



Rethinking safety through  
**INCLUSION**  
+  
**WELLBEING**

# ENVIRONMENT

## PRIMARY STANDARD

28/01/2025

## EROSION AND SEDIMENTATION

### PURPOSE AND SCOPE

The purpose of this Primary Standard is to eliminate or minimise environmental harm as a result of erosion and sedimentation.

#### 1.0 CRITICAL CONTROLS AND CONTROLS CRITERIA

**Table 1** provides mandatory Critical Controls and the associated Controls Criteria which when implemented will reduce the risk of severe environmental impacts. The Critical Controls and associated Controls Criteria are considered operational controls and are to be included in project-specific management plans and procedures. The Controls Criteria support the successful implementation of the Critical Controls.

**Table 1 Critical Controls and Controls Criteria**

CRITICAL CONTROLS	CONTROLS CRITERIA
EROSION AND SEDIMENT CONTROL (ESC) RISKS AND REQUIREMENTS ARE ASSESSED DURING THE PROJECT PLANNING PHASE OR FOR NEW SCOPES OF WORK	Assessment of the project area is undertaken to identify erosion and sediment risks.
	Assessment outcomes documented in the Construction Environmental Management Plan (CEMP) or associated sub-plan.
	Supply chain requirements to manage ESC are outlined in contracts.
	Site assessment has determined soil types, sensitive receivers, and soil erosion hazard.
	Erosion and Sediment Control Plans (ESCP) are developed, and controls documented to meet design criteria outlined in the IECA Best Practice Erosion and Sediment Control Guidelines or Blue Book (NSW only).
CONSTRUCTION ACTIVITIES ARE MANAGED TO MINIMISE EROSION AND SEDIMENTATION	Consultation is undertaken with the construction team during ESCP development.
	Environmental Control Plans (ECP) and ESCPs are developed and communicated to the site project teams.
	Vehicle and plant movement is management through the Vehicle Management Plan (VMP) to avoid unnecessary disturbance.
WEATHER MONITORING AND COMMUNICATION PROCESSES ARE ESTABLISHED	Process to document actions from inspections and responsibility for their completion is established and implemented.
	The process to assess predicted wet weather events is established and communicated to the project team and the supply chain.
DESIGN OF DRAINAGE STRUCTURES USED FOR CONSTRUCTION WATER MANAGEMENT COMPLETED	Trigger Action Response Plans (TARP) are developed for location-specific climatic conditions and communicated.
	Temporary drainage structures design outputs include construction details and design criteria.
	Design of drainage structures used for construction water management has been completed by a suitably qualified person.
	Temporary water diversion designs include dimensions and layout to meet the critical runoff flowrate and criteria for a design rainfall event.
	Temporary drainage structures are documented on the Temporary Works Register.



CRITICAL CONTROLS	CONTROLS CRITERIA
<b>DESIGN AND INSTALLATION OF SEDIMENT BASINS COMPLETED</b>	Assessment is undertaken by a suitably qualified person to determine sediment basin design requirements and location.
	Sediment basin design meets the IECA Best Practice Erosion and Sediment Control Guidelines, or Blue Book (in NSW only).
	Verification records (Inspection Test Checks (ITC)/Inspection and Test Plans (ITPs)) are available to demonstrate that the sediment basin is constructed to meet the design standards for settling zone and sediment storage zone.
	Spillway is designed to remain stable in the peak flow from a 1 in 20-year ARI time of concentration event.
	Procedure is established to monitor, treat, and discharge water from sediment basin.
	Use of marker poles to determine levels (water level or sediment storage) is documented in the plan.
<b>STOCKPILE LOCATIONS ARE PLANNED AND MANAGED</b>	Stockpile areas are designed, located in low-risk areas, and documented on the ECP or ESCP.
	Water management controls and sediment controls are identified for stockpiles. Controls are designed as outlined in the IECA Best Practice Erosion and Sediment Control Guidelines, or the Blue Book (in NSW only).
	Planning implemented for stockpiles that are not actively being worked for more than one month are stabilised with temporary vegetation, geofabric or soil binder and documented.
	Topsoil stockpiles have been designed to be less than 2m in height.
<b>SURFACE WATER AND OVERLAND FLOWS ON TO SITE ARE MANAGED</b>	Sediment and water management controls are designed and implemented as per the soil erosion hazards analysis and appropriate design criteria.
	Design drawings for temporary controls are approved for construction by a suitably qualified person.
	Clean water diversion drains designed to meet the design rainfall event.
	ESCP outlines stabilisation/rehabilitation requirements for clean water diversion drains.
	Inspection/monitoring regime in place for water management controls including clean water diversion drains.
<b>CONSTRUCTION ACTIVITIES ARE MANAGED TO MINIMISE EROSION AND SEDIMENTATION</b>	Batter chutes are outlined in ESCPs to manage runoff water on embankments.
	ECPs and ESCPs are developed and communicated to the site project teams.
	Vehicle and plant movement is managed through the VMP to avoid unnecessary disturbance.  Process to document actions from inspections and responsibility for their completion is established and implemented.
<b>SITE IS PREPARED FOR WET WEATHER EVENTS</b>	Stormwater management measures are installed and functioning as designed (design dimensions, erosion control, structure stability and location/monitoring).
	Sediment controls in place to manage sediment runoff as documented in the ESCP.
	ESC maintained and desilted to maintain capacity (minimum 70% sediment storage capacity).
	ESCs and material adequately stocked/supplied (sediment fences, coir logs, sandbags, geofabric, flocculants, pH adjustment materials).
	Clean water diversion drains are installed as documented in the ESCP.
	Erosion control and surface stabilisation provided for high-risk areas.
	Batter chutes are installed to manage runoff water on embankments.  Excavation and or vegetation clearing permits conditions have been documented and communicated.
<b>DRAINAGE STRUCTURES AND SEDIMENT BASINS ARE MONITORED</b>	Erosion controls and surface stabilisation is in place and functioning as documented in the ESCP.
	Water from water storage areas on-site is tested and treated as required prior to discharge.
	Water levels and sediment storage levels in sediment basins or water storage areas are monitored to ensure designed capacity is maintained.
<b>DUST EROSION CONTROLS ARE IMPLEMENTED AND EFFECTIVE TO MINIMISE WIND EROSION</b>	Dust suppression resources are available and being used (water, vegetation, binder, hydro mulch).
	Wind erosion controls are installed (e.g. fencing, wind barriers).
	Stockpiles not actively worked for more than one month are stabilised with temporary vegetation, geofabric or soil binder.



## 2.0 EROSION AND SEDIMENT CONTROL PLANS

Erosion and Sediment Control Plans (ESCP) are to be prepared, documented, and kept up to date. High-risk projects or projects with large, disturbed areas will require the preparation of a Soil and Water Management Plan.

Projects must determine which guidelines are applicable for their local criteria. The majority of jurisdictions use the IECA Best Practice Erosion and Sediment Control Guidelines. In NSW, projects will generally follow the Blue Book. ESCPs should:

- Include all relevant ESCs to reflect the current construction methodology. Controls are to be designed in accordance with the Blue Book or the IECA Best Practice Guidelines.
- Be updated throughout the life of the project. Plans will need to be modified and updated where catchment areas or drainage arrangement change, or controls are modified.
- Repair and manage sediment controls or excess erosion/sedimentation as required to maintain ESC devices. ESC devices are to be maintained/repared when their capacity has been reduced by 40%.
- Include design, dimension, and locational details to ensure controls are installed to meet the design requirements.
- Consider design, dimensions, and relevant details for installed sediment fences to remain functional for up to a 1 in 5-year ARI event.
- Include details for the required velocity control within site surface drainage using sandbag or aggregate check dams.
- Outline the method for stabilising clean water diversion drains.
- Include the location details for stockpiles and where necessary identifying off-set distances from watercourses and drainage works.

## 3.0 TOPSOIL AND MULCH STOCKPILES

For topsoil and mulch stockpiles:

- Retain the topsoil for use in revegetation and landscaping. When topsoil is stockpiled, there is a risk that it becomes sterilised and will not support plant growth or landscaping. Keep topsoil stockpiles to less than 2m in height.
- Actively manage the weeds on topsoil stockpiles.
- Treat topsoil stockpiles with a suitable cover crop for the local conditions.
- Mulch and other material stockpile heights are to be minimised to prevent erosion and other impacts.
- Mulch stockpiles are not to be located in low lying areas.
- Mulch stockpiles must be provided with local water quality controls including sumps and diversion bunds. Runoff from mulch stockpiles must not be mixed with water within sediment basins.



#### 4.0 INSPECTION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROLS

The CEMP must outline the inspection regime for the site's ESCs. They are to be inspected as a minimum weekly, each day prior to shutdown periods and after rainfall events that generate surface runoff. Other requirements include:

- Inspections are to be documented within the Intellex system (or suitable equivalent). Actions to address maintenance or the installation of additional ESCs are to be documented within Intellex (or suitable equivalent).
- The installation of ESCs is to be scheduled to prevent the risk of runoff from disturbed areas. ESCs are typically installed as soon as ground disturbance has occurred.
- Maintenance activities to restore capacity or functionality to ESCs are to be completed within the timeframes nominated in the inspections and prior to the next rainfall event.
- Adequate supplies of materials for ESCs are to be maintained on-site.

#### 5.0 SOIL EROSION AND STABILISATION

The following are general requirements for soil erosion and stabilisation:

- In the project area complete an erosion and sediment assessment to determine the presence of dispersive soils.
- Where dispersive soils exist on-site, the applicable ESC guidelines must be consulted to design the site specific ESCs. The presence of dispersive soils must be considered during the design phase of the project to inform permanent revegetation and rehabilitation measures.
- Temporary stabilisation for site surface drainage must be provided where dispersive soils exist on-site.
- Should work areas remain inactive for periods of greater than four weeks, apply temporary stabilisation measures (e.g. using soil binders or covering with a geo-fabric cover such as jute mesh).
- Disturbed surfaces (both cut and fill, including footpaths) to be revegetated as soon as practical and in compliance with the landscaping plans. Best practice is for revegetation to be commenced within four weeks of the completion of the final landform.
- Revegetation activities are to be completed as a quality assurance process with relevant process procedures, ITPs and verification records produced.
- The time of revegetation activities must consider the prevailing and seasonal weather conditions. Revegetation activities may need to be supported with additional watering where rainfall is insufficient to assist germination and establishment.
- Native species are to be specified for permanent revegetation activities.
- Temporary ESCs may only be removed following successful surface stabilisation where a ground cover of 70% is achieved.

#### 6.0 SITE EXIT CONTROLS

The intent of the design, implementation and maintenance of site exit controls is to ensure that operations and activities that are associated with access and egress for the site are managed to reduce the risk of harm to the environment. In addition, when sediment and mud is dragged out on to adjacent streets it represents a safety hazard to road users.

The design, implementation and maintenance of site exit controls must ensure that tracking or drag out of sediment is minimised as far as reasonably practicable in the first instance. Where there is evidence of sediment tracking or drag out on haulage routes or adjacent streets, this is cleaned up progressively and prior to rainfall. Site exit controls are to be supplemented by sediment controls at downstream stormwater drainage systems.



The requirements for site exit controls are as follows:

- At every site exit where there is a risk of sediment being dragged out or tracked on to adjacent roads or streets, a control measures are to be designed, installed and maintained.
- ESCPs and or ECPs must include the location of site exits and the associated site exit controls.
- Site exit controls are to include, but not be limited to wheel washes, rock grids/shaker mats, FOD mats, cattle grids or ballast ramps. These controls may be combined to ensure the tracking or drag out of sediment is minimised as far as reasonably practicable.
- Site exit controls are to be designed and installed in accordance with the relevant local guidelines including the IECA Best Practice Guidelines or the Managing Urban Stormwater - Soils and Construction (Blue Book).
  - Site exit controls such as rock mats, ballast ramps, cattle grids, FODs etc must comply with dimensional requirements in the guidelines above and be of a length that represents a minimum of 3 truck wheel circumferences.
- Internal haul routes are to be designed and maintained to support all weather access and to reduce the generation of sediment.
- Sufficient street sweeping/cleaning resources must be procured and be operational during haulage activities to return adjacent roads and streets to the appropriate condition.
- Street sweeping must be implemented when there is evidence of sediment tracking or drag out on adjacent streets.
- Haulage routes, adjacent streets and site exit controls must be reviewed during and after inclement weather and/or when there is evidence of sediment tracking or drag out. Stormwater entry pit controls are also to be inspected and maintained.
- Where sediment tracking or drag out cannot be controlled, haulage is to cease, and the respective site exit closed until site exit controls are installed and maintained and the adjacent streets are returned to the appropriate condition.

## 7.0 SEDIMENT BASINS

The following are the requirements for sediment basins:

- Sediment basins must be sized in accordance with the requirements of the Blue Book, IECA Best Practice Erosion and Sediment Control Guidelines, environmental licences, and relevant conditions of approval.
- Sediment basins will be constructed for the nominated size of disturbed catchment areas or soil erosion potential in accordance with the guidelines.
- Sediment basin operation and maintenance methodology is to be documented in a project-specific procedure and communicated to personnel.
- Sediment basins must have their full capacity returned within five days of the cessation of rainfall. This includes water treatment, testing, discharging, and desilting where required.
- Sediment basins must have depth indicators to identify sediment and water storage zones.
- Projects must retain on-site quantities of flocculants or materials to treat water within sediment basins such that 125% of the total combined sediment basins volume can be treated.
- All weather access must be maintained to sediment basins.
- Erosion control measures are to be provided for the inlets to sediment basins.



- The outlet of the sediment basin must be designed and installed to safely manage the discharge from the 1 in 20-year ARI event. The outlet must be provided with erosion control.
- Sediment basins are considered temporary works and must be installed in accordance with the project's earthworks specification, unless a project specific alternative specification is developed, reviewed, and approved by a competent person.
- Material for embankments must be placed in compacted layers in accordance with the associated specification. Unless the design documentation details otherwise, embankments must also be keyed into the subsurface.
- Quality verification records required by the earthworks specification must be generated and retained in the project records. This includes relevant process procedures, ITPs and checklists.

Details relating to temporary basins are also provided in the **PS Water Management**.

## 8.0 WATER DISCHARGES

A receiving water quality monitoring programme is to be developed for all projects. As a minimum, it will include monitoring of all water discharges. The monitoring programme must include monitoring of water discharges and receiving waters at appropriate intervals and times of discharge during construction to demonstrate no adverse impact to receiving water environmental values. The following are the requirements for water discharge unless alternative criteria have been agreed with the relevant regulatory authority or in accordance with a licence/permit:

- Dewatering and water discharges from site must comply with local legislation, licences and permits.
- Dewatering and water discharges from site can only be undertaken following the completion of the **Water Discharge Permit** and Laing O'Rourke approval.
- Water is to be discharged in accordance with legislation and only after Laing O'Rourke approval. Discharge water quality must comply with the following minimum requirements:
  - TSS:  $\leq 50\text{mg/l}$  (~Turbidity 30NTU unless otherwise verified). If this cannot be achieved through natural settling, the trapped sediment laden water is to be flocculated with gypsum applied at a rate of approximately  $40\text{kg}/100\text{m}^3$
  - pH: Between 6.5 and 8.5
  - No visible oil or grease.
- Records of discharge and insitu monitoring must be maintained in the project records.
- Permanent drainage to be installed as early in the programme as possible.

Approval for the wastewater management facilities (sewage) for the site office and crib shed are to be obtained prior to site mobilisation. Only connections to existing sewer or proprietary pump-out systems are permitted without detailed design being completed and the system being approved.

## 9.0 PLANS, FORMS AND TEMPLATES

For relevant plans, forms and templates see the Laing O'Rourke HSEMS at [www.lorhsems.com](http://www.lorhsems.com).