

EROSION AND SEDIMENT CONTROL GUIDELINES FOR BUILDING AND WORK SITES



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DEFINITIONS

Blue Book:	The best management practice guidelines prepared by Landcom and endorsed by the NSW Government. It is recommended that larger developments implement controls in conjunction with the guidelines to avoid pollution and subsequent fines.
Erosion:	The movement of soil and other material and generally caused by rainfall, running water, wind or traffic following removal of ground cover.
Erosion Control:	The process of stopping erosion before it happens. The best method of erosion control is maintaining good ground cover which may include grass or turf, or artificial supplements such as jute matting or aggregate.
ESCP:	Erosion and Sediment Control Plan and are plans showing how to minimise erosion, and trap sediment resulting from minor construction or building activities. They are generally required for all developments as part of development consent, and applicable to smaller sites of disturbance (i.e. under 2500m ²)
PIN:	Penalty Infringement Notice issued under the POEO Act (see below) for infringements. This can include land and water pollution, and for failing to comply with a notice.
POEO:	The Protection of the Environment Operations Act (1997) is the legislation governing environmental pollution in NSW.
Pollution Incident:	An activity that does, has the potential to, or is likely to result in the physical, chemical or biological condition; or has the potential to harm humans, the environment or ecosystems.
Sediment:	The result of erosion and consists of small detached soil particles. Sedimentation occurs when the transportation of soil particles slows or stops and these particles then settle.
Sediment Control:	The process of stopping the material after erosion has started. Methods may include sediment fences, check dams, rock gabions and drains in conjunction sediment basins. It is important to understand the limitations of each of these methods- refer to the Blue Book for more information.
SWMP:	Soil and Water Management Plan. Recommended for and may be required for developments greater than 2500m ² . A SWMP may require the assistance of an expert due to calculations required in the preparation of the plan.
Tree Preservation Order (TPO):	Tree Preservation Order which protects mature trees in the Bathurst area. Approval must be gained to lop or remove trees with a height greater than 4m, and a spread greater than 3m. Approval may be obtained by completing a TPO Application Form from Council.

PART 1 INTRODUCTION

1.1 SCOPE

This guide applies to any proposed land use, maintenance, building or development activity as well as any infrastructure works which may involve

- The submission of a Erosion and Sediment Control Plan (ESCP) as part of a Development Application;

And changes to land including:

- The disturbance of the existing ground surface or placement of fill onto land;
- Changes to the velocity and/or volume of liquid runoff entering directly or indirectly a watercourse or flowing over land;
- An effect upon flows across adjoining lands including public land; and
- Other activities that may result in liquid or solid material migrating from sites.

Actions that result in liquid or solid material entering adjoining land, stormwater drains or natural water courses are controlled by the Protection of the Environment Operations (POEO) Act (1997). Implementing recommendations listed in this guideline and maintaining good erosion and sediment control practices will minimise the risk of a breach under the POEO Act.

As part of Development Applications to Bathurst Regional Council, it is normally required for erosion control and sediment control measures to be implemented. The information provided in this guideline will also enable developers, builders or owner/occupiers to carry out both the construction and maintenance of various types of erosion controls and sediment controls.

For comprehensive and detailed information in regards to current best practice procedures refer to "The Blue Book- Managing Urban Stormwater: Soils and Construction (Volume 1) 2004. Additional information in regards to construction, waste sites, quarries and the installation of services is available in Volume 2 of the Blue Book. Copies of the Blue Book are available for purchase through Landcom (www.landcom.com.au or 02 9841 8643).

For land where the total area to be disturbed is greater than 2500m², it is recommended to complete a Soil and Water Management Plan in accordance with the Blue Book's recommendations.

1.2 AIM

The aims of this guideline are to:

- Provide individuals and companies with a basic understanding of their responsibilities under the POEO Act 1997;
- Provide individuals with an understanding of the importance of, and difference between erosion control and sediment control;
- Provide individuals and companies with an understanding of how to properly manage on-site erosion and sediment issues;
- To minimise erosion and to prevent sediment being transported from work sites;
- To improve the quality of stormwater entering Bathurst Region waterways; and,
- Reduce the occurrence of avoidable water and land pollution incidents.

1.3 IMPACT OF THE BUILDING AND CONSTRUCTION INDUSTRY ON THE ENVIRONMENT

A new house is built in New South Wales every 14 minutes, as well as numerous other activities such as maintenance, renovations and extensions to existing buildings. Therefore, the building and construction industry has the potential to have a significant impact on the environment.

The soils of the Bathurst Region are readily erodible, meaning that it takes little assistance by rain and wind to result in migration off work sites. Inadequate erosion and sediment controls and/or the poor installation, use and maintenance of these controls, results in water (and land) being contaminated with sand, soil, cement dust and slurry, paint, waste and other materials.

Any contaminated water that enters the stormwater drains flow directly to our rivers and creeks. This subsequently pollutes and increases the level of sediment in our natural water courses, causing a loss of native fish and other aquatic life, and impacting upon the flood capacity of waterways. Inappropriate controls in work sites can also reduce air quality caused by an increase in airborne dust.

1.4 BENEFITS OF EROSION AND SEDIMENT CONTROLS

Aside from the environmental benefit of the adequate erosion controls and sediment controls that are correctly installed and maintained, there are benefits to the builder, owner and the community.

1.4.1 Benefits to the Builder

- A better looking more saleable site with reduced clean up costs and less mud and dust problems;
- Improved occupational health and safety on site;
- Improved drainage and reduced site wetness which result in less down-time, earlier completion and earlier sales;
- Better image of your company within the community and marketing advantage to win work from environmentally conscious clients;
- Fewer public complaints = no fines and no problems with Council.

1.4.2 Benefits to the Owner

- Reduced site rehabilitation and landscaping costs because the soil and vegetation is still on the site;
- Peace of mind knowing their home hasn't caused damage to the environment;
- Less chance of flooding as stormwater drains are not clogged with sediment; and
- Less chance of being fined for inappropriate activities on their land.

1.4.3 Benefits to the Community

- Less risk of flooding caused by blockage of stormwater drains and waterways;
- Increased recreational opportunities in and around our waterways;
- Healthier waterways resulting in aquatic life being maintained;
- Increased sales as the surrounding environment is maintained; and
- A tidy town, with no sediment on roads.

PART 2 KNOWING YOUR RESPONSIBILITIES

2.1 WHO'S RESPONSIBLE FOR PREVENTING POLLUTION?

Everyone involved with a development is responsible for preventing pollution.

Pollution is something placed on land or water whereby it changes the pre-existing condition, or harms life that lives there. Therefore, it is **very easy** to pollute land or waters.

In regards to water pollution, the POEO Act states that **anyone** who places material into the stormwater system or even in a position where it **may** enter the stormwater system is guilty of an offence. This includes individuals **or** companies conducting the work, **and** the owner of the site. (Refer to section 2.2 for further details).

The POEO Act **DOES NOT** recognise:

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

The Site Supervisor (the applicant for the development application or complying development certificate application), or person responsible for the activity, is to ensure that erosion and sediment control measures are installed and maintained in accordance with the ESCP for the site, and in conjunction with best practice procedures.

All workers on site, including sub-contractors, must not breach environmental law and are required by the law to advise the site supervisor (or Council) if they see or cause a potential or occurring pollution incident on the site. If a major incident occurs, such as fuel entering the stormwater drain, workers are legally required to contact Council, or in this case, the NSW Fire Brigade. Failure to notify may result in substantial fines being issued.

An owner/occupier is responsible for preventing pollution from a development following handover by the builder. The owner/occupier is to ensure that the erosion and sediment control measures implemented by the builder are **maintained** until such time as revegetation has occurred on the site.

2.2 NSW ENVIRONMENTAL LEGISLATION – WHAT IT MEANS TO YOU

2.2.1 Protection of the Environment Operations (POEO) Act 1997

Pollution from development is regulated under the POEO Act. Depending upon the incident, Council or the Department of Environment, Climate Change and Water (DECCW) is the appropriate regulatory authority and may issue notices. Note that:

*Corporations, employees, contractors, subcontractors, managers/directors and owner/occupiers are **all** potentially liable if they are deemed to be primarily responsible for an offence.*

2.2.2 POEO Act Notices

There are several notices which may be issued by Council or the DECCW. The following notices are generally given when activities are undertaken that have, or are likely to result in a pollution incident.

- *Clean up notice*: issued when Council requires the clean up of sites or pollution incident, which can include the clean up of off-site pollution.
- *Prevention Notice*: can be issued if an activity is being carried out or is suspected to be carried out in an environmentally unsatisfactory manner. This notice may be appealed in the Land and Environment Court within 21 days of it being served.
- *Cost Compliance Notice*: issued where Council or DECCW has undertaken the clean-up of a pollution incident and requires the person/s to pay all or any reasonable costs and expenses incurred by the authority in connection with the clean-up.

These notices may be issued to either the occupier of the premises or the person reasonably suspected of causing a pollution incident or conducting an activity in an environmentally unsatisfactory manner.

A person issued with any of these notices is liable for a **\$320** administration fee. Additionally, they can be charged all costs incurred by Council or the DECCW to ensure compliance with a notice.

Note: A pollution incident is defined in the POEO Act as “*an incident or set of circumstances of which there is, has been or is likely to be a leak, spill, or escape of a substance, as a result of which pollution has occurred or is likely to occur.*”

Therefore, you can be liable even if a pollution incident is yet to occur.

2.2.3 POEO Act Penalties

There are 3 levels of Offence that apply to developments if they pollute the environment. The seriousness of the offence will determine which level is applicable.

- *Tier 1 Offences* – are the most serious and involve wilful or negligent behaviour resulting in harm to the environment. The maximum penalty is \$1,000,000 and/or 7 years imprisonment.
- *Tier 2 Offences* – This offence has a maximum penalty of \$250,000 for a corporation and \$120,000 for an individual and is based upon proof an offence being committed. Further daily penalties apply to continuing offences.
- *Tier 3 Offences* – are dealt with by penalty infringement notices (see below).

2.2.4 POEO Act Penalty Infringement Notices (PIN)

Persons or companies found to have breached the POEO Act may be issued with an on-the-spot penalty infringement notice, or PIN. The following lists the typical amounts that Council issues for land or water pollution incidents:

Pollute Land (Individual)	\$750.00
Pollute Land (Corporation)	\$1,500.00
Pollute Waters (Individual)	\$750.00
Pollute Waters (Corporation)	\$1,500.00
Littering (Individual)	\$200.00
Littering (Corporation)	\$400.00

2.2.5 POEO Act Public Register of Notices

Councils and the DECCW are required to keep a public register of all companies and individuals who are issued notices. So in addition to the fines and lost time in cleaning up, companies who pollute also risk damaging their reputation.

2.2.6 POEO Act Duty to Notify

If anyone involved with the site sees or causes a pollution incident which harms the environment, under the POEO Act, you have a **duty to notify** the Council or the DECCW. They can then work with you to minimise the harm to the environment.

The maximum penalty for failing to notify is \$250,000 for corporations or \$120,000 for individuals. Further daily penalties apply for continuing offences.

2.2.7 Environmental Planning and Assessment Act 1979

Council may issue a PIN under the Environment Planning and Assessment Act 1979 for failure to comply with the conditions of development consent or exempt development criteria. Depending on the issue, Council may also instruct for works to cease until the matter is dealt with.

- | | |
|--|------------|
| • Development not according to consent Class 1 & 10 (Individual) | \$750.00 |
| • Development not according to consent: Class 1 & 10 (Corporation) | \$1,500.00 |
| • Development not according to consent: Other Class (Individual) | \$1,500.00 |
| • Development not according to consent: Other Class (Corporation) | \$3,000.00 |

PART 3 HOW TO IMPLEMENT EROSION AND SEDIMENT CONTROLS

3.1 DEFINITIONS

Before continuing it is important to understand the difference between erosion control and sediment control.

Erosion control is the process of reducing the likelihood of earth being dislodged and being moved to another location. The best method of erosion control is maintaining good ground cover which may include grass or turf, or artificial supplements such as jute matting or aggregate.

Sediment control is the process of stopping the movement of material that has already been dislodged. Methods may include sediment fences, check dams, rock gabions and drains in conjunction with sediment basins. It is important to understand the limitations of each of these methods- refer to the Blue Book for more information.

3.2 WHEN TO IMPLEMENT EROSION AND SEDIMENT CONTROLS

Erosion and Sediment Control Plans (ESCP) are appropriate for lands involving disturbance less than 2500m² in size (works disturbing greater than 2500m² may require a Soil and Water Management Plan). For developments requiring consent, erosion and sediment controls must be analysed, prepared and applied **before** the activity commences.

An ESCP shows how to minimise erosion and trap sediment resulting from minor construction or building activities. It is also designed to show how **you** will minimise soil erosion and trap sediment from the site during the construction phase.

An Erosion and Sediment Control Plan should include:

- A site plan showing boundary, road access and north point;
- Approximate grade and direction of surface water run-off;
- Location and size of stabilised site access point/s*;
- Locations of sediment fences*;
- Location of barrier fencing and no-go zones to limit area of disturbance*;
- Location of waste receptacles, site office and staff amenities*;
- Location of stockpile site/s*;
- Information about maintenance and stabilisation of controls;
- Information about timing of site works; and,
- Where possible, include standard drawings in these guidelines or from the Blue Book. Drawings are also available in the Master Builders Association Guidelines and Landcom's "Managing urban stormwater: soils and construction – the hip-pocket handbook".

* **Locations should be drawn on a site layout plan.** An example of an ESCP and site plan is listed in Appendices of these guidelines.

3.3 IMPLEMENTING AN EROSION AND SEDIMENT CONTROL PLAN

Erosion and sediment controls must be installed correctly prior to site disturbance and maintained in a properly functioning manner throughout the construction phase and until the site has been stabilised.

After Council approval, it is recommended to follow the procedure below:

Conduct site assessment;
 Draw ESCP layout;
 List maintenance and work schedule details;
 Construct stabilised site access point/s to standard. It may be necessary to install fences to ensure that vehicles stay on the designated path;
 Install barrier fences to keep access to areas inside the work zone. This can be done in conjunction with safety barriers, bunting or flagging tape, and ensures that existing ground cover is maintained;
 Install all sediment fences to standard;
 Where necessary, install drainage points to draw water away from the zone and towards sediment basins. Note: these must be completed in a manner that does not push the 'problem' elsewhere;
 Begin site work, ensuring controls are maintained as work progresses;
 Complete site work including final stabilisation of disturbed areas (turbing, paving, driveways etc);
 and,
 Remove controls once stabilisation (revegetation) is complete.

Erosion and sediment control measures should be inspected at the time of the first inspection by Council's Building Surveyors or the accredited Private Certifier and monitored during further inspections as the building progresses.

Failure to implement controls will result in an inspection by Council's Environmental Officers which, depending upon the situation can result in the issuing of a stop work order, or a Penalty Infringement Notice.

PART 4 STANDARD EROSION CONTROLS

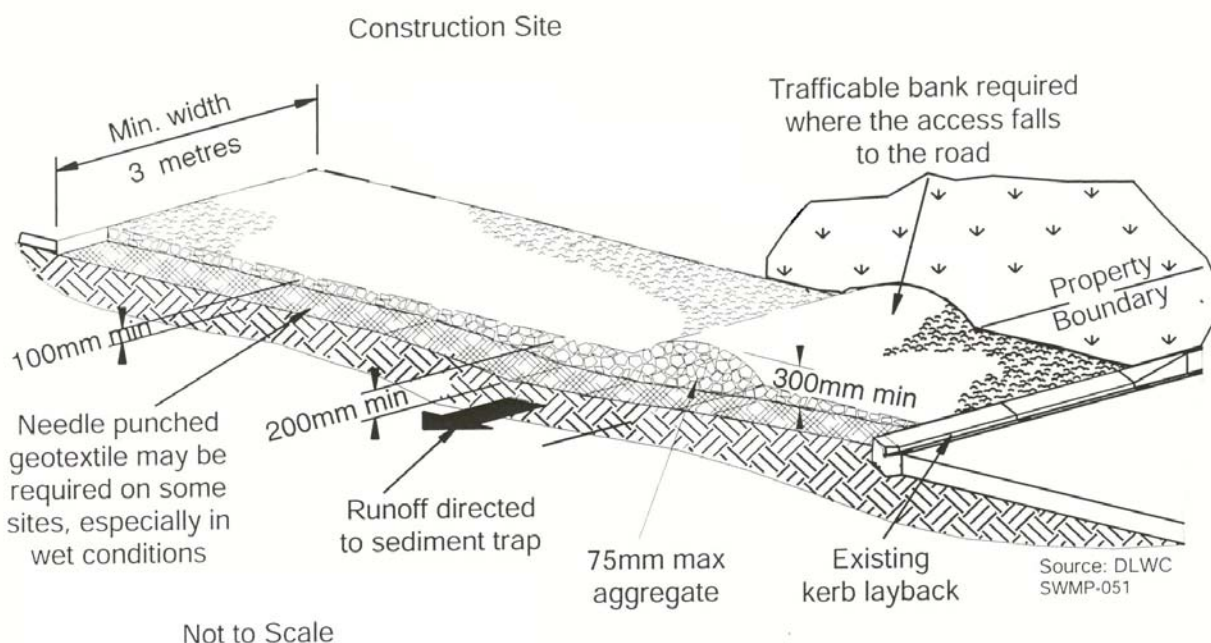
4.1 SITE ACCESS POINT

Access to the site should be **limited to one well defined location**, generally the most convenient position for easy access between a public road and the works site.

A properly constructed and stabilised site access point:

- Limits the transport of soil off-site by construction vehicles;
- Reduces erosion and ponding of water at high traffic points;
- Reduces the area of site disturbance; and
- Reduces “down time” following rain by allowing work to recommence sooner than otherwise possible.

Figure 1. Site Access Diagram



4.1.1 Site Access Point: Construction Guidelines

To reduce the amount of sediment being transported off site, follow these simple steps when constructing a coarse gravel site access point (see also Figure 1):

- Limit site access to one location, preferably the most convenient for whole site access;
- Surface water flows should be diverted to a sediment trap;
- The access pad is to be formed using minimum 30-40mm graded aggregate, and no more than 75 mm;
- Be a minimum of 3 metres wide for a residential development and 6 metres wide for a commercial/industrial development;
- Extend at least 15 metres or to the building line (which ever is the lesser);
- Be 100mm thick, increasing to 200mm at front of pad to form a diversion drain towards sediment fencing. The aggregate can be laid directly on the ground surface (geotextile may be needed under the aggregate on wet sites); and

- Where the site slopes to the road, a graded aggregate bank should be formed on the pad well inside the property boundary which directs runoff away from the road to a sediment fence or trap.

4.1.2 Site Access Point: Maintenance Procedure

Check the access point particularly during frequent use or heavy deliveries to determine if the gravel surface of the pad has been covered by soil or if wheel ruts are evident. If necessary re-spread aggregate over the pad surface;

Repair surface drains to ensure that any runoff is directed to a sediment fence or sediment trap on the construction site; and,

At the end of each day or if material has been transported from the site, sweep the public roadway and kerb and gutter around the access point to remove any soil. Place sweepings in a stabilised location on the construction site. **Sediment is NOT to be washed down from the roadway into the stormwater system.**

4.2 OTHER EROSION CONTROLS

There are a range of erosion controls that can be put in place to prevent material from being transported. These include:

- **Earth Drains:** Commonly used to direct water around the site into existing drainage or sediment drains. They need to be stabilised with matting or vegetation and care must be taken so that erosion risk is not increased through its construction. Sediment drains must also be able to cope with peak storm events (see the Blue Book for construction requirements).
- **Turf strips:** 400mm wide and placed at the site boundary and the wider the better. Best suited for relatively flat land and designed to slow water entering and exiting the site. Can also be used for sediment control.
- **Rolled Erosion Products:** Includes jute mesh/matting and coconut fibre matting. Used in areas of higher concentrated flow (drainage and depressions) and best used in conjunction with other methods (seeding / check dams).
- **Soluble Glues:** Glues that breakdown over time but reduce erosive pressures on stockpiles and other exposed surfaces. May need to be reapplied depending upon length of time and weather conditions.
- **Mulch:** Including hydromulching and chipped vegetation, this method generally uses biodegradable wood chip or straw. Best suited for low flow concentrated areas (exposed sites without depressions) as it is easily washed away.
- **Check Dams:** Used to slow water velocity along drains. May help with some sediment control but can be expensive and time consuming to maintain.
- **Track walking:** Using heavy machinery to stabilise inclines. The machinery is driven up and down the slope so the tracks create small horizontal ridges (parallel to contour) which help to slow water movement.

For details on a range of other erosion controls, please read Landcom's "Managing urban stormwater: soils and construction – the hip-pocket handbook".

4.3 VEGETATION REMOVAL

Trees and other vegetation may be removed from the site following approval of buildings, structures, permanent access ways and car parks. Trees within 3 metres of approved buildings may also be lopped, or removed subject to approval. All lopping and/or removal of trees must be undertaken in accordance with Council's Tree Preservation Order.

Vegetation is **not to be removed** from the site **prior to Council approval** for any stage of the development and not before the approved erosion and sediment control measures are in place. This includes vegetation removal for the construction of building pads or sites. Please also note:

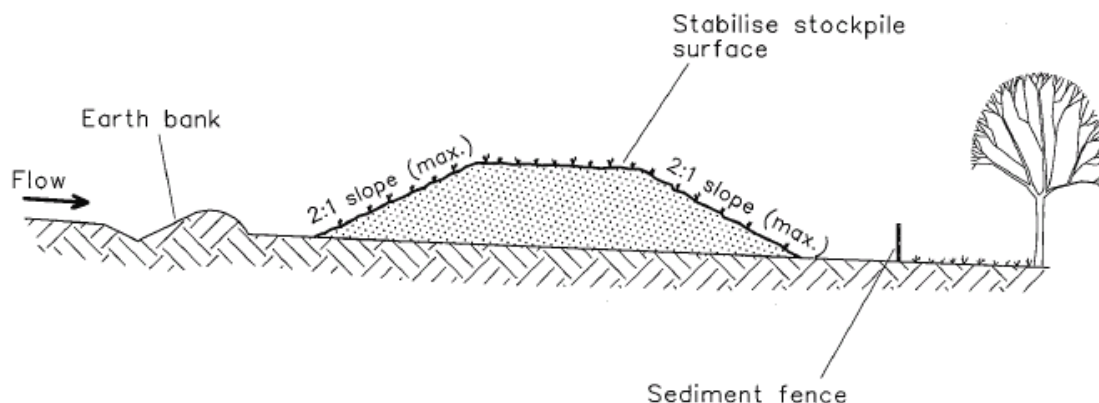
- It is good practice to retain vegetation on the site where possible as this will help to slow water and associated material flowing off the site. This is particularly important along the site boundary and on steeper ground.
- A vegetation 'buffer' of several metres in conjunction with appropriate controls enhances your efforts to prevent erosion or sediment travel. It can also reduce your costs involved in implementing control measures and the restoration of the site following works.
- Where appropriate, mulch, leaves and seeds of native plants from the site should be kept and respread on bare ground to reduce erosion and help to re-establish vegetation.

4.4 SOIL REMOVAL AND STOCKPILES

Topsoil and other stockpiles should be contained wholly within the disturbed zone and no higher than 2 metres in height, with a maximum slope angle of 2:1. This will help to reduce erosive pressures on the stockpile. The following should also be noted:

- Stockpiles should not be placed on nature strips, footpaths, roads or outside the 'disturbed zone' of the site;
- The stockpile should be of a trapezoid shape i.e. flat on top, to reduce erosive pressure (See Figure 2);
- Stockpiles should have a sediment fence/s installed on the down-slope to prevent material migration;
- Care should be taken so topsoil is not contaminated with waste or subsoil material;
- If the stockpile will be in place for extended periods, it may be necessary to implement stabilisation techniques such as soluble glue or fibre matting. See the Blue Book for more information.

Figure 2. Stockpile Design



4.5 DRAINAGE AND MOVEMENT OF WATER

All stormwater runoff flowing onto disturbed areas, including stockpiles, should be intercepted, diverted or safely disposed of. Constructing a temporary earth bank around the up-slope extent of the construction site will divert flows. The earth bank should be stabilised by turfing, seeding, placing rocks or geotextile, or by concreting. The banks should redirect stormwater to a stable holding, or filter and disposal area. Written approval will be needed before water runoff can be redirected to another property. It is highly recommended to consult the Blue Book for correct earth bank design and construction requirements.

Although it is a standard condition of Consent for all roof guttering and downpipes to be installed and connected to Council's stormwater system or other approved drainage system (e.g. a rainwater tank) within 14 days of the roof being installed, it is good practice to install these before any roofing material is installed. In this instance, the use of temporary downpipes may be appropriate in the short term. This will improve site drainage and access during wet conditions and prevent erosion caused by concentrating roof stormwater onto unstable or unprotected ground surfaces. Incomplete guttering that increases runoff from the site may impact upon your erosion and sediment controls.

PART 5 STANDARD SEDIMENT CONTROLS

5.1 SEDIMENT FENCE

Sediment fences (often incorrectly called silt fences) are temporary sediment control measures generally used to filter medium to coarse sediment from sheet stormwater flows. They are designed to catch material greater than 0.02mm- therefore many small silt and clay particles will flow through a sediment fence

They function by reducing runoff velocity and allow soil particles to settle out. The remaining water then passes through the fence and travels at a reduced velocity to other control measures or is discharged from the site.

Sediment fences are frequently used on building sites as the primary means of controlling sediment but should **always** be used in conjunction with other measures to provide an integrated approach to erosion and sediment control on a construction site.

It must be remembered that sediment fences are designed to capture small to medium sized particles: many smaller particles will flow straight through. They will not also cope with large storm events and therefore should be installed in conjunction with other control measures.

5.1.1 Sediment Fence: Construction Guidelines

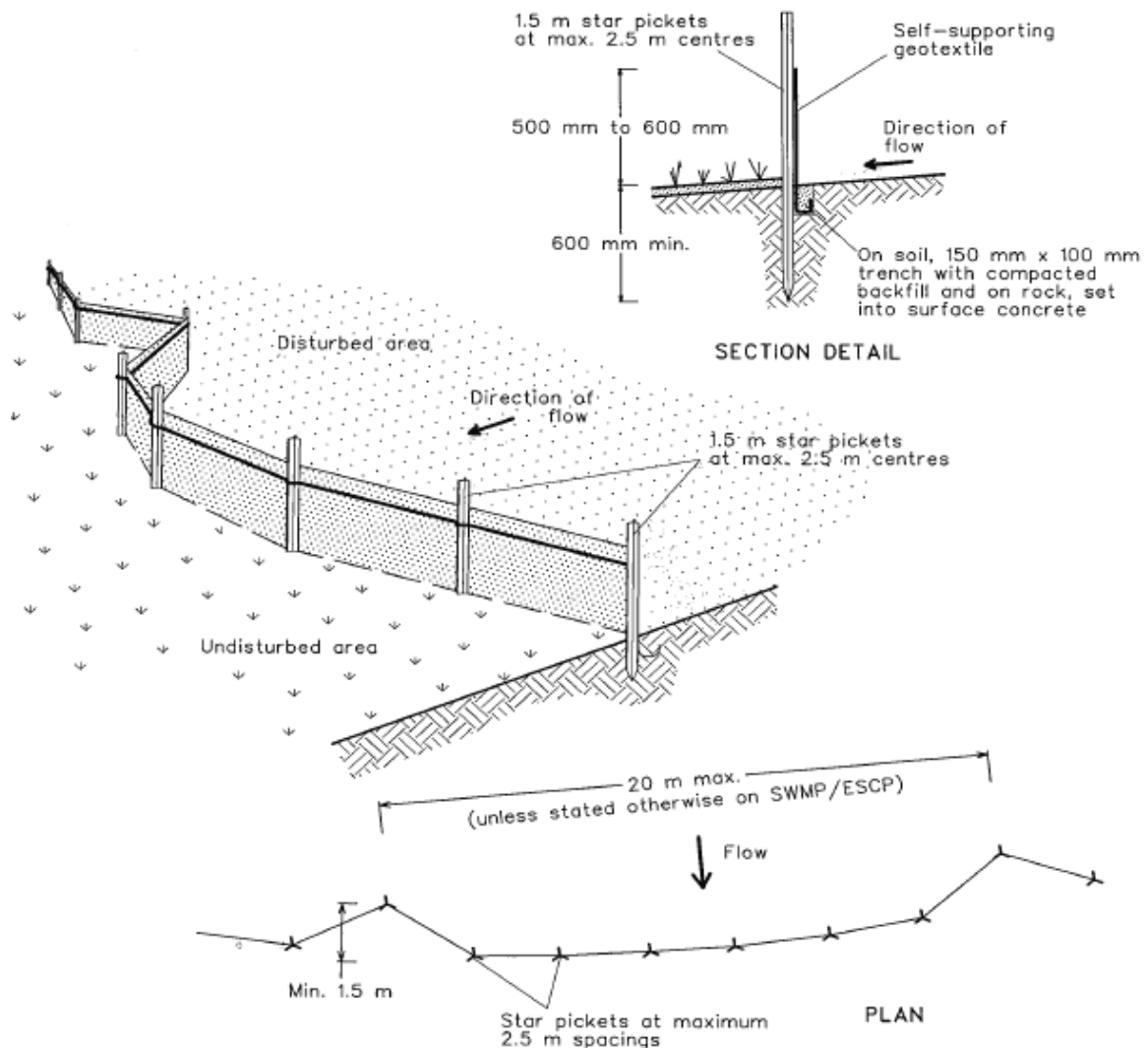
Where sediment fences are required, the following should be noted:

- **Do not** use shade cloth- use properly designed sediment fence material;
- Sediment fences must be installed **before** construction commences;
- They must be located within the property boundary and down-slope from the areas to be cleared or disturbed;
- They will need to be checked and maintained regularly- easy access for sediment removal is also important;
- Material stockpiles must have sediment fences installed on the **down-slope** side.

5.1.2 Sediment Fence: Erection Procedure

1. Identify fence location from your ESCP.
2. Construct sediment fences as close as possible to being parallel to the contours of the site (i.e. run across the slope).
3. Drive 1.5 metre long posts 600mm into ground; maximum 3 metres apart. Use 40mm square hard wood posts or steel (star) pickets
4. Staple to hardwood posts or wire tie steel pickets.
5. Dig a 150mm deep trench along the up-slope line of the fence for the bottom of the fabric to be entrenched.
6. Backfill trench over base of fabric and compact on both sides.
7. Joins should have a 150mm overlap and be located at a support post.
8. Sediment fences are to remain onsite until stabilisation of the soil has been achieved (i.e. adequate grass/vegetation cover to reduce velocity of stormwater runoff).

Figure 3. Sediment Fence Diagram



5.1.3 Sediment Fence: Maintenance Procedure

A site supervisor is required to implement (or direct) the following actions:

- Repair immediately any damage to the sediment fence caused by undercutting, bypassing or overtopping, especially after heavy rainfall; and
- Remove deposited sediment on a regular basis so that the sediment fence has a minimum 70% of its capacity (height and width) at all times. Place excavated sediment in stabilised location on site.

5.2 STRAW BALE FILTER FENCES

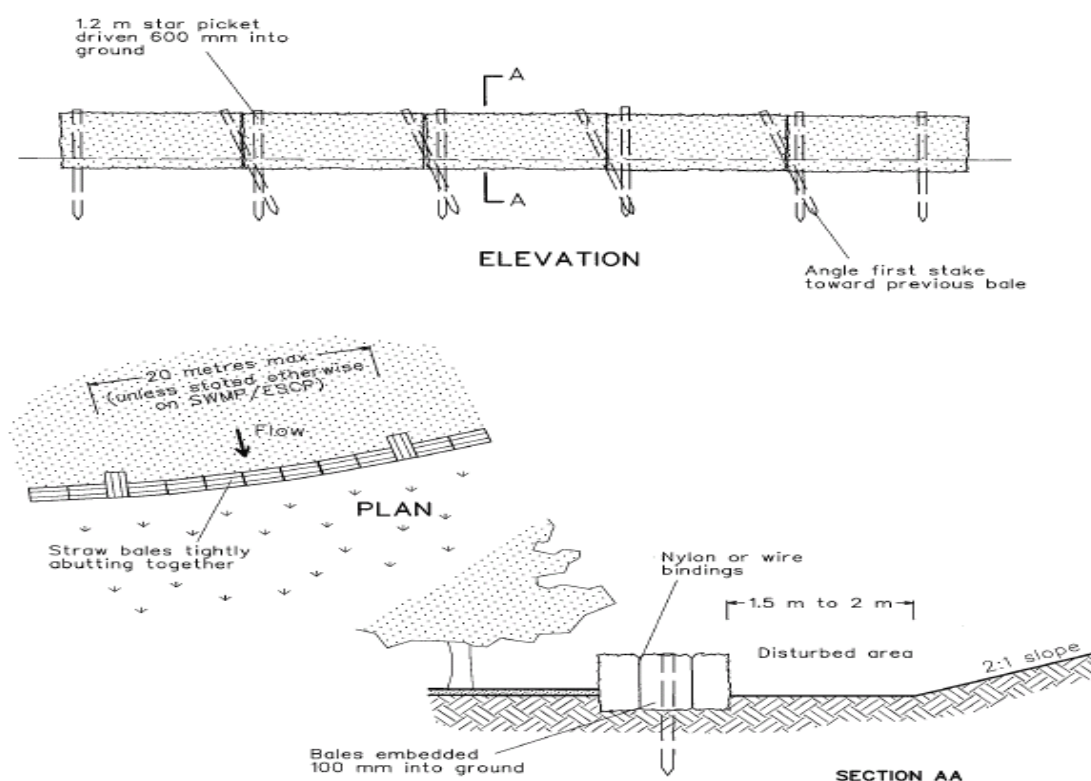
A straw bale filter fence is used for the same purpose as a sediment fence (low flows of water) however they are often not reusable.

5.2.1 Straw Bale Filter: Construction Procedure

Only use straw bales to construct the filter- hay bales bring foreign seed onto a site and may start to grow after rain.

- Construct as close as possible to being parallel to the contours of the site.
- Place bales lengthwise with ends closely abutting: the maximum height of the filter is one bale.
- Dig each straw bale 75-100mm into the ground so that water cannot flow under.
- Anchor with two 1.2 metre star pickets or stakes: angle the first picket or stake so that it enters the next bale in the row; the second picket is driven straight down. The pickets or stakes should be driven 600mm into the ground, and if possible, flush with the top of the bale.
- For lengths greater than 20 metres, place one bale perpendicular to the others to prevent water flowing along the filter wall (see Figure 4 below).
- Straw bale filter fences will need to be maintained regularly and replaced every 2-4 months.

Figure 4: Straw Bale Filter diagram



5.3 FILTER BAGS

Geotextile filter bags or 'socks' are a convenient way of quickly installing small sediment traps to catch coarse particles transported by small concentrated flows.

They are to be used in kerbs and gutters, in open earth drains or around kerb inlet pits. Filter bags/socks act as small check dams to reduce water velocity in a channel and hence allow larger sediment particles to settle out.

Where filter bags are installed, the following should be noted:

- They are useful to prevent soils entering stormwater drains, but are the **last step** in your on site sediment control.
- They are a useful supplementary control for emergency situations, on difficult sites, where works are near the kerb and gutter, or around inlet pits.
- During heavy rain periods, the majority of sediment will **flow over** or around the filter bag.

5.3.1 Filter Bags: Construction Guidelines

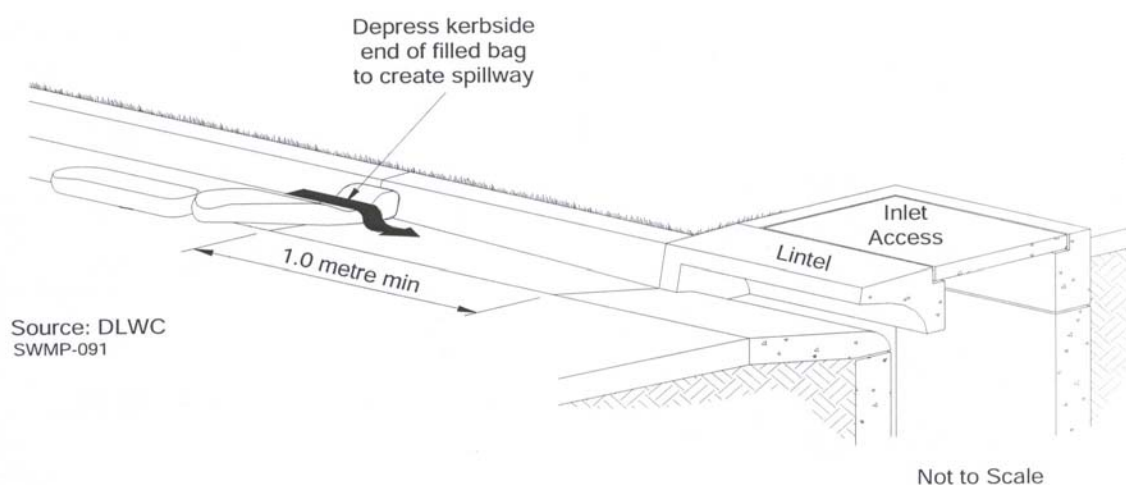
- Filter bags should be constructed from geotextile filled with screened coarse aggregate of approximately 20mm in size. Sand bags are not generally recommended as they can become clogged easily and can become a source of sediment if damaged.
- When used in kerbs, filter bags must be laid at approximately 45 degrees to the kerb and face upstream. A small spillway should be formed in the bag on the kerb side. Filter bags should be positioned to avoid undue hazard for vehicles and pedestrians.
- In open channels (associated mainly with larger scale developments) bags can be laid across the flow and the height of the bags will be determined by the site and the volumes of water to be controlled. Bags should be laid in such a manner as to ensure water is not diverted to another area or cause concentration of flow leading to scour problems.

5.3.2 Filter Bags: Maintenance Procedure

A site supervisor is required to:

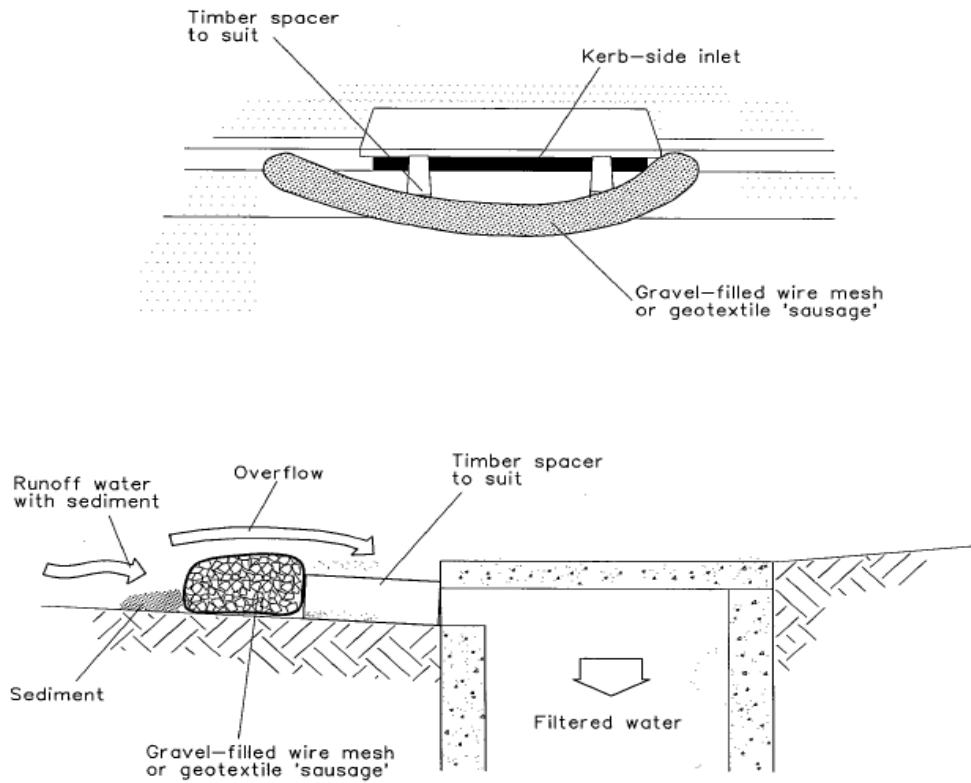
- Check and repair any damaged or displaced bags immediately;
- Check for bypassing, scouring or undercutting especially when used in earthen drains in steeper situations. Repair damage and/or relocate bags or review sediment control to reduce drain flows; and
- Remove any sediment built up behind the bags. Collected sediment should be placed in a stabilised location on the construction site. If necessary, replace the bags if they become clogged with sediment or are damaged.

Figure 5. Filter Bag Installation Diagram (Gutter)



Source: DLWC
SWMP-091

Figure 6. Filter Bag Installation Diagram (Inlet)



NOTE: This practice only to be used where specified in an approved SWMP/ESCP.

PART 6 OTHER STANDARD CONTROLS

6.1 WASH DOWN AREA

Wash down areas are simple sediment traps used in association with sediment fences to provide a suitable area for washing and cleaning of wheelbarrows, tools etc. They act to trap suspended sediment on site. Traps are temporary structures designed to reduce water velocity and allow soil particles to settle. The remaining water can be filtered through a geotextile before it enters a stormwater system or natural watercourse.

Traps are simple to construct, relatively inexpensive and are easily moved as construction proceeds or as the need arises.

The following should be noted:

- Wash down areas do not provide an adequate means of chemical disposal. All chemicals should be handled, used and disposed of in accordance with the manufacturers specifications and Material Data Safety Sheets; and,
- It may also be necessary to remove dried material and dispose through a waste receptacle to ensure that contaminants (concrete etc) are not left behind.

6.1.1 Wash Down Area: Construction Guidelines

When constructing a wash down area, the following should be noted:

- Traps are to be installed **before** construction commences, be ideally located on level ground, clear of construction activity and allow easy access for sediment removal;
- Located at least 2m (preferably 5m) from the property boundary;
- Excavate 200mm deep trench along path where wash down area is to be located;
- *Install straw bales as per straw bale filter fence design;
- Cover straw bales with geotextile material which is to be held in place by staples 150mm long, constructed from 4mm wire or similar. Ensure geotextile material is embedded 200mm into ground along with straw bales then cover geotextile over with soil and compact.

**Alternatively, a sediment fence design may be used for sites with minimal washing down of equipment, but this still needs to ensure that material does not leave the wash down area.*

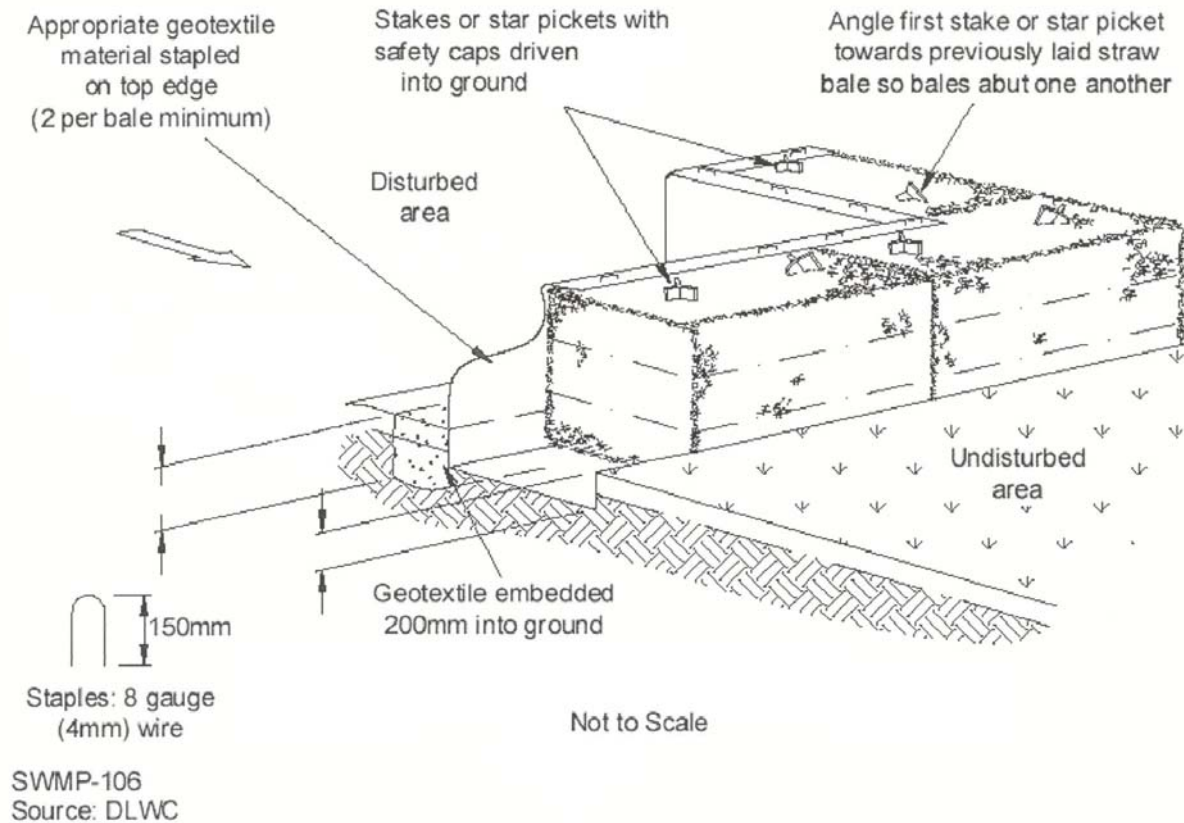
NOTE: Similar straw bale constructions can be used as minor sediment traps around onsite stormwater inlets, to ensure that sediment is not washed directly from the site to the stormwater drainage system.

6.1.2 Wash Down Area: Maintenance Procedure

A site supervisor is required to:

- Remove deposited sediment on a regular basis so that the trap has at least 70 percent capacity at all times

Figure 7: Diagram of a Sample Wash Down Area



6.2 BUILDING MATERIAL STORAGE

Erodible building materials including, sand, gravel, and concrete are to be located behind sediment control measures for the site. This ensures that material does not leave what is usually a highly disturbed area.

When considering the location to store your building material, the following should be noted:

- A design similar to that used for stockpiles may be appropriate.
- Building material is **NOT** to be stored within drainage lines, on the footpath, roadway, nature strip, kerbs, or within 2 metres of the site access point or stormwater drains.

The site supervisor is to advise all site workers, sub contractors and delivery drivers of their responsibility to locate storage of erodible (concrete, sand piles etc) and other building materials in a location that will prevent erosion. For ease, a site supervisor may designate a delivery point to delivery drivers prior to arrival at the site.

6.3 SITE CLEANUP AND GENERAL MAINTENANCE

- Accidental spills of soil or other materials onto the road or gutter should be removed immediately.
- The site supervisor is required to inspect the road and gutters following a delivery to the site.

- Any material tracked from the site by vehicles should be swept from the road or gutter, not washed down the gutter, at the end of each day.
- Following storms, the roadway and sediment control measures are to be inspected by the site supervisor and all excessive sediment residues removed.

6.4 SITE STABILISATION AND REVEGETATION

- Ground cover, especially turf is the most effective method of erosion control. Therefore, all areas disturbed by construction should be stabilised, that is revegetated, as early as possible so that they can no longer act as a source of sediment. To ensure good revegetation of the site, a landscape plan may be implemented as part of the construction phase.
- All erosion control measures are to remain on site until the vegetation has established. Persons responsible for the development should ensure that the owners/occupiers are informed of this requirement at handover. Should the site supervisor wish to remove their existing sediment fences at completion, they should still ensure that erosion or sediment movement does not occur. In this instance the installation of a boundary turf strip in conjunction with jute mat or similar laid flat on the exposed earth may be appropriate.
- Sub contractors employed to complete landscaping works, particularly those employed for the installation of the driveway, should ensure that erosion or discharge of sediment from the site is avoided.

FURTHER INFORMATION AND ASSISTANCE

Bathurst Regional Council is happy to supply further information or assistance on the material presented in this guideline.

Council's Environmental Officer can be contacted through the Environment, Planning and Building Services Department on phone (02) 6333 6111 or on fax (02) 6332 7211. Information or requests submitted in writing are to be addressed to:

The General Manager
Bathurst Regional Council
PMB 17
BATHURST NSW 2795
Attention: Environmental Officer
Email: council@bathurst.nsw.gov.au

Other organisations that may be of assistance to you

Department of Environment, Climate Change and Water
203-209 Russell Street, Bathurst NSW 2795
Phone (02) 6332 7600
Fax (02) 6332 7630
Pollution Line: 131 555
www.environment.nsw.gov.au

Department of Planning and Development (Dubbo Office)
Area 1, Level 1, 188 Macquarie Street
PO Box 58, Dubbo NSW 2830
Phone (02) 6841 2180
Fax: 02 6884 8483

Master Builders Association of NSW Pty Ltd
Private Bag 9, Broadway NSW 2007
Phone (02) 9281 3511
Fax (02) 9281 3522
www.mbansw.asn.au/new/housing/housing.htm

Further Reading

'The Blue Book'. Managing Urban Stormwater, 4th Edition, Volume 1 2004. Available from Landcom www.landcom.com.au or 02 9841 8643.

Master Builders Association of NSW: Guidelines for Erosion and Sediment Control on Building Sites. www.mbansw.asn.au or 1800 451 393

Information for industry and businesses on the DECCW Website.
<http://www.environment.nsw.gov.au/sustainbus/industryandsmallbusiness.htm>

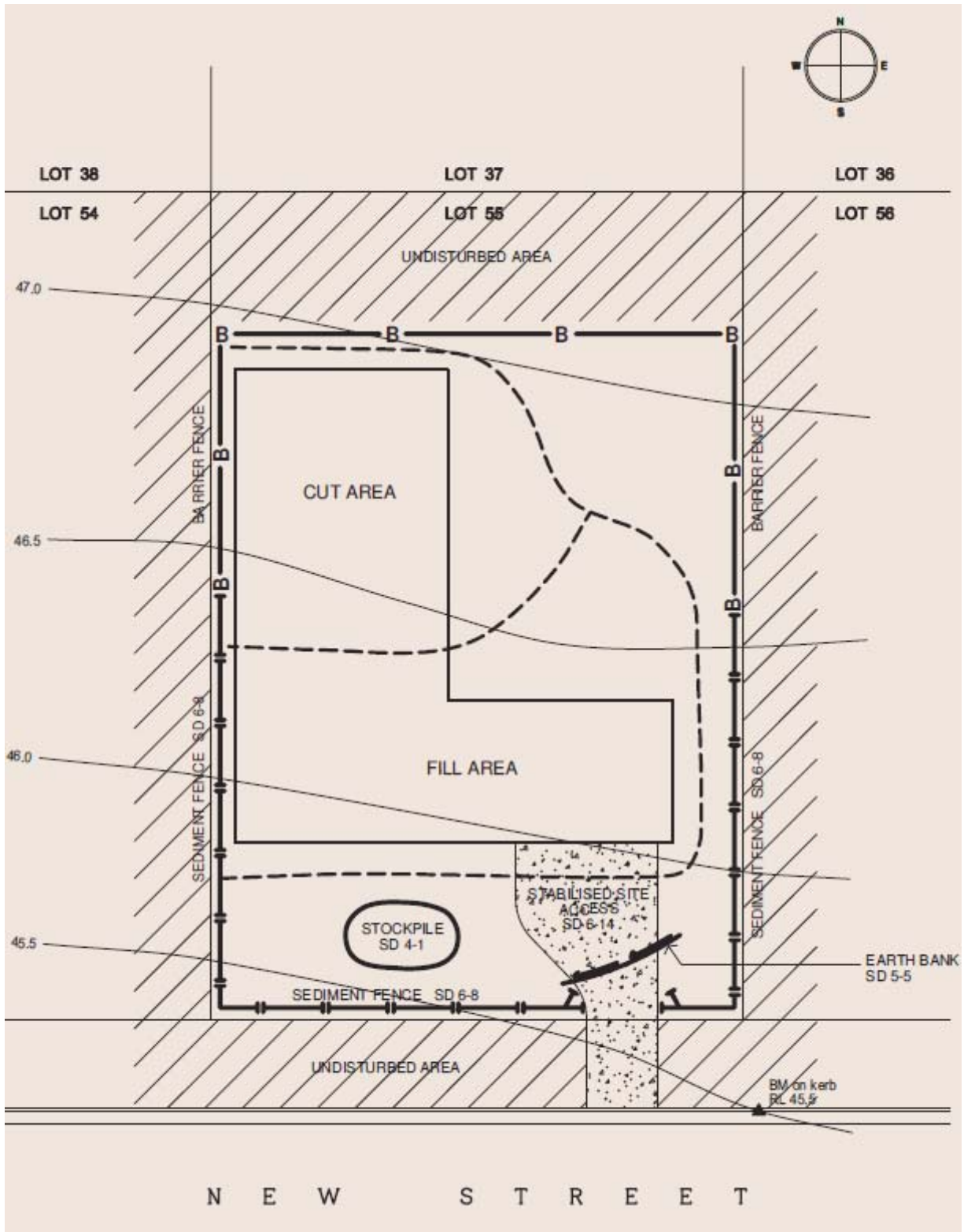
Acknowledgements

Information used to prepare these guidelines has been sourced from:

- Landcom's 'The Blue Book' Soils & Construction, Volume 1 (2004),
- The Master Builders Association 'Erosion and Sediment Control Guidelines', and,
- The DECCW 'Erosion and Sediment Control- A Resource for Local Councils' (2006).
- All designs have been sourced from Landcom's The Blue Book (2004).

APPENDIX 1: SAMPLE EROSION AND SEDIMENT CONTROL PLAN (SITE PLAN)

(Source: The Blue Book 2004)



APPENDIX 2: BEST PRACTICE EROSION AND SEDIMENT CONTROL PLAN

Site works will not start until the erosion and sediment control works outlined in

1. Clauses 2 to 4, below, are installed and functional.
2. The ingress to and egress from the site will be confined to one stabilised point. Sediment or barrier fencing will be used to restrict all vehicular movements to that point. Stabilisation will be achieved by either:
 - Constructing a sealed (e.g. concrete or asphalt) driveway to the street;
 - Constructing a stabilised site access, according to Standard Drawing (SD 6-14) or other suitable technique approved by the Council.
3. Sediment (SD 6-8) and barrier fences will be installed as shown on the attached drawing (i.e. as in Appendix 1).
4. Mesh and gravel “sausage” protection (SD 6-11) will be provided to protect gutter inlets near the allotment.
5. Topsoil will be stripped and stockpiled (SD 4-1) for later use in landscaping the site.
6. All stockpiles will be placed in the location shown on the ESCP and at least 2 metres clear of all areas of possible areas of concentrated water flow, including driveways.
7. Lands to the rear and sides of the allotment and on the footpath will not be disturbed during works except where essential, e.g. drainage works across the footpath. Where works are necessary, they will be undertaken in such a way to leave the lands in a condition of high erosion hazards for as short a period as practicable. They will be rehabilitated as soon as possible. Stockpiles will not be placed on these lands and they will not be used as vehicle parking areas.
8. Approved bins for building waste, concrete and mortar slurries, paints, acid washings and litter will be provided and arrangements made for regular collection and disposal.
9. Guttering will be connected to the stormwater system (or rainwater tank, if present) as soon as practicable. If a rainwater tank is installed, the tank overflow should be connected to the stormwater system as soon as practicable.
10. Topsoil will be respread and all disturbed areas will be rehabilitated within 20 working days of the completion of works.
11. All erosion and sediment controls will be checked at least weekly and after rain to ensure they are maintained in a fully functional condition.
12. Photocopies of the following Standard Drawings are appended to this commentary:
 - SD 4-1 Stockpile Management
 - SD 5-5 Earth Bank, Low Flow
 - SD 6-8 Sediment Fence
 - SD 6-11 Mesh and Gravel Inlet
 - SD 6-14 Stabilised Site Access.
13. A drawing of the site showing the erosion and sediment control works is attached to this commentary.

(Source: The Blue Book 2004)