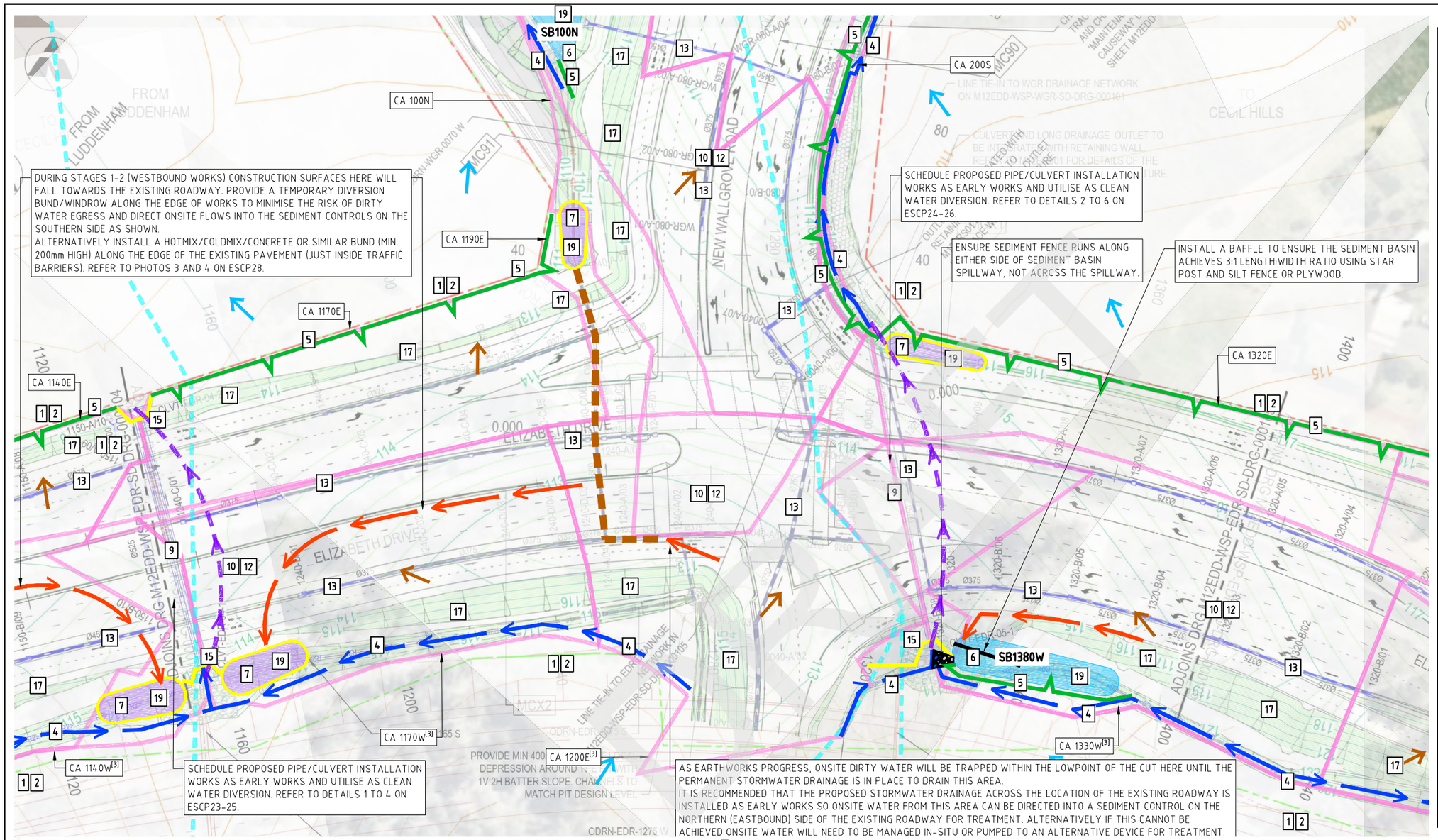
PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 6 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP06 | A |

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## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
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- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
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- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
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- TEMPORARY DIRTY PIPE
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- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
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11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
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14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
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      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
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16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

North

CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 7 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP07 | A |

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Plot Date: Friday, 19 May 2023 3:10:16 PM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.

CA 150N[3]

CA 180S[3]

ENSURE SEDIMENT FENCE RUNS ALONG EITHER SIDE OF SEDIMENT BASIN SPILLWAY, NOT ACROSS THE SPILLWAY.

DURING EARTHWORKS GRADE SURFACES OR PROVIDE TEMPORARY DRAINAGE PRIOR TO RAINFALL TO DIRECT ONSITE DIRTY WATER TO SB140S AS MUCH AS POSSIBLE.

SB140S

INSTALL A BAFFLE TO ENSURE THE SEDIMENT BASIN ACHIEVES 3:1 LENGTH:WIDTH RATIO USING STAR POST AND SILT FENCE OR PLYWOOD.

CA 140S[3]

CA 1320E

INSTALL BAFFLES TO ENSURE THE SEDIMENT BASIN ACHIEVES 3:1 LENGTH:WIDTH RATIO USING STAR POST AND SILT FENCE OR PLYWOOD.

ELIZABETH DRIVE

SB1330W

CA 1330W[3]

DURING STAGES 1-2 (WESTBOUND WORKS) CONSTRUCTION SURFACES HERE WILL FALL TOWARDS THE EXISTING ROADWAY. PROVIDE A TEMPORARY DIVERSION BUND/WINDROW ALONG THE EDGE OF WORKS TO MINIMISE THE RISK OF DIRTY WATER EGRESS AND DIRECT ONSITE FLOWS INTO THE SEDIMENT CONTROLS ON THE SOUTHERN SIDE AS SHOWN.
ALTERNATIVELY INSTALL A HOTMIX/COLDMIX/CONCRETE OR SIMILAR BUND (MIN. 200mm HIGH) ALONG THE EDGE OF THE EXISTING PAVEMENT (JUST INSIDE TRAFFIC BARRIERS). REFER TO PHOTOS 3 AND 4 ON ESCP28.

SB1640W

CA 1640W[3]

EXISTING BASIN TO BE REMOVED FOR PROPOSED BASIN B00280

SCHEDULE PROPOSED PIPE/CULVERT INSTALLATION WORKS AS EARLY WORKS AND UTILISE AS CLEAN WATER DIVERSION. REFER TO DETAILS 2 TO 4 ON ESCP24-25.

14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
        - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.

## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 8 OF 30

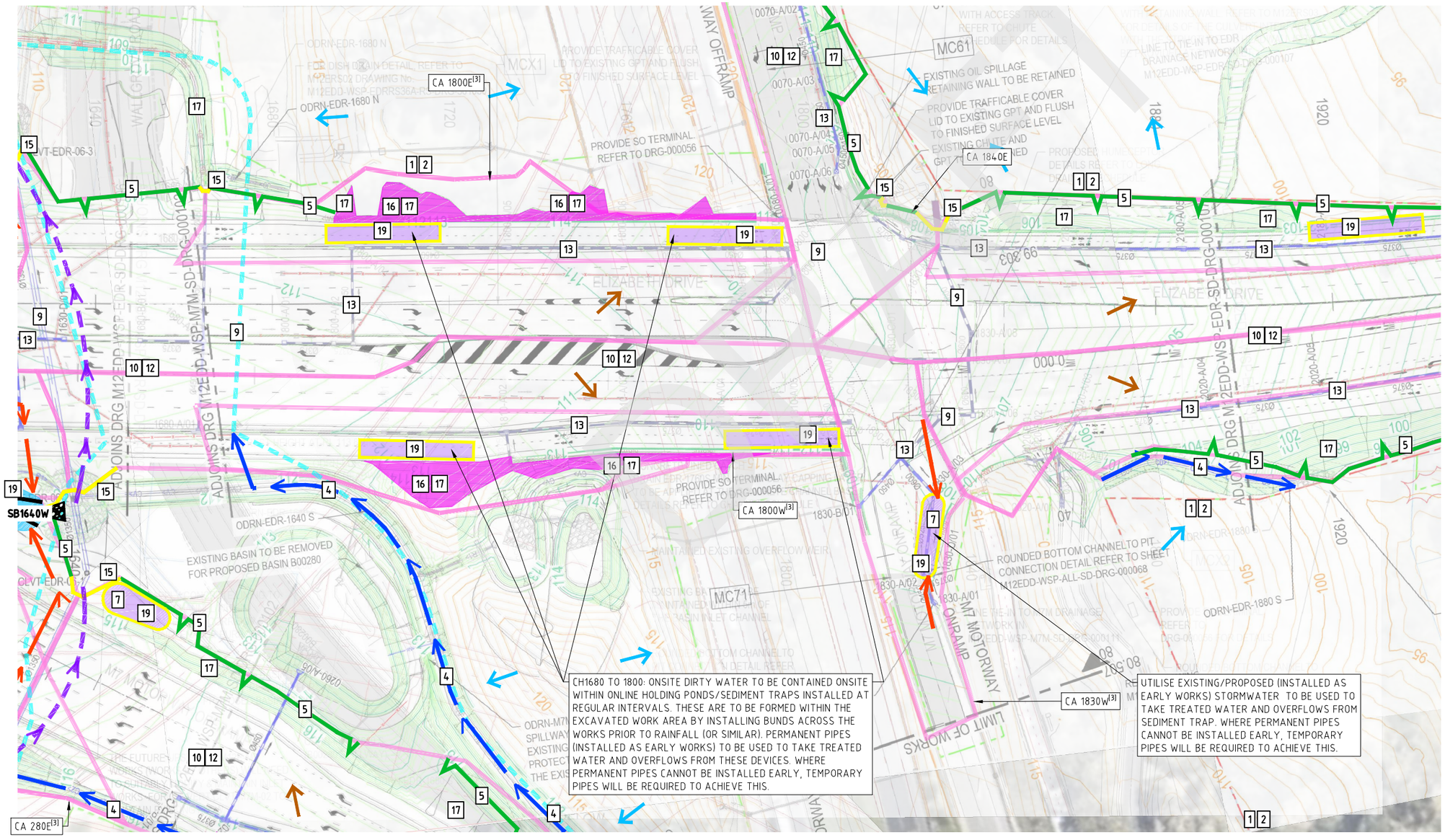
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP08 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
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9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




### LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 9 OF 30

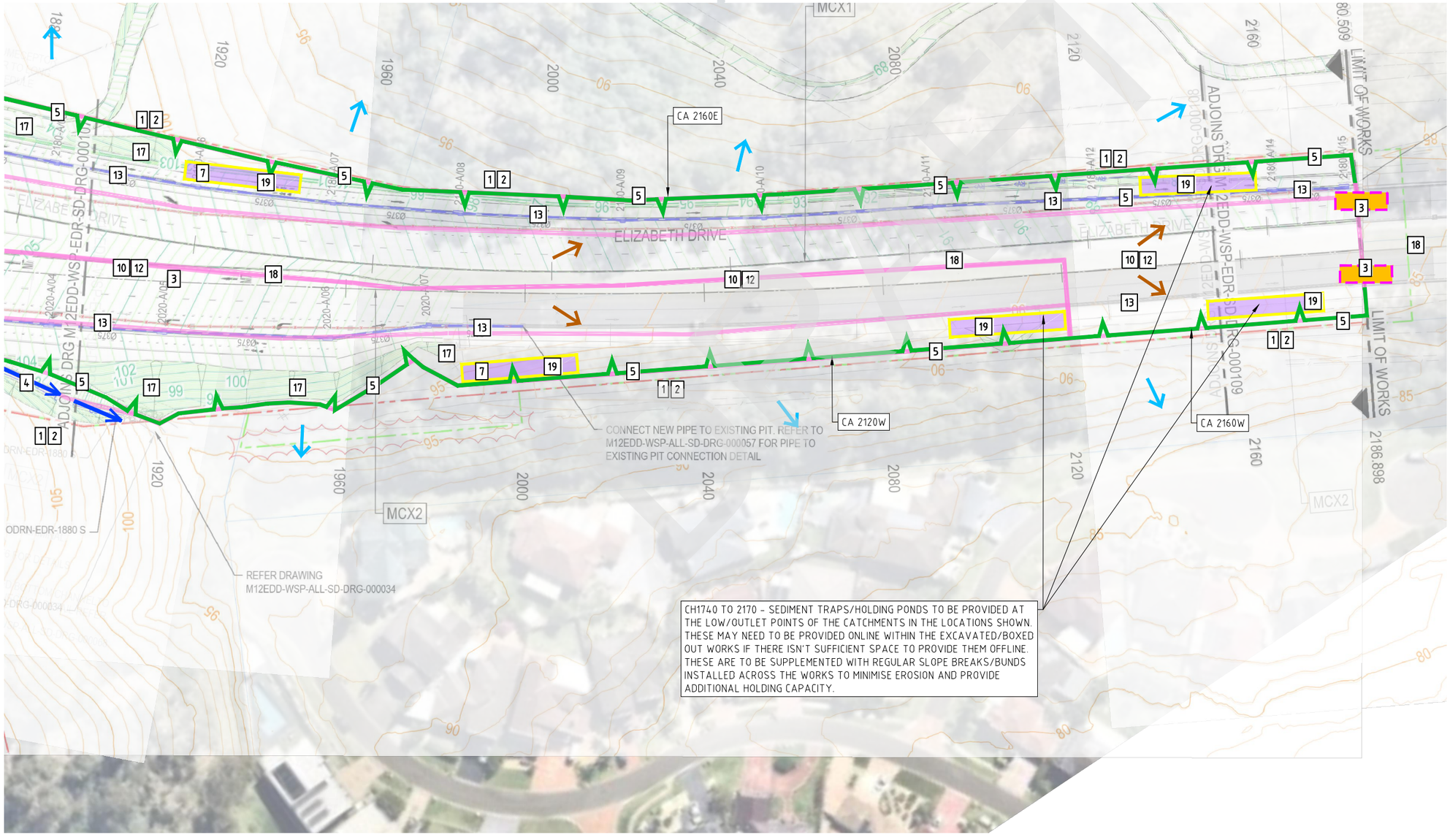
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP09 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
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9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
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      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
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- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
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- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
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**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE - FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 10 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP10 | A |

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Plot Date: Friday, 19 May 2023 3:10:39 PM CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
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## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY
ELIZABETH DRIVE CONNECTION

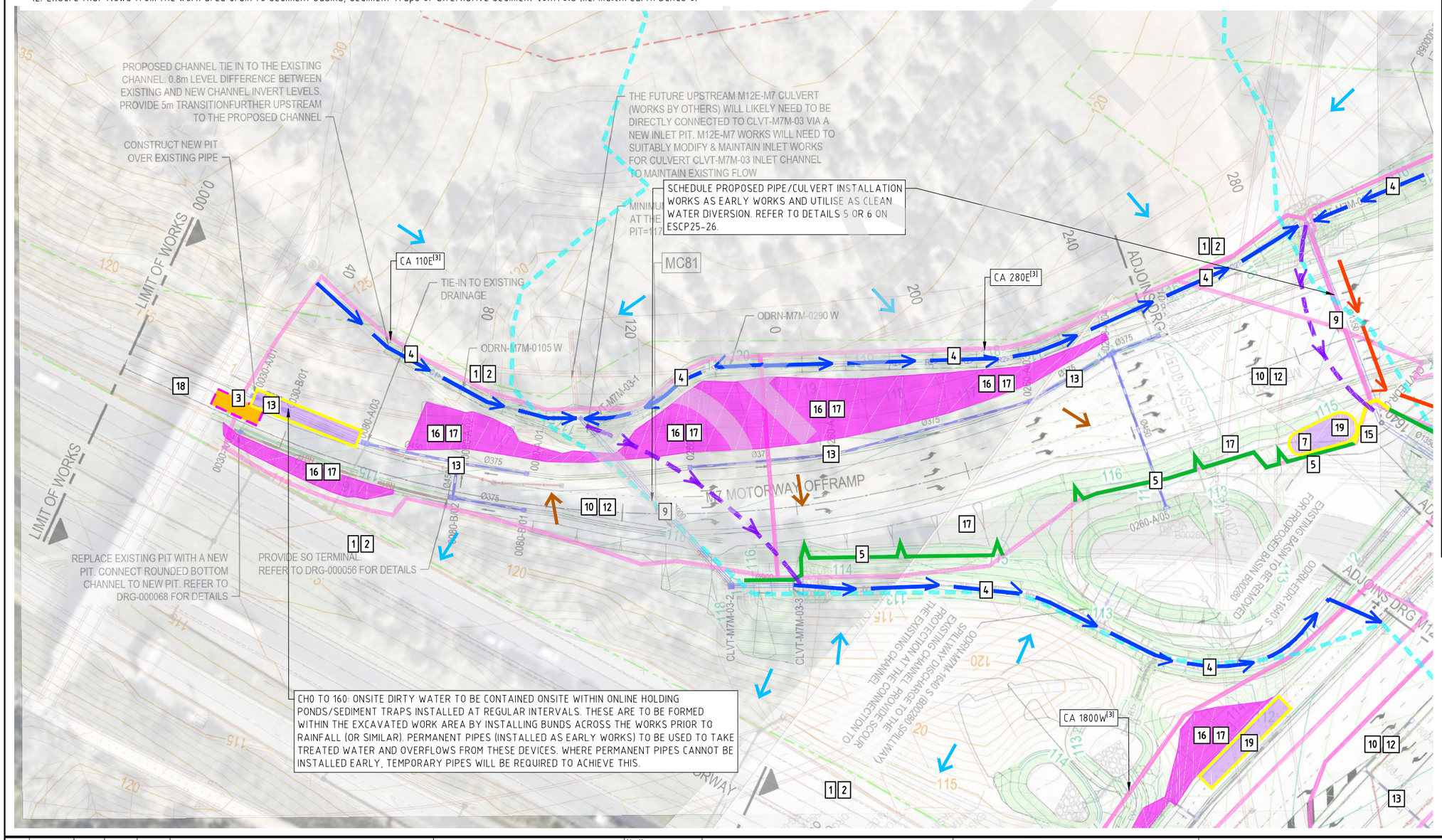
DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 11 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP11 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
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- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
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- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 12 OF 30

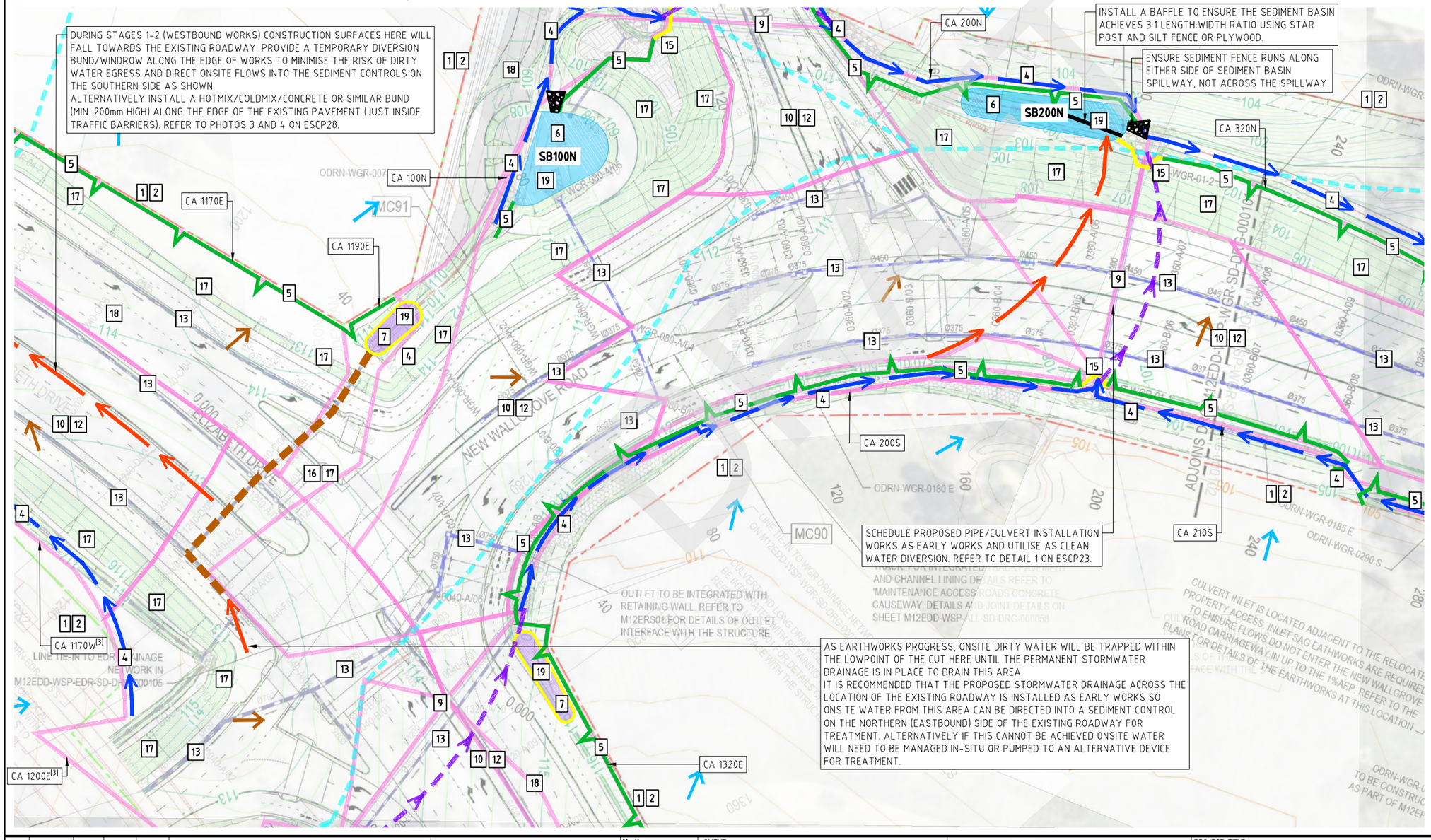
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP12 | A |

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Plot Date: Friday, 19 May 2023 3:10:49 PM
CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
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9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
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      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
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- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
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- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
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- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
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- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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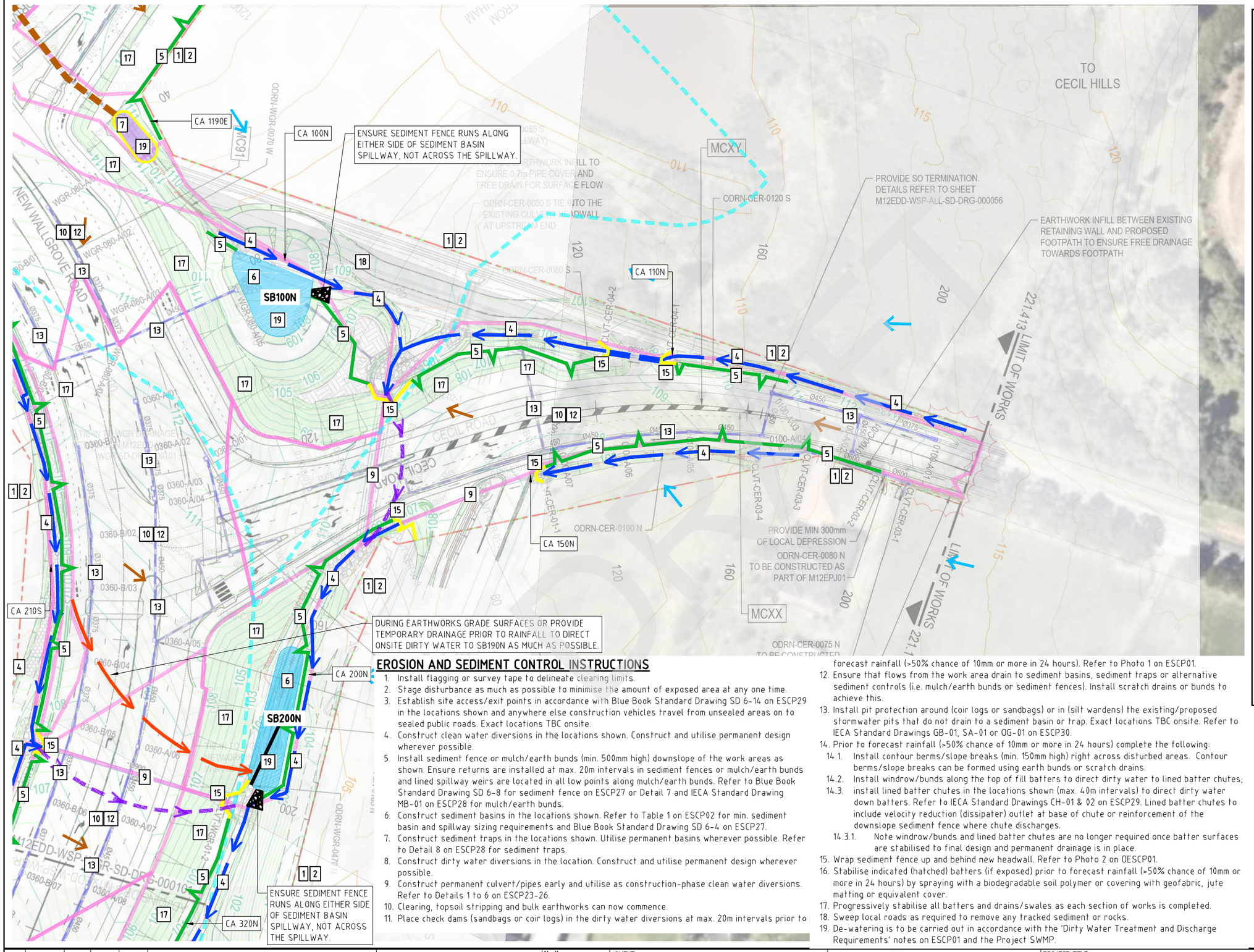
PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 13 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP13 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

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14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
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    - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
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17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.

## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
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- BAFFLE WITHIN SEDIMENT BASIN

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**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

North

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 14 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP14 | A |

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Plot Date: Friday, 19 May 2023 3:11:00 PM
CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

THIS EXISTING FARM DAM CAN BE UTILISED AS A TEMPORARY SEDIMENT BASIN DURING INITIAL PIONEERING AND STRIPPING WORKS.

IN FILLING OF THIS DAM IS TO BE UNDERTAKEN EARLY IN THE EARTHWORKS PROGRAM TO FACILITATE MANAGEMENT OF DIRTY AND CLEAN WATER VIA THE CONSTRUCTION OF SEDIMENT BASIN SB319N AND THE CLEAN WATER DRAIN AS SHOWN. DE-WATERING OF THE DAM IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE PROJECT SWMP.

A PROGRESSIVE ESCP WILL BE REQUIRED FOR THIS AREA PRIOR TO WORKS BEING UNDERTAKEN TO DETAIL ALL CONTROL MEASURES AND STAGING REQUIREMENTS.

INSTALL A BAFFLE TO ENSURE THE SEDIMENT BASIN ACHIEVES 3:1 LENGTH:WIDTH RATIO USING STAR POST AND SILT FENCE OR PLYWOOD.

ENSURE SEDIMENT FENCE RUNS ALONG EITHER SIDE OF SEDIMENT BASIN SPILLWAY, NOT ACROSS THE SPILLWAY.

SCHEDULE PROPOSED PIPE/CULVERT INSTALLATION WORKS AS EARLY WORKS AND UTILISE AS CLEAN WATER DIVERSION. REFER TO DETAIL 1 ON ESCP23.

INSTALL A BAFFLE TO ENSURE THE SEDIMENT BASIN ACHIEVES 3:1 LENGTH:WIDTH RATIO USING STAR POST AND SILT FENCE OR PLYWOOD.

ENSURE SEDIMENT FENCE RUNS ALONG EITHER SIDE OF SEDIMENT BASIN SPILLWAY, NOT ACROSS THE SPILLWAY.

PROVIDE CAUSEWAY REFER TO SHEET M12EDD-WSP-ALL-SHT-DRG-000058

ODRN-WGR-0465 N (B00360 SPILLWAY)

PROPOSED CHANNEL CONNECTS TO NATURAL CREEK

MC91

MC90

SB320N

SB480N

CA 320N

CA 480N

CA 210S

CA 410S

CA 440S

ODRN-WGR-0470 N

ODRN-WGR-0185 E

ODRN-WGR-0290 S

ODRN-WGR-0405 S

CLVT-WGR-02-2

CLVT-WGR-02-3

MAIN DRAINAGE LINE FLOWING NORTH

CULVERT INLET IS LOCATED ADJACENT TO THE RELOCATED PROPERTY ACCESS. INLET SAG EATHWORKS ARE REQUIRED TO ENSURE FLOWS DO NOT ENTER THE NEW WALLGROVE ROAD CARRIAGEWAY IN UP TO THE 1%AEP. REFER TO THE PLANS FOR DETAILS OF THE EARTHWORKS AT THIS LOCATION

DURING EARTHWORKS GRADE SURFACES OR PROVIDE TEMPORARY DRAINAGE PRIOR TO RAINFALL TO DIRECT ONSITE DIRTY WATER TO SB480N AS MUCH AS POSSIBLE.

## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
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- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
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- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
    - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.

0 5 10 15 20 25m

Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 15 OF 30

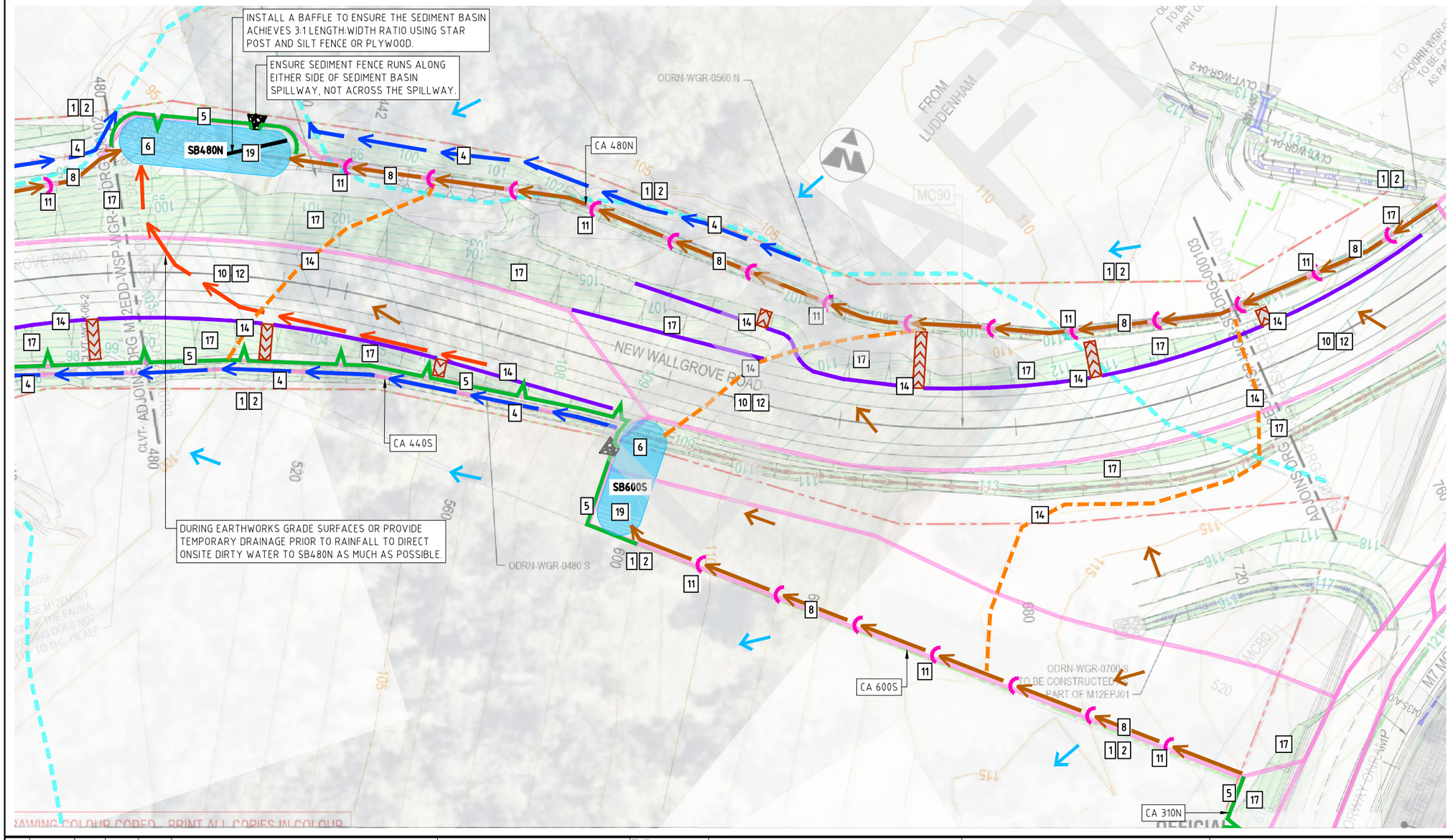
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP15 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 16 OF 30

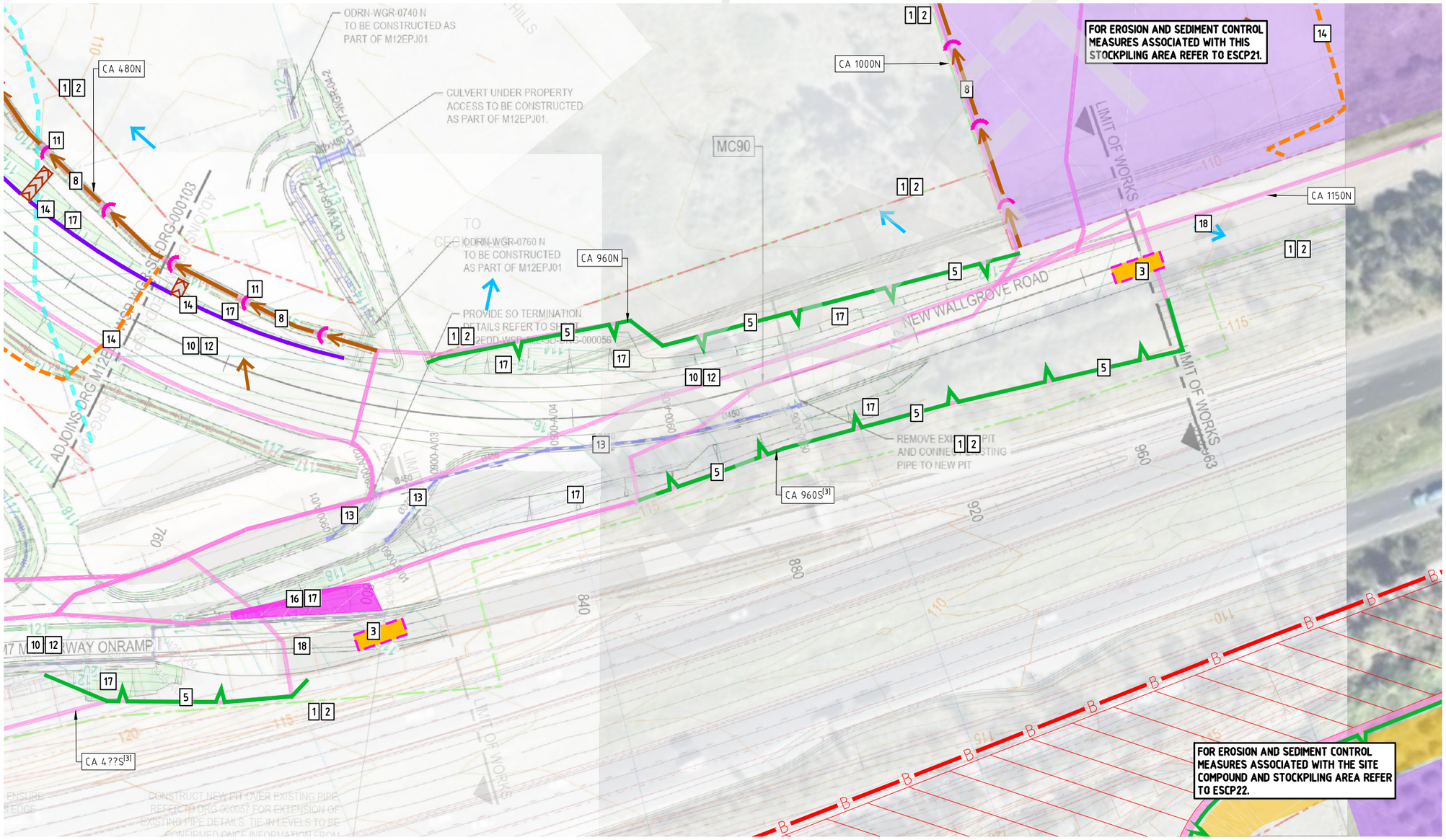
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP16 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

DRAFT

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 17 OF 30

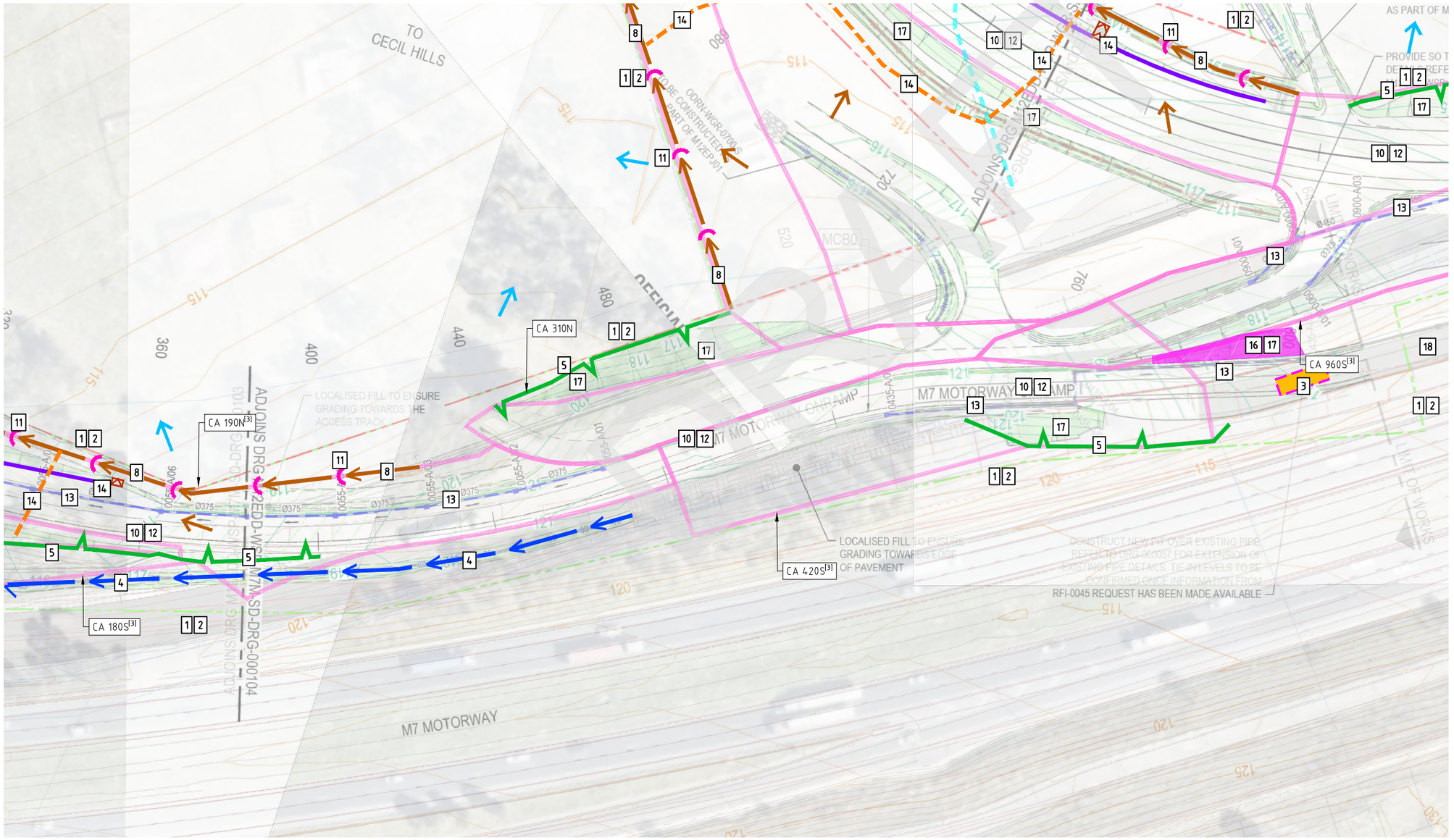
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP17 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
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15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
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17. Progressively stabilise all batters and drains/swales as each section of works is completed.
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## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
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**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |
| DRAFT | |

North

CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 18 OF 30

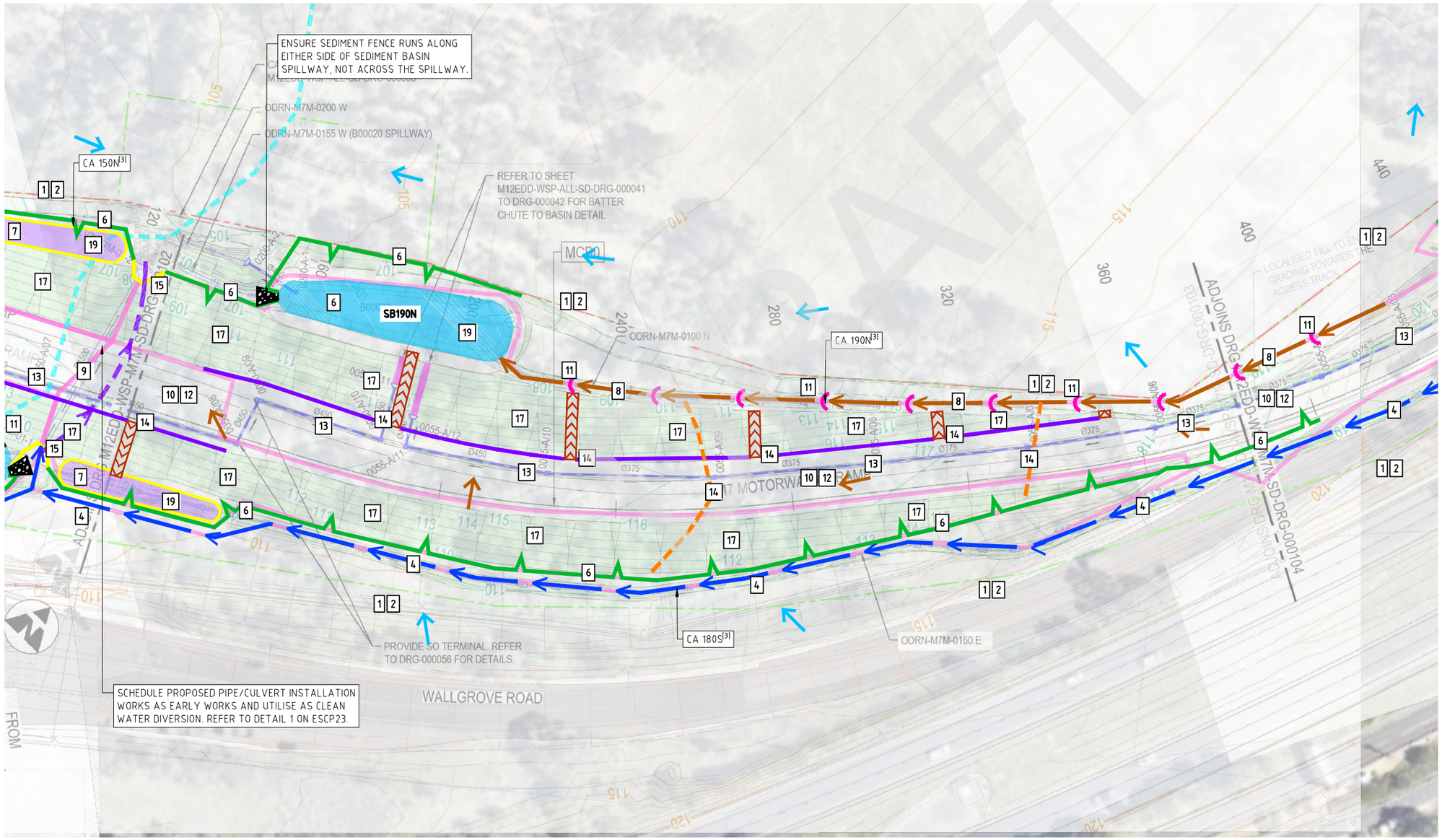
| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP18 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

| DRAWING STATUS | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |
| DRAFT | |

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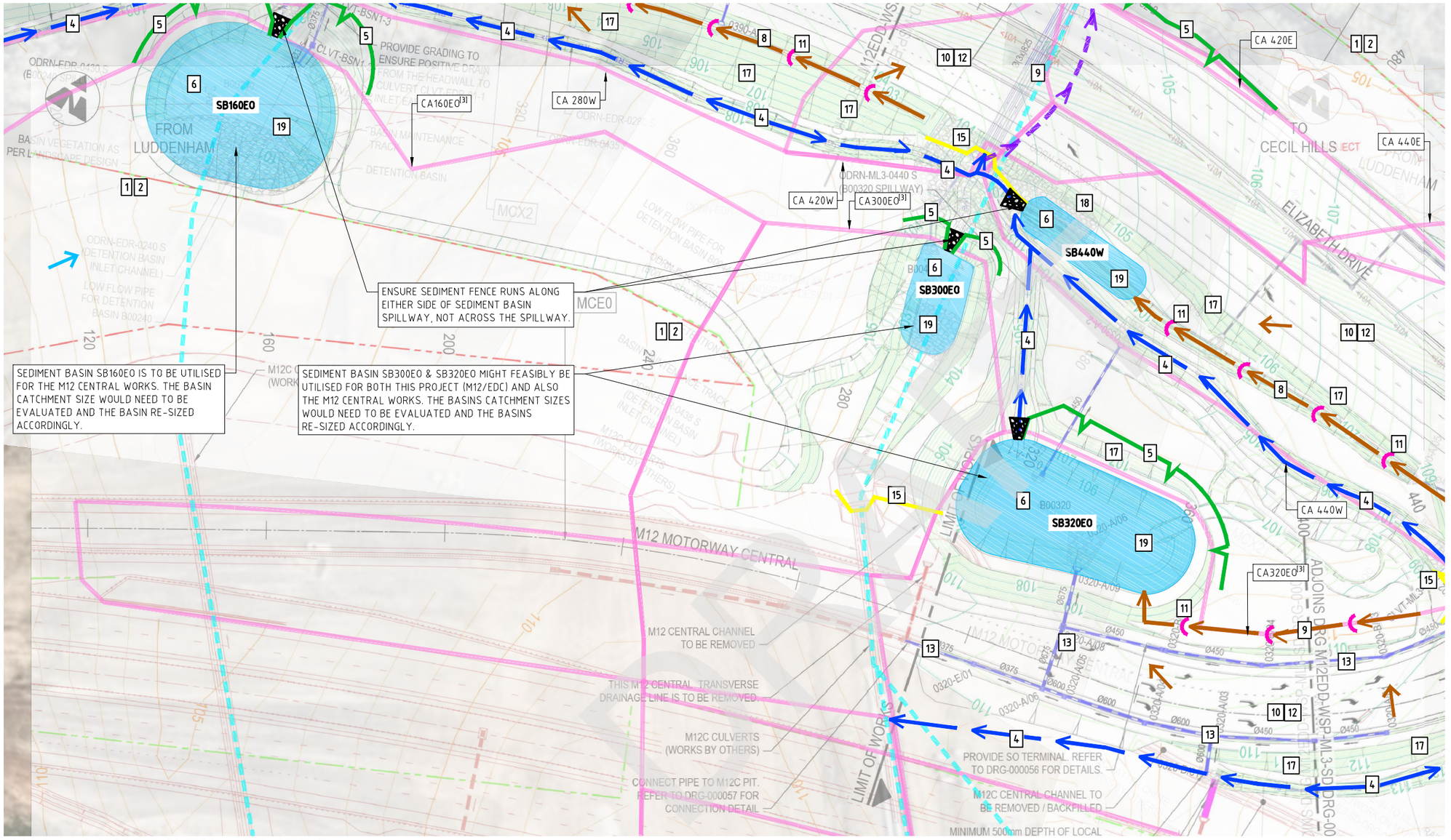
PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 19 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP19 | A |

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## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
7. Construct sediment traps in the locations shown. Utilise permanent basins wherever possible. Refer to Detail 8 on ESCP28 for sediment traps.
8. Construct dirty water diversions in the location. Construct and utilise permanent design wherever possible.
9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
10. Clearing, topsoil stripping and bulk earthworks can now commence.
11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
13. Install pit protection around (coir logs or sandbags) or in (silt wardens) the existing/proposed stormwater pits that do not drain to a sediment basin or trap. Exact locations TBC onsite. Refer to IECA Standard Drawings GB-01, SA-01 or OG-01 on ESCP30.
14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
16. Stabilise indicated (hatched) batters (if exposed) prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) by spraying with a biodegradable soil polymer or covering with geofabric, jute matting or equivalent cover.
17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

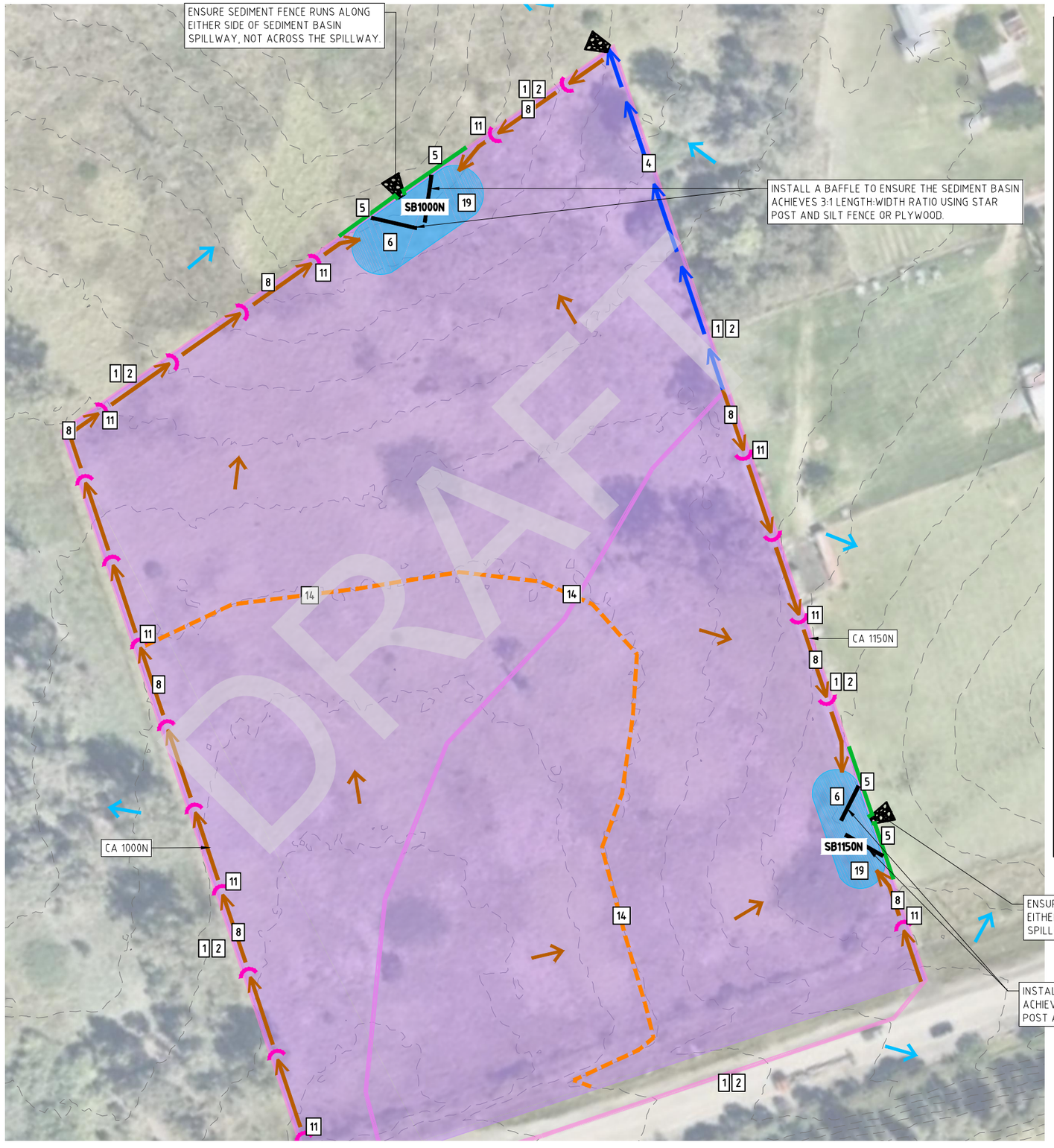
DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 20 OF 30

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|---|---|---|---|
| 23000072 | P01 | ESCP20 | A |

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## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
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3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct clean water diversions in the locations shown. Construct and utilise permanent design wherever possible.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Construct sediment basins in the locations shown. Refer to Table 1 on ESCP02 for min. sediment basin and spillway sizing requirements and Blue Book Standard Drawing SD 6-4 on ESCP27.
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9. Construct permanent culvert/pipes early and utilise as construction-phase clean water diversions. Refer to Details 1 to 6 on ESCP23-26.
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11. Place check dams (sandbags or coir logs) in the dirty water diversions at max. 20m intervals prior to forecast rainfall (>50% chance of 10mm or more in 24 hours). Refer to Photo 1 on ESCP01.
12. Ensure that flows from the work area drain to sediment basins, sediment traps or alternative sediment controls (i.e. mulch/earth bunds or sediment fences). Install scratch drains or bunds to achieve this.
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14. Prior to forecast rainfall (>50% chance of 10mm or more in 24 hours) complete the following:
    - 14.1. Install contour berms/slope breaks (min. 150mm high) right across disturbed areas. Contour berms/slope breaks can be formed using earth bunds or scratch drains.
    - 14.2. Install windrow/bunds along the top of fill batters to direct dirty water to lined batter chutes;
    - 14.3. install lined batter chutes in the locations shown (max. 40m intervals) to direct dirty water down batters. Refer to IECA Standard Drawings CH-01 & 02 on ESCP29. Lined batter chutes to include velocity reduction (dissipater) outlet at base of chute or reinforcement of the downslope sediment fence where chute discharges.
      - 14.3.1. Note windrow/bunds and lined batter chutes are no longer required once batter surfaces are stabilised to final design and permanent drainage is in place.
15. Wrap sediment fence up and behind new headwall. Refer to Photo 2 on OESCP01.
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17. Progressively stabilise all batters and drains/swales as each section of works is completed.
18. Sweep local roads as required to remove any tracked sediment or rocks.
19. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.




## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER FLOW DIRECTION
- DIRTY WATER FLOW DIRECTION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- BAFFLE WITHIN SEDIMENT BASIN

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

0 5 10 15 20 25m
Scale: 1:1000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:1000 |

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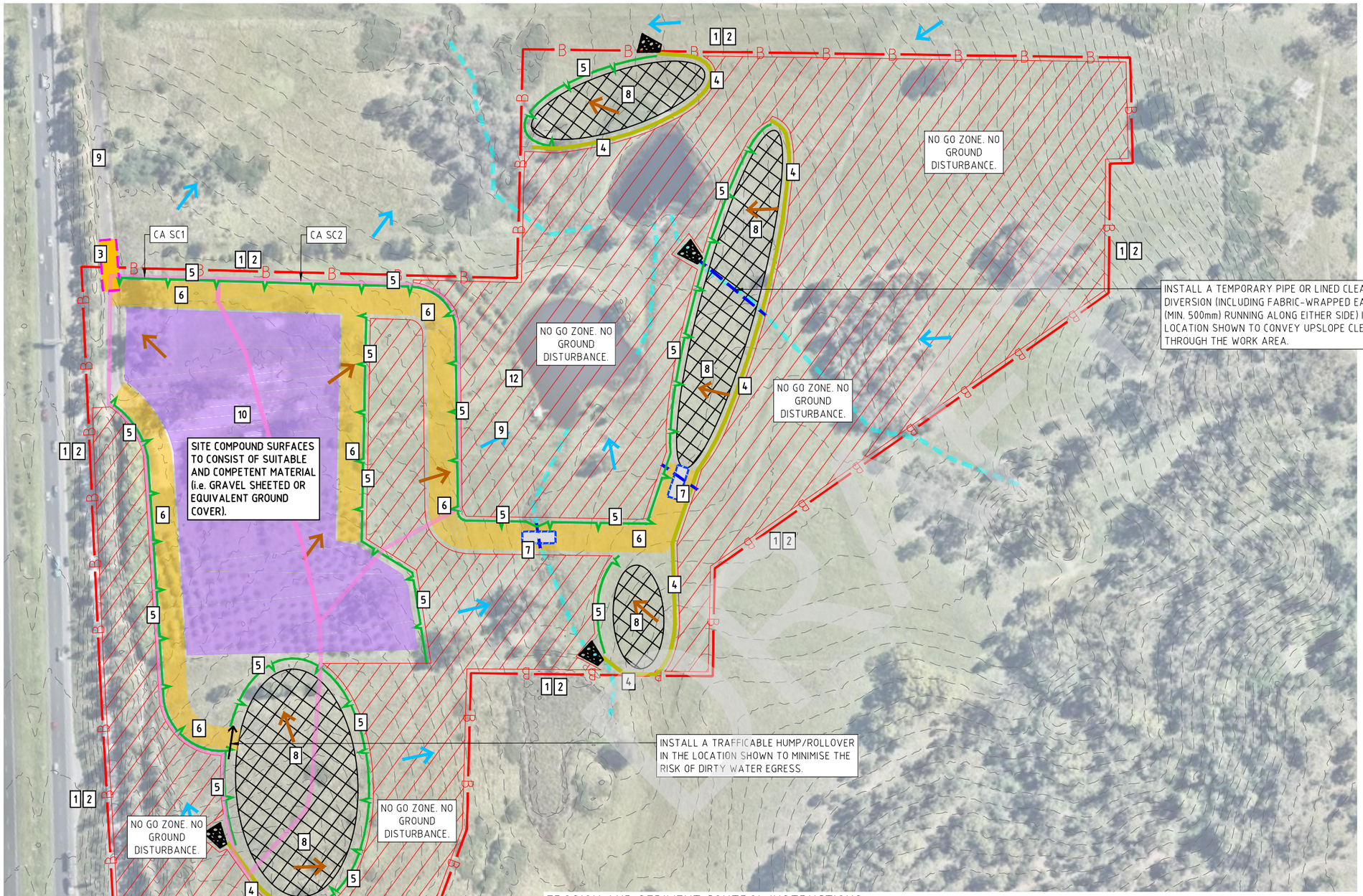
PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 21 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP21 | A |

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## LEGEND:

- SEDIMENT FENCE (BLUE BOOK SD 6-8 ON ESCP27) OR MULCH/EARTH BUNDS (MIN. 500mm HIGH) (DETAIL 7 & IECA SD MB-01 ON ESCP28)
- DIRTY WATER FLOW DIRECTION
- CLEAN WATER FLOW DIRECTION
- STABILISED SITE ACCESS (BLUE BOOK SD 6-14 ON ESCP29)
- CLEAN WATER DIVERSION
- DIRTY WATER DIVERSION
- CONTOUR BERM/SLOPE BREAK (min. 150mm HIGH)
- SEDIMENT BASIN (REFER TO ESCP02 FOR MIN. SIZING REQUIREMENTS)
- SEDIMENT TRAP (DETAIL 8 ON ESCP28) OR HOLDING POND
- WINDROW/BUND
- LINED BATTER CHUTES (IECA SD CH-01 & 02 ON OESCP29)
- INDICATIVE STOCKPILE AREA
- CHECK DAM (BLUE BOOK SD 5-4 ON ESCP27 & PHOTO 1 ON ESCP01)
- CATCHMENT BOUNDARY
- STABILISED EARTH BUND (MIN. 500mm HIGH)
- SPILLWAY/ROCK DISSIPATER OUTLET ONTO WELL VEGETATED LANDS
- SITE COMPOUND/LAYDOWN AREA
- SEDIMENT FENCE WRAPPED UP AND BEHIND NEW HEADWALL (REFER TO PHOTO 2 ON OESCP01)
- END OF DAY/SHIFT SCRATCH DRAIN OR BUND
- TEMPORARY DIVERSION
- ALL WEATHER HAUL ROAD (i.e. GRAVEL SHEETED OR EQUIVALENT GROUND COVER)
- TEMPORARY CLEAN PIPE
- TEMPORARY DIRTY PIPE
- TRAFFICABLE HUMP/ROLLOVER
- EXISTING FLOWPATH
- EXPOSED BATTERS TO BE STABILISED PRIOR TO RAINFALL
- B — INDICATIVE SITE BOUNDARY
- NO GO ZONE. NO GROUND DISTURBANCE
- TEMPORARY WATER CROSSING (BLUE BOOK SD 5-1 ON ESCP27)

**MINIMISE DISTURBANCE TO ONLY WHAT IS REQUIRED FOR SAFE AND EFFICIENT CONSTRUCTION.**

**UNDERLYING DESIGN PROVIDED BY CLIENT.**

## EROSION AND SEDIMENT CONTROL INSTRUCTIONS

1. Install flagging or survey tape to delineate clearing limits.
2. Stage disturbance as much as possible to minimise the amount of exposed area at any one time.
3. Establish site access/exit points in accordance with Blue Book Standard Drawing SD 6-14 on ESCP29 in the locations shown and anywhere else construction vehicles travel from unsealed areas on to sealed public roads. Exact locations TBC onsite.
4. Construct stabilised earth bunds (min. 500mm high) upslope of the areas of disturbance to direct upslope clean water to the rock dissipater outlets as shown.
5. Install sediment fence or mulch/earth bunds (min. 500mm high) downslope of the work areas as shown. Ensure returns are installed at max. 20m intervals in sediment fences or mulch/earth bunds and lined spillway weirs are located in all low points along mulch/earth bunds. Refer to Blue Book Standard Drawing SD 6-8 for sediment fence on ESCP27 or Detail 7 and IECA Standard Drawing MB-01 on ESCP28 for mulch/earth bunds.
6. Form all weather access roads. Ensure all weather access roads consist of suitable and competent material (i.e. gravel sheeted or equivalent ground cover).
7. Install temporary waterway crossings in the locations shown and anywhere else they are required to facilitate access. Refer to Blue Book Standard Drawing SD 5-1 on ESCP27.
8. Establish stockpiles areas in accordance with Blue Book Standard Drawing SD 4-1 on ESCP26 and the Project SWMP.
9. Sweep local roads as required to remove any tracked sediment or rocks.
10. De-watering is to be carried out in accordance with the 'Dirty Water Treatment and Discharge Requirements' notes on ESCP01 and the Project SWMP.

0 10 20 30 40 50m
Scale: 1:2000 (A3 SHEET)

| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
|---|---|---|---|---|---|
| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE – FOR CONSULTATION |

DRAWING STATUS

| | |
|---|---|
| DESIGN BY | L.O. |
| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | 1:2000 |

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CLIENT: JOHN HOLLAND

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

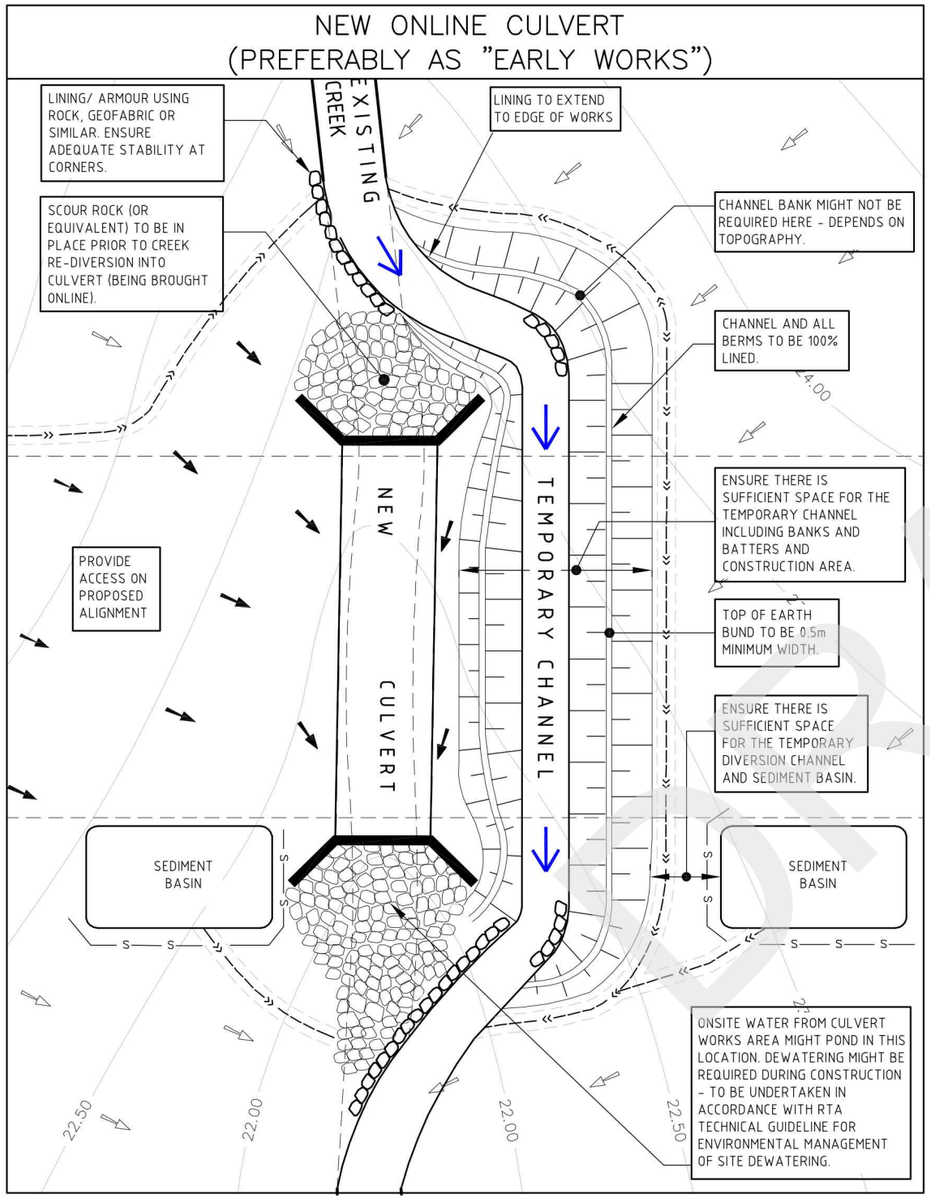
DRAWING TITLE: PRIMARY EROSION AND SEDIMENT CONTROL PLAN SHEET 22 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP22 | A |

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# DETAIL 1




SWMP – ONLINE CULVERT CONSTRUCTION AND CREEK STABILISATION WORKS

## NEW ONLINE CULVERT - CONSTRUCTION NOTES

**THESE STEPS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW.**

Stage 1: Temporary Channel Construction
- Establish diversion drains for offsite water.
- Construct and line the temporary channel including rock armouring at the existing creek and temporary channel junctions.
- Construct and line temporary earth bunds.
- Divert creek flows into this channel. Work downstream to upstream.

Stage 2: Culvert Construction Works
- Construct the new culvert including the stabilised culvert inlet and outlets.
- Stabilise the culvert construction works area once culvert construction works are complete.

Stage 3: Final diversion and Rehabilitation Works
- Divert creek flows into new culvert.
- Temporary channel and bunds to be decommissioned without allowing sediment downstream to creek and the disturbed area stabilised.
- Diversion drains for offsite water can be redirected to inlet of new culvert on upstream site or can be removed and rehabilitated.

**OTHER NOTES**

1. This design assumes that culvert construction is part of the 'early works' for the site.
2. Temporary channel to be sized and lined as per the requirements in Table 6.1 (DECC, 2008) and Table 5.2 (Landcom, 2004).
3. Ideally schedule works to periods when rainfall erosivity is low (Refer to Table 4.3 - Landcom, 2004)
4. Only undertake in-stream works (e.g. placement of rock) during periods of zero or very low flow and only when the 24 hour weather forecast suggests a significant rain event is not likely.
5. Ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils within in-stream locations if an unexpected rain or flow event occurs.
6. No culvert works are to occur until creek flows are successfully diverted into the stabilised temporary channel.
7. Culverts are to be completed before being allowed to convey flows. This includes all inlet and outlet protection, wingwalls etc.
8. Stabilisation, as defined by the Blue Book, means achieving:
- For concentrated flows- At least 70% vegetation cover (or equivalent) within 10 days AND using only materials that are suitable in concentrated flow conditions (refer to Tables A3 and D1 in the Blue Book for suitability).
- For all other areas- At least 60% vegetation cover (or equivalent) in 20 days AND 70% in 2 months.

9. A management regime should be in place to address the risk of these works creating a flooding issue due to constriction of the channel during construction.
10. If temporary access is required across the existing creek or a diversion channel, use a temporary water crossing - see standard drawing 5-1 in Blue Book Vol 1 (Landcom, 2004).
11. Minimise the time that soil is exposed to erosion.

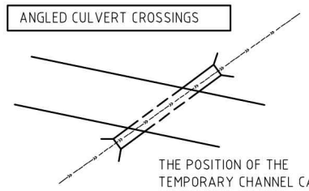
**STANDARD DRAWINGS FROM VOL 1 OF THE BLUE BOOK (LANDCOM, 2004) USED HERE:**

Sediment fence: SD 6-8
High flow earth bank (diversion drain): SD 5-6
Energy dissipater: SD 5-8
Temporary waterway crossing: SD 5-1

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

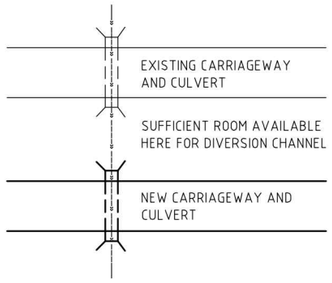
## THIS SCENARIO ALSO APPLIES TO:

ANGLED CULVERT CROSSINGS



THE POSITION OF THE TEMPORARY CHANNEL CAN BE DETERMINED BY THE PREVAILING TOPOGRAPHY

DIVIDED CULVERT EXTENSION




THE APPLICATION OF THIS SCENARIO TO DIVIDED CULVERT EXTENSIONS IS DEPENDENT ON WHETHER THERE IS ENOUGH AVAILABLE SPACE. IF SPACE IS LIMITED PART OF THE TEMPORARY CHANNEL CAN BE CONSTRUCTED OUT OF SHEET PILING OR SIMILAR OR ALTERNATIVELY THE SITE SHOULD BE STABILISED AS FOR A CONTINUOUS ONLINE CULVERT EXTENSION

## LEGEND

- S S S SEDIMENT FENCE (SD 6-8)
- DIVERSION DRAIN FOR 'OFFSITE' WATER (SD 5-6)
- SURFACE CONTOURS
- 'ONSITE' FLOWS
- 'OFFSITE' FLOWS
- CREEK/CHANNEL FLOWS
- CUT/FILL BATTER
- ROCK DISSIPATION/ STABILISATION STRUCTURES (SD 5-8)

**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP DETAIL 1 SHEET 23 OF 30

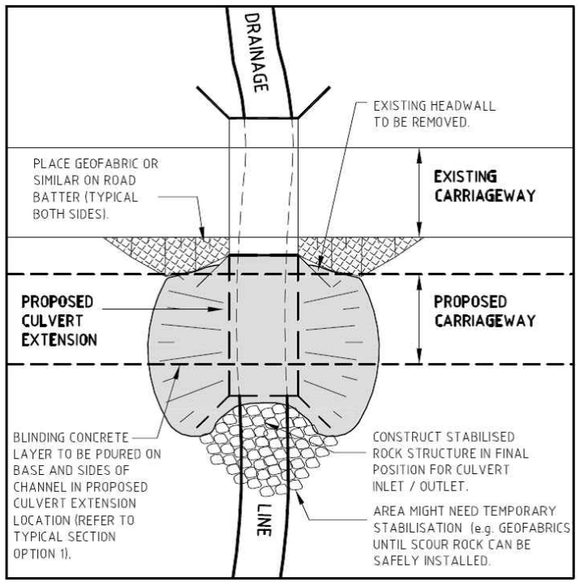
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## DETAIL 2

# CONTINUOUS CULVERT EXTENSION (ONLINE)
# OPTION 1




SITE STABILISATION PROCEDURE

**CONSTRUCTION NOTES**

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

Prior to undertaking any construction or earthworks ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils if an unexpected rain or flow event occurs.

1. Watch the weather forecast for a dry period (a period longer than the time required to complete earthworks up to the required level).
2. When a dry period is forecast, undertake earthworks quickly (preferably in less than three days).
3. Pour blinding concrete layer and lay rock inlet / outlet.
4. Lay geofabric (or similar) on existing road batter.

(Ensure steps 2, 3 and 4 occur within the forecast period of dry weather and no flow)

5. Complete culvert construction works over the top of the blinding concrete layer.
6. Maintain the blinding layer until the culvert extension is complete and stabilised. once flows are secure within the new culverts, excess blinding can be removed if desired.

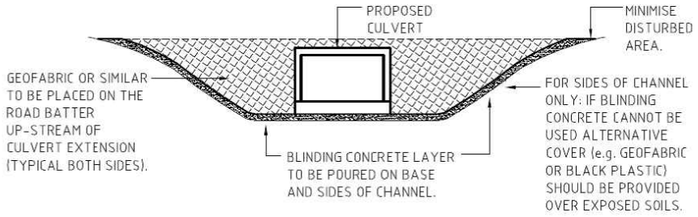
At any time during steps 1 – 4 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

**OTHER NOTES**

- For divided culvert extensions this stabilisation method could also be applied or alternatively the flows could be diverted as for a new online culvert.
- Note that this method is not suitable for perennial creeks unless additional measures (e.g. pumping or coffer dams) can be reliably included as well.
- This method might not be appropriate where there is a significant depth of unsuitable soil material to be removed.
- For systems with very minor flows in dry periods, temporary damming of flows might be required to hold water back for the nominated work period until the blinding concrete layer and rock is placed.
- Note that not all onsite water management and sediment controls are shown here.

**ENSURE THAT 'OFFSITE' CREEK FLOWS DO NOT COME INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

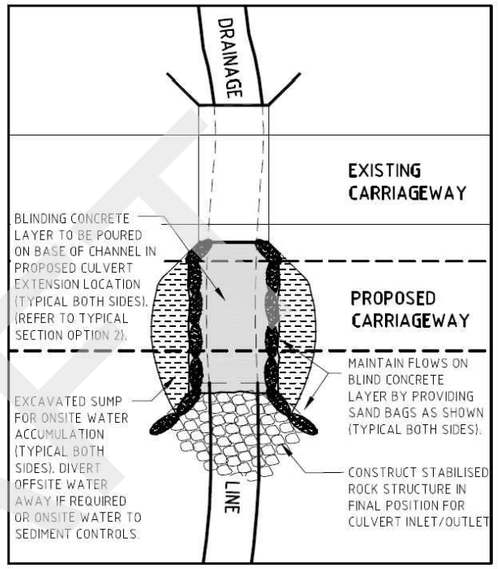
**NOTE: MAINTAIN OR INSTALL TEMPORARY GROUND COVER THROUGH FLOW AREA ANYTIME FLOWS ARE IMMINENT.**




TYPICAL SECTION – OPTION 1

## DETAIL 3

# CONTINUOUS CULVERT EXTENSION (ONLINE)
# OPTION 2




SITE STABILISATION PROCEDURE

**CONSTRUCTION NOTES**

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

Prior to undertaking any construction or earthworks ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils if an unexpected rain or flow event occurs.

1. Watch the weather forecast for a dry period (a period longer than the time required to complete earthworks up to the required level).
2. When a dry period is forecast, undertake earthworks quickly (preferably in less than three days).
3. Pour blinding concrete layer and lay rock inlet / outlet.
4. Position sand bags on the blind concrete layer.

(Ensure steps 2, 3 and 4 occur within the forecast period of dry weather and no flow)

5. Complete culvert construction works over the top of the blinding concrete layer. Take care not to disturb the integrity of the blinding layer.
6. Maintain the sandbag walls on the base slab if a flow event occurs.

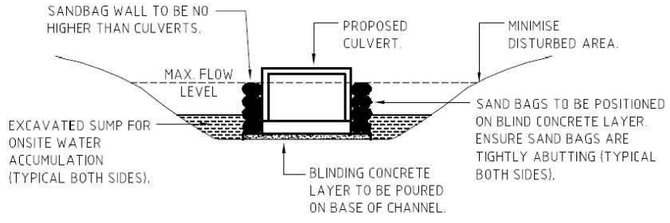
At any time during steps 1 – 4 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

**OTHER NOTES**

- For divided culvert extensions this stabilisation method could also be applied or alternatively the flows could be diverted as for a new online culvert.
- Note that this method is not suitable for perennial creeks unless additional measures (e.g. pumping or coffer dams) can be reliably included as well.
- This method might not be appropriate where there is a significant depth of unsuitable soil material to be removed.
- For systems with very minor flows in dry periods, temporary damming of flows might be required to hold water back for the nominated work period until the blinding concrete layer and rock is placed.
- Note that not all onsite water management measures and sediment controls are shown here.

**ENSURE THAT 'OFFSITE' CREEK FLOWS DO NOT COME INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

**NOTE: MAINTAIN OR INSTALL TEMPORARY GROUND COVER THROUGH FLOW AREA ANYTIME FLOWS ARE IMMINENT.**




TYPICAL SECTION – OPTION 2

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

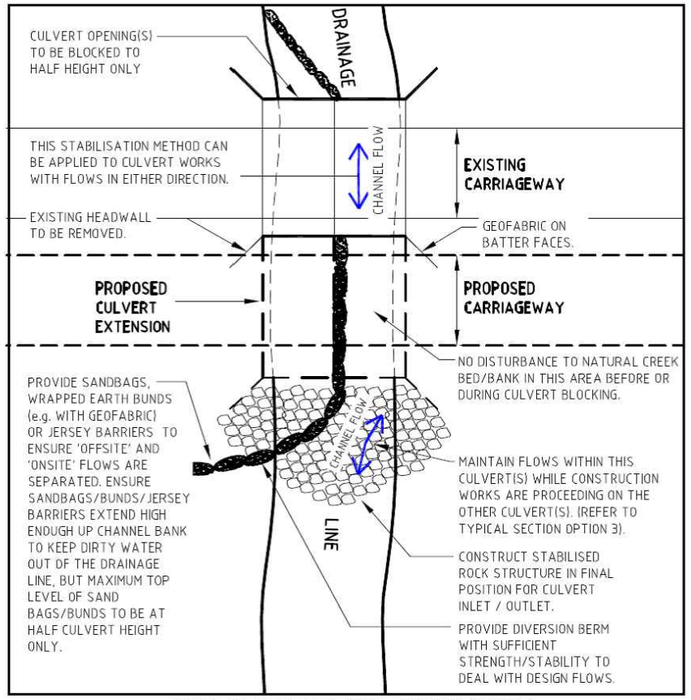
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## DETAIL 4

# CONTINUOUS CULVERT EXTENSION (ONLINE) OPTION 3




**OTHER NOTES**

- This option will only work when existing ground surface level can be maintained in at least one culvert cell. Therefore this method might not work for deep excavations requiring benching.
- Suitable for use in perennial streams providing in-stream works are conducted when flows are minimal.
- However, regardless of scheduling and timing the adopted controls need to be considerate of the risk of significant flows at any time.
- Note that not all water management and sediment controls are shown here.

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

## SITE STABILISATION PROCEDURE

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

Prior to undertaking any construction or earthworks ensure suitable temporary groundcover materials (e.g. geofabric or black plastic) are located on site for rapid stabilisation of exposed soils if an unexpected rain or flow event occurs.

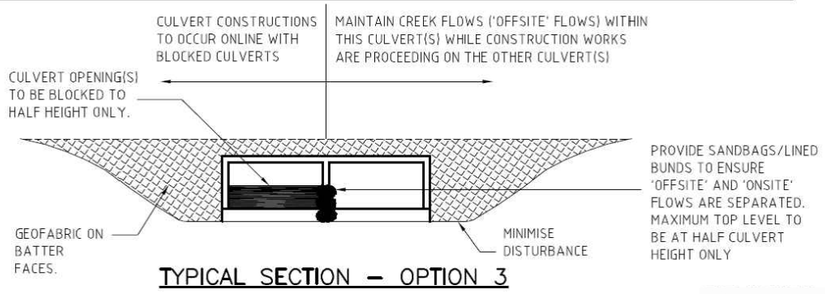
**Stage 1.**

1. Monitor creek flows ensuring flows levels are not too high.
2. Position sandbags/bunds around culvert works area and block existing culvert end to half culvert height only.
3. Undertake culvert extension construction works only on the blocked side of the culvert(s).
4. Complete inlet/outlet protections.

**Stage 2**

5. Divert the creek flows into the newly constructed culvert extension by blocking off the alternate side using a half-height wall/bund.
6. Complete the culvert extension on the other side including the stabilised inlet/outlet.

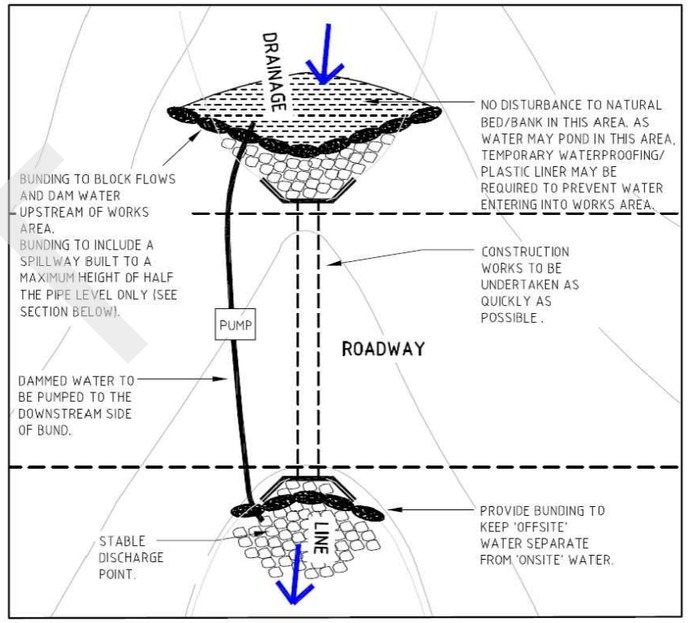
At any time where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.




## TYPICAL SECTION – OPTION 3

## DETAIL 5

# ONLINE PIPE REPLACEMENT/INSTALLATION – SMALL INTERMITTENT DEPRESSIONS ONLY (PUMP OPTION)




## SITE STABILISATION

**THIS METHOD IS ONLY SUITABLE FOR SIMPLE DEPRESSIONS WITH INTERMITTENT FLOWS. TO BE IN PLACE FOR NO MORE THAN 3 MONTHS.**

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

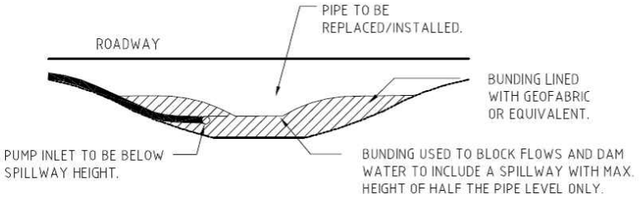
1. Ensure suitable temporary groundcover materials (e.g. geofabric, blankets) are located on site.
2. Ensure a suitable pump is available.
3. Watch the weather forecast to ensure rainfall is not forecast and monitor creek flows ensuring flows are minimal.
4. Position the bunding and line if required.
5. Undertake construction works (including inlet and outlet stabilisation) as quickly as possible. Drainage line to be blocked for no more than 3 months.

At any time during steps 4 – 5 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

### LEGEND

- OFFSITE WATER DIVERSION DRAIN (SD 5-6)
- ONSITE WATER DRAINS (SD 5-6)
- SURFACE CONTOURS
- ROCK STABILISED OUTLET (SD 5-8)
- CREEK/PIPE FLOW ROUTE
- SEDIMENT FENCE (SD 6-8)
- BUNDS

**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**




## SECTION THROUGH BUNDING LOCATION

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

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| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP DETAILS 4 & 5 SHEET 25 OF 30

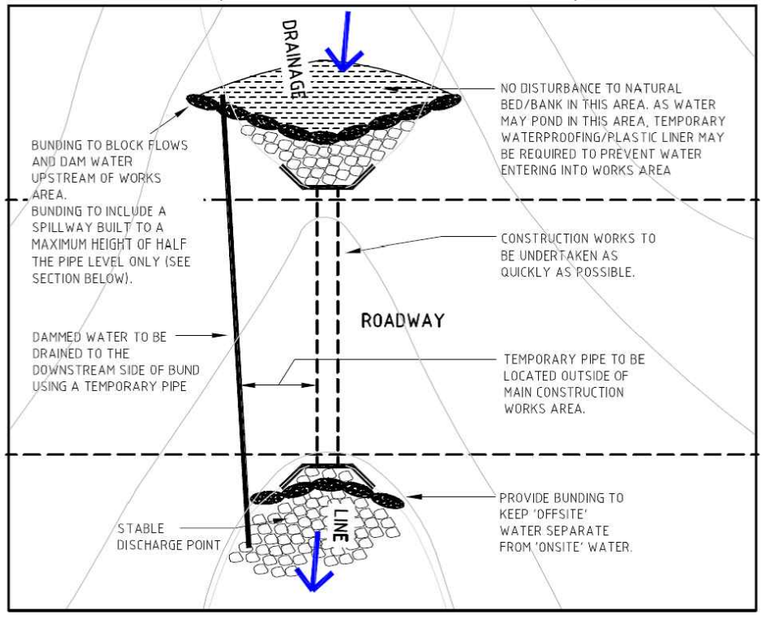
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DETAIL 6

# ONLINE PIPE REPLACEMENT/INSTALLATION – SMALL INTERMITTENT DRAINAGE LINES (TEMPORARY PIPE OPTION)




## SITE STABILISATION

THIS METHOD IS ONLY SUITABLE FOR SMALL CHANNELS WITH INTERMITTENT FLOWS.

TEMPORARY PIPE TO BE SIZED TO AT LEAST HALF THE PERMANENT PIPE.
e.g. – PERMANENT: 600Φ
– TEMPORARY: MINIMUM 300Φ

THIS METHOD (TEMPORARY PIPE SYSTEM) WILL NOT BE SUITABLE IN STEEP LOCATIONS WHERE TEMPORARY PIPE CANNOT BE LOCATED OUTSIDE OF WORKS AREA.

### CONSTRUCTION NOTES

**WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW**

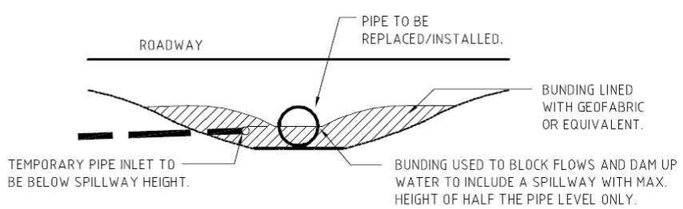
1. Ensure suitable temporary groundcover materials (eg. geofabric, blankets) are located on site.
2. Ensure a temporary pipe is available. Install temporary pipe to ensure flow, preferably by providing continuous fall.
3. Watch the weather forecast to ensure rainfall is not forecast and monitor creek flows ensuring flows are minimal.
4. Position the bunding within the channel to secure the site.
5. Undertake construction works (including inlet outlet stabilisation) as quickly as possible.

At any time during steps 4 – 5 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

### LEGEND

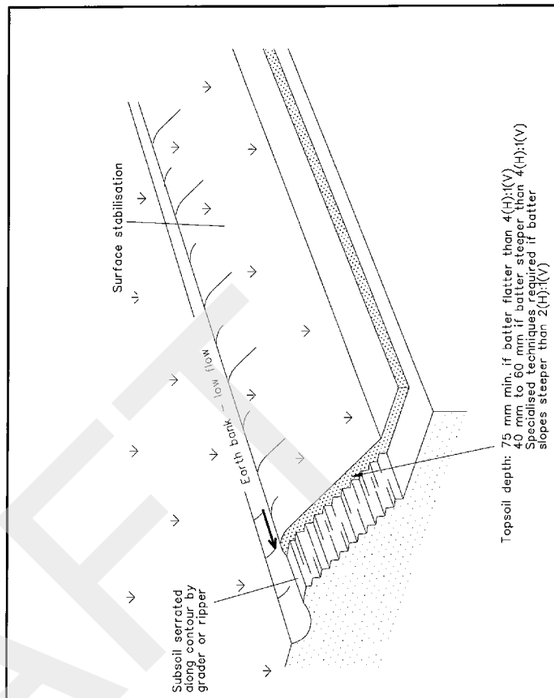
- OFFSITE WATER DIVERSION DRAIN (SD 5-6)
- ONSITE WATER DRAINS (SD 5-6)
- SURFACE CONTOURS
- ROCK STABILISED OUTLET (SD 5-8)
- CREEK/PIPE FLOW ROUTE
- SEDIMENT FENCE (SD 6-8)
- BUNDS

**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**




**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

## SECTION THROUGH BUNDING LOCATION

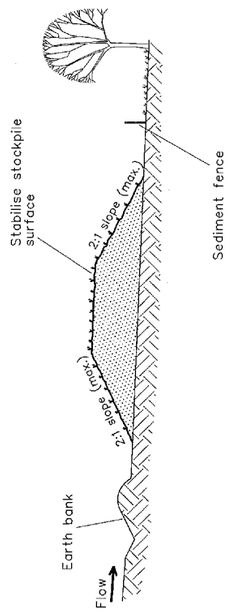



## Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

**SD 4-2**

**REPLACING TOPSOIL**




## Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

**SD 4-1**

**STOCKPILES**

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| DRAWN BY | L.O. |
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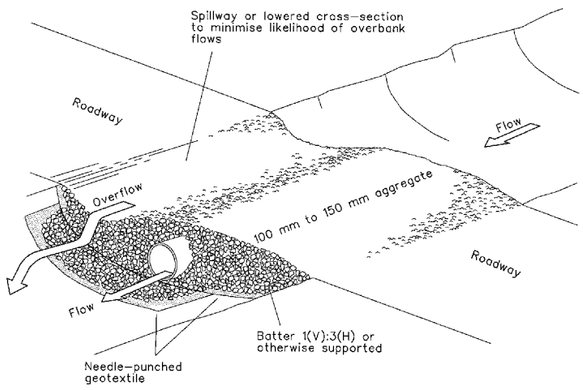
PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP DETAIL 6 & BLUE BOOK STANDARD DRAWINGS – SHEET 26 OF 30

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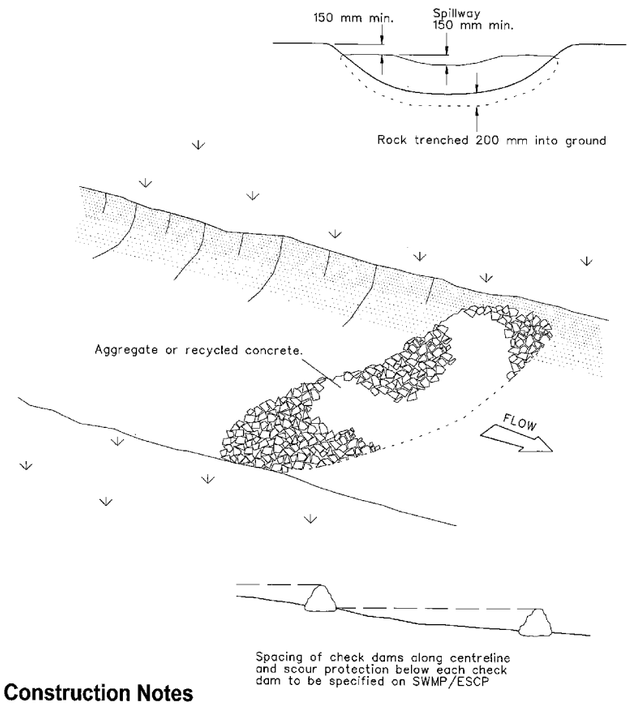
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## Construction Notes

1. Prohibit all traffic until the access way is constructed.
2. Strip any topsoil and place a needle-punched textile over the base of the crossing.
3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre wide carriageway with sufficient length of culvert pipe to allow less than a 3(H): 1 (V) slope on side batters.
5. Install a lower section to act as an emergency spillway in greater than design storm events.
6. Ensure that culvert outlets extend beyond the toe of fill embankments.

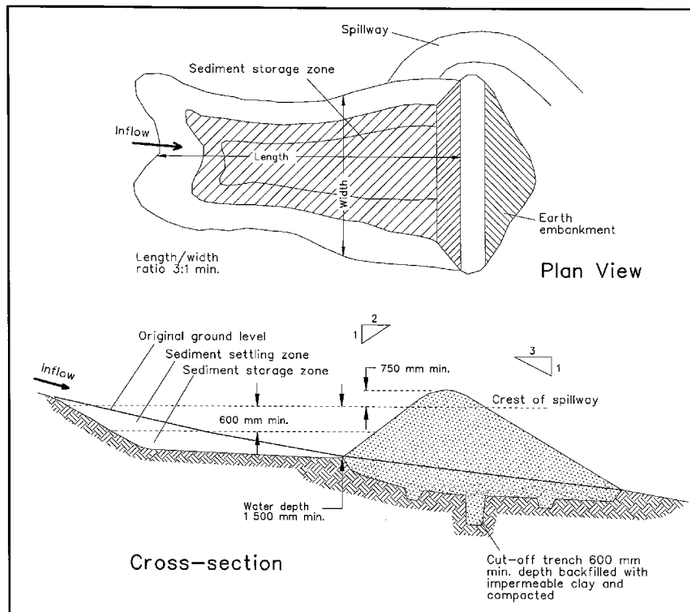
## TEMPORARY WATERWAY CROSSING — SD 5-1




## Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

## ROCK CHECK DAM — SD 5-4

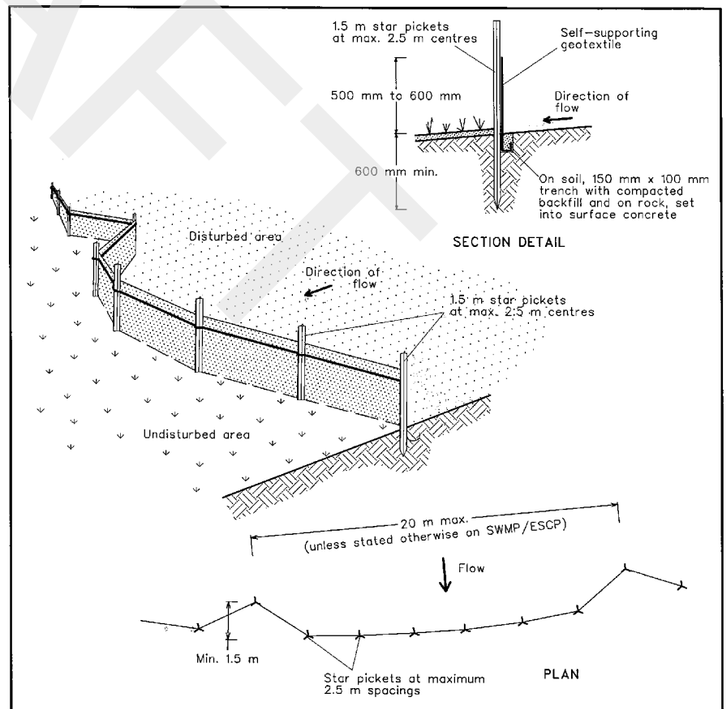



## Construction Notes

1. Remove all vegetation and topsoil from under the dam wall and from within the storage area.
2. Construct a cut-off trench 500 mm deep and 1,200 mm wide along the centreline of the embankment extending to a point on the gully wall level with the riser crest.
3. Maintain the trench free of water and recompact the materials with equipment as specified in the SWMP to 95 per cent Standard Proctor Density.
4. Select fill following the SWMP that is free of roots, wood, rock, large stone or foreign material.
5. Prepare the site under the embankment by ripping to at least 100 mm to help bond compacted fill to the existing substrate.
6. Spread the fill in 100 mm to 150 mm layers and compact it at optimum moisture content following the SWMP.
7. Construct the emergency spillway.
8. Rehabilitate the structure following the SWMP.

## EARTH BASIN - WET — SD 6-4

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)




## Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

## SEDIMENT FENCE — SD 6-8

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| A | 19/05/23 | L.O. | L.O. | K.S. | DRAFT ISSUE - FOR CONSULTATION |

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DESIGN BY: L.O.
DRAWN BY: L.O.
FINAL APPROVAL: K.S. & A.M.
SCALE: (on A3 Original) N.T.S.

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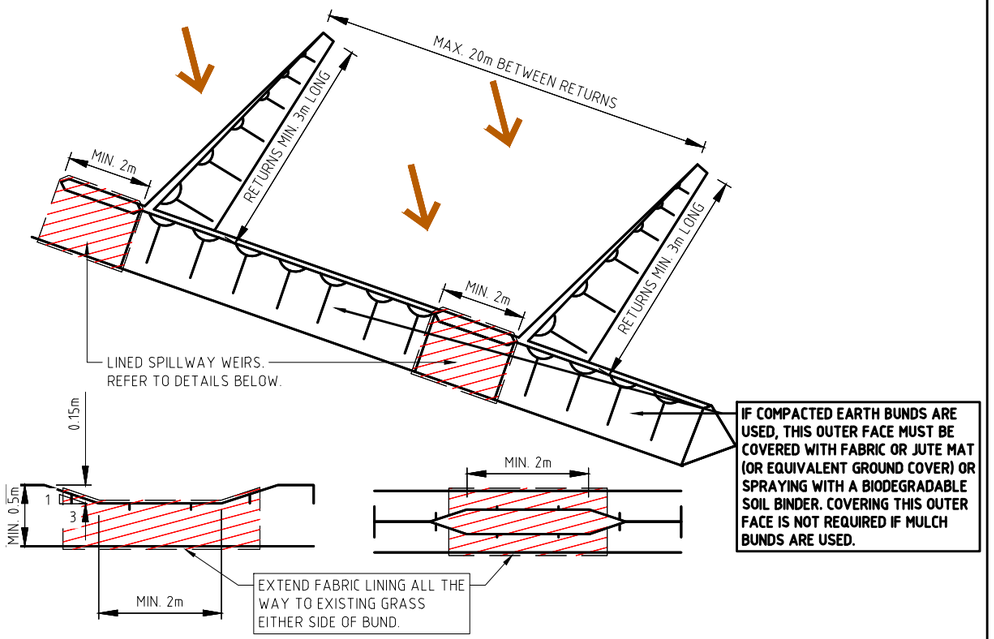
PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP BLUE BOOK STANDARD DRAWINGS SHEET 27 OF 30

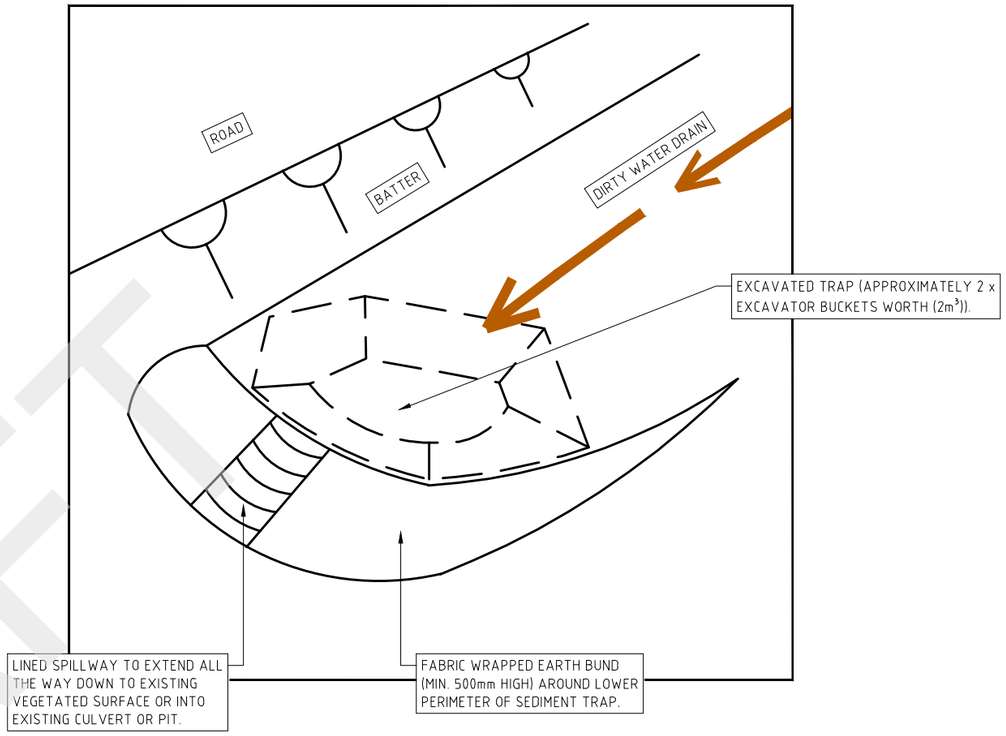
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| 23000072 | P01 | ESCP27 | A |

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CAD File Name: L:\23000072 M7 and M12 Integration Project\Drawings\23000072_P01_ESCP_REV A.dwg

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## DETAIL 7 - TYPICAL MULCH/EARTH BUND




## DETAIL 8 - SEDIMENT TRAP

**MATERIALS**

(i) MULCH MUST COMPLY WITH THE REQUIREMENTS OF AS4454.

(ii) MAXIMUM SOLUBLE SALT CONCENTRATION OF 5dS/m.

(iii) MOISTURE CONTENT OF 30 TO 50% PRIOR TO APPLICATION.

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN SELECTING THE LOCATION OF A MULCH FILTER BERM, TO THE MAXIMUM DEGREE PRACTICAL, ENSURE THE BERM IS LOCATED:

(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;

(ii) ALONG A LINE OF CONSTANT ELEVATION (PREFERRED, BUT NOT ALWAYS PRACTICAL);

(iii) AT LEAST 1m, IDEALLY 3m, FROM THE TOE OF A FILL EMBANKMENT;

(iv) AWAY FROM AREAS OF CONCENTRATED FLOW.

3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE BERM, OR THE UNDESIRABLE DISCHARGE OF WATER AROUND THE END OF THE BERM.

4. ENSURE THE BERM HAS BEEN PLACED SUCH THAT PONDING UP-SLOPE OF THE BERM IS MAXIMISED.

5. ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TURNED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM.

6. ENSURE 100% CONTACT WITH THE SOIL SURFACE.

7. WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VEGETATE THE BERM.

**MAINTENANCE**

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL BERMS AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR 1/3 THE HEIGHT OF THE BERM.

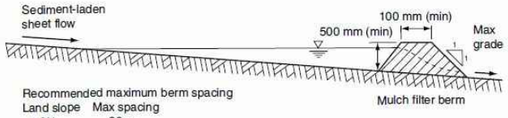
5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

**REMOVAL (IF REQUIRED)**

1. WHEN DISTURBED AREAS UP-SLOPE OF THE BERM ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE BERM MAYBE REMOVED.

2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.




Recommended maximum berm spacing

| Land slope | Max spacing |
|---|---|
| < 2% | 30 m |
| 5% | 25 m |
| 10% | 15 m |
| 20% | 8 m |

**Figure 1 - Typical placement of mulch filter berm**

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Apr-10 | Mulch Filter Berms | MB-01 |

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PHOTO 3: HOTMIX/COLDMIX BUND LOCATED INSIDE OF TRAFFIC BARRIERS TO FORM DIRTY WATER DIVERSION.



PHOTO 4: CONCRETE BUND LOCATED INSIDE OF TRAFFIC BARRIERS TO FORM DIRTY WATER DIVERSION.

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| SCALE: (on A3 Original) | N.T.S. |
| DRAFT | |

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CLIENT: JOHN HOLLAND

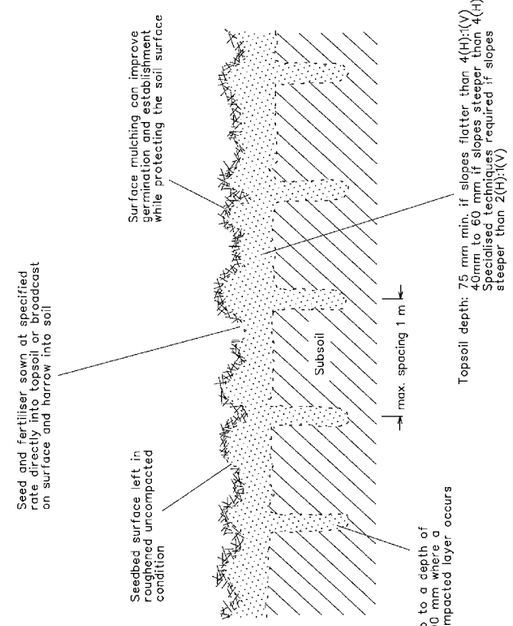
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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP DETAILS 7 & 8 – IECA STANDARD DRAWNGS – SHEET 28 OF 30

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| 23000072 | P01 | ESCP28 | A |

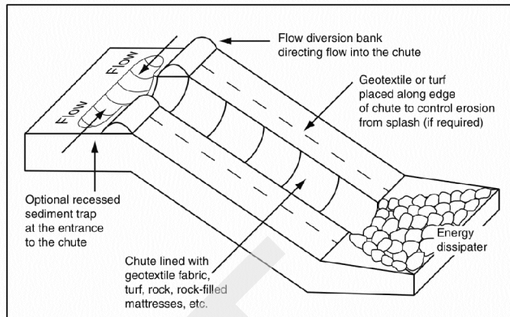
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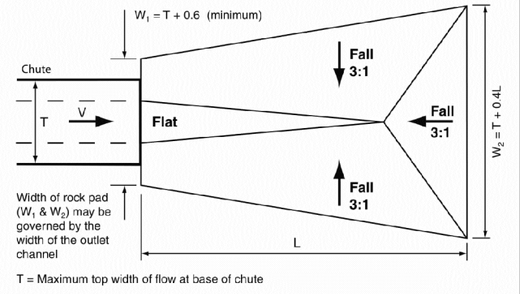

## Construction Notes

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

**SEEDBED PREPARATION** — **SD 7-1**

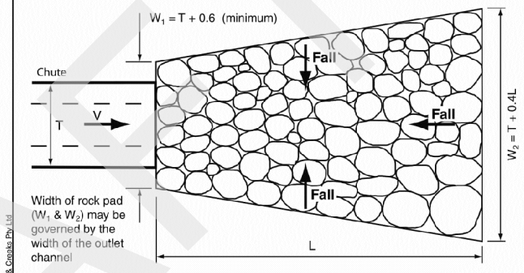



(a) Temporary drainage chute with rock pad outlet structure

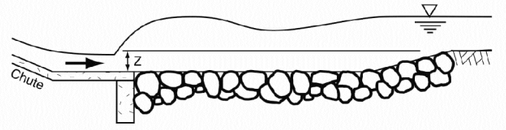



T = Maximum top width of flow at base of chute

(b) Typical layout of an outlet energy dissipater for a drainage chute



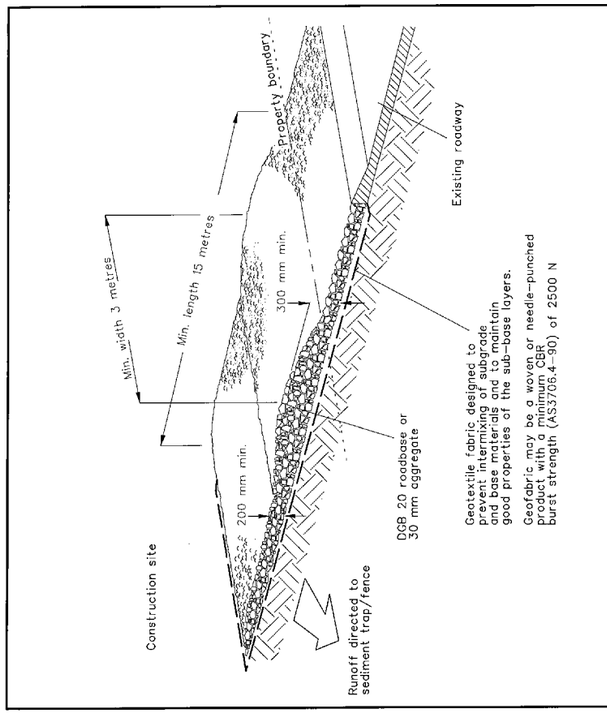

(c) Typical layout of a rock pad outlet structure for a drainage chute




(d) Typical profile of a rock pad outlet structure for a drainage chute

**Notes:**
1. Drawings applicable to temporary drainage chutes, **not** basin spillways.
2. A rock pad outlet structure is just one option for the design of the outlet energy dissipater.

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Chutes - General | CH-01 |




## Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

**STABILISED SITE ACCESS** — **SD 6-14**

**CHUTES - GENERAL SPECIFICATIONS**

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CONSTRUCT THE SUBGRADE TO THE ELEVATIONS SHOWN ON THE PLANS. REMOVE ALL UNSUITABLE MATERIAL AND REPLACE WITH STABLE MATERIAL TO ACHIEVE THE DESIRED FOUNDATIONS.

3. IF THE CHUTE IS TEMPORARY, THEN COMPACT THE SUBGRADE TO A FIRM CONSISTENCY. IF THE CHUTE IS INTENDED TO BE PERMANENT, THEN COMPACT AND FINISH THE SUBGRADE AS SPECIFIED WITHIN THE DESIGN PLANS.

4. IF THE CHUTE IS TO BE LINED WITH ROCK, THEN AVOID COMPACTING THE SUBGRADE TO A CONDITION THAT WOULD PREVENT THE ROCK LINING FROM ADEQUATELY BEDDING INTO THE SUBGRADE.

5. ENSURE THE SUBGRADE IS FIRM ENOUGH TO MINIMISE WATER SEEPAGE.

6. ON FILL SLOPES, ENSURE THAT THE SOIL IS ADEQUATELY COMPACTED FOR A WIDTH OF AT LEAST ONE METRE EACH SIDE OF THE CHUTE TO MINIMISE THE RISK OF SOIL EROSION, OTHERWISE PROTECT THE SOIL WITH SUITABLE SCOUR PROTECTION MEASURES SUCH AS TURF OR EROSION CONTROL MATS.

7. PLACE AND SECURE THE CHUTE LINING AS DIRECTED.

8. IF CONCRETE IS USED AS A LINING, THEN KEEP THE SUBGRADE MOIST AT THE TIME CONCRETE IS PLACED. FORM, CUT-OFF WALLS AND ANCHOR BLOCKS AS DIRECTED IN THE APPROVED PLANS.

9. INSTALL AN APPROPRIATE OUTLET STRUCTURE (ENERGY DISSIPATER) AT THE BASE OF THE CHUTE (REFER TO SEPARATE SPECIFICATIONS).

10. ENSURE WATER LEAVING THE CHUTE AND THE OUTLET STRUCTURE WILL FLOW FREELY WITHOUT CAUSING UNDESIRABLE PONDING OR SCOUR.

11. APPROPRIATELY STABILISE ALL DISTURBED AREAS IMMEDIATELY AFTER CONSTRUCTION.

**MAINTENANCE**

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL CHUTES PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORM EVENTS, OR OTHERWISE ON A WEEKLY BASIS. MAKE REPAIRS AS NECESSARY.

2. CHECK FOR MOVEMENT OF, OR DAMAGE TO, THE CHUTE LINING, INCLUDING SURFACE CRACKING.

3. CHECK FOR SOIL SCOUR ADJACENT THE CHUTE. INVESTIGATE THE CAUSE OF ANY SCOUR, AND REPAIR AS NECESSARY.

4. WHEN MAKING REPAIRS, ALWAYS RESTORE THE CHUTE TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED.

**REMOVAL**

1. TEMPORARY CHUTES SHOULD BE REMOVED WHEN AN ALTERNATIVE, STABLE, DRAINAGE SYSTEM IS AVAILABLE.

2. REMOVE ALL MATERIALS AND DEPOSITED SEDIMENT, AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA IN PREPARATION FOR STABILISATION, THEN STABILISE THE AREA AS SPECIFIED IN THE APPROVED PLAN.

**ADDITIONAL SPECIFICATIONS FOR ROCK PAD OUTLET STRUCTURE AT BASE OF CHUTE:**

**MATERIALS:**

**ROCK:** HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE AND SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. SPECIFIC GRAVITY TO BE AT LEAST 2.5.

**GEOTEXTILE FABRIC:** HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM BIDIM A24 OR EQUIVALENT.

**INSTALLATION (ROCK OUTLET PADS)**

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. THE DIMENSIONS OF THE OUTLET STRUCTURE MUST ALIGN WITH THE DOMINANT FLOW DIRECTION.

3. EXCAVATE THE OUTLET PAD FOOTPRINT TO THE SPECIFIED DIMENSION SUCH THE WHEN THE ROCK IS PLACED IN THE EXCAVATED PIT THE TOP OF THE ROCKS WILL BE LEVEL WITH THE SURROUNDING GROUND, UNLESS OTHERWISE DIRECTED.

4. IF THE EXCAVATED SOILS ARE DISPERSIVE, OVER-EXCAVATED THE ROCK PAD BY AT LEAST 300mm AND BACKFILL WITH STABLE, NON-DISPERSIVE MATERIAL.

5. LINE THE EXCAVATED PIT WITH GEOTEXTILE FILTER CLOTH, PREFERABLY USING A SINGLE SHEET. IF JOINTS ARE REQUIRED, OVERLAP THE FABRIC AT LEAST 300mm.

6. ENSURE THE FILTER CLOTH IS PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION OF THE FABRIC AND THE ROCK. REPAIR ANY DAMAGE BY REMOVING THE ROCK AND PLACING WITH ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA OVERLAPPING THE EXISTING FABRIC A MINIMUM OF 300mm.

7. ENSURE THERE ARE AT LEAST TWO LAYERS OF ROCKS. WHERE NECESSARY, REPOSITION THE LARGER ROCKS TO ENSURE TWO LAYERS OF ROCKS ARE ACHIEVED WITHOUT ELEVATING THE UPPER SURFACE ABOVE THE PIPE INVERT.

8. ENSURE THE ROCK IS PLACED IN A MANNER THAT WILL ALLOW WATER TO DISCHARGE FREELY FROM THE PIPE.

9. ENSURE THE UPPER SURFACE OF THE ROCK PAD DOES NOT CAUSE WATER TO BE DEFLECTED AROUND THE EDGE OF THE ROCK PAD.

10. IMMEDIATELY AFTER CONSTRUCTION, APPROPRIATELY STABILISE ALL DISTURBED AREAS.

**MAINTENANCE**

1. WHILE CONSTRUCTION WORKS CONTINUE ON THE SITE, INSPECT THE OUTLET STRUCTURE PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING RAINFALL, AND ON AT LEAST A WEEKLY BASIS.

2. REPLACE ANY DISPLACED ROCK WITH ROCK OF A SIGNIFICANTLY (MINIMUM 110%) LARGER SIZE THAN THE DISPLACED ROCK.

**REMOVAL**

1. TEMPORARY OUTLET STRUCTURES SHOULD BE COMPLETELY REMOVED, OR WHERE APPROPRIATE, REHABILITATED SO AS NOT TO CAUSE ONGOING ENVIRONMENTAL NUISANCE OR HARM.

2. FOLLOWING REMOVAL OF THE DEVICE, THE DISTURBED AREA MUST BE APPROPRIATELY REHABILITATED SO AS NOT TO CAUSE ONGOING ENVIRONMENTAL NUISANCE OR HARM.

3. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

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| GMW | Dec-09 | Chutes - General | CH-02 |

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| DRAWN BY | L.O. |
| FINAL APPROVAL | K.S. & A.M. |
| SCALE: (on A3 Original) | N.T.S. |

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PROJECT TITLE: M12 MOTORWAY ELIZABETH DRIVE CONNECTION

DRAWING TITLE: PRIMARY ESCP BLUE BOOK & IECA STANDARD DRAWNGS – SHEET 29 OF 30

| PROJECT NO. | SUB-PR NO. | DRAWING NO. | REV |
|---|---|---|---|
| 23000072 | P01 | ESCP29 | A |

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**INSTALLATION**

*THE FOLLOWING A GENERAL INSTALLATION REQUIREMENTS. OPERATORS SHOULD OBTAIN INSTALLATION INSTRUCTIONS FROM THE GULLY BAG MANUFACTURER OR DISTRIBUTER.*

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

4. ENSURE THAT NO SEDIMENT-LADEN INFLOW IS ALLOWED TO BYPASS THE GULLY BAG UNTIL THE BAG IS EITHER FULL OF SEDIMENT, OR THE INFLOW EXCEEDS THE HYDRAULIC CAPACITY OF THE BAG.

5. INSTALL APPROPRIATE SEDIMENT AND/OR FLOW CONTROLS ON THE SIDE-ENTRY SLOT (IF ANY).

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

**MAINTENANCE**

1. INSPECT ALL SEDIMENT TRAPS DAILY AND IMMEDIATELY AFTER RUNOFF-PRODUCING RAINFALL. MAKE REPAIRS AS NEEDED.

2. REMOVE AND REPLACE THE GULLY BAG WHEN IT IS EITHER FULL OF SEDIMENT, OR IS LIKELY TO BE FULL OF SEDIMENT BEFORE THE NEXT INSPECTION, OR THE HYDRAULIC CAPACITY OF THE FILTER BAG IS EXCESSIVELY REDUCED.

3. DISPOSE OF THE SEDIMENT AND FILTER BAG IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

4. ENSURE SEDIMENT DOES NOT ENTER THE STORMWATER DRAIN DURING DE-SILTING OPERATIONS AND MAINTENANCE OF THE TRAP.

5. SEDIMENT ON THE ROAD MUST BE REMOVED IMMEDIATELY IF IT REPRESENTS A SAFETY HAZARD.

**REMOVAL**

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

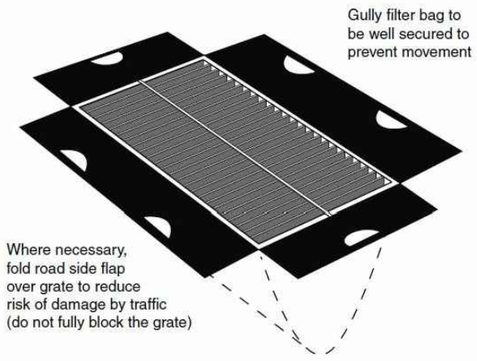



**Figure 1 - Gully filter bag**

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Gully Filter Bag | GB-01 |

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH STANDARD DRAWING SUPPLIED WITH THE APPROVED PLAN, OR AS DIRECTED BY THE SITE SUPERVISOR.

4. ENSURE THE SEDIMENT TRAP IS CONSTRUCTED UP-SLOPE OF AN ON-GRADE KERB INLET. THE SEDIMENT TRAP MUST NOT SURROUND THE KERB INLET UNLESS SPECIFICALLY DIRECTED BY THE SITE SUPERVISOR.

5. IF NECESSARY, INSTALL ADDITIONAL SEDIMENT TRAPS UP-SLOPE OF THE KERB INLET TO ADEQUATELY RETAIN THE EXPECTED QUANTITY OF SEDIMENT RUNOFF.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

**MAINTENANCE**

1. INSPECT ALL SEDIMENT TRAPS DAILY AND IMMEDIATELY AFTER RUNOFF-PRODUCING RAINFALL. MAKE REPAIRS AS NEEDED.

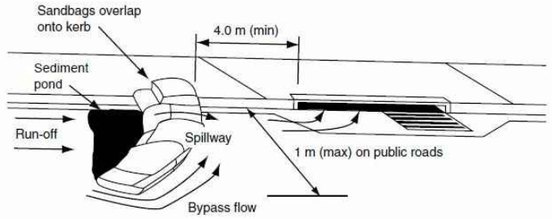
2. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. ENSURE SEDIMENT DOES NOT ENTER THE STORMWATER DRAIN DURING DE-SILTING OPERATIONS AND MAINTENANCE OF THE TRAP.

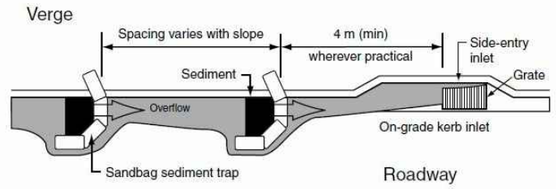
4. SEDIMENT ON THE ROAD MUST BE REMOVED IMMEDIATELY IF IT REPRESENTS A SAFETY HAZARD.

**REMOVAL**

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.




**(a) Sandbag sediment collection dam**




**(b) Typical layout of on-grade kerb inlet sediment traps**

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | On-Grade Kerb Inlet Sediment Trap | OG-01 |

**INSTALLATION**

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. INSTALL SEDIMENT TRAP IN ACCORDANCE WITH STANDARD DRAWING SUPPLIED WITH THE APPROVED PLAN, OR AS DIRECTED BY THE SITE SUPERVISOR.

4. ENSURE THE SEDIMENT TRAP FULLY ENCLOSES THE KERB INLET. USE APPROPRIATE SPACERS TO ENSURE THE SEDIMENT TRAP DOES NOT BLOCK THE SIDE-ENTRY INLET.

5. IF NECESSARY, INSTALL ADDITIONAL 'ON-GRADE KERB INLET SEDIMENT TRAPS' UP-SLOPE OF THE SAG INLET TO ADEQUATELY RETAIN THE EXPECTED QUANTITY OF SEDIMENT RUNOFF.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

**MAINTENANCE**

1. INSPECT ALL SEDIMENT TRAPS DAILY AND IMMEDIATELY AFTER RUNOFF-PRODUCING RAINFALL. MAKE REPAIRS AS NEEDED.

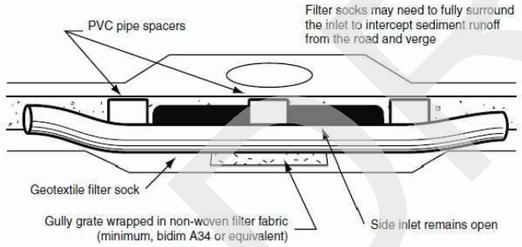
2. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. ENSURE SEDIMENT DOES NOT ENTER THE STORMWATER DRAIN DURING DE-SILTING OPERATIONS AND MAINTENANCE OF THE TRAP.

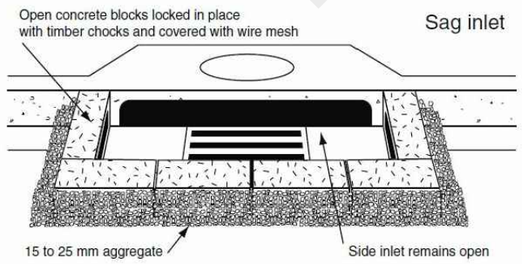
4. SEDIMENT ON THE ROAD SHALL BE REMOVED IMMEDIATELY IF IT REPRESENTS A SAFETY HAZARD.

**REMOVAL**

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.




**(a) Filter sock sediment trap on a sag inlet**




**(b) Block and aggregate type sediment trap on a sag inlet**

| Drawn: | Date: | | |
|---|---|---|---|
| GMW | Dec-09 | Sag Kerb Inlet Sediment Trap | SA-01 |

Catchments & Creeks Pty Ltd

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| REV | DATE | DES. | DRN. | APP. | REVISION DETAILS |
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# Appendix F - Tannin Management Procedure

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix F: Tannin Management Procedure



# Document Control

| | | |
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| G | 17/11/2023 | Up-revved in line with the CSWMP |
| H | 21/11/2023 | Up-revved in line with the CSWMP |

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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| AR | Amendment Report |
| ARSR | Amendment Report Submissions Report |
| CoA | Conditions of Approval |
| CSWMP | Construction Soil and Water Management Plan |
| EPA | Environmental Protection Authority |
| EPL | Environmental Protection Licence |
| ER | Environmental Representative |
| ESCP | Erosion and Sediment Control Plan |
| ESM | TfNSW Environment and Sustainability Manager |
| ESR | Environment Site Representative (John Holland) |
| EWMS | Environmental Work Method Statement |
| OCEMP | Overarching Construction Environmental Management Plan |
| POEO Act | Protection of the Environment Operations Act 1997 |
| QA | Quality Assurance |
| REMM | Revised Environmental Management Measures as provided in the Amendment Report |
| TfNSW | Transport for NSW |
| TSS | Total Suspended Solids |

# 1 Introduction

## 1.1 Purpose

The purpose of this Tannin Management Procedure (this procedure) is to describe the measures required to minimise tannin generation and handling of mulch required to be undertaken as part of the M7-M12 Integration project.

Tannins are naturally occurring plant compounds that can leach out of mulched vegetation stockpiled in areas that are subject to inundation. Tannin impacts may result in dark-coloured water discharge from construction sites. This impact can be obvious and may raise concerns from the community and other stakeholders including regulatory authorities.

Once discharged to the environment, tannins may reduce visibility and light penetration, increase the biological oxygen demand (BOD) and change the pH of receiving waters. These impacts may affect aquatic ecosystems in receiving environments.

The following document has been prepared in accordance with the RMS Environmental Direction Management of Tannins from Vegetation Mulch (2012). The primary objective of this Direction is to minimise tannin generation on construction sites.

## 1.2 Objective

The objectives of this Plan include:

- To minimise tannin generation on construction sites.
- Provide minimum management measures for the handling, stockpiling and application of mulch during the construction of the M7-M12 Integration project to prevent pollution of receiving waters with tannins.

## 1.3 Scope

This Tannin Management Procedure is an appendix of the Construction Soil and Water Management Sub-plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project.

This Plan has been prepared to address the requirements of the Minister's Conditions of Approval (M7 CoA) and Updated Environmental Management Measures (herein referred to as REMMs) listed in the Westlink M7 Modification Report, the Minister's Conditions of Approval (M12 CoA) and Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report (AR), and Amendment Report Submissions Report (ARSR) and ARSR Biodiversity Amendment, all applicable legislation, Consistency Assessments and Transport for New South Wales (TfNSW)) Specifications.

Additional background information on tannins and the use of mulch on construction sites is included in Section 2 of this management procedure.

### 1.3.1 M7-M12 Integration project

This Procedure has been updated to incorporate the relevant information and requirements to consider the M7 Motorway (Modification 6 Widening) (M7 Widening). The re-branded M7-M12 Integration project Procedure has been prepared to also address the requirements of the M7 Widening Minister's Conditions of Approval (M7 CoA) and the Revised Environmental Management Measures (REMMs) listed in the Westlink M7 Widening Modification Report and Westlink M7 Widening Submissions Report.

Due to construction programming and development of the OCEMP, the CEMP and sub-plans (and monitoring programs) have been prepared in a two-step process:

- M12 East package CEMP, sub-plans and monitoring programs (including this Monitoring Program)
- M7-M12 Integration project CEMP, sub-plans and monitoring programs.

Once the M7-M12 integration project procedure is approved, this M12 East package procedure program will be superseded.

## 1.4 Induction/training

All site personnel involved in construction of the M7-M12 Integration project will be trained and inducted in this Procedure.

Additional training will be provided personnel involved in handling, stockpiling and application of mulch to minimise and contain tannins from mulch. All site staff will be trained about how to identify potential tannins leachate or spontaneous combustion and how to report it.

Training will include inductions, toolbox talks, pre-starts and targeted training as required.

## 1.5 Roles and responsibilities

The Environmental Site Representative (ESR) is responsible for ensuring this Plan is effectively implemented, and all site personnel are aware of the requirements of this Plan.

All personnel involved in activities that involve the handling, stockpiling and application of mulch are responsible for undertaking works in accordance with this Plan.

## 1.6 Approval review and modification

This Plan will be reviewed by WSO Co, TfNSW's Environment and Sustainability Manager (ESM) (or delegate) and the Environmental Representative prior to commencement of construction.

The Procedure will be implemented for the duration of construction and for any longer period set out in this Procedure or as specified by the Planning Secretary, whichever is the greater. As part of the CEMP this Procedure will be reviewed and updated as required and in accordance with Section 8.7 of the CEMP.

# 2 Procedure

## 2.1 Planning and works staging

Prior to commencement of clearing, planning and works staging will identify the amount of mulch to be generated. With this information, a strategy can be prepared to manage mulch on site. Staging of chipping, tub grinding and/or mulching activities should be planned to reduce the volume of mulch to be managed at any one time. Where feasible tub grinding will be prioritised over chipping to reduce tannin generation.

Suitable areas will be identified to stockpile the mulch required for M7-M12 Integration project from the landscape schedule or use during landscape planting under the Contract in accordance with TfNSW R179. Mulch stockpile areas will be identified on the Progressive Erosion and Sediment Control Plans (PESCPs) prior to commencement of clearing.

Mulch in excess of the quantity required for landscape planting must not be stockpiled on site. Surplus mulch will be disposed of in accordance with TfNSW D&C R44. Mulch may be used in community mulch giveaways for residential landscaping purposes where requirements described in Appendix 2 are satisfied.

## 2.2 Mulch stockpile locational considerations

The location of mulch stockpiles should be selected with consideration of the following:

- Mulch stockpile sites should only be established on elevated ground that are not subject to inundation.
- All mulch stockpiles must be in designated stockpile sites.
- Any proposed stockpile site not shown in PESCP drawings, must be approved by TfNSW.
- The application for an alternate site must be submitted at least ten working days before stockpiling is due to commence and include the maximum dimensions of the proposed stockpile.
- Stockpile sites must be located away from drainage lines and watercourses and must be arranged to minimise damage to natural vegetation and trees.
- Mulch stockpiles should not be proposed within the flood prone land of Ropes Creek.
- The stockpile sites must be positioned so that the stockpiled material may be transported away at any time. Access should be readily available to the RFS in the event of spontaneous combustion (refer to Section 2.5).
- Stockpile sites with a duration of not more than 1 month should be constructed not less than 20 metres from a watercourse, including floodplains.
- Stockpile sites with a duration of more than 1 month should be constructed not less than 50 metres from a watercourse, including floodplains.

## 2.3 Mulch stockpile management measures

The following controls and management measures will be implemented when stockpiling mulch on site:

- Mulch stockpile sites must be established with appropriate controls in place before the main site clearing activities commence.
- Mulch stockpiles must be designed and constructed with upslope bunds or catch drains to divert upgradient water around the stockpile and prevent it from entering the stockpile site.
- Mulch stockpiles must incorporate an impermeable bund to capture stockpile leachate or tannin impacted water.
- Impervious bunds must be a minimum of 300 mm high, to capture tannin impacted water.
- All bunded stockpiles that are in place for a period longer than one month must include a lined discharge point for overflow in extreme rainfall events.
- Stockpiles established on sloping sites must be designed to provide temporary stormwater containment equivalent to a 300 mm minimum height bund on a flat site.

## 2.4 Management of tannin leachate

- Do not use mulch for surface cover or sedimentation controls in any low-lying areas of the site that remain consistently wet (Appendix 1, Plate 1). Alternative controls such as geofabric (for surface protection) or sediment fence will be required in these areas.
- Do not spread surface mulch in thicker than 100 mm layers (Appendix 1, Plate 2). Mixing mulch with topsoil is encouraged for batters to prevent loss of topsoil during initial stabilisation (Appendix 1, Plates 3 and 4). It should be noted that mulch will generally cause nitrogen draw down which may inhibit plant growth unless mulch has been composted first. Care is to be taken to ensure that excessive mulch is not applied for sedimentation controls such as perimeter bunds or catch dams (Appendix 1, Plate 5).
- Tannin impacted water should be pumped out of bunded stockpiles within 5 days of the end of a rainfall event to maintain the storage capacity. This water should be used for on-site purposes including dust suppression and landscape watering. These activities must be managed to prevent any pooling or runoff of tannin impacted water.

## 2.5 Mitigation of spontaneous combustion

Stockpiles must be regularly monitored and turned over as required to avoid spontaneous combustion. Mulch stockpile heights will be limited to 2 m to reduce heat generation.

Stockpiles are at risk of spontaneous combustion when the internal temperature is above 80°C. Indicators of elevated temperatures in mulch stockpiles include mushrooms, presence of steam and discolouration.

Where the above indicators are observed, temperature monitoring is to be undertaken of known hotspots and random sample locations within the entire mulch stockpile.

If stockpile is smoking or temperature is greater than 80°C the stockpile must be aerated and cooled.

# Appendix 1. Plates showing the use of mulch for erosion and sedimentation controls



*Plate 1: Mulched vegetation stockpiled in a low-lying area subject to inundation. This is not an appropriate stockpile location and may increase the generation of tannins from stockpiled mulch.*



*Plate 2: Mulch being placed as batter erosion control. Mulch should not be applied in layers more than 100 mm thick for surface stabilisation.*



*Plate 3: Site showing recent application of a mulch/topsoil mix on batters (40% mulch to 60% topsoil). Mulch mixes are used to provide temporary stabilisation to prevent the loss of topsoil from batters in heavy rainfall events. Mulch use is also shown as a mounded sedimentation control to prevent sediment entering the median drain.*



*Plate 4: A mulch/topsoil mix used to provide temporary batter stabilisation and to assist cover crop establishment.*



*Plate 5: Mulch used as a bund for a temporary sedimentation catch dam. Mulch is effective as it can provide both containment and filtering of site water. Mulch should not be used as a control in areas of concentrated flow where it may be washed away. Any mulch containment control should have a defined and lined outlet that allows discharge from the control without washing mulch away. Note that this control does not have a defined discharge outlet which should be installed to prevent failure of the control in heavy rainfall events.*

# Appendix 2. Minimum requirements for community mulch giveaways

The purpose of community mulch giveaways is to provide mulch for residential landscaping purposes.

The activities of a community mulch giveaway are permissible under the Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A (the Raw Mulch Exemption 2008). However, the activities remain subject to other relevant environmental regulations within the Act and Regulations. The Raw Mulch Exemption 2008 is subject to the following conditions:

- The raw mulch can only be applied to land for the purposes of filtration or as a soil amendment material or used either singularly or in any combination as input material(s) to a composting process.
- The consumer must land apply the raw mulch within a reasonable period of time.

Further information can be found at: www.environment.nsw.gov.au/resources/waste/ex08mulch.pdf

It is the mulch generators responsibility to ensure that the mulch is reused in an environmentally responsible manner.

A safe work method statement (SWMS) must be prepared that identifies potential OHS risks and all prevention and mitigation measures. The SWMS must apply to both the community and site workers involved in the mulch giveaway.

Each member of the community who participates in the mulch giveaway must read and understand a site specific information sheet. A template information sheet is attached as Appendix 4.

The site occupier must maintain written records for each load of mulch that is taken away and to ensure that each community participant understands the conditions of the community mulch giveaway information sheet. A suggested template to record this information is attached as Appendix 5.

# Appendix 3. Community mulch giveaway information sheet

The following community mulch giveaway information sheet must be populated with site-specific information.

# Community Mulch Giveaway

Information Sheet

| Details of Mulch Supply | |
|---|---|
| **Site Occupier** | <insert name of contractor/alliance etc> |
| **Project Name** | <insert project name> |
| **Location** | <insert location of mulch stockpile> |
| **Mulch stockpile access directions** | <insert adequate directions for community members to find the stockpile location> |

| Background |
|---|
| • This information sheet supports the non-commercial giveaway of mulch for local residents.<br>• The product is raw vegetation mulch from <insert project location / name>. |

| Community Safety Requirements |
|---|
| • <add in any safety requirements or mitigation measures from the SWMS that apply to the community><br>• <add in any safety requirements or mitigation measures from the SWMS that apply to the community><br>• <add in any safety requirements or mitigation measures from the SWMS that apply to the community><br>• <add in any safety requirements or mitigation measures from the SWMS that apply to the community> |

# Appendix 4. Records template for community mulch giveaway

The records in the following suggest template must be kept as a minimum.

| **Community Mulch Giveaway**<br>Record Sheet | | | | |
|---|---|---|---|---|
| **Date** | **Car registration** | **I have read and understand the 'Community Mulch Giveaway information Sheet'** | **Name** | **Signature** |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |
| | | ☐ Yes | | |

# Appendix G - Stockpile Management Procedure

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix G Stockpile Management Procedure



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| | | |
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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| ASS | Acid Sulfate Soils |
| AR | Amendment Report |
| ARSR | Amendment Report Submissions Report |
| CEMP | Construction Environmental Management Plan |
| CoA | Conditions of Approval |
| CSWMP | Construction Soil and Water Management Plan |
| CEMP | Construction Environmental Management Plan |
| EIS | Environmental Impact Statement |
| EPL | Environmental Protection Licence |
| ESCP | Erosion and Sediment Control Plan |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representative |
| OCEMP | Overarching Construction Environmental Management Plan |
| POEO Act | Protection of the Environment Operations Act 1997 |
| PESCPs | Progressive Erosion and Sediment Control Plan |
| REMMs | Revised Environmental Management Measures |
| TfNSW | Transport for NSW |
| WSO Co | Western Sydney Orbital Company, a-Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |

# 1 Introduction

## 1.1 Context

This Stockpile Management Procedure (this Procedure) is an appendix of the Construction Soil and Water Management Sub-plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project. The relevant information and requirements for both the M7 Widening and the M12 East package are included in this Procedure.

This Procedure has been prepared in accordance with accordance with the Stockpile Site Management Guideline EMS-TG-010 (RMS, 2015).

This Procedure addresses the following requirements for the M7 Widening and M12 Motorway:

- M7 Widening:
  - Minister's Conditions of Approval (CoA) for M7 Widening (SSI-663-Mod-6) (M7 CoA)
  - Updated Environmental Management Measures listed in the Westlink M7 Modification Report (August 2022) and the Submissions Report (November 2022) (M7 Updated Environmental Management Measures (referred to as M7 REMMs in this Procedure)
- M12 Motorway:
  - Commonwealth CoA for M12 Motorway Project (EPBC 2018/8286) (Commonwealth M12 CoA)
  - CoA for M12 Motorway Project (SSI 9364) (NSW M12 CoA)
  - Revised Environmental Management Measures listed in M12 Motorway Environmental Impact Statement (EIS) (October 2019), the Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 Revised Environmental Management Measure (REMMs))
  - Overarching Construction Environmental Management Plan (OCEMP)
  - Relevant consistency assessments
- Applicable legislation
- The following Transport for NSW (TfNSW) specifications:
  - TfNSW Specification G36 – Environmental Management
  - TfNSW Specification G38 – Soil and Water Management
  - TfNSW Specification R44 – Earthworks
  - TfNSW Specification 178 – Vegetation.

## 1.2 Purpose

This Stockpile Management Procedure (this Procedure) provides guidance relating to temporary and long-term stockpile management for the M7-M12 Integration project and has been developed with the aim of preventing harm to the environment.

Under the definition of a Construction ancillary facility under the consent, a material stockpile area located in the construction boundary can be managed under the CEMP once it is approved. Once the CEMP is approved, this document will govern stockpile management.

## 1.3 Objective

The objectives of this Procedure include:

- Ensure compliance with environmental requirements of the M7-M12 Integration project
- Provide a framework for suitable selection of stockpile locations and quantities throughout the construction phase of the M7-M12 Integration project works
- Ensure all materials are stockpiled in segregated areas to ensure that materials are not cross contaminated, so as to maximise their suitability for re-use or recycling
- Outline the minimum management requirements for stockpile sites in the M7-M12 Integration project.

## 1.4 Scope

This Procedure is relevant to the planning, placement and management of all stockpiles on or related to the M7-M12 Integration project. Stockpile sites may typically be required to store material including:

- Excavated or delivered materials to be used in fill embankments and other design features
- Excavated material unsuitable for reuse on the M7-M12 Integration project
- Excess concrete, pavement, rock, soils and aggregate stored for potential reuse in the Project or prior to removal from site
- Imported sands, soils, aggregates, recycled concrete products, topsoils, rock and engineered fills for use in the M7-M12 Integration project
- Topsoil, mulch, timber for landscaping and revegetation works.

This Procedure has been updated to incorporate the relevant information and requirements to consider the M7 Motorway (Modification 6 Widening) (M7 Widening). The re-branded M7-M12 Integration project Procedure has been prepared to also address the requirements of the M7 Widening Minister's Conditions of Approval (M7 CoA) and the Revised Environmental Management Measures (REMMs) listed in the Westlink M7 Widening Modification Report and Westlink M7 Widening Submissions Report.

Due to construction programming and development of the OCEMP, the CEMP and sub-plans (and monitoring programs) have been prepared in a two-step process:

- M12 East package CEMP, sub-plans and monitoring programs
- M7-M12 Integration project CEMP, sub-plans and monitoring programs.

Once the M7-M12 integration project procedure is approved, this M12 East package procedure will be superseded.

## 1.5 Induction/training

All site personnel involved in the M7-M12 Integration project works activities will be trained and inducted on the requirements of this Procedure.

Additional training will be provided personnel involved in stockpiling activities. Training will include inductions, toolbox talks, pre-starts and targeted training as required.

## 1.6 Roles and responsibilities

John Holland's Environmental Site Representative (ESR) is responsible for ensuring this Procedure is effectively implemented, and all site personnel are aware of the requirements of this Procedure. The ESR is responsible for inspecting and monitoring the stockpile requirements outlined in this Procedure.

## 1.7 Approval, review and modification

This Procedure will be reviewed by WSO Co, the TfNSW Environment and Sustainability Manager (ESM) (or delegate), Soil Conservationist and the Environmental Representative (ER) to confirm it is consistent with, and incorporates, all relevant elements of the approved Overarching Construction Environmental Management Plan (OCEMP) and other requirements, prior to submission to the Planning Secretary and the Environmental Protection Authority (EPA) for information.

Construction of the M7-M12 Integration project will not commence until the CSWMP, and this Procedure has been reviewed to the satisfaction of the TfNSW ESM and ER and provided to the Planning Secretary and EPA for information.

The Procedure will be implemented for the duration of construction and for any longer period set out in this Procedure or as specified by the Planning Secretary, whichever is the greater. As part of the CEMP this Procedure will be reviewed and updated as required and in accordance with Section 1.12 of the CEMP.

# 2 Environmental requirements

## 2.1 Legislation and guidelines

This Procedure has been developed with consideration of the following key legislation and guidelines:

- Protection of the Environment Operations Act 1997 (POEO Act)
- Managing Urban Stormwater Soils and Construction (Landcom, 2004)
- Technical Guideline EMS-TG-010: Stockpile Site Management Guideline (RTA, 2011)
- Stockpile Management Guidelines (Roads and Maritime, 2015)
- TfNSW Specification G36 – Environmental Management
- TfNSW Specification G38 – Soil and Water Management
- TfNSW Specification R44 – Earthworks
- TfNSW Specification 178 – Vegetation.

## 2.2 Requirements

The applicable NSW M7 CoA and NSW M12 CoA, REMMs relevant to the development of this Procedure are listed in Table 2-1, as identified in the CSWMP.

*Table 2-1: Stockpiling requirements*

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| NSW M7 CoA Definitions | Construction ancillary facility.<br><br>A temporary facility for construction of Modification 6 including an office and amenities compound, construction compound, material crushing and screening plant, materials storage compound, maintenance workshop, testing laboratory, a material stockpile area, access and car parking facilities, and utility connections to the facility.<br><br>*Note: Where an approved CEMP contains a stockpile management protocol, a material stockpile area located within the construction boundary is not considered to be a construction ancillary facility.* | This Procedure |
| NSW M12 CoA Definitions | Construction ancillary facility.<br><br>A temporary facility for construction of the CSSI including an office and amenities, compound, construction compound, material crushing and screening plant, concrete, and asphalt batching plant, materials storage compound, maintenance workshop, testing laboratory, material stockpile area, access and car parking facilities and utility connections to the facility. | This Procedure |

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| | *Note: Where an approved CEMP contains a stockpile management protocol, a material stockpile are located within the construction boundary is not considered to be an ancillary facility.* | |
| M7 REMM SW1 | A Soil and Water Management Plan (SWMP) will be prepared as part of the proposed modification. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land.<br><br>The CSWMP will provide measures to manage stockpiles, including locations, separation of waste types, sediment controls and stabilisation | This Procedure |
| M12 REMM SWH01 | A Construction Soil and Water Management Plan (CSWMP) will be prepared for the project. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land.<br><br>The CSWMP will provide measures to manage stockpiles including locations, separation of waste types, sediment controls and stabilisation. | This Procedure |

# 3 Protocol

## 3.1 Stockpile location criteria

Stockpiles are to be located within the M7-M12 Integration project construction footprint nominated in the Drawings or Specifications (refer to the Sensitive Area Plans in Appendix A6 of the CEMP). The M7-M12 Integration project Earthworks Management Plan provides details of the preliminary assessment of stockpiling requirements and the quantities that can be placed in nominated stockpile areas. Quantities of concrete and secondary materials have been captured as part of the waste management plan, specifically Section 4.

Stockpiles are to be set in a way that reduces the risk of damage to natural vegetation and trees, maintaining the existing surface drainage and such that the stockpiled material is accessible for carting away at any time. Stockpiles will also be located:

- Outside of the tree protection zone of trees or native vegetation identified for retention. Delineate the tree protection zone in accordance with AS 4970 and to ensure a zone of at least 5 metres from retained trees and outside the drip line.
- On land that does not require the removal of threatened species, Endangered Ecological Communities, or roosting habitat for listed threatened fauna species or native vegetation clearing beyond what is already required for the M7-M12 Integration project
- Locate stockpiles at least 50 m from likely areas of concentrated water flows and at least 10 m from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline “Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings
- Above the 20 year flood levels
- So that any slump of the stockpile will not affect erosion and sediment control measures or infringe specified minimum clearance requirements
- To ensure no cross contamination of contaminated materials with non-contaminated materials
- In areas of low heritage conservation significance (including identified Aboriginal cultural value) and not impact on heritage sites beyond those already impacted by the M7-M12 Integration project
- A suitable distance from sensitive noise and vibration receivers to minimise disruption
- Where possible, away from key views and visual receptors. Use appropriate screening measures where this is not possible.
- So that the appropriate erosion and sediment control measures can be installed and will operate effectively
- Readily accessible via the project or road network to minimise the need for heavy vehicles to travel on local roads
- On relatively level land
- Outside of utility easement corridors unless agreement has been reached with the operator
- Within construction compounds where possible
- Within the approved Environmental Protection Licence (EPL) boundary.

All proposed stockpiles will be assessed in accordance with the criteria listed above.

If any stockpile site is located on private land, approval will be obtained from the landholder under s.143 of the Protection of the Environment Operations Act 1997 (POEO Act) prior to commencement of stockpiling. Prior to movement of material, Section 4.11.4 (offsite waste disposal) under Transport Specification G36 is to be followed, including completion of the S143 Notice (see Appendix 1) and hold point released.

## 3.2 Stockpile location approval

John Holland is also required to obtain all the necessary approvals and consents, including environmental approvals, and are required to provide copies of them to the TfNSW. TfNSW will only consider requests for new stockpile areas if all stockpile areas nominated in the Drawings or Specifications have already been allocated for full use.

Any stockpile(s) that are proposed in areas outside of the M7-M12 Integration project construction footprint, must be approved by TfNSW. Additionally, John Holland must submit to TfNSW the details of the proposed maximum dimensions of the stockpiles at least 10 working days before stockpiling is due to commence.

# 4 Stockpile Requirements

## 4.1 Minimal requirements for all stockpiles

### 4.1.1 Stockpile segregation

Various materials may be stockpiled on the site for the M7-M12 Integration project works including:

- Topsoil
- Spoil including unsuitable material
- Contaminated soil/materials
- Imported natural materials (SMZ, UZF, aggregates, recycled materials, recycled bedding sand, lime, gypsum, stabilised sand)
- Mulch
- Wastes (e.g., concrete, asphalt).

Each stockpiled material must be clearly delineated to prevent mixing and cross contamination. All stockpiles of contaminated material, topsoil, or any other long terms stockpiles (stockpiles left for more than 10 days) must be clearly signposted with a stockpile number, date established, material classification, origin, and quantity.

### 4.1.2 Erosion and sediment controls

Erosion and sediment controls will be established and maintained to divert offsite stormwater, manage onsite stormwater runoff, and to stabilise stockpiles as required. Sediment and erosion control will be undertaken in accordance with the 4th edition of “Managing Urban Stormwater – Soils and Construction” Volume 1 (Landcom, 2004).

Erosion and sediment controls will include however not be limited to:

- Diversion bunds or catch drains upslope of the stockpiles to divert water around the stockpile
- Sediment fences, mulch bunds or other sediment controls downslope of stockpiles to catch sediment runoff
- Stabilisation of stockpile that will be left for more than 10 days, and as soon as practicable for stockpiles within the M7 Widening footprint.

Stockpile locations and the erosion and sediment controls around them will be included on the Progressive Erosion and Sediment Control Plan (PESCPs). Erosion control and sediment capture measures must be installed prior to stockpiling material.

The allowed height of each stockpile is not to exceed 2 m, with slopes no steeper than 2:1, unless otherwise approved by TfNSW.

Stockpiles are to be located in a suitable area so that any slump of the stockpile will not affect erosion and sediment control measures or infringe specified minimum clearance requirements.

### 4.1.3 Dust Control

During stockpiling activities, watercarts will be used to suppress dust.

Stockpiles that will be in place for more than 20 days will be stabilised where feasible by seeding with a cover crop (refer to Section 4.1.4), tackifier agent or covered to supress dust and erosion. Soil stockpiles in the M7 Widening footprint will be covered as soon as practicable. Any stockpiles that are susceptible to wind or water erosion, must be covered within 10 days of forming each stockpile.

Any stockpiles that do or may contain asbestos materials would need to be covered in accordance with the Asbestos Management Sub-plan.

### 4.1.4 Temporary Vegetation

Topsoil and spoil stockpiles and stockpile sites will be stabilised using geofabrics, hydromulching, geobinder polymers or seeding with cover crop. Use of cover crops would be limited to application on topsoil stockpiles.

Where sites are vegetated to control erosion and weed invasion the following cover crop species will be used:

- Rye Corn (during the months of April to August) at a rate of 35 kg per hectare
- Japanese Millet (during the months of September to March) at a rate of 35 kg per hectare.

Where directed by the TfNSW, native seed in accordance with the species listed in R178/A will be included.

John Holland will regularly revegetate the stockpiles to maintain a dense coverage of cover crop sufficient to minimise weed colonisation for the period of the stockpiling. Where weed cover becomes greater than 5% of the stockpile surface area, eradicate weeds in accordance with R178 Clause 3.1.1, and then re-seed disturbed areas with cover crop.

## 4.2 Topsoil

The Earthworks Management Plan provides estimated quantity of topsoil that will be stripped from each cut and fill area of the M7-M12 Integration project site. Generally, topsoil will be stripped with a dozer or grader and transported to local stockpile sites identified in the PESCPs. Topsoil will be stockpiled separately from other materials and clear of construction works for use in revegetation.

Topsoil quantities no greater than 1000 m3 will be stockpiled in piles no larger than 2 m high (unless otherwise approved by TfNSW ESM) to preserve the quality of the soil for grassing and planting on batters and to manage the environmental risk.

Before stockpiling topsoil, John Holland will carry out a survey in accordance with TfNSW Specification G71 to determine the surface levels at each stockpile area, at sufficient positions to later determine the volumes of topsoil placed at the location. When shown in Annexure R44/A1, the survey must be a joint survey in accordance with Clause 1.6.

Topsoil stockpiles must:

- Be free from weeds, subsoil, other excavated materials, contaminated materials, refuse, clay lumps and stones, timber, or other rubbish
- Be trimmed to a regular shape to facilitate quantity measurement, and with a height not exceeding 2 m and batter slopes not steeper than 2H:1V
- Have their batters track rolled or stabilised by other means acceptable to the superintendent
- Be seeded with a sterile cover crop in accordance with Specification TfNSW R178, to encourage vegetation cover. Seeding must be carried out progressively within seven days of completion of each 500 m2 of exposed batter face
- Be less than 1,000 cubic metres each.

After removing the topsoil or after determining topsoil is to be retained, determine the surface levels in each cutting and embankment at sufficient locations to determine the volume of excavation for general earthworks and the volume of unsuitable material.

When shown in Annexure R44/A1, the survey must be a joint survey in accordance with Clause 1.6.

### 4.2.1 Weed contaminated topsoil

Keep topsoil that is not contaminated by noxious weeds in stockpiles for later spreading on fill batters and other areas. Other material may also be stockpiled but kept separated from the topsoil stockpiles.

Weed contaminated topsoil will be disposed of in accordance with the requirements for spoiling in TfNSW Specification R44 by the following means:

- Flatter batter slopes being provided on embankments, or
- Uniform widening of embankments, or
- Stockpiling within the site, or
- Disposal at a TfNSW approved location outside the site.

Bury the weed contaminated topsoil away from any pavement, structure, water course or drainage path and with a cover of inert fill of a minimum 500 mm compacted thickness. The inert fill must:

- Be from the specified earthworks, or when authorised by the superintendent, from borrow
- Be free of any material with a particle size exceeding 75 mm
- Have a Plasticity Index between 10 and 20 when tested in accordance with Test Method TfNSW T109
- Be placed and compacted in accordance with the requirements for embankments in TfNSW QA Specification R44.

Uncontaminated topsoil must be spread over the burial area and revegetate within 7 days.

### 4.2.2 Restoration of the topsoil stockpile areas

After removing the topsoil, or after determining topsoil is to be retained, determine the surface levels in each cutting and embankment at sufficient locations to determine the volume of excavation for general earthworks and the volume of unsuitable material.

Following completion of the Works, carry out restoration of the stockpile areas in accordance with TfNSW Specification R178.

# 5 Inspection, monitoring and records

Compliance with this Procedure will be tracked through weekly environmental inspections of stockpile sites by the ESR or Environmental Team. Inspections will monitor the effectiveness of the control measures and ensure the environmental impacts of stockpiles are minimised. The checklist of items to be inspected will include general condition of surrounding environment, erosion and sedimentation control devices, pits and catch drains, bunding, fencing, stockpile height and condition (evidence of weeds, odour, litter etc.).

In the event that Acid Sulfate Soils (ASS) stockpiling is required, monitoring of the stockpiles (e.g., pH) will be undertaken in accordance with the ASS Manual.

Identified non-compliances will be reported to the TfNSW Environment and Sustainability Manager (or delegate) and the appropriate management measures will be put in place to ensure ongoing compliance.

John Holland will maintain records of approved stockpile locations on PESCPs or relevant site plans.

The ESR will maintain a record of stockpile locations in a Stockpile Register. The Stockpile Register will also include the purpose of the stockpile, the type of material contained, timing for establishment, material movement and removal. The ESR is responsible for developing and maintaining the register and it will be provided to TfNSW when requested.

# Appendix H - Site Stabilisation Sub-plan

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix H: Site Stabilisation Sub-plan

November 2023



# Document Control

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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| CoA | Conditions of Approval |
| CFFMP | Construction Flora and Fauna Management Sub-plan |
| CSWMP | Construction Soil and Water Management Plan |
| EPA | Environmental Protection Authority |
| EPL | Environmental Protection Licence |
| ER | Environmental Representative |
| ESCP | Erosion and Sediment Control Plan |
| ESM | TfNSW Environment and Sustainability Manager |
| ESR | Environment Site Representative (JHG) |
| EWMS | Environmental Work Method Statement |
| OCEMP | Overarching Construction Environmental Management Plan |
| POEO Act | Protection of the Environment Operations Act 1997 |
| QA | Quality Assurance |
| REMM | Revised Environmental Management Measures |
| TfNSW | Transport for NSW |
| TSS | Total Suspended Solids |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |

# 1 Introduction

## 1.1 Purpose

The purpose of this Site Stabilisation Sub-plan (the Plan) is to describe the site stabilisation approach that will be employed during construction of the M7-M12 Integration project.

The following plan has been prepared in accordance with the RMS Guideline for Batter Surface Stabilisation Using Vegetation (2015).

## 1.2 Objectives

The objectives of this Plan include:

- Provide a decision-making framework to guide the stabilisation of disturbed areas in a timely and effective manner
- Reduce incidents of erosion and downstream sedimentation and water quality impacts
- Prevent or minimise damage to the works from surface water flows
- Prevent or minimise requirement for rework of completed stabilisation works.

## 1.3 Scope

This Plan is an appendix of the Construction Soil and Water Management Sub-plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project.

This Plan has been prepared to address the requirements of the Minister's Conditions of Approval (M7 CoA) and Updated Environmental Management Measures (herein referred to as REMMs) listed in the Westlink M7 Modification Report, the Minister's Conditions of Approval (M12 CoA) and Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report, and Amendment Report Submissions Report (ARSR) and all applicable legislation, Consistency Assessments and Transport for New South Wales (TfNSW) Specifications.

The primary G38 requirement relevant to the development of this Plan is listed in Table 1-1.

*Table 1-1: Primary requirements for the Site Stabilisation Sub-plan*

| G38 | Requirement | Document reference |
|---|---|---|
| 3.10 | Prepare and implement a Site Stabilisation Sub-Plan as part of the CEMP (see TfNSW G36) for the staged stabilisation of the Works throughout Construction. The Site Stabilisation Sub-Plan must include: | This Plan |
| | (a) Site stabilisation objectives | Section 1.2 |
| | (b) identification and mapping of areas along the length of the proposal requiring stabilisation; | Section 2.1 |
| | (c) a risk assessment for disturbed areas and stockpiles; | Section 2.2 |

| G38 | Requirement | Document reference |
|---|---|---|
| | (d) identification of timing for stabilisation; | Section 3.6 |
| | (e) detailed description of methods for stabilisation; | Section 3<br>Annexure A<br>Annexure B |
| | (f) identification of areas and a program for progressive, permanent stabilisation such as implementation of landscaping; | Section 3.5 |
| | (g) a procedure for regularly monitoring and assessing the performance and effectiveness of your stabilisation control measures against the site stabilisation objectives and for implementing improvements; | Section 4 |
| | (h) a procedure to ensure all stabilisation risk areas would be stabilised within the periods listed in Clause 4; and | Section 3.6 |
| | (i) a process for identifying additional stabilisation methods. | Section 2.2 |

### 1.3.1 M7-M12 Integration Project

This Sub Plan has been updated to incorporate the relevant information and requirements to consider the M7 Motorway (Modification 6 Widening) (M7 Widening), following approval of the M12 East package CEMP, Sub-plans and monitoring programs. This re-branded M7-M12 Integration project plan has been prepared to also address the requirements of the M7 Widening Minister's Conditions of Approval (M7 CoA) and the Updated Environmental Management Measures (UEMMs) listed in the Westlink M7 Widening Modification Report and Westlink M7 Widening Submissions Report.

Due to construction programming and development of the OCEMP, the CEMP and sub-plans (and monitoring programs) have been prepared in a two-step process:

- M12 East package CEMP, sub-plans and monitoring programs
- M7-M12 Integration project CEMP, sub-plans and monitoring programs.

Once this M7-M12 integration project plan is approved, the M12 East package plan will be superseded.

## 1.4 Induction/training

All site personnel involved in construction of the M7-M12 Integration project will be trained and inducted in this Plan.

## 1.5 Roles and responsibilities

The Environmental Site Representative (ESR) is responsible for ensuring this Plan is effectively implemented, and all site personnel are aware of the requirements of this Plan.

All personnel involved in site stabilisation works are responsible for undertaking works in accordance with this Plan.

## 1.6 Approval, review and modification

This Plan will be and reviewed by WSO Co, TfNSW Environment and Sustainability Manager (ESM) (or delegate) and the Environmental Representative prior to commencement of construction for the M7 Widening project.

The Plan will be implemented for the duration of construction and for any longer period set out in this Plan or as specified by the Planning Secretary, whichever is the greater.

# 2 Procedure

During construction the natural soil profile is substantially disturbed by stripping, stockpiling and changing the landforms by cutting, filling, stockpiling and creating mounds and basins.

Respreading topsoil can mix multiple soil layers and significantly alter the physical, chemical and biological properties of the soils from those that existed pre-disturbance. Surface Stabilisation is therefore required to minimise potential impacts during the construction works.

This section outlines the procedure for the identification of areas along the length of the project requiring stabilisation.

## 2.1 Site stabilisation plans

Site stabilisation plans (maps) will be prepared and maintained throughout construction. Initially the site stabilisation plans may be incorporated into the Erosion and Sediment Control Plan. Once batter stabilisation commences, separate maps will be prepared of the alignment to document the proposed and implemented stabilisation of the site.

## 2.2 Additional stabilisation methods

JHG will consider various factors to select appropriate surface stabilisation solutions for all disturbed areas. Works such as clearing, topsoil stripping, bulk excavation, stockpiling and piling without necessary stabilisation considerations can cause mobilisation of dust and sediment that may impact sensitive receivers. Refer to the decision support table in Annexure A for additional stabilisation methods that may be implemented in addition to the specification requirements.

# 3 Stabilisation mitigation and management measures

JHG will implement the following general techniques to stabilise disturbed surfaces during the construction works. Factors outlined in RMS Guideline for Batter Surface Stabilisation using vegetation will be considered to achieve Stabilisation requirements and targets. See Annexure A for batter surface Stabilisation decision table. Fact sheets describing fifteen batter stabilisation techniques referred to in the decision table are provided in Annexure B.

## 3.1 Batter Stabilisation

The selection of a Stabilisation technique on the project will be undertaken in consultation with the Contractor's Soil Conservationist and based on evaluation of slope lengths and steepness of the respective batters where works are to be undertaken as identified in the Progressive Erosion and Sediment Control Plan And/or landscape drawings.

The slope gradient influences the ability to apply and hold topsoil, type of erosion risk, while slope length determines the potential for erosion. Soil testing will be undertaken to ensure that soil is properly managed and ameliorated and stabilised where required. Where necessary, methods such as hydro mulching and hydroseeding will be augmented to assist in preparing the soil for vegetation upon required temporary stabilisation and completion of works.

Drainage control requirements onsite will be implemented to divert upstream surface flows away from batter slopes. On cut batters, this will generally be provided by the surface drains that divert water around the top of cut batters.

On fill batters, +300 mm diversion bunds will be maintained along the top of the batter to prevent uncontrolled surface water spilling. During construction, until permanent drainage is installed to divert surface water away from the full batters, batter chutes will be maintained to provide controlled drop points for water from the top to toe of batter (see Standard Drawing R0100-06 in Annexure C).

Site-won topsoil will be used predominantly for batter slope rehabilitation. Prior to application, the topsoil stockpiles and subsoils will be tested to determine what ameliorants (including fertiliser, lime, sulphur, gypsum, compost, wetting agents and biological inoculants) are required to target soil deficiency.

Ameliorants must be mixed into the soil to be effective and may be added to both topsoil and subsoils. Soil amelioration is most effective if undertaken during the soil stripping phase. Ameliorants are applied to the soil prior to soil stripping and they are then easily incorporated during the stripping and stockpiling process. Where this has not occurred, amelioration on batters >3:1 will typically involve use of a bulldozer working perpendicular to contours.

Vegetation cover will be established on batter surfaces temporarily and permanently as determined by length of exposure to the elements. Stabilisation will be conducted for areas that remain unworked for two weeks.

Rehabilitation will commence at the earliest opportunity to ensure progressive rehabilitation and establish vegetation cover on topsoil during the construction period. This will reduce the erosion

from exposed batter, reduce the period that topsoil stored in stockpiled, and allow easy access for watering, additional seeding or amelioration as required prior to opening the road to live traffic.

Routine inspections conducted by the ESR and the Soil Conservationist will help to identify opportunities to stabilise the batters.

## 3.2 Stockpile Stabilisation

Stockpiles will be required for storage of construction materials including topsoil, spoil, vegetation and others. The Stockpile Management Plan provided in Appendix G of the CSWMP outlines the requirements for establishment of stockpiles.

Stockpiles left for more than 10 days will be stabilised where feasible by seeding a cover crop (refer to Annexure A), tackifier agent or covered to suppress dust and erosion. Any stockpiles that are susceptible to wind or water erosion must be covered within 5 days of forming each stockpile.

Topsoil stockpiles and stockpile sites (and other areas nominated by the Principal) will be vegetated to control erosion and weed invasion with the following cover crop species:

- Rye Corn (during the months of April to August) at a rate of 35 kg per hectare.
- Japanese Millet (during the months of September to March) at a rate of 35 kg per hectare.

Where directed by TfNSW, native seed in accordance with the species listed in R178/A will be included. Seeding must be carried out progressively within seven days of completion of each 500 m2 of exposed batter face.

JHG will regularly revegetate the stockpiles to maintain a dense coverage of cover crop sufficient to minimise weed colonisation for the period of the stockpiling. Where weed cover becomes greater than 5% of the stockpile surface area, weeds will be eradicated in accordance with R178 Clause 3.1.1 and disturbed areas reseeded with cover crop.

## 3.3 Drainage lines

Drainage lines will be stabilised in accordance with the design drawings. Turf used in vegetated drainage channels must comply with recommendations in AS5181:2017 “Use and installation of turf as an erosion, nutrient and sediment control measure”. Selected turf must be 25 mm thick of dense and well rooted grass. Turf must be verdant and fresh when delivered and be free of weeds, soil pests and disease and must be accompanied with a “Certificate of Authenticity” from the supplier. The turf must be mown and freshly cut in long lengths, of uniform width not less than 300 mm, and in sound unbroken condition.

Where temporary stabilisation is required, jute mesh (or similar), and where recommended by the Contractor’s Soil Conservationist, with bitumen as per TfNSW standard drawing R0100-03 (refer to Annexure C) will be applied promptly.

## 3.4 Waterways

Disturbed waterways will be promptly and progressively stabilised to avoid potential scouring and sedimentation and permanent stabilisation measures will be implemented as soon as practicable.

This will consist of, however not be limited to using jute mesh, or similar, to provide scour protection for any earthen areas of waterways that have been disturbed and that do not have a permanent vegetative or water cover and are likely to experience flows of a minimum 1:5-year flow event until long-term stabilisation measures are established as shown on the Drawings.

Guidelines, EWMS requirements and proposed control measures for conducting works on waterfront land and within waterways are described in Section 6.9 of the CSWMP.

## 3.5 Permanent stabilisation

Landscaping, or other permanent stabilisation works, will be completed progressively as early in the construction program as practical. Once earthworks are completed and access permits, areas will be stabilised with the permanent treatments and then further disturbance avoided. Areas of permanent stabilisation will be monitored and maintained until completion. Any damage resulting from ongoing construction activities around stabilised areas will be rectified to prevent ongoing erosion and prior to completion.

## 3.6 Timing for stabilisation

Target timeframes for stabilisation works for the M7-M12 Integration project are summarised in Table 3-1.

*Table 3-1: Timing for stabilisation*

| G38 | Target timing for stabilisation |
|---|---|
| Hydromulching/hydroseeding | Within 2 days of completion of soil preparation or, if delayed by the weather conditions, as soon as weather conditions permit |
| Compost Blanket | Within 5 days of completion of subsoil preparation |
| Stockpiles (general) | Withing 10 days of being left inactive |
| Stockpiles that are susceptible to wind or water erosion | 5 days |
| Open drains | Complete vegetation within 7 days of excavation |
| Waterways that have been disturbed and that do not have a permanent vegetative or water cover and are likely to experience flows of a minimum 1:5 year flow event | 10 days or prior to rainfall following disturbance (whichever is first) |
| Vegetation of Areas with Slopes 5 to 1 or Flatter: where earthworks requiring vegetation have been completed over an area exceeding one hectare. | Carry out vegetation within 14 days |
| Vegetation of Areas with Slopes steeper than 5 to 1: where earthworks requiring vegetation have been completed over an area exceeding one hectare, carry out vegetation within 7 days. | Carry out vegetation within 7 days. |

| G38 | Target timing for stabilisation |
|---|---|
| Removal of erosion and sediment control measures | Soil erosion and sediment control measures for any area must remain in place and be maintained at least until the new vegetation provides sufficient protection to keep erosion to a similar level to that of typical local natural bushland as agreed with the Principal. |

# 4 Inspection and monitoring

Inspections of stabilisation will occur in accordance with the inspection and monitoring program outlined in Section 7.4 of the CSWMP. This will include, however not be limited to:

- TfNSW environmental inspection including review of the implementation of the current ESCPs
- Soil Conservationist site inspections.

During inspections of stabilisation, the performance and effectiveness of the stabilisation control measures will be assessed against the site stabilisation objectives. Where stabilisation is determined to be ineffective or requiring improvement, recommendations will be made and the site stabilisation plans updated to document the measures to for implementing improvements.

# Annexure A. Decision support table

Section 2

# Batter surface stabilisation – Decision support table

Table 2 – Decision support table provides a summary of the slope conditions for each batter surface stabilisation technique that might be suitable, as well as the indicative cost of each to install and the time period until each technique will provide surface erosion protection (see Key below). The information should only be used for the purposes of short-listing potential stabilisation options for a particular site. The relevant factsheets should then be consulted to provide details about each technique and to select the most appropriate option/s from the shortlist.

## Key

| Suitability for Slope | |
|---|---|
| | Technique is likely to work for slope |
| | Technique may work for the slope, if supplemented with other techniques |
| | Technique is not likely to work for the slope |

| Indicative Cost (at time of publication) | |
|---|---|
| | Low (~ $0.15 – $1.50/m²) |
| | Moderate (~ $1.50 – $5.00/m²) |
| | High (~ $5.00 – $10.00/m²) |
| | Very High (~ $10.00 – $35.00/m²) |

| Time until erosion protection | |
|---|---|
| | Slow (relies on establishment of vegetation) |
| | Rapid (within 48 hours, but erosion protection will be enhanced with vegetation establishment) |
| | Rapid (within 48 hours) |
| | Immediate (effective as soon as installation is complete) |

## Table 2 – Decision support table

| Batter stabilisation technique | Indicative cost | Time until erosion protection | Suitability for slope (described as horizontal run (h) to vertical rise (v) – see Table 3.1.1a) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 4h:1v | 3h:1v | 2h:1v | 1.5h:1v | 1h:1v | 1h:2v |
| Drill/Broadcast seeding | $ | | ■ | ■ | ■ | | | |
| Soil binder – Bitumen emulsion | $ | | ■ | ■ | ■ | | | |
| Soil binder – Tackifier | $ | | ■ | ■ | ■ | ■ | ■ | |
| Mulch/Topsoil mixes | $ | | ■ | ■ | ■ | ■ | | |
| Hydroseeding | $ | | ■ | ■ | ■ | ■ | | |
| Straw mulching | $ | | ■ | ■ | ■ | | | |
| Hydromulching – Standard | $ | | ■ | ■ | ■ | ■ | | |
| Hydromulching – Bonded fibre matrix | $ | | ■ | ■ | ■ | ■ | ■ | |
| Hydromulching – Hydrocompost | $ | | ■ | ■ | ■ | ■ | ■ | |
| Erosion control blanket – Organic fibre | $ | | ■ | ■ | ■ | ■ | ■ | ■ |
| Erosion control blanket – Synthetic | $ | | ■ | ■ | ■ | ■ | ■ | ■ |
| Cellular confinement systems | $ | | ■ | ■ | ■ | ■ | ■ | |
| Compost blanket | $ | | ■ | ■ | ■ | ■ | ■ | |
| Placed turf | $ | | ■ | ■ | | | | |
| 2-D turf reinforcement mats | $ | | ■ | ■ | ■ | ■ | | |
| 3-D turf reinforcement mats | $ | | ■ | ■ | ■ | ■ | | |

# Annexure B. Batter stabilisation techniques

# Section 7
# Fact sheets:
# Batter surface stabilisation techniques

The following fact sheets provide details on some of the common batter surface stabilisation techniques that are used on Roads and Maritime road construction projects. There are many variations of the techniques available on the market as proprietary products, and also new and alternate products and equipment that may not be covered in this Guideline. As with any construction process using vegetation, regionally-specific requirements should also be employed to ensure success. Please contact your local Environment Officer (see Section 5) if you would like to clarify the details or suitability of a particular product.

Each fact sheet can be removed from the Guideline and used as standalone information. The following fact sheets are included:


Fact Sheet 1 Drill / Broadcast seeding

Fact Sheet 2 Soil binder – Bitumen emulsion

Fact Sheet 3 Soil binder – Tackifiers

Fact Sheet 4 Mulch / Topsoil mixes

Fact Sheet 5 Hydroseeding

Fact Sheet 6 Straw mulching

Fact Sheet 7 Hydromulching – Standard

Fact Sheet 8 Hydromulching – Bonded fibre matrix

Fact Sheet 9 Hydromulching – Hydrocompost

Fact Sheet 10 Erosion control blanket – Organic fibre

Fact Sheet 11 Erosion control blanket – Synthetic

Fact Sheet 12 Cellular confinement systems

Fact Sheet 13 Compost blanket

Fact Sheet 14 Placed turf

Fact Sheet 15 Turf reinforcement mats


The fact sheets detail how each of the techniques relate to the Factors to consider (see Section 3). The fact sheets have been prepared to be consistent with, and complementary to, the Roads and Maritime contract specifications G36 (Environmental Protection), G38 (Soil and Water Management), G40 (Clearing and Grubbing), R176 (Native Seed Collection), R178 (Vegetation) and R179 (Landscape Planting). Specifications for various materials and installation methods as referenced in R178 and R179 are found in various other Australian Standards, Roads and Maritime guidance documents and other industry documents. These include the correct site and weather conditions that affect the safe implementation of these techniques.

# Fact Sheet 1

Guideline for Batter Surface Stabilisation using vegetation

# Drill / Broadcast seeding

## Drill seeding involves seeding using a mechanical disc seeder towed by a tractor.

Drill seeders have metal discs that create small furrow and seed is placed into the furrow. Broadcast seeding involves the mechanical spreading of seed on the soil surface using a trailer or truck mounted spinning type or agitator type seed spreader. Following the seeding, the soil should be harrowed to cover the seed with a thin layer of soil.




*Figure FS1a: Direct seeding a batter. (Source: Martin Sullivan)*



*Figure FS1b: Air seeding native grass using a 4WD. (Source: Martin Sullivan)*

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| FACTOR | DETAIL |
|---|---|
| Slope | Mechanical seeders are either truck or trailer mounted and as such they cannot work safely across slopes steeper than 3h:1v. Hand seeding can be undertaken on small areas that are steeper than 3h:1v. |
| Level of erosion protection | Once vegetation has established, raindrop splash erosion and sheet flow. |
| Growing media | Topsoil. |
| Soil amelioration | Soil ameliorants are delivered with seed. Fertiliser can cause seed burn. |
| Bioregion | Areas with high rainfall or strong winds may need additional surface protection that is appropriate to the species being used. Drill seeding is ideal for locations where species tend to have longer dormancy. |
| Access | Installation – access will be required for machines to apply seed.<br>Maintenance – access may be required to water vegetation as it establishes and remove weeds as necessary. |
| Duration | Completely dependent on 'Vegetation type' (see below). |
| Visual amenity and ecological outcome | Drill / broadcast seeding is appropriate for the use of cover crops, grasses, legumes and many natives. However, there is significant scope within these types of vegetation to plant a desirable selection of species to meet visual and ecological outcome requirements. |
| Vegetation type | Cover crops, grasses, legumes and many natives. |
| Establishment time until erosion protection | Drill / broadcast seeding does not provide any erosion protection until the vegetation establishes. Optimum erosion protection is provided once 70 percent soil surface cover is achieved. A mulch cover is often recommended to provide raindrop splash and erosion protection during establishment. |
| Cost (at time of publication) | Low if suitable weed free topsoil and suitable machinery is available in the immediate area:<br>• \$0.15 – \$0.50 / $m^2$ depending on location and area seeded<br>• \$3 – \$5/$m^2$ to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for watering in dry conditions and weed suppression (where necessary). |
| Preparation | Planning by relevant experts and agronomists to develop the appropriate species, seeding rates, ameliorants and watering requirements.<br>Soil surface should be scarified and topsoil / subsoil should be ameliorated (where necessary) based on results of soil tests. |
| Rate of vegetation establishment | Slow and highly variable, depending on Vegetation type and Bioregion. |
| Quality assurance and surveillance | Quality assurance and surveillance should consider: soil preparation; soil testing; soil amelioration; seed germination and purity; application rate.<br>Seed should be buried in the soil two to three times its diameter to ensure intimate contact with the soil and access to soil moisture. Drill seeders typically place the seed at depths greater than 50 millimetres. Poor plant establishment can result as the shoots use all the available energy in the seed to push through the depth of the soil. Broadcast seeders apply the seed to the soil surface and can result in poor soil contact. It is desirable to lightly harrow or roll the seeded area to ensure intimate soil contact. |
| Establishment and maintenance | Establishment and maintenance costs can be high depending on the quality of topsoil used, the presence of weed seeds in the topsoil and the surrounding vegetation. Maintenance might include:<br>• Erosion repairs if rain occurs prior to vegetation establishment<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent or vegetation establishment is slow<br>• Watering immediately after application of seed / mulch in dry conditions and in rural areas to establish the vegetation<br>• Ongoing specialist advice if performance is poor. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

# Fact Sheet 2

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Soil binder – Bitumen emulsion

**Soil binders are a range of products that are applied to the soil surface to effectively glue the soil particles together, forming a crust that is resistant to erosion in varying degrees. They can also be referred to as soil stabilisers.**

Bitumen emulsion is a specific type of soil binder that can be used for a variety of applications. There are different types of bitumen emulsion, but the type that should be used for batter surface stabilisation is Anionic Slow Setting Bitumen emulsion. Cationic bitumen emulsion, which is typically used for road sealing, is not suitable for use in vegetation areas.

Bitumen emulsion should be applied at a rate of one litre of undiluted residual bitumen emulsion per square metre. It can be diluted up to 50/50 with water, and the diluted emulsion sprayed to achieve the application rate (1L/$m^2$). It is generally applied with conventional agricultural spray bars, and can be used in a variety of ways.

Bitumen emulsion can be sprayed directly onto the soil surface to simply bind the soil together. It can also be used in conjunction with Straw Mulching (see Fact Sheet 6) to provide temporary batter protection, or open weave Organic fibre Erosion control blankets (see Fact Sheet 10) to provide an increased level of erosion protection for higher velocity flow situations. Application with Straw Mulching or Organic fibre Erosion control blankets will also aid in vegetation establishment, conserve moisture in the soil, increase infiltration and minimise temperature fluctuations. For all applications, 100 percent soil surface cover is critical to ensure effective erosion control.



*Figure FS2a: Application of bitumen emulsion (darker area) over straw mulch.*



*Figure FS2b: Uneven establishment of grass through bitumen emulsion.*

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| FACTOR | DETAIL |
|---|---|
| Slope | ≤ 3h:1v but the length of the slope should be limited. |
| Level of erosion protection | If used standalone or in conjunction with Straw Mulching, bitumen emulsion will withstand raindrop splash erosion and low velocity sheet flow. If used in conjunction with an open weave Organic fibre Erosion control blankets (see Fact Sheet 10) bitumen emulsion will withstand low velocity concentrated flow. If vegetation is established, erosion protection will be enhanced. |
| Growing media | Can be applied to any growing media or soil surface cover (eg – organic fibre erosion control blankets). If the soil is dispersible it should be ameliorated prior to application. |
| Soil amelioration | Bitumen emulsion provides no soil amelioration. If vegetation is to be established, soil amelioration might need to be undertaken prior to installation to provide suitable conditions for the desired vegetation type. |
| Bioregion | Avoid application during low humidity or in areas with very dry or very wet soil, around wetlands, riparian areas or other sensitive receivers. |
| Access | Installation – application machinery (eg – agricultural spray bar) will need access to the batter. If necessary, access for applying Straw Mulch (see Fact Sheet 6), Organic fibre Erosion control blankets (see Fact Sheet 10) or undertaking soil amelioration may also be necessary.<br>Maintenance – access may be required for erosion repairs or repeat applications if rainfall occurs prior to any vegetation establishment. Depending on site conditions, access may also be required for weed control, repeat applications of ameliorants or watering vegetation. |
| Duration | Bitumen emulsion will remain effective for 3 – 12 months, depending on site conditions and level of disturbance.<br>Much longer stabilisation will be achieved if vegetation is established along with straw mulch or organic fibre erosion control blankets – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Bitumen emulsion is a dark colour that provides minimal visual impact, but alone it provides no ecological value. The establishment of vegetation will improve the visual amenity and has the potential to improve ecological outcomes. |
| Vegetation type | None if used directly on the soil as a binder.<br>All vegetation types if used to stabilise growing media while vegetation establishes. |
| Establishment time until erosion protection | Erosion protection will usually be achieved after 24 hours curing time, though slow-breaking emulsion may take longer in humid areas. |
| Cost (at time of publication) | Moderate if suitable machinery and materials are available in the area:<br>• $1.00 -$5.00 / $m^2$ depending on location<br>• $3-$5/$m^2$ to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Bitumen emulsion can be applied to any surface, however maximum effectiveness will generally be achieved when the surface is uniformly roughened. Roughening should be done along the contour (ie – horizontally) rather than down the slope, to ensure runoff is not concentrated into channels. |
| Rate of vegetation establishment | Establishment of any vegetation used in conjunction with the bitumen emulsion is completely dependent on the Vegetation Type and Bioregion (see above). |
| Quality assurance and surveillance | Soil preparation; seed germination and purity (if used in conjunction); application rate; seed application method; soil surface cover; ensure application coverage by multiple passes in different directions; ensure the area is moist prior to application. |
| Establishment and maintenance | If used in isolation and while a complete surface crust remains, very little establishment and maintenance should be required. If used in conjunction with vegetation and/or if the surface crust breaks, the following establishment and maintenance might be required:<br>• Reapplication if heavy rain or flow damages the surface crust<br>• Watering vegetation during dry periods<br>• Weed control if topsoil is poor, weeds are adjacent to the seeded area or vegetation establishment is slow<br>• Maintenance applications of ameliorants. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 3

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Soil binder – Tackifiers

Soil binders are a range of products that are applied to the soil surface to effectively glue the soil particles together, forming a crust that is resistant to erosion in varying degrees. They can also be referred to as soil stabilisers.

For the purposes of this fact sheet 'Tackifier' refers to all soil binders other than bitumen-based (see Fact Sheet 2), and includes products that are based on polymer, cementitious or organic (natural) ingredients. Commonly used products include:

- Guar gum – a natural organic tackifier that comes from seeds in the guar plants
- Starch-based – a natural organic tackifier that comes from cornstarch
- Polymer-based – chemical products that are engineered for specific purposes, and can contain additional beneficial ingredients such as fertiliser.

Soil binders are mixed with water and applied to batters hydraulically. They are extremely versatile and can often be used for other applications, such as binding mulches, straw / hay, seeded batters, organic fibre erosion control blankets and compost. Individual product specifications should be used to guide the use and application of each product, noting that some manufacturer's claims might be based on ideal conditions, which are rarely available on dynamic road construction sites.

The effectiveness of tackifiers can be significantly affected by soil type. Heavy and / or well compacted soils may limit the ability of the tackifier to penetrate the soil and form a sufficiently thick surface crust.

Impacts on downstream environments should be considered when selecting an appropriate tackifier. Some are fully biodegradable, while others are photo/chemical degradable.



*Figure FS3a: Tackifier applied with a green dye.*



*Figure FS3b: Water cart application of a tackifier. (Photo: Vital Chemical Pty Ltd)*

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| FACTOR | DETAIL |
|---|---|
| Slope | Tackifiers are likely to be effective on slopes ≤ 3h:1v Some manufacturers claim their products will be effective on slopes up to 1h:1v. Application rate will generally increase with steepening slopes. |
| Level of erosion protection | Dependent on the specific product, but generally raindrop splash erosion and sheet flow. |
| Growing media | Can be applied to any growing media or soil surface cover (eg – organic fibre erosion control blankets). |
| Soil amelioration | Generally none. Some advanced products contain added ingredients that can assist with soil amelioration. |
| Bioregion | Organic tackifiers are generally suitable in all bioregions, but some types may turn the soil hydrophobic. Areas with prolonged or frequent rainfall reduce the effectiveness of tackifiers by leaching or slippages when wet. |
| Access | Installation – access will be required for machines to apply the tackifier. Proximity will depend on the application distance of the specific machine.<br>Maintenance – access may be required for repeat applications. |
| Duration | Short term.<br>Duration varies dramatically, from as little as one month to more than a year. Factors that influence durability include the specific product type, the application rate and the type of activity on the batter. Some are designed to withstand heavy activity such as haul roads, while others will not withstand any disturbance at all. |
| Visual amenity and ecological outcome | Unless a dye is applied, tackifiers are generally not visible once set and will have no impact on visual amenity or ecological outcome. If they are used in conjunction with seeding, the vegetation type will influence this factor. |
| Vegetation type | Many tackifiers are appropriate to stabilise the growing media but still allow the germination of seed. As they are designed to degrade over time, they are suitable for use with any vegetation type. |
| Establishment time until erosion protection | Maximum erosion protection is achieved once the tackifier has cured, which can vary from almost instant to 24 hours, depending on the specific product. |
| Cost (at time of publication) | Low if suitable weed free topsoil is available in the immediate area and application equipment is available on site:<br>• $0.15 - $0.50/m²<br>• Additional $3 - $5/m² to strip, ameliorate and respread topsoil if necessary<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Tackifiers can be applied to any surface, however maximum effectiveness will generally be achieved when the surface is uniformly roughened. Roughening should be done along the contour (ie – horizontally) rather than down the slope, to ensure runoff is not concentrated into channels. Pre-wetting of the surface should be undertaken to assist with adhering the tackifier. |
| Rate of vegetation establishment | Establishment of any vegetation used in conjunction with the tackifier is completely dependent on the Vegetation Type and Bioregion (see above). |
| Quality assurance and surveillance | Soil preparation; seed germination and purity (if used in conjunction); application rate; seed application method; soil surface cover; ensure application coverage by multiple passes in different directions; ensure the area is moist prior to application. |
| Establishment and maintenance | If used in isolation and while a complete surface crust remains, very little establishment and maintenance should be required. If used in conjunction with vegetation and/or if the surface crust breaks, the following establishment and maintenance might be required:<br>• Reapplication if heavy rain or flow damages the surface crust<br>• Watering vegetation during dry periods<br>• Weed control if topsoil is poor, weeds are adjacent to the seeded area or vegetation establishment is slow<br>• Maintenance applications of ameliorants. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

# Fact Sheet 4

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Mulch / Topsoil mixes

## Mulches are homoegenous materials that are derived from organic products.

They can be laid as a blanket directly over the batter surface to be vegetated, or can be used in combination with other stabilisation techniques, such as under- or overlays for organic and synthetic erosion control blankets. They can also be blended with topsoil or compost to provide a relatively stable product that holds growing media in place and provides erosion protection.

Mulches are applied to batters hydraulically, airblown, mechanically or spread manually and may be applied lightly or thickly depending on the material and performance requirements. Mulches provide protection to the batter surface from raindrop, wind and overland flow erosion and can act as a blanket for seed protection, weed suppression, dust control and soil moisture conservation. Commonly used products include:

- Straw – covered separately in Fact Sheet 6
- Shredded vegetation – generally bark and upper canopy material that cannot be milled and is processed for further use (does not include tub-ground mulch which can only be used with caution and specific approval)
- Woodchip – derived from processed hardwood and softwood timbers and some post-consumer wood waste. Apply with caution on acidic soils
- Blended mulches – organic material combined with other materials including tackifiers, topsoil, compost and/or conditioners. The ratio of growing media to mulch must be advised by the soil scientist.

Although most mulches can have multiple purposes, products available as garden or landscape mulches (including fine composts) are not always compatible for use in slope stabilisation. Mulches sourced from site-won material are generally not appropriate for reuse without further processing. Individual product specifications should be used to guide the use and application of each mulch, noting that some manufacturer's claims might be based on ideal conditions, which are rarely available on dynamic road construction sites. Mulch selection must also consider the soil type and soil reports.

Mulches perform in all seasons and climates, although their effectiveness can be influenced by microclimate, aspect, thickness of application and drainage controls. Impacts on downstream environments should be considered when selecting an appropriate mulch as some can float and clog drainage inlets and channels, and some contain tannins that can leach and drain into downstream waterways.



*Figure FS4a: Mix of 60% soil and 40% shredded mulch from local vegetation at Glenugie Upgrade on rock cutting.*



*Figure FS4b: Woodchip and shredded mulch from local paper mill on planted 2h:1v cuts at Woomargama Bypass.*

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| FACTOR | DETAIL |
|---|---|
| Slope | Generally acceptable ≤ 4h:1v. Might be effective up to ≤ 1.5h:1v, if combined with a supplementary stabilisation technique, depending on the geology and drainage design. |
| Level of erosion protection | Excellent for most erosion types except concentrated flows. Mineral mulches (including rock mattresses) should be used on non-dispersive soils in locations of concentrated flows. |
| Growing media | Can be applied over any growing media. Some forms of mulch may be mixed with growing media to enhance adhesion to the slope surface in rural areas only. |
| Soil amelioration | Requirements subject to soil report recommendations. Fresh mulch should not be used in acidic environments. Breakdown of woodchip mulches can result in nitrogen being drawn out of the soil (nitrogen draw-down), so additional amelioration with nitrogen may be required. |
| Bioregion | Suitable for use in all bioregions, but the rate of biodegradation will be faster with increased humidity, temperature and moisture. |
| Access | Installation – direct access for machines is preferred, but some mulches can be airblown or hydraulically applied up to 100 metres from the access point.<br>Maintenance – access may be required for erosion repairs or repeat applications for light mulches if heavy rainfall occurs prior to any vegetation establishment. Depending on site conditions, access may also be required for weed control, repeat applications of ameliorants or watering vegetation. |
| Duration | Extremely variable – mulch and mulch blends will remain effective anywhere from 2–12 months, depending on the type of mulch used.<br>Much longer stabilisation will be achieved if vegetation is established with the mulch – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Mulch and mulch blends alone provide little value for visual amenity or ecological outcomes. Good outcomes can be achieved if vegetation is established with the mulch, but will vary according to the Vegetation Type. |
| Vegetation type | Cover crops, grasses, legumes, native ground covers, shrubs and trees. |
| Establishment time until erosion protection | Some fine materials will wash out immediately, but mulch and mulch blends will provide instant erosion protection. Additional erosion protection will be provided once vegetation (if used) is established.<br>It should be noted that it may not be possible to achieve 70 percent vegetation cover using this technique – however, the mulch pieces will provide part of the soil surface cover, in addition to any vegetation that has established. |
| Cost (at time of publication) | Low, but variable depending on availability of weed-free mulch:<br>• Call local landscape suppliers or Environment Officers for availability and cost if mulch is not available on-site<br>• $3-$5/m² should be allowed to strip and ameliorate topsoil (if necessary), then mix with mulch and respread mulch / topsoil mix<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil scarification and amelioration of subsoil and topsoil. |
| Rate of vegetation establishment | Vegetation establishment is generally moderate to rapid, although will largely depend on the type of mulch or mulch blend used, the Vegetation Type and the Bioregion. |
| Quality assurance and surveillance | Soil preparation; soil testing; soil amelioration; seed germination and purity; seed application rate; seed carrier application rate (where specified); binder type and application rate (where specified); mulch application rate; soil surface cover. |
| Establishment and maintenance | • Site won topsoils may also contain a seed bank of native or weed seeds<br>• The soil must be appropriately managed to pressure the native seed for natural regrowth<br>• Weed seed infested topsoil should be managed as per relevant specifications. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

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# Fact Sheet 5

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Hydroseeding

**Hydroseeding is the hydraulic application of seed and soil ameliorants using purpose built equipment. The seed and ameliorants are added to a tank fitted with an agitator and pump.**

The agitator mixes and then applies the materials via a cannon from the top of the unit or via hoses. The largest and most powerful hydro-seeders can apply seed up to 100 metres away from the unit.

A seed carrier is commonly used to ensure even mixing of the seed in the tank and help it stick to the soil surface. The seed carrier allows visual inspection of the seed application rates and also protects the seed as it passes through the hydro-seeder pump. The seed carrier is normally shredded recycled paper or wood fibre and is applied at 200kg / hectare.

Hydroseeding is mainly used where suitable topsoil is available. Native plant seeds can be applied on subsoil and rocky slopes but vegetation establishment is generally poor.

IMPORTANT NOTE: Hydroseeding is not hydromulching – it is simply a method of applying seed. It does not offer erosion protection until vegetation establishes. It's normally used in situations where conventional seeding equipment such as drill seeders cannot be used due to access limitations or slope steepness. Hydroseeding is often undertaken prior to hydromulching or straw mulching, which will then provide erosion protection until vegetation establishes.



*Figure FS5a: Hydroseed application on a prepared batter.*



*Figure FS5b: Diverse vegetation establishment resulting from hydroseeding overlaid with hydromulch on the Kempsey Bypass.*

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| FACTOR | DETAIL |
|---|---|
| Slope | < 2h:1v if followed by hydro mulching. The slope is limited by the topsoil application. |
| Level of erosion protection | Sheet flow less than maximum permissible velocity of the soil. |
| Growing media | Topsoil. |
| Soil amelioration | Very low. Multiple applications required. Ameliorants easily washed off the slope. |
| Bioregion | Hydroseeding for temporary cover will work in all NSW bioregions, but success will depend on the amount of follow-up rain. Extreme weather conditions will cause failure in hydroseeding from inadequate moisture and death of germinated seed, or the seeding mix being washed off the batter prior to root establishment. Hydroseeding with native seed mixes are more difficult to establish reliably and consistently, as many native seeds require specific climatic conditions to germinate, and may have natural periods of dormancy. Species that have tropical or rainforest origins typically do not work in hydroseeding due to the size and type of seed. Hydroseeding works well in bioregions with little climatic variation. |
| Access | Installation – access will be required for hydro-seed machines to apply the seed. Proximity will depend on the application distance of the specific machine – truck-mounted units are fixed and will need to be immediately adjacent to the batter, whereas machines fitted with hoses may be able to apply seed up to 100 metres from the access point.<br>Maintenance – access may be required for erosion repairs or repeat applications if rainfall occurs prior to establishment. Depending on site conditions, access may also be required for weed control, repeat applications of ameliorants or watering vegetation. |
| Duration | Completely dependent on 'Vegetation type' (see below). |
| Visual amenity and ecological outcome | Hydroseeding allows the use of any Vegetation Type (see below), subject to seed availability, and hence any visual amenity and ecological outcome requirements can be tailored in the seed mix. |
| Vegetation type | Cover crops, grasses and legumes, native ground covers, shrubs and trees. |
| Establishment time until erosion protection | No erosion protection is provided until vegetation establishes. Optimum erosion protection is usually provided once 70 percent soil surface cover is achieved. A hydromulch cover is often recommended to provide erosion and raindrop protection during establishment. |
| Cost (at time of publication) | Low if suitable weed free topsoil is available in the immediate area:<br>• $0.40-$2.00/m² depending on location and area seeded<br>• Additional $3-$5/m² to strip, ameliorate and respread topsoil if necessary<br>• Maintenance costs can be high depending on conditions (see below). |
| Preparation | Soil surface should be scarified and topsoil and subsoil should be ameliorated. Advice should be sought by relevant experts and agronomists to develop the appropriate species, seeding rates, ameliorants and watering requirements. |
| Rate of vegetation establishment | Slow – highly variable. |
| Quality assurance and surveillance | Soil preparation, soil testing, soil amelioration, seed germination and purity, application rate and purity, seed carrier application (where specified), seed application method, binder application rate (where specified). |
| Establishment and maintenance | Establishment and maintenance can be intensive depending on site conditions, and could include:<br>• Erosion repairs or repeat applications if rain occurs prior to vegetation establishment<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent to the seeded area or vegetation establishment is slow<br>• Watering in dry conditions to establish vegetation. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 6

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Straw mulching

**Straw mulching is the application of a cereal or cane toppings straw material to the soil surface to provide raindrop splash erosion protection and moisture retention and thermal insulation.**

These properties make it a very effective method for vegetation establishment (particularly grasses). Despite this, the use of straw mulch has declined due to the difficulty in obtaining cheap and weed free straw. Hay can be used when the establishment of pasture grasses and weeds is not an issue.

If vegetation is to be established, the topsoil must be tested, ameliorated and seeded (normally Hydroseeding) prior to the application of the straw mulch. When straw is used as seed mulch, it is important that the application rates are sufficient to retain moisture in the soil (~25mm), but not too deep that a physical barrier is formed and all sunlight is restricted (~50mm).

Straw and hay can be spread by hand or with a straw blower. For large jobs, using a trailer or truck mounted blower unit is the most practical application method. Straw mulch should be applied at a rate of 5000kg/hectare (approximately 250 bales). The distance that straw or hay can be blown depends on the hay blowing equipment, wind conditions during application, straw characteristics, and whether the material is being applied upslope or downslope (cuts or fills). When wind is favourable, straw can be blown up to 45 metres. However in adverse conditions the application of straw may not be possible.

Once applied, the straw is susceptible to movement with moderate to high winds, so is usually applied with some form of binder, such as Bitumen emulsion (see Fact Sheet 2) or Tackifier (see Fact Sheet 3). The straw and bitumen emulsion can either be applied at the same time or the bitumen emulsion applied as an overspray. Tackifiers are often applied over the straw, and can be used with low quantities of Hydromulch to assist in binding the straw together.

However if a binder is used it only glues the straw to itself, not the soil surface. As such it is critical that all upstream flows are diverted away from the batter so the straw is not dislodged by overland flow. As an alternative, straw can also be crimped, rolled, or punched into the soil. These measures will bury portions of the stems into the soil and can increase erosion protection because of the more intimate contact of straw with the soil surface. The potential for compaction is increased and should be considered if using these treatments.

NOTES: Straw mulch should not be used on dispersive soils unless they are suitably ameliorated with gypsum. *Triticale* species must not be used in the Tablelands, East Slopes and Western Plains regions, in order to prevent the spread of "wheat rust" in wheat growing areas.



*Figure FS6a: Straw mulch being applied with a trailer mounted straw blower.*



*Figure FS6b: Straw mulch being ineffectively applied in adverse wind conditions.*

| FACTOR | DETAIL |
|---|---|
| Slope | ≤ 2h:1v |
| Level of erosion protection | Raindrop splash erosion only. |
| Growing media | Topsoil. |
| Soil amelioration | Straw mulching provides little or no soil amelioration. Depending on the results of soil tests, the subsoil and topsoil should be ameliorated prior to seeding (if relevant) and the application of straw mulch |
| Bioregion | Straw mulching is appropriate for use in all NSW bioregions, and can be used at any time of year for erosion control purposes. Straw mulching is an excellent thermal cover for seeded batters in frost-prone and cool climate areas, and soil moisture retention in hot and dry areas. Careful planning should be untertaken for the application of straw mulch in windy areas or hot seasons as dry straw can be a fire risk and is easily blown from site. In wet sites, ensure that the species origin of the straw will not host pathogens or other plant diseases that may affect agricultural areas. |
| Access | Installation – Straw mulch has a limited application distance so machinery will need access immediately adjacent to the batter. If necessary, access for soil amelioration may also be necessary.<br>Maintenance – access may be required for erosion repairs or repeat applications if rainfall occurs prior to establishment. Depending on site conditions, access may also be required for weed control, repeat applications of ameliorants or watering vegetation. |
| Duration | Straw mulch will remain effective for 2 – 6 months.<br>Much longer stabilisation will be achieved if vegetation is established with the straw mulch – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Straw mulch (& binder if used) alone provides little value for visual amenity or ecological outcomes. Good outcomes can be achieved if vegetation is established with the straw mulch, but will vary according to the Vegetation Type. |
| Vegetation type | Cover crops, grasses and legumes. |
| Establishment time until erosion protection | Immediate if only straw mulch is used. Up to 24 hours if a binder is used, to allow for curing. |
| Cost (at time of publication) | Moderate if suitable weed free topsoil is available in the immediate area:<br>• $0.60-$5.00/m² depending on location, area to be treated and availability of weed free straw<br>• Additional $3-$5/m² to strip, ameliorate and respread topsoil, if necessary<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil scarification and amelioration of subsoil and topsoil. |
| Rate of vegetation establishment | Vegetation establishment is moderate to rapid. |
| Quality assurance and surveillance | Soil preparation; soil testing; soil amelioration; seed germination and purity; seed application rate; seed carrier application rate (where specified); seed application method; binder type and application rate (where specified); straw mulch weed certification certificates; straw mulch application rate; soil surface cover. |
| Establishment and maintenance | Establishment and maintenance can be relatively intensive depending on site conditions, and could include:<br>• Watering (dependent on rainfall and Vegetation Type)<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow<br>• Re-application if vegetation does not establish or there is damage from wind or water erosion. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 7

Guideline for Batter Surface Stabilisation using vegetation

# Hydromulching – Standard

Hydraulic Mulch (Hydromulch) consists of various types of organic fibrous materials (eg – paper / wood pulp, wood fibre, straw fibre or milled cane fibre) mixed with water and sprayed onto the soil surface in slurry form that sets to provide a layer of temporary protection from wind and water erosion. There are three broad types of Hydromulching: Standard (this Fact Sheet), Bonded fibre matrix (Fact Sheet 8) and Hydrocompost (Fact Sheet 9).

Standard Hydromulches should be applied at the specified rate, generally between 1,500 and 3,500 kilograms per hectare. They are manufactured containing around 5 percent Tackifier (see Fact Sheet 3), soil ameliorants, and sometimes seed. However ideally the seed should be applied separately prior to mulching, to ensure good contact with the soil. Food-based dyes are commonly added to provide a blue or green colouring.

Standard Hydromulch provides a degree of short term soil surface protection from raindrop splash erosion and low volume sheet flow in low to moderate rainfall erosivity environments. It is essential that upstream flows are diverted away from the batter.

IMPORTANT NOTE: Aged organic materials should be used to prevent nitrogen draw-down.



*Figure FS7a: Standard Hydromulch being applied to a batter on the Hunter Expressway.*



*Figure FS7b: Hydromulch application on a shallow gradient batter, with green dye for visibility.*

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| FACTOR | DETAIL |
|---|---|
| Slope | < 3h:1v<br>On slopes ≥ 3h:1v Hydromulch can potentially be used in combination with a suitable supplementary stabilisation technique, such as an open weave organic fibre erosion blanket. |
| Level of erosion protection | Raindrop splash erosion and low volume sheet flow. Bonded fibre matrix or Hydrocompost will withstand heavier flow conditions. |
| Growing media | Topsoil. |
| Soil amelioration | Low. Only very small quantities of ameliorants are retained in the mulch. Ameliorants are easily washed off the slope so multiple applications may be required. The quality of the growing media and the Vegetation Type will determine the type and quantity of ameliorants that are required. |
| Bioregion | Hydromulching for temporary cover will work in all NSW bioregions, but success will depend on the amount of follow-up rain. Extreme weather conditions will cause failure in hydromulching from inadequate moisture and death of germinated seed, or the seed and mulch mix being washed off the batter prior to root establishment. Hydromulches with native seed mixes are more difficult to establish reliably and consistently, as many native seeds require specific climatic conditions to germinate, and may have natural periods of dormancy. Species that have tropical or rainforest origins typically do not work in hydromulching due to the size and type of seed. Hydromulching is appropriate to use in areas where the may be sudden changes in climatic conditions, or where straw mulching cannot be applied. |
| Access | Installation – Access will be required for Hydromulch machines to apply the mulch (and seed, where used). Proximity will depend on the application distance of the specific machine – truck-mounted units are fixed and will need to be immediately adjacent to the batter, whereas machines fitted with hoses may be able to apply mulch up to 100 metres from the access point.<br>Maintenance – Access may be required for re-application, watering, applications of ameliorants or weed control. |
| Duration | Hydromulch will remain effective for 2 – 6 months.<br>Much longer stabilisation will be achieved if vegetation is established with the Hydromulch – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Hydromulch alone provides little value for visual amenity or ecological outcomes. Good outcomes can be achieved if vegetation is established with the Hydromulch, but will vary according to the Vegetation Type (see below). |
| Vegetation type | Cover crops, grasses, legumes, native shrubs. |
| Establishment time until erosion protection | Hydromulch will provide erosion protection as soon as the mulch sets (12 - 24 hours), however only offers a low level of protection. Vegetation (if used) will provide significantly better erosion protection once established.<br>Bonded fibre matrix or Hydrocompost will provide better erosion protection than Standard Hydromulch, in a similar time period. |
| Cost (at time of publication) | Low if suitable weed free topsoil is available in the immediate area:<br>• $0.70 - $2.50/m² depending on location and area treated<br>• Additional $3 - $5/m² to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Scarified soil and amelioration of topsoil and subsoil. |
| Rate of vegetation establishment | Vegetation establishment is slow and variable. |
| Quality assurance and surveillance | Soil preparation, soil testing, seed application method, seed application rate, seed germination and purity, mulch type and application rate, soil surface cover, binder application rate, soil ameliorant application rate; application coverage by multiple passes in different directions, ensure the area is moist prior to application. |
| Establishment and maintenance | Establishment and maintenance can be relatively intensive depending on site conditions, and could include:<br>• Reapplication if heavy rain or flow washed hydromulch off the slope<br>• Watering vegetation during dry periods<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 8

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Hydromulching–Bonded fibre matrix

Hydraulic Mulch (Hydromulch) consists of various types of organic fibrous materials (eg – paper / wood pulp, wood fibre, straw fibre or milled cane fibre) mixed with water and sprayed onto the soil surface in slurry form that sets to provide a layer of temporary protection from wind and water erosion. There are three broad types of Hydromulching: Standard (Fact Sheet 7), Bonded fibre matrix (this Fact Sheet) and Hydrocompost (Fact Sheet 9).

Bonded fibre matrix (BFM) Hydromulches contain a high percentage of long fibres and are generally applied at a rate of 4,000 to 6,000 kilograms per hectare. BFMs should not be applied immediately before, during or immediately after rainfall or if the soil is saturated. They are generally manufactured containing around 2-4 percent cross-linked adhesive, around 1 percent polymer tackifier (see Fact Sheet 3) and soil ameliorants. The cross-linked adhesive should be biodegradable and should not dissolve or disperse upon rewetting. Food-based dyes are commonly added to provide a blue or green colouring.

BFM is designed to provide increased performance compared to Standard Hydromulch. This includes longer term erosion protection by providing complete soil surface cover, improved seed germination and hence revegetation outcomes and a greater ability to suppress weeds.



*Figure FS8a: Correctly applied BFM Hydromulch - note 100% coverage. (Source: Landloch Pty Ltd)*



*Figure FS8b: Poorly applied BFM Hydromulch - note ineffective coverage. (Source: Landloch Pty Ltd)*

| FACTOR | DETAIL |
|---|---|
| Slope | ≤ 1h:1v<br>On steep slopes the BFM Hydromulch can be anchored or covered using a suitable supplementary stabilisation technique (eg – open weave organic blanket, turf re-enforcement mat) to increase likelihood of success. |
| Level of erosion protection | Raindrop splash erosion or sheet flow. May withstand concentrated flow if combined with a supplementary stabilisation technique (see above). |
| Growing media | Topsoil. |
| Soil amelioration | Moderate. Only a small quantity of ameliorants can be retained in the mulch. Ameliorants can be washed off the slope and re-application may be required. The quality of the growing media and the Vegetation Type will determine the type and quantity of ameliorants that are required. |
| Bioregion | BFM hydromulch is appropriate for use in all NSW bioregions, but success will depend on the seed mix and application of seeds prior to covering with BFM. It is best used in areas prone to erosion from weather events, and with seed mixes that are aggressive pioneer species. |
| Access | Installation – Access will be required for Hydromulch machines to apply the mulch (and seed, where used). Proximity will depend on the application distance of the specific machine – truck-mounted units are fixed and will need to be immediately adjacent to the batter, whereas machines fitted with hoses may be able to apply mulch up to 100 metres from the access point.<br>Maintenance – Access may be required for re-application, watering, applications of ameliorants or weed control. |
| Duration | BFM Hydromulch will remain effective for 6–12 months.<br>Much longer stabilisation will be achieved if vegetation is established with the BFM Hydromulch – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | BFM Hydromulch alone provides little value for visual amenity or ecological outcomes. Good outcomes can be achieved if vegetation is established with the BFM Hydromulch, but will vary according to the Vegetation Type (see below). |
| Vegetation type | Cover crops, grasses, legumes, native ground covers, shrubs and trees. |
| Establishment time until erosion protection | BFM Hydromulch will provide erosion protection as soon as the mulch sets (24 - 48 hours), and offers a medium to high level of protection. Vegetation (if used) will provide further erosion protection once established. |
| Cost (at time of publication) | Moderate if suitable weed free topsoil is available in the immediate area:<br>• $2.50-$4.50/m² depending on location and area treated<br>• Additional $3-$5/m² to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil scarification and amelioration of subsoil and topsoil. |
| Rate of vegetation establishment | Vegetation establishment is moderate to rapid. |
| Quality assurance and surveillance | Soil preparation; soil testing; soil amelioration; seed germination and purity; seed application rate; mulch type and application rate; application coverage by multiple passes in different directions; binder type and application rate; soil ameliorant application rate; soil surface cover. |
| Establishment and maintenance | Establishment and maintenance requirements are dependent on site conditions, and could include:<br>• Reapplication if heavy rain or flow washes materials off the slope<br>• Watering vegetation during dry periods<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow (although BFM Hydromulch generally provides good weed suppression). |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

Fact Sheet 9

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Hydromulching – Hydrocompost

Hydraulic Mulch (Hydromulch) consists of various types of organic fibrous materials (eg – paper / wood pulp, wood fibre, straw fibre or milled cane fibre) mixed with water and sprayed onto the soil surface in slurry form that sets to provide a layer of temporary protection from wind and water erosion. There are three broad types of Hydromulching: Standard (Fact Sheet 7), Bonded fibre matrix (Fact Sheet 8) and Hydrocompost (this Fact Sheet).

Hydrocompost combines approximately 4,000kg / hectare of finely screened compost into the hydromulch slurry. Specified seed can also be added to the mix. Some proprietary products are available that combine these ingredients into a pre-packaged blend. Hydrocompost is particularly useful as an in-fill for three-dimensional batter surface stabilisation techniques, such as Turf reinforcement mats (see Fact Sheet 15).

Many Australian soils have extremely low organic carbon levels, which can limit vegetation establishment and growth in new stabilisation projects. However, when combined with other appropriate soil ameliorants, Hydrocompost can often improve the organic carbon levels and the soils biological properties enough to accelerate seed germination and growth and achieve an acceptable revegetation outcome. The heavy mulch and likely good revegetation outcomes can result in good weed suppression.

The compost used in hydrocompost is screened to remove particle sizes that would block the pumps in the hydromulching equipment. The quality of the compost is critical and it must comply with relevant specifications (eg – Australian Standard 4454: Compost, Soil conditions and Mulches). Poor quality compost can result in high nitrogen draw down, contain heavy metals, plastics and glass fragments and have elevated salinity.



*Figure FS9a: Application of Hydrocompost on the Kempsey Bypass. (Source: Matthew Easton)*



*Figure FS9b: Vegetation establishment from Hydrocompost on the Kempsey Bypass. (Source: Matthew Easton)*

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| FACTOR | DETAIL |
|---|---|
| Slope | No limits. Hydrocompost is limited by the ability of the topsoil over which it is applied to hold on a slope.<br>On steep slopes the Hydrocompost can be anchored or covered using a suitable supplementary stabilisation technique (eg – open weave organic erosion control blanket, turf re-enforcement mat) to increase likelihood of success. |
| Level of erosion protection | Raindrop splash erosion or sheet flow. May withstand concentrated flow if combined with a supplementary stabilisation technique (see above). |
| Growing media | Topsoil and sub-soil (assuming sufficient organic carbon can be applied to the sub-soil in the compost). |
| Soil amelioration | Moderate. Only a small quantity of ameliorants can be retained in the mulch. |
| Bioregion | Hydrocompost is bested suited to bioregions that can supply the required materials and will return the appropriate organics to the affected areas. As it can be used on steep slopes and often in conjunction with additional slope stabilisation techniques, it is suitable for forest and woodland environments and areas with regular heavy rain events. |
| Access | Installation – Access will be required for Hydromulch machines to apply the Hydrocompost (and seed, where used). Proximity will depend on the application distance of the specific machine – truck-mounted units are fixed and will need to be immediately adjacent to the batter, whereas machines fitted with hoses may be able to apply the material up to 100 metres from the access point.<br>Maintenance – Access may be required for re-application, watering, applications of ameliorants or weed control. |
| Duration | Hydrocompost will remain effective for 6–12 months.<br>Much longer stabilisation will be achieved if vegetation is established with the Hydrocompost –duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Hydrocompost alone provides little value for visual amenity or ecological outcomes. Good outcomes can be achieved if vegetation is established with the Hydrocompost, but will vary according to the Vegetation Type (see below). |
| Vegetation type | Cover crops, grasses, legumes, native ground covers, shrubs and trees. |
| Establishment time until erosion protection | Hydrocompost will provide erosion protection as soon as the mulch sets (24–48 hours), and offers a medium to high level of protection. Vegetation (if used) will provide further erosion protection once established. |
| Cost (at time of publication) | Moderate if suitable weed free topsoil is available in the immediate area. Low if applied directly to subsoil and an acceptable vegetation outcome can be achieved.<br>• $3.50-$6.50/m² depending on location and area treated<br>• Additional $3-$5/m² to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil scarification and amelioration of subsoil and topsoil. |
| Rate of vegetation establishment | Vegetation establishment is slow and variable. |
| Quality assurance and surveillance | Soil preparation; soil testing; seed germination and purity; seed application rate; mulch type and application rate; application coverage by multiple passes in different directions; compost quality and application rate; binder application rate; soil ameliorant application rate; soil surface cover. |
| Establishment and maintenance | Establishment and maintenance requirements are dependent on site conditions, and could include:<br>• Reapplication if heavy rain or flow washes materials off the slope<br>• Watering vegetation during dry periods<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow (although Hydrocompost generally provides good weed suppression). |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 10

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Erosion control blanket – Organic fibre

Erosion control blankets (ECBs) are rolled erosion control products designed to protect the soil surface from various degrees of erosion.

They range from open meshes to thick dense mats, and can be manufactured from organic fibres (this fact sheet) or synthetic materials (Fact Sheet 11). There are many different Organic fibre ECBs available, so this fact sheet only describes general information.

Organic fibre ECBs are biodegradable and are suitable to be left in-situ if vegetation is also established. Organic fibre ECBs can be divided into two broad types:

- Grass promotion blankets – generally open meshes or thin mats and made of straw fibre, wood shavings or coir. Seed should be applied under the blanket to ensure intimate soil contact
- Weed suppression blankets – generally thick mats and made of jute or recycled fibre. Seedlings can be planted into the soil below the blanket using slits.

To function correctly and avoid being undermined, all ECBs require intensive soil preparation and correct installation. They must be adequately anchored at the top of the batter, pinned (stapled) and secured down the batter face (≤300mm spacing) to ensure intimate soil contact, and be overlapped the correct way (≥100mm, with each length over the top of the one below, like roof tiles). Installation should also achieve 100 percent coverage to ensure water cannot ingress and undermine the ECB.

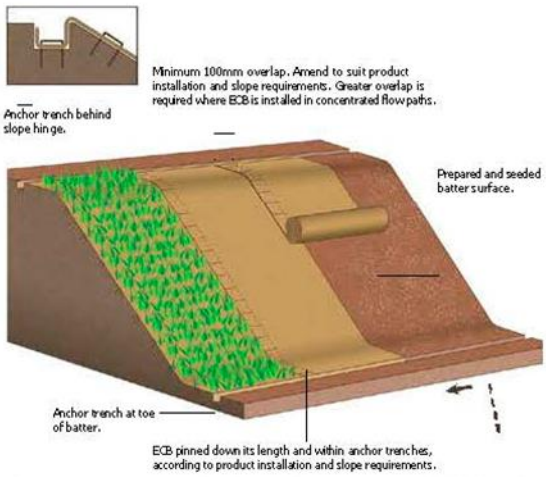



*Figure FS10a: Correct ECB installation for a grass promotion blanket using seed. See Fact Sheet 11 for correct ECB installation for a weed suppression blanket using planting.*

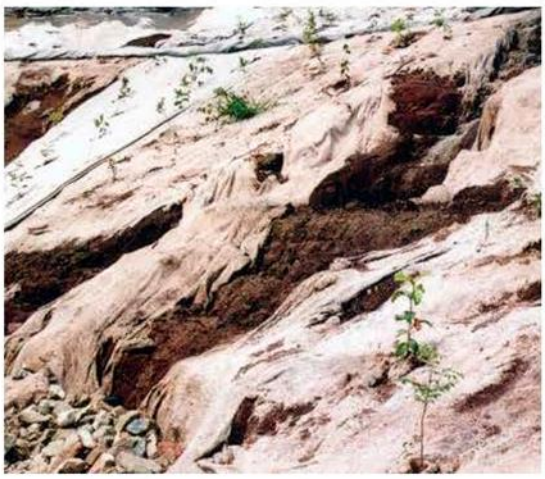


*Figure FS10b: ECB failure due to poor surface preparation and water ingress through tree planting cuts.*
*(Source: Landloch Pty Ltd)*

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| FACTOR | DETAIL |
|---|---|
| Slope | There is no limit to the slope that Organic fibre ECBs can be applied to, as they are anchored to the slope surface with pins. They will be limited by the ability of the topsoil below to hold on the slope. |
| Level of erosion protection | Raindrop splash impact and sheet flow. |
| Growing media | Topsoil. |
| Soil amelioration | Organic fibre ECBs provide no soil amelioration. If vegetation is to be established through the ECB, soil amelioration might need to be undertaken prior to installation to provide suitable conditions for the desired vegetation type. |
| Bioregion | Organic fibre ECBs are suitable for use in all NSW bioregions, but the climate and level of exposure to weather (especially wetting and drying cycles) will affect the longevity and integrity of the material. |
| Access | Installation – intensive slope preparation and anchoring is required and access is needed down the entire batter. On steep slopes where safety is an issue, this may require the use of a cherry picker and/or other machinery.<br>Maintenance – Access may be required for watering vegetation, anchoring repairs, replacing any damaged ECB and weed control. |
| Duration | Organic fibre ECBs will last up to 12 months before biodegrading - thickness and density are the biggest factors influencing duration.<br>Much longer stabilisation will be achieved if vegetation is established with the ECB – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Organic fibre ECBs are made from natural materials that provide minimal visual impact, but alone they provide little ecological value. The establishment of vegetation will improve the visual amenity and has the potential to improve ecological outcomes. |
| Vegetation type | Grass promotion blankets – cover crops, grasses and legumes.<br>Weed suppression blankets – native ground covers, shrubs and trees. |
| Establishment time until erosion protection | Erosion protection is provided immediately upon installation. This will be enhanced if vegetation is established with the ECB. |
| Cost (at time of publication) | High:<br>• $5-$10/m$^2$ for materials, plus intensive soil preparation and labour costs<br>• Additional $3-$5/m$^2$ to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for plants, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil amelioration and intensive soil preparation to provide a uniform surface free of obstructions, tree stumps or rubble and create intimate contact between the ECB and soil surface. Preliminary weed control is essential before laying the material. If using a grass promotion blanket, seed should be applied before laying the material. |
| Rate of vegetation establishment | Vegetation establishment is generally slow. |
| Quality assurance and surveillance | Soil testing; soil amelioration; soil preparation; seed germination and purity; seed application rate; mulch type and application rate; compost quality and application rate; binder application rate; soil ameliorant application rate; soil surface cover. |
| Establishment and maintenance | Establishment and maintenance requirements are generally low to moderate, and could include:<br>• Reapplication if heavy rain or flow washes materials off the slope<br>• Watering vegetation during dry periods<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 11

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Erosion control blanket – Synthetic

Erosion control blankets (ECBs) are rolled erosion control products designed to protect the soil surface from various degrees of erosion. They range from open meshes to thick dense mats, and can be manufactured from organic fibres (Fact Sheet 10) or synthetic materials (this fact sheet). There are many different Synthetic ECBs available, so this fact sheet only describes general information.

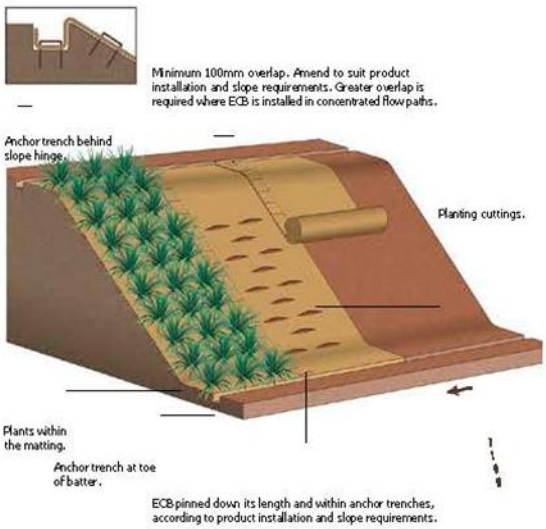
Synthetic ECBs are manufactured from a variety of polymers and are not biodegradable. As such, they can generate a waste problem and must be removed and appropriately disposed of once they are no longer required for stabilisation. Synthetic ECBs can be divided into two broad types:

- Grass promotion blankets - generally open meshes or thin mats. Seed should be applied under the blanket to ensure intimate soil contact
- Weed suppression blankets – generally thick mats. Seedlings can be planted into the soil below the blanket using small slits (see Figure FS11a).

To function correctly and avoid being undermined, all ECBs require intensive soil preparation and correct installation. They must be adequately anchored at the top of the batter, stapled and secured down the batter face (≤300mm spacing) to ensure intimate soil contact, and be overlapped the correct way (≥100mm, with each length over the top of the one below, like roof tiles). Installation should also achieve 100 percent coverage to ensure water cannot ingress and undermine the ECB.



*Figure FS11a: Erosion control blanket with cuttings for plantings. (Source: Geofabrics Australasia Pty Ltd)*




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| FACTOR | DETAIL |
|---|---|
| Slope | There is no limit to the slope that synthetic ECBs can be applied too, as they are anchored to the slope surface with staples. They will be limited by the ability of the topsoil below to hold on the slope. |
| Level of erosion protection | Synthetic erosion control blankets are designed to withstand sheet flow up to ~1.5 metres / second. |
| Growing media | Topsoil. |
| Soil amelioration | Synthetic ECBs provide no soil amelioration. If vegetation is to be established through the ECB, soil amelioration might need to be undertaken prior to installation to provide suitable conditions for the desired vegetation type. |
| Bioregion | Synthetic ECBs are suitable for use in all bioregions, but the should consider aspect and temperature. If left uncovered or unshaded, synthetic ECBs may increase the soil temperature in the upper root zone for newly germinated plants, which can inhibit vegetative establishment. Ensure that the ECB is UV-stable for use in exposed areas. |
| Access | Installation – intensive slope preparation and anchoring is required and access is needed down the entire batter. On steep slopes where safety is an issue, this may require the use of a cherry picker and/ or other machinery.<br>Maintenance – Access may be required for watering vegetation, anchoring repairs, replacing any damaged ECB and weed control. |
| Duration | Synthetic ECBs will last up to 2 years before starting to break down - thickness and density are the biggest factors influencing duration.<br>Much longer stabilisation will be achieved if vegetation is established with the ECB – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | Synthetic ECBs are often neutral colours that provide minimal visual impact, but alone they provide little ecological value. The establishment of vegetation will improve the visual amenity and has the potential to improve ecological outcomes. |
| Vegetation type | Grass promotion blankets – cover crops, grasses and legumes.<br>Weed suppression blankets – native ground covers, shrubs and trees. |
| Establishment time until erosion protection | Erosion protection is provided immediately upon installation. This will be enhanced if vegetation is established with the ECB. |
| Cost (at time of publication) | Very high:<br>• $5-$10/m$^2$ for materials, plus intensive soil preparation and labour costs<br>• Additional $3-$5/m$^2$ to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for plants, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil amelioration and intensive soil preparation to provide a uniform surface free of obstructions, tree stumps or rubble and create intimate contact between the ECB and soil surface. Preliminary weed control is essential before laying the material. If using a grass promotion blanket, seed should be applied before laying the material. |
| Rate of vegetation establishment | Vegetation establishment is generally slow. |
| Quality assurance and surveillance | Soil testing, soil amelioration, soil preparation; seed germination and purity; seed application rate; seed application method; mulch type and application rate; binder application rate; soil ameliorant application rate; soil surface cover. |
| Establishment and maintenance | Establishment and maintenance requirements are generally low to moderate, and could include:<br>• Reapplication if heavy rain or flow washes materials off the slope<br>• Watering vegetation during dry periods<br>• Maintenance application of ameliorants<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

# Fact Sheet 12

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Cellular confinement systems

**Cellular confinement systems are either a permanent or biodegradable product with the primary purpose to uniformly contain soil and other materials over an area and provide geotechnical strength with low strength materials and/or environments. The permanent cellular confinement systems are constructed from HDPE and the biodegradable ones from coconut fibre.**

Cellular confinement systems were originally designed to contain material for temporary or permanent low cost, load-bearing access tracks over soft or unstable ground such as sand dunes, river beds and water logged areas. They can be effective for some batter surface stabilisation situations, where they confine fill material to resist flows, minimise erosion and prevent the downward migration of the materials. They are also suitable as a channel liner in some low velocity situations.

For batter surface stabilisation and the establishment of vegetation, they can be filled with topsoil or compost. Seed can either be applied with the growing media, or as a secondary application on top of the growing media. To protect seeds and assist with germination and establishment, compost blankets or bonded fibre matrix Hydromulch products can be used in conjunction with the cellular confinement system.

Cellular confinement systems require intensive slope preparation and fastening, and the edges of the system should be installed at or below ground level to minimise scouring at the edges by run on stormwater. Incorrect installation can result in dramatic failures, as one weak point can drag the entire batter down the slope.




*Figure FS12a: Installation of cellular confinement system - backfilling with unbound granular material beneath the pavement and imported topsoil on the batter slope. (Source: Queensland Department of Transport and Main Roads)*



*Figure FS12b: Cellular confinement that has been installed and planted out on an extremely steep slope, and begun to slump due to insufficient anchoring.*

April 2015

| FACTOR | DETAIL |
|---|---|
| Slope | ≤1h:1v |
| Level of erosion protection | Raindrop splash erosion, sheet flow and low velocity concentrated flow. |
| Growing media | Topsoil or compost. |
| Soil amelioration | Soil amelioration is completely dependent on the material used to fill the cellular confinement system. If topsoil is used, it should be tested and ameliorated (if necessary) to ensure it is appropriate for any vegetation that is to be established. If compost is used, it can provide good soil amelioration for the existing topsoil / subsoil below. |
| Bioregion | Cellular confinement systems are generally able to be used in all NSW bioregions, but their effectiveness and installation depends on the geotechnical conditions. Avoid using cellular confinement systems in vegetation systems with buttressing roots that can "heave" the system off the ground surface. Cellular confinement systems made with thick synthetic materials may also absorb extra heat in exposed aspects. |
| Access | Installation – intensive slope preparation and anchoring is required and access is needed down the entire slope. On steep slopes where safety is an issue, this may require the use of a cherry picker and/ or other machinery.<br>Maintenance – Access may be required for watering, re-application of seed, anchoring repairs and weed control. |
| Duration | HDPE cellular confinement systems can be installed as permanent fixtures.<br>Coconut fibre cellular confinement systems will last up to 4 years. |
| Visual amenity and ecological outcome | HDPE cellular confinement systems can be visually obtrusive and provide little ecological value. Coconut fibre cellular confinement systems can also be visually obtrusive, but provide a more natural appearance, but still provide little ecological value. The establishment of vegetation will improve the visual amenity of both products and has the potential to improve ecological outcomes. |
| Vegetation type | Cover crops, grasses, legumes, native ground covers, shrubs and trees. The cell size (ranges from ~200–400mm diameter) will limit the growth of trees and should be considered when selecting species so as not to cause ring-barking. |
| Establishment time until erosion protection | Erosion protection is immediate once appropriately installed, and will improve as vegetation (if used) establishes. Cellular confinement systems should not be used on dispersive soils unless suitably ameliorated with gypsum. |
| Cost (at time of publication) | Very high:<br>• $20-$30/m² for supply of cellular confinement system and installation<br>• Additional cost for soil anchors (eg – duck billed anchors, soil nails)<br>• Additional $3-$5/m² to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for seed, watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil amelioration may be required when topsoil is used. Intensive soil preparation is required to provide intimate contact between the cellular confinement system and the soil surface. If vegetation is to be established, seeding will be required. |
| Rate of vegetation establishment | Vegetation establishment will be variable if topsoil alone is used.<br>Vegetation establishment will be rapid if installation is combined with compost, a compost blanket or topsoil with BFM hydromulch. |
| Quality assurance and surveillance | Soil testing and amelioration; cellular confinement system type and installation; soil preparation; seed germination and purity; seed application rate; seed application method; mulch type. |
| Establishment and maintenance | Establishment and maintenance requirements can be intensive and long-term, and could include:<br>• Watering in dry conditions and re-seeding any failed areas<br>• Long term maintenance of slopes with plastic matrix in place<br>• Long term observations of tree establishment to ensure they are not strangled by cells<br>• Ongoing observations of anchoring<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 13

Guideline for Batter Surface Stabilisation using vegetation

# Compost blanket

A compost blanket consists of high quality compost, organic tackifiers (normally Guar), biological stimulants (bacteria and fungi foods), wetting agents, soil ameliorants and (usually) a seed mix, that is applied to the surface of the batter. They have many potential applications, but can be particularly useful when slopes are too steep for topsoil application, there is insufficient topsoil, the topsoil is of poor quality (including weed infested), or the topsoil is inaccessible for amelioration.

The compost production process results in a stable growing media that is high in organic carbon, has low potential for viable weed seeds (due to pasteurisation) and will not result in nitrogen drawdown. The compost provides slow release nutrients for vegetation establishment, has good water holding capacity and can be used on compacted and dispersible (with amelioration) soils. To ensure the quality of the compost, it is normally recommended that it be produced according to Australian Standard 4454.

Compost blankets are usually applied with pneumatic blowers at thicknesses ranging from 25 - 100 millimetres depending on slope conditions and desired vegetation outcome. Thin compost blankets are normally used for grass establishment and/or low rainfall environments and thick compost blankets are normally used for native vegetation establishment and/or high rainfall environments. The installation must achieve 100 percent soil surface cover with a uniform thickness, and must extend over the top of the batter to ensure water does not undermine the blanket.



*Figure FS13a: Application of a compost blanket on a steep batter. This application also included the addition of woodchip to provide additional erosion protection. (Source: Leighton Contractors)*



*Figure FS13 b: Watering of compost blanket after application. (Source: The Hills Bark Blower)*

April 2015

| FACTOR | DETAIL |
|---|---|
| Slope | ≤ 2h:1v<br>≤ 1h:1v if used with a supplementary stabilisation technique (eg – open weave organic blanket, turf re-enforcement mat). |
| Level of erosion protection | Raindrop splash erosion and sheet flow. May withstand low velocity concentrated flow if combined with a supplementary stabilisation technique (see above). |
| Growing media | The compost is supplied as the growing media, and is best applied over subsoils and where topsoil does not exist (eg – over rock). |
| Soil amelioration | The compost blanket provides medium-long term, slow release amelioration to the soil over which it is placed. However the compost itself normally provides all of the required properties to establish the desired vegetation. |
| Bioregion | Compost is appropriate for use in any NSW bioregion. |
| Access | Installation – Access requirements will depend on the application method. If applied by earthmoving machinery, the machines will need suitable access to the batter itself. Truck-mounted pneumatic blowers can apply compost up to 100 metres from the truck access point.<br>Maintenance – Access may be required for watering and re-application in any failed areas. |
| Duration | The compost blanket itself will remain effective for 6 – 12 months.<br>Much longer stabilisation will be achieved if vegetation is established with the compost blanket – duration will be dependent on the Vegetation Type (see below). |
| Visual amenity and ecological outcome | The compost blanket itself provides little visual amenity or ecological outcomes. However the vegetation, once established, can provide significant outcomes – this will be dependent on the vegetation type (see below). |
| Vegetation type | Cover crops, grasses, legumes, native ground covers, shrubs and trees. |
| Establishment time until erosion protection | Compost blankets will provide a medium to high level of erosion protection as soon as the tackifier sets (24-48 hours). Vegetation (if used) will provide further erosion protection once established. |
| Cost (at time of publication) | High upfront cost:<br>• $3.50-$12/m$^2$ – depending on distance from suitable compost supply, area to be treated, depth of application and additives (eg – seed, ameliorants) required<br>• However topsoil is not required, and maintenance costs are often minimal, so lifecycle costs should be considered. |
| Preparation | The batter surface (soil or rock) must be contour scarified and all loose rocks, roots, clods, stumps and debris over 50mm in diameter must be removed. Ameliorants must be applied to dispersive soils. |
| Rate of vegetation establishment | Vegetation establishment is usually rapid. |
| Quality assurance and surveillance | Soil preparation; soil testing; soil ameliorant application rate; seed germination and purity; seed application rate; application coverage by multiple passes in different directions; tackifier type and application rate; compost quality and application rate; soil surface cover. |
| Establishment and maintenance | Establishment and maintenance requirements are usually low, but could include:<br>• Initial watering and in dry conditions<br>• Replacing any washed out areas (must be done immediately)<br>• Weed control if weeds are adjacent to the area. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

Fact Sheet | April 2015

# Fact Sheet 14

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Placed turf

**Turf refers to growing grass, root and soil material that is harvested from the field in rolls. The rolls are placed on the ground providing immediate erosion protection from wind, raindrops and light surface flow.**

Freshly laid turf is susceptible to lifting by strong sheet flows, and should be laid perpendicular to the path of flow to prevent scouring between rolls and pinned into place. The spacing and depth of anchor pins depends on the slope gradient and estimated surface water flow. Turf is easily cut to shape at junctions, around drains and culverts.

All turf requires mowing, but different turf species will grow at different speeds, have a variety of grass blade lengths, and a range of microclimate tolerances. Slow-growing, low maintenance turfs may be intolerant to wear or high flows, whereas fast-growing turfs may be more tolerant to wear or high flows but will require more frequent mowing or slashing.



*Figure FS14a: Turf strip at top of seeded batter to spread sheet flow, Kempsey Bypass.*



*Figure FS14b: Turf placed on variable slopes, Bega Bypass.*

| FACTOR | DETAIL |
|---|---|
| Slope | Although turf can thrive on very steep slopes, it is usually limited by the angle of access of mowing or slashing, which is ≤ 3h:1v. |
| Level of erosion protection | Raindrop splash erosion, sheet flow and concentrated flow. |
| Growing media | Turf should be laid on 50 – 150mm of sandy loam over cultivated subsoil for fastest root establishment. Turf may be pinned directly onto heavily cultivated subsoil to prevent eroding of growing media prior to establishment, but the quality and evenness of turf cover will be poorer. |
| Soil amelioration | Turf will grow in all soils except those with high acid or alkaline levels. Turf responds quickly to ameliorated growing media. |
| Bioregion | Turf is best suited to warmer climates for rapid growth and coverage. Most turfs are resistant to light frosts. Few turfs are drought tolerant, however dead turf will provide erosion control for a limited period if undisturbed. |
| Access | Installation – Turf rolling machinery can only access slopes ≤ 1v:4h. Turf can be laid by hand, so installation will only be limited by the ability to safely access the slope.<br>Maintenance –machines to mow or slash the turf can only operated on slopes ≤ 1v:3h. Access may be required for watering, application of fertiliser and re-application in any failed areas. |
| Duration | If an appropriate turf variety is selected for the bioregion and it is not subject to excessive climate differentials, wear or compaction, turf can provide permanent stabilisation. Some cultivar turfs have sterile seed, so if the turf is worn or patchy, it will not recover. |
| Visual amenity and ecological outcome | Turf provides reasonable visual amenity outcomes, with a neat, uniform batter surface cover. Turf is excellent for late-finishing works and provides instant effect. Most turf grasses are exotic and low-growing, with little ecological benefit. There are significant environmental benefits in using turf to reduce ground surface heat, provide a temporary access surface and to keep areas open for sightlines or hazard clearance. |
| Vegetation type | Turf. Some grass species can be left to grow wild or managed as turf. There are some native turfs that are slow growing and will not require regular mowing, but these can be sensitive to frosts and frequent inundation. |
| Establishment time until erosion protection | Erosion protection from wind, raindrop and low sheet flow is immediate. Protection from concentrated flows will be provided after root establishment in 1-6 weeks, depending on bioregion, season and turf variety. Most turfs are much slower to establish in cold seasons and climates. |
| Cost (at time of publication) | High:<br>• $4-$12/m², depending on location and availability of turf<br>• Additional $3-$5/m² to strip, ameliorate and respread topsoil if required<br>• Additional cost allowances should be made for watering in dry conditions and weed suppression (where necessary). |
| Preparation | Soil amelioration may be required when topsoil is used and cultivation of subsoil will be required to ensure it is free-draining. Intensive soil preparation is required to provide a level and uniform surface free of obstructions, debris and materials that prevent intimate contact between the turf roots and the soil surface. |
| Rate of vegetation establishment | Turf is installed as a mature product, and only requires the roots to establish in the sites growing media. Rate of vegetation establishment is dependant on the species, quality of bed preparation, climate and watering, but is generally rapid. Warm weather, frequent watering and preventing use or access over the new turf will increase the rate of establishment. |
| Quality assurance and surveillance | Turf type and installation; soil testing and amelioration; soil preparation; soil ameliorant application rate; soil surface cover; watering. |
| Establishment and maintenance | Establishment and maintenance requirements are generally moderate, but can be high for exotic turfs laid in peak warm seasons, and could include:<br>• Watering in dry conditions and re-application in any failed areas<br>• Mowing (~every 8-12 weeks after initial establishment)<br>• Weed control if growing media is poor or weeds are adjacent to the area. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

Fact Sheet 15

Guideline for Batter Surface Stabilisation using vegetation

Roads & Maritime

# Turf reinforcement mats

Turf Reinforcements Mats (TRMs) are primarily used as an alternative to hard armours in channel lining situations. In slope stabilisation situations TRMs are used when overland flows are present or the slope gradients are too steep to hold topsoil or compost.

TRMs are two- or three-dimensional rolled mats made from a dense mesh of synthetic polymers (ie – not biodegradable) that are placed on the soil surface to protect it from medium to high velocity flows.

Two-dimensional non-soil filled TRMs are flat and are used in situations where suitable topsoil exists but an overland flow could erode it. The topsoil is seeded prior to the application of the TRM. Once established, the plant stems intertwine with the TRM to form a strong surface that withstands flow.

Soil filled TRMs are up to 10mm thick and are considered the most appropriate for slope stabilisation solutions. They can be used where the slope is too steep to hold topsoil or compost. Following installation of the TRM, topsoil or compost is applied using a slinger or blower truck to fill the voids in the three-dimensional mat. Seed is either mixed in with the growing media or applied on top of it. The mat then assists to hold the soil and seed in place while the plants establish and intertwine with the TRM to form a strong surface that withstands flow. Other stabilisation techniques (eg – BFM Hydromulch) can be applied over the surface of TRMs to provide an additional level of erosion protection for critical sites.

Like other rolled batter surface stabilisation techniques (eg – erosion control blanket, cellular confinement systems), correct installation of TRMs is critical to ensure success. It requires a smooth and uniform soil surface to ensure intimate soil contact, sufficient anchoring at the top of the batter, stapling down its length (≤300mm spacing) and sufficient overlapping (≥100mm).



*Figure FS15a: Soil-filled turf reinforcement mat. (Source: Wally Butman - Profile Products)*



*Figure FS15b: Non-soil filled turf reinforcement mat.*

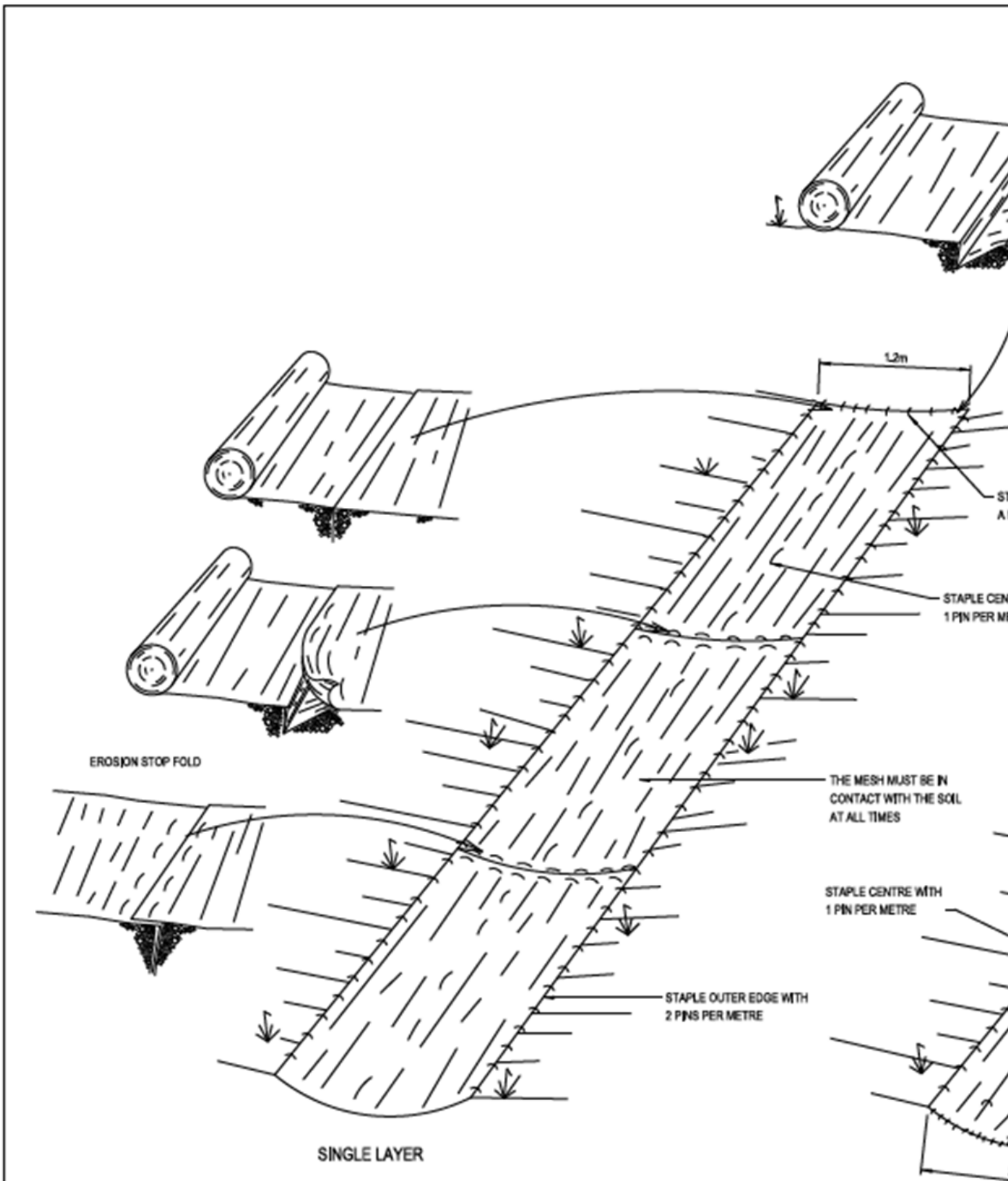
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| FACTOR | DETAIL |
|---|---|
| Slope | TRMs can be applied on slopes ≤ 3h:1v. It may be possible to apply a TRM to slopes <1h:1v if a complementary measure (eg – BFM Hydromulch) is used to help stabilise the slope. |
| Level of erosion protection | Raindrop splash erosion, sheet flow and concentrated flow. |
| Growing media | The growing media is dependent on the type of TRM that is used. Two-dimensional TRMs are laid on the slope surface and rely on an existing growing media. Three-dimensional TRMs are laid on the slope surface and topsoil (existing or imported) or compost is then applied to fill the voids in the matting. |
| Soil amelioration | No soil amelioration is provided when two-dimensional TRMs are applied over existing topsoil. Soil amelioration can be provided when imported topsoil (variable and reliant on quality of source material) or compost (usually high levels of amelioration) are applied to three-dimensional TRM's. Both topsoil and compost can be artificially ameliorated prior to application. If BFM Hydromulch is used with a TRM it can provide moderate additional levels of amelioration. |
| Bioregion | TRMs are appropriate for use in any NSW bioregion. If made with thick synthetic materials they may also absorb extra heat in exposed aspects. |
| Access | Installation – intensive slope preparation and anchoring is required and access is needed down the entire slope. On steep slopes where safety is an issue, this may require the use of a cherry picker and/ or other machinery.<br>Maintenance – Access may be required for watering, re-application of seed, anchoring repairs and weed control. |
| Duration | TRMs are designed as a permanent stabilisation technique. Each product will eventually break down (longevity is dependent on the materials used), however established vegetation will continue to provide some level of stabilisation. |
| Visual amenity and ecological outcome | TRMs are often a natural or unobtrusive colour that provides minimal visual impact, but alone they provide little ecological value. The establishment of vegetation will improve the visual amenity of both products and has the potential to improve ecological outcomes. |
| Vegetation type | TRM's can be used with either temporary or permanent vegetation, however the cost will likely limit the application of TRM's for temporary solutions. Vegetation type will be limited by the pore size of the given TRM, and will be restricted to cover crops, grasses, legumes and possibly some small native ground covers. |
| Establishment time until erosion protection | The erosion protection provided by a two-dimensional TRM is limited until vegetation establishes, as the soil underneath is not held in place. The erosion protection provided by a three-dimensional TRM is instant, and will be enhanced when vegetation establishes. |
| Cost (at time of publication) | Very high:<br>• $12 - $35/m² to supply and install<br>• For three-dimensional TRMs, additional costs should be allowed to either strip, ameliorate and re-apply topsoil, or import, ameliorate and apply topsoil or compost. |
| Preparation | Intensive soil preparation is required to ensure a smooth and uniform surface (free of obstructions, tree stumps, clods and rubble) and intimate contact between the TRM and slope surface.<br>Soil amelioration may also be required to ensure the growing media (existing or imported) is suitable for the vegetation that is to be established with the TRM. Preliminary weed control is essential before laying the TRM. |
| Rate of vegetation establishment | Vegetation establishment is dependent on the vegetation type and the quality of the growing media. Rate of establishment with topsoil is extremely variable, but will generally be rapid if compost is used. The use of BFM Hydromulch with any growing media will generally speed up the rate of establishment, by shielding seed from rain drop impact and regulating soil temperature and moisture levels. |
| Quality assurance and surveillance | TRM type and installation; soil testing and amelioration; compost quality; soil preparation; seed germination and purity; seed application rate; seed application method; mulch type. |
| Establishment and maintenance | Establishment and maintenance requirements are usually low, but could include:<br>• Watering in dry conditions and re-seeding any failed areas<br>• Ongoing observations of anchoring and repair where necessary<br>• Weed control if topsoil is poor, weeds are adjacent to the area or vegetation establishment is slow. |

This fact sheet has been prepared to be complementary to Section 3, Factors to consider, of the Guideline for Batter Surface Stabilisation using vegetation.

**Fact Sheet** | April 2015

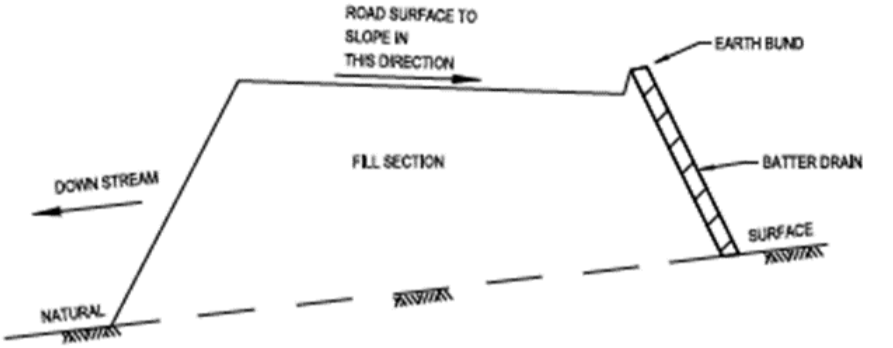
# Annexure C. TfNSW Standard Drawings



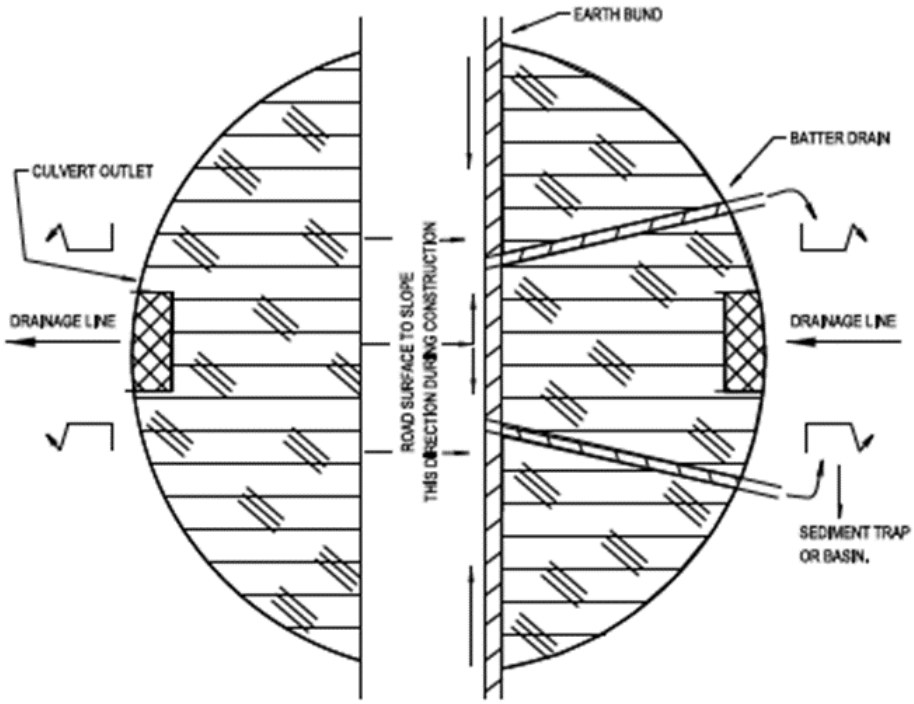

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LEAVE BUND AT TOP OF SLOPE AT THE END
OF EACH DAYS FILL OPERATION TO DISCHA
INTO TEMPORARY BATTER DRAIN. A TEMPO
BANK MAY BE REQUIRED TO HELP DIVERT
RUN-OFF INTO THE BATTER DRAIN.




PLACE 100 H
ROCK BUND

GEOTEXTILE TRENCHED
BACKFILLED AT TOP OF DR

ROAD SURFACE

GEOTEXTILE LINED
'DISH' DRAIN

GEOTEXTILE STAKED
AT REGULAR INTERVALS
DOWN DRAIN (I.E. SIDES & MIDDLE)

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# Appendix I - Water Reuse Strategy

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix I: Water Reuse Strategy

November 2023



# Document Control

| | |
|---|---|
| Date | November 2023 |
| Document No. | M712UDC-JHGRP-M7A-EN-PRG-000076 |
| Title | M7-M12 Integration project Construction Environmental Management Plan<br>Appendix B4 - Construction Soil and Water Management Sub-plan<br>Appendix I: Water Reuse Strategy |
| File Name | M712UDC-JHGRP-M7A-EN- PRG-000076_CSWMP_RevH_AppI |

# Document History and Status

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|---|---|---|
| A | 9/08/2023 | First draft for WSO Co / TfNSW review |
| B | 06/09/2023 | Second draft for WSO Co / TfNSW review |
| C | 29/09/2023 | Third draft for WSO Co/ TfNSW review |
| D | 13/10/2023 | For ER endorsement |
| E | 02/11/2023 | Updated in response to DPE comments |
| F | 15/11/2023 | Up-revved in line with the CSWMP |
| G | 17/11/2023 | Up-revved in line with the CSWMP |
| H | 21/11/2023 | Up-revved in line with the CSWMP |

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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| AF | Ancillary Facility |
| AR | Amendment Report |
| ARSR | Amendment Report Submissions Report |
| BOM | Bureau of Meteorology |
| CA | Consistency assessment |
| CEMP | Construction Environmental Management Plan |
| CoA | Conditions of Approval |
| Construction | Includes all activities required to construct the M7-M12 Integration project:<br>• As described in the documents listed in Infrastructure Approval SSI-663-Mod-6 Condition 1A, including commissioning trials of equipment and temporary use of any part of Modification 6 (M7 Widening), but excluding low impact work which is carried out or completed prior to approval of the CEMP<br>• As described in the documents listed in Infrastructure Approval SSI 9364 (M12 Motorway) Condition A1, including commissioning trials of equipment and temporary use of any part of the CSSI, but excluding Low Impact Work which is carried out or completed prior to the approval of the CEMP, works approved under a Site Establishment Management Plan, demolition of acquired residential houses, structures and sheds, and works specified in Appendix B and approved under an environmental management plan(s) in accordance with Condition A24. |
| CSWMP | Construction Soil and Water Management Sub-plan |
| CSSI | Critical State Significant Infrastructure |
| DPE | NSW Department of Planning and Environment |
| EAD | Environmental Assessment Documentation |
| EIS | Environmental Impact Statement |
| Environmental Representative | A suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. The principal point of advice in relation to all questions and complaints concerning environmental performance. |
| Environmental Assessment Documentation, M7 EAD, M12 EAD | The set of documents that comprise the Division 5.2 Approval of the M7 Widening:<br>• Transport for NSW (August 2022) Westlink M7 Widening Modification Report<br>• Transport for NSW (November 2022) Westlink M7 Widening Submissions report.<br>The set of documents that comprise the Division 5.2 Approval of the M12 Motorway: |

| Acronym | Definition |
|---|---|
| | • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS)<br>• Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report)<br>• Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR)<br>• Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR)<br>• Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment)<br>• WSP (October, 2021) M12 Motorway – West Package Detailed Design: Proposed changes between east of Badgerys Creek and The Northern Road Consistency Assessment<br>• GHD (October, 2021) M12 Motorway – Central Package Detailed Design: Design and boundary changes between Cecil Park and east of Badgerys Creek Consistency Assessment<br>• Arcadis (June, 2022) M12 Motorway – West and Central Package Sydney Water Pipeline Crossings: Proposed Sydney Water pipelines crossings for M12 West and Central Consistency Assessment<br>• Arcadis (July, 2022) M12 Motorway – Design Boundary Changes: Proposed construction and operational design boundary changes for the M12 Project Consistency Assessment<br>• Arcadis (August, 2022) M12 Central Boundary Changes: Proposed construction design boundary changes for M12 Central – Minor Change Consistency Assessment<br>• WSP (September, 2023) Proposed construction and operational design boundary changes for the M12 Project (East) Consistency Assessment.<br>The documents that comprise the EPBC referral:<br>• Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW<br>• Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286. |
| EP&A Act | Environmental Planning and Assessment Act 1979 |
| EPBC Act | Environmental Protection and Biodiversity Conservation Act 1999 |
| EPL | Environment Protection Licence |
| ER | Environmental Representative |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representative (refer to Section 5.1.1 of the CEMP) |
| Federal Approval | Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the Environmental Protection and Biodiversity Conservation Act 1999 subject to specific CoA as detailed in Annexure A of the approval. |

| Acronym | Definition |
|---|---|
| Infrastructure Approval | Approval (SSI 663 Mod 6) for carrying out the M7 Widening modification under Section 5.25 of the EP&A Act subject to specific CoA as detailed in Schedule 2 of the Approval.<br>Approval (SSI 9364) for carrying out of the M12 Project under Section 5.19 of the EP&A Act subject to specific CoA as detailed in Schedule 2 of the approval. |
| km | Kilometre(s) |
| M7 CoA | Minster's Conditions of Approval for the M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) |
| M7 REMMs | Updated Environmental Management Measures listed in the Westlink M7 Submissions Report (November 2022) |
| M7 Widening | Westlink M7 Modification 6 Widening |
| M7-M12 Integration project, the Project | The M7-M12 Integration project incorporates the following:<br>• M7 Motorway (Mod 6 Widening) (SSI 663 Mod 6) – modification (mod) to the M7 Motorway approved on 17 February 2023 under Division 5.2 of the EP&A Act<br>• M12 Motorway (CSSI 9364) – approved on 23 April 2021 under Division 5.2 of the EP&A Act and split into separate packages (West, Central (main construction), Central (temporary roundabout) and East). The M12 Motorway is also subject to a federal approval under the EPBC Act. The M7-M12 Integration project incorporates the M12 East package only |
| M12 CoA | Minister's Conditions of Approval for the M12 Motorway (CSSI 9364) |
| M12 East package | M12 Motorway – East package |
| M12 EAD | M12 Environmental Assessment Documentation |
| M12 REMMs | Revised Environmental Management Measures listed in M12 Motorway Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) |
| OCEMP | Overarching Construction Environmental Management Plan |
| Planning Secretary | Secretary of the NSW Department of Planning and Environment, or delegate |
| REMM | Revised Environmental Management Measure |
| TfNSW | Transport for New South Wales (formerly NSW Roads and Maritime Services) |
| Work | Includes:<br>• Any physical activity for the purpose of Modification 6 (M7 Widening), including construction and low impact work<br>• Any physical work to build or facilitate the building of the CSSI (M12 Motorway), including low impact work, environmental management measures and utility works. However, it does not include activities that inform or enable detailed design of the CSSI and generate noise that is no more than 5 dB(A) above the rating background level at any sensitive receiver. |

| Acronym | Definition |
|---|---|
| WSO Co | Western Sydney Orbital Company, joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |

# 1 Introduction

## 1.1 Purpose

This Water Reuse Strategy has been prepared to detail the quantities and uses of water on the Project through the construction phase, to investigate and evaluate all feasible reuse options for stormwater and groundwater, and to identify water saving opportunities to reduce potable water use during construction.

A copy the strategy will be kept at the premises for the duration of construction.

## 1.2 Objectives

The objectives of this Strategy include:

- Ensure compliance with environmental requirements of the Project
- Detail water use monitoring and reduction measures
- To investigate and evaluate all feasible reuse options for stormwater
- Identify water saving opportunities to reduce potable water during construction.

This Strategy is an appendix of the Construction Soil and Water Management Sub-Plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project.

This Strategy has been prepared to address the requirements of the Minister's Conditions of Approval (M7 CoA) and Updated Environmental Management Measures (herein referred to as REMMs) listed in the Westlink M7 Modification Report, the Minister's Conditions of Approval (M12 CoA), Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report, Amendment Report Submissions Report (ARSR), ARSR Amendment Report, all Consistency Assessments, all applicable legislation, and Transport for New South Wales (TfNSW) specifications.

### 1.2.1 M7-M12 Integration project

This strategy has been updated to incorporate the relevant information and requirements to consider the M7 Motorway (Modification 6 Widening) (M7 Widening). The re-branded M7-M12 Integration project Monitoring Program has been prepared to also address the requirements of the M7 Widening Minister's Conditions of Approval (M7 CoA) and the Revised Environmental Management Measures (REMMs) listed in the Westlink M7 Widening Modification Report and Westlink M7 Widening Submissions Report.

Due to construction programming and development of the M12 Motorway Overarching CEMP (OCEMP), the CEMP and sub-plans (and monitoring programs) have been prepared in a two-step process:

- M12 East package CEMP, sub-plans and monitoring programs
- M7-M12 Integration project CEMP, sub-plans and monitoring programs.

Once this M7-M12 Integration project strategy is approved, the M12 East package strategy will be superseded.

## 1.3 Induction/training

All site personnel involved in construction of the M7-M12 Integration project will be trained and inducted in this Strategy. Training will also include inductions, toolbox talks, pre-starts and targeted training as required.

## 1.4 Consultation

In accordance with M7 REMM SW6 and M12 REMM SWH03, Sydney Water has been consulted during the development of this strategy. This consultation includes, but is not limited to, the project construction water requirements and potential water sources to supply the water demand. In accordance with M7 CoA D79, advice will also be sought from DPE Water and Water NSW regarding this Strategy.

## 1.5 Roles and responsibilities

The Environmental Site Representative (ESR) is responsible for ensuring this Strategy is effectively implemented, and all site personnel are aware of the requirements of this Strategy.

All personnel involved site stabilisation works are responsible for undertaking works in accordance with this Strategy.

## 1.6 Approval, Review and modification

This Strategy will be and reviewed by WSO Co, TfNSW Environment and Sustainability Manager (ESM) (or delegate) and the Environmental Representative (ER) prior to commencement of construction.

The Strategy will be implemented for the duration of construction and for any longer period set out in this Strategy or as specified by the Planning Secretary, whichever is the greater. As part of the CEMP this Strategy will be reviewed and updated as required and in accordance with Section 1.1.1 of the CEMP.

## 1.7 Requirements

The applicable CoAs and REMMs relevant to the development of this Strategy are listed in Table 1-1.

*Table 1-1: CoAs and REMMs applicable to this Strategy*

| Reference | Requirement | Where addressed |
|---|---|---|
| M7 CoA D79 | A Water Reuse Strategy must be prepared, which sets out options for the reuse of collected stormwater during construction. The Water Reuse Strategy must include, but not be limited to: | This strategy<br>(a) – Section 2.2 |

| Reference | Requirement | Where addressed |
|---|---|---|
| | a. evaluation of reuse options;<br>b. details of the preferred reuse option(s), including volumes of water to be reused, proposed reuse locations and/or activities, proposed treatment (if required), and any additional licences or approvals that may be required;<br>c. measures to avoid misuse of recycled water as potable water;<br>d. consideration of the public health risks from water recycling; and<br>e. a time frame for the implementation of the preferred reuse option(s).<br>The Water Reuse Strategy must be prepared based on best practice and advice sought from relevant agencies, as required. The Strategy must be applied during construction of Modification 6.<br>Justification must be provided to the Planning Secretary if it is concluded that no reuse options prevail.<br>A copy of the Water Reuse Strategy must be made publicly available.<br>*Note: Contaminated groundwater must be disposed of in accordance with Condition D111* | (b) – Section 2.3<br>(c) – Section 2.4, Table 2-3<br>(d) – Section 2.4, Table 2-3<br>(e) – Section 2.4, Table 2-3 |
| M7 REMM SW6 | A water reuse strategy will be developed for the construction of the proposed modification to reduce reliance on potable water. This strategy will be prepared during the detailed design stage and will outline the construction water requirements and potential water sources to supply the water demand in consultation with Sydney Water. Alternative water supply options to potable water will also be investigated, with the aim of reusing water using recycled water where feasible. This includes sourcing non-potable water from construction sediment sumps where it is feasible to reuse. | This strategy |
| M12 REMM SWH03 | A water reuse strategy will be developed for both construction and operational phases of the Project to reduce reliance on potable water. This strategy will be prepared during the detailed design stage and implemented throughout the Project and will outline the construction and operational water requirements and potential water sources to supply the water demand in consultation with Sydney Water. Alternative water supply options to potable water will be investigated, with the aim of reusing water using recycled water where feasible. | This strategy |

# 2 Strategy

## 2.1 Water Reuse

For the M7 Widening works as part of the modification application, it was estimated that 280 ML will be required during construction. Water will be utilised for several purposes as outlined in Section 1.3. Water reuse is not likely to be feasible for many of these purposes where water quality is required to meet certain requirements (e.g. drinking water or water supply for concrete batching).

For the M12 East package, around 302.5 ML of water would be required. Measures to minimise the consumption of potable water are described below, and will continue to be investigated through the detailed design process. Measures include:

- Rainwater and/or stormwater will be used to provide passive irrigation to tree plots and vegetated areas that are part of the Contract
- Water from sediment basins will be prioritized for use as dust suppression/compaction through the construction phase. Opportunities to enlarge selected sediment basins to Blue book 10 day or 20 day design criteria will be assessed with the Soil conservationist during establishment works. This will allow the storage of water for longer periods to allow reuse. Changes to basin design criteria will need to be reflected in the project Environment Protection Licence (EPL)
- Standpipes will be installed at selected dams to be dewatered and this water will be utilised for enabling earthworks on the project. Dams will progressively be emptied and backfilled allowing for construction of the road corridor
- Other water saving opportunities to reduce potable water use include; the selection of native species in landscape design to reduce the establishment water requirements and the use of geobinder polymers to reduce the need for water dust suppression
- The project will target at least 33 per cent of water use (e.g. dust suppression, fill conditioning, landscape watering) from non-potable sources and a minimum of 5% of water generated/collected during construction is reused, recycled or reclaimed. Other potential sources of recycled water may include captured stormwater from roofs at construction ancillary facilities stored in water tanks, and recycled water from Sydney Metro's Western Sydney Airport tunnel water treatment plants.

## 2.2 Water Reuse Options

Table 2-1 outlines the projected uses for water on the project and includes an evaluation of the reuse options available for collected stormwater during construction of the M7. Given the difficulties of providing for a recycled water supply either through trucked supplies (with limited ability to fill trucks at recycled water producers) or through a pipeline (given works are occurring primarily within the median strip of the M7), water reuse has primarily focussed on reuse of stormwater collected during construction, aligning with the requirements of the M7 CoA.

Table 2-1 also includes other dewatering activities to provide analysis of the potential for their inclusion in this Strategy. Other dewatering activities, such as dewatering of excavations of rainfall, dewatering of any erosion sediment controls as required, or dewatering as part of other approved processes, may provide more localised and timely opportunities for reuse above others considered.

*Table 2-1: Water reuse options*

| Reuse Options/Activities | Suitable for Reused Water? | Water Locations/Source | Reliability and Feasibility during Construction | Cost Impacts | Social and Environmental Impacts | Preferred? |
|---|---|---|---|---|---|---|
| Dust suppression | Yes | Water Quality Basins | Difficult given that basins are largely located on the outer edges of the M7, whilst works are occurring within the median strip. | High given difficulties with access. | Increased impact on traffic for access to basins and worksites. | No |
| | | Site Shed Rainwater Tanks | Possible for compounds and laydown areas, but highly limited supply | Medium-High, given large storage volumes required, and limited space for dam/basin construction at compounds | Minimal for dust suppression at site compounds | Yes |
| | | Other Dewatering Activities e.g. open sump pumping | Feasible on a case-by-case basis, depending on water quality and quantities involved | Low, for instances where dewatering is occurring at similar times to dust generating activities | Potential concerns around water quality and potential for impacting local environments | Yes |
| Landscaping maintenance | Yes | Water Quality Basins | Feasible for landscaping located near or adjacent to basins | Low where landscaping is adjacent to existing basins | Minimal where water has already been treated by the basins | Yes |
| | | Site Shed Rainwater Tanks | Possible, but limited quantities and additional transport distances | Medium-High given large volumes required, limited space, and transport distances | Minimal where first flush systems installed as part of site compounds | No |
| | | Other Dewatering Activities e.g. open sump pumping, wells etc | Feasible on a case-by-case basis, depending on water quality and quantities involved | Low, for instances where dewatering is occurring during landscape maintenance activities | Potential concerns around water quality and potential for impacting local environments | Yes |

| Reuse Options/Activities | Suitable for Reused Water? | Water Locations/Source | Reliability and Feasibility during Construction | Cost Impacts | Social and Environmental Impacts | Preferred? |
|---|---|---|---|---|---|---|
| Plant/Equipment washdown | Yes | Site Shed Rainwater Tanks | Feasible for compounds and laydown areas, noting potentially limited supply relative to demand for larger compounds | Medium-High, given large storage volumes required, and limited space for dam/basin construction at compounds | Minimal depending on other erosion and sediment controls | Yes |
| | | Other Dewatering Activities e.g. open sump pumping | Possible on a case-by-case basis depending on water quality and quantities involved | Low-Medium, depending on water quality, which may require further treatment before use | Potential concerns around water quality and potential for impacting local environments | No |
| Compaction activities | Yes | Water Quality Basins | Difficult given that basins are largely located on the outer edges of the M7, whilst works are occurring within the median strip. | High given difficulties with access. | Increased impact on traffic for access to basins and worksites. | No |
| | | Other Dewatering Activities e.g. open sump pumping, wells etc | Possible on a case-by-case basis depending on water quality and quantities involved | Low-Medium, depending on water quality, which may require further treatment before use | Potential concerns around water quality and potential for impacting local environments | Yes |
| Concrete | No | - | - | - | - | N/A |
| Drinking water | No | - | - | - | - | N/A |
| Toilet blocks | Yes | Site Shed Rainwater Tanks | Feasible for site sheds/ablution units at larger compounds | Medium, depending on site constraints including number of ablution blocks to be modified, relative roof/collection area, and tank sizing | Minimal | Yes |

Preferred water reuse options include:

- Dust suppression supplied from site shed rainwater tanks,
- Dust suppression supplied from other dewatering activities,
- Landscaping maintenance supplied from water quality basins,
- Landscaping maintenance supplied from other dewatering activities,
- Plant/equipment washdown supplied from site shed rainwater tanks,
- Compaction activities supplied from other dewatering activities, and
- Toilet blocks from site shed rainwater tanks.

## 2.3 Supply Potential for Preferred Options

Volumes of water to be reused will largely be constrained by environmental conditions and site constraints, rather than the volumes required for construction. A high-level estimate of potential supply relevant to the preferred water reuse options was conducted to further refine potential options during construction. This estimate focusses on the potential sources identified.

For simplicity, water usage was based off an average water intensity per square meter, with volumes calculated over a 33-month construction period. A daily water balance was conducted using rainfall data from Prospect Reservoir which was chosen given the length of data available (100+ years). However, it is noted that the M7 works stretch along a 26 km length of roadway, and that potential precipitation and associated volumes of stormwater for reuse may differ both according to spatial location as well as seasonal and climatic conditions. Additionally, variations in water intensity and project program have been simplified for these calculations.

### 2.3.1 Site Sheds and Rainwater Tanks

Construction planning for the M7 scope of works is continuing, with the number of site sheds across the project varying depending on the project timeframe. Site sheds for the project will be found at both the main site offices at Ancillary Facility 9 (AF 9) shared with the M12, as well as zone construction ancillary facilities compounds (expected to be larger and provide support for their respective zones along the M7), as well as site compounds at various sites along the work area.

Table 2-2 shows potential supply volumes across the life of the project for various sizes of site compounds. The potential supply volumes are calculated using the estimated square meterage roof area sizes for each compound size and historical climate data. The recommended storage figures below attempt to optimise potential supply volumes with respect to the potential volumes of rainwater available, as well as the increasing costs of storage.

The percentage of days rainwater utilised has been provided as a measure to indicate the relative number of days where either collected rainwater or storage from preceding days is utilised in the water balance to satisfy modelled demand.

This is for an average water intensity which for the purposes of evaluating reuse options would include dust suppression, washdown, and toilet usage.

*Table 2-2: Potential site shed reuse volumes*

| Site Size | Potential Volume of Rainwater during project (ML) | Potential Supply Volume across project life ~33 months (ML) | Site Storage (L) | Percentage of Days Rainwater Utilised (%) |
|---|---|---|---|---|
| Main Offices (e.g. AF 9) | 8.09 | 4.9 | 90000 | 34% |
| Zone Ancillary Facility | 0.8 | 0.5 | 10000 | 36% |
| Site Ancillary Facility | 0.083 | 0.07 | 5000 | 51% |

Across the whole program of works and the different sites involved, this could potentially be up to 18.5 ML in total. Rainwater collected from site sheds would where necessary be provided with a first flush system to minimise contamination but is not expected to require any treatment for proposed use cases. No additional licenses or approvals are expected to be required.

### 2.3.2 Water Quality Basins

As provided for in the Surface Water and Flooding Impact Assessment for the M7 Modification Application, there are 99 water quality basins of varying function within the footprint of the proposed works. These basins are largely situated along the outer edges of the M7, making use for widening activities in the median difficult. However, it is expected that there will be some planting and landscaping activities occurring along the M7 for which these basins may be more accessible. A daily water balance was undertaken for the combined volume of these basins along the M7 works footprint. This estimate assumes that all stormwater within the entire operational area of the M7 works will drain into the water quality basins, and that all runoff is then available for reuse, and does not account for the designed drawdown of the basins. Additionally, given a lack of local long-term evaporation or evapotranspiration data, area averages taken from Bureau of Meteorology (BOM) maps have been used for both these parameters.

Across a 3-month watering and maintenance period, there is the potential for supplying up to 8.47 ML for landscape maintenance activities, which would be expected to supply 69% of demand for that period. There is likely potential for stormwater to have poorer water quality resulting from the motorway, but the water quality basins are expected to be designed to manage expected levels of contamination. There is not expected to be any additional permits or approvals required for reuse.

### 2.3.3 Other Dewatering Activities

Other dewatering activities, such as dewatering of excavations of rainfall, dewatering of any erosion sediment controls as required, or dewatering as part of other approved processes may also provide sources for water reuse on the project, however, are difficult to estimate given their ad-hoc nature. Given their use for dust suppression, landscape maintenance, and compaction activities, it is not expected that any further treatment will be required.

## 2.4 Public Health Risks, mitigation of risks and implementation

Of the preferred water reuse options, Table 2-3 details the consideration of public health risks from water recycling, measures to avoid misuse and timeframes for implementation. The Australian Guidelines for Water Recycling (from the Environment Protection and Heritage Council, the Natural Resource Management Ministerial Council & the National Health and Medical Research Council, 2009) was consulted as part of the review of consideration of public health risks.

*Table 2-3: Potential public health risks, measures to avoid misuse and implementation timeframes*

| Preferred water reuse option | Potential public health risks | Measures to avoid misuse of recycled water as potable water | Timeframe for implementation |
|---|---|---|---|
| Dust suppression supplied from site shed rainwater tanks | Water from rainwater tanks is consumed as potable water without treatment.<br>High loads of organic matter reducing dissolved oxygen levels | All rainwater taps are appropriately labelled as non-potable<br>Education of staff and suppliers using water carts<br>Use of appropriate PPE when drawing water from rainwater tanks<br>Where practical, mixing with coloured dust suppressant polymers | During construction of site compound |
| Dust suppression supplied from other dewatering activities | Water is potentially contaminated with harmful inorganic and organic particles such as oils and heavy metals | Education of staff and suppliers using water carts<br>Use of appropriate PPE<br>Where practical, mixing with coloured dust suppressant polymers | On ad hoc basis |
| Landscaping maintenance supplied from water quality basins | Water is consumed as potable water without treatment.<br>High loads of organic matter reducing dissolved oxygen levels<br>High nitrogen and phosphorus levels supporting algal growth in open storages, potentially increasing turbidity and possibly reaching bloom levels<br>High loads of organic matter reducing dissolved oxygen levels<br>High nitrogen and phosphorus levels supporting algal growth in open storages, potentially | Direct connections using irrigation systems if possible<br>Appropriate signage that water is non-potable<br>Appropriate PPE is worn when handling water | TBC – late 2026 |

| Preferred water reuse option | Potential public health risks | Measures to avoid misuse of recycled water as potable water | Timeframe for implementation |
|---|---|---|---|
| | increasing turbidity and possibly reaching bloom levels | | |
| Landscaping maintenance supplied from other dewatering activities | High loads of organic matter reducing dissolved oxygen levels<br>High nitrogen and phosphorus levels supporting algal growth in open storages, potentially increasing turbidity and possibly reaching bloom levels | Appropriate signage that water is non-potable.<br>Appropriate PPE is worn when handling water | On ad hoc basis |
| Plant/equipment washdown supplied from site shed rainwater tanks | Cross-connections (ie the roofwater pipes being inadvertently connected to the potable water system)<br>High loads of organic matter reducing dissolved oxygen levels<br>Water from rainwater tanks is consumed as potable water without treatment | All rainwater taps are appropriately labelled as non-potable<br>Appropriate signage of non-potable water used in washdown areas<br>Appropriate PPE is used in washdown areas<br>Education of staff and supplier using plant/equipment | During construction of site compound |
| Compaction activities supplied from other dewatering activities | Water is potentially contaminated with harmful inorganic and organic particles such as oils and heavy metals<br>Water is consumed as potable water without treatment | Appropriate signage that water is non-potable<br>Monitoring via regular Environmental inspections<br>Appropriate PPE is worn when handling water | On ad hoc basis |
| Toilet blocks from site shed rainwater tanks | Cross-connections (ie the roof water pipes being inadvertently connected to the potable water system)<br>Water from rainwater tanks is consumed as potable water without treatment | All rainwater taps are appropriately labelled as non-potable<br>Direct connection of rainwater tanks to the flushing of toilets | During construction of site compound |

# 3 Inspection, Monitoring and Reporting

Compliance with this Strategy will be tracked through weekly environmental inspections of water use onsite. The checklist of items to be inspected will include water source and use application across the site.

Monitoring of Water Resource Use will occur during construction and reported to the Principal within the Quarterly Project Sustainability Report. Monthly Water and Waste reporting is also conducted via Project Pack Web.

# 4 Records

JHG will maintain records of all water use monitoring and any required water use approvals or agreements with landholders. The ESR is responsible for developing and maintaining the records and the monitoring data will be provided to TfNSW within the Quarterly Project Sustainability Report.

Project Pack Web will be used to record water and waste data in accordance with the John Holland system (for example prior to discharge of water from site, monthly surface water results and waste tracking data). Refer to Appendix C of this CSWMP and Appendix B9 of this CEMP for further information.

# Appendix J - ISC compliance table

# M7-M12 Integration project

## Construction Soil and Water Management Sub-plan

### Appendix J: ISC Compliance table

November 2023



# Document Control

| | |
|---|---|
| Date | November 2023 |
| Document No. | M712UDC-JHGRP-M7A-EN-PLN-000076 |
| Title | M7-M12 Integration CEMP: Appendix B4<br>Construction Soil and Water Management Sub-plan<br>Appendix J – ISC Compliance table |
| File Name | M712UDC-JHGRP-M7A-EN-PLN-000076_SWMP_RevH_Appendix J |

# Document History and Status

| Rev | Rev Date | Description |
|---|---|---|
| A | 8/08/2023 | First Draft for TfNSW Review |
| B | 06/09/2023 | Second draft for WSO Co / TfNSW review |
| C | 29/09/2023 | Third draft for WSO Co / TfNSW review |
| D | 13/10/2023 | For ER endorsement |
| E | 2/11/2023 | Updated in response to DPE comments |
| F | 15/11/2023 | Up-revved in line with the CSWMP |
| G | 17/11/2023 | Up-revved in line with the CSWMP |
| H | 21/11/2023 | Up-revved in line with the CSWMP |

| CREDIT/LEVEL | REQUIREMENT | LOCATION ADDRESSED |
|---|---|---|
| **Dis-1 – Receiving Water Quality** | | |
| **Level 1** | Measures to minimise adverse impacts to receiving water environmental values during construction and operation have been identified and implemented. | Identification of values – section 4.7 |
| | Monitoring of water discharges and receiving waters is undertaken at appropriate intervals and at times of discharge during construction and operation | Section 7.4.1, Appendix B |
| **Level 2** | Monitoring and modelling of water discharges and receiving waters demonstrates no adverse impact on receiving water environmental values. | Section 2.2, Section 3.8, |
| **Level 3** | TBA | TBA |
| **Wat-1 – Water Use Monitoring and Reduction** | | |
| **Level 1** | Monitoring and modelling of water use is undertaken | Section 3.6, Section 7.4.1, |
| **Level 2-3** | Monitoring and modelling demonstrates a reduction in water use compared to a base case footprint | Initiatives/methodology-- Section 3.6, Section 7.4.1, further detail in SMP and Water model |
| **Wat -2 Non-potable water use - Water saving opportunities** | | |
| **Level 1** | Monitoring and Modelling Demonstrates that some portion of total water use is from non-potable sources (substitution for potable) | Section 6.7 (methodology described) |
| **Level 2-3** | Fractions of levels may be achieved on a sliding scale up to 100% for Level 3 | Water model and SMP |
| **Lan-2 - Topsoil** | | |
| **Level 1** | Conservation of topsoil and subsoil has been considered | Section 6.4, Section 6.5 |
| **Level 2** | 95% of all topsoil (by volume) retains its productivity and is beneficially re-used on or nearby to the project | Section 6.5 |
| **Level 3** | Opportunities to improve topsoil productivity of previously disturbed areas have been identified and incorporated into the project. | Section 6.5 |

# Appendix K - Spill Response Procedure

# M7-M12 Integration project

## Construction Soil and Water Management Sub-plan

### Appendix K: Spill Response Procedure

November 2023



# Document Control

| | |
|---|---|
| Date | November 2023 |
| Document No. | M712UDC-JHGRP-M7A-EN-PLN-000076 |
| Title | M7-M12 Integration project Construction Soil and Water Management Sub Plan Appendix K - Spill Response Procedure |
| File Name | M712UDC-JHGRP-M7A-EN-PLN-000076_SWMP_Rev H_Appendix K |

# Document History and Status

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|---|---|---|
| A | 04/08/2023 | First Draft for TfNSW Review |
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| G | 17/11/2023 | Up-revved in line with the CSWMP |
| H | 21/11/2023 | Up-revved in line with the CSWMP |

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# 1 Purpose

A spill response procedure is required for the M7-M12 Integration project in accordance with:

- TfNSW Specification D&C G36 Environmental Protection specification; and
- TfNSW Specification D&C G38 Soil & Water Specification.

This procedure explains the processes and procedures to be carried out for spill response associated with construction activities included in TfNSW Specification G36 Clause 4.3, such as:

- Refuelling or maintenance and cleaning of plant and equipment including concrete agitators, bitumen spray bars and asphalt pavers
- On-site batching of concrete and asphalt
- Mixing of bitumen with cutting oil and additives
- Application of liquid membranes, including paint and thermoplastic, resin, emulsion, pre- coat agent and curing compound
- Bulk fuel or chemical deliveries
- Removal and disposal of excess chemicals and water used for washing down of equipment
- Pumping out of oil and grease collection pits
- Decanting operations such as for fuel, chemicals and bitumen.

The Pollution Incident Response Management Plan (PIRMP) in Appendix A9 of the CEMP also outlines the pollution incident response to spills and releases.

# 2 Induction/Training

All personal involved in the M7-M12 Integration project will be trained during the project induction in the requirements of this spill response procedure. Training will also include toolbox talks, pre-starts and targeted training as required. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee as well as the name of the course.

# 3 Scope

This procedure includes site specific advice and control measures for responding to spills and ensure compliant and appropriate response, handling, and disposal. It is intended that the environmental safeguards outlined in this plan will be incorporated into the pre-construction and construction phases of the project. Spill response and management and mitigation will be undertaken in accordance with the RMS Spill Management and Response Environmental Fact Sheet Issue 4 (15 September 2009) management plans and procedures for the project.

# 4 Spill Response Summary

The spill incident response process is provided in Figure 4-1 below, with further details provided in Section 4.1.

In the event of a spill, all material spilled will be removed as soon as practicable and at least within 24 hours where it is safe and feasible.

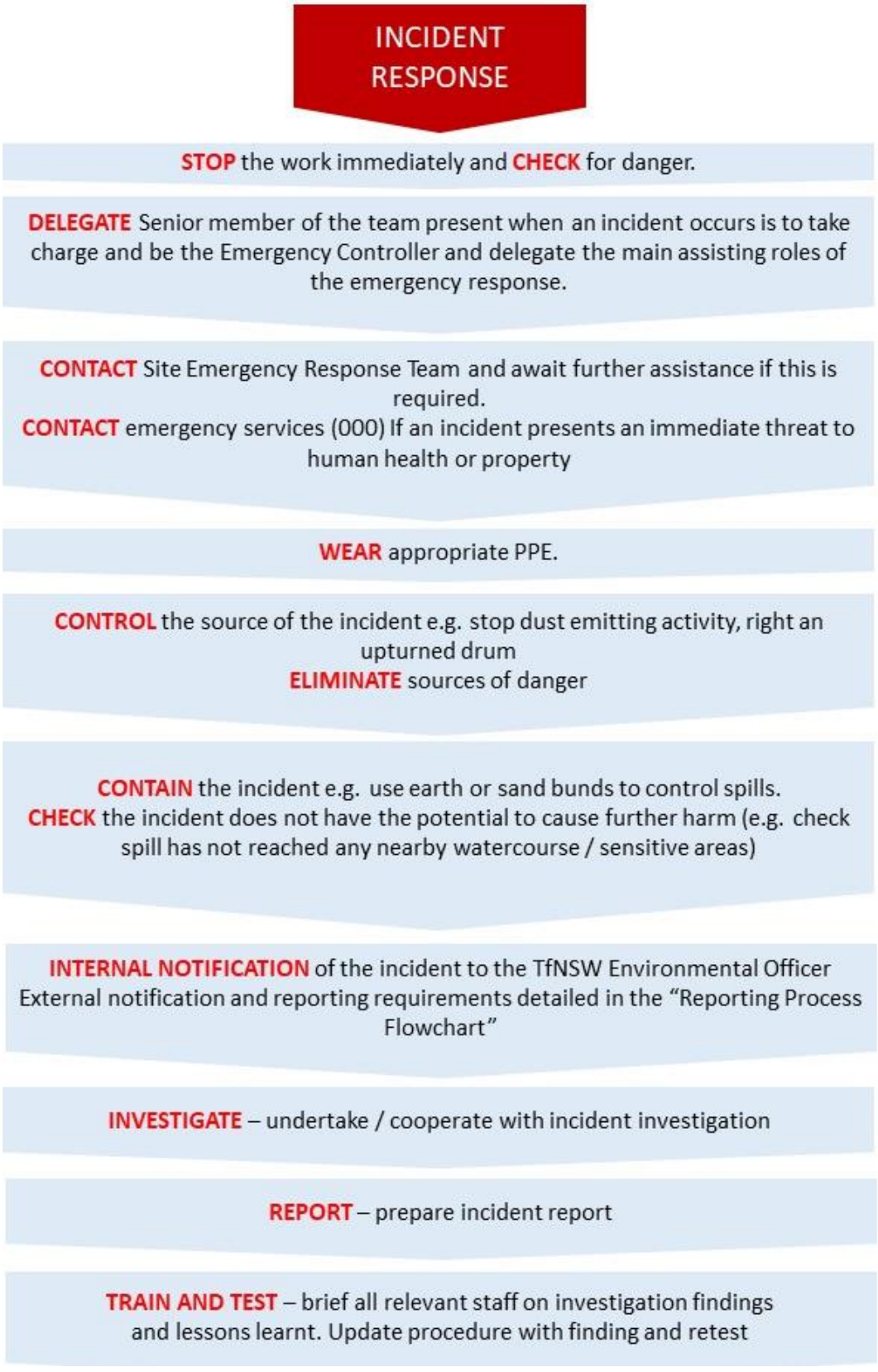



*Figure 4-1: Spill Incident Response Procedure*

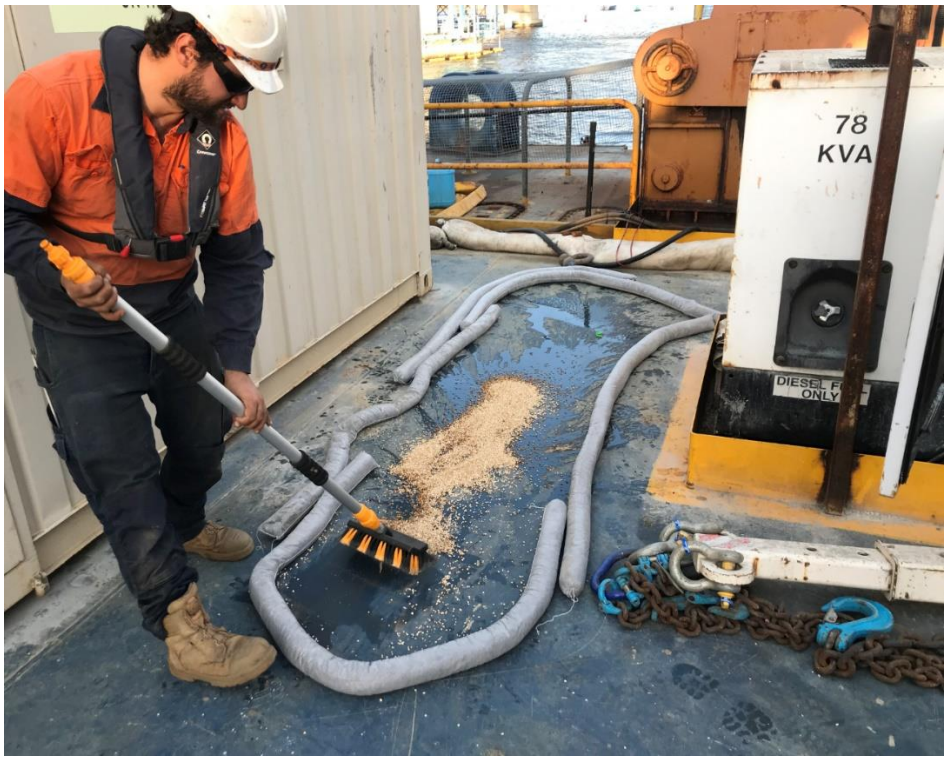
1. Control the source of the spill; stop the leak, close the valve, turn off the machine.
2. Contain the spilled material to a smallest area possible.
   a. Spills on land: On bare soil, use soil to create a bund to prevent the spill from spreading. Shovel up or excavate any contaminated soil and dispose of to a licensed landfill site. On non-impervious surfaces use spill kit socks (or sandbags or similar) to form a bund downhill from the spill to stop it spreading; place spill kit under leaks; broadcast absorbent material over the spill and work towards the centre of the spilled material with a stiff bristle broom. Mop up liquids with spill kit pads or pillows; sweep, shovel or vacuum up granular absorbent material; dispose to a licensed landfill site.
   b. Spills on water: Deploy floating boom on downstream side of spill. Consider wind direction and current or tidal flows. Slowly pull the boom around the spill and then draw it back into a small area. Position hydrophobic absorbent pads or hydrophobic granular material over the surface of the spill contained by the floating boom.
   c. Contact and report spill to Supervisor and/or Environment Representative.
3. Identify the spilled material and refer to Material safety Data Sheets (MSDS) for any specific Personal Protective Equipment (PPE) requirements.
4. Clean-up using the spill kit materials, absorbent sweep, absorbent pads, and implement any specific procedure specified in the MSDS.
5. Place the spill response materials in the contaminated waste bags and place the contaminated materials in the allocated area on site. Pending disposal to a licensed facility. Do not place contaminated materials into general waste bins.
6. Communicate details of the incident and response efforts. Complete the Environmental Incident Report and submit the details and improvements to the relevant stakeholders.
7. Restock the spill kits after use.

## 4.1 Spill Response Procedure Photographic Example

- Turn off the plant/equipment causing the leak. Contain the spilled material to a smallest area possible, using booms, bunds or another suitable material. When the spill is contained, and the leak and source has been stopped. Contact the Supervisor.




- Once contained, install absorbent sweep. Ensure that the absorbent sweep is placed across the spill and thoroughly swept in multiple times.




- Use the absorbent pads to soak up the spill. Place all spill materials into the clearly labelled contaminated waste bags and tie up the bag



- Once the pads and absorbent sweep has be used, conduct a final spray of the dispersant to collect any surface remnants caused by the spill. Use pads to collect the surface remnants and placed in contaminated waste bag.




- If the spill is on the ground. Remove the contaminated and earthen materials and place in the contaminated waste bags.



- Place all materials, absorbent sweep, spill pads and contaminated earthen materials into the contaminated waste bags.



- Place the contaminated waste bags into the designated hydrocarbon waste site facility. This will include steel drums, fully bunded, signed and secured.




- Restock the spill kits. Ensure they have all items including:
  - Absorbent Pads
  - Absorbent Mini-Booms
  - Absorbent Pillows
  - Absorbent Sweep
  - Contaminated Waste Disposal Bags & Ties
  - Nitrile Rubber Gloves
  - Heavy Duty Brush and Shovel Set
  - Laminated Instructions



# Appendix L - Acid Sulfate Soils and Salinity Management Plan

# M7-M12 Integration project

## Construction Soil and Water Management Sub-plan

### Appendix L: Acid Sulfate Soils and Salinity Management Plan

November 2023



# Document Control

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# Acronyms and Abbreviations

| Term | Expanded text |
|---|---|
| ASS | Acid Sulfate Soils |
| ASSSMP | Acid Sulfate Soils and Salinity Management Plan |
| ARSR | Amendment Report Submissions Report |
| ANC | Acid Neutralising Capacity |
| CEMP | Construction Environmental Management Plan |
| CoA | Conditions of Approval |
| CSWMP | Construction Soil and Water Management Plan |
| CEMP | Construction Environmental Management Plan |
| CRS | Chromium Reducible Sulfur |
| DAWR | Department of Agriculture and Water Resources |
| DIPNR | NSW Department of Infrastructure, Planning and Natural Resources |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Authority |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representative |
| OCEMP | Overarching Construction Environmental Management Plan |
| PASS | Potential Acid Sulfate Soils |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| REMMs | Revised Environmental Management Measures |
| sPOCAS | Suspension Peroxide Oxidation Combined Acidity and Sulfur |
| TfNSW | Transport for NSW |
| TPA | Total Potential Acidity |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |
| WSROC | Western Sydney Regional Organisation of Councils |

# 1 Introduction

## 1.1 Context

This Acid Sulfate Soils and Salinity Management Plan (ASSSMP) is an appendix of the Construction Soil and Water Management Sub-Plan (CSWMP), which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project. The relevant information and requirements for both the M7 Widening and M12 East package are included in this Plan.

The M12 East package components of this plan has been prepared under and is consistent with the Overarching Construction Environmental Management Plan (OCEMP) and relevant sub-plans developed for M12 Motorway.

This Plan addresses the following requirements for the M7 Widening and M12 Motorway:

- M7 Widening:
  - Minister's Conditions of Approval (CoA) for M7 Widening (SSI-663-Mod-6) (M7 CoA)
  - Updated Environmental Management Measures listed in the Westlink M7 Modification Report (August 2022) and the Submissions Report (November 2022) (M7 Updated Environmental Management Measures (referred to as M7 REMMs in this Plan)
- M12 Motorway:
  - Commonwealth CoA for M12 Motorway Project (EPBC 2018/8286) (Commonwealth M12 CoA)
  - CoA for M12 Motorway Project (SSI 9364) (NSW M12 CoA)
  - Revised Environmental Management Measures listed in M12 Motorway Environmental Impact Statement (EIS) (October 2019), the Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 Revised Environmental Management Measure (REMMs))
  - Overarching Construction Environmental Management Plan (OCEMP)
  - Relevant consistency assessments
- Applicable legislation
- Transport for NSW (TfNSW) specifications.

This ASSSMP supersedes the previously approved M12 East package ASSSMP.

## 1.2 Purpose

This ASSSMP provides detailed management strategies to mitigate the risks posed by the disturbance of naturally occurring acid sulfate soils (ASS) and soluble salts in soils within the M7-M12 Integration project. This plan has been developed with the aim of preventing harm to the environment in accordance with M7 CoA C4 (d), M12 CoA C4 (d) and (e), M7 Updated Environmental Management Measures (M7 REMM) C1, C5 and C6 and M12 Revised Environmental Management Measure (M12 REMM) SC01.

This Plan is an appendix of the Construction Soil and Water Management Sub-plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project.

This Plan has been prepared in accordance with the Department of Agriculture and Water Resources National Acid Sulfate Soils Guidance; National acid sulfate soils sampling and identification methods manual 2018 (DAWR, 2018a) and National Acid Sulfate Soils Guidance; National acid sulfate soils identification and laboratory methods 2018 (DAWR, 2018b), NSW Department of Primary Industries (2014) Salinity Training Handbook, Book 4 Dryland Salinity: Productive Use of Saline Land and Water (Water DECC, 2008), Managing Urban Stormwater: Soils and Construction Volume 1 (DPIE, 2004) and the TfNSW Specifications:

- TfNSW Specification D&C G36 – Environmental Management
- TfNSW Specification D&C G38 – Soil and Water Management
- TfNSW Specification D&C R44 – Earthworks.

## 1.3 Objectives

The objectives of this Plan include:

- Ensure compliance with environmental requirements of the M7-M12 Integration project
- Assist in the effective management of the environmental and waste disposal risks associated with excavating ASS during the construction phase of the M7-M12 Integration project works
- Assist in the effective management of the environmental risks associated with excavating soils with saline soils during the construction phase of the M7-M12 Integration project works
- Ensure project personnel are aware of this plan and can identify instances of saline soils and ASS from visual and olfactory observations
- Ensure appropriate control measures are adopted to protect the environment
- Provide a framework to manage and treat ASS soils to enable off-site disposal
- Contingency strategies.

## 1.4 Scope

The scope of this Plan is to describe the steps to be taken in the event that acid sulfate soils are discovered during construction including identification, management of excavations, transport procedures, treatment, process management and verification testing. In addition, management of salinity in groundwater, stormwater and drainage.

This Plan is applicable to all activities during the construction of the M7-M12 Integration project, including all areas where physical works will occur or areas that may otherwise be impacted by the construction works and under the control of John Holland. All John Holland staff and sub-contractors are required to operate fully under the requirements of this Plan and the CSWMP.

## 1.5 Induction/training

All site personnel involved in the M7-M12 Integration project works activities will be trained and inducted on the requirements of this Plan.

Additional training will be provided personnel involved in earthworks, stockpiling activities and transport of waste. Training will include inductions, toolbox talks, pre-starts and targeted training as required.

## 1.6 Roles and responsibilities

John Holland's Environmental Site Representative (ESR) is responsible for ensuring this Plan is effectively implemented, and all site personnel are aware of the requirements of this Plan. The ESR is responsible for inspecting and monitoring of excavations, transport procedures, treatment, process management and verification testing requirements outlined in this Plan.

*Table 1-1:Summary of responsibilities*

| Position / Organisation | Report to | Summary of Responsibilities |
|---|---|---|
| John Holland | TfNSW WSO Co | - Engage a suitably qualified environmental consultant<br>- Communicate requirements to all contractors<br>- Review documentation provided by contractors<br>- Review the ASSSMP and any other reports developed by consultants<br>- Ensure the ASSSMP is implemented correctly<br>- Ensure the ASSSMP is available to anyone. |
| John Holland | TfNSW WSO Co | - Must have experience in managing, treating and disposing ASS<br>- Complete SafeWork NSW permits and notification as required<br>- Notify landfill for acceptance of the waste and adhere to landfill requirements<br>- Undertake ASS treatment, soil and wastewater removal in accordance with their contract and ASSSMP requirements for the site<br>- Follow instructions by environmental consultant during the works<br>- Regularly inspect and monitor all activities for adherence to appropriate environmental standards.<br>- Undertake works in a safe and environmentally responsible manner and in accordance with legislative requirements<br>- Management of unexpected constraints and conditions that may arise during the works. |
| Environmental Consultant | John Holland | - Must be experienced in contamination assessments including the identification and management of ASS<br>- Provide work, health and safety and environmental consultancy to John Holland<br>- Ensure works are undertaken in accordance with this ASSSMP and current legislative requirements<br>- Provide validation testing for ASS and waste classification assessments prior to off-site disposal as required<br>- Track all materials moving on and off-site<br>- Undertake surface water monitoring as required. |

## 1.7 Approval, review and modification

This Plan will be reviewed by WSO Co, the TfNSW Environment and Sustainability Manager (ESM) (or delegate) and the Environmental Representative (ESR) to confirm it is consistent with, and

incorporates, all relevant elements of the M7-M12 Integration project CEMP, approved Overarching Construction Environmental Management Plan (OCEMP) and other requirements, prior to submission to the Planning Secretary and the Environmental Protection Authority (EPA) for information.

Construction of the M7-M12 Integration project will not commence until the CSWMP, and this Plan has been reviewed to the satisfaction of the TfNSW ESM and ER and provided to the Planning Secretary and EPA for information.

The Plan will be implemented for the duration of construction and for any longer period set out in this Plan or as specified by the Planning Secretary, whichever is the greater. As part of the CEMP this Plan will be reviewed and updated as required and in accordance with Section 8.7 of the CEMP.

# 2 Environmental Requirements

## 2.1 Legislation and guidelines

This Procedure has been developed with consideration of the following key legislation and guidelines:

- Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC, 2008)
- Department of Agriculture and Water Resources National Acid Sulfate Soils Guidance; National acid sulfate soils sampling and identification methods manual 2018
- Department of Agriculture and Water Resources National Acid Sulfate Soils Guidance; National acid sulfate soils identification and laboratory methods manual 2018
- Protection of the Environment Operations Act 1997 (POEO Act)
- Managing Urban Stormwater: Soils and Construction Volume 1 (DPIE, 2004)
- NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) 'Site Investigations for Urban Salinity 2002' (DIPNR, 2002)
- NSW Department of Infrastructure, Planning and Natural Resources (DIPNR): Western Sydney Regional Organisation of Councils Ltd (WSROC) 'Western Sydney Salinity Code of Practice, 2003' (WSROC, 2003)
- NSW Department of Primary Industries (2014) Salinity Training Handbook.
- NSW Work Health and Safety Act 2011
- NSW Work Health and Safety Regulation 2017
- NSW EPA Waste Classification Guidelines 2014: Part 1 – Classifying Waste; and Part 4 – Acid Sulfate Soils 2014 (NSW EPA 2014)
- Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze (RTA NSW, 2005)
- Urban salinity management in the Western Sydney Aerotropolis area (Department of Planning, Industry and Environment, 2021)
- TfNSW Specification D&C G36 – Environmental Management
- TfNSW Specification D&C G38 – Soil and Water Management
- TfNSW Specification D&C R44 – Earthworks.

## 2.2 Requirements

The applicable M7 and M12 REMMs relevant to the development of this procedure are listed in Table 2-1, as identified in the CSWMP.

*Table 2-1:Salinity and acid sulfate soils requirements*

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| **M7 REMMs** | | |
| SW1 | A Soil and Water Management Plan (SWMP) will be prepared as part of the proposed modification. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land. The SWMP will include:<br>• Measures to manage potential saline soils | This Plan<br>Sections 4.2 and 4.3 |
| AQ13 | Any acid sulphate soils encountered during earthworks will be managed in accordance with the with the Acid Sulfate Soils Manual (Acid Sulfate Soil Management Advisory Committee, 1998) and Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze (NSW Roads and Traffic Authority, 2005b). | This Plan<br>Section 3 |
| C1 | A Soil and Water Management Plan (SWMP) will be implemented during construction and incorporate the following measures:<br>• Register of known or suspected areas of contamination (from site investigations) and areas requiring remediation<br>• Testing procedures to determine the actual presence of acid sulfate soils prior to ground disturbance activities<br>• Testing procedures to determine the presence of saline soils prior to ground disturbance activities. | Section 3.1, 3.2 and 3.3<br>Section 4<br>Section 6.9 of CSWMP<br>Appendix B<br>Appendix H<br>CCLMP |
| C4 | Contamination within the Westlink M7 lease area will be managed in accordance with the existing or updated Operational Environmental Management Plan (OEMP). Pre-construction contamination condition surveys will be undertaken on all sites intended to be used as construction ancillary facilities. Post-construction contamination condition surveys will be undertaken on all ancillary facilities and any contamination caused by the use of the site as a construction ancillary facility remediated to a standard suitable for the identified land use. | Section 5<br>CCLMP |

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| | Remediation will be undertaken by the construction contractor prior to operation of the modification. | |
| C5 | Prior to ground disturbance in areas of potential inland acid sulfate soil occurrence, testing will be carried out to determine the actual presence of acid sulfate soils. This measure is especially appliable to areas on waterbodies where disturbance of sediments and surrounding soil is to occur. If acid sulfate soils are encountered, they will be managed in accordance with the *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998) and *Guidelines for the Management of Acid Sulfate Materials: Acid Sulfate Soils, Acid Sulfate Rock and Monosulfidic Black Ooze* (NSW Roads and Traffic Authority 2005b). | Section 3.3<br>CCLMP |
| C6 | Prior to ground disturbance in high probability salinity areas, testing will be carried out to determine the presence of saline soils. If salinity is encountered, excavated soils will not be reused, and will be managed in accordance with Book 4 Dryland Salinity: Productive Use of Saline Land and Water (NSW DECC, 2008c). Erosion controls will be implemented in accordance with the Managing Urban Stormwater: Soils and Construction Volume 1 (DPIE, 2004). | Sections 2.1 and 4<br>Section 6.1 and 6.3 of the CSWMP<br>Appendix D<br>CCLMP<br>CWRMP |
| **M12 REMMs** | | |
| REMM SWH01 | A Construction Soil and Water Management Plan (CSWMP) will be prepared for the project. The plan will outline measures to manage soil and water impacts associated with the construction works, including contaminated land.<br>The CSWMP will provide measures to manage stockpiles including locations, separation of waste types, sediment controls and stabilisation. | This Plan<br>Sections 3.5.1, 3.5.2, 3.6, and 4.3 |
| REMM SC01 | Construction within areas of moderate to high-risk saline soils will be managed in accordance with the CSWMP. Specific measures will also include (but not be limited to):<br>• Ongoing groundwater monitoring of salinity as part of the water quality monitoring program | Sections 2.1 and 4<br>Section 6.9 of the CSWMP |

| Reference | Measure/requirement | Where addressed |
|---|---|---|
| | • Identification and management of saline discharge sites<br>• Progressive stabilisation and revegetation of exposed areas following disturbance as soon as is practicable<br>• Testing to confirm the presence of saline soils in areas of high salinity potential prior to disturbance<br>• Soil salinity management will also be carried out in accordance with the NSW Department of Primary Industries (2014) Salinity Training Handbook | Appendix B<br>Appendix H |
| REMM SC02 | Testing will be carried out to confirm the presence of saline soils in areas of high salinity potential and to confirm the presence of ASS around creeks prior to disturbance | Section 4 |
| REMM SC03* | 3. Measures to manage potential ASS (as required based on testing results) within sediments of the creeks in the construction footprint to minimise impacts to the environment | Section 3.1<br>CCLMP |
| * Identified in the Construction Contaminated Land Management Plan. In the event of any inconsistency, refer to the Construction Contaminated Land Management Plan | | |

# 3 Acid Sulfate Materials

## 3.1 Monosulfidic black ooze

Monosulfides and Monosulfidic Black Ooze (MBO) are characterised by their black and often oily appearance and, when disturbed, by the release of hydrogen sulfide (H2S, also known as rotten egg gas). They generally accumulate in low energy ASS environments such as waterways and lagoons, forming thick 'blankets' of organic rich, gel like materials. When disturbed in significant quantities they can cause acidification of waterways and deoxygenation of waters. Where drains and wetlands are constructed MBO can continue to accumulate where favourable conditions exist and present an ongoing management issue. It should be noted that MBO has not been identified along the project alignment to date during preliminary site investigations.

## 3.2 Acid sulfate rock

Acid Sulfate Rock (ASR) includes geological rock units that contain sulfide and sulfate minerals (pyrite). All rock has the potential to contain varying quantities of sulfide / sulfate minerals. Elevated concentrations are generally associated with metalliferous ore deposits and coal units, but can also occur in other forms such as uplifted marine sedimentary rocks and wind driven sediments containing pyrite.

No occurrences of acid rock were documented within Bringelly Shales soil landscapes. On this basis, the potential for encountering acid rocks along the project footprint is considered to be extremely low. If ASR is encountered, this document would be updated to address the relevant management measures.

## 3.3 Acid sulfate soils

Acid Sulfate Soils (ASS) is the common name for naturally occurring sediments and soils containing iron sulphides. The exposure of these soils to oxygen by drainage or excavation oxidises the iron sulphides and generates sulfuric acid. The sulfuric acid can be readily released into the environment, with adverse effects on the natural and built environments.

According to the Australian Soil Resources Information System the site has a probability rating of 'Extremely Low Probability of Occurrence'.

As required in M7 REMM C5 and M12 REMM SC03 Item 3 'measures to manage potential ASS (as required based on testing results) within sediments of the creeks in the construction footprint to minimise impacts to the environment'. The reviewed data indicates that there is variability in the results from ASS testing, with some soils showing no risk and others presenting a low to moderate risk of generating acid within shallow acidic soils / potential ASS (PASS).

The preliminary visual checking of PASS will be based on material type, colour and consistency. Grey to dark grey and black clays, silts and sands are generally suspected to be PASS.

### 3.3.1 Field screening

According to DAWR (2018a) soil samples must be analysed as soon as possible for field pH tests (pHF) Soils that record a pH of below 6, following oxidation with peroxide (H2O2) (pHFOX), should be managed as PASS and must be treated to mitigate the risk of acid generation. Other indicators of PASS, during the field peroxide test that also assist in the determination of ASS risk, include change in colour of the soil from grey tones to brown tones, effervescence, release of sulfur-smelling gases such as sulfur dioxide or hydrogen sulphide and a lowering of the soil pH by at least one unit.

Where confirmation of the PASS status is desired or a liming rate is required, samples should be submitted to the laboratory for the chromium reducible sulfur (CRS) suite.

### 3.3.2 Management plan trigger criteria

The guidelines provide action criteria based on the percentage of oxidizable sulfur or Total Potential Acidity (TPA), for broad categories of soil. The suspension peroxide oxidation combined acidity and sulfur (sPOCAS) or chromium reducible sulfur (SCR) suite of analysis is used to assess soil for the presence of ASS. Where soils containing concentrations at or above the action criteria are disturbed, an ASS Management Plan is needed as there is a potential for the soil to generate acid, and specific management may be required.

*Table 3-1:ASSMP action criteria*

| Type of Material | | Action Criteria 1-1000 tonnes ASS disturbed | | Action Criteria if more than-1000 tonnes ASS disturbed | |
|---|---|---|---|---|---|
| **Texture range. McDonald et al. (1990)** | **Approx. clay content (%<0.02mm)** | **Sulfur trail % S oxidisable (oven-dry basis) e.g. STOS or SPOS** | **Acid trail mol H+/T (oven-dry basis) e.g. TPA or TSA** | **Sulfur trail % S oxidisable (oven-dry basis) e.g. STOS or SPOS** | **Acid trail mol H+/T (oven-dry basis) e.g. TPA or TSA** |
| Coarse Texture | <5 | 0.03 | 18 | 0.03 | 18 |
| Sands to loamy sands | 5 - 40 | 0.06 | 36 | 0.03 | 18 |
| Medium Texture | >40 | 0.1 | 62 | 0.03 | 18 |

DAWR, 2018b includes guidance to verify if sufficient neutralising material has been applied to soil to prevent any further acidification. In a properly ameliorated soil, the $pH_{KCl}$ will usually be greater than 6.5 and the verification net acidity will be less than zero. In the determination of verification net acidity, the acid neutralising capacity (ANC) measured in the treated soils is subtracted from that initially measured in the untreated soil.

The verification net acidity equation is provided in DAWR, 2018b and is as follows:

**Equation 3.3 Verification Net Acidity.**

$$\begin{aligned} &\textit{Verification Net Acidity} \\ &\quad = \textit{Potential Sulfidic Acidity} + \textit{Actual Acidity} + \textit{Retained Acidity} \\ &\quad - (\textit{post treatment Acid Neutralising Capacity} \\ &\quad - \textit{initial Acid Neutralising Capacity}) \end{aligned}$$

*Figure 3-1:Verification Net Acidity Equation*

In summary, the verification criteria for treated ASS is:

- Net acidity (using appropriate fineness factor) = Zero or negative mol H+ / t
- pHKCl = Greater than 6.5.

## 3.4 Management of excavations

ASS management will be required to prevent adverse impacts occurring to the environment and infrastructure from ASS during the proposed excavation works at the site. Any material that screening shows to be a potential risk should be transported to the acid sulfate soil treatment compound and managed in accordance with the protocol in Section 3.5.2, or otherwise disposed of to a licenced waste receiver able to treat the acid sulfate soil.

ASS management will be required to prevent adverse impacts occurring to the environment and infrastructure from ASS during the proposed excavation works at the site.

Based on the nature of the works, and the identification of PASS within the soils planned for disturbance, the recommended ASS management strategy for the proposed works should be undertaken over two stages:

- Stage 1: Onsite treatment and assessment prior to off-site disposal, and
- Stage 2: Disposal of treated ASS offsite.

## 3.5 Onsite treatment and assessment prior to off-site disposal

### 3.5.1 Treatment area setup

An appropriate assessment/treatment area must be constructed for the treatment of excavated soils. The soils are to remain within this area until the treated soils are considered appropriate to be removed off-site. The assessment/treatment area should be constructed in accordance with the ASSMAC Management Guidelines 1998 and the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines 2014.

Allowances should be made during construction planning to resume sufficient land to allow for these items. Figure 3-2 below shows a cross section of a typical treatment pad. It should be noted that a treatment pad established on hardstand can achieve the outcomes of that described below without excavated drains. Final designs must be developed in reference to this ASSMP and approved by the supervising environmental consultant.

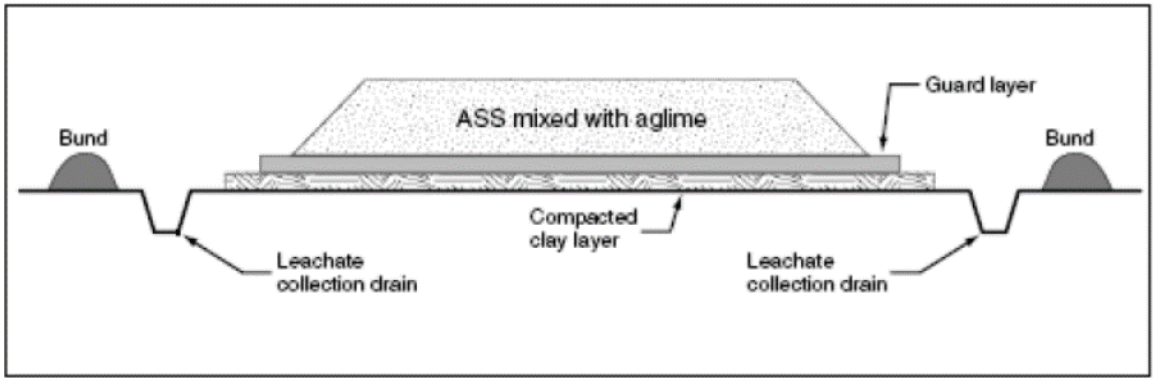



*Figure 3-2:Schematic cross-section of a treatment pad, including clay layer, guard layer, leachate collection system and containment with bunding*

The assessment/treatment area should be prepared as follows:

- Prepare a treatment pad of appropriate area for the volume of soil to be treated/stored. The pad should be prepared on relatively level or gently sloping ground to minimise the risk of any potential instability issues
- It is recommended that the ASS assessment/treatment area must be constructed on a hardstand or a similar impervious layer such as high-density polyethylene (HDPE) sheeting and shall be within a portion of the site that does not lie in a natural drainage line
- Apply a guard layer of fine agricultural lime (ag-lime) over the impervious layer to neutralise downward seepage. This guard layer should be applied at a rate of 5 kg of ag-lime/m2 per vertical meter of fill. The guard layer should be re-applied following removal of treated soils prior to the addition of untreated ASS
- Liming pads should be bunded with onsite soils not classified as PASS and a perimeter drain excavated to collect and contain leachate. The bunds should be preferably constructed of low permeability soil (i.e. clay) or, where suitable soil is not available, hay bales covered with impermeable plastic, with bunds at least 0.3 m high around the entire stockpile/treatment area. The drain and inner bund slopes should have a layer of ag-lime applied to neutralise any possible leachate migrating from the stockpiled material.

It should be noted that alternate methods for establishing an appropriate assessment/treatment area may be considered due to practicality constraints onsite. This would be subject to achieving the required treatment standard to the satisfaction of a suitably qualified environmental consultant.

### 3.5.2 Treatment

The treatment process should involve the following:

- Removal of non-ASS overburden (i.e possible non-ASS fill) from the soils containing ASS to the satisfaction of a suitably qualified environmental consultant
- Transport ASS material requiring treatment to the assessment/treatment area
- Manage ASS during stockpiling and treatment to minimise dust and leachate generation (eg. by covering, or lightly conditioning with water). If wet weather prevails, stop works and cover the stockpiled material with a HDPE sheeting to reduce the formation of leachate
- Limit the surface area of the ASS exposed to oxygen by forming relatively high-coned stockpiles

- Material must be treated as soon as practical. Several treatment areas may be required for stockpiling and treatment, depending on the quantity of ASS material excavated
- Spread the ASS onto the guard layer in a layer of 0.2 to 0.3 m thickness. When spreading the first soil layer, care should be taken not to churn the lime guard layer
- Let the ASS dry to facilitate lime mixing (if too wet, then adequate mixing of lime cannot be undertaken).
- Apply ag-lime (3.5.3) to the stockpiled soil at the indicative liming rate in Section 3.5.3 and harrow/ mix thoroughly prior to spreading the next layer
- Continue the spreading/liming/mixing cycle. This can be done one layer at a time or with multiple ASS layers placed on top of each other
- Assess the success of the treatment using validation testing in accordance with Section 3.5.4
- Samples will need to be collected from all layers, which is likely to require use of plant for sampling.
- If validation sampling indicates that additional neutralisation is required, add additional lime and mix.
- When validation testing indicates that lime neutralisation is complete in accordance with Section 3.5.4, then the stockpiled soil may be assessed for waste classification purposes
- Undertake waste classification assessment and dispose of off-site in accordance with Section 3.6
- It is possible that excavation of both acidic and ASS will be required for the proposed development. The excavated soils should be stockpiled such that the acidic soils are segregated from the ASS and that these soils are also segregated from non-ASS
- Additionally, stockpiles of ASS should be kept moist to minimise oxidation, prior to lime treatment. They should be covered to prevent rainfall leaching through the stockpile and possibly creating acidic runoff and be located as far away as possible from any sensitive receptors (e.g. waterways, drainage channels etc.).

### 3.5.3 Neutralising materials for soils and lime application rate

An appropriate neutralising agent must be selected for the works. Ag-lime is the preferred neutralisation material for the management of ASS. Ag-lime comprises calcium carbonate (CaCO3), typically made from limestone that has been finely ground and sieved to a fine powder. Ag-lime with a purity of 95% or better should be used (i.e. ENV >95, where ENV is the effective neutralising value, a term used to rate the neutralising power of different forms of materials relative to pure, fine CaCO3 which is designated ENV = 100). The ag-lime should be fine and dry, as texture and moisture can also decrease the ENV.

The amount of lime required for treatment of ASS material must be estimated based on the laboratory analytical results. Based on the results of the Chromium Reducible Sulfur suite, a liming rate was calculated (kg of CaCO3/tonne of soil), detailing the volume of lime required to neutralise the acidity present within the soils, based on total and potential acidity as well as the acid neutralising capacity of the soils.

It should be noted that the acid production will vary both horizontally and vertically through the ASS profile due to the variability of natural systems. The liming rate to be calculated from the analytical

results should therefore be considered as a 'starting point', and pH monitoring should be conducted during treatment to assess the progress of the neutralisation and need for additional mixing and/or addition of ag-lime.

Material will only be considered to have been successfully treated when all soil has been validated in accordance with Section 3.3.2. If an alternate neutralising product is used, a specific dosing rate will need to be calculated.

For material remaining in-situ, an application of lime should be applied by dusting the top surface of the soil following excavation. The intent is to form a narrow crust of neutralised soil to prevent significant acid generation. However, excessive amounts of lime should not be applied to prevent altering the chemistry of the receiving waterbody. It should be noted that in-situ material does not require validation, however ongoing monitoring may be required for soil and water parameters at the site.

### 3.5.4 Validation testing

A suitably qualified environmental consultant must conduct all validation inspections and validation sampling required during the treatment works. The validation assessment should be conducted progressively throughout the bulk excavation works, following the neutralisation and blending of each stockpile of material. The validation assessment shall be undertaken as follows:

- A visual and olfactory assessment to determine that indicators of ASS such as monosulfidic black oozes (MBO), unripe muds, peat or peat soils, coffee rock or sulfurous/hydrogen sulfide odours
- During and following neutralisation, the stockpiled soils can undergo pH screening to provide an indication of that the appropriate quantities of lime have been added and the soils have been suitably mixed/blended
- NATA accredited laboratory testing. The preferred laboratory testing method is the Chromium Reducible Sulfur suite, and should be undertaken at a frequency of at least 1:250 m3 from within the treated material with a minimum of 2 samples, to validate the lime neutralisation:
    - Validation sampling locations to be selected on:
        - Systematic sampling (gridded) pattern;
        - Visual inspection for indications of ASS during site inspection; and
        - Accessibility of the proposed sampling location.
    - Validation samples shall be collected using the following methodology:
        - Soil samples will be recovered from a minimum of 0.3 m beneath the soil surface of the stockpile utilising hand equipment;
        - Nitrile gloves will be used during sampling, with a change of gloves between each sampling location;
        - Soil samples will be collected in sampling containers provided by the analysing laboratory, ensuring sufficient sample is collected for the required analysis;
        - All containers will be clearly labelled with unique sample identification; and
        - All samples will be stored on ice prior to dispatch and during transportation to the nominated laboratory under chain of custody procedures.

- Compare the validation results with the verification criteria given in Section 3.3.2. If all results meet the verification criteria, the ASS will be considered to have been successfully treated and may be disposed off-site to an appropriately licensed waste facility following the procedures outlined in Section 3.6
- Further treatment and verification testing of the soil will be required if the verification criteria are not met, or there is sufficient rationale to confirm the adequate treatment of soil
- Further treatment and verification testing will be required if ASR is encountered
- Analytical results are to be compiled into an ASS stockpile validation report and incorporated into this ASSMP.

## 3.6 Stage 2: offsite disposal of treated acid sulfate soils

Following successful treatment of ASS, the environmental consultant must undertake chemical assessment of the soils, or alternatively review the available chemical data for the soils for comparison against NSW EPA 2014 criteria in order to facilitate off-site disposal. All testing must be undertaken in accordance with the Remedial Works Plan. If any ASR is encountered, this document would be updated to include any additional requirements.

Stockpiled materials will need appropriate storage onsite while waste classification or ASS verification testing is undertaken. As a minimum, each stockpile will need to be maintained and secured within the assessment/treatment area and covered with weighted HDPE sheeting to prevent leachate generation whilst awaiting waste classification assessment results.

Prior arrangements should be made with the waste facility to ensure that it is licensed to accept the waste. The waste facility should be informed that the PASS has been treated in accordance with the neutralising techniques outlined in this ASSSMP and that the waste has also been classified in accordance with NSW EPA 2014.

## 3.7 Unexpected acid sulfate material find procedure

In the event that ASS or ASR is detected or disturbed, which has not been previously identified in the Environmental Assessment, John Holland and subcontractors will follow all reporting and notification requirements in CEMP Appendix A7 Environmental Incident Classification and Reporting Procedure, including notifying the ESR.

ASS management will be undertaken as follows:

**Step 1** - Cease works in the vicinity of the uncovered ASS/ASR

**Step 2** - The workers identifying the unexpected ASS/ASR shall inform ESR of the suspected material;

**Step 3** - Appropriately stockpile the soil within an area designated for the material;

**Step 4** - If necessary, use physical barriers to shelter and prevent runoff to environmentally sensitive features (i.e. Creeks, vegetated areas etc.);

**Step 5** - Assume the soil is ASS until an assessment is conducted;

**Step 6** - Engage a suitably qualified environmental consultant to undertake an environmental assessment of the affected area and provide further advice; and

**Step 7** - Further remedial works may be required or additional control measures in order to maintain a safe work zone.

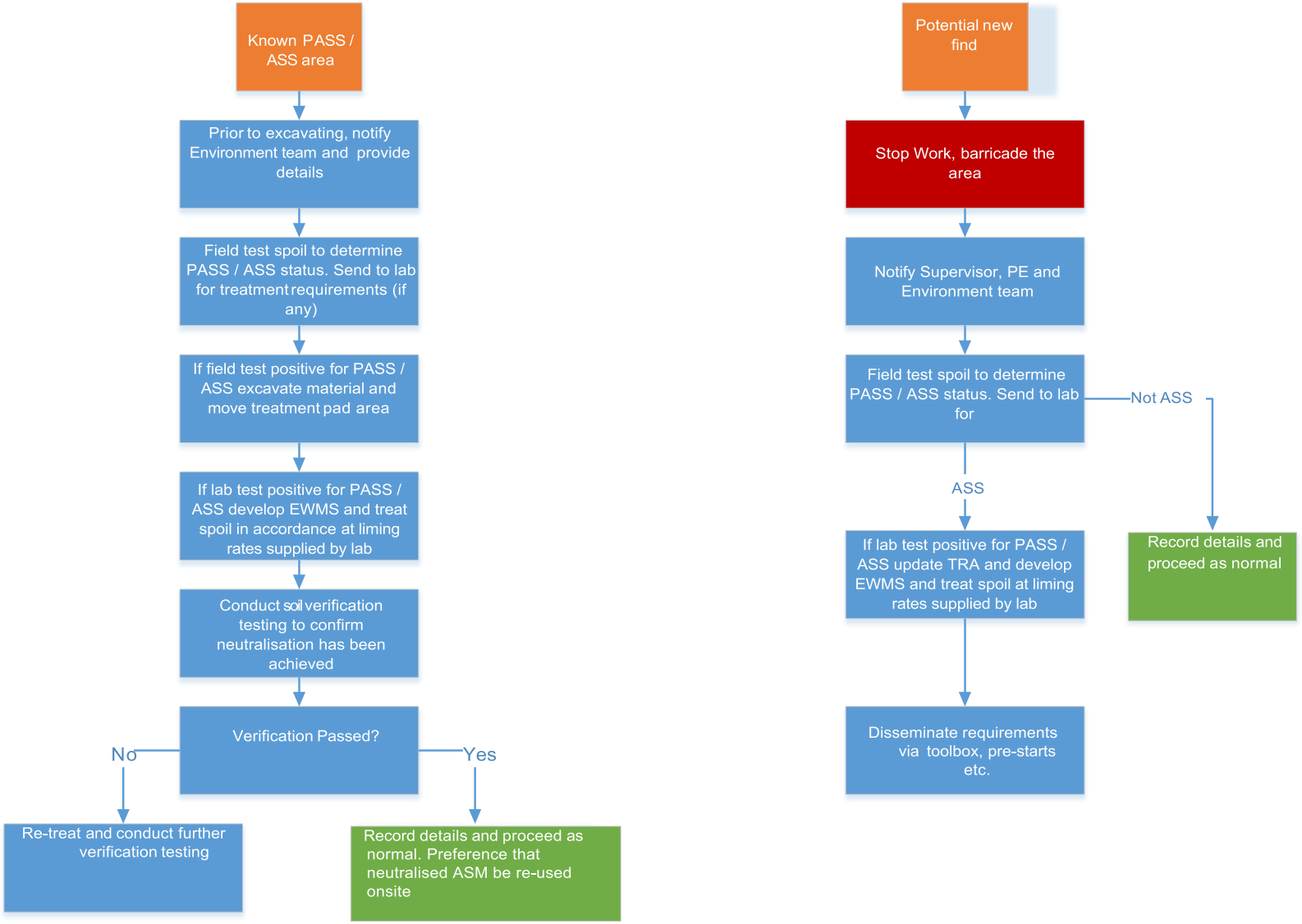



*Figure 3-3:Acid Sulphate Materials Management Flow Chart*

# 4 Salinity

Salinity is caused by the accumulation of soluble salts in the soil profile by surface water or groundwater movement and can produce aggressive soil conditions which may be detrimental to concrete and steel. Salts occur naturally in soil from sources such as weathering processes, soils formed on old sea beds and salt lakes, or from the ocean via wind and rain.

The NSW DIPNR, 2003 Salinity Potential in Western Sydney map shows the site as being on land with a moderate salinity potential with localised areas of high salinity potential identified at creek crossings and drainage lines.

Figure 4-1 to Figure 4-5 presents the M7 Widening project and Figure 4-6 presents the M12 project alignment against the Salinity Potential in Western Sydney Map (DIPNR, 2003) which depicts the distribution and potential for surface soil salinity based on areas of known salinity and their contributing factors, including soil landscapes, geology, topography and groundwater conditions.

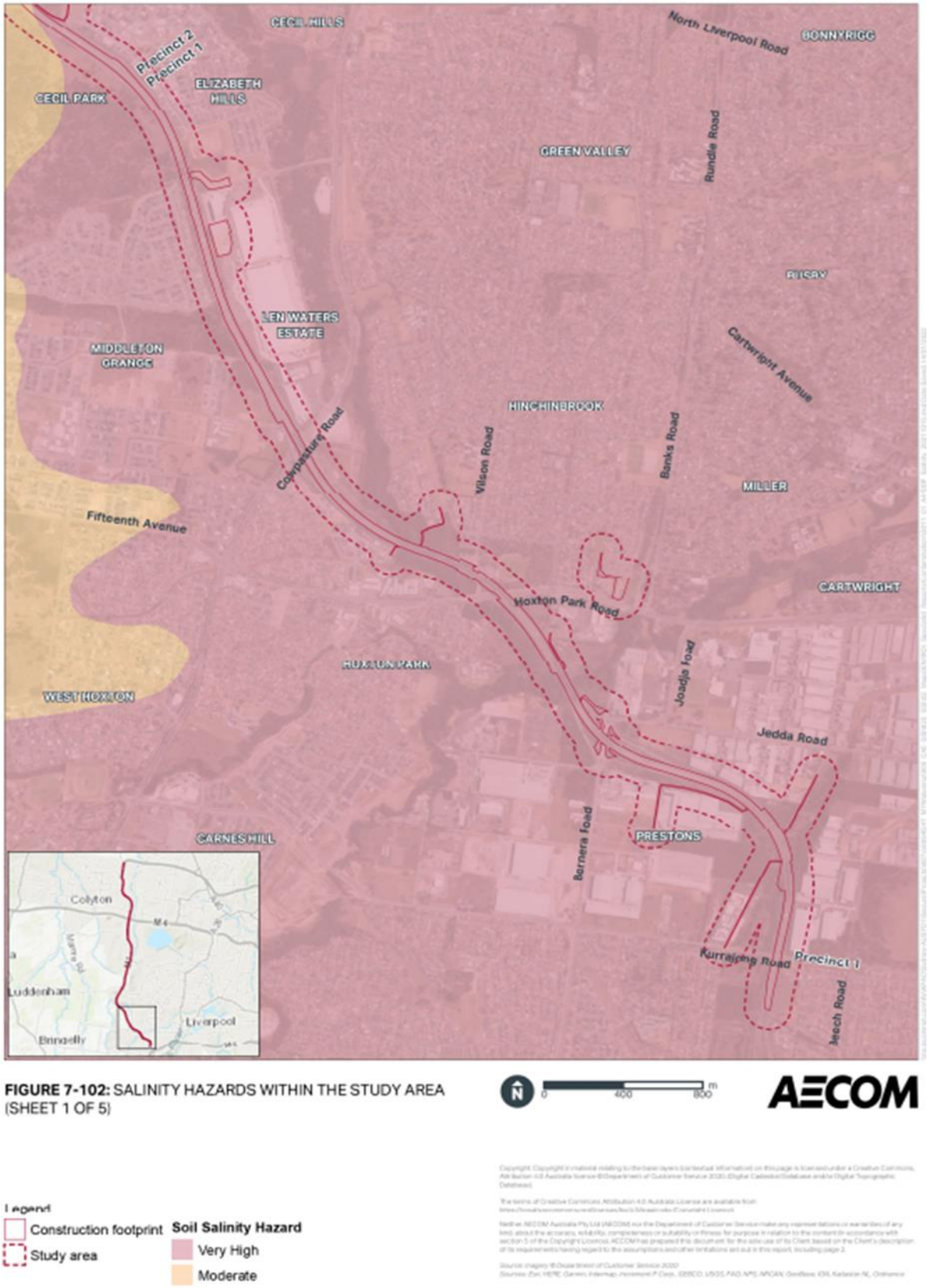



*Figure 4-1:Soil salinity potential map (source Westlink M7 Widening Modification Report)*

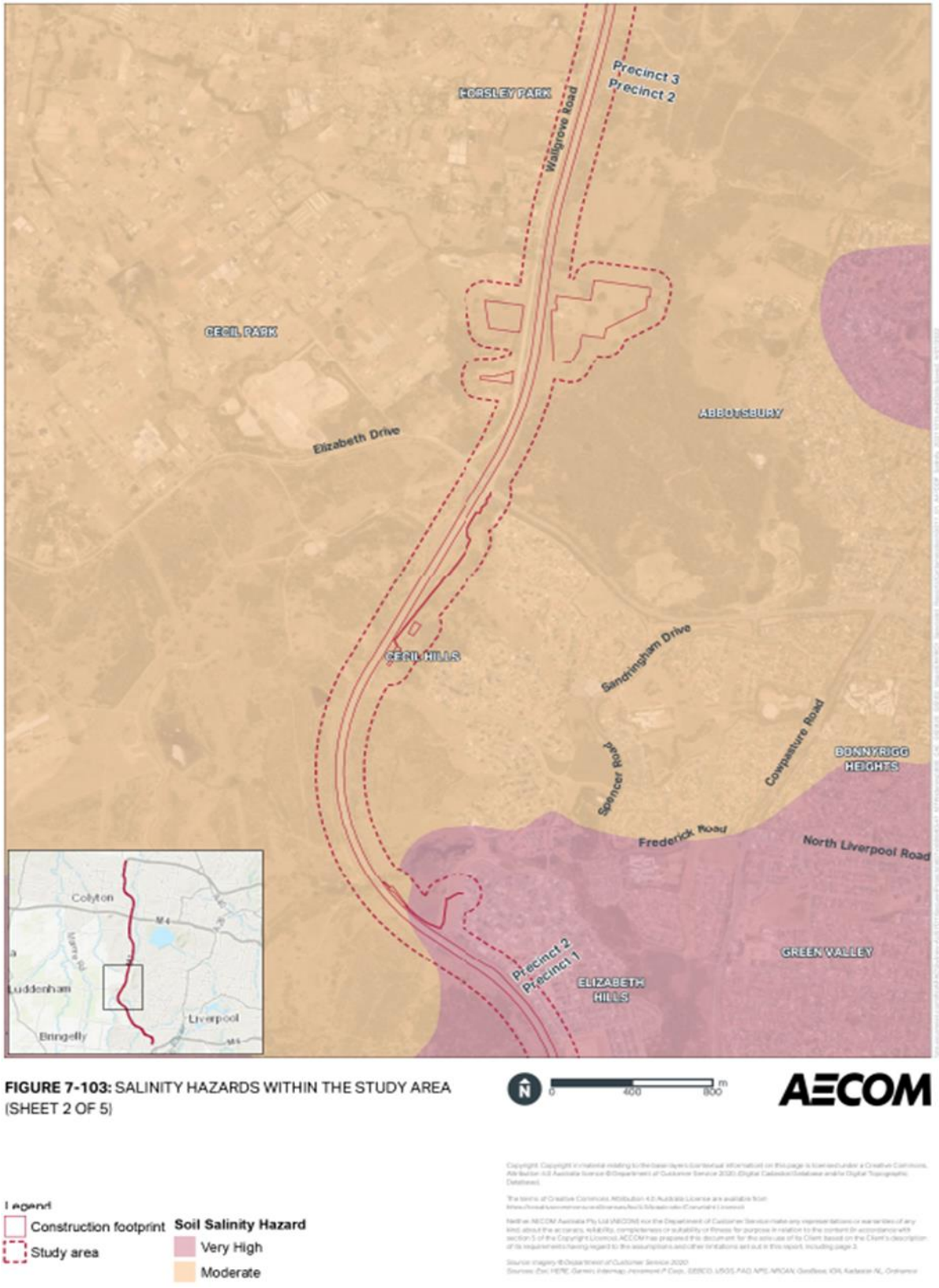



**FIGURE 7-103:** SALINITY HAZARDS WITHIN THE STUDY AREA (SHEET 2 OF 5)

AECOM

*Figure 4-2:Soil salinity potential map (source Westlink M7 Widening Modification Report)*

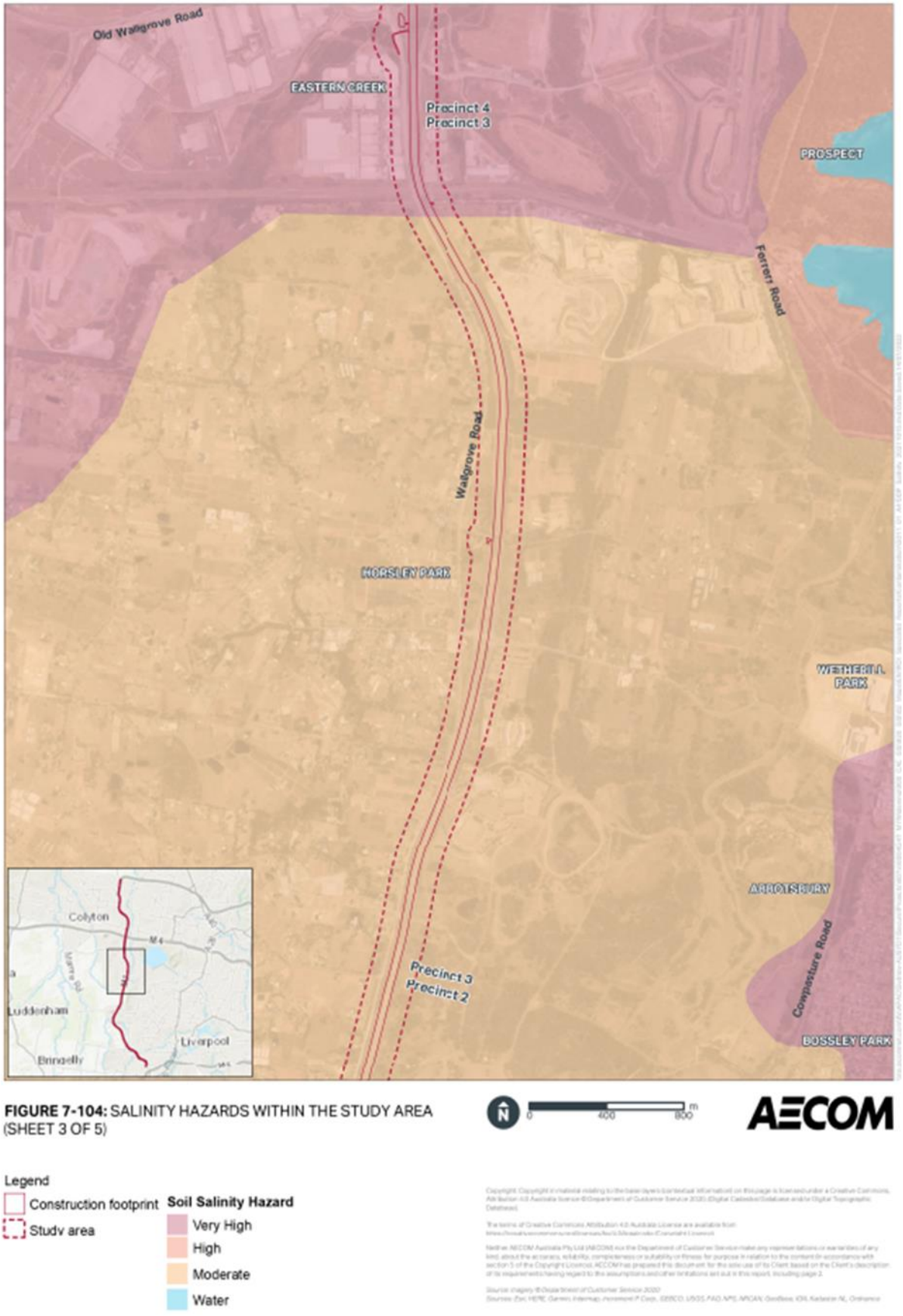



*Figure 4-3:Soil salinity potential map (source Westlink M7 Widening Modification Report)*

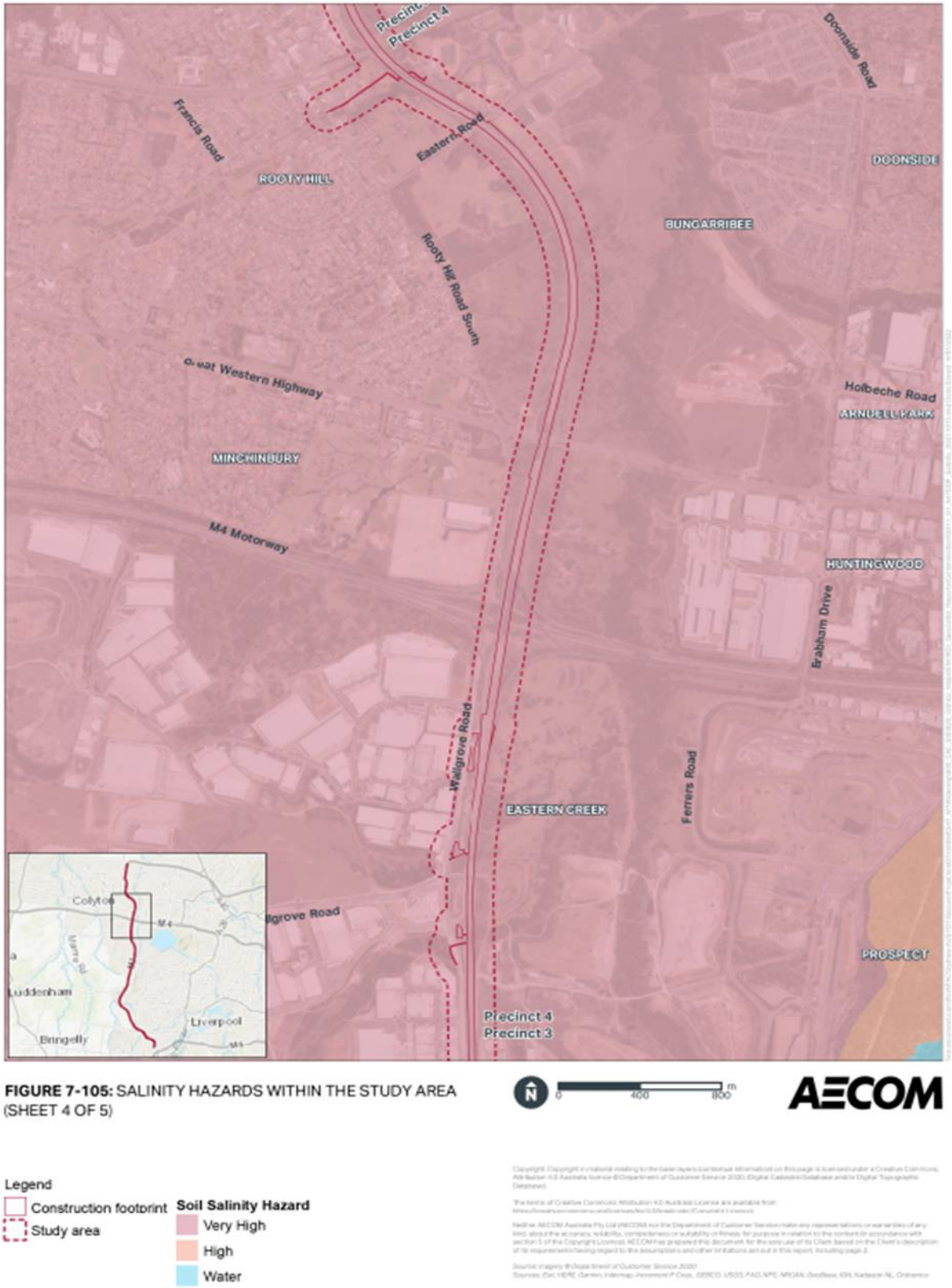



**FIGURE 7-105:** SALINITY HAZARDS WITHIN THE STUDY AREA (SHEET 4 OF 5)

*Figure 4-4:Soil salinity potential map (source Westlink M7 Widening Modification Report)*




**FIGURE 7-106:** SALINITY HAZARDS WITHIN THE STUDY AREA (SHEET 5 OF 5)

*Figure 4-5:Soil salinity potential map (source Westlink M7 Widening Modification Report)*




*Figure 4-6:Soil salinity potential map (excerpt based on DIPNR, 2003)*

The purpose of the salinity management plan is to integrate the design and construction of the proposed development with measures to reduce the short and long-term impacts of adverse salinity conditions during the redevelopment works. Outlined below are some general management principles, however some detailed management measures for specific construction activities are provided in the following subsections:

- Practise good soil management techniques during construction – in particular the implementation of erosion and sediment control plans, stockpile management (coverings and placement on impervious materials) and excavation lining and dewatering
- Minimise water inputs and maintain natural water balance
- Carefully manage areas of existing salinity or discharge areas
- Avoiding water collecting in a low-lying area, in depressions, or behind fill. This can lead to water logging of the soils, evaporate concentrations of salts, and eventually breakdown in soil structure resulting in accelerated erosion
- Maintain good site drainage, install additional drainage mechanisms (after assessing the site for reactive soils) to support the movement of water through and away from site
- Surface drains should generally be provided along the top of batter slopes to reduce the potential for concentrated flows of water down slopes possibly causing scour
- Properly install and maintain damp proof courses, do not breach with gardens, paving or extensions.
- Avoid the use of susceptible bricks or highly porous material in contact with the soil

- In areas of poor soil infiltration or high soil salinity it may be necessary to use salt proof building materials
- Avoid clearing. Retain and establish salt resistant native vegetation.

## 4.1 Monitoring criteria

Laboratory testing of soil salinity (electrical conductivity of a sample with one part soil to five parts water, EC1:5) is converted into conductivity of a saturated soil extract (ECe) by a multiplication factor to consider the influence of soil texture (Taylor, 1996). For the M7-M12 Integration project, a conversion factor of seven (medium clay) is adopted based on soil across the alignment generally characterised as medium to high plasticity with typical clay content between 40% to 55% (consistent with soil texture classifications as per AS4419-2018).

*Table 4-1:Salinity action criteria*

| Class | ECe (dS/m) | Comments |
|---|---|---|
| Non-saline | < 2 | Salinity efforts mostly negligible |
| Slightly saline | 2-4 | Yields of very sensitive crops may be affected |
| Moderately saline | 4-8 | Yields of many crops may be affected |
| Highly saline | 8-16 | Only tolerant crops yield satisfactorily |
| Extremely saline | >16 | Only a few very tolerant crops yield satisfactorily |

## 4.2 Management of groundwater, stormwater and drainage

Salinity management will be required to prevent adverse impacts occurring to the environment and infrastructure from saline soils during the proposed excavation works at the site.

Salinity problems generally occur in the areas where water accumulates, or which are subject to continuous wetting and drying cycles. This can be where natural through flow or surface flow is impeded by buildings, retaining walls or land resurfacing. Areas adjacent to downpipes, guttering or outdoor taps may also be susceptible to salinity problems particularly if leaking.

Leaking water pipes may also contribute to damp soils around properties and therefore cause salinity problems in areas with even mildly saline soils. Additionally, the corrosivity of the soils may weaken pipes and joints creating leaks which in turn lead to further salinity problems. In areas where salinity is a problem the maintenance of underground water and sewer pipes is very important. Water pipes can be checked for leaks by reading the meter before and after a period of nil water use.

The following are recommended when designing and constructing stormwater management structures:

- Construction design should allow for appropriate drainage and dissipation of water around buildings to mitigate flow impediments
- During construction, excavations and trenches should be left open for as minimal time as possible to prevent exposure to rainfall events and wetting/drying. Trenches (if must be left open) should be covered/lined by a geotextile material to minimise infiltration and dewatered where possible

- Consider soil corrosivity and choose appropriate construction materials and vegetation to resist the salts present
- Seek further advice and information from specialists regarding suitable design, materials and construction techniques for areas with a salinity potential.

The site has potential for localised salinity problems as this type of salinity is related to the evaporation of soil water containing salts through the concrete. Therefore, the management of drainage and damp build-up against physical structures is necessary.

The following recommendations are general, and any specific building requirements should be informed by geotechnical investigation and assessment:

- The disturbance of the subsoil should be reduced where possible to minimize the exposure of building materials to the corrosive elements in the soil
- Minimise vegetation clearing where possible in line with procedures described in Appendix B of the CFFMP
- Construction design should allow for appropriate drainage and dissipation of water around buildings to mitigate flow impediments
- Construction design should allow for, where appropriate the installation of protective barriers such as a geotextile membrane or inert materials such as stabilised sand to reduce direct contact of building elements with soils
- Where such soils or severe dampness is a problem consideration may need to be given to the suitability of slab on ground and the possibility of alternative housing construction methods, such as suspended slab or pier and beam
- In buildings where the parts of the floor are significantly above the ground level a second damp proof course may be necessary to protect rows of bricks between the ground surface and the required damp proof course
- Salt resistant bricks and concrete are available and are more suitable for use in saline environments generally referred to as ‘exposure quality bricks’
- Considerations should be made when choosing materials for underground services and other infrastructure. Metal pipes are susceptible to corrosion; therefore, plastic pipes, such as polybutylene or polyethylene are alternatives for water supply, and unplasticized Polyvinyl Chloride (UPVC) for plumbing pipes.

## 4.3 Contingency protocol

Although unlikely if salinity impacts are observed during the development despite the implementation of management measures, the following protocol should be followed:

- Stop work immediately
- Review ErSed (Erosion and Sediment) controls are in place and add additional controls where needed.
- Remove any pooled or excess waters before further excavation work proceed
- Add gypsum, lime or organics to stabilise soil PH and sodicity ranges
- Add further geotextile or protective barriers to limit any further infiltration which may cause further wetting/drying

- Recommence any works and complete with backfilling as soon as reasonably practicable if the component of work is close to finishing. However, if excavations are required to remain open for greater than a minor period of time, excavations may need to be temporarily backfilled to prevent further scouring, erosion or salt precipitation.

# 5 Monitoring, reporting and records

Compliance with this Plan will be tracked through weekly environmental inspections of excavation sites, inspection of all elements of the ASSMP management plan to ensure management protocols are being implemented and investigate for evidence of salinity and ASS impacts by the ESR or Environmental Team.

Maintain general inspection records, record of management, treatment, monitoring, validation and disposal of ASS should be maintained as set out in Table 5-1.

Identified non-compliances will be reported to the TfNSW Environment and Sustainability Manager (or delegate) and WSO Co and the appropriate management measures will be put in place to ensure ongoing compliance.

In accordance with M7 REMM C4, and detailed further in the CCLMP, pre-construction contamination surveys are programmed to be undertaken on all sites intended to be used as construction ancillary facilities. Post-construction contamination surveys will be undertaken on all ancillary facilities.

*Table 5-1:General acid sulfate soil monitoring requirements*

| Monitoring | Record | Responsibility | When |
|---|---|---|---|
| Regular monitoring of all ASM management activities will be undertaken during inspections | Weekly Environmental Inspection | Environmental team<br>Project Engineers<br>Supervisors | Weekly |
| Any incidents relating to acid sulfate soils will be reported either in accordance with the Roads and Maritime Environmental Incident Classification and Reporting Procedure or with the Unexpected Find Procedure outlined in the CLMP. | Environmental Incident Report | Environmental team | As required |
| During excavation of ASS material, the Project Engineer and Supervisor will ensure the following is recorded daily:<br>• Details of source location including chainage, offset, and depth;<br>• Volume of excavated material;<br>• Quantity of agricultural-lime added to excavation walls as a guard layer;<br>• Disposal/storage location. | Daily site diary<br>Waste classification documentation<br>Waste dockets | Project Engineer<br>Supervisor | Daily (as required) |

| Monitoring | Record | Responsibility | When |
|---|---|---|---|
| Manage the remediation and subsequent validation of the material, including any certification required. Any acid sulfate material removed from the Site must be appropriately treated, if required, and disposed of at a suitably licenced receiving facility and a written copy of such records provided to the Principal. | Testing and lab records<br>Validation records<br>Waste dockets | Environmental team<br>Project Engineer | Daily (as required) |

# Appendix M - Unexpected Contaminated Land Finds Procedure

# M7-M12 Integration project

## Construction Soil and Water Management Sub-plan

### Appendix M: Unexpected Contaminated Land Finds Procedure

November 2023



# Document Control

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| E | 02/11/2023 | Updated in response to DPE comments |
| F | 15/11/2023 | Up-revved in line with the CSWMP |
| G | 17/11/2023 | Up-revved in line with the CSWMP |
| H | 21/11/2023 | Up-revved in line with the CSWMP |

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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| AR | Amendment Report |
| ASS | Acid sulfate soil |
| ARSR | Amendment Report Submissions Report |
| CEMP | Construction Environmental Management Plan |
| CEnvP(SC) | Environmental Practitioner (Site Contamination) scheme |
| CLM Act | *Contaminated Land Management Act 1997* |
| CoA | Conditions of Approval |
| Commonwealth CoA | Federal Conditions of Approval under the EPBC Act |
| CPSS CSAM | Certified Professional Soil Scientist Contaminated Site Assessment and Management |
| CSWMP | Construction Soil and Water Management Plan |
| EIS | Environmental Impact Statement |
| EPA | NSW Environment Protection Authority |
| EPBC Act | *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* |
| ER | Environmental Representative |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representatives |
| EWMS | Environmental Work Method Statements |
| M7 CoA | Minster's Conditions of Approval for the M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) |
| M7 REMMs | Updated Environmental Management Measures listed in the Westlink M7 Submissions Report (November 2022) |
| M12 CoA | Minister's Conditions of Approval for the M12 Motorway (CSSI 9364) |
| M12 REMMs | Revised Environmental Management Measures listed in M12 Motorway Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 REMMs) |
| OCEMP | Overarching Construction Environmental Management Plan |
| PASS | Potential acid sulfate soil |
| PPE | Personal protective equipment |
| Procedure, this | Unexpected Contaminated Land Finds Procedure |
| RAP | Remedial Action Plan |

| Acronym | Definition |
|---|---|
| REMMs | Revised Environmental Management Measures |
| SDS | Safety Data Sheet |
| SWMS | Safe Work Method Statements |
| TfNSW | Transport for New South Wales |
| WSO Co | Western Sydney Orbital Company, joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |

# 1 Introduction

## 1.1 Context

This Unexpected Contaminated Land Finds Procedure (this Procedure) is an appendix of the Construction Soil and Water Management Sub-plan (CSWMP) which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project. The relevant information and requirements for both the M7 Widening and the M12 East package are included in this Procedure.

The M12 East package components of this procedure has been prepared under and is consistent with the Overarching Construction Environmental Management Plan (OCEMP) and relevant sub-plans, in particular with the M12 Motorway overarching Unexpected Contaminated Land Finds Procedure.

This Procedure addresses the following requirements for the M7 Widening and M12 Motorway:

- M7 Widening:
  - Minister's Conditions of Approval (CoA) for M7 Widening (SSI-663-Mod-6) (M7 CoA)
  - Updated Environmental Management Measures listed in the Westlink M7 Modification Report (August 2022) and the Submissions Report (November 2022) (M7 Updated Environmental Management Measures (referred to as M7 REMMs in this Procedure)
- M12 Motorway:
  - Commonwealth CoA for M12 Motorway Project (EPBC 2018/8286) (Commonwealth M12 CoA)
  - CoA for M12 Motorway Project (SSI 9364) (NSW M12 CoA)
  - Revised Environmental Management Measures listed in M12 Motorway Environmental Impact Statement (EIS) (October 2019), the Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 Revised Environmental Management Measure (REMMs))
  - Overarching Construction Environmental Management Plan (OCEMP)
  - Relevant consistency assessments
- Applicable legislation
- Transport for NSW (TfNSW) specifications.

This Procedure supersedes the previously approved M12 East package Unexpected Contaminated Land Finds Procedure.

## 1.2 Purpose

This procedure has been prepared in accordance with M7 CoAs D75 and D76 and M12 CoAs E89 and E90 to outline the procedure to be undertaken if potentially contaminated soil and/or material is encountered during excavation and construction activities during the construction of the M7-M12 Integration project, in accordance with M7 REMM SW1 and C1 and M12 REMM SWH01 and SC04.

This procedure details the actions to be taken when potentially contaminated soil and/or material is encountered during excavation and construction activities. In the event that hazardous materials are discovered, this procedure should be implemented.

## 1.3 Scope of the Procedure

The scope of this procedure is to describe the steps to be taken in the event of unexpected find contamination of soil/material during construction. This procedure is not applicable to the identification of soils suspected to be contaminated with plant pathogens.

This procedure is applicable to all activities during the construction of the M7-M12 Integration project, including all areas where physical works will occur or areas that may otherwise be impacted by the construction works and under the control of John Holland. All John Holland staff and sub-contractors are required to operate fully under the requirements of this Procedure and CSWMP over the full duration of the construction program.

A copy of this Procedure will be kept on the premises for the duration of construction.

## 1.4 Induction and training

Where required, all site personnel (including sub-contractors) are to be inducted on the identification of potential contaminated soil/material along with the requirements of this procedure during inductions and/or regular toolbox talks. All potential sources of contamination associated with the M7-M12 Integration project should be made known to Site personnel. Additionally, Site personnel should be informed of indications of contamination in soil and groundwater, such as:

- Odour
- Discolouration/staining of soils
- Groundwater or surface water sheen
- Evidence of landfilling/discarded drums.

## 1.5 Roles and responsibilities

The Environmental Site Representative (ESR) will ensure that this procedure is effectively implemented and that all personnel are informed of the requirements of this Procedure.

The John Holland Superintendent will be responsible for ensuring that in the event that contaminated land is uncovered, site personnel are made aware immediately, and all work in the vicinity of the identified contamination ceases. Additionally, they will be informed of any actions required for the control of the identified contamination, including the implementation of exclusion zones and putting up adequate signage. They will be made responsible for ensuring that all actions are undertaken and adhered to.

The Western Sydney Orbital Company (WSO Co) and/or TfNSW Environment and Sustainability Manager (ESM) (or delegate) will communicate with the relevant authorities (such as EPA and a Contaminated Land Specialist) where necessary and will approve the recommencement of works following the implementation and completion of any remedial works required.

A Contaminated Site Specialist (consultant) certified under either the Environment Institute of Australia and New Zealand's certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) will be engaged for the M7-M12 Integration project to carry out a Detailed Site Investigation (Stage 2 Site Contamination Assessment) and intrusive asbestos investigations.

The Contaminated Site Specialist will identify opportunities to improve the topsoil productivity of previously disturbed areas which will be incorporated into the M7-M12 Integration project as feasible and reasonable.

## 1.6 Review

This Procedure was reviewed by WSO Co/TfNSW and the independent Environmental Representative (ER) to confirm it is consistent with and incorporates all relevant elements of the approved CEMP prior to submission to the Planning Secretary for information.

This Procedure was reviewed and approved (for the purposes of M7 CoA D75(c) by a consultant who is certified under the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP (SC)) (SC41123).

Construction of the M7-M12 Integration project will not commence until this Procedure has been accepted by the ER and provided to the Planning Secretary for information.

This Procedure will be updated throughout the construction of the M7-M12 Integration project to include any newly identified sites of contamination if required, and subsequent additional management measures. This Procedure will be reviewed annually or as required in accordance with the continuous improvement process described in Section 8 of the CSWMP.

# 2 Procedure

In the event that contaminated materials are encountered during construction works, the following steps to be followed are outlined below. Indicators of contamination in soils include:

- Discolouration of the soil, including staining and horizontal layers of discolouration
- Odours from soil
- Oily sheen on water leaving soils.

**Step 1. Potential contaminated soil/material encountered during construction activities**

If potentially contaminated soil/material is encountered during any excavation/construction activities:

- Cease work in the immediate/affected area
- The John Holland Foreman/Site Supervisor must immediately inform the WSO Co/TfNSW ESM (or delegate) and the independent ER. TfNSW will further notify landowners (e.g., Water NSW) where contamination is identified on their land
- Install environmental controls around the site to contain the contaminated material, including diversion of water to minimise potential spread via surface water runoff
- If a potential risk of environmental harm from the potentially contaminated material is identified, the EPA must be notified immediately in accordance with the TfNSW Environmental Incident and Classification Procedure (refer to Appendix A7 of the CEMP)
- If it is determined that the contaminated soil/material may contain asbestos-containing material, refer to the Asbestos Management Plan (Appendix M of the CSWMP)
- Recommence works in an alternate area where practicable.

**Step 2. Environmental management and work health safety management**

Prior to any contamination investigation, management or remediation activities, appropriate Safe Work Method Statements (SWMS) and Environmental Work Method Statements (EWMS) will be prepared by the ESR and/or Safety Manager and reviewed by the WSO Co/TfNSW Project Manager and WSO Co/TfNSW ESM (or delegate).

Personal protective equipment (PPE) will be worn as per the relevant Safety Data Sheet/s (SDS) (where the SDS are available). This may include, but not be limited to:

- Protective eyewear (if not wearing a full-face mask)
- Face mask
- Steel–capped rubber-soled work shoes or gumboots with no laces or disposable overshoes that have an anti-slip sole for placement over work shoes;
- Single-use disposable nitrile or latex gloves
- Disposable asbestos coveralls rated type 5, category 3
- Suitable work clothes (i.e. long sleeve shirt/pants and steel-capped boots).

**Step 3. Undertake Detailed Site Investigation**

The ESR will assess the situation and, if considered necessary, the Contaminated Site Specialist to undertake a contamination investigation in the area of the find.

The material will be classified in accordance with the Waste Classification Guidelines (EPA, 2014).

If necessary, the ESR will liaise with the relevant authorities to determine the appropriate management options. Should the Detailed Site Investigation confirm contamination, an assessment will be made by the suitably qualified contamination specialist to determine whether there is a duty to notify the EPA under the *Contaminated Land Management Act 1997* (CLM Act). Following receipt of this advice, the ESR will inform WSO Co/TfNSW ESM of the duty to notify. The WSO Co/TfNSW ESM is responsible for any notifications required under the CLM Act.

The ESR (in consultation with WSO Co/TfNSW and specialists) will determine the appropriate management measures to be implemented. This may include leaving contamination undisturbed, capping of contamination, treatment or off-site disposal. Material to be disposed of off-site will be transferred to an appropriately licensed waste facility, as outlined in the Construction Waste and Resources Sub-plan.

If the material is determined to be acid sulfate soil (ASS) or potential acid sulfate soil (PASS), refer to the Construction Soil and Water Management Plan for management procedures relating to ASS or PASS.

**Step 4. Remedial action**

If the Detailed Site Investigations concludes that contamination of the specified land is to an extent to warrant a Remedial Action Plan (RAP), or the Asbestos Management Plan requires encapsulation of asbestos on site, a Contaminated Site Specialist will prepare a RAP. The Draft RAP for the subject land will be used as a guide to preparing the RAP for remediation of that land. The RAP will be completed in accordance with all guidelines under the CLM Act.

Prior to commencing with the remediation in the above circumstances, the RAP and an Interim Audit Advice or a Section B Site Audit Statement from a NSW EPA accredited Site Auditor that certifies that the RAP is appropriate and that the site can be made suitable for the proposed use will be submitted to WSO Co/TfNSW in accordance with TfNSW Specification G36, 4.2 Hold Point. TfNSW will submit the RAP to the Planning Secretary for information only in accordance with M7 CoA D70 and M12 CoA E87.

Based on known contamination data, a RAP is not required.

Relevant EWMS or SWMS will be reviewed and updated when required.

**Step 5. Recommence works**

Recommence works once remedial works have been implemented and sampling has validated that the remediation strategy has been successful, where required. In the event a RAP is required, the ESR will submit a Section A1 or Section A2 Site Audit Statement and the accompanying Site Audit Report from the NSW EPA accredited site auditor, which states that the contaminated land disturbed by the works has been made suitable for the intended land use, to WSO Co/TfNSW, following implementation of the RAP. WSO Co/TfNSW will submit the Section A1 or Section A2 Site Audit Statement and the accompanying Site Audit Report to the Planning Secretary and relevant councils in accordance with M7 CoA D73 and D74 and M12 CoA E88 no later than one month before the commencement of operations where one is needed. The WSO Co/TfNSW ESM (or delegate) will grant approval for John Holland to recommence works upon reviewing the documentation provided.

# 3 Records

A register of any unexpected contamination finds, including a map of all contaminated and/or remediated sites will be maintained. This register will be made available to the WSO Co/TfNSW ESM (or delegate) per request for inclusion in the Monthly Reports.

# Appendix N - Asbestos Management Plan

# M7-M12 Integration project

# Construction Soil and Water Management Sub-plan

## Appendix N: Asbestos Management Plan

November 2023



# Document Control

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# Acronyms and Abbreviations

| Acronym | Definition |
|---|---|
| ABN | Australian business number |
| ACD | Asbestos-contaminated dust or debris |
| ACM | Asbestos-containing material |
| AMP | Asbestos Management Plan |
| AR | Amendment Report |
| ARSR | Amendment Report Submissions Report |
| ARCP | Asbestos Removal Control Plan |
| CEMP | Construction Environmental Management Plan |
| CEnvP(SC) | Certified Environmental Practitioner (Site Contamination) |
| CoA | Conditions of Approval |
| Commonwealth CoA | Federal Conditions of Approval under the EPBC Act |
| CPSS CSAM | Certified Professional Soil Scientist Contaminated Site Assessment and Management |
| CSWMP | Construction Soil and Water Management Plan |
| EIS | Environmental Impact Statement |
| EPA | NSW Environment Protection Authority |
| ESM | Transport for New South Wales Environment and Sustainability Manager |
| ESR | John Holland Environmental Site Representatives |
| EWMS | Environmental Work Method Statements |
| LAA | Licensed asbestos assessor |
| LTEMP | Long-Term Environmental Management Plan |
| M7 CoA | Minster's Conditions of Approval for the M7 Motorway (Modification 6 Widening; SSI-663-Mod-6) |
| M7-M12 Integration project, the Project | The M7-M12 Integration project incorporates the following:<br>• M7 Motorway (Mod 6 Widening) (SSI 663 Mod 6) – modification (mod) to the M7 Motorway approved on 17 February 2023 under Division 5.2 of the EP&A Act<br>• M12 Motorway (CSSI 9364) – approved on 23 April 2021 under Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and split into three packages (West, Central and East). The M12 Motorway is also subject to a federal approval under the Environment Protection and Biodiversity Conversation Act 1999. The M7-M12 Integration project incorporates the M12 East package only |

| Acronym | Definition |
|---|---|
| M12 CoA | Minister's Conditions of Approval for the M12 Motorway (CSSI 9364) |
| OCEMP | Overarching Construction Environmental Management Plan |
| OH | Occupational Hygienist |
| PPE | Personal protective equipment |
| REMM | Revised Environmental Management Measure |
| RPE | Respiratory Protective Equipment |
| SWMS | Safe Work Method Statements |
| TfNSW | Transport for New South Wales |
| WSO Co | Joint venture between Transurban Group, Queensland Investment Corporation and Canada Pension Plan Investment Board |

# 1 Introduction

## 1.1 Context

This Asbestos Management Plan (AMP) is an appendix of the Construction Soil and Water Management Sub-Plan (CSWMP), which forms part of the Construction Environmental Management Plan (CEMP) for the M7-M12 Integration project. The relevant information and requirements for both the M7 Widening and M12 East package are included in this Plan.

The M12 East package components of this plan has been prepared under and is consistent with the Overarching Construction Environmental Management Plan (OCEMP) and relevant sub-plans developed for M12 Motorway, in particular with the M12 Motorway overarching AMP.

This Plan addresses the following requirements for the M7 Widening and M12 Motorway:

- M7 Widening:
  - Minister's Conditions of Approval (CoA) for M7 Widening (SSI-663-Mod-6) (M7 CoA)
  - Updated Environmental Management Measures listed in the Westlink M7 Modification Report (August 2022) and the Submissions Report (November 2022) (M7 Updated Environmental Management Measures (referred to as M7 REMMs in this Plan)
- M12 Motorway:
  - Commonwealth CoA for M12 Motorway Project (EPBC 2018/8286) (Commonwealth M12 CoA)
  - CoA for M12 Motorway Project (SSI 9364) (NSW M12 CoA)
  - Revised Environmental Management Measures listed in M12 Motorway Environmental Impact Statement (EIS) (October 2019), the Submissions Report (October 2020), the Amendment Report (October 2020), Amendment Report Submissions Report (ARSR) (December 2020), and the ARSR Biodiversity Amendment (March 2021) (M12 Revised Environmental Management Measure (REMMs))
  - Overarching Construction Environmental Management Plan (OCEMP)
  - Relevant consistency assessments
- Applicable legislation
- Transport for NSW (TfNSW) specifications.

This AMP supersedes the previously approved M12 East package AMP.

## 1.2 Purpose

This AMP has been prepared to outline the procedure to be undertaken if potential asbestos-containing material (ACM) or actual asbestos is uncovered during the construction of the M7-M12 Integration project, in accordance with M7 REMM C1 and M12 REMM SC04. The implementation of this Plan will ensure that asbestos is managed in such a way as to avoid harm to site personnel, visitors and the community.

Asbestos/ACM fragments remnants from previous activities may be scattered throughout the construction footprint or present in existing stockpiled material. The asbestos-contaminated ground

may be encountered when undertaking excavation for roadworks and/or property adjustments at unknown locations. It may also be encountered during demolition works or the removal of structures. Disturbance of ground and/or pits associated with utilities creates the potential for exposure to airborne asbestos fibres.

This Plan has been developed in accordance with relevant legislation, NSW Environment Protection Authority (EPA) endorsed guidelines (including the waste guidelines), industry codes of practice, TfNSW draft Asbestos in Soils Management Procedure (TfNSW, 2020) and TfNSW specifications.

## 1.3 Scope

Work involving, or likely to involve, the disturbance of asbestos is considered a high-risk construction activity. Implementation of this AMP does not replace the need for John Holland to prepare Environmental Work Method Statements (EWMS) and Safe Work Method Statements (SWMS) for the management of materials containing asbestos. Note that EWMS are required for other high-risk activities on the project, and it may be that asbestos management measures are also included in another EWMS, e.g. earthworks. This AMP is to be implemented for the duration of the construction of the M7-M12 Integration project.

EWMS will be prepared by John Holland Environmental Site Representative (ESR) and reviewed by WSO Co/TfNSW before the commencement of the construction activities to which they apply.

## 1.4 Objectives

The objectives of this Strategy include:

- Provide the method for asbestos/ACM assessment in the project area
- Maintain accurate records of the location of asbestos in an Asbestos Register
- Avoid or minimise asbestos-related risks by implementing environmental control measures
- Ensure control measures are effectively implemented
- Ensure asbestos removal is performed by a licensed asbestos removalist under the direction/ recommendation of an accredited occupational hygienist.

## 1.5 Induction and training

It will be mandatory for all site personnel (including sub-contractors) to undertake an induction to ensure that they understand the types and location of ACM/potential ACM within the site. They will also be trained on control measures and safe work methods, including procedures to be followed to prevent exposure and correct use of personal protective equipment (PPE) before commencing work. Site personnel will be adequately trained to recognise the health risks of asbestos and informed on how to use the Asbestos Register.

If, on any day, there are planned asbestos removal works prior to the commencement of the shift or change in shift, the Foreman/Site Supervisor will inform all site personnel of the asbestos removal works being conducted.

A copy of this Plan will be kept at the construction work site where the work is being carried out.

## 1.6 Roles and responsibilities

All site personnel are responsible for ensuring they are familiar with the Asbestos Register and the locations where asbestos/ACM is identified. Any suspected asbestos/ACM finds will be reported to John Holland Foreman and/or Site Supervisor, the ESR and WSO Co.

Asbestos removal must be undertaken by the holder of a Class A or Class B Asbestos Removal Licence issued by SafeWork NSW, as required.

A Licenced Asbestos Assessor (a consultant certified under either the Environment Institute of Australia and New Zealand's certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM)) will perform any required air monitoring, clearance inspections and clearance certificates during Class A asbestos removal.

An Occupational Hygienist (appropriately degree qualified and 5-year contaminated land/site assessment/remediation experienced individual) will supervise topsoil stripping activities in accordance with TfNSW Specification R44.

## 1.7 Review

This Plan will be updated throughout the construction of the M7-M12 Integration project to consider any changes to construction methodologies and/or subsequent additional management measures. This Plan will be reviewed annually or as required in accordance with the continuous improvement process described in Section 8 of the Construction Soil and Water Management Sub-plan (CSWMP).

# 2 Procedure

## 2.1 Unexpected asbestos finds procedure

In the event that asbestos/ACM is detected or disturbed, which has not been previously identified in the Asbestos Register, John Holland and subcontractors will follow all reporting and notification requirements in CEMP Appendix A7 Environmental Incident Classification and Reporting Procedure, including notifying the ESR.

Asbestos management for both friable and non-friable asbestos will be undertaken as follows:

**Step 1** – Cease works in the area potentially impacted by ACM as soon as it is safe to do so and move to the upwind side of the area or away from the area.

**Step 2** – Assess the potential immediate risk to human health posed by the unexpected find and move away from the area if required.

**Step 3** – Delineate an exclusion zone around the affected area using fencing and/or appropriate barriers and signage. Keep soil/ACM damp to minimise/prevent the release of fibres into the air.

**Step 4** – Notify the John Holland ESR, TfNSW ESM and WSO Co to assess the unexpected find and determine what further assessment and/or remediation works are required. Implement the incident reporting procedure. TfNSW will notify landowners (e.g., Water NSW) where contamination is identified on their land.

**Step 5** – John Holland ESR, in consultation with the Environmental Consultant, is to implement a RAP where it is deemed the nature and extent of the asbestos contamination cannot be managed under an AMP.

**Step 6** – Where a RAP is required and implemented, a NSW EPA accredited auditor to confirm remedial actions have been successful and confirm works may proceed.

## 2.2 Asbestos removal

Asbestos removal will be undertaken by suitably qualified personnel and/or subcontractors who are licensed by SafeWork NSW.

### 2.2.1 Asbestos Removal Control Plan (ARCP)

An Asbestos Removal Control Plan (ARCP) is required to be completed in accordance with Work Health and Safety Regulation 2017 (Regulation 464). The ARCP will be prepared prior to undertaking any asbestos removal works by the nominated licensed asbestos removalist. The aim of the plan is to outline the specific methods and processes that will be used to ensure the removal is safe and effective.

Additionally, Safe Works Method Statements (SWMS) will also be generated for individual ACM-related activities.

### 2.2.2 Identification

Friable Asbestos

- Requires Class A License
- Any amount of friable asbestos, ACM, asbestos-contaminated dust or debris (ACD) or non-friable asbestos.

Licensed Non-friable asbestos

- Requires class B license
- Greater than 10 metres squared of non-Friable (bonded) asbestos or ACM
- ACD that is associated with the removal of 10 square metres or more of non-friable asbestos or ACM.

Unlicensed Asbestos

- No license required
- 10 meters squared or less of Non–Friable (bonded) asbestos or ACM
- ACD that is not more than a minor contamination and is associated with the removal of 10 square meters or less of non-friable asbestos or ACM.

Asbestos Removal from soil

- May require Class A or Class B license depending on type (Friable or Non-Friable) Asbestos-contaminated soil comprising non-attached pieces of asbestos cement products and other material containing asbestos uncovered in soil.

### 2.2.3 Notification

Prior to the commencement of licensed asbestos removal works, the Occupational Hygienist must provide notification to SafeWork NSW as required. SafeWork NSW requires a minimum of five days' notice prior to the removal of asbestos, and the notification will include: Name, registered business name, Australian business number (ABN), license number and business contact details of the licensed asbestos removalist.

- Name and business contact details of the Supervisor who will oversee the removal work
- Client name and contact details
- Name, including registered business or corporate name, of the person with management or control of the workplace
- Workplace address, including specific location if a large workplace
- Kind of workplace where removal work will be performed (workplace type and scope of work)
- Date of notification
- Start date of the removal work and an estimation of how long it will take
- Nature of asbestos to be removed – friable or non-friable
- Type of asbestos, e.g., asbestos-contaminated sheeting, vinyl tiles, lagging, gaskets, etc.

- For friable asbestos (not restricted to soils), the mechanism by which the area will be enclosed
- Estimated quantity of asbestos to be removed
- Number of workers who will perform the removal work and details of their competency to carry out the removal work.

### 2.2.4 Site Establishment and Signage

The boundaries of the 'Asbestos Works Area' and the 'Asbestos Removal Site' will be determined and defined by the nominated Occupational Hygienist (OH) or Licence Asbestos Assessor (LAA). All stakeholders will agree on the asbestos removal boundaries, and consideration shall be given to the following:

- The use and suitability of various types of enclosures and asbestos removal methods; and
- The impacts of the asbestos removal work, including potential exposures in the surrounding region. In determining the distance between barriers and the asbestos work area a risk assessment should take into account of:
  - Whether the ACM is friable or non-friable
  - Activity around the asbestos work area (other workers, visitors, neighbours, the public, etc.)
  - The methods of ACM removal
  - Any existing barriers (walls, doors, etc.)
  - The quantity of ACM to be removed
  - The type of barrier used (e.g., boarding or tape).

Protective barricades will be installed to delineate the asbestos-related area/s and restrict unauthorised persons from entering the asbestos removal work. The asbestos removal site boundary will be clearly and securely delineated to ensure persons do not enter inadvertently or without authority. Signage may also be installed along the construction boundaries of sites adjoining the community. Signage will warn persons that asbestos removal work is being carried out of the dangers of exposure to asbestos and PPE and other site entry requirements. Stockpiles will also be covered and labelled.

All boundary delineation and warning/danger signs will remain in place until a re-occupation clearance has been granted. All warning/danger signage will comply with AS 1319 Safety signs for the occupational environment. These signs will be weatherproof, constructed of lightweight material and adequately secured.

Signage and barricades will remain until all licensed asbestos removal work is complete and a clearance certificate is provided.

In circumstances where the erection of fencing or barricades is not feasible, such as on concrete hard stand or within a building, tape may be used as a barrier to define an asbestos work area (for some types of asbestos removal work of short duration). If a sign is not feasible, tape with the words' asbestos hazard' repeated along its length may be used instead to delineate and communicate the hazard.

### 2.2.5 Removal Methods

The asbestos removalist will use techniques to eliminate or minimise the generation of asbestos fibres so far as reasonably practicable. They will choose the method of asbestos removal that is most effective at minimising fibre release at the source. The removal methods are listed in the preferred order:

- Wet spray method – asbestos fibres are significantly suppressed; however, they are not entirely eliminated, so the use of respiratory protective equipment is essential
- Saturation and water injection method – used during friable removal
- Dry method - can only be used if the wet spray method is not suitable, for example, if there are live electrical conductors or if equipment could be permanently damaged or made dangerous by contact with water.

Table 2-1 outlines the typical removal techniques that may be used to remove ACM in soils.

*Table 2-1: Removal techniques, applications and limitations*

| Removal technique | Applicability and limitations |
|---|---|
| Hand Picking | • Suitable for bonded ACM in near-surface soils only (i.e., <10 cm)<br>• Raking may enhance removal, although only in sandy soils<br>• Not applicable for friable asbestos<br>• Less effective in areas of dense vegetation |
| Mechanical Excavation | • Physical excavation of soil containing ACM where impact extends beneath surface soils<br>• Generates larger volume of soil that requires further management (i.e. offsite disposal, screening, spreading and handpicking/tilling) |
| Mechanical Screening | • Suitable for large volumes of soil impacted by Bonded ACM<br>• Susceptible to generate fibres requiring effective dust/fibre control<br>• Not applicable for friable asbestos |

### 2.2.6 Personal Protective Equipment

All workers undertaking asbestos remediation work at the site shall be responsible for providing their workers with appropriate PPE to minimise the risk of asbestos exposure. A risk assessment should determine the level of PPE required for asbestos related/asbestos work as outlined in the code of practice and regulations. Below is an outline of some types of PPE used as a minimum for asbestos-related/asbestos work.

#### Asbestos Removal PPE

The following asbestos removal PPE will be required to be worn by the Licensed Asbestos Removal Contractors during the removal works:

- Minimum of a face-fitted P2 respirator or full-face P3 respirator for friable removals;
- Disposable coveralls rated Type 5/6

- Dedicated asbestos removal footwear such as steel-capped gumboots or boot covers rated Type 5/6
- Disposable gloves.

### Coveralls and Boot Covers

Disposable coveralls should be utilised to minimise the risk of asbestos fibres contaminating clothing or undergarments during asbestos related/asbestos work. Coveralls rated Type 5/6 or Category 3 (EN ISO 13982–1) are suitable and should be fitted with elastic hoods, cuffs and anklets to reduce the risk of penetration of asbestos fibres.

If laced boots with eyelets are worn by workers, it is advisable that protective boot covers are worn in tandem with coveralls. Boot covers help ensure asbestos fibres do not contaminate footwear which cannot be easily decontaminated.

Coveralls and boot covers should be used for single use only. Once coveralls and boot covers have been used, they should be treated as asbestos-contaminated waste.

### Respiratory Protective Equipment (RPE)

The selection of suitable RPE depends on the nature of the asbestos work, the probable maximum concentrations of asbestos fibres to be encountered and any personal characteristics of the wearer that may affect the facial fit of the respirator (facial hair and glasses etc.).

A competent person should determine the level of respiratory protection (or supplied air respirators) and must meet the requirements of AS/NZS 1716:2012 Respiratory Protective Devices or its equivalent.

Fitted respirator masks should be decontaminated and stored in a suitable and clean location between each use.

Any respirators must be face fitted to the individual, and evidence of the quantitative face fit provided with the contractor’s safety documentation.

All operatives required to wear respirators must be cleanly shaven to ensure a suitable seal.

### Gloves

Disposable latex or nitrile gloves should be worn when handling asbestos or working around asbestos. Gloves should be single-use only and disposed of as asbestos waste once used.

### General Site PPE

Other site-specific PPE may be required. These are to be outlined within the ARCP induction undertaken prior to asbestos remedial works commencing.

- Hard hat
- Safety boots
- Gloves
- Hi-vis long sleeve shirt and pants

- Glasses
- Anything else as noted in SWMS.

### 2.2.7 Air Monitoring

Air monitoring will be conducted by a licensed asbestos assessor (LAA) in accordance with the requirements outlined. The location and layout of the air monitors will be detailed within the ARCP. Air monitoring requirements will vary depending on the type of asbestos being removed, the location and position of the asbestos. The following rules should be applied when determining if air monitoring is required (extract from Safe Work Australia – Code of Practice on How to Safely Remove Asbestos (2016):

- For friable asbestos removal – Air monitoring is mandatory for all friable asbestos removal. This includes prior to dismantling an enclosure and for the purposes of the clearance inspection.
- For more than 10 m² of non-friable asbestos removal – Air monitoring is not required but may be considered to be carried out by an independent licensed asbestos assessor or competent person to ensure compliance with the duty to eliminate or minimize exposure to airborne asbestos and to ensure the exposure standard is not exceeded
- Public Location – Air monitoring should be considered where the asbestos removal work is being undertaken in or next to a public location
- Exposure air monitoring – Air monitoring should be carried out at other times to determine a worker's exposure to airborne asbestos if, based on reasonable grounds, there is uncertainty as to whether the exposure standard may be exceeded and a risk assessment by a competent person indicates it is necessary. Since most uses of asbestos are prohibited, exposure monitoring should not be required frequently.

Air monitoring may be required when:

- It is not clear whether new or existing control measures are effective
- There is evidence (for example, dust deposits are outside the enclosure) the control measures have deteriorated as a result of poor maintenance
- Modifications or changes in safe work methods have occurred that may adversely affect worker exposure
- There has been an uncontrolled disturbance of asbestos at the workplace.

John Holland, in conjunction with the LAA, will conduct the air monitoring of the asbestos work area. Monitors will be placed at several locations by the LAA prior to the commencement of asbestos work. The air monitoring results will be made available to all workers on site as soon as possible. The asbestos supervisor will be notified immediately if the fibre count exceeds the recommended level, as set out in Table 2-2.

*Table 2-2: Exposure standards for asbestos as set out in the National Code of Practice: How to Safely Remove Asbestos*

| Action level (fibres/mL) | Control/action |
|---|---|
| Less than 0.01 | Continue with current control measures |
| Greater than and equal to 0.01 and less than or equal to 0.02 | Review control measures; investigate the cause and implement controls to eliminate or minimise exposure and prevent further release. |
| Greater than 0.02 | Stop removal work, notify the regulator together with air monitoring results by phone followed by fax or written statement. Investigate the cause by conducting a visual inspection of enclosure (if used) and associated equipment in consultation with all workers involved. Implement controls to eliminate or minimise exposure and prevent further release by extending the isolated/barricaded area around the removal area/enclosure as far as reasonably practicable until fibre levels are at or below 0.01 fibres/ml. Wet wipe and vacuum surrounding area and seal any identified leaks. Smoke test the enclosure until it is satisfactorily sealed.<br><br>Recommence work once further air monitoring confirms fibre levels are at or below 0.01 fibres/ml. |

### 2.2.8 Clearance

Following removal of asbestos/ACM, the licensed asbestos removalist will arrange for a clearance inspection of the area to facilitate the issue of a clearance certificate and allow construction to recommence in the affected area. The clearance inspection is conducted by:

- An independent licensed asbestos assessor for work that was carried out by a Class A licensed asbestos removalist
- An independent competent person for asbestos work that is not required to be carried out by a Class A licensed asbestos removalist.

To be independent, the licensed asbestos assessor must not be involved in the removal of asbestos for that specific job and is not involved in a business or undertaking involved in the removal of the asbestos for that specific job.

A clearance certificate will be issued if the independent licensed asbestos assessor or competent person is satisfied that the asbestos removal and immediate areas are free from visible asbestos contamination. Entry to the area will be permitted following confirmation of certification.

Should the clearance inspection be unsuccessful, meaning that ACM or debris remains, the LAA is to instruct the Class-A Contractor to return and undertake further remediation until the area can be visually cleared.

### 2.2.9 Decontamination

Decontamination applies to all workers exiting the asbestos work area, all plant, equipment and tools used in the asbestos work area (at the completion of the asbestos work or at their earlier

removal from the area) and, at the completion of the asbestos removal work, the asbestos work area itself.

The methods used for decontamination are based on the Code of Practice How to Safely Remove Asbestos 2016.

## Decontamination of personnel

Personal decontamination will be undertaken each time workers leave the asbestos work area. Personal decontamination shall be done within the asbestos work area in a location where re-contamination cannot occur. This area should be at the entry/exit interface of the site so that workers have to pass through. The only exemption from the need to decontaminate is during extreme emergencies.

Asbestos-contaminated PPE must not be transported outside the asbestos work area except for disposal purposes after being appropriately decontaminated.

Respiratory protective equipment must be used until all contaminated disposable coveralls and clothing have been vacuum cleaned and/or removed and bagged for disposal and personal washing has been completed.

Any PPE used while carrying out asbestos work must not be taken home.

Personal hygiene and careful washing are essential. Particular attention shall be paid to the hands, fingernails, face and head.

All contaminated materials, including cleaning rags, plastic sheeting, PPE, etc., must be disposed of as asbestos waste.

## Decontamination of re-useable PPE

Re-used PPE during asbestos removal work, e.g., boots, helmets, non-disposable respirators, must be fully dismantled and cleaned in a suitable asbestos work area and placed in sealed containers labelled ‘For asbestos removal work only’. Before removal from the asbestos work area, the containers must be decontaminated by vacuuming and/or wiping down with wet cloths. This retained PPE must only be used for asbestos removal work.

## Decontamination of plant, equipment and tools

Plant, equipment and tools that are engaged to work within asbestos work areas must be clearly identified during the procurement stage. Providers of plant and equipment to be used in the asbestos work area are to be advised in writing that the plant is required to work within this area. Plant requirements in regard to the operator’s cabin air conditioning, air pressurising system filters and other internal combustion engine air filters must be communicated in writing with clear procedures documented on maintenance and decontamination.

After asbestos removal works are completed, plant equipment and tools must be decontaminated. Any warning tag fitted to plant, with respect to the decontamination of air filters, must be removed.

After the contaminated filters have been removed, they must be replaced with new filters for use outside of the asbestos work area.

At the end of the asbestos removal work, all tools should be:

- Decontaminated (i.e., fully dismantled and cleaned) in a suitable asbestos work area; and
- Placed in sealed containers that are labelled 'For asbestos removal work only' (and used only for asbestos removal work); or
- Disposed of as asbestos waste.

Procedures for the decontamination of plant and equipment will be outlined in the stage-specific AMP identifying processes that will be implemented onsite. These procedures may include details for the capture and disposal of water should the hosing down of equipment be required and measures to decontaminate tracks and wheels to minimise the potential of cross-contamination.

### 2.2.10 Waste Disposal

Asbestos waste will be disposed of as soon as reasonably practicable. Temporary storage of minor amounts of ACM in a designated bin may be required before disposal can occur. Asbestos waste will be disposed at a waste disposal site in accordance with NSW EPA guidelines (including Waste Classification Guidelines (EPA, 2014)) and relevant industry codes of practice. Disposal of ACM will be to an approved asbestos waste facility listed on the NSW EPA website (http://www.epa.nsw.gov.au/waste/asbestos/).

John Holland will notify the WSO Co/TfNSW ESM (or delegate) and TfNSW Project Manager at least 24 hours prior to the removal of ACM from the site and will provide details of the proposed method and location of disposal.

All ACM materials disposed of offsite will be recorded on the waste tracking form(s) and documented within the M7-M12 Integration project waste management register. Additionally, asbestos weighing more than 100 kilograms or consisting of more than 10 square metres of asbestos sheeting in one load will be tracked using the NSW EPA Waste locate the system.

#### Asbestos waste transported by trucks

The transportation of asbestos waste by trucks must comply with the following requirements:

- Transporter must have the appropriate EPA license to transport asbestos waste
- Asbestos-contaminated soils are wetted down
- Any part of any vehicle in which a person transports asbestos waste is covered and leak-proof during transportation
- Bonded asbestos materials must be securely packaged during transportation
- Friable material is kept in a sealed container during transportation.

### 2.2.11 Encapsulation

Encapsulation of ACM minimises the need to dispose of the material off-site. Locations suitable for encapsulation of ACM on site will be determined by the project Geotechnical Engineer and ESR.

Encapsulation involves the placement of impermeable barriers below, around and covering the ACM-impacted material to isolate it from being a potential pathway of exposure. This barrier is typically comprised of non-woven geotextile and is used to separate ACM-impacted material from the clean materials used to construct the covering layer.

ACM material is to be placed in maximum 300mm thick layers with an intermediate knitted polyester geogrid placed centrally in each layer. Geogrid is to have a minimum tensile strength of 100/100 kN/m. Each layer is to meet the compaction requirement of TfNSW D&C R44 Clause 5.2 and TfNSW D&C R44 Clause 7.4. Geotextile materials should be of a high visibility colour to provide a warning of underlying ACM contamination. The geotextile selected may also need other properties, depending on its application (e.g., increased tensile strength, permeability, chemically inert etc.). Notwithstanding other conditions which may be applied by Statutory Authorities, encapsulation must:

- Only be under pavements;
- Not extend outside the face of any kerbs;
- Be at depths to:
  - Comply with legislation;
  - Not impact the structural integrity of the pavement;
  - A minimum of 1.3 metres below top of finished surface level;
  - 300mm below the lowest designed drainage or utility asset crossing;
  - Avoid impact of all known roadworks (including future widening in the median);
  - Avoid being within and around ground water table and near water ways
  - Avoid impact of all known utility works; and,
  - Avoid impact to all known maintenance activities.

Construction of any encapsulation will be completed under a Remedial Action Plan (RAP) prepared by a certified Contaminated Land Specialist. The RAP must be completed and submitted to TfNSW at least four weeks prior to onsite encapsulation, for release of the hold point detailed in Appendix B1 of the D&C G36. Completion of the remediation work and validation of the work is required to be in accordance with the RAP.

Validation will include, but not limited to:

- As-built documentation for all ACM encapsulation placement locations, including survey prior to placing the ACM and after placement
- Photos to show geofabric layers
- Validation of the thickness and quality of covering layer(s).

The location and method of ACM encapsulation on the Project will:

- Consider the nature of material with ACM, e.g., topsoil, general fill, mixed with other materials (asphalt, concrete) and affecting suitability for reuse under the pavement
- Be at a depth of emplacement to minimise the risk of pavement failures and impact on underground utilities
- Be in an area free of drainage structures and utilities, which will require maintenance

- Be in an area offline to the critical path of road construction
- Be where excavation can be undertaken relatively easily
- Allow easy access for maintenance, inspection and revegetation work
- Avoid additional clearing or impact on threatened species or Endangered Ecological Communities (EECs)
- Minimise flood risk
- Not impact on groundwater sources
- Be removed from sensitive receivers.

John Holland will prepare a Long-Term Environmental Management Plan (LTEMP) for the encapsulation where required, in consultation with, and obtaining the concurrence of, relevant statutory authorities and agencies, regarding all applicable conditions. The LTEMP will be approved by the NSW EPA accredited site auditor.

Twenty days prior submission of the LTEMP to the NSW EPA accredited site auditor, John Holland will provide the draft LTEMP to TfNSW. This is required to release the hold point detailed in Section 4.2.4 off D7C G36. Any comment provided by TfNSW will be closed out prior to the approval of the LTEMP by the NSW EPA accredited site auditor.

Any required approvals will be obtained by John Holland. The ESR will submit the LTEMP, including details of consultation undertaken during its development and copies of any applicable statutory documentation, to the TfNSW ESM (or delegate) for approval

The LTEMP will include, at a minimum:

- Details regarding the final location and capping thickness of the completed ACM encapsulation sites. Location details are to include proximity markers from features (e.g., proximity from structures, stormwater, services or other features) to clearly identify the position of the encapsulation on site
- As-built drawings of the completed ACM encapsulation sites and certification that the encapsulation has been undertaken in accordance with these drawings. Certification to include signed or stamped works-as-executed drawings or similar
- Procedures associated with maintenance and monitoring (including a maintenance and inspection schedule) of the completed ACM encapsulation sites.

Five days prior to the commencement of the excavation of asbestos contaminated material that is intended for onsite encapsulation John Holland will submit to TfNSW the following:

- Material classification test results to confirm that that material is suitable for encapsulation
- Each proposed location and method of encapsulation, including the exact type and extent of the encapsulation zone and applicable Statutory documentation
- Air monitoring and dust suppression methodology for management and treatment of ACM
- If a borrow pit option is proposed submit a report from a hydrogeologist confirming and certifying the suitability of the following:
  - the locations where fill material can be located and the depths at which it can be placed;
  - the design of any encapsulation and drainage systems required to minimise interaction of encapsulation material with groundwater.

### 2.2.12 Community notification

Notification to the community for asbestos-related works will be consistent with statutory requirements. Adjacent sensitive receivers may be notified based on the risk.

# 3 Monitoring, reporting and records

## 3.1 Monitoring

The ESR may recommend that, as a precaution during asbestos removal works, continuous asbestos fibre monitoring be carried out at the perimeter of the area, and if deemed necessary, personal exposure asbestos fibre air monitoring for workers in the area.

During the remedial works, air monitoring for respirable fibres may be conducted on each of the project area boundaries (i.e., areas with potential asbestos impact, stockpile site and placement site), to be defined at the commencement of site remediation works for the duration of the works. Additional downwind monitoring locations will be included in the monitoring program, as required.

Air monitoring will be conducted in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular, the Guidance note for the estimation of Airborne Asbestos Fibres (2nd Edition) [NOHSC 3003 (2005)]. Monitoring will also be undertaken in accordance with the How to Safely Remove Asbestos Code of Practice (Safe Work NSW, 2022).

## 3.2 Reporting

Any asbestos finds will be reported by the ESR to WSO Co/TfNSW and the EPA in accordance with the Environmental Incident Classification and Reporting Procedure (refer to Appendix A7 of the CEMP).

## 3.3 Asbestos register

An Asbestos Register will be maintained that documents all identified or potential asbestos-containing material in the M7-M12 Integration project. The Asbestos Register will contain the following information:

- Identification of any potential or asbestos-containing material
- Location, type and condition of the asbestos-containing material
- Date when the asbestos was identified
- Labelling of the asbestos
- Maps, photographs or diagrams detailing the location of the asbestos within the Project area.

The Asbestos Register will be made available to WSO Co/TfNSW on request for inclusion in the M7-M12 Integration project Monthly Reports.

# Attachment 1. Asbestos management feasibility screening assessment

This encapsulation screening assessment evaluated whether it is feasible that ACM impacted materials be encapsulated under road structures or other permanent structures on the Project site. If it is feasible to encapsulate ACM, then subsequent cost assessment (Attachment 2) must be completed to assess whether the proposed encapsulation should be approved.

| Factors for consideration | Yes/No | Comments to support response |
|---|---|---|
| Is there opportunity to encapsulate ACM under the road pavement structure or another approved structure? | | |
| Is the volume of ACM greater than 1000 m3?<br>(Encapsulation of less than 1,000 cubic metres of ACM on any Project site is unlikely to be cost effective on a whole-of-life basis) | | |
| Is there sufficient time and opportunity within the Project program and staging to effectively manage ACM in an encapsulation? | | |
| Is the proposed encapsulation location located so that it will not impact or cause concern to external stakeholders (including adjoining landowner/community, local Council or NSW EPA) | | |
| Are concentration of other potential chemicals of concern assessed as suitable for the proposed encapsulation? | | |
| Is the proposed encapsulation above the potential highest level of the groundwater table? | | |
| Is the proposed encapsulation located away from current or future areas of underground services? | | |
| Is the proposed encapsulation located in an area that is not impacted by acid sulfate soils? | | |

**Is the answer to all of the questions 'Yes'?**

☐Yes If 'Yes' the encapsulation option is considered feasible for this Project. Proceed with the Whole-of-life Cost Assessment (Attachment 2).

☐No If 'No', the encapsulation of ACM is not considered an appropriate option for this Project.

| Assessment prepared by: | Assessment reviewed by: | Assessment reviewed by: |
|---|---|---|
| Construction Contractor Environmental Site Representative | TfNSW Environment and Sustainability Manager | WSO Co Environment and Planning Manager |
| Name: | Name: | Name: |
| Signature: | Signature: | Signature: |
| Date | Date | Date: |

# Attachment 2. Asbestos management cost and feasibility assessment

Any proposed ACM encapsulation must be demonstrated to provide whole-of-life cost savings to the NSW Government and the community. To support management option approval cost estimates should be developed to enable a comparison of each option. The table below provides guidance on the elements to be considered for each option.

| Cost estimate considerations | |
|---|---|
| **Source removal and offsite disposal** | **Encapsulate** |
| • Initial assessment costs to assess the extent of asbestos impacts (professional fees and laboratory costs)<br>• Plant and labour to excavate, stockpile and haul asbestos<br>• Haulage costs<br>• Disposal costs<br>• Landfill levy<br>• Purchase materials to reinstate remediation excavation (if required)<br>• Labour and plant to reinstate remediation excavations (if required)<br>• Professional services to manage WHS risks (asbestos assessors, air monitoring and reporting). | • Initial assessment costs to assess the extent of asbestos impacts (professional fees and laboratory costs), preparation of containment strategy and approvals, and NSW EPA Site Auditor review<br>• Plant and labour to excavation, and stockpile/segregate materials<br>• Haulage costs<br>• Labour and plant to place asbestos impacted soil in designated area<br>• Purchase materials to cover buries asbestos impacted materials (e.g. clean fill, geotextile, other)<br>• Professional services to manage WHS risks, during works (asbestos assessors, air monitoring and reporting), and prepare validation report/EMP<br>• Site management costs over longer term (e.g. periodic inspection, maintenance of capping layer, etc). Costs to be presented in net present value. |