Erosion and Sediment Control Procedure

1. Purpose

The purpose of this document is to provide a summary of tasks, responsibilities, tools and templates applicable to renewals programs delivered by the TasWater Project Delivery Group (PDG) and its Contractors relevant to erosion and sediment control. The Procedure includes:

- TasWater Standards for Erosion and Sediment Control
- Site Planning for Sediment and Erosion Control
- Drainage Control
- Erosion Control
- Sediment Control

This document should be read in conjunction with the following Procedures:

- Environmental Management Plan
- Environmental Monitoring Procedure
- Workplace Inspection Testing and Monitoring Procedure
- Dewatering and Bypass Pumping Procedure

2. Scope

☐ Planning	☒ Delivery	☐ Handover
☐ Program Management	☐ Procurement	☐ Community & Stakeholder
☐ Safety	☒ Environment	☐ Quality

This Procedure steps through the processes for erosion and sediment control for construction projects delivered by the TasWater PDG.

3. Definitions

This Procedure should be read in conjunction with the Project Delivery Group Acronyms and Glossary document.

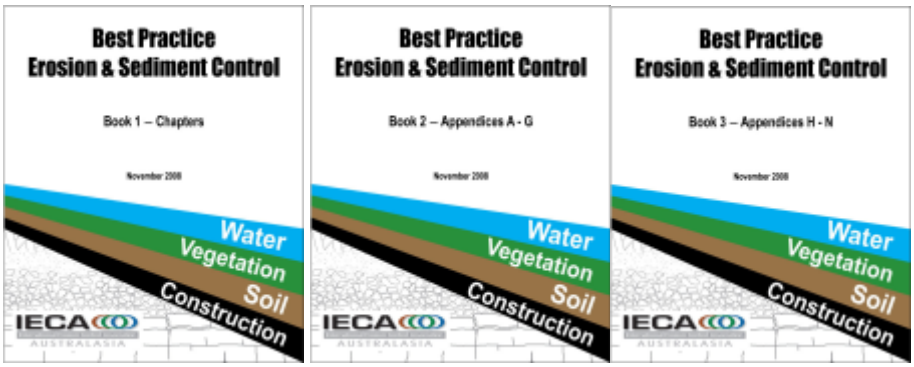
This is not an exhaustive list. It provides step-by-step guidance. Please refer to the relevant management plan or tools for detailed information.

4. TasWater Standards for Erosion and Sediment Control

The TasWater PDG requires sediment and erosion control planning and execution to align with the fundamentals and techniques outlined in the **International Erosion Control Association Australasia's (IECA Australasia)** document - ***Best Practice Erosion & Sediment Control*** [Ref. 4]. The document suite consists of a collection of books, field guides and facts sheets which provide:

- Clearly defined principles of erosion and sediment control
- Guidance on the development of erosion and sediment control plans
- Recommended drainage/erosion/sediment control standards and control measures
- Guidance on the development and construction of control measures
- Example inspection checklists and audit schedules

The **Best Practice Erosion & Sediment Control** [Ref.4] suite sets the standard for sediment and erosion control in Australia and is referred to throughout this procedure.



IECA Best Practice Erosion & Sediment Control Books 1-3

The field guides, books and fact sheets are available for download or hard copy purchase from the IECA Australasia website https://www.austieca.com.au/ or for download from the site https://www.catchmentsandcreeks.com.au/.

Book 1 Chapters

1-Introduction, 2-Principles of erosion and sediment control, 3-Site planning, 4-Design standards and technique selection, 5-Preparation of plans, 6-Site management, 7-Site inspection, 8-Bibliography

Book 2 Appendices A–G

A-Construction site hydrology and hydraulics, B-Sediment basin design and operation, C-Soils and revegetation, D-Example plans, E-Soil loss estimation, F-Erosion hazard assessment, G-Model code of practice

Book 3 Appendices H–N

H-Building sites, I-Instream works, J-Road and rail construction, K-Access tracks and trails, L-Installation of services, M-Erosion processes, N-Glossary of terms.

Site personnel (TasWater and Contractors) involved in the supervision, design, installation and maintenance of erosion and sediment control measures should be able to demonstrate that they are appropriately experienced with erosion and sediment controls so that selection, installation and maintenance of controls occurs in accordance with industry best practice.

4.1. Site Planning for Erosion and Sediment Control

When planning erosion and sediment control for a project site, there are number of project and site-specific factors that need to be taken into consideration. A **sediment and erosion control plan** may be required to be developed for TasWater PDG construction projects based on the size, scope and risk profile of the project.
The **Best Practice Erosion & Sediment Control** document [Ref.4] along with the field guide *Erosion and Sediment Control – A Field Guide for Construction Site Managers* [Ref.5] provides an appropriate level of information for site managers to develop an erosion and sediment control plan.

PROCEDURE	RESPONSIBILITY
STEP 1: IDENTIFY THE PROJECT FOOTPRINT AND AREAS OF CONTRUCTION	
• On a project site plan, firstly identify the project footprint and the location of all of its components. • Include all construction-related ancillary features such as footprints for laydown areas, stockpile locations and construction site offices.	Contractor
STEP 2: IDENTIFY THE NATURAL WATERWAYS AND DRAINAGE FEATURES OF THE SITE	

PROCEDURE	RESPONSIBILITY
• Identify any waterways or drainage features of the site and surrounds, including the eventual receiving environment of the features if applicable. This will include rivers, creeks, dams, lakes, drainage lines, estuaries, oceans and intertidal areas. • Identify the topography of the site to identify any specific peaks and depressions in the landscape, identify these on the site plan with direction of drainage.	Contractor
STEP 3: IDENTIFY EROSION HAZARDS	
• From a site visit or through use of satellite imagery, identify the areas at risk of erosion from the construction process. • This may include areas of unvegetated soils, banks of waterways, and steep areas. • Include these features on the plan.	Contractor
STEP 4: IDENTIFY THE POTENITAL FOR DISPERSIVE OR 'SODIC' SOILS	
• Dispersive or 'sodic' soils are soils prone to tunnel and gully erosion and are characterised by high sodium content (>6% exchangeable sodium), which affects its binding properties. This soil type is common in southern Tasmanian and can require significant management to prevent damage to the construction site and surrounds. These soil types are usually buried in the subsoil layer and hence may not be obvious. • For construction projects in southern Tasmania, the potential for sodic soils should be assessed through either desktop investigations or through soil testing if deemed necessary by the TasWater Project Manager, in accordance with *Dispersive Soils and their Management: Technical Reference Manual* [6].	Contractor
 **Example of gully and erosion formations by sodic soils**	
STEP 5 IDENTIFY SUITABLE SITE ACCESS POINTS	
• Consideration of suitable site access locations are important for minimising transport of sediment on and offsite. • Ensure access locations are: - Away from drainage lines - At a high point if possible - At a functional distance to the construction site	Contractor
STEP 6 IDENTIFY ACCESS ROADS	
• Identify where access roads will be needed throughout the construction process. • Where possible: - Position access roads to utilise existing access tracks/disturbed areas or along the easements of planned permanent roads. - Avoid crossing of waterways - Avoid sloped areas.	Contractor
STEP 7 DEVELOP AN EROSION AND SEDIMENT CONTROL PLAN	

PROCEDURE	RESPONSIBILITY
• Using a combination of the management and mitigation methods outlined in the IECA Australasia document suite, determine the sediment and erosion controls likely needed for the construction site. • If required, develop an erosion and sediment control site plan to be appended to the Site Environment Plan (SEP) for the project, using the **IECA Australasia symbology** provided in **Attachment A**.	Contractor

4.2. Drainage Control

Drainage management and mitigation is necessary to effectively control the flow of water around a construction site and to prevent erosion and sediment movement.

PROCEDURE	RESPONSIBILITY
PLAN DRAINAGE CONTROLS FOR PROJECT SITE	
• Identify the areas of disturbance that will require drainage control, these can include areas that will be disturbed during construction, locations of machinery storage and temporary or permanent facilities, or where material will be stockpiled. • Design a drainage system that separates the clean and potentially dirty water • Use a combination of catch drains and diversion banks depending on the slope of the terrain and the expected rain fall for the area. • Avoid the use of excavated catch drains in areas of potential 'sodic' soils to avoid erosion. • Determine the method of directing the water off-site and in a legal manner. • Determine the need for additional drainage structures to control flow rates and movement of sediments. • Include the drainage design on the **sediment and erosion control plan** using the techniques outlined below, using the **IECA Australasia symbology** provided in **Attachment A**.	Contractor
DRAINAGE CONTROLS MEASURES	
IECA Australasia provide fact sheets for a number of drainage control measures, these are available from https://www.austieca.com.au/publications/book-4-design-fact-sheets and can be freely downloaded. The facts sheets are included in Book 4 of the **IECA Australasia** document suite - **Best Practice Erosion & Sediment Control**.	
• Flow Control Berms • Catch Drains – General Info, Earth-lined, Grass-lined, Geotextile-lined, Rock lined • Cellular Confinement Systems • Chutes – General Info, Synthetic lining, Grass-lined, Mattress linings, Rock-lining • Flow Diversion Banks – General, Earth slopes, Grass slopes • Diversion Channels • Drainage Control General • Erosion Control Mats • Energy Dissipaters • Emergency Spillways Sediment Basins • Grass Linings	• Geosynthetic Linings • Hard Armouring • Level Spreaders • Outlet Structures • Check Dams • Rock Mattress Linings • Rock Linings • Slope Drains • Temporary Course Crossings Bridges • Temporary Course Crossings Culverts • Temporary Downpipes • Temporary Water Course Crossing Fords • Turf Reinforcement Mats

4.3. Erosion Control

Erosion control is required to prevent the erosion of soils by rain or sheet flow.

<table>
<tr><th>PROCEDURE</th><th>RESPONSIBILITY</th></tr>
<tr><td colspan="2">PLAN EROSION CONTROLS FOR PROJECT SITE</td></tr>
<tr><td colspan="2">• Identify the areas within the project site and surrounds that are prone to potential erosion, including unvegetated areas, drainage lines, banks of waterways and man-made drains that form part of the planned drainage system for the site.
• Assess the physical aspects of the areas at potential risk of erosion including the volumes of water likely to be received, the predominant weather in the region, and the slope of the areas.
• Use a combination of erosion control measures outlined below to suitably mitigate the project site against erosion.
• Include the erosion control measures on the sediment and erosion control plan using the techniques outlined below, using the IECA Australasia symbology provided in Attachment A.</td><td>Contractor</td></tr>
<tr><td colspan="3">EROSION CONTROL MEASURES</td></tr>
<tr><td colspan="3">IECA Australasia provide fact sheets for a number of erosion control products and measures, these are available from https://www.austieca.com.au/publications/book-4-design-fact-sheets and can be freely downloaded. The facts sheets are included in Book 4 of the IECA Australasia document suite - Best Practice Erosion & Sediment Control.</td></tr>
<tr><td>• Erosion Fact Sheet
• Bonded Fibre Matrix
• Cellular Confinement
• Compost Blankets
• Dust Control
• Erosion Control Blankets
• Erosion Control General
• Gravelling
• Mulching heavy</td><td colspan="2">• Instream Erosion Control
• Mulching light
• Mulch tackifiers
• Polyacrylamide
• Revegetation
• Mulching rock
• Soil Binders
• Structural soil
• Surface Roughening</td></tr>
</table>

4.4. Sediment Control

Sediment control is necessary to restrict the movement of sediments around and from the project site as a result of erosion.

<table>
<tr><th>PROCEDURE</th><th>RESPONSIBILITY</th></tr>
<tr><td colspan="2">PLAN SEDIMENT CONTROLS FOR PROJECT SITE</td></tr>
<tr><td colspan="2">• Identify the project drainage features and assess the level of sediment control required so as to not impact the surrounding environment, both biologically and visually. This will depend on the erosion potential and soil characteristic of the project site.
• Use a combination of sediment control measures outlined below to suitably mitigate the project site's drainage system against sediment movement.
• Include the sediment control measures on the sediment and erosion control plan using the techniques outlined below, using the IECA Australasia symbology provided in Attachment A.</td><td>Contractor</td></tr>
<tr><td colspan="3">SEDIMENT CONTROL MEASURES</td></tr>
<tr><td colspan="3">IECA Australasia provide fact sheets for a number of sediment control measures, these are available from https://www.austieca.com.au/publications/book-4-design-fact-sheets and can be freely</td></tr>
</table>

PROCEDURE	RESPONSIBILITY
downloaded. Together the facts sheets make up Book 4 of the **IECA Australasia** document suite - **Best Practice Erosion & Sediment Control**.	
• Blocks and aggregate drop inlet protection • Buffer Zones • Check Dam Sediment Traps • Compost Filter Berms • Compost Filled Filter Socks • Coarse Sediment Traps • Excavated Sediment Traps • Excavated Drop Inlet Protection • Construction exits general • Fabric drop inlet protection • Filter Fence • Fabric Rolls • Filter Socks • Filter Tube Dams • Fabric Wrap Drop Inlet Protection • Gully Filter Bags • Grass Filter Strips • Mesh and Aggregate Drop Inlet Protection • Mulch Filter Berms • Modular Sediment Traps • Kerb Inlet Sediment Traps	• Stormwater Outlet Sediment Traps • Pipe and Culvert Inlet Sediment Traps • Rock and aggregate drop inlet protection • Construction exits • Rock filter dams • Kerb Inlet Sediment Traps sag inlets • Sediment Basins • Straw Bale Barriers • Sediment Basin Riser Pipe Outlets • Sediment Control Classification System • Sediment Control Systems for Sheet Flow • Sediment Fence • Stiff Grass Barriers • Stormwater Inlet Sediment Traps • Sediment Traps for Minor Concentrated Flows • Sediment Trench • Type 1 and 2 Sediment Traps general • Sediment Weirs • U shaped sediment traps • Construction exits vibration grids • Construction exits wash bays	

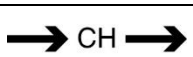
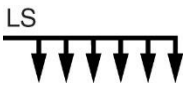
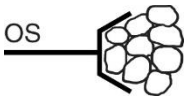
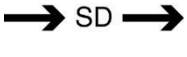
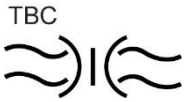
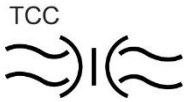
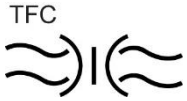
5. References

1. PDG Environmental Management Plan
2. Environmental Monitoring Procedure
3. Workplace Inspection Testing and Monitoring Procedure
4. Dewatering and Bypass Pumping Procedure
5. Best Practice Erosion & Sediment Control Books 1-6, International Erosion Control Association Australasia's (IECA Australasia), November 2008
6. Witheridge 2017, Erosion and Sediment Control – A Field Guide for Construction Site Managers. Catchments & Creeks Pty Ltd., Brisbane, Queensland
7. Dispersive Soils and their Management: Technical Reference Manual, Department of Primary Industries and Water, April 2009

Attachment A

IECA Australasia Standard Symbols November 2008

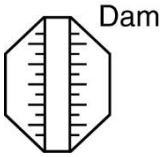
Drainage control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Catch Drain	CD		Chute	CH	
Diversion Channel	DC		Flow Diversion Bank	DB	
Level Spreader	LS		Outlet Structure	OS	
Recessed Rock Check Dam	RRC		Rock Check Dam	RCD	
Sandbag Check Dam	SBC		Slope Drain	SD	
Bridge	TBC		Culvert	TCC	
Temporary Downpipe	TD		Ford	TFC	
Triangular Ditch Check	TDC				

Drainage control – channel/chute lining techniques

Technique	Code	Symbol	Technique	Code	Symbol
Cellular Confinement System	CCS		Erosion Control Mat	ECM	
Geosynthetic lining	GEO		Grass lining	GC	
Grass Pavers	GP		Hard Armouring	HA	
Rock lining	RR		Rock Mattress	RM	
Turfing	T		Turf Reinforcement Mat	TRM	

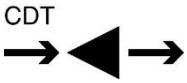
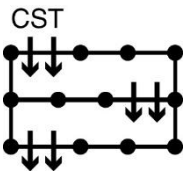
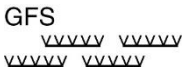
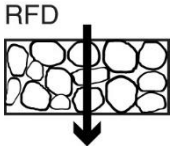
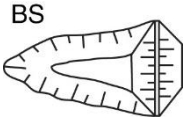
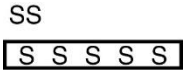
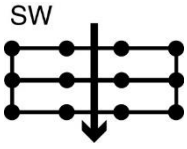
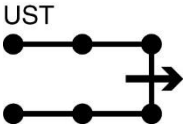
Instream flow control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Cofferdam	Dam		Floating Silt Curtain	FSC	FSC
Geo Log	Log	Log	Isolation Barrier	IB	IB
Sediment Fence Isolation Barrier	SFB	SFB			

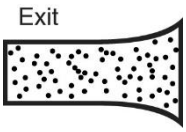
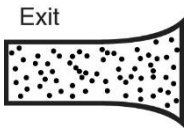
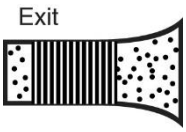
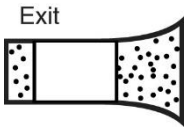
Erosion control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Bonded Fibre Matrix	BFM	BFM	Cellular Confinement System	CCS	CCS
Compost Blanket	CBT	CBT	Erosion Control Blanket	ECB	ECB
Gravelling	Gravel	GRAVEL	Heavy Mulching	MH	MH
Light Mulching	M	M	Poly-acrylamide	Poly	Poly
Revegetation	R	R	Rock Mulching	MR	MR
Soil Binders	SBS	SBS	Surface Roughening	SR	SR

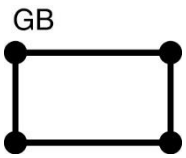
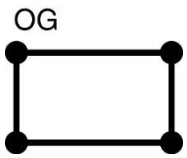
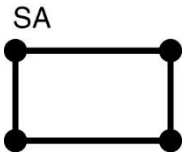
Sediment control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Buffer Zones	BZ		Check Dam Sediment Trap	CDT	
Coarse Sediment Trap	CST		Compost Berm	CB	
Fibre Roll	FR		Filter Fence	FF	
Filter Sock	FS		Filter Tube Dam	FTD	
Grass Filter Strips	GFS		Modular Sediment Trap	MST	
Mulch Berm	MB		Rock Filter Dam	RFD	
Sediment Basin	SB		Sediment Fence – woven fabric	SF	
Sediment Trench	SS		Sediment Weir	SW	
Stiff Grass Barrier	SGB		Straw Bale Barrier	SBB	
U-Shaped Sediment Trap	UST				

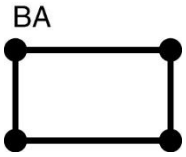
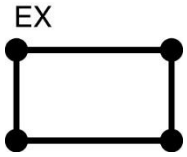
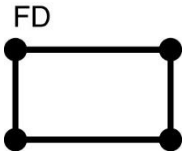
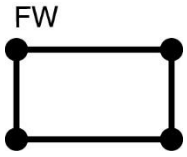
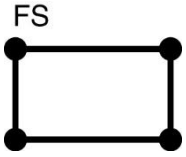
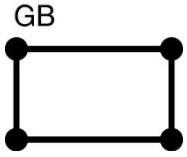
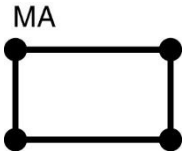
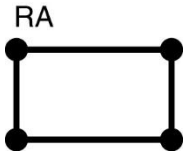
Sediment control – entry/exit control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Construction Exit	Exit		Rock Pad	Exit	
Vibration Grid	Exit		Wash Bay	Exit	

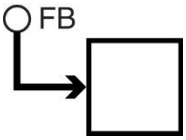
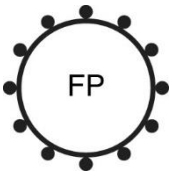
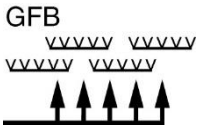
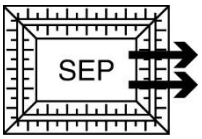
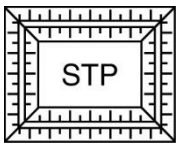
Sediment control – roadside kerb inlet control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Gully Bag	GB		On-grade Kerb Inlet Sediment Trap	OG	
Sag Inlet Sediment Trap	SA				

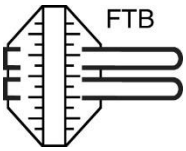
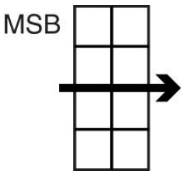
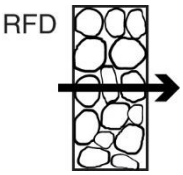
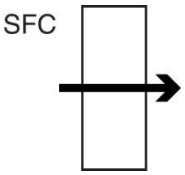
Sediment control – field (drop) inlet control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Block & Aggregate Drop Inlet Protection	BA		Excavated Drop Inlet Protection	EX	
Fabric Drop Inlet Protection	FD		Fabric Wrap Inlet Protection	FW	
Filter Sock Drop Inlet Protection	FS		Gully Bag	GB	
Mesh & Aggregate Drop Inlet Protection	MA		Rock & Aggregate Drop Inlet Protection	RA	

De-watering sediment control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Filter Bag	FB		Filter Fence	FF	
Filter Pond	FP		Filter Tube	FT	
Filter Tube Dam	FTD		Grass Filter Bed	GFB	
Portable Sediment Tank	PST		Settling pond	SEP	
Stilling Pond	STP		Sump Pit	SP	

Instream sediment control techniques

Technique	Code	Symbol	Technique	Code	Symbol
Filter Tube Barrier	FTB		Modular Sediment Barrier	MSB	
Rock Filter Dam	RFD		Sediment Filter cage	SFC	
Sediment Weir	SW