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Tahmoor Coal Pty Ltd

# **EROSION AND SEDIMENT CONTROL PLAN**

**Redbank Creek CMAP**

July 2019

Tahmoor Coal Pty Ltd

# EROSION AND SEDIMENT CONTROL PLAN

Redbank Creek CMAP

July 2019

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Document Control

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# 1 Introduction

## 1.1 Introduction

Tahmoor Coal Mine (**Tahmoor Mine**) is an underground coal mine located approximately 75km south of Sydney in New South Wales, Australia.

Tahmoor Mine has been operated by Tahmoor Coal Pty Ltd (**Tahmoor Coal**) since the mine commenced in 1979 and via longwall mining methods since 1987. Tahmoor Coal, trading as Tahmoor Coking Coal Operations (**TCCO**) is a subsidiary within the SIMEC Mining Division (**SIMEC**) of the GFG Alliance (**GFG**).

## 1.2 Project Background

TCCO prepared a Redbank Creek Corrective Management Action Plan (**Redbank Creek CMAP**) in response to a Section 240(1)(d) Notice (*DI 0680 2018 ACES Ref: 0353-2016 Out17/48999*), dated 4 May 2018, under the *Mining Act 1992* requiring submission of a CMAP for Redbank Creek. The Redbank Creek CMAP was prepared to comply with the requirements of the Section 240(1)(d) Notice (*DI 0680 2018 ACES Ref: 0353-2016 Out17/48999*), dated 4 May 2018. Redbank Creek CMAP is currently under review by the NSW Resources Regulator.

TCCO is anticipating the commencement of the Redbank Creek CMAP in June 2019, which includes the following activities;

- a) Pool mapping;
- b) Creek characterisation drilling and analysis;
- c) Grout curtain walls at identified rock bars;
- d) Surface remediation works at identified pools; and
- e) Remediation reporting.

## 1.3 Scope

This Erosion and Sediment Control Plan (**ESCP**) outlines strategies to minimise soil, erosion and the discharge of sediment to waterways as a result of the Myrtle Creek CMAP works. Specifically, this ESCP details:

- a) General control methods;
- b) Planning of site access and construction;
- c) Materials and chemical storage;
- d) Clean-water diversion and dirty water discharge;
- e) Use of tools such as sediment traps, dams, catch drains and silt fences;
- f) Site rehabilitation works controls;
- g) Inspections, monitoring and reporting; and
- h) Defining individual responsibilities.

## 1.4 Objectives

The overall objectives of this ESCP are to:

- Control soil erosion and sediment generation from areas disturbed during Redbank Creek CMAP works; and
- Minimise potential project related activities resulting in decreased water quality downstream of the works site.

## 1.5 Statutory Requirements

Condition 13 of The Tahmoor North Development Consent DA 67/98, states the following:

*For longwalls up to and including Longwall 32, if determined necessary by the Secretary in consultation with Council and DoI, the Applicant must carry out works in accordance with an Erosion and Sediment Control Plan, prepared to the requirements of DoI, to restore any damage to watercourses (including the banks) resulting from the mining operations, subject to any other necessary approvals.*

This ESCP has been prepared to meet the satisfaction of NSW Department of Planning and Environment. This ESCP has been prepared using the NSW Office of Environment & Heritage (OEH) erosion and sediment control guideline, *Managing Urban Stormwater: Soils and Construction (Blue Book)*.

## 2 Site Characteristics

Redbank Creek is a Category 2 stream with a 3rd order or higher channel, whilst its tributaries are Category 1 streams, being 1st or 2nd order channels.

The topography in the vicinity of Redbank Creek is varied, ranging from gently undulating plateaus, ridges and low hills in the upland areas, to a rugged landscape of deeply dissected valleys and gorges in Hawkesbury Sandstone.

Redbank Creek flows roughly west to east through the township of Thirlmere before joining Stonequarry Creek just south of Picton, approximately 2.5 km upstream of the junction with the Nepean River. The Redbank Creek total catchment covers an area of approximately 8 km<sup>2</sup> and incorporates areas of both Thirlmere and Picton townships. The remainder of the catchment is undeveloped or agricultural land or mixed industrial/residential urban area. Mapped pools along Redbank Creek are shown on **Figure 1**.





Figure 1 Redbank Creek pools relative to longwall extraction

## 2.1 Hydrology

Flooding in Redbank Creek is typically contained in the creek channel with the exception of overbank flow located in the north-eastern extent of the hydraulic model downstream of the Antill Street culvert and in the vicinity of the Argyle Street Bridge. Depths in these areas range between 0.2 m and 1.0 m. Depths in the creek channel are significant in places with flood depths in excess of 4.0 m located downstream of the Argyle Street bridge.

Stream velocities in Redbank Creek are high (point velocities greater than 2.5 m/s) during the 1% the AEP design event. The velocities in the overbank flow path downstream of Antill Street and in the vicinity of the Argyle Street Bridge are slightly lower (less than 2.0 m/s).

## 2.2 Soils

Redbank Creek contains a sequence of clay /sand based alluvial pools, exposed sandstone rock bars and creek beds, boulder fields and gravel / cobble riffles, with varying degrees and types of riparian and stream bed vegetative cover.

## 2.3 Vegetation

Vegetation along the banks of Redbank Creek has previously been mapped as Cumberland Shale Sandstone Transition Forest. The upper banks of the creek contain diagnostic overstorey species such as: *Eucalyptus crebra*, *Eucalyptus punctata* and *Angophora floribunda*, and understorey species consisting of *Acacia parramattensis*, *Sigesbeckia orientalis*, and *Indigofera australis*.

Redbank Creek also has vegetation areas of what can be characterised as Grey Myrtle Dry Rainforest community, given the presence and dominance of *Backhousei myrtifolia*, *Pteridium esculentum*, *Blechnum cartilagineum*, *Oplismenus aemulus*, and *Persicaria decipiens*.

The condition of the vegetation along Redbank Creek varies, with some sections containing high occurrences of introduced species, namely large- leaf privet (*Ligustrum lucidum*) and small-leaf privet (*Ligustrum sinense*).

# 3 Control Methods

## 3.1 General Principles

Effective erosion and sediment control practices are based on the following principles:

- a) Planning works during forecasted dry weather periods;
- b) Ensuring exposed dispersive soils that are susceptible to erosion are covered (vegetation establishment, topsoil, etc.) or runoff from these areas is directed to water containment structures that prevent dirty water flowing offsite;
- c) Use of diversion structures to separate 'clean' water runoff from disturbed areas runoff, to minimise volumes of sediment-laden water for management;
- d) Ensuring sediment-laden runoff is treated via designated sediment control devices;
- e) Integrate erosion and sediment control into site and construction planning;



- f) Develop flexible erosion and sediment controls based on anticipated soil, weather and construction conditions;
- g) Minimise the extent and duration of soil disturbance;
- h) Maximise sediment retention on site;
- i) Maintain all erosion and sediment control measures in proper working order;
- j) Monitor the site and adjust erosion and sediment control practices to maintain the required performance standard; and
- k) Rehabilitate disturbed areas within two weeks after works have completed.

## 3.2 Site Layout

Site layout will be based on a site-by-site basis and depend on individual characteristics, including but not limited to:

- a) Access;
- b) Substrate type;
- c) Remediation method;
- d) Size and shape of pool;
- e) Potential for flooding; and
- f) Vegetation.

### 3.2.1 Grout Curtain Wall Site Layout

Grout curtain wall remediation works will involve mobilisation of a drill rig into the creek bed. This will require the installation of extensive erosion and sediment controls, particularly surrounding the access track itself. **Appendix A – Figure 1** depicts the generic site layout and erosion and sediment controls for grout curtain wall works.

### 3.2.2 Hand Grouting Site Layout

Hand grouting remediation works will involve a small team and concentrated works on notable surface fractures. **Appendix A – Figure 2** depicts the generic site layout and erosion and sediment controls for surface / hand grouting works. Final erosion and sediment control locations will be determined during the planning stages of site setup.

## 3.3 Disturbance Minimisation

Land disturbance will be minimised by only accessing areas required for site access and site works. Any works involving clearing will be undertaken using the following controls:

- a) Installation of delineation markers, e.g. to define working areas and “No-Go Zones”;
- b) Identifying and managing habitat trees near work sites;
- c) Clearing vegetation only as required; and
- d) Leaving native root-balls in the ground to facilitate regeneration after works are complete; and
- e) Rehabilitating areas within four weeks of works cessation.

### 3.4 Site Access Construction and Controls

A single site access track will be constructed to individual sites. Prior to construction of a site access track, an ecological survey will take place to identify the most suitable path with the least impact. When a site access track is being constructed the following measures will be followed:

- a) Confine plant movement to access points using barrier tape or similar, to delineate No-Go Zones;
- b) Use a catch drain / roll-over at the base of the access track to divert any sediment-laden water into a small excavated sediment trap or U-shaped sediment trap formed with a sediment fence. Regularly remove sediment from the trap as necessary and dispose it in an approved location well away from concentrated flow.
- c) Where a ramp has to be excavated as part of the site access track, use clean compacted natural aggregate that will not cause environmental harm. Shape the surface to shed water to surrounding vegetated areas (see **Appendix B – Figure 1**);
- d) Use rubber tyred/tracked vehicles where available;
- e) Ensure tracks are free draining; and
- f) Include cross fall and outfall drainage, where required, to prevent concentration runoff.

### 3.5 Containment Bund

Where a drill pad is constructed, a low (300mm) containment bund will be installed around the periphery of the pad. This bund will be constructed from aggregates and wrapped in geotextile.

### 3.6 Rock Check Dam

Where surface hand-grouting works are to be conducted, a Rock Check Dam built from sandbags or similar will be constructed downstream of the work area. It should be built to less than 500mm (see **Appendix B – Figure 2**).

### 3.7 Site Compound

A site compound will be at the work site outside of the banks of the creek and above potential flood levels. The compound will be sufficient size to allow all tools and materials to fit after each work day. The site compound will be positioned in a previously cleared area to avoid vegetation clearing. The location of the site compound will consider its access track to and from the work area.

### 3.8 Material Storage

Where applicable, materials will be stored within the site compound at the end of each work day. Bulk materials such as sands or aggregates will be stored above the banks of the creek in designated lay-down areas and covered in geofabric to avoid the risk of pollution during rain events. A sediment fence will be installed around the lay-down areas.

### 3.9 Chemical Use and Storage

All chemicals will be stored in a designated chemical storage area within the site compound. The following guidelines will be followed:

- a) Chemicals will be stored as per the SDS requirements;

- b) All chemicals must be returned to the site compound after each day of work;
- c) All chemical storage areas will be covered and bunded to 110% of their capacity;
- d) All chemical storage containers will have functioning nozzles and/or lids to reduce dripping or spilling;
- e) Conflicting chemicals will be stored separately in accordance with the SDS;
- f) All waste chemicals will be removed offsite;
- g) All chemical storage containers will be labelled; and
- h) A spill kit must be kept onsite, and all staff inducted in their use. Used spill kits must be replaced.

The refuelling and maintenance of plant and equipment will be undertaken above the banks of the creek. A spill kit must be present.

### 3.10 Clean-Water Diversion

Clean water diversions will be constructed upstream of areas to be disturbed to convey clean water runoff away from disturbed areas and prevent water from entering active areas and dirty water systems. Bunding upstream will pool water where it will be diverted further downstream by gravity, pump or pipe (see **Appendix C**). Natural rock bunds and pools, where present upstream of the works area, will be used to do the same function.

### 3.11 Catch Drains / Roll over

Catch drains / rollovers will be established to convey runoff from the disturbed areas to sediment ponds or dams. A catch drain / roll-over located at the base of the access track to divert any sediment-laden water into a small excavated sediment trap or U-shaped sediment trap formed with a sediment fence will be installed. Built up sediment will be regularly removed from the trap as necessary and disposed to an approved location.

### 3.12 Sediment Fences and Sediment Filters

Sediment fences will be installed parallel to the banks along contours prior to any vegetation clearing works. Sediment fences are to be constructed using geotextile filter fabric with structural posts to be spaced no more than 1.5 metres apart (see **Appendix B – Figure 3**). Sediment filters may be constructed in lieu of sediment fences if terrain permits. Materials for sediment filters may include straw bales, woven geotextile, earth, rock or suitable crushed concrete products (see **Appendix B – Figure 4**).

### 3.13 Dirty-Water Disposal

Drill water will be re-circulated into a dedicated tank. Dirty water trapped anywhere on site must be removed by pumping and disposed of by spreading it onto well-vegetated lands at least 40 metres from the banks of the creek. The water is to be spread evenly so it infiltrates and does not scour. If it is not possible to spread the water 40 metres from the banks it must be removed offsite.

### 3.14 Site Rehabilitation

Progressive rehabilitation by stabilisation and revegetation is to be conducted as areas are no longer required for works. Topsoil removed during construction phases will be stored and reused

during rehabilitation. Soil stabilisation controls such as topsoil reestablishment, jute mat, seedbed establishment, and tube stock planting will be considered (see Appendix B -

## 4 Inspection and Monitoring

### 4.1 Inspections

Prior to forecast of more than 50% chance of more than 5 mm rainfall over 24-hour period, the TCCO Environmental Project Coordinator will inspect the condition of all erosion and sediment controls. As required, repair and maintenance works will be actioned. Fortnightly inspections of all erosion and sediment controls will be conducted by the TCCO Environmental Project Coordinator.

The following indicators will be used to identify if the objectives of the ESCP are being met:

- a) Visible evidence of deterioration of water quality of downstream watercourses that is directly attributable to the site (e.g. high turbidity);
- b) Visible significant erosion; and/or
- c) Failure of control measures.

### 4.2 Maintenance

The triggering of an investigation indicator will require the following remedial actions:

- a) Locate source of water quality deterioration;
- b) Prevent continuing deterioration with temporary controls; and
- c) Repair existing controls, construct additional controls or modify procedures to prevent future deterioration in water quality.

Maintenance works will be conducted as soon as practicable.

### 4.3 Environmental Reporting

TCCO has a publicly available Pollution Incident Response Management Plan (**PIRMP**) that details the procedures for notification of pollution incidents resulting in or having the potential to cause material harm to the environment.

A pollution incident is defined in the POEO Act as an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.

In the case of an environmental incident, prior to any other action, the site must contact triple zero '000' if the incident presents an immediate threat to human health or property. Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, as they are responsible for controlling and containing incidents.

If the incident does not pose any threat to human health or property, concurrently with contacting emergency services (triple zero '000'), all possible actions will be taken to control the pollution incident and minimise health, safety and environmental consequences. These actions must be employed to the maximum extent possible to:

- a) Provide for the safety of people at and within the vicinity of the site; and
- b) Contain the pollution incident.

In compliance with the Tahmoor Incident Procedure, the actions to be implemented at Tahmoor Coking Coal on the occasion of an incident include the following:

- a) Secure the scene and contain the incident.
- b) Gather information (i.e. environmental monitoring).
- c) Determine the investigation level.
- d) Commence an ICAM (if required).
- e) Review and classify information and determine actions.
- f) Complete actions.
- g) Trend analysis reports.

## 4.4 Weather Monitoring

Works will be planned for periods of dry weather. If wet weather is forecast, works will be suspended, or strategies put in place to remove equipment from the creek bed.

## 5 Inductions and Training

Contractor inductions will involve a training component of the ESCP operational aspects and controls. Prior to the commencement of any new stage of works all members of the work team will attend a toolbox talk detailing specific information regarding this ESCP.



## 6 Roles and Responsibilities

Role	Responsibilities for this document
Environment & Community Manager	<ul style="list-style-type: none"> <li>• Approve the ESCP for this project</li> <li>• Ensure appropriate resources for implementation</li> </ul>
Environment Coordinator	<ul style="list-style-type: none"> <li>• Notify regulatory authorities of any erosion and sediment control related incidents</li> <li>• Assist with the design and construction of erosion and control structures</li> </ul>
Environmental Project Coordinator	<ul style="list-style-type: none"> <li>• Control activities that might lead to contamination of erosion and sediment</li> <li>• Design and construction of erosion and control structures</li> <li>• Maintain erosion and control structures</li> <li>• Coordinate inspection erosion and control structures</li> <li>• Coordinate monitoring as required</li> <li>• Coordinate reporting as required</li> </ul>
All contractors	<ul style="list-style-type: none"> <li>• Report incidents affecting erosion and sediment to supervisor</li> <li>• Prevent and report potential erosion and sedimentation</li> </ul>



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# APPENDIX A

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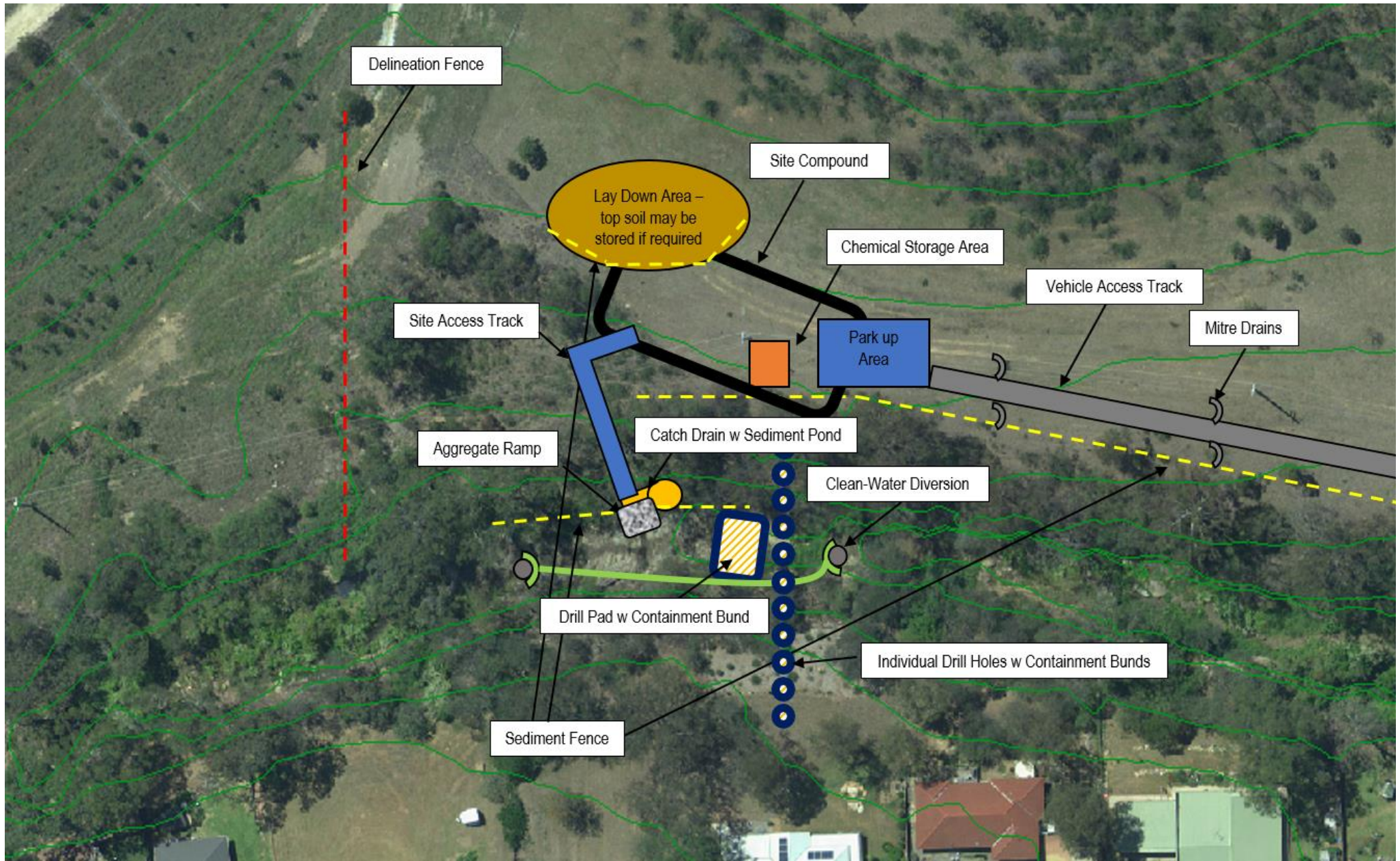


Figure 1 Proposed Site Layout for Grout Curtain Wall Works

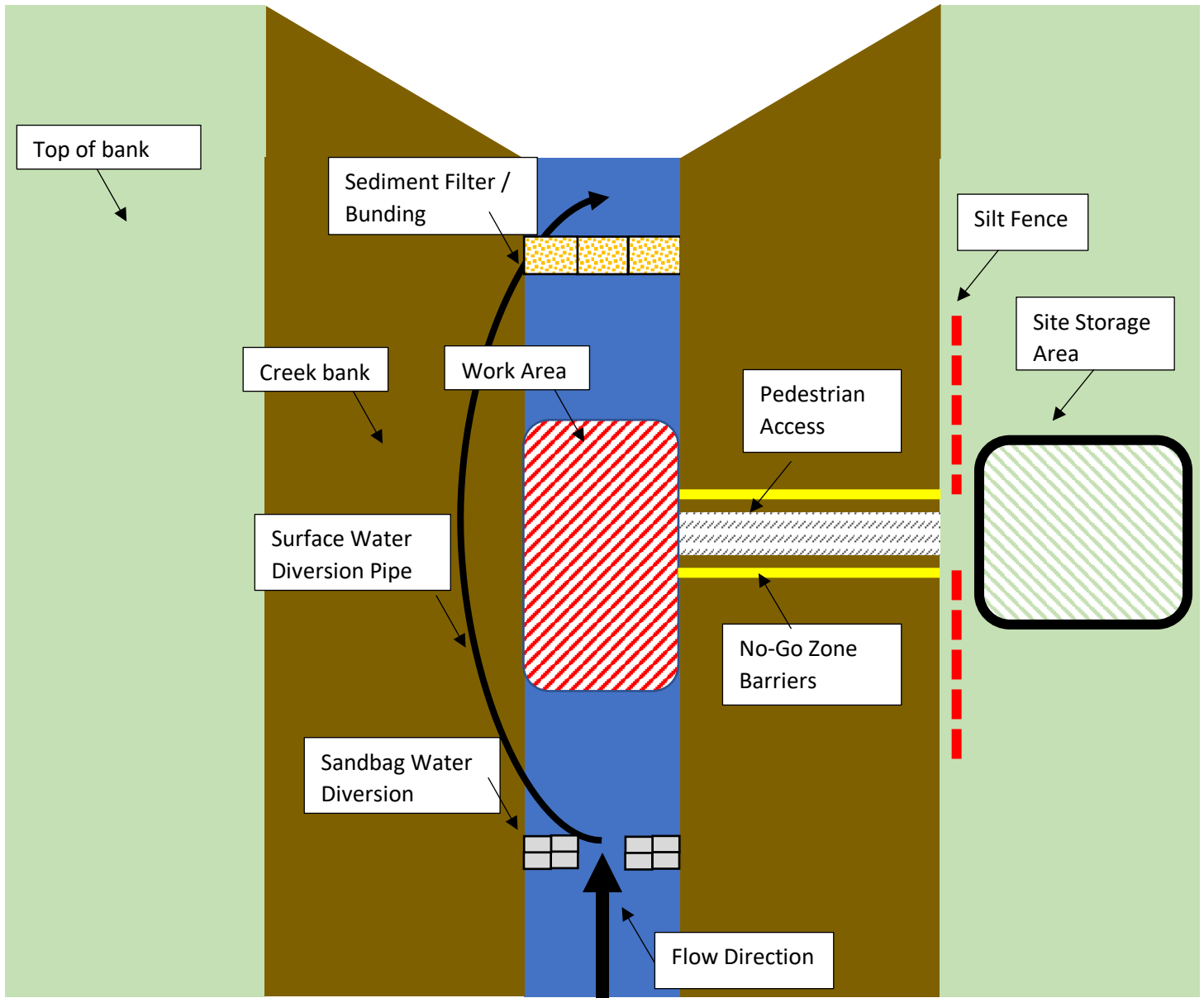


Figure 2 Proposed Site Layout for Hand Grouting Works





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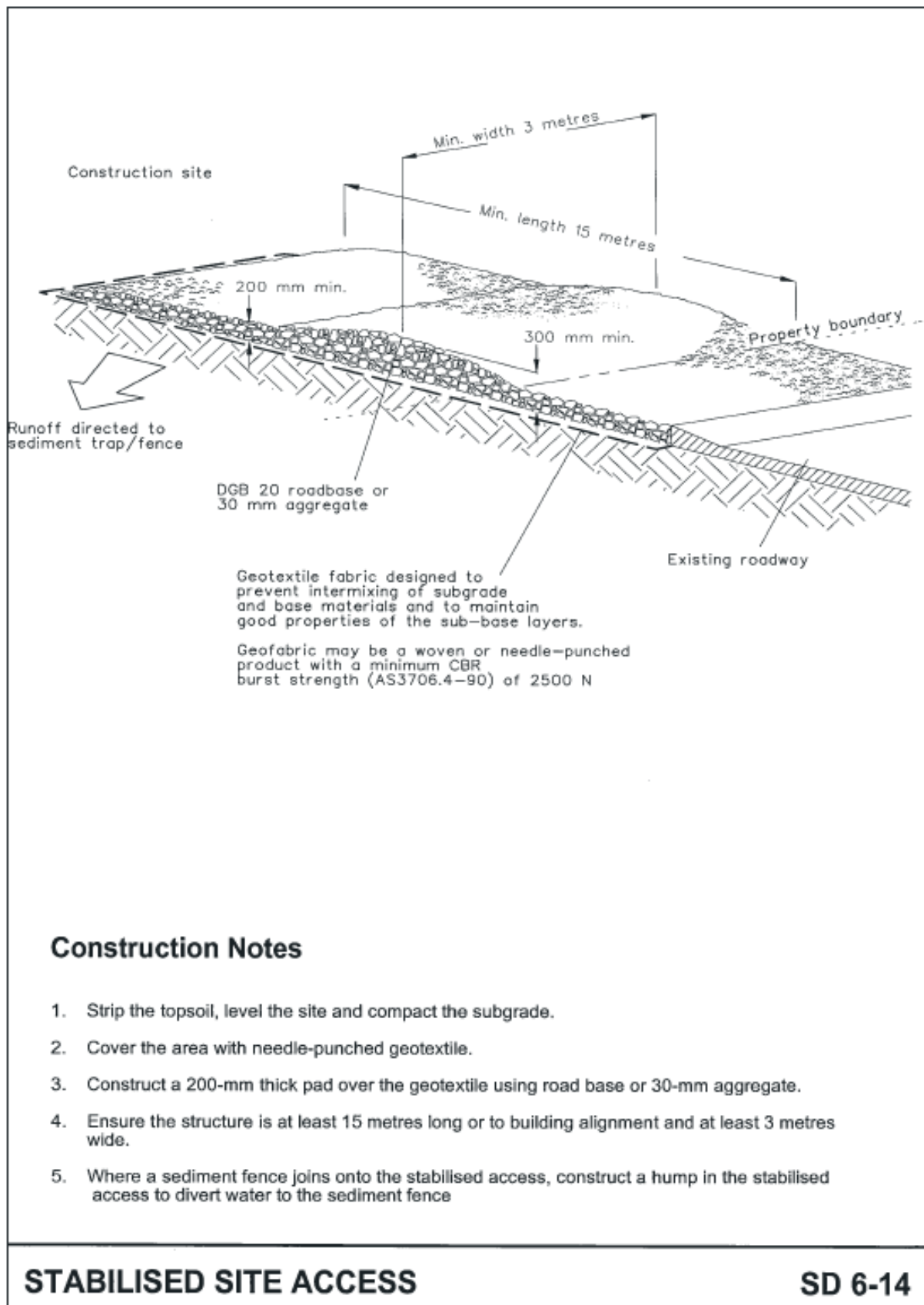
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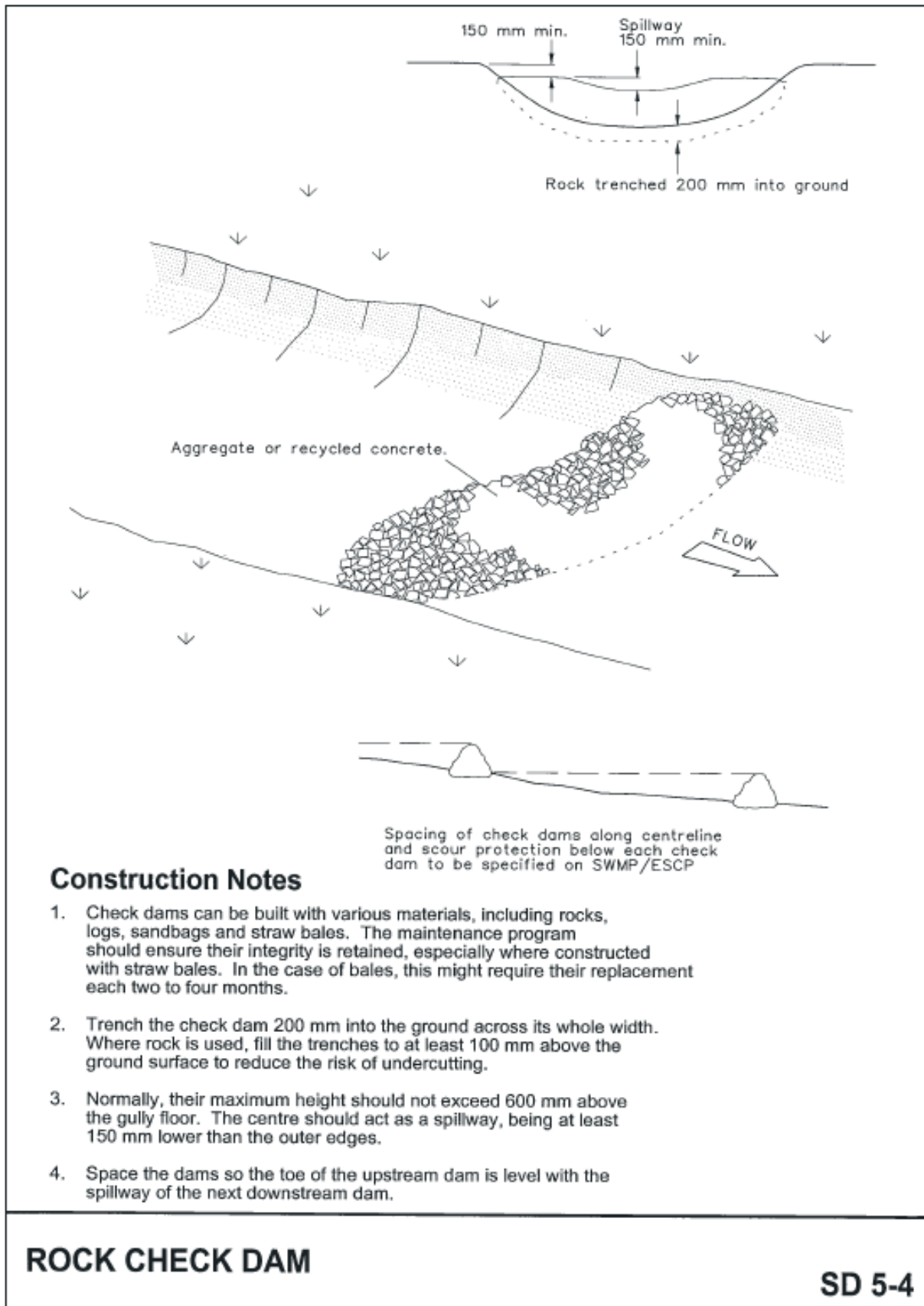
# APPENDIX B

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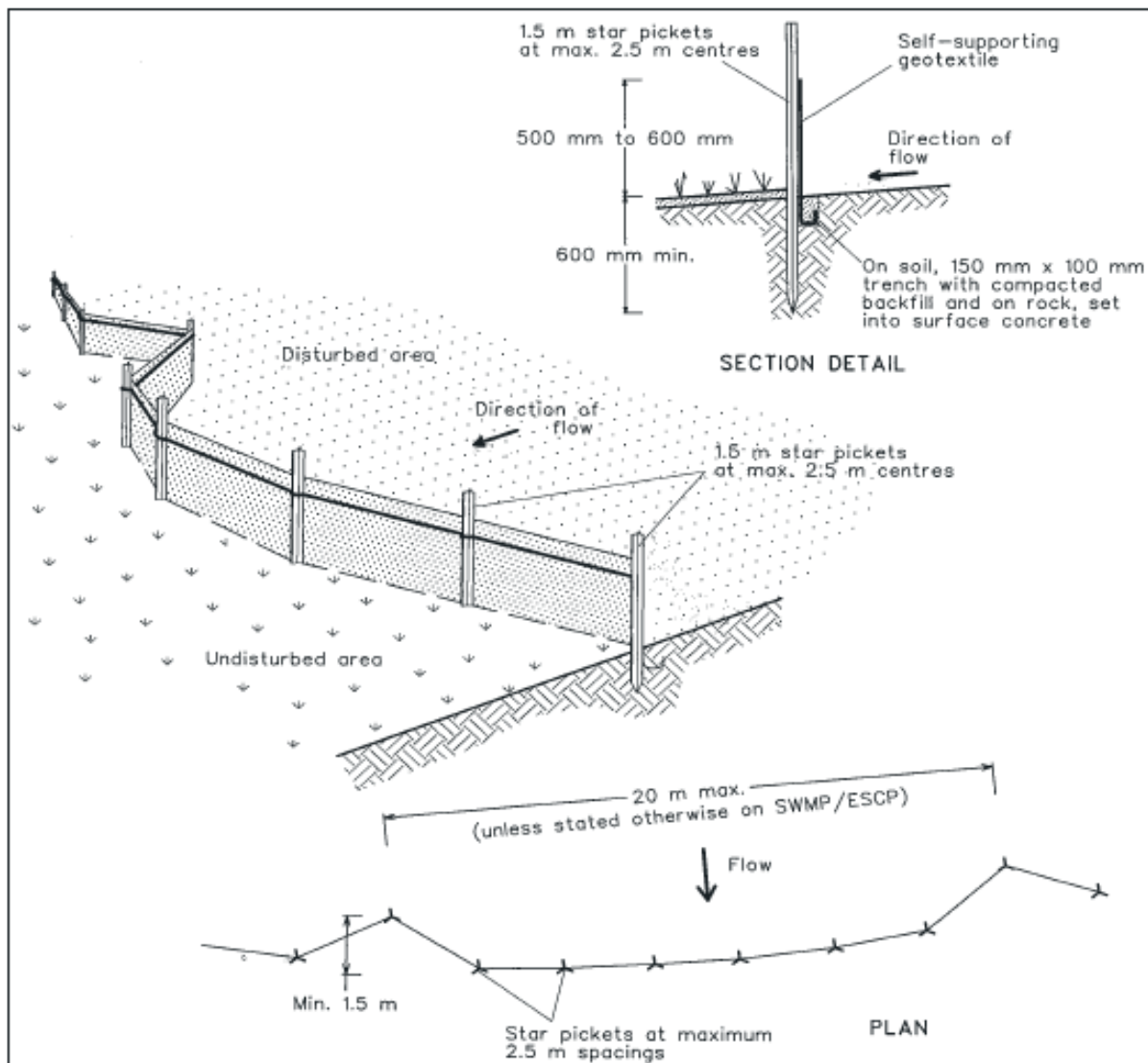




Appendix B - Figure 1 Stabilised Site Access



Appendix B - Figure 2 Rock Check Dam

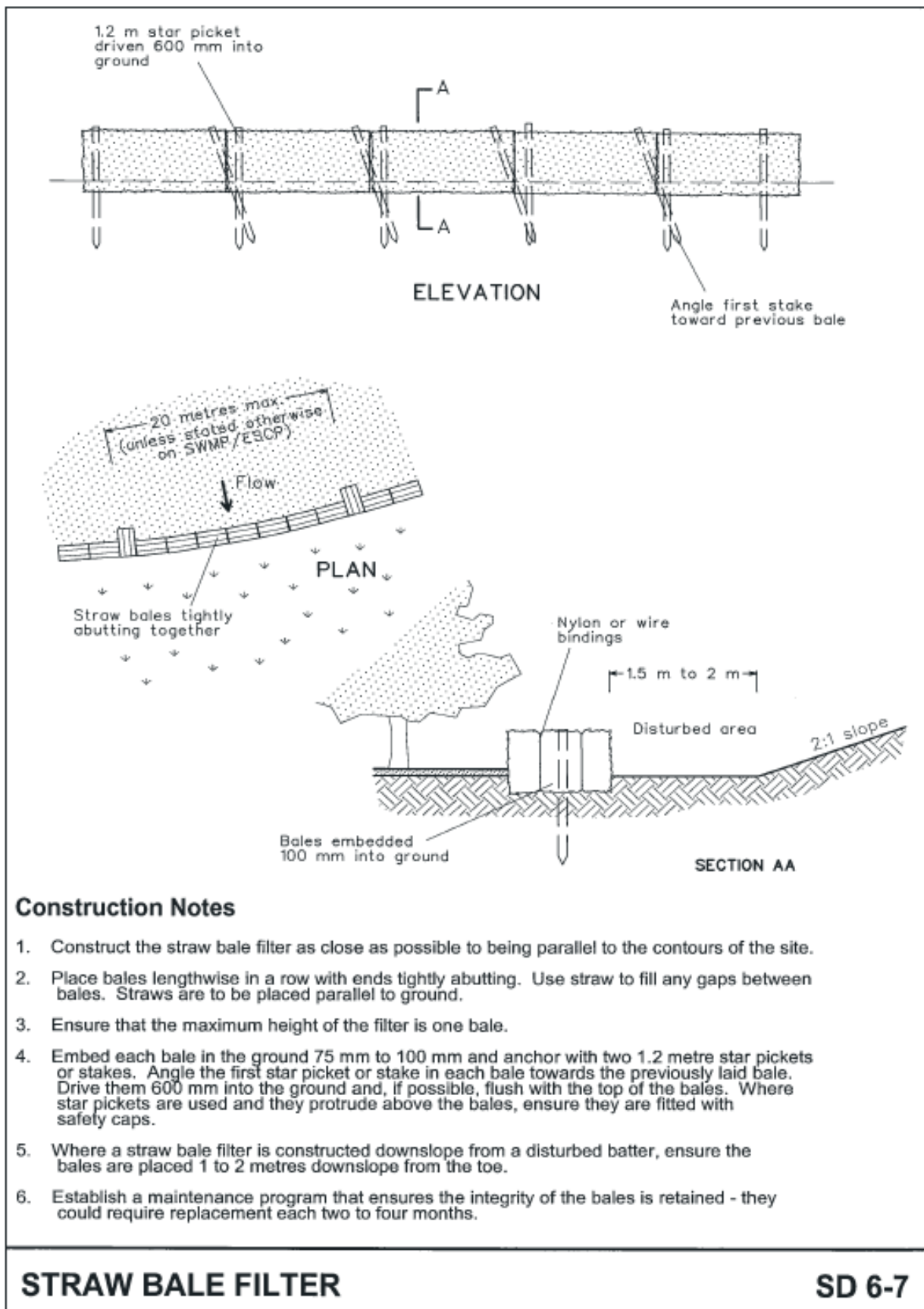


### Construction Notes

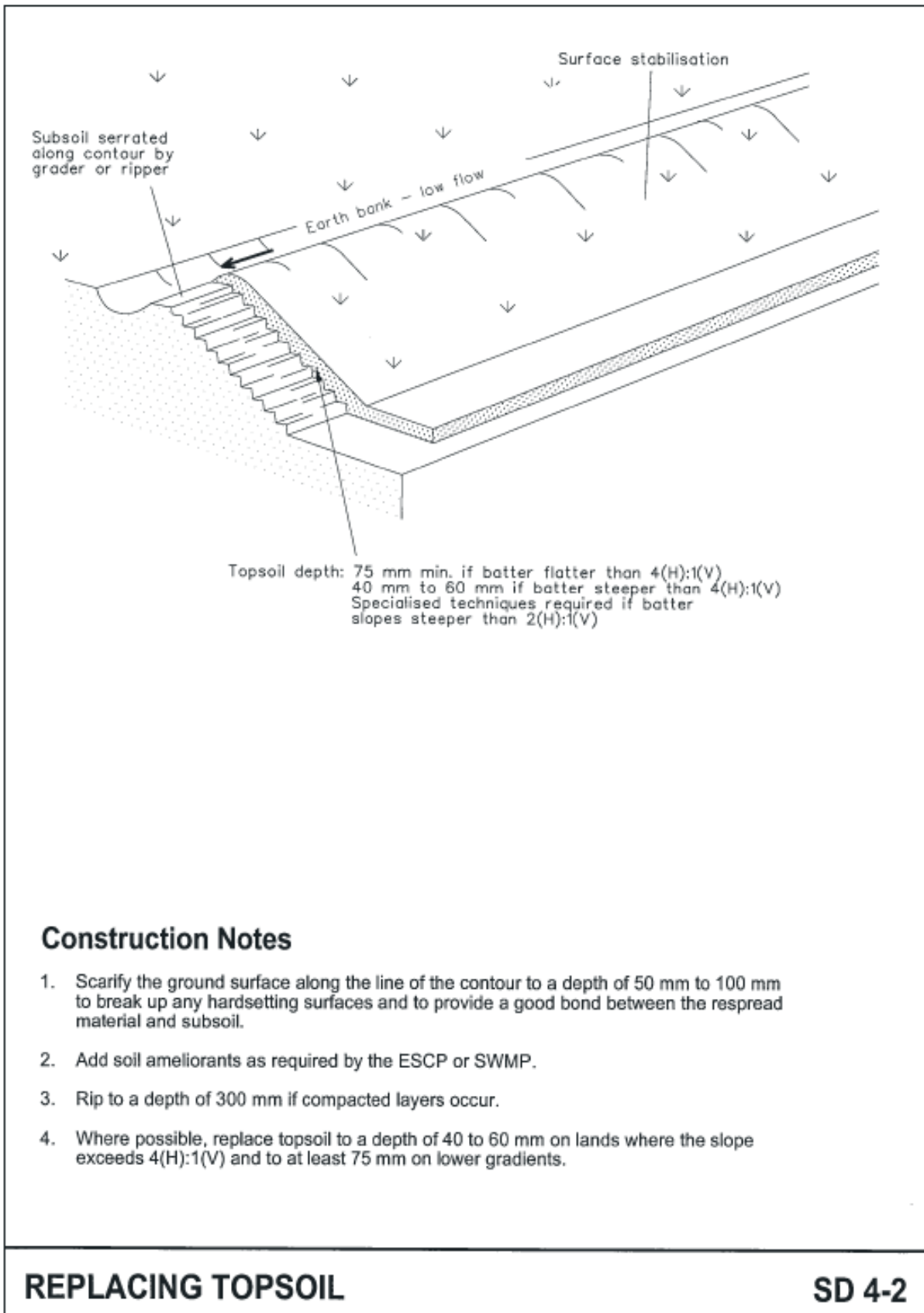
1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

**SEDIMENT FENCE**

**SD 6-8**

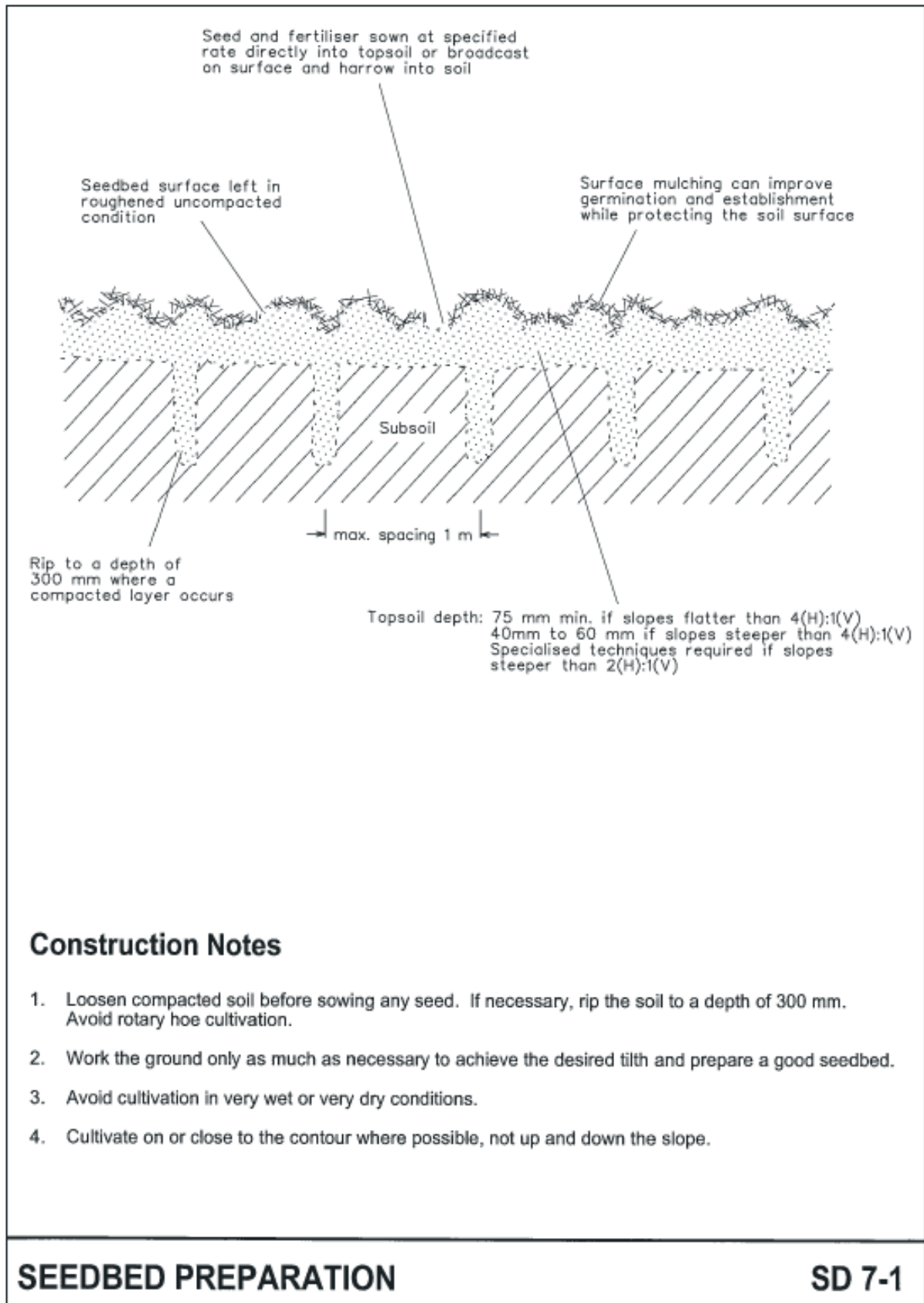


Appendix B - Figure 4 Sediment Filter



Appendix B - Figure 5 Replacing Topsoil





Appendix B - Figure 6 Seedbed Preparation



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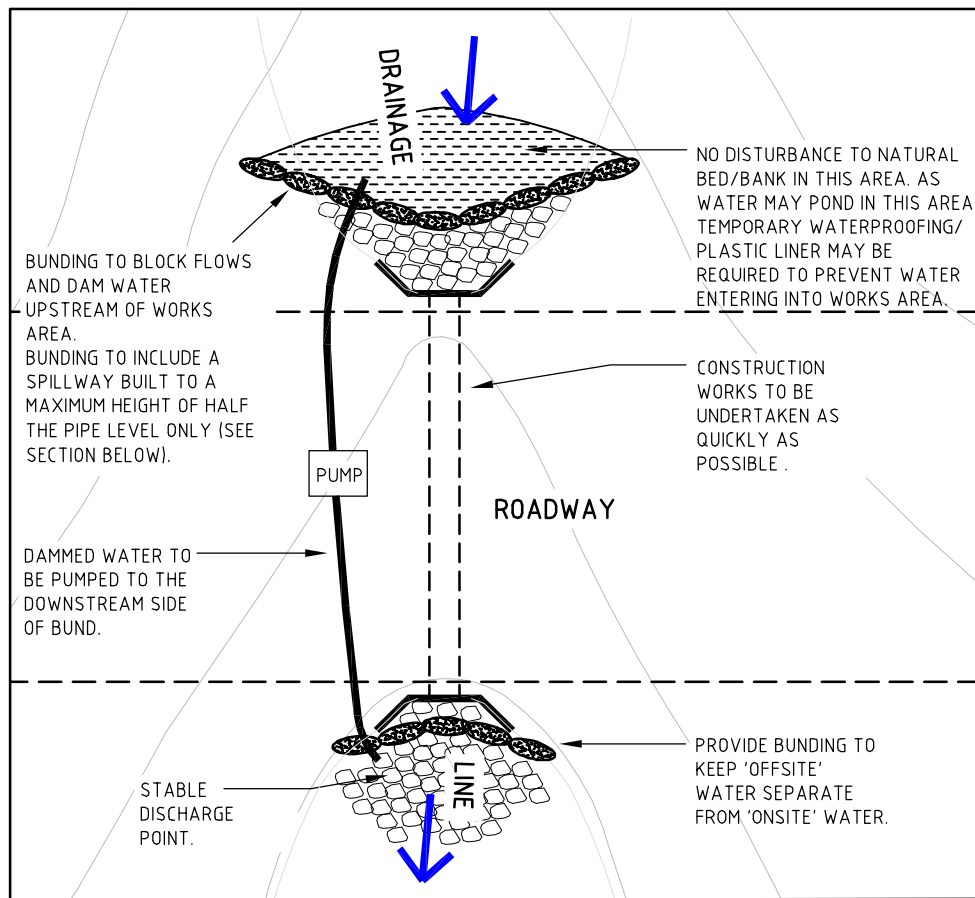
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# APPENDIX C

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# ONLINE PIPE REPLACEMENT/INSTALLATION – SMALL INTERMITTENT DEPRESSIONS ONLY (PUMP OPTION)



## SITE STABILISATION

**THIS METHOD IS ONLY SUITABLE FOR SIMPLE DEPRESSIONS WITH INTERMITTENT FLOWS. TO BE IN PLACE FOR NO MORE THAN 3 MONTHS.**

### CONSTRUCTION NOTES

#### WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW

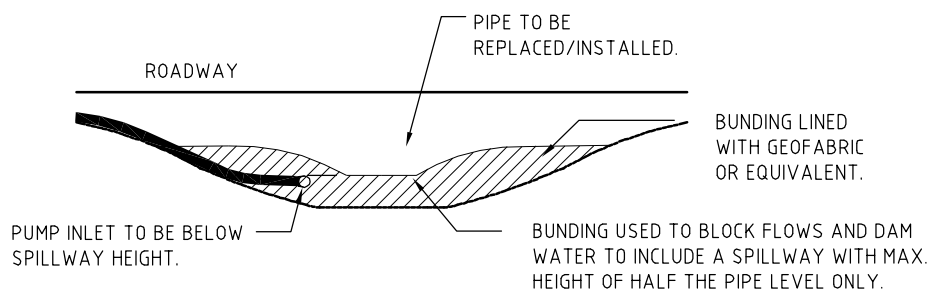
1. Ensure suitable temporary groundcover materials (e.g. geofabric, blankets) are located on site.
2. Ensure a suitable pump is available.
3. Watch the weather forecast to ensure rainfall is not forecast and monitor creek flows ensuring flows are minimal.
4. Position the bunding and line if required.
5. Undertake construction works (including inlet and outlet stabilisation) as quickly as possible. Drainage line to be blocked for no more than 3 months.

At any time during steps 4 - 5 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

### LEGEND

	OFFSITE WATER DIVERSION DRAIN (SD 5-6)
	ONSITE WATER DRAINS (SD 5-6)
	SURFACE CONTOURS
	ROCK STABILISED OUTLET (SD 5-8)
	CREEK/PIPE FLOW ROUTE
	SEDIMENT FENCE (SD 6-8)
	BUNDS

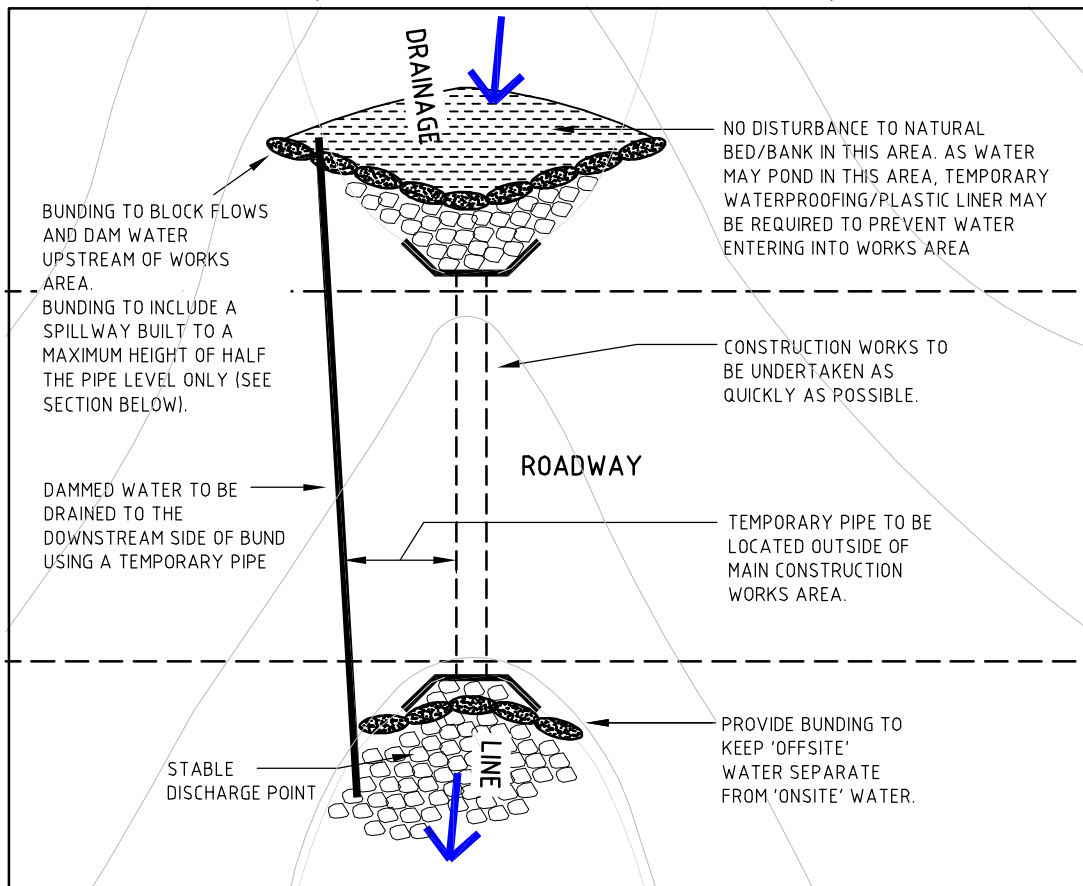
**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**



## SECTION THROUGH BUNDING LOCATION

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**

# ONLINE PIPE REPLACEMENT/INSTALLATION – SMALL INTERMITTENT DRAINAGE LINES (TEMPORARY PIPE OPTION)



BUNDING TO BLOCK FLOWS AND DAM WATER UPSTREAM OF WORKS AREA.  
BUNDING TO INCLUDE A SPILLWAY BUILT TO A MAXIMUM HEIGHT OF HALF THE PIPE LEVEL ONLY (SEE SECTION BELOW).

DAMMED WATER TO BE DRAINED TO THE DOWNSTREAM SIDE OF BUND USING A TEMPORARY PIPE

NO DISTURBANCE TO NATURAL BED/BANK IN THIS AREA. AS WATER MAY POND IN THIS AREA, TEMPORARY WATERPROOFING/PLASTIC LINER MAY BE REQUIRED TO PREVENT WATER ENTERING INTO WORKS AREA

CONSTRUCTION WORKS TO BE UNDERTAKEN AS QUICKLY AS POSSIBLE.

TEMPORARY PIPE TO BE LOCATED OUTSIDE OF MAIN CONSTRUCTION WORKS AREA.

PROVIDE BUNDING TO KEEP 'OFFSITE' WATER SEPARATE FROM 'ONSITE' WATER.

## SITE STABILISATION

THIS METHOD IS ONLY SUITABLE FOR SMALL CHANNELS WITH INTERMITTENT FLOWS.

TEMPORARY PIPE TO BE SIZED TO AT LEAST HALF THE PERMANENT PIPE.

e.g. - PERMANENT: 600 $\phi$   
- TEMPORARY: MINIMUM 300 $\phi$

THIS METHOD (TEMPORARY PIPE SYSTEM) WILL NOT BE SUITABLE IN STEEP LOCATIONS WHERE TEMPORARY PIPE CANNOT BE LOCATED OUTSIDE OF WORKS AREA.

### LEGEND

- OFFSITE WATER DIVERSION DRAIN (SD 5-6)
- ONSITE WATER DRAINS (SD 5-6)
- SURFACE CONTOURS
- ROCK STABILISED OUTLET (SD 5-8)
- CREEK/PIPE FLOW ROUTE
- SEDIMENT FENCE (SD 6-8)
- BUNDS

**NOTE THAT NOT ALL ONSITE WATER MANAGEMENT AND SEDIMENT CONTROLS ARE SHOWN HERE.**

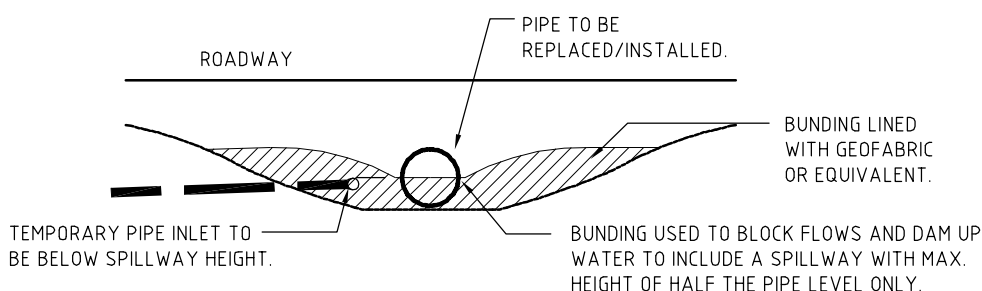
### CONSTRUCTION NOTES

#### WORKS TO BE UNDERTAKEN IN THE ORDER GIVEN BELOW

1. Ensure suitable temporary groundcover materials (eg. geofabric, blankets) are located on site.
2. Ensure a temporary pipe is available. Install temporary pipe to ensure flow, preferably by providing continuous fall.
3. Watch the weather forecast to ensure rainfall is not forecast and monitor creek flows ensuring flows are minimal.
4. Position the bunding within the channel to secure the site.
5. Undertake construction works (including inlet outlet stabilisation) as quickly as possible.

At any time during steps 4 - 5 where a significant rain or flow event is forecast or if the site is left unattended for prolonged periods temporary groundcover should be applied to all exposed soils in the works area.

**AT ALL TIMES DURING WORKS, ENSURE THAT 'OFFSITE' WATER IS PASSED AROUND OR THROUGH THE SITE WITHOUT COMING INTO CONTACT WITH EXPOSED SOIL OR 'ONSITE' WATER**



## SECTION THROUGH BUNDING LOCATION



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