Sediment control

Sediment control techniques are used on building sites to prevent sand, soil, cement and other building materials from reaching waterways. Even a small amount of pollution from a site can cause significant environmental damage by killing aquatic life, silting up streams and blocking stormwater pipes.

Successful control measures on building sites trap and retain sediment displaced by up-slope erosion. This results in:

- cleaner waterways and healthier aquatic life
- reduced clean-up costs to the community
- improved site conditions
- improved wet weather working conditions
- reduced wet weather construction delays
- reduced losses from material stockpiles
- fewer mud and dust problems
- fewer public complaints and less chance of fines.

Use this overview of sediment control principles and techniques as a guide to the topic and to sources of further information. Any attempt to control sediment on building sites should comply with the requirements of local erosion and sediment control guidelines and it is strongly recommended that advice be obtained from appropriately qualified experts.

Council regulations

Most local councils have guidelines on sediment control and many provide supporting publications on their websites. Ask them for information.

A sediment control management plan may need to be submitted to council for approval before work begins. The plan should address the location, design, scheduling and maintenance of sediment control measures and details of site rehabilitation.

The need for sediment control

The need for sediment control is influenced by several factors:

Soil type — Clay soils are more likely to cause environmental harm; sandy soils are more likely to cause traffic hazards and drainage problems. Exposed subsoils generally cause more problems than exposed topsoils.

Slope — The steeper and longer the slope, the greater the potential for erosion and sedimentation.

Extent, nature and duration of the soil disturbance — The greater the disturbance, the greater the risk of erosion and sedimentation.

Climate and season — Rainfall (intensity and duration) and high winds influence erosion and sedimentation. As rainfall events are likely to intensify under climate change, the extent and severity of erosion and sedimentation will increase and the need to mitigate their impacts will become increasingly important.

Size and location of the site — Sediment control on small sites is often harder to implement, especially if the slope is towards the street. Consult your local council. Large vegetated rural sites may not always require specific controls.

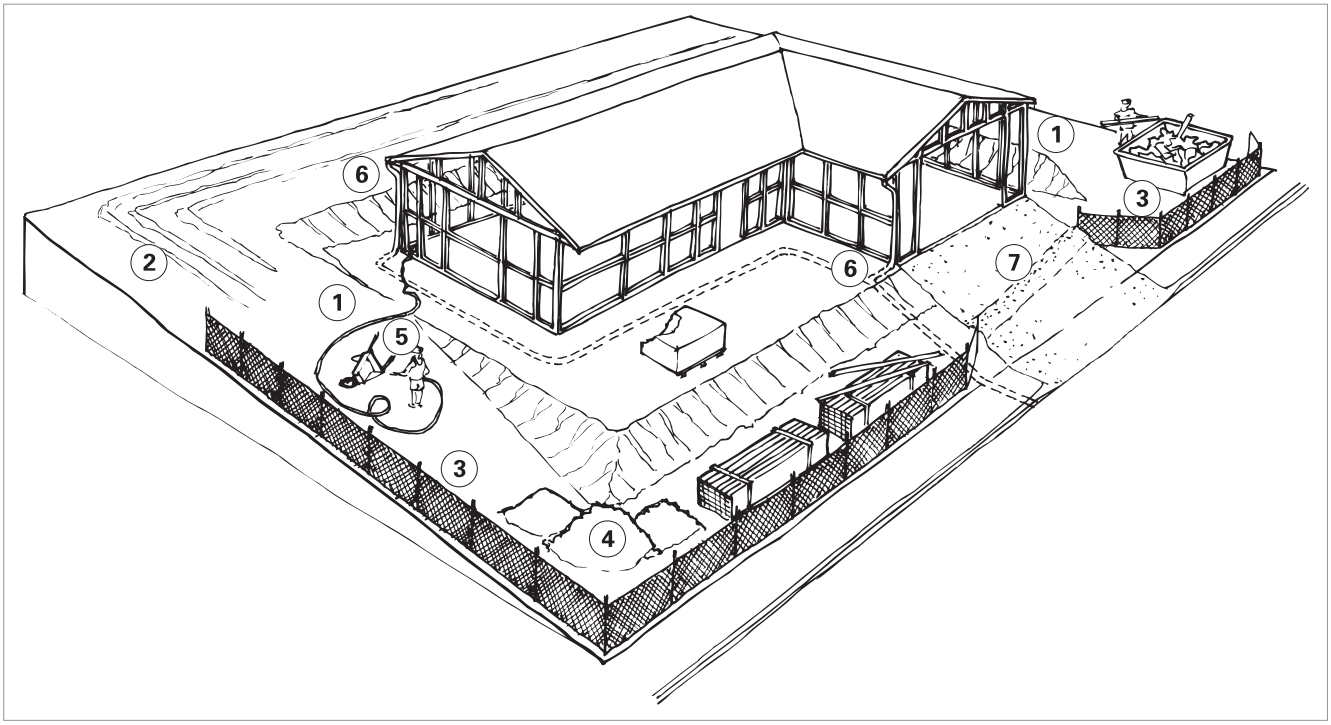
The objectives of sediment control are to:

- divert uncontaminated water away from the work area
- minimise erosion by minimising site disturbance and stabilising disturbed surfaces
- prevent material stockpiles from collecting or discharging sediment.

Minimising site disturbance

Prevention is better than cure. Careful design and an efficient construction sequence minimise disturbance to the site — and saves money and reduces environmental impact.

- Design to avoid excessive cut and fill and unnecessary clearing of vegetation.
- Preserve existing site drainage patterns.
- Clear only those areas necessary for building work to occur. (see *Choosing a site*)
- Preserve grassed areas and vegetation where possible. They help filter sediment from stormwater before it reaches the drainage system and stop rain turning exposed soil into mud.



Erosion and sediment control measures: 1 minimise disturbance, 2 diversion devices, 3 sediment barriers, 4 secure stockpiles, 5 other containments, 6 early stormwater connection, 7 controlled access point.

- Delay removing vegetation or beginning earthworks until just before the start of building activities.
- Avoid building activities that disturb soil during periods of expected heavy or lengthy rainfall.

How to implement sediment control

Install sediment control measures before beginning any excavation or earthmoving. Regularly maintain them until construction is complete and the site is stabilised. It is vital to ensure that stormwater is not unlawfully diverted or released into neighbouring properties, or allowed to cause erosion at discharge points.

Divert uncontaminated stormwater away from the work area

Avoid contamination of stormwater with sediment. Use flow diversion devices to reduce the volume of stormwater reaching the disturbed area.

On compact urban sites restrict overland flow through the work area by installing the final stormwater drainage system as early as possible in the construction process. Before then, install an up-slope perimeter bank and catch drain to take uncontaminated stormwater directly to the stormwater system. On steep sites, line catch drains with turf or geotextile.

On larger sites a diversion channel may be used to divert uncontaminated stormwater around the disturbed area. Construct the channel up-slope of the disturbed area with a bank on the lower side. Remove sediment from the channel frequently.

Line the channel with erosion control mats or turf to prevent soil erosion, or use check dams constructed from sand or gravel-filled bags.

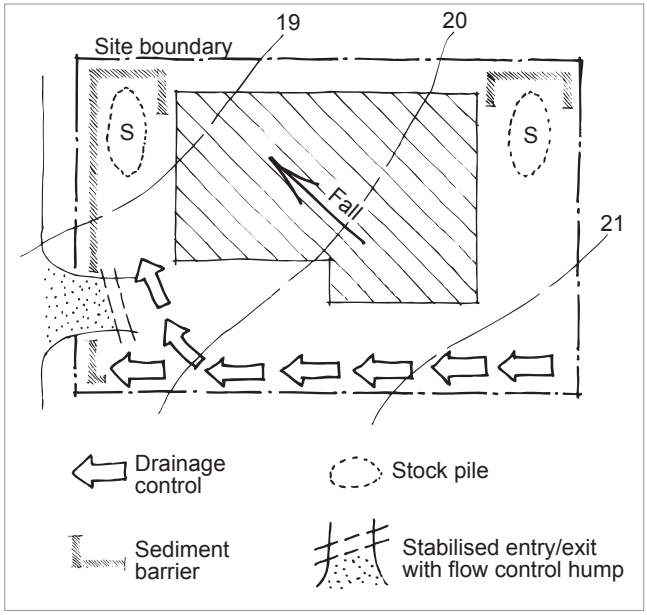
Uncontaminated stormwater from the channel should discharge to the stormwater system. In some cases discharge onto non-erodible areas of land is permissible. Check with your local council. Do not allow discharge into neighbouring properties.

Roof drainage must discharge to the stormwater system, unless rainwater is being harvested. Complete the final stormwater drainage system before the roof is installed. Connect using temporary or permanent downpipes. (see *Rainwater*; *Stormwater*)

Minimise the potential for erosion

Construct a single vehicle entry/exit pad to minimise tracking of sediment onto roadways. Use a 150mm (minimum) layer of 40mm crushed rock. A raised

hump across the entry/exit pad can be used to direct stormwater into a sediment trap to the side of the pad.



Sediment control layout on a compact urban site.

Protect materials that may erode, particularly sand and soil stockpiles, with waterproof coverings. Contain waste in covered bins or traps made from geotextile.

Locate stockpiles of building materials away from drainage paths and up-slope of sediment barriers. Divert runoff around stockpiles unavoidably located in drainage paths using an up-slope perimeter bank.

Use biodegradable erosion control mats to protect exposed earth. These are particularly useful on high-risk soils and steep sites where there is a delay in building or site rehabilitation.

Minimise sediment-contaminated water leaving the site

Use barriers to trap coarse sediment at all points where stormwater leaves the site, before it can wash into gutters, drains and waterways. Install sediment fences down-slope of the disturbed area, usually along the lowest site boundary with the ends returning up-slope. Inspect barriers after storms and remove sediment. Stockpile extra sediment fence on site for emergency repairs. (*see 'Sediment control devices' below*)

Regularly sweep adjacent streets and gutters clean — do not hose them. Relocate sediment on site or dispose of it suitably. Remove accidental spills of soil or other material immediately.

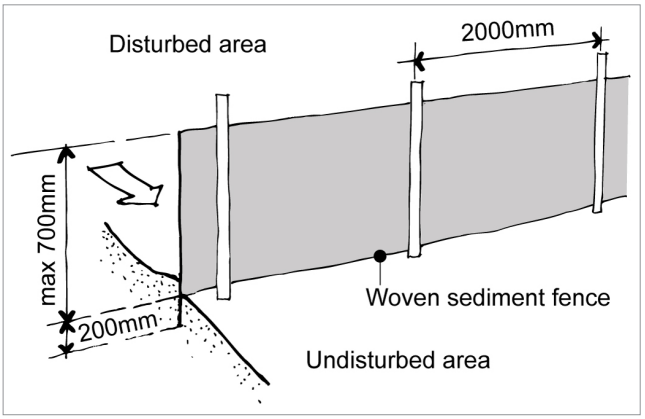
Maintain kerbside vegetation in a healthy state as it can function as an additional filter for sediment. Do not use nature strips or footpaths for parking or stockpiling unless unavoidable. Council permission is required.

Cut bricks, tiles or masonry on a pervious surface such as grass or loosened soil within the property boundary. The same applies when cleaning equipment. Waste concrete, paint and other solutions used on site should be properly disposed of so they do not contaminate stormwater. (see *Stormwater*)

Sediment control devices

Woven sediment fences

These are generally the most efficient barriers for building sites.



Woven sediment fences trap sediment but allow water through.

Constructed from geotextile attached to posts, these fences trap sediment but allow water through. On small frontage sites with limited access, use steel posts and wire tied fences that can be readily unhooked for unloading of materials.

Vegetated filter strips

Vegetated filter strips are useful as a secondary measure but generally are not a substitute for sediment barriers. Strips of turf or vegetation are used to trap sediment, acting as a buffer zone between the site and the gutter. The nature strip is often used for this purpose.

Stormwater inlet traps

Stormwater inlets are not usually found in residential building lots but may occur on larger development sites. Construct a temporary sediment fence around on-site

stormwater inlet grates. Wrap geotextile around posts fitted at each corner of the drainage grate. Embed the base of the fabric into the soil.

Off-site sediment traps

For safety and efficiency, do not locate sediment barriers outside property boundaries, particularly on roads. Anything placed on a road requires the permission of the road owner, whether it is the local council or the developer.

Sediment barriers in front of roadside stormwater inlets are rarely effective and usually just result in the sediment being washed down the street into the nearest gully inlet.

As a last resort use off-site sediment traps, made from sand or geotextile gravel bags. Ensure they do not fully block the gully inlet. Check daily and remove accumulated sediment.

Post-construction and erosion control

Stabilise the site as soon as possible after construction, or while the last trades are finishing, to minimise the potential for ongoing soil erosion.

Turf lawns are commonly used to stabilise soil but their high water consumption can be an environmental burden. For considerably lower water use:

- plant native ground cover plants to stabilise soil (see *Outdoor water use*; the appendix *Landscaping and garden design*)
- don't replace native vegetation with turf.

Mulch (straw or other material) can be used on open garden beds to protect soil and support plant growth. Mulch spread to a depth of 75–100mm minimises soil and water loss and controls weed growth. It may be less suitable on steep sites and in high wind areas.

Temporary, quick germinating grasses such as rye and oats can be used to stabilise soil until slower growing plants can be established. This method is only effective after the grass seeds have germinated and established a root structure.

Semi-permeable paving can be used to stabilise areas of the site. Avoid excessive use of hard surfaces that create inappropriate water flows and prevent stormwater percolating into the ground. (see *Stormwater*)

Biodegradable erosion control mats are useful when revegetating steep slopes.

Integrate your landscaping strategy with sediment control. For example, diversion channels and trenches that filter sediment can be used with rubble in the base to create a deep root planting opportunity.

References and additional reading

Contact your state, territory or local government for further information on sediment control: www.gov.au

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