



Cockatoo Skatepark Upgrade

Environmental Management Plan

October 2010

Project Name:	Cockatoo Skatepark Upgrade
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Table of Contents

TABLE OF CONTENTS	3
1. PREFACE.....	5
2. ENVIRONMENTAL ASSESSMENT	5
2.1. OBJECTIVE	5
2.2. MEASURES	5
3. RISK ASSESSMENT	5
3.1. OBJECTIVE	5
3.2. MEASURES	5
4. RISK MANAGEMENT.....	6
4.1. OBJECTIVE	6
4.2. MEASURES	6
5. ENVIRONMENTAL MANAGEMENT PLAN	6
5.1. OBJECTIVE	6
5.2. MEASURES	6
5.3. MINIMISING EROSION.....	7
5.3.1. <i>Objective</i>	7
5.3.2. <i>Measures</i>	7
5.4. CONTAMINATED STORMWATER MANAGEMENT.....	7
5.4.1. <i>Objective</i>	7
5.4.2. <i>Measure</i>	7
5.5. EROSION AND SEDIMENT CONTROLS.....	8
5.5.1. <i>Objective</i>	8
5.5.2. <i>Measures</i>	8
5.6. CONCRETE DELIVERIES.....	8
5.6.1. <i>Objective</i>	8
5.6.2. <i>Measures</i>	8
5.7. PROTECTED WASH AREAS	9
5.7.1. <i>Objective</i>	9
5.7.2. <i>Measures</i>	9
5.8. PROTECTED WASTE MANAGEMENT AND CHEMICAL STORAGE.....	9
5.8.1. <i>Objective</i>	9
5.8.2. <i>Measures</i>	9
5.9. DUST CONTROL.....	10
5.9.1. <i>Objective</i>	10
5.9.2. <i>Measures</i>	10
5.10. MANAGEMENT OF STOCKPILES AND BATTERS	10
5.10.1. <i>Objective</i>	10
5.10.2. <i>Measures</i>	10
5.11. NOISE AND VIBRATION	11
5.11.1. <i>Objective</i>	11
5.11.2. <i>Measures</i>	11
5.12. PROTECTING VEGETATION	12
5.12.1. <i>Objective</i>	12
5.12.2. <i>Measures</i>	12
5.13. WASTE MINIMISATION	12
5.13.1. <i>Objective</i>	12

5.13.2. <i>Measures</i>	12
5.14. CONTAMINATED MATERIAL AND WASTES	13
5.14.1. <i>Objective</i>	13
5.14.2. <i>Measures</i>	13
5.15. AIR QUALITY	13
5.15.1. <i>Objective</i>	13
5.15.2. <i>Measures</i>	13
5.16. LITTER	14
5.16.1. <i>Objective</i>	14
5.16.2. <i>Measures</i>	14
5.17. STORAGE OF CHEMICALS AND FUEL	14
5.17.1. <i>Objective</i>	14
5.17.2. <i>Measures</i>	14
5.18. STABILISED SITE ACCESS	15
5.18.1. <i>Objective</i>	15
5.18.2. <i>Measures</i>	15
6. SOIL AND WATER MANAGEMENT PLAN.....	16
7. INSPECTIONS.....	17
7.1. INSPECTIONS	17
7.2. MONITORING.....	18
7.3. AUDITS.....	18
7.3.1. <i>Objective</i>	18
7.3.2. <i>Measures</i>	18
7.3.3. <i>Checklist</i>	19
8. ANNEXURE	20
8.1. ANNEXE 1 ENVIRONMENTAL MANAGEMENT POLICY	21
8.2. ANNEXE 2 DIVERSION OF UPSLOPE WATER FACT SHEET	22
8.3. ANNEXE 3 DUST CONTROL FACT SHEET	23
8.4. ANNEXE 4 EXCAVATION PUMP OUT FACT SHEET	24
8.5. ANNEXE 5 PROTECTED CONCRETE, BRICK & TILE CUTTING FACT SHEET	25
8.6. ANNEXE 6 PROTECTED CONCRETE DELIVERY FACT SHEET	26
8.7. ANNEXE 7 PROTECTED SERVICE TRENCHES FACT SHEETS	27
8.8. ANNEXE 8 PROTECTED STOCK PILES FACT SHEET	28
8.9. ANNEXE 9 PROTECTED WASH AREAS FACT SHEET	29
8.10. ANNEXE 10 PROTECTED WASTE MANAGEMENT & CHEMICAL STORAGE FACT SHEET	30
8.11. ANNEXE 11 PROTECTING VEGETATION FACT SHEET	31
8.12. ANNEXE 12 PROTECTION OF GUTTER & STREET STORMWATER DRAINS FACT SHEET	32
8.13. ANNEXE 13 PROTECTION OF SITE STORMWATER PITS	33
8.14. ANNEXE 14 SEDIMENT CONTROLS FACT SHEET	34
8.15. ANNEXE 15 SOIL & WATER MANAGEMENT PLANS FACT SHEET	35
8.16. ANNEXE 16 STABILISED SITE ACCESS	36
8.17. ANNEXE 17 SITE PLAN	37
8.18. ANNEXE 18 ENVIRONMENTAL MANAGEMENT SITE INSPECTION CHECKLIST	38

1. Preface

The following Environmental Management Plan has been prepared in consideration of upgrade of the Cockatoo Skatepark and is designed to ensure construction activities on the site are adequately protected from damaging the environment.

2. Environmental Assessment

2.1. Objective

- Identify and/or obtain information on any relevant environmental impact from the construction project

2.2. Measures

- Identify sensitive environmental areas or uses that may be affected by construction activities.
- Identify whether residents adjacent to the site could be affected by pollution from construction or suffer reduced amenity
- Monitor baseline air and water quality and ambient noise levels adjacent to the construction site if required.
- Conduct an assessment of expected noise levels from construction activities which may affect the surrounding community
- Conduct a desk study to identify potentially contaminated sites in the construction area, and sample and analyse soils that are suspected of being contaminated before commencing construction

3. Risk Assessment

3.1. Objective

- Identify and rank all potential risks that may arise from construction of major or projects.

3.2. Measures

- Collect all relevant information needed to conduct a risk assessment of construction.
- Identify, assess and rank risks to all segments of the environment, human beings, nuisance and loss of amenity from plans of the proposed development.
- Once construction commences, review the risk assessment as risk manage strategies are implemented, inspection or monitoring identifies new risks, or when there are changes to the project.

4. Risk Management

4.1. Objective

- Implement risk management strategies to reduce all significant risks to the environment to acceptable levels.

4.2. Measures

- Develop an as close to the source of the problem as possible.

5. Environmental Management Plan

5.1. Objective

- Develop an environmental management plan to reduce the adverse impact of construction activities on the environment.

5.2. Measures

- Having the environmental management system in place, as a prerequisite to preparing an environmental plan, prepare an environmental control plan for the whole of the site.
- The plan should implement the risk management action plan, including detailed specifications on site-specific controls and include a rehabilitation program in the plan
- Base the measures in the plan on best practice
- Update the plan to meet new risks or where inspections, monitoring or audit reveal that measures are ineffective.
- Update the plan to achieve ongoing improvement

5.3. Minimising Erosion

5.3.1. Objective

- Minimise the quantity of soil lost during construction due to land clearing.

5.3.2. Measures

- Schedule measures to avoid and reduce erosion by phasing the Work program to minimise land disturbance in the planning and design stage
- Keep the areas of land cleared to a minimum and the period of time areas remain cleared to a minimum
- Mulch, roughen and seed cleared slopes and stockpiles where no works are planned for more than 28 days with sterile grasses
- Keep vehicles to well defined haul roads.
- Rehabilitate cleared areas promptly.

5.4. Contaminated Stormwater Management

5.4.1. Objective

- Minimise generation of contaminated stormwater

5.4.2. Measure

- Minimise the quantity of uncontaminated stormwater entering cleared areas
- Establish cut-off or intercept drains to redirect stormwater away from cleared areas and slopes to stable (vegetated) areas or effective treatment installations.
- Reduce water velocities

5.5. Erosion and Sediment Controls

5.5.1. Objective

- Minimise the impact of containment stormwater on receiving waters.

5.5.2. Measures

- Document sediment control plan outlining methods to prevent pollution entering the stormwater system
- Identify lines and install control measures to handle predicted stormwater and sediment loads generated in the mini-catchment
- Review sediment controls as the site drainage patterns change and adjust as necessary
- Install a sediment fence constructed from heavy duty geofabric (refer to attachment "Sediment Controls Fact Sheet 14" for details on the installation of the sediment fence).
- Evaluate whether additional controls are necessary such as grass strip or straw bale filters and sediment traps/ponds (refer to attachment "Sediment Controls Fact Sheet 14" for details on the installation of the sediment fence).
- Establish an adequate inspection, maintenance and cleaning program for sediment runoff control structures and remove built up sediment.
- Ensure that contingency plans are in place for unusual storm events.
- Continually assess the effectiveness of sediment control measures and make necessary improvements

5.6. Concrete Deliveries

5.6.1. Objective

- Ensure that concrete does not enter the stormwater system.

5.6.2. Measures

- Ensure concrete deliveries are made entirely on the site where spillage can be cleaned up without risk of it entering the stormwater system
- Ensure concrete supplier complies with Australian Premixed Concrete Association guidelines for safe concrete delivery
- If concrete deliveries cannot be made entirely within the site, controls in "Protected Concrete Delivery Fact Sheet 6"

5.7. Protected Wash Areas

5.7.1. Objective

- Ensure that construction waste and contaminants such as paint, concrete and other dirty equipment does not enter the stormwater system as a result of washing equipment.

5.7.2. Measures

- Choose a site for the wash down area that is away from drainage lines and stormwater pits. Identify its location on the Soil and Water Management Plan.
- Install sediment controls around the wash down area
- Ensure the sediment controls are of sufficient size to contain all waste water generated
- Signpost the wash down area and ensure that all staff and subcontractors during the site induction
- Sweep excess dirt and mud off equipment prior to washing
- Clean all site debris and do not sweep or hose it into the gutter
- Monitor the protected wash area and its sediment controls and empty solid residues regularly in a bin.
- Refer to attachment "Protected Wash Areas Fact Sheet 9"

5.8. Protected Waste Management and Chemical Storage

5.8.1. Objective

- Ensure that solid and liquid materials and wastes are stored such that they do not pollute the stormwater system.

5.8.2. Measures

- Keep all chemicals inside the site container in the nominated "hazardous materials area"
- Keep copies of the Material Safety Data Sheets (MSDS) on file for all chemicals
- In the event of a chemical or fuel spill, contain the spill and immediately treat using a spill kit (available from safety suppliers including BOC)
- Skip bins for waste should be covered to prevent wind blowing waste off-site and prevent rain water from entering and being contaminated by the wastes.
- Arrange regular and timely clearance of all waste skips so that over filling and wet weather pick up are avoided.
- Remove chemicals from site once they are no longer required.
- Refer further to "Protected Waste Management and Chemical Storage Fact Sheet 10"

5.9. Dust Control

5.9.1. Objective

- Ensure there is no health risk or loss of amenity due to emission of dust to the environment.

5.9.2. Measures

- Assess the dust potential of the site and decide on dust controls prior to building commencing
- Maintain as much vegetation as possible
- Cover materials and stockpiles
- Ensure that all equipment has dust suppressors fitted
- Dampen the site slightly during excavation or when dust is being raised. Be careful not to wet it to the point of creating polluted runoff
- Ensure that vehicles only leave via the stabilised access
- Minimise the amount of the site that is disturbed at any one time
- Install wind fences or shade cloth to the perimeter wherever appropriate.
- Refer to attachment "Dust Control Fact Sheet" for further information.

5.10. Management of Stockpiles and Batters

5.10.1. Objective

- Manage soil stockpiles so that dust and sediment in run-off are minimised.

5.10.2. Measures

- Minimise the number of stockpiles, and the area and the time stockpiles are exposed.
- Keep topsoil and under burden stockpiles separate.
- Locate stockpiles away from drainage lines, at least ten metres away from natural waterways and where they will be least susceptible to wind erosion
- Ensure that stockpiles and batters are designed with slopes no greater than 2:1 (horizontal/vertical).
- Stabilise stockpiles and batters that will remain bare for more than 28 days by covering with mulch or anchored fabrics or seeding with sterile grass.
- Establish sediment controls around unstabilised stockpiles and batters
- Suppress dust on stockpiles and batters, as circumstances demand.
- Refer to attachment "Protected Stockpiles Fact Sheet 8" for further information.

5.11. Noise and Vibration

5.11.1. Objective

- Ensure nuisance from noise and vibration does not occur

5.11.2. Measures

- Fit and maintain appropriate mufflers on earth-moving and other vehicles on the site
- Enclose noisy equipment
- Provide noise attenuation screens, where appropriate
- Where an activity is likely to cause a noise nuisance to nearby residents, restrict operating hours to between 7 am and 6pm weekdays and 7 am to 1 pm Saturday, except where for practical reasons the activity is unavoidable
- Noise should not be above background levels inside the residence of the nearest sensitive receiver, between 10 pm and 7 am
- Advise local residents when unavoidable out-of-hours work will occur
- Schedule deliveries to the site so that disruption to local amenity and traffic are minimised
- Conduct a study on the impact of ground vibration from construction activities where these operations occur within 50 metres of a building and take appropriate action
- Minimise air vibrations

5.12. Protecting Vegetation

5.12.1. Objective

- Retain as much of the existing grass and plants on the site as possible

5.12.2. Measures

- Review the plans to identify the vegetation that requires specific protection
- Identify "no go" areas on all work plans
- Install "no go" areas by fencing off these zones with red tape or other bright materials around trees and plants to be retained.
- Where vegetation is to be removed, leave it in place as long as possible and stage the earthworks to minimise the amount of the site cleared at any one time.
- If the soil is not stable due to its structure, texture or excessive slope, provide interim measures such as erosion control matting
- If the site has not been rehabilitated prior to handover, the Client needs to understand that they are legally responsible to ensure that pollution does not enter the stormwater system
- Refer to attachment "Protecting Vegetation" for further information.

5.13. Waste Minimisation

5.13.1. Objective

- Minimise the waste load discharged to the environment.

5.13.2. Measures

- Carry out a waste minimisation assessment, which examines opportunities for waste avoidance, reduction, reuse and recycling.
- Reduce wastes by selecting, in order of preference, avoidance, reduction, reuse and recycling.
- Incorporate waste minimisation targets and measures into the environmental management plan

5.14. Contaminated Material and Wastes

5.14.1. Objective

- Ensure that all contaminated materials uncovered on a construction site are excavated and disposed of in an environmentally responsible manner.

5.14.2. Measures

- Assay material uncovered on-site prior to disposal. If the wastes include putrescible wastes, then also analyse leachate and landfill gases.
- Excavate material in a manner that avoids off-site environmental problems.
- Seal remaining contaminated material or wastes, where only part of the tip has been excavated to ensure that there is no off-site effect now or in the future
- Transport odorous wastes in covered vehicles.
- Dispose of contaminated material in a landfill licensed to take the type of material or wastes uncovered.

5.15. Air Quality

5.15.1. Objective

- Ensure there is no health risk or loss of amenity due to emission of exhaust gases to the environment

5.15.2. Measures

- Ensure that all vehicles and machinery are fitted with appropriate emission control equipment, maintained frequently and serviced to the manufacturer's specifications.
- Smoke from internal combustion engines should not be visible for more than ten seconds

5.16. Litter

5.16.1. Objective

- Ensure that all litter is disposed of in a responsible manner and is not released into the environment

5.16.2. Measures

- Maintain a high quality of housekeeping and ensure that materials are not left where they can be washed or blown away to become litter.
- Provide bins for construction workers and staff at locations where they consume food.
- Conduct ongoing awareness education with staff of the need to avoid littering

5.17. Storage of Chemicals and Fuel

5.17.1. Objective

- Ensure that chemicals and fuel storage is safe, and that any materials that escape do not cause environmental damage

5.17.2. Measures

- Minimise chemicals and fuel stored on-site
- Install bunds and take other precautions to reduce the risk of spills
- Implement a contingency plan to handle spills, so that environmental damage is avoided

5.18. Stabilised Site Access

5.18.1. Objective

- Reduce tracking of sediment off the site on to the council's road and stormwater system.

5.18.2. Measures

- Stabilised site access has a rough coarse surface which traps mud from vehicle tyres as they roll across it
- Identify the most suitable location for the stabilised site access prior to commencement
- The most suitable location will ideally be in an elevated position with little or no water flowing to it from upslope and away from any down slope stormwater pits.
- The recommended construction method for stabilising the access point is laying down 200mm of aggregate or recycled concrete greater than 40mm in size (note crushed sandstone is not suitable).
- Where the access area slopes toward the road, a diversion hump should be installed across the stabilised area to direct stormwater run-off to the side where it can be filtered by a sediment fence.
- Cover all loads of soil being taken off-site for disposal
- Monitor the access point as it may compact, become smooth and be no longer suitable
- Monitor roads and sweep at the end of each day if necessary.

6. Soil and Water Management Plan

Prepare a Soil and Water Management Plan (or Erosion and Sediment Control Plan) prior to commencement on site. The plan will detail the specific methods of erosion and sediment control used to meet the specific site conditions at various stages of the construction.

Include in the plan as a minimum:

- Basic site information
- Property boundary
- North point
- Contours (existing and completed)
- Date
- Author)
- Construction details
- "Site" or "disturbed area"
- Vehicle access point
- Location of stockpiles and secure chemical storage area
- Location and details of all temporary and permanent soil and water management controls
- Staging of works (major projects only)
- Location of all drains, downpipes, pits and watercourses
- Location of vegetation to be removed
- Revegetation program
- Stormwater management
- Integration with onsite detention/ infiltration
- Stormwater discharge point if proposed

Ensure the Client and Local Council approve the Plan prior to commencing works on site. For further information refer to attachment "Soil and Water Management Plan Fact Sheet 15".

7. Inspections

A key component to the effective implementation of our Environmental Management Plan is the process of inspections and checklists recorded in Convic Environmental Management Site Inspection Checklist.

7.1. Inspections

Installation	Possible Problems	Frequency of inspections	Remedial Action
Drainage	New drainage lines not controlled	At least once a week	Install appropriate sediment controls on new drainage lines
Sediment controls, silt fences and traps	Not controlled effectively	Daily in dry weather Within first two hours of a storm Three times a day during prolonged rainfall	Remove sediment from trap Replace barrier or filter material out Redesign installation (approval required) Improve maintenance
Haul roads	Dust Soil on paved roads	Daily	Pave haul roads with gravel Install wheel washes and rumble grids Manually wash vehicle wheels Increase road cleaning frequency
Cut-off and diversion drains	Water not diverted away from sensitive areas	When the threat of rain is present at least every 2 days	Replace or repair damaged drains Redesign ineffective drains (approval required) Relocate incorrectly placed drains
Stockpiles and bare slopes	Erosion	Weekly	Minimise exposure to run-off and action of wind Ensure stabilisation measures are effective
Unvegetated areas	Dust	Daily during dry weather	Increase use of water spray on unvegetated areas Protect untrafficked areas temporarily with mulch
Vehicles and machinery	Noise pollution Exhaust gases	Initially when vehicle is introduced to the site	Ensure that mufflers and noise-shielding are effective Ensure that emission controls are effective and motors well maintained
Chemical storage areas	Spills	Weekly	Clean-up contaminated areas Improve bunding
Litter controls	Litter on and off-site	Daily	Clean-up litter originating on site Review number and placement of bins Ensure materials are not stored in such a manner that they could contribute to litter Speak to staff about litter disposal

7.2. Monitoring

Area of Risk	Purpose	Monitoring Requirements	Remedial Action
Noise	Determine whether a noise nuisance exists	As Standard EMP-template August 2010K:\Environmental Management\Standard EMP-template August 2010.docx required by complainants at their homes Monitor noise continuously at a representatives residence near construction activities	Review and enhance noise control measures
Air Quality (Dust)	Determine whether a dust nuisance exists	Daily during dry weather for dust deposits at locations that indicate impact on adjacent locations or at site boundary	Improve controls on dust emissions
Excavated Material	Detect old fill material that may contain contaminated soil or rubble	Daily in areas being excavated	Analyse fill materials suspected of being contaminated Remove contaminated material to an approved landfill and ensure necessary approvals have been obtained

7.3. Audits

7.3.1. Objective

- To conduct checks on significant environmental risks to ensure that they are adequately managed and control systems are operating effectively.

7.3.2. Measures

- Establish baseline monitoring program before construction commences
- Prepare an inspection, monitoring and audit program, designed to match the environmental risk

- Ensure that remedial action is taken promptly when monitoring, inspections or audit results reveal a problem in environmental management
- Arrange for regular independent audits of environmental performance and the environmental management system

7.3.3. Checklist

Issue	Action Taken	Tick
Pre Construction Planning		
Environmental Assessment	All possible impacts that the project will have on the environment have been assessed	
	Whether construction activities will intersect a contaminated site or old tip has been determined	
	The impact of the development of the amenity to adjacent residents has been assessed	
Environmental Management System	All staff are adequately trained	
	All procedures have been written down	
	An Environmental Management Plan based on the Risk Management Action Plan Have been implemented	
Plan Prepared	Special work procedures to avoid or reduce environmental harm has been prepared	
	Maintenance, inspection and surveillance schedules	
Land Disturbance		
Erosion	The erosion potential of the site during each phase of construction has been characterised	
	Action has been taken to minimise vegetation clearance	
Stormwater Management	Quantity of contaminated stormwater entering the project has and will be reduced	
	Water velocities will be reduced wherever possible	
	Stormwater flows over bare slopes will be reduced to a minimum	
Noise & Vibration	Procedures that comply with limits on working hours have been established	
	Adjacent residents have been and will be advised of out – of – hours work	
	Machinery and vehicles will be regularly serviced	
	Noise is reduced to an acceptable level wherever practicable	
Waste Minimisation	Waste minimisation programs have been implemented	

8. Annexure

8.1. ANNEXE 1 Environmental Management Policy

ENVIRONMENT POLICY STATEMENT

Convic Skate Parks is committed to the minimisation of the environmental impact of its activities. To achieve this, the protection of the environment is the responsibility of all Convic Skate Parks' management and employees.

Convic Skate Parks will:

- Ensure to comply with all relevant environmental legislation, standards and guidelines.
- Ensure that environmental factors are integrated into all work requirements.
- Ensure that management and employees are trained on environmental issues relating to their particular work requirements.
- Supervise and review the effective implementation of environmental management requirements and rehabilitate the environment adversely affected by its work activities.

Specific environmental factors are to include the following:

1. Soil stockpiles
 - Must not be placed near storm water drains or grates.
 - Batter stockpiles to 2:1 (horizontal to vertical) or less.
 - Prevent flow of storm water from stockpiles into drains.
 - Contaminated soils must be placed into areas indicated by Site/Project Manager.
2. Storm Water
 - Use hay bales and silt fences to remove excess dirt from storm water
 - Fix or replace any damaged bales or silt fences.
 - Clean away dirt from drains, bales and silt fences.
3. Waste
 - Place all waste in dedicated bins.
 - Prevent concrete wash water from entering storm water drains.
 - Waste solvents must be placed in appropriate disposal container.
 - Waste paint (solid), paint containers, chemical containers, render, render containers will be placed in a hazardous waste bin.
 - Advise Convic Skate parks of any odorous solids excavated on site.

4. Air and Dust

- Keep exposed soils and roads moist so they do not generate excessive dust.
- Do not drive vehicles on unsealed areas unless absolutely necessary.
- Park cars in designated areas ONLY.
- Remove excess soil from wheels and vehicle bodies before leaving site.

5. Noise

- Maintain plant and equipment regularly and fit with manufacturers specified noise silencers.
- DO NOT leave vehicles running in adjacent residential streets outside normal working hours.
- All deliveries must be during normal working hours.

6. Chemicals

- All chemicals must be stored in specified containment areas unless in immediate use.
- No smoking when handling flammable liquids.
- DO NOT place chemicals or chemical containers in general purpose bins.
- DO NOT put chemicals in storm water drains or the sewer.
- Immediately clean up any spills.

7. Environmental Incidents

- Any spill onto soil or water.
- Excessive noise.
- Excessive dust.
- High sediment loads in storm water/drain.

Convic Skate Parks' employees will:

- Take active measures to protect the environment during work activities.
- Report any relevant environmental concerns to the management of Convic Skate Parks.

Convic Skate Parks will regularly monitor its work activities to assess environmental performance. The Environmental Policy will be reviewed on a yearly basis or as circumstances require.

SIGNED 

Director

Convic Skate Parks

DATED 8.2.07

8.2. ANNEXE 2 Diversion of Upslope Water Fact Sheet

Diversion of Upslope Water

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.



Diversion of Upslope Water What is it?

This refers to placing controls around the disturbed work area and on the road gutters above your site to divert rainwater from travelling through the work site

Why is it important?

Preventing water from above the site reaching the development area will ensure that it doesn't get contaminated and reduces the amount of water you need to deal with. This means less mud problems on site and less sediment being washed into the stormwater system. The environmental impact of sediment such as mud and dirt is significant. They smother animals and plants that live on the bottom of creek beds. They settle and make the creeks shallower. This results in the sun's rays heating the water. Many native plants and animals can not survive in this hotter water and die. Even though mud and dirt are natural they are still serious pollutants that must be prevented from entering our waterways.

What do I need to do?

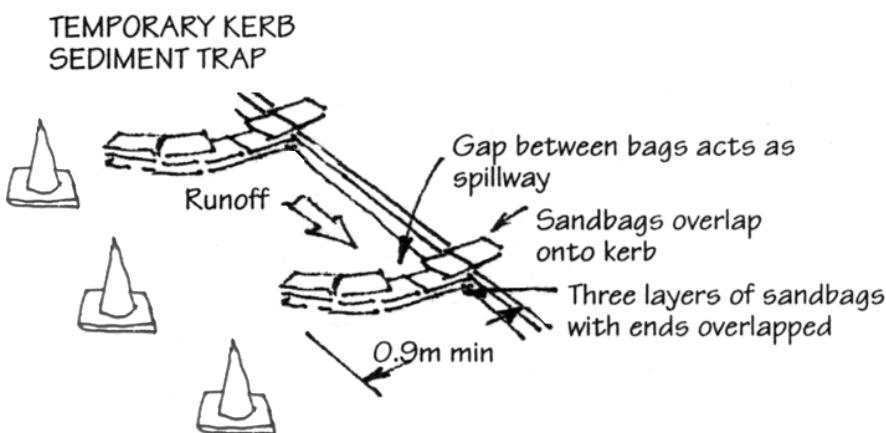
Before building commences:

Look at the construction plans to identify areas on site where water can be diverted around the disturbed or active work area. Identify the relevant street gutters and drains up slope of the site. Decide on diversion methods and install them. Document these on your Soil and Water Management Plan and ensure that staff are aware of their importance.

Installing the controls:

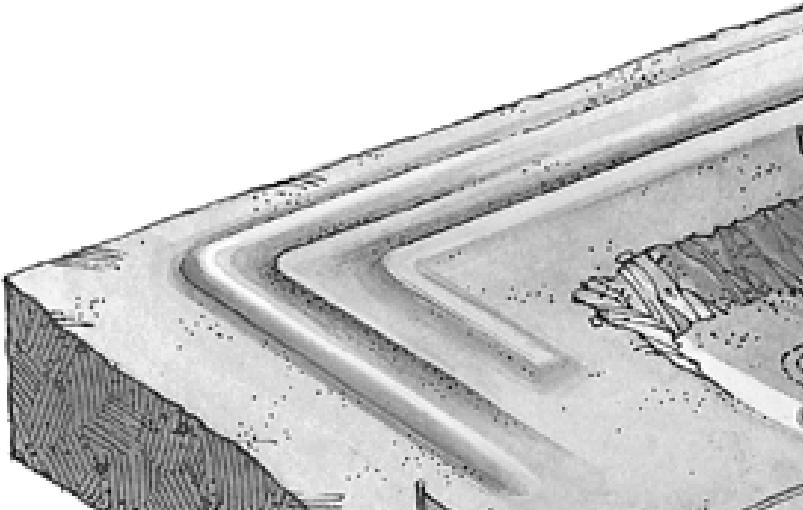
Street Gutters: Install a gravel sausage or sand bag barrier downslope of the roadside gully pit that is immediately upslope of the worksite. Make the barrier big enough and sufficiently well attached to divert low and medium flows into the gully pit. Fashion a low point on the barrier, near the kerb, so that high flows spill to the gutter rather than flood the roadway.

Two or three of these traps in a row may be required to allow sediment to drop out. Place safety cones around the area so that cars do not damage them.



On Site: Construct a bund, graded to one end so that clean water flows around your work site without making contact with your construction activities. It can then flow safely to council stormwater drains without any need for pollution control. This bund can be made from soil stabilised with grass, sand bags or 'continuous berm'. Avoid directing stormwater towards the site's entry/exit point as this makes controlling tracking of mud on vehicle wheels more difficult. Also ensure water is not diverted into adjoining properties as this may cause damage and result in a civil lawsuit.

Fact Sheet 1



Maintenance of the controls:

Check that controls are in place at the end of the day's operations and when ever rain is forecast. Check diversion channels and bunds for erosion. Ideally they should be lined with geotextile material to ensure that they do not erode.

Remember:

Everyone has a responsibility to protect the environment. The site supervisor is required to make sure that all workers, including sub-contractors are doing the right thing and all workers are required to notify their supervisors and Council if they see pollution occurring.

It is illegal for any substance other than rainwater to enter the stormwater system. If you do have an accident and pollution occurs you are required by law to notify the Council so that they can work with you to minimise any harm to the environment.

Penalties for polluting the stormwater system range from \$750 on the spot fines to \$1 million and seven years in gaol. Both companies and individuals can be fined.

Council Officers and the EPA enforce the environmental legislation and do routine inspections of building sites. They can issue notices to make companies clean up sites, change the way they are managing the sites and if necessary, cease work. They will attempt to work with you but penalties will be issued if a satisfactory environmental outcome is not achieved.

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**THE DRAIN
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List of fact sheets available from Council:

1. **Diversion of Upslope Water**
2. Dust Control
3. Early installation of Roof Drainage
4. Excavation Pump Out
5. Protected Concrete, Brick and Tile Cutting
6. Protected Concrete Delivery
7. Protected Service Trenches
8. Protected Stockpiles
9. Protected Wash Areas
10. Protected Waste Management and Chemical Storage
11. Protecting Vegetation
12. Protection of Gutter and Street Stormwater Drains
13. Protection of Site Stormwater Pits
14. Sediment Controls
15. Soil and Water Management Plans
16. Stabilised Site Access

For further information on preventing pollution from building and construction sites contact your local council:



Southern Sydney Regional Organisation of Councils

8.3. ANNEXE 3 Dust Control Fact Sheet

Dust Control

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Dust Control What is it?

Dust control refers to minimising the amount of dust that enters the air and stormwater system from your site.

Why is it important?

Dust blowing from your site has a four way impact. Firstly, it is a nuisance to neighbours which can result in poor relations or complaints about your company.

Secondly, it can result in adverse health effects like asthma in workers and others. Thirdly, blown away materials are blown away dollars, and finally, it is dangerous to the environment.

The environmental impact of dust and sediment is significant. They smother animals and plants that live on the bottom of creek beds and make the creeks shallower. They carry nutrients which can lead to algal blooms and fish kills, as well as weeds which can take over from native plants.

Even though mud and dirt are natural they are still serious pollutants that must be prevented from entering our waterways.



What do I need to do?

Before building commences:

Assess the dust potential of your site and decide on dust controls. If there is high risk of dust generation then barriers to divert the wind up and over the site can be constructed. These include shade cloth walls of height one-fifth the site length. Document controls on your Soil and Water Management Plan and ensure staff are aware of its importance.

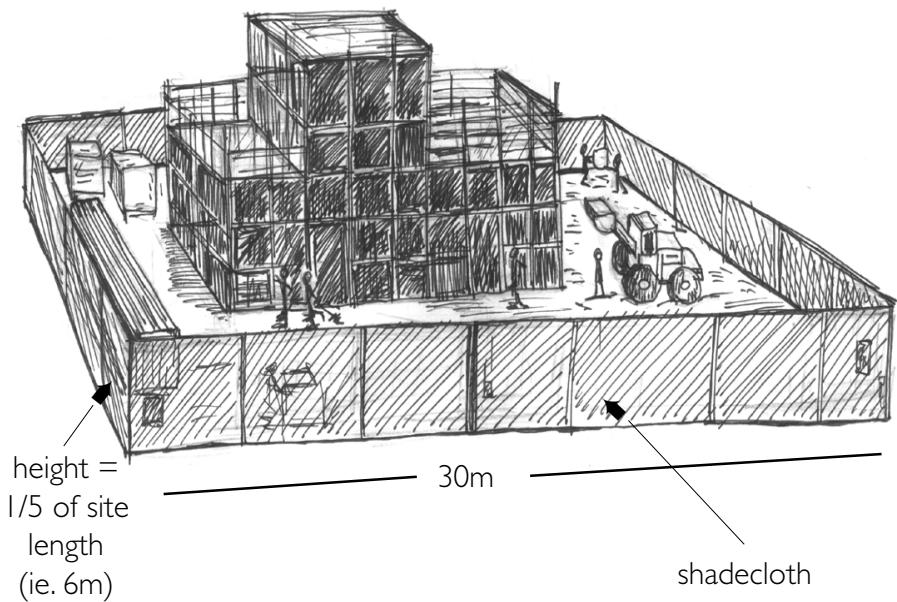
Installing the controls:

Good sediment management can alleviate most of the dust problem. Some of the steps that can be taken to minimise dust include:

- Maintain as much vegetation as possible
- Cover materials and stockpiles
- Ensure that all equipment has dust suppressors fitted
- Dampen the site slightly during excavation or when dust is being raised. Be careful not to wet it to the point of creating polluted runoff.
- Ensure that vehicles only leave via the stabilised site access
- Minimise the amount of the site that is disturbed at any one time

All of these actions will help to minimise the amount of sediment loose on the site and therefore the dust that can be generated.

If dust becomes too serious on windy days the best option is to cease work until wind conditions are suitable.



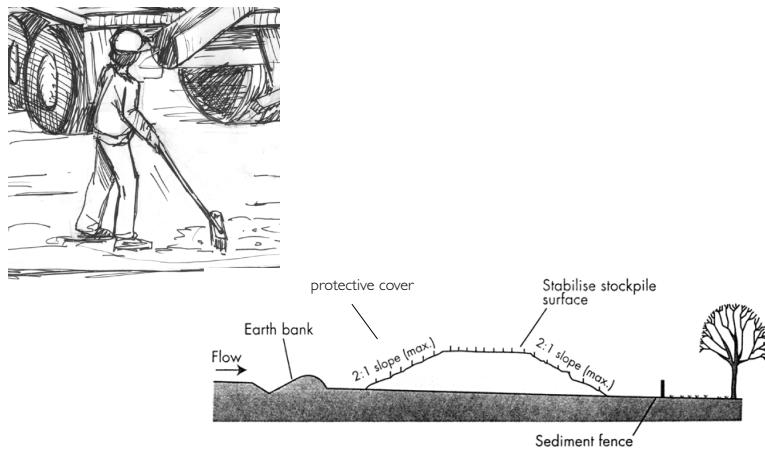
Fact Sheet 2

Maintenance of the sediment controls:

Dust collected around sediment controls will need to be removed regularly to maintain effectiveness. Built up material can be restockpiled, used on site or collected by an Earth Moving Company.

Inspect and sweep roads at the end of each day and when rain is likely.

On larger sites dust monitoring should be undertaken. The National Health and Medical Research Centre (NHMRC) guidelines require an annual mean of 90ug/m³ for total suspended particulate.



Remember:

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2. **Dust Control**
3. Early installation of Roof Drainage
4. Excavation Pump Out
5. Protected Concrete, Brick and Tile Cutting
6. Protected Concrete Delivery
7. Protected Service Trenches
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16. Stabilised Site Access

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Southern Sydney Regional Organisation of Councils

8.4. ANNEXE 4 Excavation Pump Out Fact Sheet

Excavation Pump Out

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Excavation Pumpout What is it?

Excavation pump out refers to the pumping of water collected in the bottom of excavated sites to the stormwater system. This water may be ground water or collected rain water.

Why is it important?

Rain Water

Rain water pooled on building sites picks up mud, dirt and any other contaminants present.

All of these pollutants can cause serious harm to our waterways. Even if the water is just muddy it can cause significant damage through smothering plants and bottom dwelling animals.

Ground Water

Ground water seeping up from aquifers may contain a range of contaminants such as heavy metals, petrochemicals and toxins depending on prior land uses in the area.

Approval is needed from the Department of Land and Water Conservation and Council to install ground water bores or spear points for pumpout of ground water.



What do I need to do?

Before building commences:

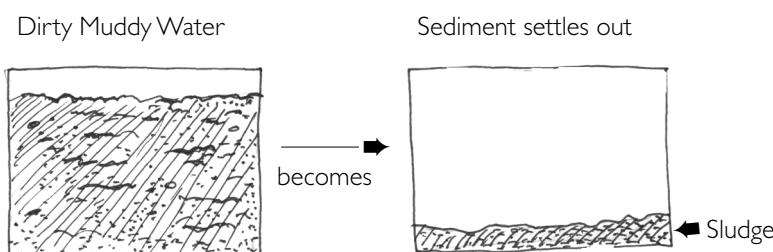
Review the site requirements and consider the best option for dealing with the collected water. Depending on the level of contamination it may be possible to:

- 1) pump it after treatment to the stormwater system
- 2) pump it to the sewer with approval from Sydney Water or
- 3) have it collected by a liquid waste company for disposal at a licensed treatment facility.

The second and third options are the most preferable as they reduce the risk to the stormwater system and ensure you are not breaking the law. Document the methods to be used on your Soil and Water Management Plan and ensure that staff are aware of its importance. If the groundwater is contaminated EPA advice should be sought and may require waste disposal tracking.

Installing the controls:

If the water contains only sediment it can be pumped to the stormwater system after filtering. It must have less than 50 mg/L Total Suspended Solids. This is water with no visible cloudiness. If you do not have time or room on-site to let the sediment settle naturally, flocculants such as gypsum can be used. Flocculants speed up the settling process. Unfortunately they raise the pH of the water and pH correction is needed prior to pumping to the stormwater system. Some flocculating agents can be toxic to fish above certain critical concentrations. Council advice should be sought prior to their use. Once settled, pump the clean water from the top to an area of the site where it can soak in or to the stormwaer system. The settled sediments, "the sludge", can be reused on site or disposed of in a bin.



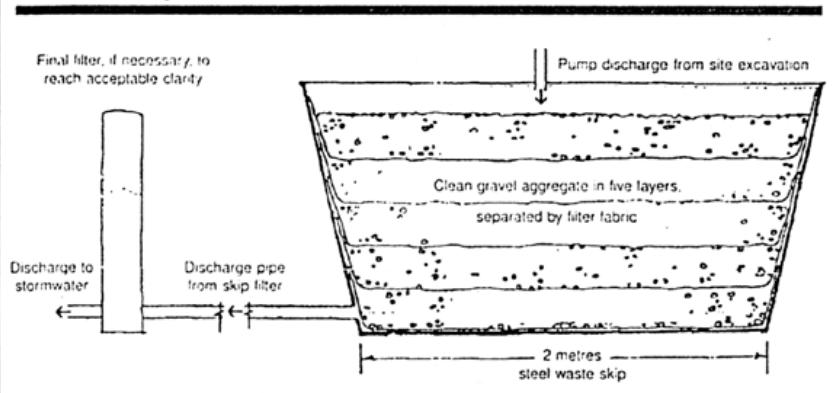
Sediment settles over time but can be sped up with flocculant.
Reuse sediment or place in bin

Pump clear water to "soak in" site or to stormwater system

Fact Sheet 4

List of fact sheets available from Council:

One method of filtering site water before discharge into the stormwater system.



Source: Environetwork News, EPA, 5/99

Maintenance of the sediment controls:

If you install a filtering system such as the one pictured it will need to be cleaned regularly to remove the sediment that it filters out.

Remember:

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8.5. ANNEXE 5 Protected Concrete, Brick & Tile Cutting Fact Sheet

Protected Concrete, Brick and Tile Cutting



'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protected Concrete, Brick and Tile Cutting

What is it?

This refers to doing these activities in such a way that no waste products enter the stormwater system.

Why is it important?

It is important because concrete, brick and tile dust cause significant damage to our waterways.

Surplus concrete and mortar slurries will block stormwater pipes if washed into Council systems and cause flooding.

Cement also raises the pH of waterways making it more alkaline which is deadly to aquatic animals. It therefore must not be allowed to enter the stormwater system.

Fines may be issued if pollution occurs.

What do I need to do?

Before building commences:

Find a location on the site away from stormwater drains to undertake these activities. This includes mixing of cement and mortar. The area should be large enough to contain all excess water, residues and waste.

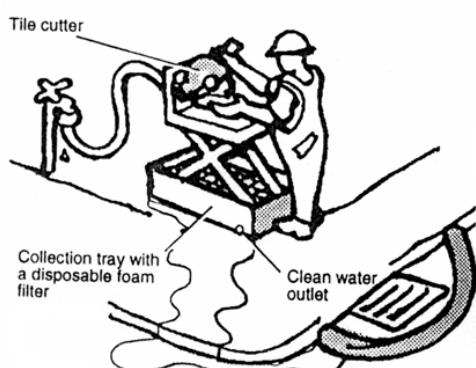
If the nature of the job requires that cutting be done in a location close to the stormwater drain eg: cutting of the footpath, then controls will need to be put in place to ensure that no material enters the stormwater system. Identify site requirements and list them on the Soil and Water Management Plan before building commences. Ensure controls and designated cutting area are available before building commences.

Installing the controls:

The designated cutting area should be placed away from stormwater drains and have a diversion channel (speed hump) up slope of it and sediment collection devices such as sediment fence or straw bales below it.

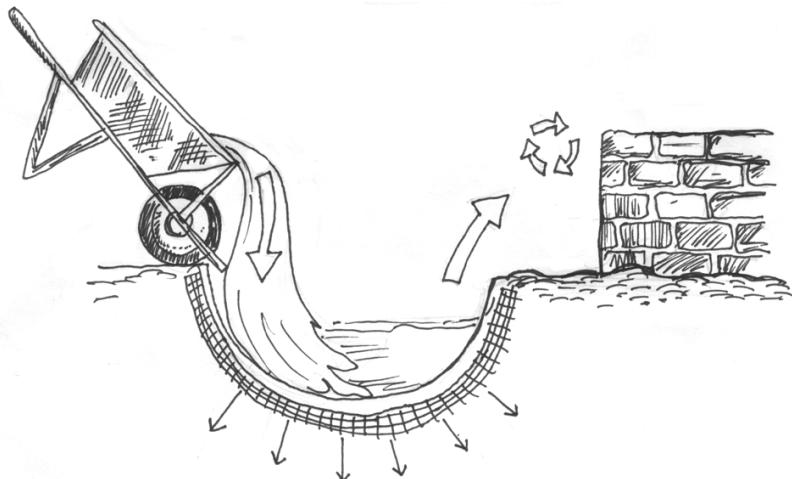
If cutting in an area near stormwater drains, use temporary collection devices such as gravel sausages or plastic bunds to direct the waste water onto a land area where it can soak in. If this is not possible and the waste water is likely to flow to the stormwater system then filtering will be required. There are filtration systems available that work in the brick cutting machine, in the gutter and in the side entry / gully pit. The filtered water must have less than 50 mg/L Total Suspended Solids before it can be discharged to the stormwater system, which is water with no cloudiness.

If required, rinse equipment in the designated wash down area on site (see Fact sheet 9. Protected Wash Areas)



Safe disposal of waste concrete slurry can be achieved by tipping small amounts into plastic or geofabric lined ditches. This will enable the water to evaporate or soak in to the earth and the solids can then be placed in a skip bin or recycled as clean fill in construction or as road base. Larger amounts should be sent to licensed recyclers or landfill.

Fact Sheet 5



Maintenance of the controls:

All filter systems and sediment collection controls will require regular cleaning to maintain effectiveness. Remove the built up sediment and check for holes or other breaks in the controls. Repair and replace them. Built up material can be re-stockpiled, used on site or collected by an Earth Moving Company.

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2. Dust Control
3. Early installation of Roof Drainage
4. Excavation Pump Out
- 5. Protected Concrete, Brick and Tile Cutting**
6. Protected Concrete Delivery
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15. Soil and Water Management Plans
16. Stabilised Site Access

For further information on preventing pollution from building and construction sites contact your local council:

8.6. ANNEXE 6 Protected Concrete Delivery Fact Sheet

Protected Concrete Delivery

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protected Concrete Delivery What is it?

This refers to receiving concrete deliveries in a manner that does not pollute the stormwater system.

In the past the usual way of delivering concrete was for the truck to park either in the site access point or next to the site and pump the concrete to the required area. Any spills would land on the road. The chute of the concrete truck would often be washed down, resulting in all of this waste concrete slurry entering the drains and our rivers.

Why is it important?

Concrete that enters the stormwater system causes several problems.

It hardens in the pipes, reducing their diameter. This increases the risk of flooding to the surrounding neighbourhoods.

It also affects the pH of the water, making it toxic to many plants and animals. This kind of pollution results in major fish kills.



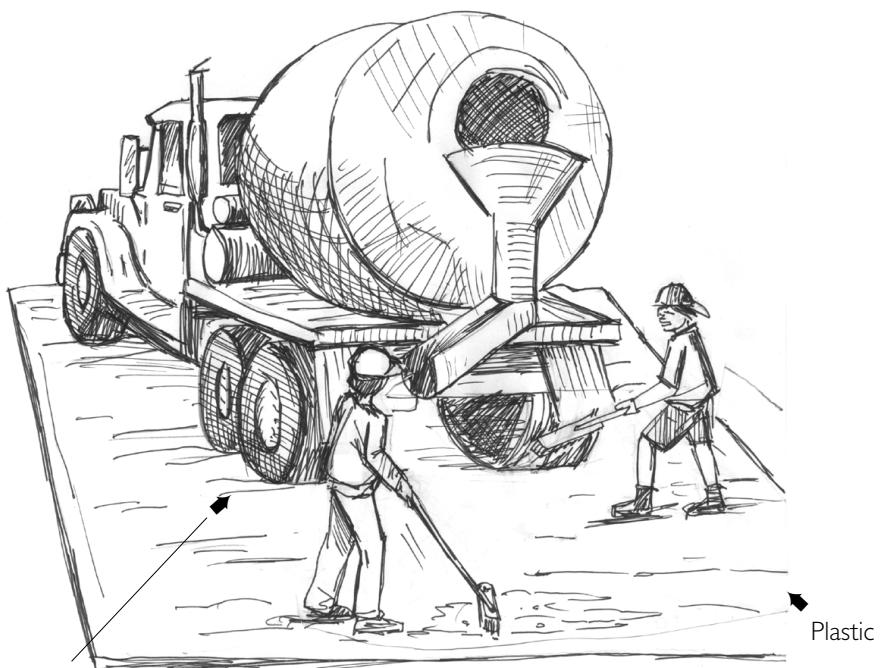
What do I need to do?

Before building commences:

Plan to have concrete deliveries made entirely on the site where spillage can be cleaned up without risk of it entering the stormwater system. If this is not possible you will need to place controls around and under the concrete truck to catch any spills. Document the delivery area on your Soil and Water Management Plan. Purchase these controls and ensure staff are aware of the need to use them. When selecting a concrete supplier ask them if they comply with the Australian Premixed Concrete Association guidelines for safe concrete delivery.

Installing the controls:

1. Before pumping begins, place plastic under the concrete pump and temporary bunds across all downslope gutters to trap any spillage. Sweep up all spillage before removing the bunds. Do not wash it away.
2. Ideally vehicles and equipment should be washed down within a designated bunded area within the site where the washwater can soak in to the ground or at a washdown depot. If more washwater occurs than can soak into the ground, it can be stored, settled and/or filtered by techniques that render waters clear for safe discharge to council drains ie: 50mg/l Total Suspended Solids which means clear water with no visible turbidity (cloudiness). pH correction may be required. Contact suppliers for help with meeting EPA requirements.



Scrape down wheels/tyres

Ensure tyres are clean before leaving construction site

Collect and remove all spillage

Sweep up residues

Fact Sheet 6

List of fact sheets available from Council:

Wash down chutes and barrels in proper wash area on site or at a washdown depot. If not applicable, collect wash water in a wheelbarrow and transport on site to wash area



Letting any materials enter the stormwater system may result in fines

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8.7. ANNEXE 7 Protected Service Trenches Fact Sheets

Protected Service Trenches

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.



Protected Service Trenches

What are they?

This refers to installing phone, power, water and drainage services in a manner that does not pollute the stormwater system.

Why are they important?

Underground service connections can concentrate runoff into rivulets and channels that cause rapid soil erosion and pollution of discharged waters.

This sediment has significant impacts on our waterways. It smothers animals and plants that live on the bottom of creek beds. It settles and make the creeks shallower. This results in the sun's rays heating the water. Many native plants and animals can not survive in this hotter water and die.

Even though mud and dirt are natural they are still serious pollutants that must be prevented from entering our waterways.

What do I need to do?

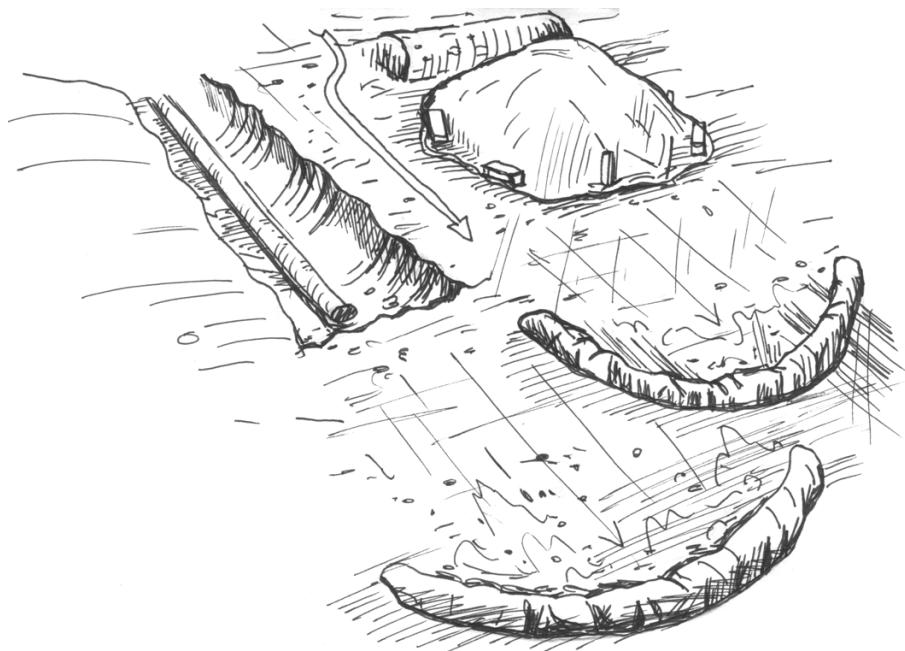
Before building commences:

Decide where the service trenches will need to go. Document them on your Soil and Water Management Plan. Ideally they should be away from areas where water flow is likely to concentrate. Plan to coordinate the various service connections so that a single trench can be used and schedule work to periods when rainfall is low.

Installing the controls:

1. Remove and store vegetated topsoil so that it can be replaced after works to provide immediate erosion protection.
2. Place the soil on the uphill side of trenches to divert water flow away from the trench line. Temporary bunds can also be used.
3. The trench should be open for a maximum of 6 days. Once completed, backfill subsoil and compact.
4. Replace topsoil and any grass / vegetation to match surrounding ground levels. If trench runs are steep place sediment barriers at 5 metre intervals to prevent erosion.

If cutting of pavement is required, ensure that proper measures are taken to prevent 'cuttings' entering the stormwater - see Fact Sheet 5 on 'Protected Concrete, Brick and Tile Cutting' in this series.



Minimise the width of cut and the time trenches are open - then quickly stabilise the backfill.

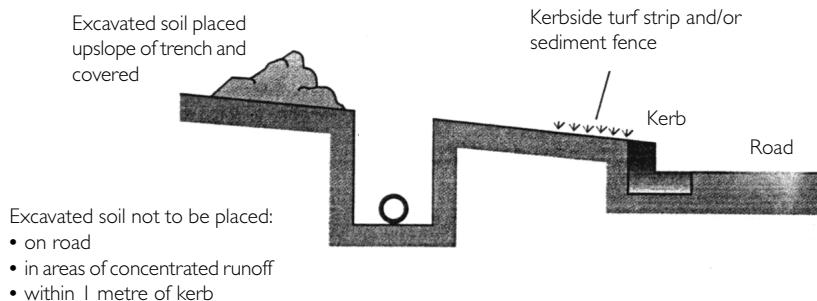
Fact Sheet 7

List of fact sheets available from Council:

1. Diversion of Upslope Water
2. Dust Control
3. Early installation of Roof Drainage
4. Excavation Pump Out
5. Protected Concrete, Brick and Tile Cutting
6. Protected Concrete Delivery
7. **Protected Service Trenches**
8. Protected Stockpiles
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For further information on preventing pollution from building and construction sites contact your local council:

When Excavating Trench...



- Excavated soil not to be placed:
- on road
 - in areas of concentrated runoff
 - within 1 metre of kerb

Maintenance of the controls:

If using temporary bunds, sediment will need to be collected from them to maintain their effectiveness. This material can be re-stockpiled, used on site or collected by an Earth Moving Company. The stockpile of excavated sediment that will be reused to cover the trench should also be checked regularly to ensure it is compacted and not being washed away - see Fact Sheet 8 on 'Protected Stockpiles' in this series for more information.

Remember:

Everyone has a responsibility to protect the environment. The site supervisor is required to make sure that all workers, including subcontractors are doing the right thing and all workers are required to notify their supervisors and Council if they see pollution occurring.

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8.8. ANNEXE 8 Protected Stock Piles Fact Sheet

Protected Stockpiles

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protected Stockpiles

What are they?

They are materials such as sand, gravel, topsoil, mulch and woodchip stored in a way that will not enter the stormwater system.

Why are they important?

Stockpiles are at risk of being washed or blown away and polluting stormwater. Loose materials in heaps with steep sides and impervious foundations are most at risk. Not only does this affect the environment but it is expensive to the builder, increasing the amount of materials needing to be purchased for the development.

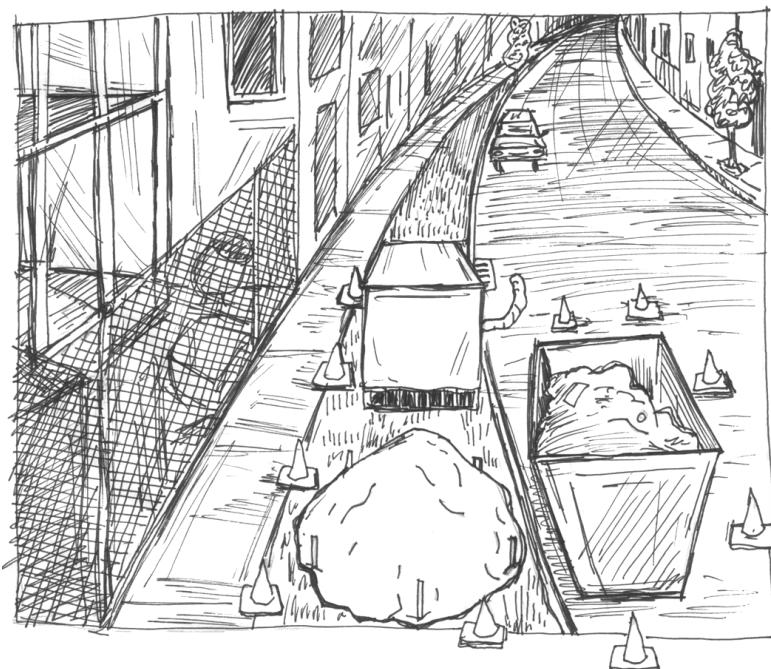
The environmental impact of these materials is significant. Mulch and woodchip decompose absorbing all the oxygen in the water resulting in suffocation of animals. Sediment settles making creeks shallower and smothering animals and plants that live on the creek beds. This shallower water depth also results in the suns rays heating the water. Many native plants and animals can not survive in this hotter water and die.



What do I need to do?

Before building commences:

Identify a protected storage area for stockpiles. This should be inside the site under cover, away from stormwater flow paths, with erosion control measures such as sediment fence, gravel sausage or straw bales placed around them. If there is no room on site Council approval will be needed to store materials on the kerb or footpath. Materials should be stored in sand bags or bale/pallet containers with sediment controls around them. Document your storage area on the soil and water management plan and ensure staff are aware of its importance.



Installing the controls:

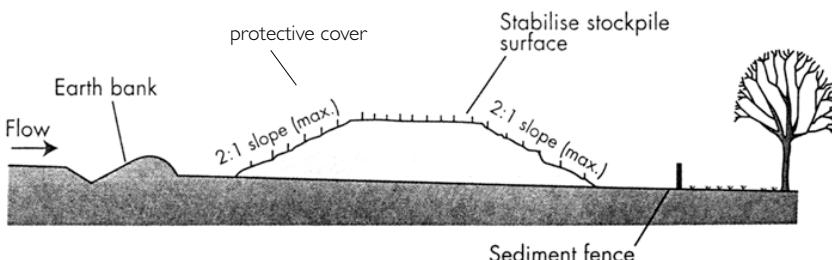
1. Locate stockpile away from stormwater flow paths, roads and hazard areas (ideally at least 5m away).
2. Place on a level area as a low, flat, elongated mound.
3. Where there is sufficient area topsoil stockpiles shall be less than 2m in height.
4. Construct an earth bank on the upslope side to divert run off around the stockpile and a sediment fence 1 to 2 m downslope of the stockpile (or sand bag, gravel sausage).
5. Stockpiles should be covered during windy conditions, rain or unattended site periods.
6. Once the roof has been installed on the frame, move stockpiles inside.

Fact Sheet 8

List of fact sheets available from Council:

Maintenance of the controls:

Stockpiles should be checked and covered at the end of each day. Materials trapped by the down slope controls should be removed regularly to maintain their effectiveness. Built up material can be restocked, used on site or collected by an Earth Moving Company. Incorrect storage of stockpiles is a major source of stormwater pollution. All site workers, subcontractors, and delivery drivers should be advised of their responsibilities. Delivery drivers should be given a designated location to deliver materials on site.



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8.9. ANNEXE 9 Protected Wash Areas Fact Sheet

Protected Wash Areas

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.



Protected Wash Areas What are they?

Protected Wash Areas refers to having a designated spot on site that does not drain to the stormwater system for washing of all painting, plastering, concreting and other dirty equipment.

Why are they important?

Even at low concentrations water soluble paints (acrylics) raise the turbidity in creeks which reduces oxygen and light, resulting in plants, fish and frog deaths. Oil or turps based paints form a thin film over the surface of water, starving insects, frogs, and fish species of oxygen. They can also contain heavy metal components that are highly toxic and irritating to all animal species including humans. Concrete alters the pH of the water making it too alkaline for many plants and animals to survive. Protected Wash Areas are required to trap silt and pollutants and prevent them entering the stormwater system.

What do I need to do?

Before building commences:

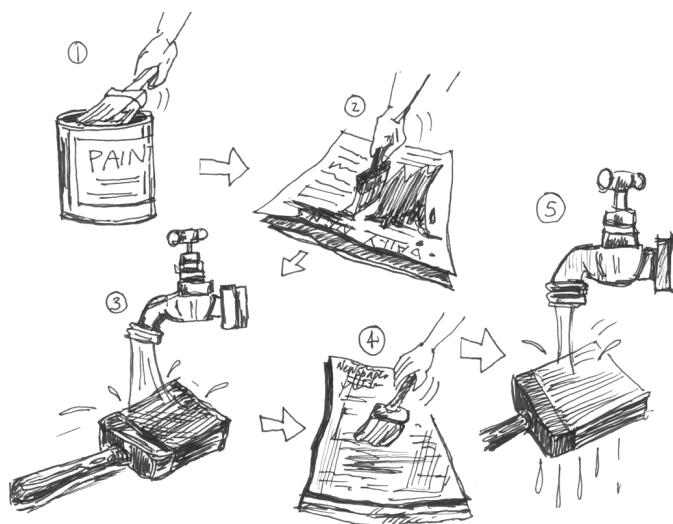
Choose a site for the wash down area that is away from drainage lines and stormwater pits. Show its location on the Soil and Water Management Plan and ensure all staff are aware of it.

Installing the controls:

The wash down area should have sediment controls around it and be large enough to hold all waste water generated. It should be clearly signposted to alert subcontractors and staff of their responsibilities.

Minimise the amount of waste water generated by:

- Sweeping excess dirt and mud off equipment prior to washing.
- With Paint wastes- Spin the rollers and brushes to remove excess paint and return as much as possible to the original container for reuse. For water based paints- wash brushes in small amounts of water over newspaper. This will let the water soak through into the ground and keep the paint residue on the paper. The paper can then be placed in a solid waste bin or taken to a licensed solid waste transfer station. It is illegal to let paint and other liquid wastes contaminate the soil.
- For oil based paints- wash equipment in a series of solvent baths until clean. The solvent can be reused until it becomes saturated with paint. Solvent should be stored in air tight tins to prevent evaporation and disposed of to a licenced solid waste transfer station. It can not be placed in the bin or on the ground.



- Plastering wastes and wash waters should be allowed to dry within the protected wash area and then disposed of either to a bin or taken to a licensed waste depot. Solid wastes from plastering such as calcium sulphate can be used as a modifier in gardens.

Remember to clean up all site debris- don't sweep or hose it into the gutter.



Maintenance of the controls:

The protected wash area and its sediment controls will need to be emptied of solid residues regularly in order for it to have the capacity to catch and detain waste waters. The larger the area the less often this will need to be done. Solids from this process should be disposed of in a bin or taken to a licensed waste depot.

Remember:

Everyone has a responsibility to protect the environment. The site supervisor is required to make sure that all workers, including sub-contractors are doing the right thing and all workers are required to notify their supervisors and Council if they see pollution occurring.

It is illegal for any substance other than rainwater to enter the stormwater system. If you do have an accident and pollution occurs you are required by law to notify the Council so that they can work with you to minimise any harm to the environment.

Penalties for polluting the stormwater system range from \$750 on the spot fines to \$1 million and seven years in gaol. Both companies and individuals can be fined.

Council Officers and the EPA enforce the environmental legislation and do routine inspections of building sites. They can issue notices to make companies clean up sites, change the way they are managing the sites and if necessary, cease work. They will attempt to work with you but penalties will be issued if a satisfactory environmental outcome is not achieved.

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List of fact sheets available from Council:

1. Diversion of Upslope Water
2. Dust Control
3. Early installation of Roof Drainage
4. Excavation Pump Out
5. Protected Concrete, Brick and Tile Cutting
6. Protected Concrete Delivery
7. Protected Service Trenches
8. Protected Stockpiles

9. Protected Wash Areas

10. Protected Waste Management and Chemical Storage
11. Protecting Vegetation
12. Protection of Gutter and Street Stormwater Drains
13. Protection of Site Stormwater Pits
14. Sediment Controls
15. Soil and Water Management Plans
16. Stabilised Site Access

For further information on preventing pollution from building and construction sites contact your local council:



Southern Sydney Regional Organisation of Councils

8.10. ANNEXE 10 Protected Waste Management & Chemical Storage Fact Sheet

Protected Waste Management and Chemical Storage



'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protected Waste Management and Chemical Storage - What is it?

This refers to storage of your solid and liquid materials and wastes in a way that does not pollute the stormwater system.

Why is it important?

Building sites provide temporary storage to a number of chemicals and materials with high potential to pollute stormwater.

Chemicals such as:

- wood preservatives
- toilet reagents
- pesticides
- paint thinners
- fuels
- adhesives
- water repellents
- lime
- cement

can be spilt into the stormwater system.

Waste materials including:

- timber off cuts,
 - packaging,
 - sawdust,
 - small paper & cardboard items
- can be blown into the stormwater system. Many of these substances are toxic to animals and plants.

Fact Sheet 10

What do I need to do?

Before building commences:

Assess the site and your requirements. Can you minimise the number of chemicals needed or the waste produced? What wastes can be recycled or reused? How are you going to store the different wastes safely? Decide on your needs and choose a part of the site for the storage area that is not within a surface drainage area or close to any stormwater inlets. The waste area should be near the stabilised access point so that the pick up truck can retrieve skips without causing undue damage to the soil and vegetation surrounding the area. Document it on your Soil and Water Management Plan and ensure staff are aware of its importance.

Installing the controls:

Ideally place all chemicals inside a secure shed on site with keys allocated to persons approved by the worksite supervisor. If no shed is available but the site is secure, chemicals can be stored in sealed containers within a leak proof spill tray and covered with a tarpaulin. Where secure onsite storage is not available, have all chemicals removed and safely stored off site at the end of each work day. Store copies of the Material Safety Data Sheets (MSDS) for all chemicals and 'spill clean up kits' on site. Train staff on their use. In the event of a spill, the source should be quickly and safely stopped and the spilt material isolated and contained from the stormwater system and waterways. The spill must be cleaned up according to the MSDS. Help and advice must be sought from the appropriate emergency authorities for large or hazardous spill incidents. It is an offence not to notify them.

Skip bins for wastes and recycling should be covered to prevent wind blowing waste off-site but also to prevent rain water from entering and being contaminated by the wastes. **Cover the skip any time the site is unattended, over night, at weekends and when it is wet or windy.** Provide continuous dust protection for any chutes and conveyors used to load the skip from roof or upper storeys. If skip bins are stored in public areas, notify neighbours and Council inspectors and ask for their help in stopping illegal use.

Maintenance of the controls:

Arrange regular and timely clearance of waste skips so that over filling and wet weather pick up are avoided. Remove chemicals from the site as soon as they are no longer needed.



Reuse and recycling potential of materials

MATERIALS	PROCESS	END USE
Concrete	Crushed and recycled	Used as Fill, levelling, road base
	Surplus	Used as base for paths, minor slabs
Bricks	Cleaned and reused	Used in Construction, landscaping
	Crushed	Used in Driveways, landscaping
Roof Tiles	Cleaned and reused	Sold, reused as roofing, in landscaping
	Crushed and recycled	Into Landscaping, driveways, drainage
Plasterboard	Reprocessed and recycled	Into New plasterboard
Hardwood Beams	Denailed and reused	Used as Flooring, furniture, fencing, craft
Other timber	Cleaned and reused	Used as Formwork, bridging, propping
	Ground and recycled	Into Mulch, engineered timber products
Doors, windows	Cleaned and reused	Sold to Second hand market
Fittings	Cleaned up and reused	Sold to Second hand market
Glass	Crushed and recycled	Into Aggregate for concrete products
Carpet- wool	Reused	Used as Mulch, landscaping
Underfelt - natural	Reused	Used as Compost cover, mulch, landscaping
Underlay - rubber	Shredded and recycled	Used in Safety barriers, speed humps
Trees	Relocated and reused	Used in Landscaping on or off site
Greenwaste	Shredded and recycled	Used in Compost, mulch, fertiliser
Overburden	Screened and reused	Used as Topsoil
Metals	Scrap metals recycled	Into New metal products
Packaging	Shredded and recycled	Into New packaging

Table modified from 'After the inner City Waste Board'(1998) as published in: Master Builders Association (1998) 'Smart resourceful building- save on waste'.

Remember:

Everyone has a responsibility to protect the environment. The site supervisor is required to make sure that all workers, including sub-contractors are doing the right thing and all workers are required to notify their supervisors and Council if they see pollution occurring.

It is illegal for any substance other than rainwater to enter the stormwater system. If you do have an accident and pollution occurs you are required by law to notify the Council so that they can work with you to minimise any harm to the environment.

Penalties for polluting the stormwater system range from \$750 on the spot fines to \$1 million and seven years in gaol. Both companies and individuals can be fined.

Council Officers and the EPA enforce the environmental legislation and do routine inspections of building sites. They can issue notices to make companies clean up sites, change the way they are managing the sites and if necessary, cease work. They will attempt to work with you but penalties will be issued if a satisfactory environmental outcome is not achieved.

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8.11. ANNEXE 11 Protecting Vegetation Fact Sheet

Protecting Vegetation

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protecting Vegetation What is it?

This is keeping as much of the existing grass and plants on the site as possible.

Why is it important?

Vegetation is the best value for money surface stabiliser available on a building site because it:

- 1) protects the soil surface from rain impact;
- 2) increases the amount of rain that soaks into the ground;
- 3) reduces runoff speeds;
- 4) binds the soil; and
- 5) filters the runoff.



Show no go areas on your Soil & Water Management Plan and ensure staff are aware of them.

Display Soil & Water Management Plan on a prominent part of the site.



What do I need to do?

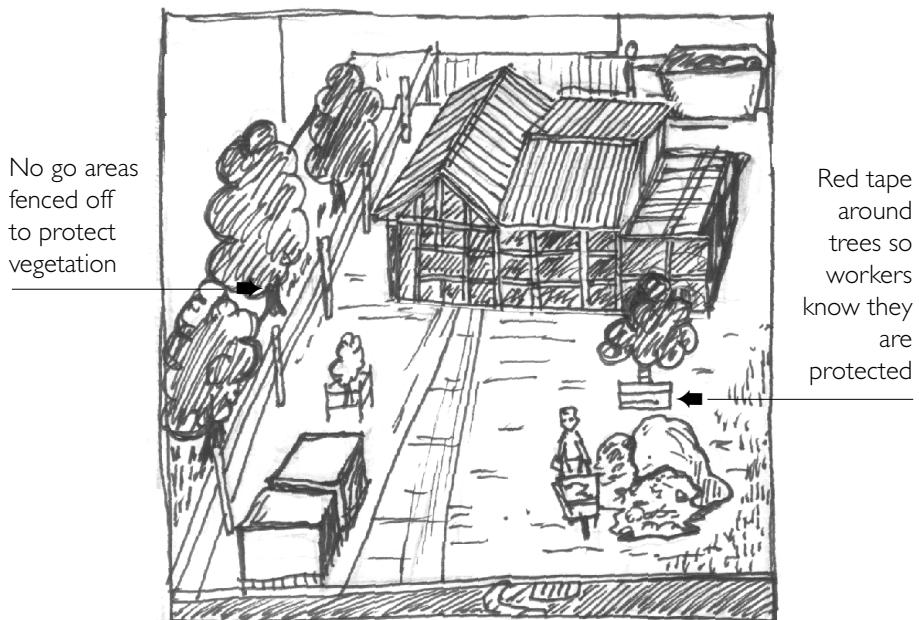
Before building commences:

Identify vegetation on site which can be kept throughout the whole development and mark this as a 'no go' area on all work plans including the Soil and Water Management Plan. Where vegetation needs to be removed, plan to leave it in place as long as possible and stage earthworks to minimise the amount of the site cleared at any one time.

Installing the controls:

Install the 'no go' areas by fencing off these zones. Place red tape or other bright materials around trees and plants to be kept. Ensure staff and subcontractors know not to enter. As you finish earthworks in one part of the site, revegetate it or plant temporary crops like rye to prevent erosion.

Revegetation should not be expected to provide complete erosion protection for a soil that is not stable due to its structure, texture or excessive slope. Erosion control matting should be used for revegetation areas on excessive slopes to provide interim protection until the vegetation cover can be fully established.



Maintenance of the controls:

If the site has not been rehabilitated and is handed over to a new homeowner, the owners need to understand that they are legally responsible to ensure that pollution does not enter the stormwater system. As a general rule sediment control devices should be left in place until 70% revegetation cover has been established, or other measures installed in accordance with the council's requirements.

Fact Sheet 11

List of fact sheets available from Council:



Builders should advise home owners of their responsibility to prevent stormwater pollution

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8.12. ANNEXE 12 Protection of Gutter & Street Stormwater Drains Fact Sheet

Protection of Gutter and Street Stormwater Drains



'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protection of Gutter and Street Stormwater Drains

What is it?

This refers to placing sediment collection devices around or in the drains down slope of your site to prevent pollutants entering. **This should not be your only measure.**

Street drain protection is a backup measure to support your on-site controls.

Why is it important?

The environmental impact of sediment such as mud and dirt is significant. They smother animals and plants that live on the bottom of creek beds and make the creeks shallower. This results in the sun's rays heating the water. Many native plants and animals can not survive in this hotter water. Even though mud and dirt are natural they are still serious pollutants that must be prevented from entering our waterways.

What do I need to do?

Before building commences:

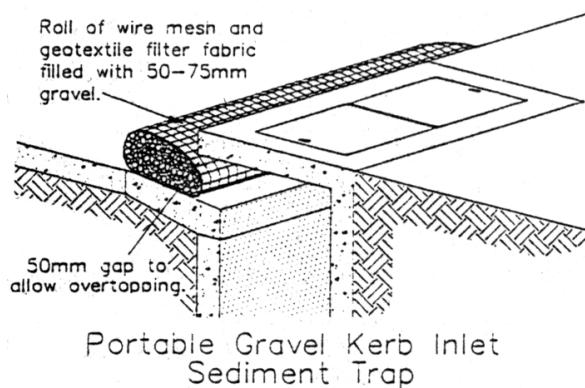
Find the street drains below your work site. Choose the most appropriate method for protection and install prior to commencement of building works. Document these on your Soil and Water Management Plan and ensure staff are aware of its importance.

Installing the controls:

Choose the best down slope control method for your site. Those that collect sediment above the pit are easier to clean but have low storage capacity compared to controls that 'sit' in the pits. Place cones around controls in the gutters or on roads to prevent drivers damaging them.

Portable gravel kerb inlet sediment trap:

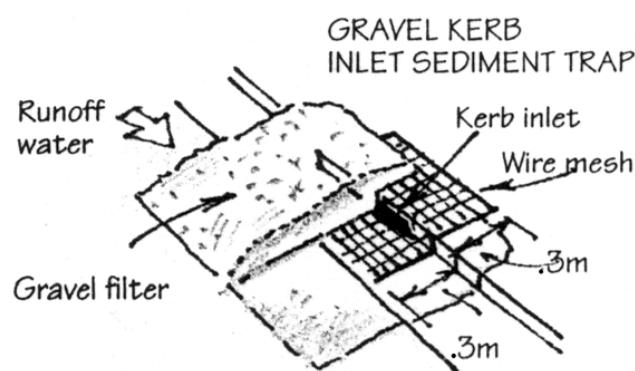
This trap involves a roll of wire mesh and geotextile filter fabric filled with gravel in front of the kerb inlet. It has the benefit of being portable and easily removed for cleaning. Ensure there is a gap at the top to allow overtopping and prevent flooding.



Portable Gravel Kerb Inlet Sediment Trap

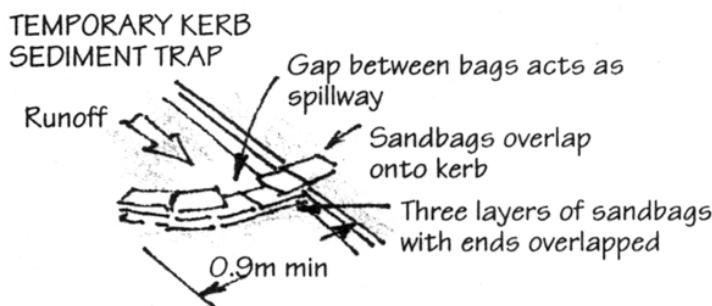
Gravel surface barrier strategy

This method involves placing wire mesh over the drain and placing large gravel upslope of it. The sediment will be filtered out into the gravel with only the clean water entering the stormwater system.



Sandbag kerb sediment trap

Place sandbags in front of flow of water. This will slow down the water enabling sediment to settle out. Two or three of these traps in a row may be required to ensure sediment settles out.



Pit Baskets

There are a range of products that can be placed inside side entry pits that act as baskets or sacks to trap any pollutants that enter. Council permission must be sought before placing any items inside the side entry / gully pit.

Maintenance of the sediment controls:

All sediment collection devices will need to be cleaned regularly to maintain effectiveness. The built up material can be re-stockpiled, used on site or collected by an Earth Moving Company.

Remember:

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- 12. Protection of Gutter and Street Stormwater Drains**
13. Protection of Site Stormwater Pits
14. Sediment Controls
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8.13. ANNEXE 13 Protection of Site Stormwater Pits

Protection of Site Stormwater Pits



'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Protection of Site Stormwater Pits What is it?

This refers to placement of sediment collection devices around any existing stormwater drains on the site.

Why is it important?

Stormwater drains on the construction site are at high risk of having pollutants such as dirt, stockpiled soil, mulch and barkchips washed straight into them. The environmental impact of these materials is significant. Mulch and woodchip decompose absorbing all the oxygen in the water resulting in suffocation of animals. Sediment settles making creeks shallower, smothering animals and plants that live on the creek beds. Many native plants and animals can not survive this and die.



What do I need to do?

Before building commences:

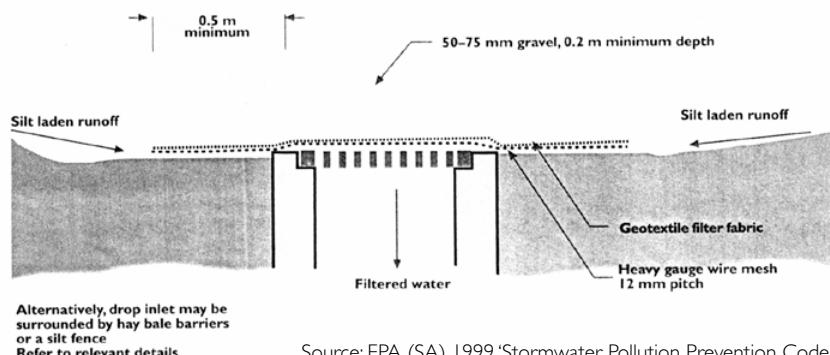
Identify any stormwater drains on the site. Plan the layout of the work site so that any wash down areas, tile or brick cutting areas are not near these drains. Clearly mark the stormwater drains on the site and choose a method of protection for them. Install the protective controls prior to building work commencing. Document all of this on your Soil and Water Management Plan and ensure staff are aware of its importance.

Installing the controls:

There are a range of sediment traps to choose from.

Drop inlet sediment Trap:

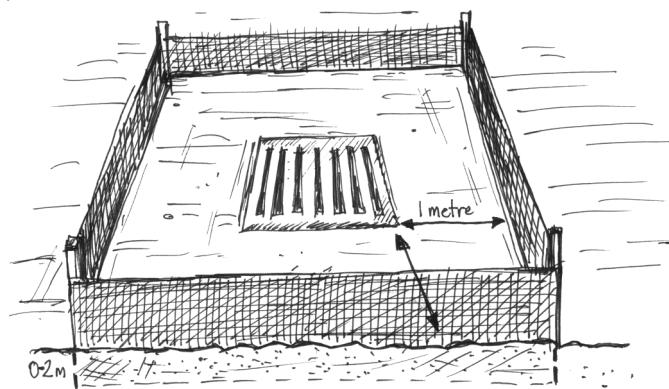
Three layers on top of the drain to trap the sediment. 1) heavy gauge wire netting or mesh 2) geotextile filter fabric with 3) a layer of prewashed 50-75mm gravel on top.



Source: EPA (SA) 1999 'Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry.'

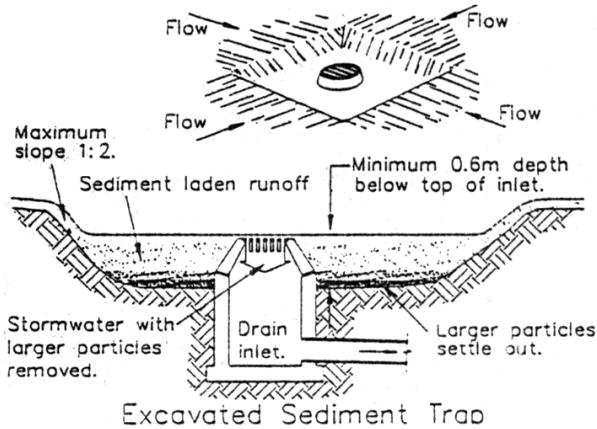
Sediment Fence drop inlet sediment trap:

Sediment fence staked around the drain to trap sediment. Note: It is important to partially bury the fabric so that water and sediment can not just flow underneath. The more space between the fence and the drain, the more chance of sediment settling and the greater the capacity of the trap.



Geotextile Filter Fabric Drop Inlet Sediment Trap

Excavated sediment trap: This is a detention basin technique for on-site drains. The basin depth needs to be at least 0.6m to ensure that water is held in place and sediment can settle out.



Source: Department of Conservation and Land Management (1995) 'Preparing an Erosion and Sediment Control Plan.'

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8.14. ANNEXE 14 Sediment Controls Fact Sheet

Sediment Controls

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.

Sediment Control

What is it?

These are a range of products installed across drainage flows to filter sediment out of water and enable its deposition by slowing down water flow. They include sediment fences, straw bales, grass/vegetation strips and sediment traps/basins. Other controls may be available and advice should be sought from suppliers of Sediment Control Equipment.

Why is it important?

Sediment on building sites causes problems not only for the environment but also for builders. A dirty site causes difficulties in wet weather, increases costs from having to replace stockpiles that are washed away, increases clean up costs, penalties and potential damage to your company's reputation if fined for polluting.

The environmental impact of sediment such as mud and dirt is significant. They smother animals and plants that live on the bottom of creek beds. They settle and make the creeks shallower. Many native plants and animals can not survive this and die. Even though mud and dirt are natural they are still serious pollutants that must be prevented from entering our waterways.



What do I need to do?

Before building commences:

Prepare a soil and water management plan, also known as a sediment control plan. This will be required by Council prior to issuing a construction certificate (either at DA stage or as a condition of consent) and should outline the methods you will use to prevent pollution of the stormwater system throughout the life of the development. There may be different controls needed as the site develops due to changes in drainage patterns and vegetation. This should be thought through and shown on your plans. Council can provide you with sample plans, however it is important that you develop a plan specifically for your site.

Remember the more erosion you can prevent the less sediment will need to be captured! The easiest way to prevent erosion is to leave shrubs and grass in place. This has the dual effect of holding the soil and dirt together as well as filtering and slowing down water flows enabling sediment to settle out.

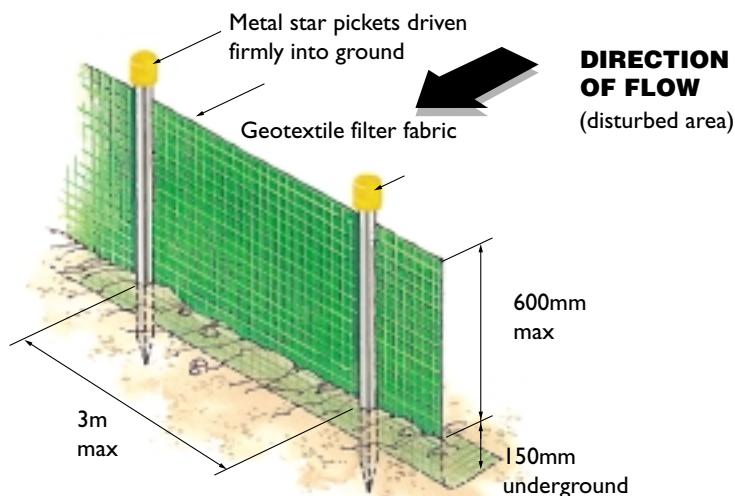
If vegetation needs to be removed try not to do it until immediately before works commence or stage the works to limit the amount of the site that is disturbed at any given time. As you move into a new area, revegetate the finished area. Another way to minimise erosion is to ensure that you only have small amounts of sand, soil and other stockpiles on site at any time. Ensure stockpiles are stored in ways to reduce erosion - see Fact Sheet 8 on Protected Stockpiles.

Installing the controls:

The sediment controls need to be in place prior to the commencement of building works. Remember that the sediment controls will need to be altered as construction occurs and the sites drainage patterns change.

Sediment Fence

A sediment or silt fence is the most widely used strategy. It is constructed from heavy duty geofabric. Although a sediment fence looks like shade cloth it is very different and is not interchangeable. A sediment fence is specifically designed to allow the free passage of water and trap sediment



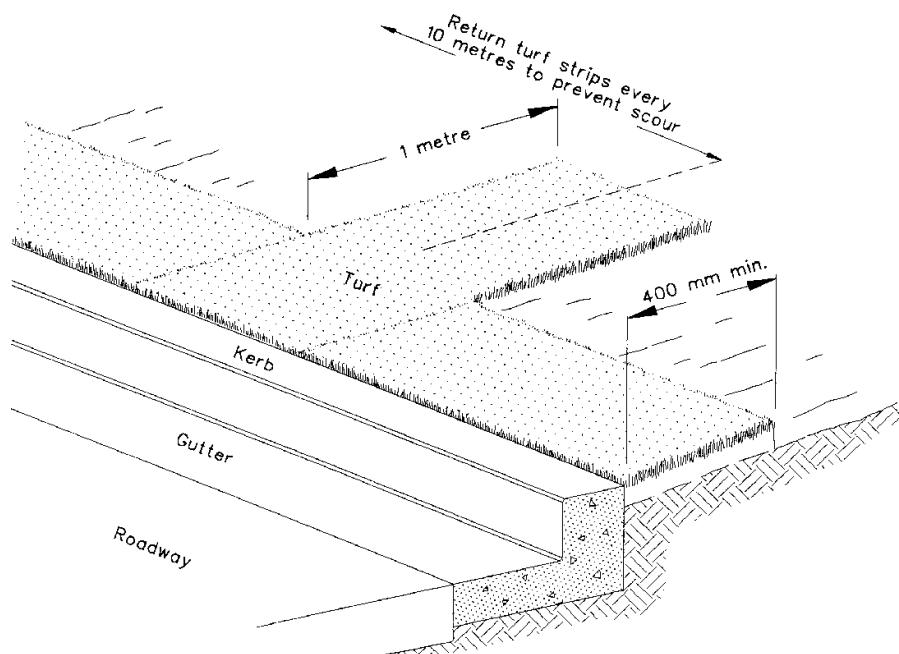
Sediment Fence (continued)

Construction Notes:

1. construct the sediment fence as close as possible to parallel to the contours of the site
2. drive 1.5m long star picket into ground, 3m apart
3. dig a 150mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched
4. backfill trench over the base of fabric (where the sediment barrier has to be located on hard pavement that cannot be trenched, a gravity system held firm by its weight eg: gravel sausage can be used.)
5. fix self supporting geotextile to upslope side of posts with wire ties or as recommended by geotextile manufacturer
6. join sections of fabric at a support post with a 150mm overlap

Grass Strip Filters

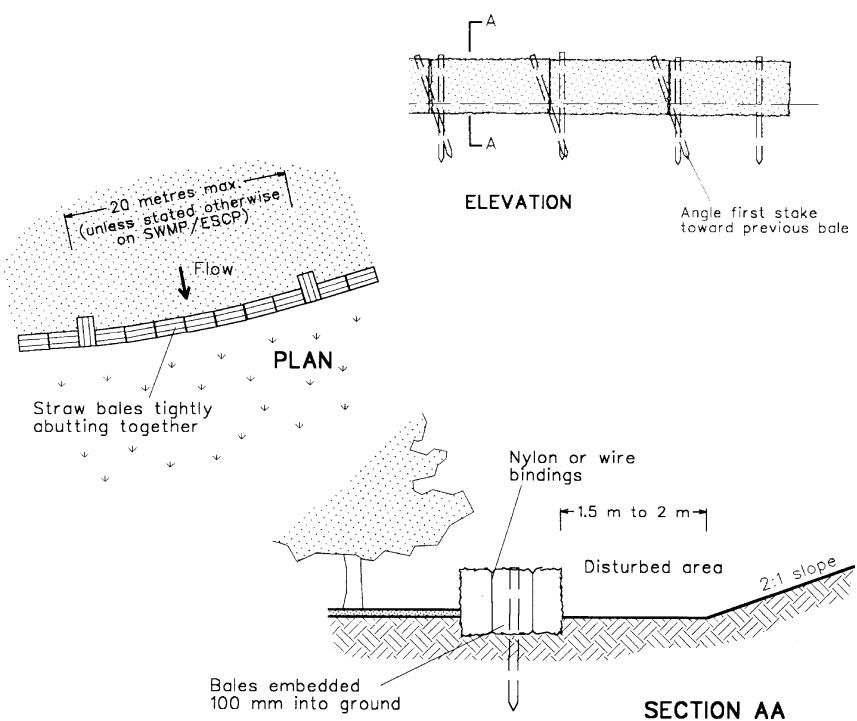
These are strips of undisturbed vegetation or grass planted down slope from earthworks. They provide a simple method of trapping coarse sediment. The flatter and wider the strips are, the more effective they become. They are only suitable on low grades. A 400mm wide grass strip between the kerb and the footpath can be a good last resort sediment control, filtering the water before it enters the stormwater system.



Straw Bale Filters

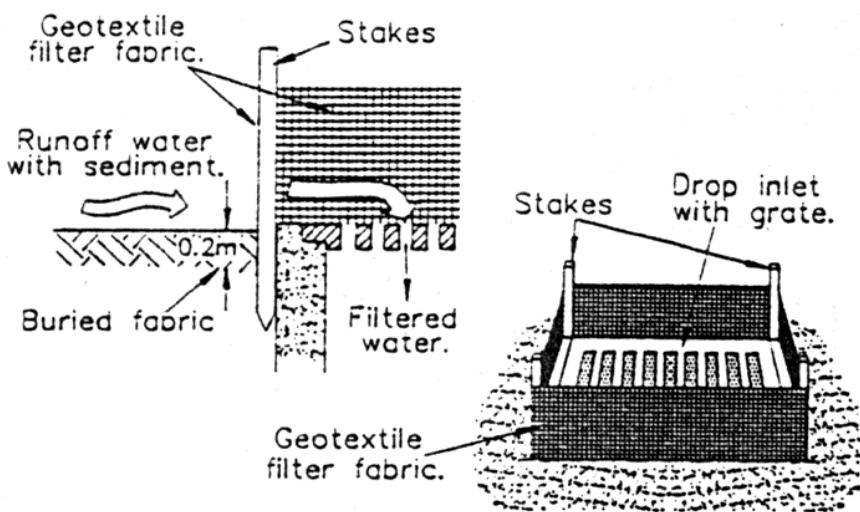
These are straw bales tightly abutted together and partially buried into the ground. They are only suitable for low flows. Filter fabric can be placed in front of them adding to the sediment stoppage. It is recommended that at least 4 bales are used as during a storm any less result in the water simply hitting the bales and flowing around them. This defeats the purpose of using them, which is to slow the water and have it filter through the bales with the sediment settling out.

Straw bales are usually used incorrectly. Seek Council guidance if unsure.

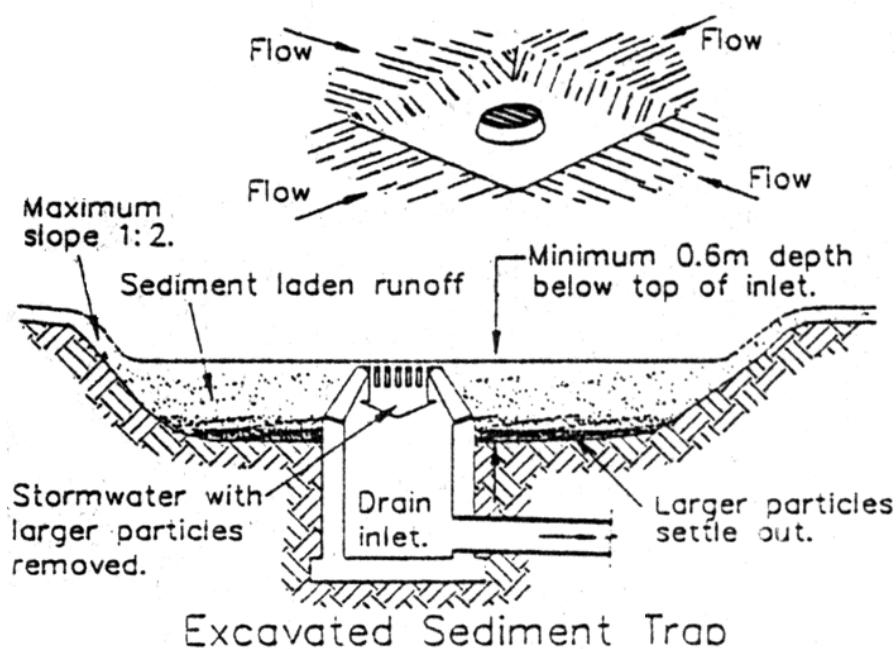


Sediment Traps / Ponds

These are basins designed to capture a concentrated sediment laden flow and store it under still conditions enabling the silt to deposit at the bottom of the trap. The effectiveness of the traps to remove fine particles may be improved by the placement of filter fabric along the uphill face of the embankment.



Geotextile Filter Fabric Drop Inlet Sediment Trap.



Maintenance of the sediment controls:

Sediment controls will naturally fill up with sediment and need to be maintained to stay effective. This involves removing the built up sediment as well as ensuring that they are still in good working condition.

Often sediment controls will be moved during works and they should be checked daily to ensure they have been put back in place properly.

Straw bales deteriorate and can end up polluting waterways. Their average life is 3 months and should be inspected regularly. Enclosing bales in sediment fence reduces this risk. At the end of their life they can be used as mulch on gardens. Sediment fences should also be checked regularly for holes.

Some Councils do not allow straw bales to be used, so check with them when planning your controls.

Soil and water controls should be kept in place until works are completed. If landscaping is not completed prior to handover ensure that the new owners are aware of their responsibility to prevent pollution from entering the stormwater system.



Suppliers of Sediment Control Equipment

There are a large number of companies that supply sediment control equipment listed in Outdoor Design Source and the Yellow Pages. While we do not necessarily endorse any particular company or product we thought it useful to list some company details as a starting point for you:

Total Erosion and Pollution ph: 02 9524 0155

GSE Lining Technology ph: 02 9821 2977

Hardware House

Maccaferri Pty Ltd ph: 02 9648 3800

Mulch Mat Products ph: 02 9905 5344

Naturelink Environmental ph: 02 4578 4588

Polyfabrics Australia Pty Ltd ph: 02 9829 5599

Spraygrass Landscapes ph: 02 9627 4352

Remember:

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It is illegal for any substance other than rainwater to enter the stormwater system. If you do have an accident and pollution occurs you are required by law to notify the Council so that they can work with you to minimise any harm to the environment.

Penalties for polluting the stormwater system range from \$750 on the spot fines to \$1 million and seven years in gaol. Both companies and individuals can be fined.

Council Officers and the EPA enforce the environmental legislation and do routine inspections of building sites. They can issue notices to make companies clean up sites, change the way they are managing the sites and if necessary, cease work. They will attempt to work with you but penalties will be issued if a satisfactory environmental outcome is not achieved.

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**THE DRAIN
IS JUST FOR
RAIN**

List of fact sheets available from Council:

1. Diversion of Upslope Water
2. Dust Control
3. Early installation of Roof Drainage
4. Excavation Pump Out
5. Protected Concrete, Brick and Tile Cutting
6. Protected Concrete Delivery
7. Protected Service Trenches
8. Protected Stockpiles
9. Protected Wash Areas
10. Protected Waste Management and Chemical Storage
11. Protecting Vegetation
12. Protection of Gutter and Street Stormwater Drains
13. Protection of Site Stormwater Pits

14. Sediment Controls

15. Soil and Water Management Plans
16. Stabilised Site Access

For further information on preventing pollution from building and construction sites contact your local council:



**Southern Sydney Regional
Organisation of Councils**

8.15. ANNEXE 15 Soil & Water Management Plans Fact Sheet

Soil and Water Management Plans

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.



Soil and Water Management Plans What are they?

A Soil and Water Management Plan (also called an erosion and sediment control plan) is the formal plan designed to control erosion and sedimentation on a building site. It details the specific methods of erosion and sediment control that will be used to meet the specific site conditions at the various stages of construction. A Soil and Water Management Plan will be required by Council prior to issuing a construction certificate (either at DA stage or as a condition of consent).

Why are they important?

The Building and Construction Industry has a large impact on the environment, in particular our waterways. Sand, soil, cement slurry, paint and other building materials that enter our waterways kill fish and aquatic plants, silt up streams, and block stormwater pipes, leading to increased flooding. Due to the high number of construction sites even small amounts of pollution from each site is enough to cause significant damage to our waterways. Soil and Water Management Plans help in reducing pollution from building sites.

What do I need to do?

Develop a Soil and Water Management Plan along with other site documentation. The plan needs to include a minimum of:

- Basic site information
- Property boundary
- North point
- Contours initial and final
- Date
- Author
- Construction details
- 'Site' or 'disturbed area'
- Vehicle access point
- Location of stockpiles and secure chemical storage area
- Location and details of all temporary and permanent soil and water management controls
- Staging of works - the Soil and Water Management Controls will need to be altered as the site is developed and drainage patterns altered. The phases and controls to be used for each phase should be specified (major projects only)
- Location of all drains, downpipes, pits and watercourses
- Location of vegetation to be removed
- Revegetation program
- Stormwater management
- Integration with onsite detention / infiltration
- Stormwater discharge point if proposed

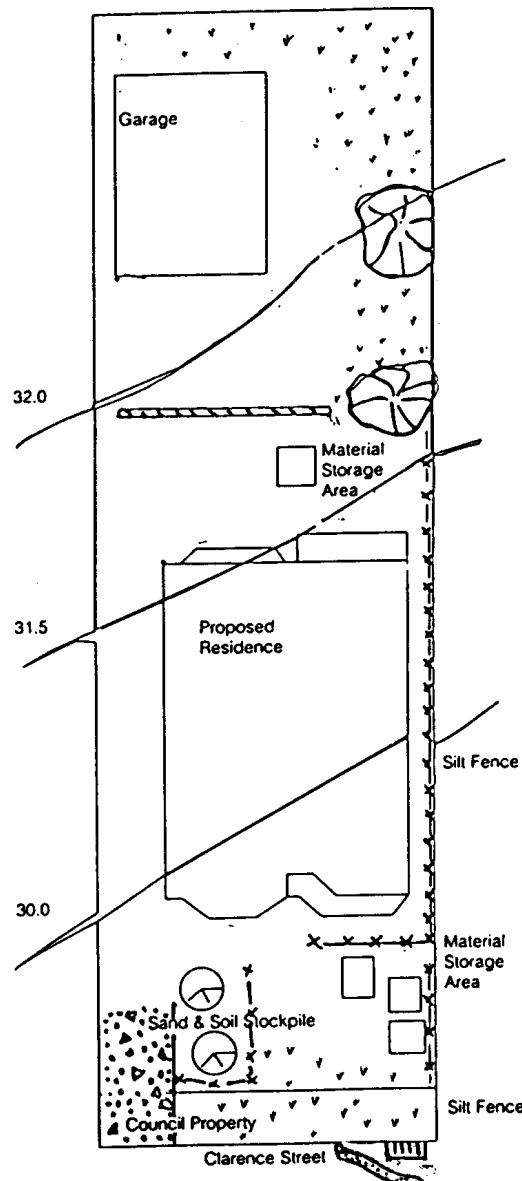
Other details may be required depending on the scale of the development and the specific requirements of the site- Council can advise on this and provide you with example Plans. Remember the example Plan will need to be modified to meet the needs of your specific site.

Councils may accept written plans stating what you will do to control sediment and erosion for smaller sites and developments that involve a minimum amount of earthworks, clearing or delivery of building materials. Contact the local Council for more information.



Example: Soil & Water Management Plan for Larger Sites

sample
only



Note

- 1 All erosion and sediment control measures to be inspected and maintained daily by site manager
- 2 minimise disturbed areas
- 3 all stockpiles to be clear from drains, gutters and footpaths
- 4 drainage is to be connected to stormwater system as soon as possible
- 5 roads and footpath to be swept daily
- 6 If you do not comply you may be liable to a \$750 or \$1500 fine

Legend

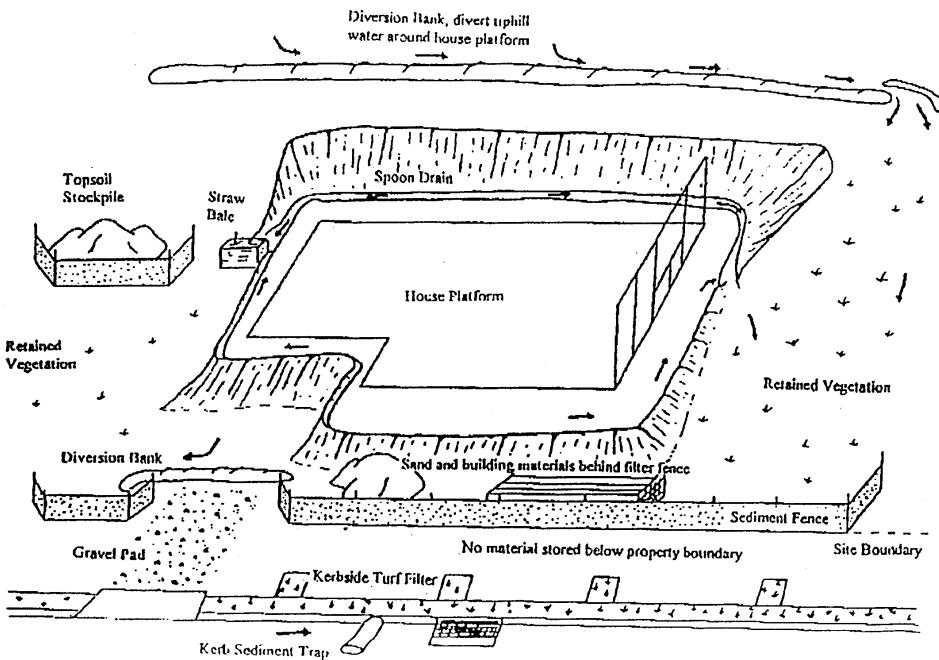
- Undisturbed vegetation
- Silt Fence
- Stockpiles
- Gravel access
- Geotextile fabric filled with gravel
- water diversion
- Stormwater pit.

Drawn by: Mr House Date: 02/08/00	Location: 3 Smith Street, Bankstown	Scale: Not to Scale	Applicant: Mr Andrews
--------------------------------------	--	---------------------	-----------------------

Example: Soil & Water Management Plan for Small Restrictive Site

Rear Lane			
<p>Garage and court yard may also be used for storage of building material</p> <p>The extents of the storage area is to be barricaded</p> <p>Slope of footpath</p> <p>Location of tiles, pavers, brick pallets</p> <p>Gutter flow</p> <p>Existing garage</p> <p>Court Yard</p> <p>Residence under construction</p> <p>Existing garage</p> <p>Court Yard</p> <p>Provide Pedestrian access Min 1.2 metres wide between property line and storage area.</p> <p>Extent of storage area to be approved by Council</p> <p>Location of stockpile material. All stockpile material located on footpath is to be wrapped in plastic material, or stored in bale bags on pallets</p> <p>Rolled wire mesh and geotextile fabric filled with gravel</p> <p>22</p> <p>21.S</p>	<p>Note</p> <ol style="list-style-type: none"> 1 All erosion and sediment control measures to be inspected and maintained daily by site manager 2 Existing garage and court yard can be used as storage area for building materials 3 Council approval must be obtained prior to the placement of any materials on the footpath 4 all stockpiles to be clear from drains, gutters and footpaths 5 drainage is to be connected to stormwater system as soon as possible 6 roads and footpath to be swept daily 7 If you do not comply you may be liable to a \$750 or \$1500 fine <p>Legend</p> <ul style="list-style-type: none"> Stockpiles Geotextile with gravel Footpath Stormwater pit 		
Drawn by: Mr House Date: 02/08/00	Location: 3 Smith Street, Bankstown	Scale: Not to Scale	Applicant: Mr Andrews

Example: Soil & Water Management Plan for Larger Site



Remember:

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13. Protection of Site Stormwater Pits
14. Sediment Controls
- 15. Soil and Water Management Plans**
16. Stabilised Site Access

For further information on preventing pollution from building and construction sites contact your local council:



Southern Sydney Regional Organisation of Councils

8.16. ANNEXE 16 Stabilised Site Access

Stabilised Site Access

'Do it right on site' is a project to help the construction industry protect the environment and achieve the many benefits that come from doing so.



Stabilised Site Access

What is it?

A single entry/exit point for the site that is stabilised to reduce the tracking of sediment off the site on to Council's road and the stormwater system.

Why is it important?

A stabilised track allows vehicles to enter and exit the site safely during all weather conditions without either destroying valuable grass or carrying large amounts of mud and dirt on to the paved road surfaces. It provides a clean, dry surface for vehicles to enter and unload. The stabilised site access has a rough coarse surface which traps mud from vehicle tyres as they roll across it.

Mud and dirt have significant impacts on our waterways. They smother animals and plants that live on the bottom of creek beds. They settle and make the creek shallower. Many native plants and animals can not survive this and die. Even though mud and dirt are 'natural' they are still serious pollutants that must be prevented from entering our waterways.

What do I need to do?

Before building commences:

Identify the best location to place the entry/exit point- ideally it should be in an elevated position with little or no water flowing to it from upslope and away from any down slope stormwater pits. All deliveries should be able to be made through this point. Document it on your Soil and Water Management Plan and ensure staff are aware of its importance.

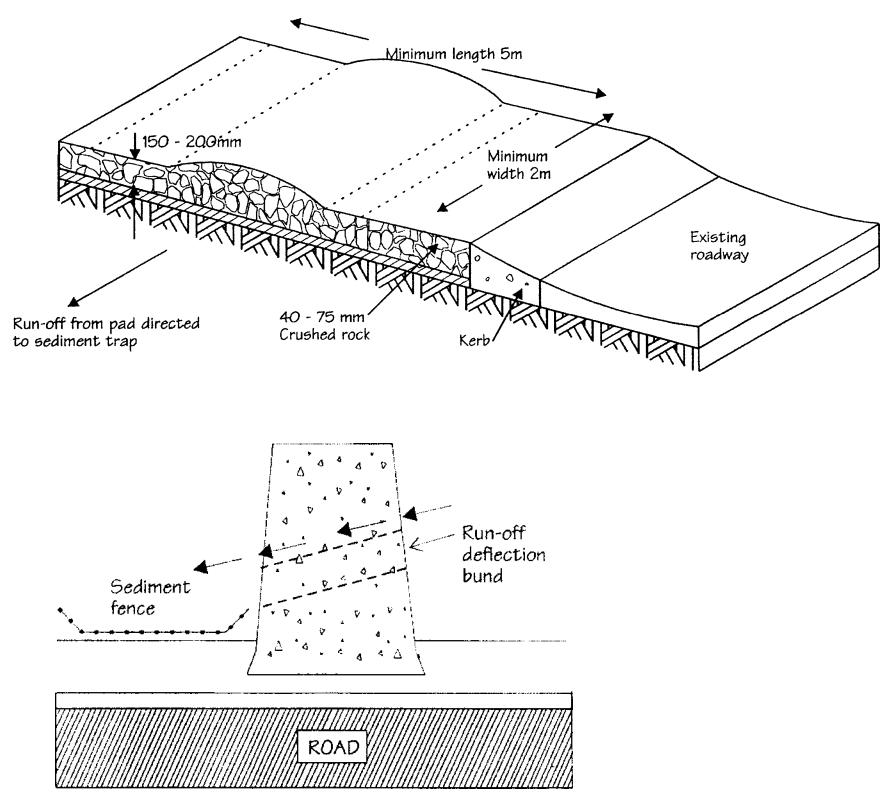
Installing the stabilised access point:

The recommended construction method for stabilising the access point is laying down 200mm of aggregate or recycled concrete greater than 40mm in size. (note: crushed sandstone is not suitable).

Where the access area slopes toward the road, a diversion hump should be installed across the stabilised area to direct stormwater run-off to the side where it can be filtered by a sediment fence. If the construction process enables it the permanent driveway can be laid and used as the access point.

Construction notes:

1. Strip at least 150mm of topsoil, level area and stockpile in space available
2. Compact subgrade
3. Cover area with needle punched geotextile
4. Construct a 200mm thick pad over geotextile using aggregate at least 40mm in size. Length ideally from kerb to building footprint.
5. Construct diversion hump 300mm thick immediately within boundary to divert water to a sediment fence or other sediment trap



Fact Sheet 16

On larger sites cattle grid or shaker grids can also be installed at the access point. These allow the wheels to turn a couple of times and shake off excess dirt. If mud still remains wheels can be washed as long as the wash water does not drain to the street. It should drain to a detention area on site to allow the sediment to settle out and the water to evaporate or can be pumped into undisturbed grassed areas where it can soak into the ground.

Maintenance of the stabilised access point:

As vehicles use the stabilised access point they will slowly compact the gravel or rock. If the access point becomes smooth it will no longer help control sediment as it is the rough surface that slows water flows and shakes off mud and dirt from tyres. It is therefore important to monitor the surface of the access point and to add new gravel or rock as needed. Roads should be inspected for any sediment that has escaped the site at the end of each day and swept if necessary. This should also be done when ever rain looks likely.



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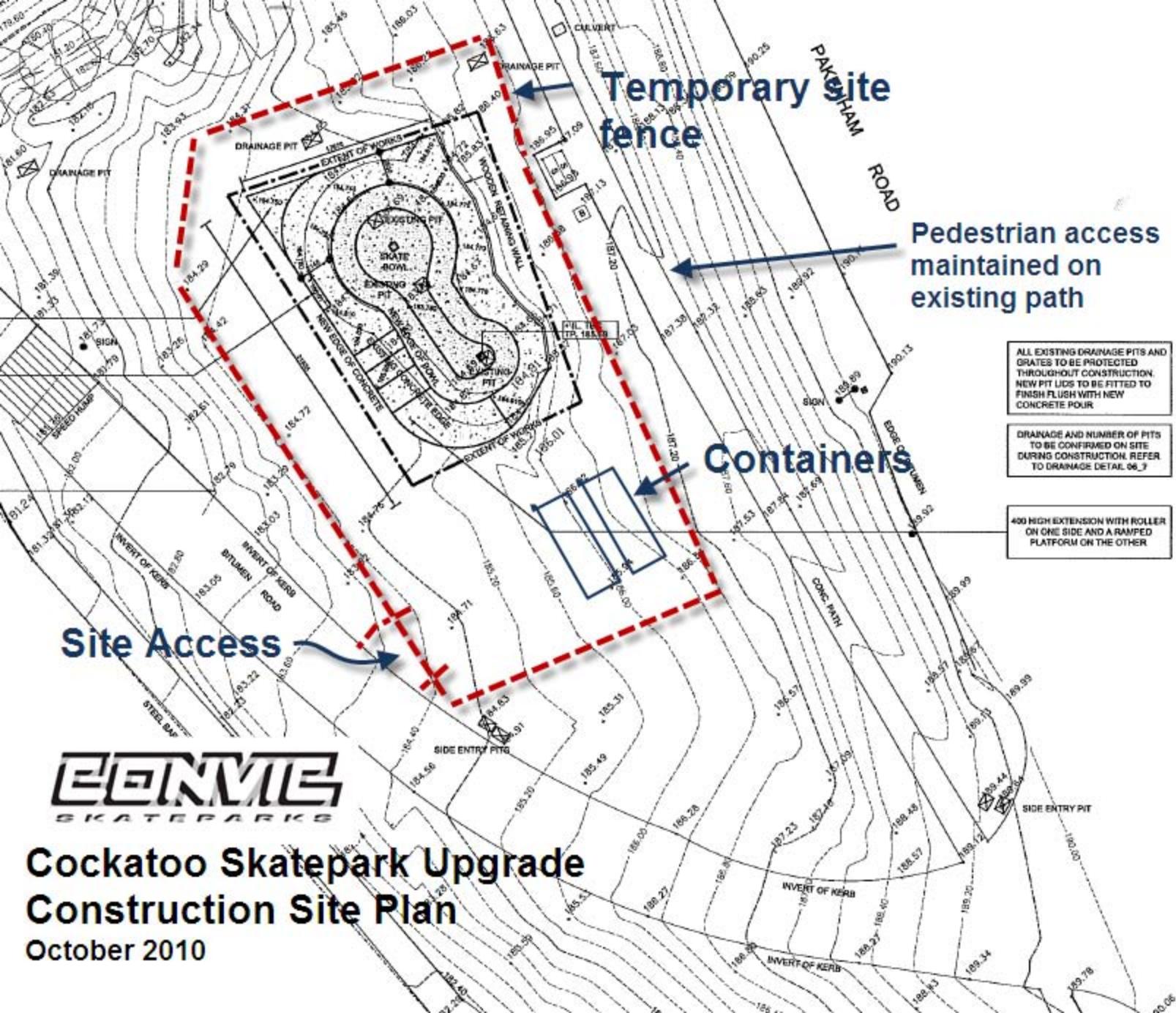
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15. Soil and Water Management Plans

16. Stabilised Site Access

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8.17. ANNEXE 17 Site Plan



EENIE
SKATEPARKS

Cockatoo Skatepark Upgrade Construction Site Plan

October 2010

8.18. ANNEXE 18 Environmental Management Site Inspection Checklist.

ENVIRONMENTAL MANAGEMENT SITE INSPECTION CHECKLIST

PROJECT: _____

INSPECTING PERSON: _____

DATE: _____

RATING	<input checked="" type="checkbox"/>	Acceptable	NA	Not Applicable	R	Rectified during inspection
COLUMN	<input checked="" type="checkbox"/>	Rectification within 24hrs required			S	Instruction Issued to Personnel

ITEM	RATING	ITEM	RATING
1. New Drainage		Sediment/erosion controls effective	
Sediment controls installed		Sediment/erosion controls maintained	
Sediment controls effective		Build up removed	
Sediment controls maintained		6. Unvegetated areas	
Build up removed		Sediment/erosion controls installed	
2. Sediment Controls, silt fences and traps		Sediment/erosion controls effective	
Sediment controls installed		Sediment/erosion controls maintained	
Sediment controls effective		7. Vehicle and machinery	
Sediment controls maintained		Compliance with working hours limits	
Build up removed		Resident consultation has occurred	
3. Haul Roads		Vehicles/machinery maintained	
Rumble grids installed		Noise reduction measures in place	
Rumble grids effective		8. Waste Management	
Rumble grids maintained		Litter collected from site	
Build up removed		Bins installed	
Entry and exit road clean		Bin Placement effective	
4. Cut-off and diversion drains		Bins maintained	
Drains installed		Waste minimisation plan in place	
Drains effective		Staff consulted and trained	
Drains maintained		9. Other:	
Build up removed			
5. Stockpiles and bare slopes			
Sediment/erosion controls installed			

Comments _____

Follow Up on Previous Inspections			
Date	Item No.	Result	Further Action

INSPECTING PERSON: _____

DATE: _____