INLAND RAIL

Landscape and Rehabilitation Framework

ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

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Table of Contents

Appendices

List of tables

Glossary

Specific terms and acronyms used throughout this strategy are listed and described in the table below.

TERM / ACRONYM / ABBREVIATION	DEFINITION
Accountable Entity	Formerly called the Delivery/Construction Manager, this term is used to cover all potential delivery scenarios (i.e. Design and Construct, Construct only and Public-private partnership).
ARTC	Australian Rail Track Corporation (ARTC) is an Australian Government-owned corporation tasked with developing a 10-Year Program to implement Inland Rail.
AS	Australian Standard
Blue Book	Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom).
Conditions of Approval	The Conditions of Approval may include the Qld Coordinator-Generals conditions and recommendations, NSW Minister for Planning conditions and recommendations or the conditions stipulated in the Victorian Planning Scheme Amendment or Victorian Minister (DELWP) conditions. The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) Approval conditions and the relevant Environmental Impact Assessment report (such as EIS for NSW and QLD, EES for Victoria) for each Project including the EMP and Proponent Commitments.
CPESC	Certified Professional in Erosion and Sediment Control.
CEMP	Construction Environment Management Plan (CEMP) includes Plans and subplans prepared by the relevant contractor for each Project to implement the environmental management measures during the construction stage and establish the compliance reporting processes to demonstrate compliance with the Project commitments and Conditions of Approval.
CPTED	Crime Prevention Through Environmental Design
EES	Environmental Effects Statement
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
IECA	International Erosion Control Association (Best Practice Erosion and Sediment Control)
ISCA	Infrastructure Sustainability Council of Australia (ISCA) is an independent third party that administers the IS rating tool which is an industry-compiled voluntary sustainability performance rating scheme.
Inland Rail (IR) Program	The Inland Rail Program encompasses the design and construction of a new inland rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba and associated works. The Inland Rail route, which is approximately 1 700 kilometres (km) long, will involve: Using the existing interstate rail corridor through Victoria and southern NSW; upgrading approximately 400 km of existing corridor, mainly in western NSW and providing approximately 600 km of new corridor in northern NSW and southeast QLD.
ISO	International Organisation for Standardisation
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical process.
NATA	National Association of Testing Authorities
NEPM	National Environmental Protection Measure

PMO	Program Management Office
Pre-disturbance condition	For revegetation, the pre-disturbed condition of an area will need to be determined in accordance with the Conditions of Approval and subsequent management plan. This will be particularly relevant where there is a commitment for ongoing monitoring to demonstrate success against the original reference position.
Primary Approval	Projects delivered under the Inland Rail Program require environmental assessment and approval. As the process varies depending on State or Commonwealth jurisdiction, this approval is collectively referred to as the 'primary approval'. The term 'Primary Approval Document' is to collectively refer to any of the following: - Environmental Impact Statement (New South Wales and Queensland). - Review of Environmental Factors (New South Wales). - Impact Assessment Report (Queensland). - Planning Scheme Amendment (Victoria). - Environmental Effects Statement (primary assessment) (Victoria). - Documentation prepared for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
Rehabilitation	Rehabilitation is the process of making a former site stable and self-sustaining.
Revegetation	The process of assisting the re-establishment and development of vegetation, on cleared land and areas disturbed during construction. Revegetation seeks to reinstate and restore vegetation cover to highly modified areas. The vegetation can also assist in soil stabilisation, particularly when pioneering species are used, such as grasses and legumes. Most often native plants are used in revegetation. Revegetation can be achieved by applying either a Naturalistic Planting Approach or a Structured Planting Approach, or a combination of both.
Reinstatement	The manipulation of a disturbed habitat or landscape to a desired condition. This is typically associated with revegetation works.
SEARs	When an application for approval of a declared Critical State Significant Infrastructure/State Significant Infrastructure Project is made, the Secretary of the Department of Planning and Environment is required to issue Environmental Assessment Requirements (SEARs).
SME	Subject Matter Expert (SME) is a specialist in a specific discipline. They provide specialist advice / assistance to Inland Rail when requested.
TA	Technical Advisor (TA) provides assurance to Inland Rail, especially through the Design and Primary Approval review process. The TA acts on behalf of Inland Rail as an embedded representative within the Inland Rail Project team.
TfNSW	Transport for NSW. Formerly called Roads and Maritime Service.
TOR	Terms of Reference outlines the general and specific matters the Project proponent must address when preparing the Environmental Impact Statement. The TOR are prepared by the Coordinator-General.
TMR	Department of Transport and Main Roads – Qld.
QA/QC	Quality Assurance / Quality Control.

1 Introduction

The Melbourne to Brisbane Inland Rail (IR) Program comprises an alignment of approximately 1 700 kilometres of rail linking Melbourne and Brisbane, via Parkes, Moree and Toowoomba. IR will connect regional Australia to domestic and international markets, transforming the way we move freight around the country.

IR contains sections of varying levels of intervention and complexity in work types including:

- Enhancement works to enable double stacking;
- Missing links to provide standard gauge rail link, predominately in greenfield where there is currently no track and / or rail corridor protection; and
- Upgrade Projects to provide major upgrades to existing track within current rail corridor.

It is anticipated that IR will be constructed and operational by 2025, with sections progressively transitioning to operation during this period.

1.1 Purpose and Scope

This Landscape and Rehabilitation Framework (the Framework) aligns with the vision and commitments outlined within the Inland Rail Environment and Sustainability Policy, ARTC Environmental Policy, the *Inland Rail Programme Environmental Management Plan (0-0000-900-EEC-00-PL-0001)* and the *IR Environmental Assessment Procedure (2-9000-PEN-00-RP-1001).*

This Framework, (formerly called the draft Landform Construction Specification), supports the *Landscape and Rehabilitation Strategy (the Strategy) (0-0000-900-ELE-00-ST-0001)* and must be read in conjunction with the Strategy.

The Strategy establishes governing landscape objectives and principles and describes the overarching approach to meeting landscape obligations and commitments. This Framework provides further guidance for IR Projects in detailed design and construction but may be used as a reference document for Projects in earlier phases of delivery.

Performance outcomes outlined in this Framework are to inform subsequent Project specific completion criteria, which are to be developed by Service Providers during detailed design. In developing the completion criteria, Service Providers must take account of the Strategy, Framework, Primary Approval documents and Conditions of Approval (when available).

The Design of Landscape Treatments (Appendix A) provides guidance for Projects to deliver a consistent approach in relation to environmental design solutions and landscape rehabilitation and establishment. It provides direction on the selection of treatments which are complementary to the surrounding environment, have been adequately evaluated and assessed, are feasible, and cognisant of constructability, costs and on-going management during Project handover. Appendix A is particularly relevant to Stage 3 (Market Readiness) of IR Project delivery (refer to Section 3, Delivery mechanism overview and milestone requirements).

The Construction and Operational Requirements (Appendix B) defines the process and responsibility for the reinstatement, rehabilitation and revegetation of areas disturbed or cleared during construction, such that the landform is returned to the pre-disturbance condition or achieves other stated outcomes. This is particularly relevant to Stages 5 (Construction and Commissioning) and 6 (Close-out and Operations) of IR Project delivery.

Individual IR Projects will be subject to different Project delivery mechanisms, such as design and construction, public-private partnership (PPP), or construction only. Expected deliverables for each IR Program stage is discussed further in Section 3. This Framework is intended to inform these delivery processes, providing Program-wide guidance, however, it does not override individual Project Conditions of Approval, Primary and Secondary Approvals, management plans, etc (discussed in Section 1.3), which, by law, take precedence over, and may vary the requirements identified in this Framework. Therefore, the user must refer to the relevant Project documentation, current for that Project's stage of delivery.

1.2 Framework Objectives

The objectives of this Framework are to:

- Support the Objectives and Principles of the Landscape and Rehabilitation Strategy, with respect to 'Conserve and connect', 'Self-sustaining solutions', 'Integrated outcomes', and 'Beyond delivery';
- Capture the landscape and rehabilitation measures in the Primary Approval Document, Conditions of Approval and operational requirements for implementation and maintenance, discussed in Appendix B, Section 4;
- Support compliance with the relevant Project Conditions of Approval (when available);
- Provide the framework for the development of completion criteria that can be applied consistently Program wide as well as be tailored to individual Projects to achieve the required outcomes for reinstatement, rehabilitation and revegetation of disturbed areas, meeting statutory requirements;
- Define a list of contractual requirements for the design and implementation of landscape/rehabilitation treatments. Contractual requirements to be incorporated into Project schedules, forecasts and bill of quantities; and
- Ensure collaboration across multiple disciplines, such as engineering and environment (including noise, ecology, heritage, sustainability, geotechnics, etc), as well as Construction and Operations Teams, to deliver a sensitive, informed and integrated outcome.

1.3 Framework Context

This Framework has been structured as follows:

- Section 1: General information regarding purpose and structure, framework context, roles and responsibilities and relationships with other documents
- Section 2: Relevant standards and guidelines
- Section 3: Delivery mechanism overview and milestone requirements
- Appendix A: Design of Landscape Treatments (including rural landscape, ecological sensitive areas and township)
- Appendix B: Construction and Operational requirements (including soil preparation and management and landscape and revegetation application).

The following order of precedence shall be adopted for this Framework:

- Project Conditions of Approval;
- Project Primary Approval Documentation;
- Approved management plans, or other documents required under a Project's Condition of Approval, secondary and subsequent approvals, licences and permits;
- Other Project-specific documents and procedures (i.e. the services brief, Basis of Design, TOR, SEARs, design drawings and Bill of Quantities, Project Construction Environmental Management Framework (CEMF));
- Design drawings (where applicable);
- Landscape and Rehabilitation Strategy and Landscape and Rehabilitation Framework;
- Australian Standard requirements, regulations and industry guidelines including the NSW "Blue Book" (further discussed in Section 2); andWhere there is a discrepancy, clarification must be sought in writing from the 'Accountable Entity' prior to proceeding with the works containing the discrepancy.

Note that site-specific requirements are applicable where landowner agreements are in place for certain properties (e.g. temporary works areas such as construction access, site compounds, workforce camps, borrow pits or other enabling works). Where requirements differ between this Framework and the landowner agreement, the landowner agreement or responsible entity takes precedence. However, if these contradict or do not align with any statutory, licence or compliance requirements, the statutory, licence and compliance requirements take precedence.

1.4 Responsibilities / Accountabilities

The Inland Rail (IR) Program Environment Manager is the owner of the Landscape and Rehabilitation Framework. In addition, the following table outlines the roles and responsibilities related to landscape and rehabilitation.

Table 1 – Roles and Responsibilities

ROLE	RESPONSIBILITIES
Project Director / Project Manager	▸ Overall responsibility to ensure implementation of this Framework for all works within the scope of this document; ▸ Ensure suitably experienced and qualified person/s are engaged in design processes, with input from disciplines as required (e.g. landscape architects, ecologists, heritage, sustainability, and noise specialists); ▸ Ensure review of landscape assessment and landscape designs prepared is conducted by a suitably qualified professional, and other personnel as required; ▸ Ensure ISCA requirements are addressed in the design and implementation of landscape treatments; ▸ Ensure appropriate landscape treatments are costed appropriately in design and tender documentation and discussions held with ARTC Operations Team; and ▸ Ensure design milestones and performance outcomes are developed appropriately in accordance with Project Conditions of Approval, commitments in the Primary Approval Document/s and subsequent management plans, with involvement from the wider ARTC as required.
Senior Environment Advisor / Environment Advisor	▸ Ensure the proposed mitigation measures are appropriate to the impacts identified in the preparation of the Primary Approval Documents; and ▸ Ensure environmental management measures, commitments and approval conditions are appropriately addressed in the design and construction of the landscape design.
Program Environmental Team	▸ Communicate the requirements contained within this Framework, and ensure they are captured in Project contractual information (such as plans, drawings, specifications). ▸ Provide advice on the requirements contained within this Framework; ▸ Ensure that periodic reviews of measures contained within this Framework and updates occur as required; and ▸ Check compliance to stated landscape objectives and agreed outcomes.
Design Managers	▸ Support the development of the landscape design and lead design innovation; ▸ Support landscape design collaboration across multiple design disciplines, such as engineering, sustainability, noise, ecology, geotechnics, heritage, etc. Ensure discussions held with ARTC Operations Team regarding ongoing management/maintenance of landscape treatments; ▸ Ensure landscape design treatments/solutions are sustainable, practical and feasible; and ▸ Competency in, and awareness of, landscape design for rail Projects.
Accountable Entity (i.e. IR Project Manager, Delivery Manager, and/or	▸ Ensure environmental management measures, commitments and Conditions of Approval are appropriately addressed in the delivery of the landscape design; and ▸ Ensure the appropriate programming and coordination of landscape works to ensure the landscape design is undertaken during Stage 5 (Construction and Commissioning) and Stage 6 (Close out and Operations).

Construction Managers)	
Service Provider	▸ Ensure that appropriately qualified landscape architects are appointed to deliver landscape design packages; ▸ Undertake field investigation and environmental assessment (including landscape design) to inform Primary Approval Documents; ▸ Design must respond to the requirements of the relevant basis of assessment (SEARs, TOR or other guidelines) and the requirements of the IR Environmental Assessment Procedure (i.e. Stages 2 and 3); and ▸ Deliver detailed design to ensure that the objectives and principles of the Landscape and Rehabilitation Strategy and Performance outcomes of the Framework are incorporated into design documentation (Stage 3). Landscape and Rehabilitation contractual information (in the form of plans, drawings and specifications) to be provided.
ARTC Corporate, Interstate and Hunter Valley	▸ Operational responsibility for Inland Rail Projects. To be engaged in decisions where performance outcomes or subordinate completion criteria are incorporated into the environmental management system and documentation and is compliant with relevant legislation and individual Project Conditions of Approval and permits.
Technical Advisor (TA), including Landscape Subject Matter Expert	▸ Review Service Provider deliverables and provide technical advice to Project teams.
Operations Team	▸ Consideration of Project handover to commence during the design stage. Liaison on landscape design treatments to be undertaken as early as possible; ▸ Ensure works are undertaken in accordance with the *Project Handover guidelines (0-0000-900-PMA-00-GU-1000)* and handover plan; ▸ Handover plan to detail the requirements to the Operations team for efficient and safe handover of assets to prevent additional costs, delays and safety risks. Handover plan to be prepared by the Accountable Entity and forwarded to ARTC for review and agreement; and ▸ Where rehabilitation is on land that ARTC will not manage into the future, the ultimate Asset Owner to be involved in the design process, construction works and the handover plan.

1.5 Relationship with other documents

Table 2 lists key supporting documents relevant to this Framework. Additional standards and guidelines to support this Framework are detailed within Section 2.

Table 2 – Supporting Documents

DOCUMENT NUMBER / TITLE	DOC. TYPE	DESCIRPTION
ARTC Environment Policy (COR-PO-007)	Policy	Provides a framework for continual improvement of ARTC's Environmental Management System and sets out commitments for managing potential environmental risks.
Inland Rail Environment and Sustainability Policy (0-0000-900-ESS-00-PO-0001)	Policy	Policy statement outlines ARTC's commitment to sustainable delivery of the IR Program.
Programme Environmental Management Plan (0-0000-900-EEC-00-PL-0001)	Management Plan	Provides a framework for environmental management across all IR Projects.
Environmental Assessment Procedure (2-9000-PEN-00-PR-1001)	Procedure	Outlines ARTC's requirements for preparation of Primary Approval Document for Projects in the IR Program.
Inland Rail Landscape and Rehabilitation Strategy (0-0000-900-ELE-00-ST-0001)	Strategy	Provides guidance to both IR and service providers to deliver a consistent approach to the integration of environmental management measures and design treatments through landscape design and establishment across all delivery stages of individual IR Projects and the Program.
Infrastructure Sustainability Technical Manual Version 1.2 (Infrastructure Sustainability Council of Australia, 2016)	Technical Manual	Outlines what is required to achieve ISCA credits. The relevant credits to be considered include Urb-1 Urban design and Urb-2 Implementation, Lan-2 Conservation of on-site resources, Was-1 Waste Management, Was-2 Diversion from landfill (of spoil), Wat-1 Water use monitoring and reduction and Eco-1 Ecological Value (Maintenance and enhancement of ecological value).
Rail Sustainability Strategy (0-0000-900-ESS-00-RP-0003)	Strategy	Governs the sustainability approach for Inland Rail. The strategy describes how the Inland Rail team will establish and achieve both Program and Project sustainability objectives and targets.
IR Program Infrastructure Sustainability Rating Implementation Plan (0-0000-900-ESS-00-PJ-0001)	Project Plan	Outlines ongoing Infrastructure Sustainability management, knowledge sharing and reporting requirements across the Program and for the individual Projects.
Beyond the Pavement (NSW Roads and Maritime Services, 2014)	Policy	Establishes the policy, principles and approach to urban design for infrastructure Projects, and is not limited to roads or urban environments.
ARTC Project Handover Guidelines Function: Inland Rail construction (0-0000-900-PMA-00-GU-1000)	Guidelines	Details the requirements for efficient and safe handover of assets, and to prevent additional costs, delays and safety risks arising from the asset handover. It will also set out the requirements for the Accountable Entity to develop and deliver an approved "Handover Plan" during the Project planning period.
Contamination, Spoil and Waste Strategy (0-0000-900-EEC-00-ST-0002)	Strategy	This strategy documents IR's approach to meeting obligations and establishes governing contamination, spoil and waste objectives and principles. This strategy also outlines contamination, spoil and waste design and management processes to inform appropriate management measures throughout the delivery of IR Projects.

DOCUMENT NUMBER / TITLE	DOC. TYPE	DESCIRPTION
Standard Environmental Management Measures (ENV-WI-004)	Work Instructions	Establishes the Standard Environmental Management Measures developed to support the management of potential and actual environmental impacts associated with ARTC activities.
ARTC Pesticide Application (ENV-PR-003)	Procedure	Procedure provides instruction to ARTC staff and contractors on pesticide use, licensing and record keeping for the control of pests (plant and animal).
ARTC Noise Prediction and Mitigation Guideline (ENV-GL-007)	Guidelines	The purpose of this Guideline it provides guidance on noise modelling and abatement (including noise wall/barrier) for the ARTC network.
ARTC Spoil Guideline (ENV-GL-010)	Guidelines	Outlines the regulatory controls and requirements that apply to management of spoil ballast in each state. Where applicable, criteria for utilising relevant exemptions that facilitate beneficial re-use are also presented in conjunction with associated tracking and record keeping requirements.
ARTC Waste Timber Management Guideline (ENV-GL-011)	Guidelines	The purpose of this Guideline is to provide information and advice to ARTC staff on managing ARTC waste timber sleepers, turn-outs and transoms (referred to collectively as ‘waste timbers’ or ‘timbers’).

2 Relevant Guidelines and Standards

The following guidelines and standards shall be appropriately referred to and considered for the Project (current versions as applicable) for all design, materials, equipment, workmanship and installations.

The Accountable Entity is responsible for identifying any additional requirements under the relevant jurisdiction, Conditions of Approval or other agreements with State Agencies, Councils, etc.

It is noted that there are other rail infrastructure standards and guidelines to be considered, such as Queensland Rail, Department of Transport and Main Roads, etc, which interface with Inland Rail infrastructure. As such, relevant guidelines and standards include, but are not limited to, the following:

ARTC:

- *Earthworks Materials Specification (ETC-08-03)*
- *Earthworks Construction Specification (ETC-08-04)*
- *Boundary Fencing. (ETM-17-02)*
- *Right of Way – Fencing (STD-T0193 to STD-T0202)*
- *Right of Way – Fauna (TD-T0172 to STD-T0175)*
- *ARTC Track and Civil Code of Practice*

Note: Latest ARTC Engineering Standards and Codes of Practice available from extranet.artc.com.au .

International Standards

- Various standard drawings provided by the International Erosion Control Association (https://www.austieca.com.au/publications/best-practice-erosion-and-sediment-control-bpesc-document)

Australian Standards:

- *AS 1158 Lighting for roads and public spaces*
- *AS 1289 Methods of testing soil for engineering purposes*
- *AS 1725 Chain-Link Fabric Security Fences and Gates*
- *AS 2303 Tree stock for landscape use*
- *AS 2758 Aggregates and rock for engineering purposes*
- *AS 3706 Geotextiles – Methods of test*
- *AS 4282-1997 Control of the obtrusive effects of outdoor lighting*
- *AS 4373 Pruning of Amenity Trees.*
- *AS 4419 Soils for Landscaping and Garden use*
- *AS 4454 Compost, soil conditioners and mulches*
- *AS 4489 Test methods for limes and limestones*
- *AS 4843 Synthetic weed blocking fabric*
- *AS 4970 Protection of Trees on Development Sites*
- *AS 5100 Bridge Design Set - Noise Barriers (Clause 17)*
- *AS 5101 Methods for preparation and testing of stabilised materials*
- *AS/RISSB 7637 Railway Infrastructure - Hydrology and Hydraulics*
- *AS 7638 Railway Earthworks*

- *AS/NZ ISO 9001:2008 Quality management systems – Requirements*

Other relevant guidelines and standards, which may inform the works, depending on the jurisdiction and Conditions of Approval include but are not limited to:

National:

- *Australian Soil and Land Survey Handbooks (CSIRO)*
- *Austroads AP-G17/04, Pavement Design – A Guide to the Structural Design of Road Pavements*
- *Austroads AGPT06-09, Guide to Pavement Technology Part 6: Unsealed Pavements*
- *Austroads Guide to Road Design - Part 5: Drainage General and Hydrology Considerations*
- *Austroads Guide to Bridge Technology - Part 8: Hydraulic Design of Waterway Structures*
- *Australia and New Zealand (ANZECC/ARMCANZ) Guidelines for Fresh and Marine Water Quality.*

Queensland:

- *Technical Specification (MRTS 16) Landscape and Revegetation Works (Queensland Department of Transport and Main Roads (Department of Transport and Main Roads (DTMR), 2017)*
- *Roads Landscape Manual. A Guide to the Planning, Design, Operation and Maintenance of Road Landscape Infrastructure (DTMR, 2013)*
- *Queensland Government Crime Prevention through Environmental Design Guidelines for Queensland*
- *Crime prevention and the assessment of development applications (DUAC, 2001)*
- *Fauna Sensitive Road Design Volume 1 and 2, (DTMR, 2010)*
- *Accepted development requirements for operational work that is constructing or raising waterway barrier works, (Department of Agriculture and Fisheries (DAF), 2017)*
- *What is not a waterway barrier work? (DAF, 2017)*
- *What is a waterway? (DAF, 2017)*
- *Energex safe tree planting guide where the Project Works interface with utilities.*

NSW:

- *NSW "Blue Book": Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom)*
- *Landscape Guideline (New South Wales Roads and Maritime Services (RMS))*
- *Landscape planting (RMS, R179)*
- *Vegetation (RMS, 178)*
- *Bridge Aesthetics: Design guidelines to improve the appearance of bridges in NSW (RMS, 2012)*
- *Beyond the pavement: Urban design policy, procedures and design principles (RMS, 2014)*
- *Technical guideline for Urban Green Cover in NSW (OEH, 2015)*
- *Dark Sky Planning Guideline Protecting the observing conditions at Siding Spring (DEP, 2016)*
- *Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries)*
- *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries, 2003)*
- Requirements for Waterway Crossings (NSW Fisheries, 2003)

Victoria:

- *CCF Environmental Guidelines for Civil Construction (Civil Contractors Federation, Victoria)*
- *Fauna Sensitive Road Design Guidelines, (VicRoads, 2012)*
- *Victorian Planning provisions*
- *Urban Design Guidelines for Victoria (DELWP, 2017)*
- *Crime Prevention Through Environmental Design, (Victoria Police)*
- *Good Design + Transport, Issue 05, (Office of the Victorian Government Architect, 2012)*
- *A Guide to Healthy Parks Healthy People, (Parks Victoria, 2017)*
- *Healthy Waterways Strategy 2018-2028, (Melbourne Water)*
- *Plan Melbourne 2017–2050 Metropolitan Planning Strategy, Victorian Government*
- *Urban Design Charter, (Victorian Government, 2009)*

3 Delivery Mechanism Overview and Milestone Requirements

As discussed earlier, individual IR Projects will be subject to different Project delivery models (such as design and construction, public-private partnership (PPP), construction only, etc). Table 3 shows an outline of milestones for IR Program delivery stages. The Strategy and Framework provide guidance for IR Projects in detailed design (Stage 3), construction and operation (Stages 5 and 6), but may be used as a reference document for Projects in earlier stages of delivery. Please note that the below Program stage process is currently being reviewed by PMO. Figure 1: Delivery mechanism overview (IR Program Stages).

Table 3 – IR Program Delivery Stages

IR PROGRAM STAGES		MILESTONE REQUIREMENTS (DELIVERABLES)
Stage 1	Concept Design	Identification of preliminary environmental risks and issues, route selection and concept design, identification of applicable primary approval pathway for each Project.
Stage 2	Reference Design	Preparation of primary approval documents and feasibility design, field assessments and investigations, consultation with stakeholders and community, initial ISCA assessments.
Stage 3	Market Readiness	Exhibition / public notification / consultation on primary approval documents, finalisation of primary approval documentation (unless undertaken in Stage 2), progression of detailed design including further field assessments and investigations to inform detailed design, ISCA assessments and verification where applicable.
Stage 4	Delivery Readiness	Obtain secondary and subsequent approvals from relevant State and Commonwealth agencies, local governments and other stakeholders/ entities.
Stage 5	Construction and Commissioning	Construct and commission Projects or Project elements in accordance with the Conditions of Approval and close out construction activities in accordance with Conditions of Approval.
Stage 6	Close-out and Operations	Operate in accordance with Conditions of Approval and applicable licences.

Milestone requirements (i.e. deliverables) relevant to landscape and rehabilitation for each IR Program stage are outlined in Table 3. Service Providers are to provide evidence provided in Table 3.

Given the current status of IR, the initial stages (i.e. Concept Design and Reference Design) are no longer relevant, however, they have been included for completeness.

Please note that the below Program stage process is currently being reviewed by PMO. Updates may be required to this table following the proposed PMO stage amendments.

Table 4 - Deliverables required for Landscape and Rehabilitation for IR Program stages

IR PROGRAM STAGES		MILESTONE REQUIREMENTS (DELIVERABLES)
Stage 1	Concept Design	▸ Desktop studies to collect baseline information (including review of past reports, policies, scoping studies); and ▸ Site visits
Stage 2	Reference Design	To provide evidence within EIS or equivalent document of complying with the following: ▸ TOR, SEARs, etc; ▸ Landscape and Visual amenity requirements listed in the Programme Environmental Assessment Procedure document; ▸ Stage 2 Technical and approvals Consultancy Services briefs and contracts; and ▸ Consideration of ISCA credit weightings relevant to the scope and influence of the IR Project in accordance with the Program Infrastructure Sustainability Rating Implementation Plan.
Stage 3	Market Readiness	To provide evidence of complying with the following: ▸ Landscape design commitments and rehabilitation treatments required to deliver mitigation and management measures defined for each specific Project location; ▸ List of relevant landscape design commitments and rehabilitation treatments from the approved Primary Approval Documents and Reference Design documentation (i.e. EIS or equivalent); ▸ List of Project specific Conditions of Approval (when available) relevant to the landscape design commitments and rehabilitation treatments; ▸ List of Project specific standards, policy, legislation, relevant to landscape design commitments and rehabilitation treatments; ▸ Landscape design commitments and rehabilitation treatments to be documented in accordance with ARTC data management specification to account for ongoing management; ▸ Agreement with ARTC Operations Team regarding operational management and maintenance of landscape design commitments and rehabilitation treatment; ▸ Bill of quantities to detail cost of landscape design commitments and rehabilitation treatments; ▸ Outcomes of Detailed Design to inform the development of completion criteria for incorporation into construction contract documentation, such as, Landscape and Rehabilitation Management Plan, Reinstatement and Rehabilitation Plan, Soil Management Plan, Clearing and Vegetation Management Plan, Clearing and Grubbing, Erosion and Sediment Control Plan, Pest and Weed Management Plan, Urban and Landscape Design Plan, Site Plans, landscape specifications, landscape drawings (supported by typical details and cross sections), landscape planting schedules, etc. Plans to be completed in accordance with Conditions of Approval, Primary and Secondary Approvals;

IR PROGRAM STAGES		MILESTONE REQUIREMENTS (DELIVERABLES)
		▸ Provide site constraint drawings (scale of 1:4000 at A3) for the rail alignment and proposed Licenced Construction Area, illustrating 'understanding of the landscape' including site characteristics, constraints and opportunities; and ▸ Provide 1:1000 drawings illustrating application of landscape treatments outlined within Appendix A.
Stage 4	Delivery Readiness	▸ Obtain Secondary Approvals and other approvals; ▸ Document landscape design commitments and rehabilitation treatment changes as a result of consultation with Commonwealth and State Agencies or Local Councils; and ▸ Outcome of this stage to inform the development of completion criteria for incorporation into construction contract documentation (such as plans listed above).
Stage 5	Construction and Commissioning	▸ Completion of relevant plans, such as Landscape and Rehabilitation Management Plan, Reinstatement and Rehabilitation Plan, Soil Management Plan, Clearing and Vegetation Management Plan, Clearing and Grubbing, Erosion and Sediment Control Plan, Pest and Weed Management Plan, Urban and Landscape Design Plan, Site Plans, landscape specifications, landscape drawings (supported by typical details and cross sections), landscape planting schedules, etc. Plans to be completed in accordance with Conditions of Approval, Primary and Secondary Approvals; ▸ Update of site constraint drawings, as required (scale of 1:4000 at A3) for the rail alignment and proposed Licenced Construction Area, illustrating 'understanding of the landscape' including site characteristics, constraints and opportunities. Provide 1:1000 drawings illustrating application of landscape treatments outlined within Appendix A; ▸ Agreement with ARTC Operations Team regarding defect liability period, operational management and maintenance of landscape design commitments and rehabilitation treatment; ▸ Documented evidence provided on landscape monitoring criteria, key performance indicators, etc.; ▸ Land that is temporary occupied during construction to be returned to meet conditions of any landowner agreement and/or regulatory approvals; ▸ Landscape treatments to be classified by type and documented in accordance with ARTC data management specification to account for ongoing management; and ▸ ISCA verification and certification as detailed in the IR Program Infrastructure Sustainability Rating Implementation plan.
Stage 6	Close-out and Operations	▸ Undertake monitoring prior to handover to ARTC Operations Team in accordance with contract requirements; ▸ State Environment Manager shall work with Compliance and EMS Manager and ARTC Business Units to ensure all relevant Conditions of Approval and requirements are delivered and completed ahead of handover to the ARTC Operations Team and Project Close Out; ▸ Document evidence of compliance with Conditions of Approval, applicable licences, permits etc. and ▸ Ongoing management to be captured in Asset Management System and agreed with Operating Business Unit.

Appendix A: Design of Landscape Treatments - Performance Outcomes

1 Typical Landscape Scenarios

Typical landscape scenarios (outlined in the Landscape and Rehabilitation Strategy) are discussed further below. These illustrate common landscapes which IR and associated works will pass through, including:

- **Rural landscapes** – general rural corridor which IR will pass through;
- **Ecologically sensitive areas** – ecological features (such as watercourses and vegetation corridors) that IR may intersect;
- **Townships** –the urban rail corridor elements; and
- **Temporary treatments** – such as hoarding and screening for site compounds and rehabilitation of borrow pits.

These landscape scenarios provide opportunities for innovation and landscape and environmental enhancement/improvement, while satisfying regulatory requirements/approvals.

For each landscape scenario, relevant performance outcomes provide guidance to Service Providers to inform subsequent delivery stages and Project specific completion criteria. In developing the completion criteria, Service Providers must consider of the Strategy, this Framework, Primary Approval documents and Conditions of Approval.

All the proposed treatments detailed below will require agreement and approval from the IR Project Managers. Discussion must also be undertaken with the ARTC Operations Team to ensure ongoing management/maintenance of landscape treatments are documented and agreed.

1.1 Rural Landscape Performance Outcomes

LANDSCAPE TREATMENT
Landform contouring: ▸ The alignment shall aim to utilise the existing contours and topography, where possible; ▸ Where there are extensive cuttings along the alignment, the landscape design to look at opportunities for revegetating, steepening to reduce extent, rounding earthworks to allow vegetation to establish at the crests, and/or exposing of geology; ▸ The alignment shall look to provide a cut and fill balance, where possible, utilising fill (where appropriate) through the delivery of an integrated landscape design response (e.g. noise mounds/bund, rehabilitation); ▸ The alignment is to create a safe and stable landform that is maintainable and non-polluting, utilising appropriate material on slopes that does not cause additional erosion and sediment run-off and is in keeping with any future vegetation maintenance requirements; and ▸ Stormwater will be managed to clean water principals, including clean water diversions where appropriate.
Minimising footprint: ▸ Minimise vegetation clearance where possible while ensuring adequate room is provided for temporary and permanent works, including laydown and stockpile areas; and ▸ Respond to treatments which go beyond the Project boundary, for example, for temporary and permanent erosion and sediment control measures, landowner agreements and/or pollution control measures.
Planting and revegetation ▸ Tree and plant species shall be suitable for their location having consideration for the local species and landscape character, climatic condition, soil conditions, security, surveillance, sight lines, height limitations, root structure impact and public safety at the plants' full anticipated size; ▸ Tree and plant species shall be designed and position at safe planting distances from infrastructure and minimise falling debris on rail infrastructure and all public areas; ▸ The seeding application type (e.g. drill seeding, broadcast seeding, hydromulch, hydro-compost, organic blanket, seeded mesh) shall be appropriate for plant establishment and appropriate to the local context; and ▸ Reuse of mulch to be in accordance with Appendix B (Section 2.8) of this document. ▸ Reinstatement of watercourses to be undertaken in accordance with Appendix B, (Section 3.1.2) of this document.

Fencing (excluding fauna fencing)

- The fencing shall extend to the adjacent owner or occupiers of lands adjoining the railway corridor, except where boundaries are shared between road and rail corridors. Note in some locations, fencing of the rail corridor from the road may be necessary where the road is used as a stock route;
- The fencing shall connect to existing fencing where appropriate;
- The fencing shall allow for drainage channels and waterways;
- Clearing for fence lines will be compliant with Project requirements and regulations;
- The fencing will be applied such that it doesn't present an entanglement or entrapment hazard to stock or wildlife. For example, avoid double strands, non-tensioned wires, ground wires, mesh sizes matching livestock heads or high chain-wire dead-ends that force wildlife back towards the rail corridor;
- The fencing shall include gates in the boundary fence at new private level crossings, and as agreed with landowners; and
- The position of fencing shall be given careful consideration to allow the fencing to be a discrete element in the landscape.

Integration with roads and access tracks

- Liaise with Local Councils, relevant State Agencies (e.g. DTMR, TfNSW, Vic Roads) and Rural Fire Services regarding existing access tracks, local roads, level crossings, etc, to understand who will own and manage the asset and on-going maintenance requirements once operational; and
- Liaise with Local Councils (as relevant) on the integration of landscape treatments, ensuring the delivery of appropriate landscape design solutions that respond to local Council objectives.

1.2 Ecological Sensitive Areas Performance Outcomes

LANDSCAPE TREATMENT

Ecological connectivity

- Identify key habitat linkages within the landscape which require connection (utilising State and Regional biodiversity corridor mapping, or equivalent), and identify target fauna which may utilise crossings;
- At bridges and viaducts – fauna passage shall be accommodated where practical and aligned to fauna movement corridors or reinstate habitat connectivity across the rail line. Typically, this constitutes a minimum width of 5 metres dry passage under a structure, with sufficient clearance to allow light penetration and vegetation cover on the approaches;
- At culverts – fauna culverts shall be provided where a bridge or viaduct structure are not feasible, and the rail line impacts fauna movement corridors or habitat connectivity. Sizing of the fauna culvert shall be based on the target species. A 3m x 3m box culvert is generally considered suitable to accommodate macropods, koalas and flightless birds. Fauna culverts shall not be co-located with drainage culverts and be designed to provide dry passage;
- When revegetating, planting to be of the appropriate species along these ecological movement corridors; and
- Additional hydrological studies may be required if underpass travels along a waterway which intersects beneath a railway.

Fauna furniture

- Fauna furniture is to be provided at fauna culverts intended to facilitate arboreal or non-ground dwelling terrestrial fauna movements. Typically, this includes koala refuge poles, and fauna logs erected at a height of at least 1m above ground, to minimise risk of predation with sufficient clearance to allow the fauna to freely pass;
- Fauna escape mechanisms – constituting a ramp or other arrangement that allows one-way egress from the corridor for target fauna species;
- Utilise furniture (e.g. logs, fauna poles) as well as planted vegetation to link fauna corridors to adjacent vegetation. This will further aid fauna movement and reduce predation;
- Arboreal overpasses (i.e. rope bridges/ladders) – these are to be considered where arboreal fauna passage provision is required including such species as possums and gliders. Typically, these are used to provide linkage between vegetated areas and connect in with adjacent vegetation. Need to consider clearance zones above railway;
- During clearing and grubbing, look to reuse timber for habitat logs, koala poles and nest boxes; and
- When proposing fauna furniture treatments, consider maintenance requirements when IR is operational.

Fauna fencing

- The target species will inform the type, dimensions and inclusions for each Project and location;
- Typically, fauna fencing shall be specified in locations adjacent to known habitat, or fauna movement corridors;
- Generally, fauna fencing shall extend at least 200 metres beyond known fauna crossings (such as underpasses);

- Look at opportunities to provide temporary fauna fencing during construction at key ecological corridor locations to reduce fauna mortality or look to install permanent fauna fencing earlier during the construction Program;
- Consider fauna exclusion or barrier devices on rail infrastructure to limit fauna mortalities (e.g. anti-climbing devices, or lids and covers); and
- Ensure appropriate clearance zones either side of the fence to minimise fauna trying to jump or climb from adjacent vegetation.

Watercourses

- Reinstatement of watercourses post construction to be undertaken in accordance with Appendix B, (Section 3.1.2) of this document;
- Consider temporary creek crossings required during construction and regulatory compliance including bed-level fish passage requirements. Also consider if such structures could be made compliant permanent structures at the time of the initial installation;
- Applying measures or controls to mitigate sediment, nutrient or contaminant loading into local waterways during and after construction;
- Provision for fish passage to be designed in accordance with relevant guidelines and standards (Section 2), Primary Approval documentation and Conditions of Approval. Note that the type of waterways may dictate the fish passage design requirements. Waterway type will be defined in the EIS (or equivalent document);
- Consider specific fish passage requirements when selecting culvert type. Consider stream hydrology, drown out characteristics and target species;
- Culvert structure and placement to allow for fish movement in high and low water flows;
- Ensure erosion and scour management is adequate upstream and downstream of the crossing;
- Ensure embankment treatments and plantings are consistent with requirements;
- Stream simulation design recommends burying the base of culvert, installing multicell culverts as the same level as the waterway bed profile, having the cell width as wide as bank full waterway width and the cell area as large as the bank full waterway area; and
- Sediment control debris deflector walls can be used to reduce the impact of debris blockages on fish passage while also reducing maintenance costs.

1.3 Townships Performance Outcomes

LANDSCAPE TREATMENT

Integration with bridges and structures

- Maintain function of existing structures and look to enhance features (where possible) which complement the surrounding environment through appropriate treatments (i.e. vegetation planting, lighting);
- Ensure a bridge's form, proportion, symmetry and materials make a positive visual contribution to the landscape character;
- Ensure the material/colour selected for structures does not detract the visual aesthetics and landscape character of the area;
- New bridge deck drainage shall not discharge directly onto railway lines, traffic lanes, cycle paths, shared use paths or footpaths;
- The surfaces of all concrete bridges and culverts that are within 3m of an adjacent, accessible surface shall be treated with an anti-Graffiti coating; and
- Liaise with relevant asset owners if structures/bridges owned by Local Council or State Agencies.

Noise walls/barriers

- Material selected for noise wall/barrier is appropriate to the landscape character of the area and complies with Operational noise criteria;
- Consider absorptive barrier materials where reflective materials may exacerbate or be perceived to exacerbate other noise impacts;
- Look at opportunities to utilise noise wall/barrier, noise mound or combination of both depending on the location and meeting the Operational noise criteria;
- Noise wall/barrier selected to account for on-going operational/maintenance requirements;
- Where required, noise walls/barriers to be designed to reduce the visual impacts to sensitive receptors (including surrounding properties, rail passengers) by incorporating design aesthetics, treatments and/or landscaping elements such as massed planting and/or earth mounding.
- Look at opportunities to use clear or transparent materials to maintain existing expansive views beyond the rail corridor, subject to security and maintenance considerations;
- Adequate separation between noise wall/barrier and vegetation to avoid potential damage; and
- Hydrological and hydraulic conditions should be considered to ensure that noise wall/barrier does not impact natural flow of water.

Lighting, Crime Prevention Through Environmental Design (CPTED) and Disability

- Ensure lighting does not detract from a structure/bridge but looks to enhance its features;
- Use appropriate lighting ensuring it does not cause additional light pollution to sensitive receptors;
- Temporary lighting to be designed and sited, so it complies with ***Australian Standard AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting and Dark Sky Planning Guideline: Protecting the observing conditions at Siding Spring (Department of Planning and Environment, 2016);***
- Complete a CPTED Assessment for all bridges/tunnels, Use CPTED recommendations such as lighting or throw screens to reduce safety risks;
- Look to identify areas requiring application of the ***Disability Discrimination Act 1992 (Cth)*** equitable access provisions including but not limited to tunnel and facilities; and
- Relevant road authorities and emergency services to be consulted in relation to the design of level crossings, pedestrian movement and community safety issues associated with the rail corridor.

Planting and revegetation

Refer to performance outcomes discussed above (i.e. under rural landscapes). Planting to be as appropriate for an urban landscape appropriate to the township.

Water Sensitive Urban Design

- Permanent water quality drainage design to comply with Water Quality Objectives;
- Look to include additional width at public road realignments to allow for the inclusion of stormwater treatment devices to comply with the water quality requirements of the relevant Road Authority;
- Drainage impacted by the Project Works shall meet the standards of the Asset Owner;
- Look to reduce the area of impervious surfaces through minimising hard surfaces;
- Allow drainage to discharge directly to planted areas and design cross falls to direct run-off to localised treatment elements;
- Consider incorporating swales to carry minor flows, with major storm events bypassed to larger basins.
- Look to incorporate the collection, treatment and/or reuse of stormwater runoff; and
- Look to reuse treated wastewater and reduce the amount created, where possible.

1.4 Temporary Features Performance Outcomes

LANDSCAPE TREATMENT

Site compounds (temporary fencing/hoarding)

- Within an urban environment, look at opportunities to utilise different material for fencing/hoarding. This may include use of art-based treatments or plantings to assist in screening the works to reduce visual impact to sensitive receptors or passing visitors. Alternatively, look to provide information on fencing/hoarding, such as contact information, construction timeframes, etc. Viewing platforms could also be provided to actively involve the public
- Fencing colour to suit the landscape character of the area. Ensure it is not too brightly coloured or reflective.
- Consider position of temporary fencing if the site requires early establishment of planting;
- Ensure appropriate diversion is provided to pedestrians/cyclist, as required, if site compound/fencing impacts on existing footpaths/cycleway. Engage with Local Council and cycling group, as required; and
- Look to retain existing vegetation around the perimeter of site compounds as much as possible.

Borrow pits

- Fill imported from borrow areas shall comply with the Earthworks Materials and Construction Specification (ETC-08-03 and ETC-08-04);
- Appropriate Approval Authority to carry out borrow pit works (this may include, for example, extractive industry licence, etc);
- Borrow areas shall be maintained in a tidy, graded and formed condition such as to drain into natural watercourses and avoid soil erosion. Their design must also meet the water quality objectives;
- The Accountable Entity shall comply with conditions for the particular activity. They shall remove only such materials and excavate to such levels documented in Project approvals. If the Accountable Entity removes material without approval, they shall fill, compact and rehabilitate the area at their own cost and be responsible for any regulatory o other actions undertaken by the regulating authority as a result of their activities/actions;
- Prior to excavation, topsoil is to be removed and stockpiled to a maximum of 2.5metres to ensure the seed bank is preserved during stockpiling. Topsoil shall be respread over the excavated area as shown on Drawings, as directed by the IR Project Manager and in accordance with approved site rehabilitation arrangements; and

- At completion, the Accountable Entity shall leave the borrow areas in a tidy and safe condition. Unless otherwise approved, carry out restoration of borrow areas as shown on the Drawings and in agreement with landowner (as relevant).

Appendix B: Construction and Operational Requirements – Performance Outcomes

1 Introduction

This section discusses the performance outcomes for soil preparation and management, reinstatement, rehabilitation and revegetation of areas disturbed or cleared during construction. Landform reinstatement is to be carried out in conjunction with other work such as earthworks, surface and subsurface drainage works and environmental control measures.

Performance outcomes outlined in this Framework are to inform subsequent Project specific completion criteria, which are to be developed by Service Providers during detailed design. In developing the completion criteria, Service Providers must take account of the Strategy, Framework, Primary Approval documents and Conditions of Approval.

Requirements for landscaping and rehabilitation include areas appropriately defined within the site design, layout, drawings and CEMP, including any sub-documentation, and any relevant conditions or requirements of Project approvals, licenses or permits. The minimum standard to be achieved, unless stated otherwise, as set out in the order of precedence (refer to Framework Context, Section 1.3).

Works under this Framework comprise the supply of all labour, materials and plant for the proposed landscaping and rehabilitation required for the construction of the Project.

The works include (but are not limited to) the following items that are be carried out in accordance with the Contract:

- Testing and application of topsoil;
- Soil amendment and/or amelioration;
- Seeding;
- Establishment of vegetation cover;
- Permanent rehabilitation controls;
- Establishment, fertilising and watering;
- Measurement and monitoring to demonstrate compliance; and
- Compliance with the Construction Environmental Management Plan.

All the proposed treatments detailed below will require agreement and approval from the IR Project Managers. Discussion must also be undertaken with the Operational ARTC Business unit to ensure ongoing management/maintenance of landscape treatments are documented and agreed.

1.1 Private Property

No private property shall be removed, relocated or altered without the approval of the ARTC Project Manager.

1.2 Services

All work areas are to be subject to a services search as per the *Earthworks Construction Specification (ETC-08-04).*

1.3 Construction Water

Construction water is to be sourced in accordance with the Project water supply strategy, the requirements of the *Earthworks Construction Specification (ARTC document ETC-08-04)* and relevant Project Conditions of Approval.

The Accountable Entity is to evaluate the suitability of using recycled water (wherever possible). Should this not be an option, the suitability of non-potable water by field and laboratory testing to be investigated, as required, at the discretion of, and as approved by the Project Manager. This includes, but is not limited to ensuring the water:

- Does not contain toxins, pollutants or any substance which would adversely affect vegetation establishment;
- Does not contribute to an environment exceeding any adjoining structure's design exposure classification (including via leachates or runoff);
- Does not cause adverse impacts to ecosystems at or adjacent to the site and is applied in a lawful manner that does not cause any pollution;
- Is applied in such a way as to not cause runoff or erosion at or adjacent to the site in accordance with the NSW "Blue Book" and Erosion and Sediment Control plans; and
- Is suitable for the structure design exposure classification.

2 Soil Preparation and Management Performance Outcomes

2.1 Material

The Accountable Entity shall supply information on all proposed materials for the approval and records of the Project Manager prior to bringing to site and implementing the works. Approval from the IR Project Manager must be received before progressing with these works. This may include (but is not limited to) technical specifications, material safety data sheets, supply dockets, compliance certificates, treatment receipts, certifications, quality reports, materials lists, verification records etc.

2.2 General Reuse of Material

The reuse of spoil material is to be undertaken in accordance with the *Inland Rail Contamination Spoil and Waste Strategy (0-0000-900-EEC-00-ST-0002)*. The *Earthworks Materials Specification (ETC-08-03)* is also to be followed and defines regulatory environmental processes in accordance with legislation. This defines the objectives and principles for management of contamination, spoil and waste, in particular, criteria for the beneficial reuse of spoil materials generated from the Program. The *Spoil Guidelines (ENV-GL-010)* outlines the regulatory controls and requirements that apply to management of spoil ballast in each state.

ARTC are not licensed for resource recovery, waste storage or waste application to land. ARTC must therefore look to beneficially reuse or dispose of waste timbers and avoid stockpiling within the corridor. ARTC have a reuse hierarchy for waste timbers, with reuse for architecture, construction and rail applications being the preferred options, followed by use of unprocessed Landscaping and processed landscaping, then energy recovery and finally disposal being the least preferred. Unprocessed landscaping refers to the reuse of timbers in landscaping applications without processing for example as retaining walls or garden borders, while processed landscaping refers to the recycling of timbers via the process of mulching or shredding to render the timber suitable for end use as mulch or compost. The ARTC *Waste Timber Management Guidelines (ENV-GL-011)* currently documents permissible regulatory options for disposal and management of ARTC waste timbers, such as a timber sleeper resource recovery order and exemption. It provides information and advice to ARTC staff on managing ARTC waste timber sleepers, turn-outs and transoms (referred to collectively as 'waste timbers' or 'timbers').

2.3 Topsoil

2.3.1 Topsoil stripping and handling

Topsoil refers to the upper most layer of the soil (the A horizon) usually dark in colour and rich in organic material. Preferred topsoils for revegetation are typically loose and friable. The Accountable Entity should be aware of the requirement to strip and manage topsoils as part of the contracted works. Operator awareness

regarding locations and required depth of topsoil salvage is important, as is topsoil stockpiling locations and demarcation. Stripping should only be carried out during the right soil moisture conditions and stockpiles should be height limited to 2.5metres, free draining and outside tree drip lines. Weed classified areas/topsoils should be managed separately and in accordance with any relevant weed management strategy.

2.3.2 Topsoil sampling and testing

Topsoils should be classified and agronomically tested as soon possible for planning and topsoil stripping reasons. At a minimum, topsoil sampling and testing must occur before re-spreading in accordance with relevant applicable industry standard/s (i.e. *NSW "Blue Book", AS 1289, DTMR MRTS 16*), to determine its stability and viability as a growing medium. These works shall be undertaken and verified by a suitably qualified person, and records retained for submission of relevant 'as constructed' reports, information and drawings.

If the site topsoil fails to conform to the site-specific requirements (i.e. existing conditions and Project approval requirements), the material may be ameliorated, in accordance with the recommendations of appropriate laboratory or agronomy report, or as per the relevant Specification/standard, to reach the relevant site-specific requirements.

If the material is deemed unsuitable for amelioration, imported topsoil (meeting the below requirements) or a weed/pest/pathogen free topsoil medium, shall be used in landscape construction, following notification to, and approval by the IR Project Manager.

2.3.3 Topsoil requirements

Site topsoil is to be used in preference to imported topsoil and is to be stored separately from subsoil.

Topsoil is to achieve the following minimum requirements:

- Free of contaminants (i.e. at a level that does not pose any unacceptable risk of harm to human health or ecological receptors);
- Reuse of site topsoil is to be undertaken only where soils are confirmed suitable for reuse and meet contaminant concentration criteria as specified within applicable State or Federal statutory requirements;
- Achieving a topsoil pH within ± 0.5pH units of the nominated requirement;
- Free from weeds at a greater density then pre-disturbance conditions, and, in any case, free of prohibited or restricted biosecurity matters (including restricted weeds & pests);
- A volume of stone no greater than the pre-disturbance topsoil;
- Have a texture similar to the pre-disturbance condition; and

Should imported soil be required, the subsoil is to be ripped and cultivated to a suitable depth to combine with the existing soil/base, and mimic existing pre-disturbance natural conditions.

The Accountable Entity shall provide quality assurance documentation from the supplier to the IR Project Manager, to demonstrate the imported topsoil is in accordance with the requirements of this Clause, prior to delivery to site.

2.3.4 Soil treatments

Soil amelioration is to be implemented where recommended in a Soil Assessment or Agronomy Report, or where necessary to achieve revegetation, or to reduce/manage soil dispersion potential, including but not limited to the following amelioration agents:

- Agricultural lime, dolomite and gypsum;
- Fertiliser;
- Organic soil conditioner;
- Microbial inoculants; and

- Soil wetting and holding agents.

2.3.5 Placement of topsoil

- Topsoil to be placed within three days (weather permitting) of subsoil ground preparation works described below;
- Topsoil shall be spread to the depths required for the vegetation and consistent with the pre-disturbance condition and allow for settlement after placement. Where depths aren't indicated, aim for 40-60mm on steeper slopes (> 4H:1V) and 75-100mm on lesser slopes;
- Amelioration and/or amendment shall be added during topsoil placement depending on the landscaping treatment being applied; and
- Seeding may also occur at the time of topsoil placement. Ensure any crusted or compacted topsoils are cultivated to depth prior to applying seed.

2.4 Subsoil

2.4.1 Subsoil sampling and testing

Subsoil refers to the B horizon which occurs beneath the A horizon (topsoil). Subsoil is to be sampled and tested prior to spreading in accordance with industry standards ((i.e. *NSW "Blue Book", AS 1289, DTMR MRTS 16*), and a Soil Assessment Report prepared by a suitably qualified person provided for approval prior to use.

Subsoil to be ameliorated where required in accordance with the relevant Project plans and design.

2.4.2 Ground Preparation

Prior to the commencement of ground preparation operations, the area shall be in a weed free condition (where possible).

The following is to occur as part of site preparation prior to rehabilitation, topsoil reinstatement or landscaping treatments:

- If necessary, reinstatement areas to be treated to remove weeds at least four weeks prior and then again two weeks prior to applying turf or other topical landscaping applications;
- All rubbish, debris and loose maintenance obstructions are to be removed from the surface;
- Deep ripping (to 300mm) heavily compacted soils in areas to be revegetated with slopes ≤ 4H:1V or as per site design drawings, but not for dispersive subsoils);
- Lightly scarifying subsoils (to 100mm) in areas to be revegetated with slope ≤ 4H:1V (or as per site design drawings);
- Roughening shall be used in areas to be vegetated with slope > 4H:1V (approximately 50mm depth, or as per site design drawings);
- Consider increasing deep ripping followed by roughening, depending on timing of works and if environment is particularly dry;
- Amelioration agents to be applied where specified in relevant plans and spread over the subsoil surface to the specified rates. Ground preparation to occur immediately after the application of amelioration rates;
- Topsoil is to be evenly spread where required, graded to drain freely and lightly compacted; and
- Take particular note of treating dispersive subsoils and covering them as soon as possible with less erosive media such as topsoil and mulch.

2.5 Turf

Where turf is proposed to be used by the Accountable Entity for revegetation purposes, it shall be consistent with the species composition as per the pre-disturbance condition on site, this Framework or as agreed to by Inland Rail Project Manager, as per the Project Contract.

A proposal for the use of turf must be captured in the relevant Project plans and design.

Turf shall meet any relevant applicable industry specifications and be handled, applied and maintained in a manner to ensure that it will achieve the desired outcomes (refer Section 2 – Guidelines and standards). Where turf is to be applied to drains, ensure that calculated flow velocities are appropriate for turf application, and that pinning is considered if prevailing weather conditions warrant it. The Accountable Entity shall identify the requirements within submitted methodology.

2.6 Soil Wetting Agent

If a soil wetting agent is used, it is recommended that it meets the following requirements:

- Have a life of at least 3 months;
- Work to reduce soil wetting repellence and surface tension of soil particles;
- Allow for water penetration into the soil;
- Be free from matters toxic to plant growth; and

Any proposal for the use of a wetting agent must be captured in the relevant Project plans and design.

2.7 Fertiliser

If fertiliser is to be used, it must be suitable to the species and location to ensure surface water run-off doesn't cause nutrient loading and dissolved oxygen drawdown situations in nearby aquatic ecosystems. It must also be applied in accordance with manufacturer's recommendations and Conditions of Approval. These shall be utilised in accordance with the relevant recommendations as per any soil monitoring, soil condition or agronomy reports for establishment of the desired vegetation.

Any proposal for the use of fertilisers must be captured in the relevant Project plans and design, approved by the IR Project Manager.

2.8 Mulch and Compost

If mulch or compost is proposed to be used on site, it shall preferably be manufactured on site, or if this is not viable, alternatively imported. Suitability of cleared vegetation for mulching / erosion protection will be assessed on a site by site basis. Any vegetated material containing or with the potential to contain weed seed material will not be used for on-site mulching or erosion protection. Any mulch generated as part of the Project shall be re-used within appropriate timeframes and manners as specified in the Erosion and Sediment Control Plan and the Reinstatement and Rehabilitation Plan.

Any mulch or compost used on site must be:

- From a licensed facility (if imported);
- Free from contaminants, rubbish and deleterious material (i.e. at a level that does not pose any unacceptable risk of harm to human health or ecological receptors);
- Free from weeds, including prohibited or restricted biosecurity matter; and
- In accordance with AS 4454 and applicable State regulations including but not limited to the *NSW Protection of the Environment Operations Act 1997* (POEO Act), *Queensland Environmental Protection Act 1994* (EP Act) and the *Victorian Environment Protection Act 1970.*

For imported mulch, the Accountable Entity shall provide quality assurance documentation from the supplier to demonstrate material is in accordance with the requirements of this clause, prior to delivery to site.

Mulch type and size shall be appropriate for rehabilitation and/or plant protection purposes.

2.9 Herbicides and Pesticides

Where the proposed use of pesticides triggers requirements for licensing of the persons conducting the work, the Accountable Entity shall ensure licenses are in place.

Any herbicides and pesticides proposed to be used must be currently registered for their intended use by the Australian Pesticides and Veterinary Medicines Authority (APVMA) that are approved for the intended situation and used in accordance with the *ARTC Pesticide Use and Recording Procedure (ENV-PR-003)*, relevant Material Safety Data Sheet, and regulatory requirements.

The proposed use of these shall be captured in the relevant Project plans (i.e. CEMP) and procedures, approved by the IR Project Manager.

Liaison with adjacent landowner shall be undertaken should they be operating a certified organic farm.

2.10 Hydromulch, Hydroseed and Binders

If a bonded fibre matrix (BFM), hydromulch, hydroseed or soil binder application is proposed to be used it shall be captured in the relevant Project plans (i.e. CEMP), procedures and designs. These plans, procedures and designs shall document how the use of these product/s help achieve the required landform outcomes.

- BFM, hydromulch, hydroseed or soil binder application proposed shall meet any relevant statutory requirements (i.e. free of contaminant at a level that does not pose any unacceptable risk of harm to human health or ecological receptors);
- It is recommended that they shall also be free from:
    - matter toxic to plant growth / seed germination;
    - plant propagules;
    - cationic emulsions;
    - Soil;
    - Rubbish; and
    - other deleterious materials.
- Be comprised of materials adhering to relevant quality standards and mixing rates, with pre-treatment requirements applied (supplier or Accountable Entity to verify);
- Be applied and utilised as per the manufacture's guidelines and/or recommendations. Verification of constituent quantities at the time of mixing is encouraged; and
- Hydromulch binders may be pre-packaged with fibre, which shall be free from matter toxic to plant growth, prohibited or restricted biosecurity matter, plant propagules, soil, rubbish, seed germination inhibitors and other deleterious materials.

2.11 Seed Mix

Cover crop, perennial and seed and native seed used must:

- Have a species selection appropriate to the region and locale being revegetated, including consideration of landholder and seasonal requirements (as directed and/or agreed to with IR Project Manager / Accountable Entity); and
- Have any pre-treatments or coatings applied in accordance with the relevant applicable Australian and/or Industry Standard, (refer to Relevant Guidelines and Standards, Section 2);

And shall:

- Be cleaned to remove extraneous matter and/or verified weed/pest/pathogen free;
- Be tolerant to drought conditions where required;
- Be of moisture content suitable for optimal germination for the species;

- Have a purity of seed not less than National Seed Quality Standards for Basic and Certified Seed; and
- Be applied at a rate and time that is conducive to achieving key desired outcomes, such as 70% ground cover densities.

3 Landscape and Revegetation Performance Outcomes

3.1 Rehabilitation Performance Outcomes

The selection and application of appropriate rehabilitation measures will be informed, as a minimum, by the relevant Conditions of Approval, regulatory requirements and guidelines (such as the NSW "Blue Book" or IECA Best Practice Erosion and Sediment Control guidelines), soil assessments and an erosion risk assessment, and documented in the Reinstatement and Rehabilitation Plan (or similar plan) for each stage or element of the works.

Permanent erosion and scour protection shall be provided (where required) in accordance with ETC-08-04, detailed design and drawings. These shall be constructed in a progressive manner over the course of the works, thus minimising the use of temporary erosion and sediment control works where possible. Progressive rehabilitation of work areas should be made clear within Erosion and Sediment Control Plans.

3.1.1 General

The following outcomes are to be achieved as a minimum at completion of the works:

- Achieving contractually defined sign-off criteria for handover at Project completion (e.g. minimum 75% groundcover at Project completion);
- Land stability and erosion rates to be the same as, or less, than the pre-disturbance condition, or reference locations, as agreed to by Inland Rail;
- No slumping, gullying or tunnelling of the material present;
- No contaminated or waste materials present that pose an unacceptable risk of harm to human health/ecological receptors;
- Pre-existing weeds at acceptable densities, and no new restricted weed outbreaks, or as stipulated by statutory obligations; and
- All treatments, structures and erosion and sediment control measures that are no longer required have been removed.

3.1.2 Watercourses

In addition, for reinstatement of watercourses, the following are to be achieved as a minimum at completion of the works:

- Reinstatement in accordance with relevant applicable state guidelines, Conditions of Approval, etc.;
- As per design and relevant standards;
- Placement of remaining structures or materials appropriate to the location of watercourses, hydrology design and velocity at discharge;
- Temporary structures, such as at creek crossings to be removed, stabilised and rehabilitated;
- No noticeable scour events or high-risk scour potentials; and
- Reinstatement consistent with natural stream channel morphology, ecology and terraces, where feasible.

3.1.3 Temporary disturbance areas

Site-specific requirements are applicable where landowner agreements are in place for certain properties (e.g. temporary works areas such as construction access, site compounds, workforce camps, borrow pits, level crossings or other enabling works). Likewise, the CEMP and subplans may have key visual amenity criteria that needs to be met. Where requirements differ between this Framework and the landowner agreement, the

landowner agreement takes precedence. However, if these contradict or do not align with any statutory, licence or compliance requirements, the statutory, licence and compliance requirements take precedence.

3.1.4 Removal of erosion and sediment control measures

A well completed Erosion and Sediment Control (ESC) Plan will have a decommissioning sequence for ESC measures. Where this is absent, and advice is required, Certified Professional ESC accredited advice should be sought. ESC device decommissioning shall not be attempted unless the site catchment has achieved rehabilitation criteria, and the site is stable. Device cleanout must occur prior to decommissioning, with removed sediment being treated, buried or removed off site.

3.1.5 Materials

Permanent rehabilitation materials (such as stabilisation matting, mesh, binder, aggregates) are to be placed in accordance with detailed design drawings, construction and manufacturers specifications and with consideration of the relevant design velocity, relevant industry specifications or standards.

3.2 Revegetation Performance Outcomes

Details regarding landscape and revegetation works shall be included in the Accountable Entity's CEMP, relevant management plans, contract specifications, drawings and Planning Approval document.

The Accountable Entity shall include appropriate identification of the objectives for revegetation, so that the performance outcomes are achieved.

Key considerations, to be included to deliver successful revegetation include:

- Unless otherwise indicated or accepted in writing, a minimum 75% vegetative ground cover protection at the time of Project handover. Where this is not achievable, other landscaping treatments shall be considered and applied as noted below;
- At least 90% plants applied to be healthy, appropriate size and suitable for the context;
- Species to be chosen to replicate the pre-disturbance condition and species composition, (excluding any weed species);
- Ground to be prepared prior to planting, including topsoil placement where required, ripping or planting holes;
- Planting density to be optimised to achieve rapid ground coverage; and
- Mulching, weeding and watering to be implemented as needed to contribute to revegetation success.

Note that rehabilitation of final landform may be achieved without revegetation (i.e. through other forms of permanent ground cover), subject to compliance with the drawings, the Project Contract and the rehabilitation performance outcomes.

3.2.1 Maintenance

Revegetated/grassed areas are to be maintained up to practical completion and beyond if a defects liability period applies. This maintenance shall include (but is not limited to) the following activities to achieve the performance outcome:

- Watering (using water of suitable quality and via a method that doesn't induce erosion or contamination of the site, and in suitable quantities for the species requirements;
- Fertilising;
- Reseeding;
- Weed control;

- Pest and disease control;
- Vegetation control and management;
- Repair or reinstallation of failed treatments;
- Topping up of mulch;
- Protection of vegetation works from surface water flows through installation of appropriate temporary measures; and
- Removal of any rubbish or contamination.

3.2.2 Weeds

Weed management shall include the following activities to achieve the performance outcome:

- Pest plant (weed) densities no greater than the pre-disturbance condition, or reference locations, as agreed to by IR;
- No new outbreaks of restricted weeds (as defined by statutory requirements);
- To validate the above condition, post construction weed surveys will apply to the Accountable Entity. Such surveys should be initiated during favourable growing conditions and be passed onto Operational ARTC Business Unit for consideration of maintenance requirements; and
- Operational ARTC Business Unit to be advised in writing of any targeted weed treatment areas such as on-corridor washdown sites or weed incident locations.

3.2.3 Seeding treatments

Seeding treatments shall include the following activities to achieve the performance outcome:

- Have a cover of perennial and cover crop grasses so that performance outcome will ultimately be achieved;
- Show no signs of nutrient deficiency;
- Show no signs of water deficiency (unless cover crop targets have been met); and
- Have erosion and ground cover rates as per the performance outcome.

3.2.4 Turfing treatments

Turfing treatments shall include the following activities to achieve the performance outcome:

- Show no signs of nutrient deficiency; and
- Show no signs of water deficiency.

3.2.5 Planting treatments

Planting treatments shall include the following activities to achieve the performance outcome:

- Have a species composition (excluding pest plants (weeds)) of ground cover similar to (at least 75% consistency of species) the pre-disturbance condition, or reference locations, as agreed to by IR;
- Show no signs of nutrient deficiency;
- Show no signs of water deficiency;
- Show no signs of pests or disease;
- Are established and well formed, showing evidence of growth; and
- Have a mulch depth in accordance with the site conditions and species requirements.

4 Operational Management and Maintenance

Performance outcomes outlined in this Framework (Appendix A and B) are to inform subsequent Project specific completion criteria, which are to be developed by Service Providers during detailed design. In developing the completion criteria, Service Providers must take account of the Strategy, Framework, Primary Approval documents and Conditions of Approval (when available).

Consideration of Project handover commences during the design stage as there will be aspects that require addressing prior to finalising solutions that may have a cost, risk, and delay implication. This is particularly relevant to design of landscape treatments discussed in Appendix A. Discussions may also be required with State Agencies and Local Council should they be the remaining asset owner.

Information to be collated in the form of a handover plan, which is prepared by the Accountable Entity and forwarded to IR and relevant ARTC Operations Team for review and agreement. Further information is contained within *ARTC Project handover guidelines (0-0000-900-PMA-00-GU-1000).*

Prior to handover for operational management, the site is to comply with the Conditions of Approval, handover criteria and applicable licences/permits.

There shall be a monitoring activity of scope and duration approved by IR and outlined in the handover plan, to ensure that an approved minimum standard of establishment is achieved. Ongoing monitoring, as defined in Operational Handover requirements to ensure that the established landscape strategies, that are being achieved and implemented, continue to be successful. Additional maintenance or intervention works may be required if monitoring demonstrates that landscape and rehabilitation completion criteria are not being achieved.

Inspections of reinstated, landscaped or revegetated areas shall occur as otherwise specified in the CEMP, Project Contract requirements or Planning Approval including the management of defects and/or punch list items. Reporting shall include information on reinstatement, landscaping and revegetation or as specified by the Project Contract.

For any IR Project, following practical completion of required construction works and agreed defect liability period, individual Project areas shall be handed over, in accordance with any applicable agreements and/or procedures, to the relevant Operations Team (nominated by IR) for ongoing operational management and maintenance. The Operations Team to be responsible for managing the reinstated areas to ensure the long-term landscape completion criteria are achieved in accordance with the handover plan. Any long-term commitments post-handover to be clearly defined and documented in the IR/ARTC EMS for the corridor.

IR and its Accountable Entity shall ensure long-term management and monitoring commitments are reasonable and appropriate for an operational railway corridor, in liaison with a suitably qualified Landscape professional, and can be adequately budgeted and captured in asset management systems and agreed upon with the ARTC Operations Team.

The ongoing maintenance of sites shall include management of weeds, pests and vegetation (e.g. for bushfire and safe access), fauna furniture and fencing, and other infrastructure as well as ensuring an ongoing safe and stable non-polluting landform. These works shall be managed in accordance with operational environmental management documentation.