

Guidelines for Erosion and Sediment control on a building site



This booklet was originally created by the former Department of Land and Water Conservation 2001 (ISBN 18 75994 70 X) and has been adapted, with permission, by Hawkesbury City Council 2013.

This publication had been developed for *Keep the Soil on Site* by the former Hawkesbury-Nepean Catchment Management Trust. All material was based on "Managing Urban Stormwater – Soil and Construction" (3rd Edition, 1998), also known as the "Blue Book".



This document contains important information.
If you do not understand it, contact the
Telephone Interpreter Service on 131 450.



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WARNING!

\$4,000

On-the-spot fine

It is illegal to allow soil,
cement slurry or other
building materials to enter
the stormwater system

**Protect Our
Waterways**



Introduction

This handbook provides a practical guide to best practice to reduce stormwater pollution from building sites. These guidelines will help you to comply with your statutory environmental obligations. This document does not override advice issued to you by Council.

Construction disturbs soil and creates dust and debris. Run-off from a building site travels down the gutters and drains to creeks and canals and eventually ends up in a river, lake or the sea.

Polluting stormwater is an offence that can result in on-the-spot fines or legal proceedings.

Although a single block of land may seem insignificant, if you consider all the building sites in the region, erosion has a huge effect on water quality. Studies by the EPA show that one building site can lose up to four truckloads of soil in a single storm.

It is important to keep soil in the site.

Everyone on site is responsible. Preventing site erosion saves money for you and your client and protects you from prosecution.

Be sure that all of your employees and contractors understand what they need to do.

Section 1 The Law and You

There are many laws, regulations, policies and guidelines to help protect the environment in NSW. These laws give guidance to business and industry. In some cases, if you break these laws it is an offence that can carry serious penalties and in most instances the prosecutor does not need to prove that you intended to cause the incident. Even accidents can result in prosecution. You and others in your business should be aware of these laws and take all reasonable care not to harm the environment.

The Protection of the Environment Operations Act (POEO)


The Protection of the Environment Operations Act (POEO) came into effect on 1 July 1999 and has consolidated the following, earlier acts:

- Clean Air Act 1961
- Clean Waters Act 1970
- Noise Control Act 1975
- Pollution Control Act 1970
- Environmental Offences and Penalties Act 1989
- Regulatory sections of the Waste Minimisation and Management Act 1995

All owners, managers and operators should ensure that they know all about environmental laws and their responsibilities in relation to these laws.

The POEO Act focuses on environmental management. Since 1 July 1999, local councils hold increased powers in relation to environmental management in their local area.

These changes mean that owner-builders, builders and landscapers are directly responsible for preventing sediment and construction wastewater from leaving a building site. While the EPA monitored builder's actions in the past, now councils have the power and responsibility to monitor the industry and issue penalty infringement notices.



Under the POEO Act, **on-the-spot fines of \$4000 may be imposed on builders, owner-builders or landscapers** of land where pollution has the potential to, or has entered gutters, drains and waterways. In addition, you may be charged a \$320 administration fee.

Supervisors need to take reasonable and practical steps to ensure that workers under their control on the site (e.g. subcontractors) do not breach environmental laws.

The law does not recognise:

- whether or not the site is difficult;
- problems that might be encountered in implementing the plan; or
- whether or not you are familiar with good soil and water standards.

Note: Workers who become aware of significant environmental harm in association with their work, e.g. loss of sediments from their site, have a legal duty under the POEO Act to notify their employer.

Local councils may issue the following:

- Clean up notices
- Prevention notices
- Penalty infringement notices
- Compliance cost notices
- Noise control notices
- Noise abatement notices

Section 2 Control and Management Plans

Erosion and Sediment Control Plans (ESCP) or *Soil and Water Management Plans (SWMP)* are the key to managing erosion and sediment on construction sites and subdivisions. These plans are submitted to council at the Development Application (DA) stage. It is the size of works that dictates which kind of plan will be used. Both plans are principal management tools used during works.

ESCP's identify the erosion and sediment control for relatively small sites between 250 and 2500m² in size.

SWMP's identify soil and erosion controls (including whether a sediment retention basin is required) for "green field" or "urban renewal or infill" developments in excess of 2500m² of actual developed area.

Where circumstances change during construction, councils may require erosion and sediment control measures in addition to those measures specified in the plan.

Other contractors, such as landscapers, should check any relevant *ESCP*'s or *SWMP*'s and ensure that any DA conditions do not affect their work.

For more details, please refer to Section 3 "Plan Preparation" in the publication "Managing urban Stormwater – Soil and Construction" (3rd Edition) – commonly known as the "Blue Book".

A form titled '*Erosion and Sediment Control Plan*' is available at www.hawkesbury.nsw.gov.au and can be used to provide details of your *ESCP* to Council at the DA stage.



Section 3 Suggested erosion and sediment controls for a “typical” development site

- Minimise area to be cleared and leave as much vegetation as possible. Install temporary fences to define ‘no-go’ areas that are not to be disturbed.
- Install sediment fence/s along the low side of the site before work begins.
- Divert water around the worksite and stabilise channels ensuring that you do not flood neighbouring properties.
- Establish a single stabilised entry/exit point. Clearly mark the access point indicated for all supplies.
- Leave or lay, a kerb-side turf strip (e.g. the nature strip) to slow the speed of water flows and to trap sediment.
- Check the erosion and sediment controls every day and keep them in good working condition.
- Stockpile topsoil within the sediment controlled zone.
- Always be aware of the weather forecast.
- Stabilise exposed earth banks (e.g. vegetation or erosion control mats).
- Fill in and compact all trenches immediately after services have been laid.
- Install site waste receptacles (mini-skips, bins, wind-proof litter receptors).
- Sweep the road and footpath everyday and put soil behind the sediment controls. *Hosing down roads and footpaths is unacceptable.*
- Connect downpipes from the guttering to the stormwater drain as soon as the roof is installed.
- Revegetate the site as soon as possible. The erosion and sediment control devices must be kept in place until 70% of the site has been revegetated.



Section 4 Fact Sheets

Fact Sheet 1: Site-Planning

The overall principle is to stop both erosion and sediment from leaving your site. However, this requires careful planning and forethought. The way you run your building site can have a large impact on the amount of pollution in stormwater run-off.

When planning the site-layout, building location and earthworks, it is possible to make sure that control devices don't interfere with the building process.

Your council will have guidelines for you DA submission, including:

- Avoid stripping and excavating until ready to build.
- Minimise the reshaping of the land; any fill needs to be well compacted.
- Allow stormwater to flow around the building area and any disturbed areas.
- In new estates, temporary revegetation may be required.
- Allow room for a sediment barrier (i.e. sediment fence) to be located along the lower end of the disturbance.
- Ensure that stockpiles are stored within the sediment fence.
- Avoid long, steep, unstable driveways.
- Limit the amount of material on-site to what is required at any one time.
- Ensure that all material is immediately removed from the site at completion of work.
- Instruct site workers on the need to prevent materials from washing or blowing into the stormwater system.
- Ensure that all materials are immediately removed from the site when work is completed.

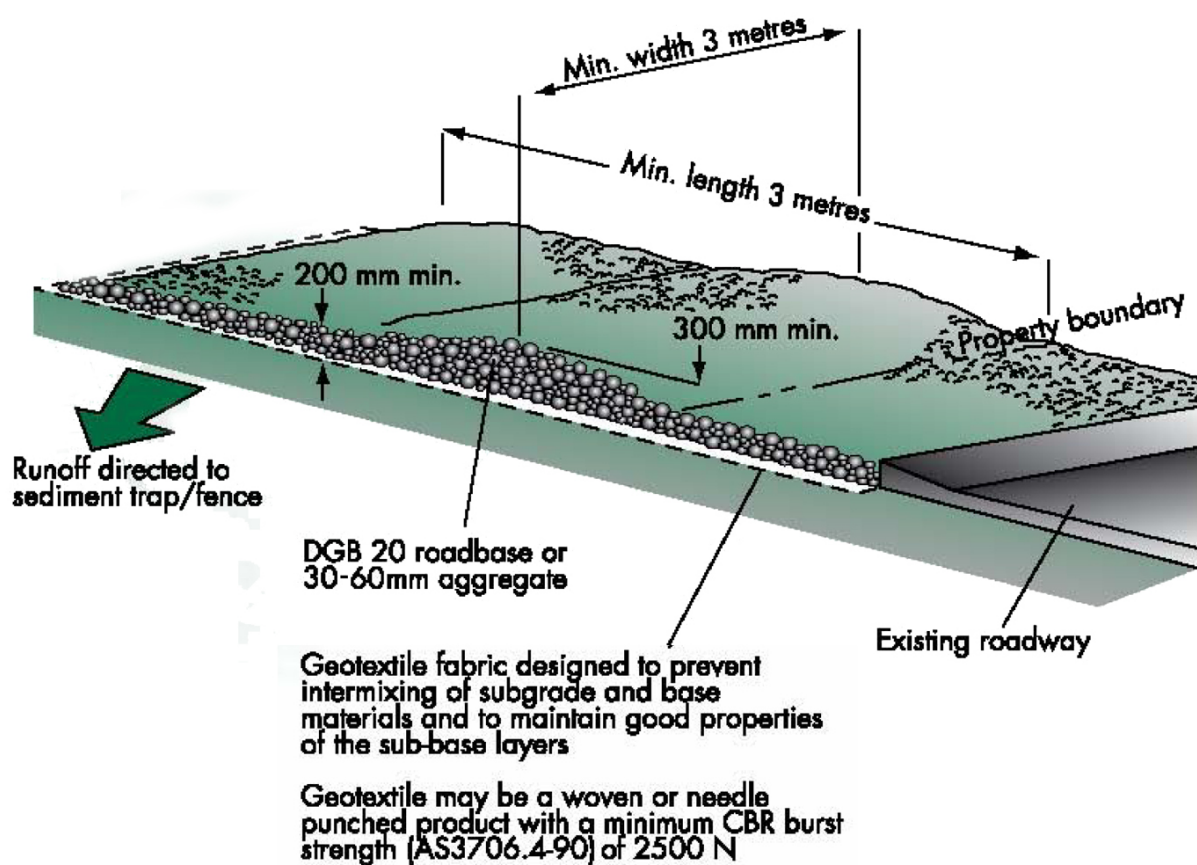
Fact Sheet 2: Stabilised Entry/Exit Point

Where possible, the entry/exit point of the site should be managed so that sediment is not tracked off the site and it should be restricted to one stabilised location.

Note: An appropriate location for the construction entrance may not be the location of the permanent driveway.

The recommended construction method for stabilising the access point is 200mm of aggregate at 30-60mm in size; *crushed sandstone is not acceptable*. The access should be a minimum of three metres wide and eight metres long or to the building alignment for all residential or subdivision sites.

Where possible, the entry/exit point should extend from the kerb to the building footprint. Remember that a large truck must be able to gain access to this site without leaving the stabilised access.



Where the entry/exit 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.

Stabilised access points only require periodic maintenance with the topping up of the rock. Street sweeping on adjacent roads may still be required.



Advantages

The advantages to builders of stabilising the access point is that restricting vehicular movement allows the entire site to be more stable and durable during wet weather. After wet weather, work can begin on the site more quickly due to the area becoming more stable. This prevents the most heavily travelled routes from becoming a source of sediment and reduces the likelihood of vehicles becoming bogged on-site.

Remember: Extra crushed rock or recycled concrete needs to be added to maintain its effectiveness.

Construction Notes

1. Strip at least 150mm of topsoil, level area and stockpile site if space is available.
2. Compact sub-grade.
3. Cover area with needle-punched geotextile.
4. Construct a 200mm thick pad over geotextile using aggregate at least 40mm in size. Minimum length of three metres or to the building alignment; minimum width three metres.
5. Construct diversion hump immediately within the boundary to divert water to a sediment fence or other sediment trap.

Fact Sheet 3: Sediment Fencing

The most efficient and widely accepted sediment barrier for construction site is a specially manufactured geotextile sediment fence. Sediment fences act like dams – trapping the sediment while allowing the water to leave the site. They are effective in retaining suspended solids coarser than 0.02mm. They are simple to construct, relatively inexpensive and easily moved as development proceeds.

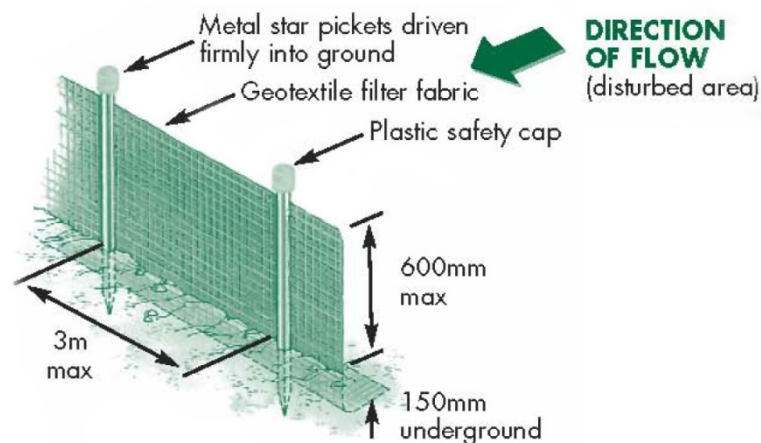
When using a sediment fence, keep in mind that it will be effective within the following parameters:

- It is generally not designed to filter concentrated flows and therefore needs to be placed following the land contours whenever possible.
- It should last for up to six months but requires regular maintenance and weekly checks are needed. The performance of a sediment fence diminishes considerably when crushed by delivery of building materials. It must remain vertical and keyed into the soil.
- Where the sediment fence is not installed correctly, water will inevitably flow through the point of least resistance. Damaged fences must be repaired promptly.
- Sediment fences need to be trenched in at least 150mm and buried so that the water flows through and not underneath.
- Soil on both sides of the fence must be compacted to avoid seepage under the barrier.

On a typical residential building block (approx. 700m²) a sediment fence should work well providing it is situated on the low side of the block. If there needs to be a break in the fence for any reason (i.e. an access point) a contour bank/diversion bank or bund needs to be constructed to direct water back to the fence. The sediment fence must have uphill returns at either end to prevent sediment flowing around it.

Advantages

It is a simple strategy that is easily installed, shifted or removed. Sediment fences work well and, if maintained, will last for the duration of the construction stage.



Construction Notes

1. Construct sediment fences as close as possible to follow the contours of the site.
2. Drive 1.5m long posts into the ground, maximum three metres apart.
3. Staple to 40mm square hardwood posts or wire tied to steel posts.
4. Dig a 150mm deep trench along the up-slope line of the fence for the bottom of the fabric to be entrenched.
5. Backfill trench over base of fabric and compact on both sides.

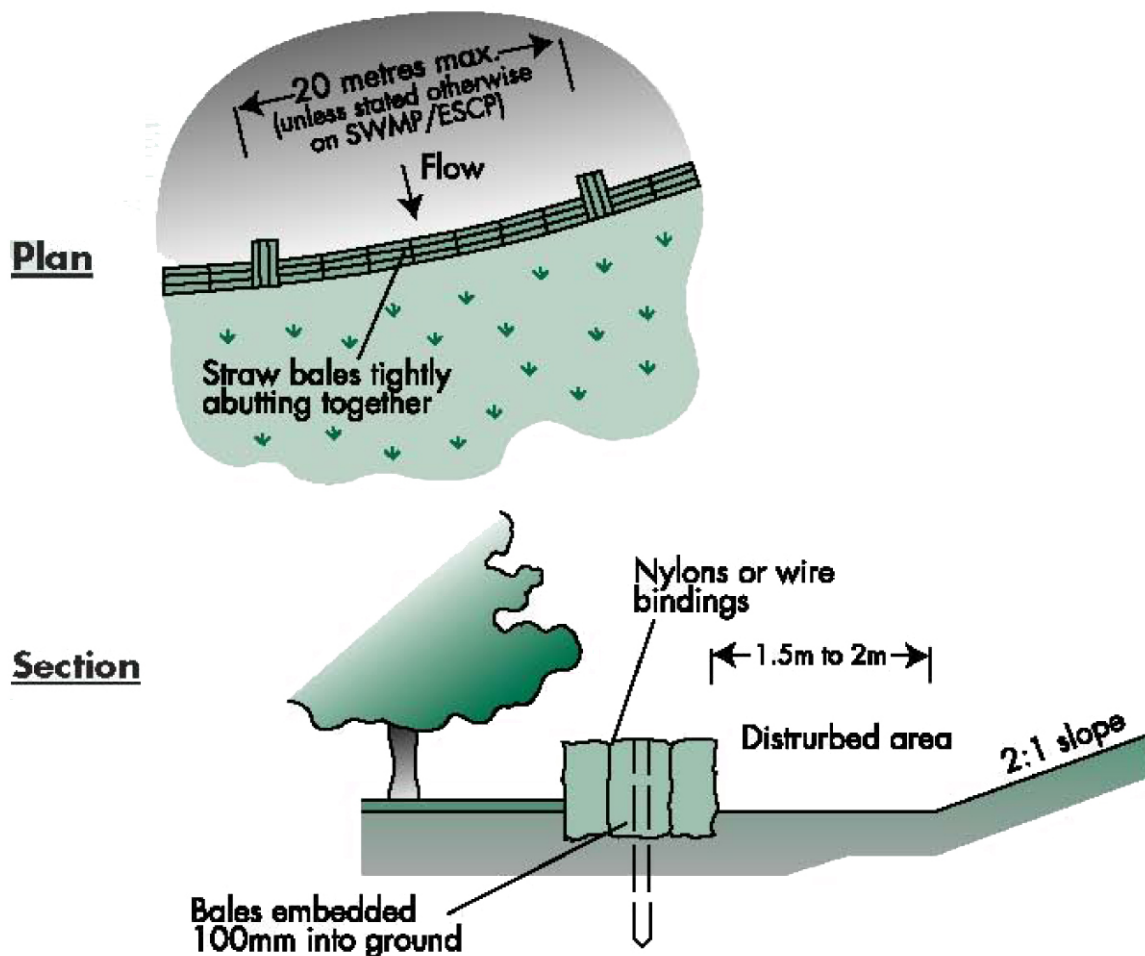
Fact Sheet 4: Straw Bale Filter

Straw bales are suitable for low flows of water. It is only recommended that these are used in limited applications such as reducing the flow velocity.

The return of straw bales every 20 metres is recommended to ensure some stability for this style of barrier.

Note: The straw bales need to be imbedded into the ground and held firmly in place with star pickets.

The minimum number of bales to be used is four; if only two bales are used, the water will simply hit the bales during a storm event and flow around, increasing erosion. The bales must dam the run off and allow the sediment to settle behind the bales.

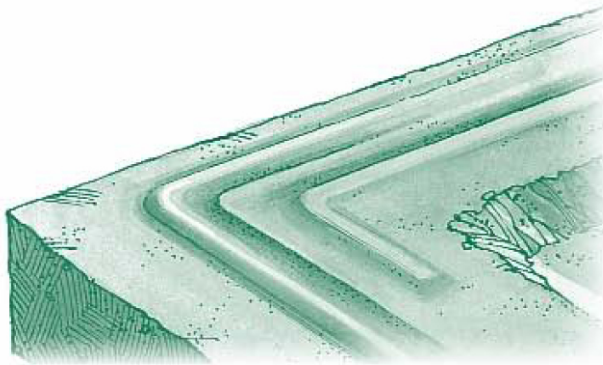


Note: Straw bales do not filter sediment-laden waters. They will only hold back water if installed correctly.

Fact Sheet 5: Diversion of up-slope water

Where practical, or where stormwater run-off is more than 0.5 hectare, up-slope water should be diverted around the slope. Stormwater can be diverted with the use of diversion banks.

Diverted stormwater should be discharged onto stable areas and should not be diverted into neighbouring properties unless written permission is obtained from the land owner/s. Avoid directing stormwater towards the site's entry/exit point.



Advantages

There is a reduction in the amount of water that must be treated. The site is kept drier during wet periods.

Remember: On steep slopes, depending on the duration of works and expected water flows, it may be necessary to line the earth drain with turf or a geotextile fabric to avoid unnecessary soil erosion.

Fact Sheet 6: Stockpiles and storage of material

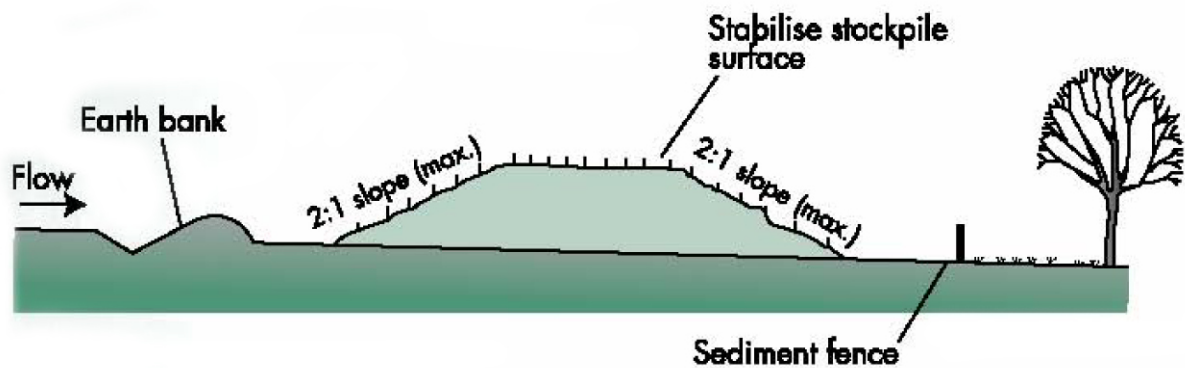
Stockpiles and building materials are not to be stored on the footpath or within the road reserve. Where necessary, stockpile losses can be minimised with the use of covers.

All stockpiles and building materials should be located behind the sediment controls. Stockpiles should be protected from run-on water by placing diversion banks up-slope and with sediment control structures placed immediately down-slope.

The location of all stockpiles on-site should be at least two metres (preferably five metres) from hazard areas, especially likely areas of concentrated or high velocity flows such as waterways, kerb inlet pits, paved areas and driveways. The height of the stockpile should be less than two metres.

Note: The incorrect storage of stockpiles is a major source of stormwater pollution.

All site workers, subcontractors and delivery drivers need to be advised of their responsibilities to minimise soil erosion and pollution. The delivery driver must be given a designated location to deliver materials on-site. This practice will also keep sediment from being discharged to the stormwater system.



Fact Sheet 7: Grass Filter Strips

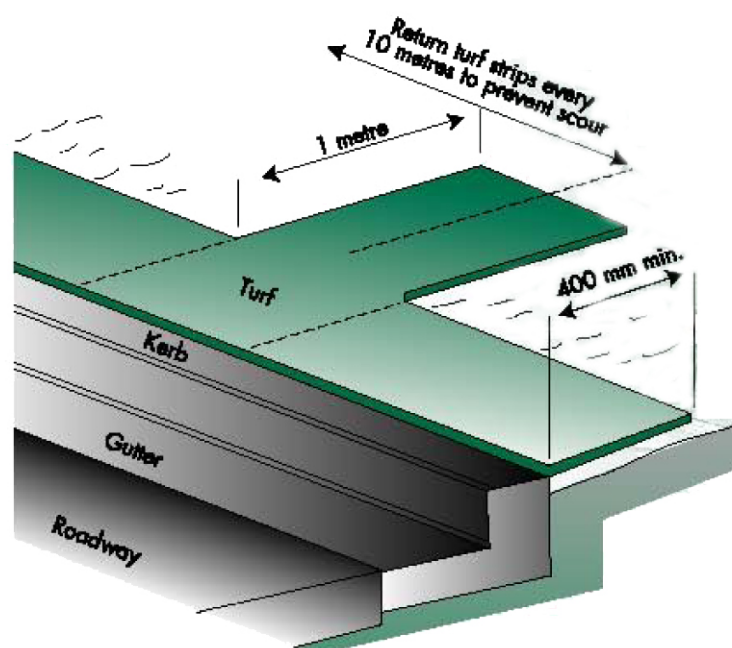
Strips of vegetation left or planted down-slope from earthworks provide a simple method of trapping coarse sediment.

The flatter and wider the filter strips are, the more effective they become. Grass filter strips have little effect in a storm, but form an important part of a sediment control program.

A 400mm wide grass strip can be installed next to a kerb to stabilise the area between the kerb and the footpath. It is also valuable for trapping sediment in very small storm events.

For best results, it is advised that the whole footpath is planted.

Grass strips will stabilise a disturbed site quickly and easily and act as an excellent erosion and sediment control device.



Advantages

Grass filter strips can be very effective in removing coarse sediment upstream from detention basins or infiltration structures. They prevent sediment travelling from bare soil areas towards the formal drainage system.

Remember: Grass filter strips are only suitable on low grades.

Construction Notes

1. Install minimum 400mm wide roll of turf on the footpath adjacent to the kerb and at the same level as the top of the kerb.
2. Lay 1.5m long turf strips (at 90 degrees) every ten metres.
3. Rehabilitate disturbed soil behind the turf strip in accordance with the *ESCP* and/or the *SWMP*.

Fact Sheet 8: Litter and building waste

All hard waste should be stored on-site in a way that prevents material loss caused by wind or water.

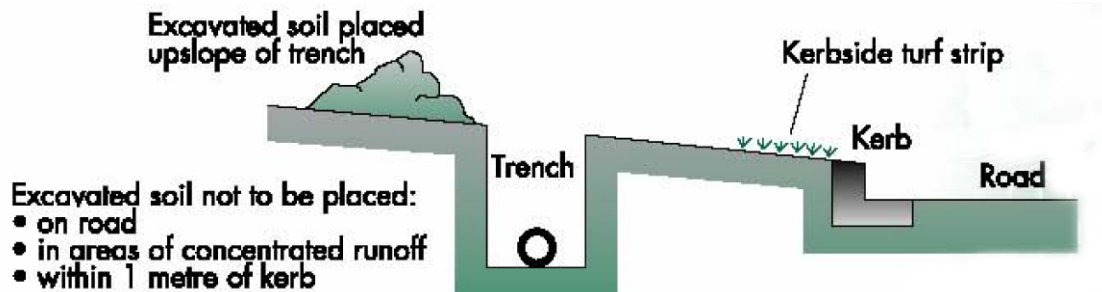
Smaller materials such as litter, should be contained in covered bins or litter traps formed on three sides by geotextile as a windbreak.

Tipping fees can be reduced by separating building waste products into separate litter traps, so that this material can be recycled.



Fact Sheet 9: Service Trenches

Where possible, coordinate the various service connections so that a single trench can be used. Avoid trenching in areas where water flow is likely to concentrate. Alternatively, try to schedule work for periods when rainfall is low.



Try to limit the time that trenches are open to fewer than three days and avoid opening them whenever there is a high risk of storms. Remove and store vegetated top soil (sod), so that it can be used to provide immediate erosion protection after backfilling.

Place the soil on the uphill side of trenches to divert water flow away from the trench line. Alternatively, use temporary bunds for similar effect. Backfill topsoil and compact to 95% Standard Proctor. Then replace topsoil and any sod to match surrounding ground levels.

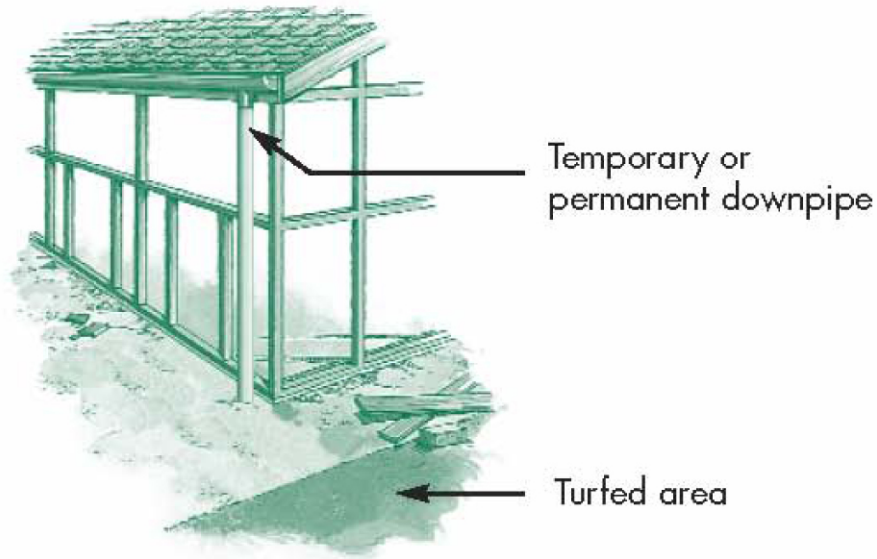
Construction Notes

1. Do not open any trenches, unless it is likely to be closed within three days.
2. Place excavated material upslope of the trench.
3. Divert any runoff from the trench line with diversion.
4. Revegetate.

Fact Sheet 10: Early roof downpipe connection

Temporary or permanent downpipes should be installed at the same time as the roof is installed. The early connection of downpipes to the stormwater system will reduce site drainage problems.

This will reduce downtime following storm events. Connecting roof downpipes is a vital process to keep the water off-site and *Keep the Soil on the Site*.



Section 5 Maintenance of control measures

Proper maintenance of erosion and sediment controls is vital to their success. After a storm event, the effectiveness of the established controls can be assessed. The site manager should check the operation of all erosion and sediment controls each day and initiate repair or maintenance as required.

An effective maintenance program should include ongoing modification to plans as development progresses. These plans are usually based on a specific landform, but as development proceeds, changes occur in slope gradients and drainage paths.

Best practice includes anticipating potential risks as well as being prepared for abnormal circumstances and emergencies. This could include storing extra sediment fence fabric and posts on-site to facilitate emergency repairs or ensuring that the sediment control contractor's phone number is available on-site.

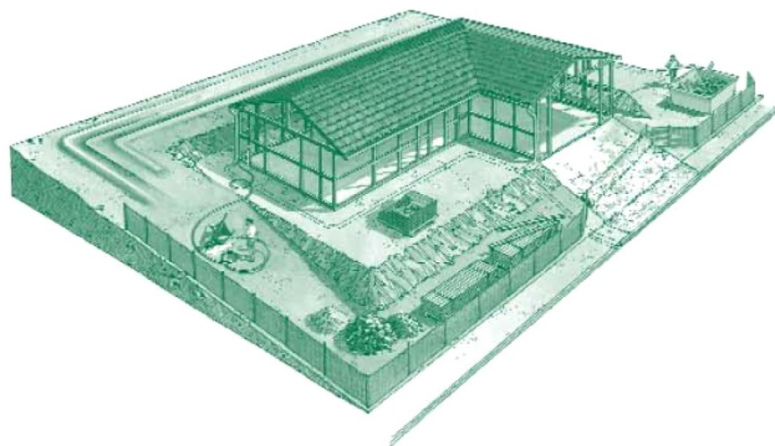
- The entry/exit pad will require reapplication of aggregate if excessive sediment build-up occurs.
- Clean any catch drains.
- Erosion in drainage channels should be replaced if the fabric is ripped or otherwise damaged. Retrenching may also be needed. Sediment fences work well if they are maintained on a weekly basis and/or after every storm.
- Keep an eye on the weather.

Section 6 Site clean-up and rehabilitation

Accidental spills of soil or other material onto the road or gutter should be removed at the end of the day's work. Materials should be swept away from the road, not washed down the gutter. Following storms, the roadway and sediment contents should be inspected and all excessive sediment residues removed.

All areas that are disturbed by construction should be promptly stabilised (e.g. revegetated) so that they can no longer act as a source of sediment loss.

If the site has not been rehabilitated and is handed over to a new homeowner, they need to understand their legal obligation associated with erosion and sediment control, especially if a subcontractor is employed to complete landscaping works.



Note: Sediment control devices must be left in place until 70% revegetation cover has been established, or other measures installed in accordance with the local council's requirements.

Important Phone Numbers - Industry

Note: the authors of this document do not necessarily endorse these services/contacts.

AGL – Hot Water Emergency	131 404
Consumer, Trader and Tenancy Tribunal NSW	1300 135 399
Crime Stoppers Hotline	1800 333 000
Department of Fair Trading NSW	133 220
Department of Natural Resources	131 555
Department of Planning and Infrastructure	(02) 9228 6111
Dial-Before-You-Dig	1100
Electricity Ausgrid	131 388
Endeavour Energy	131 003
Essential Energy	132 080
Emergency Services	000
Environmental Defenders Office	(02) 9262 6989
EPA Pollution Line	131 555
Gas Jemena Gas Networks	131 909
Housing Industry Australia – Consumer Hotline	1902 973 555
International Erosion Control Association - Australia	(02) 4677 0901
Master Builders Association NSW	(02) 8586 3555
Master Plumbers Association of NSW	1800 424 181
NSW Department Primary Industries	(02) 6391 3100
Poisons Information Centre	131 126
Standards Australia	1800 035 822
Stormwater Industry Association	(02) 9744 5252
Sydney Water – Emergencies and Trade Waste	132 090
Telstra – Repairs, Faults and Infrastructure	132 203
Translating and Interpreting Service	131 450
Urban Development Institute of Australia	(02) 9262 1214
Waste Service NSW	1300 351 116
Workcover Authority NSW	131 050
WSROC	(02) 9671 4333

Important Phone Numbers – Local Councils

Note: the authors of this document do not necessarily endorse these services/contacts.

Baulkham Hills Shire Council	(02) 9843 0555
Blacktown City Council	(02) 9839 6000
Blue Mountains City Council	(02) 4780 5000
Camden Council	(02) 4654 7777
Campbelltown City Council	(02) 4645 4000
Cessnock City Council	(02) 4993 4100
Fairfield City Council	(02) 9725 0222
Gosford City Council	(02) 4325 8222
Hawkesbury City Council	(02) 4560 4444
Holroyd City Council	(02) 9840 9840
Ku-ring-gai Municipal Council	(02) 9424 0000
Lithgow City Council	(02) 6354 9999
Liverpool City Council	1300 362 170
Mid-west Regional Council	(02) 6378 2850
Parramatta City Council	(02) 9806 5050
Penrith City Council	(02) 4732 7777
Pittwater Council	(02) 9970 1111
Singleton Shire Council	(02) 6578 7290
Warringah Council	(02) 9942 2111
Wingecarribee Shire Council	(02) 4868 0888
Wollondilly Shire Council	(02) 4677 1100

Your most frequently called numbers

SAMPLE PLAN

EROSION AND SEDIMENT CONTROL PLAN

Dwelling Construction

- Legend**
- xx— Extent of clearing or disturbance
 - <<<< Diversion channel
 - - - - Property boundary
 - ▢▢▢▢ Straw bale sediment trap
 - - - - Dwelling site
 - ▬▬▬▬ Sediment fence
 - ~ Contour
 - ▧▧▧▧ Kerb and gutter

- Notes:**
1. All runoff and sediment control structures will be maintained in a functional condition.
 2. All vegetation outside the building envelope will be retained.

