

# Site Management

## GENERAL CONSTRUCTION PRACTICE

Construction site managers are required to focus on a wide range of economic, social and environmental issues of which erosion and sediment control (ESC) is just one. Safety is usually given the highest priority on construction sites. If however, the adopted ESC measures must be amended for reasons of safety, then the amended measures must still achieve the required treatment standard.

### Site management practices

The *due diligence* associated with the management of a development site, or any other soil disturbance that could potentially cause environmental harm, requires site managers to ensure that appropriately trained and experienced personnel are incorporated into the process at all times. Such personnel must, collectively, have the following capabilities:

- An understanding of the local environmental values that could potentially be affected by the proposed works.
- A good working knowledge of the site's Erosion and Sediment Control (ESC) issues, and potential environmental impacts, that is commensurate with the complexity of the site and the degree of environmental risk.
- A good working knowledge of current best practice Erosion and Sediment Control measures for the given site conditions and type of works.
- Ability to appropriately monitor, interpret, and report on the site's ESC performance, including the ability to recognise poor performance and potential ESC problems.
- Ability to provide advice and guidance on appropriate measures and procedures to maintain the site at all times in a condition representative of current best practice, and that is reasonably likely to achieve the required ESC standard.
- A good working knowledge of the correct installation, operational and maintenance procedures for the full range of ESC measures used on the site.

### Site establishment

Best practice site establishment procedures incorporate of the following activities as appropriate for the site conditions and proposed works. Not all of the following activities will be appropriate on all sites.

- Obtain all necessary permits and plan approvals prior to site establishment.
- Ensure the approved ESC plans are available on-site.
- Review the development/contract conditions, Stormwater Management Plan (SMP), Erosion and Sediment Control Plan (ESCP) including all technical notes associated with the ESCP.
- Nominate the responsible ESC entity or site officer.
- Where appropriate, establish perimeter fencing to manage public safety and unauthorised material dumping.
- Construct and stabilise site entry/exit points.
- Establish the site compound, installing all necessary drainage, erosion and sediment controls.
- Stockpile materials necessary for the installation and ongoing maintenance of ESC measures including those materials necessary for emergency ESC activities in the event of imminent rainfall.
- Install or establish waste receptors for building waste, including litter and rubbish bins (e.g. mini-skips) and concrete waste receptors.



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**Photo 1 – Waste receptor bins**



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**Photo 2 – Identification of non-disturbance areas**

- Establish any non-disturbance or exclusion areas identified within the ESCP.
- Implement remaining ESC measures in accordance with the specified Installation Sequence.
- Conduct a pre-construction conference. A pre-construction conference is an opportunity for all interested parties to discuss critical issues, such as:
  - key objectives of the Erosion and Sediment Control Plan (ESCP);
  - required water quality objectives;
  - monitoring and inspection procedures;
  - identification of the 'responsible' site officers;
  - identification of critical environmental concerns;
  - reporting procedures for non-compliance activities.



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**Photo 3 – Plans, permits and approvals**



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**Photo 4 – Pre-construction conference**



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**Photo 5 – Site clean-up equipment**



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**Photo 6 – Essential ESC materials**

## Office compound

Best practice (2008) site management requires giving appropriate consideration to the following issues when establishing the office compound:

- Establish only the minimum number of site entry/exit points required to perform the necessary works.
- Ensure sediment control devices placed at entry/exit points are appropriate for the site conditions.
- Ensure the site office and car park are established in locations that minimise safety risks to site visitors. This includes locating the site office and car park as close to site entry points as is practicable to reduce visitor movement through active work areas.



**Photo 7 – Office compound**



**Photo 8 – Entry/exit rock pad**

- Wherever reasonable and practicable, locate the site office and car park up-slope of soil disturbances and any soil, earth, or sand stockpiles such that sediment-laden runoff does not flow through these areas.
- Wherever reasonable and practicable, locate the site compound so that all sediment-laden runoff can be fully contained and treated on-site.
- Ensure roof water from buildings and sheds will not cause unnecessary erosion or soil saturation around common traffic areas (vehicular or pedestrian).
- Where appropriate (e.g. long-term construction sites) use gravelling techniques to minimise soil compaction and the generation of excessive mud around the site compound.
- Ensure appropriate storage of chemical and fuels (AS1940: *The storage and handling of flammable and combustible liquids*).
- Where necessary, establish drip pans (or similar, e.g. filter cloth sheeting) in vehicle maintenance areas to control pollution runoff from road surfacing equipment.



**Photo 9 – Gravelling of compound**



**Photo 10 – Secure storage of chemicals**

In addition to the above, the specific elements of best practice site management vary from site to site, but in generally incorporate the following concepts:

- Adopt flexible work procedures that can accommodate necessary amendments to the site's ESC measures.
- Establish an ESC training program for site staff.
- Appropriately control subcontractors and material suppliers.
- Where appropriate, utilise appropriate notice boards and educational posters to highlight ESC issues. Such signs are used to:
  - minimise damage to the site's erosion and sediment control measures;
  - minimise damage to buffer zones and retained vegetation; and
  - remind site personnel of the importance of appropriate environmental management within the site.



**Photo 11 – On-site notices**



**Photo 12 – Warning signs at site exit**

- Suitably control site traffic to minimise dust generation and undesirable soil compaction outside designated access paths.
- If significant concreting is to occur on the site, then establish a concrete disposal area(s) enclosed by permeable, earth filter-banks, or other appropriate filter systems.
- Maintain adequate supplies of emergency ESC materials such as: straw bales, wire, stakes, sediment fence fabric, filter cloth, wire mesh and clean aggregate.
- Ensure responsible environmental management procedures are followed at all times, including controlling the handling of all potential contaminants, such as litter; concrete/cement, oil and fuel; sand, soil and sediment; organic mulches, and fertilisers.
- Coordinate the installation of services to minimise the extent and duration of soil disturbances caused by service providers.



**Photo 13 – Soil stockpiles**



**Photo 14 – Disposal areas for waste concrete**

- Ensure employees receive adequate training on:
  - work place health and safety issues;
  - environmental management;
  - best practice erosion and sediment control practices;
  - incident reporting procedures;
  - site inspection and maintenance procedures (selected staff only).
- Nominate the officer(s) responsible for on-site erosion and sediment control measures.
- Establish an appropriate site inspection routine as well as maintenance and reporting procedures. Identification tags such as a strip of filter cloth stapled to sediment fence fabric (Photo 16) can be used to identify those measures requiring maintenance.

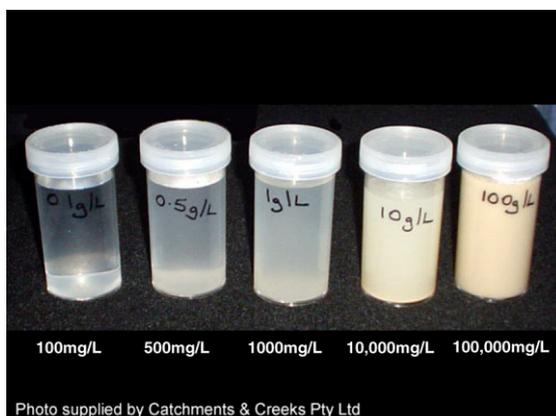


**Photo 15 – Staff training**



**Photo 16 – Site inspections**

- Confirm the target water quality objectives (WQOs) for the site. WQOs are normally assigned by the State or local government. Typical water quality objectives are:
  - 50mg/L of total suspended sediment;
  - a turbidity level no greater than 10% above that of the receiving water;
  - water pH in the range 6.5 to 8.5
- Identify an appropriately trained person/organisation to collect all water samples.
- Establish appropriate incident reporting procedures, including:
  - the chain of responsibility;
  - procedures for recording areas of non-compliance;
  - monthly reporting procedures (if required);
  - procedures for recording corrective actions;
  - internal recording and filing procedures.



**Photo 17 – Water quality requirements**



**Photo 18 – Environmental harm**

## Preparing a site for the expected weather conditions



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**Photo 19 – Approaching storm**

- A well-managed site is a site that is appropriately prepared for both likely and unlikely (but possible) weather conditions.
- Only in those regions of Australia where extended periods of dry weather can be anticipated with high certainty can erosion and sediment control measures be reduced to a minimum.

**Table 1 – Overview of critical ESC measures for various weather conditions**

Expected weather conditions	Likely critical aspects of erosion and sediment control
No rainfall or strong winds expected	<ul style="list-style-type: none"> <li>• If favourable, dry weather conditions are likely to exist with a reasonable degree of certainty, then avoid unnecessary expenditure on ESC measures; otherwise, ensure the site is appropriately prepared for possible, unseasonable weather conditions.</li> <li>• It should be noted that effective sediment controls at site entry/exit points are generally always required even during dry weather conditions.</li> </ul>
Light rainfall	<ul style="list-style-type: none"> <li>• In general, the lighter the rainfall, the higher the expected quality of the water discharged from the site.</li> <li>• Wherever practical, sediment control measures should be designed to maximise the 'filtration' of sediment-laden water during periods of light rainfall.</li> <li>• It should be noted that if a site discharges to a minor watercourse, then the release of sediment-laden water during periods of light rainfall can potentially cause more environmental harm than if the same quantity of sediment were released during periods of moderate to heavy rainfall.</li> </ul>
Moderate to heavy rainfall	<ul style="list-style-type: none"> <li>• It is critical to ensure effective drainage control measures exist on the site to prevent the formation of rill and gully erosion.</li> <li>• It is critical to ensure that sediment traps have an effective flow bypass system to prevent structural failure of the sediment traps.</li> <li>• Wherever practical, sediment control measures should be designed to maximise the gravity-induced 'settlement' of sediment-laden waters during periods of moderate to heavy rainfall.</li> <li>• It is noted that sediment control measures that rely on 'filtration' processes (i.e. filtration through an aggregate or geotextile) often experience excessive blockage during such storm events.</li> </ul>
Strong winds	<ul style="list-style-type: none"> <li>• Ensure erosion control measures are appropriately anchored.</li> <li>• Maintain soil surfaces in a roughened condition to reduce dust generation.</li> <li>• Assess the benefits of chemical-based soil stabilisers instead of just using water trucks.</li> </ul>

## Site inspection and monitoring

Erosion and Sediment Control Plans (ESCPs) are living documents that can and should be modified as site conditions change, or if the adopted measures fail to achieve the required treatment standard. When a site inspection detects a notable failure in the adopted ESC measures, the source of this failure must be investigated.

Monitoring the effectiveness of an ESCP through a combination of site inspections and water quality monitoring, is part of responsible site management. On some small, low-risk sites (e.g. smaller than 0.5ha) reporting requirements may consist only of simple diary notes listing inspection times, field observations and conducted maintenance activities. On larger or high-risk sites, monitoring is likely to include specific water quality sampling and detailed logbook entries of the site's monitoring and maintenance activities.

All erosion and sediment control measures should be inspected:

- at least daily when rain is occurring;
- at least weekly (even if work is not occurring on-site);
- within 24 hours prior to expected rainfall; and
- within 18 hours of a rainfall event of sufficient intensity and duration to cause on-site runoff.

Personnel involved in the preparation and/or supervision of *Monitoring and Maintenance Programs* must, collectively, have the following capabilities:

- an understanding of the local environmental values that could potentially be affected by the proposed works; and
- a good working knowledge of the site's ESC issues, and potential environmental impacts, that is commensurate with the complexity of the site and the degree of environmental risk; and
- a good working knowledge of current best practice ESC measures appropriate for the given site conditions and type of works; and
- a good working knowledge of the correct installation, operational and maintenance procedures for the full range of ESC measures used on the site.



**Photo 20 – Fence in need of maintenance**



**Photo 21 – Blanket in need of maintenance**

## Temporary site shutdown procedures

A work site may be shutdown for a number of reasons, including planned shutdowns during periods of extreme erosion risk, and unplanned shutdowns due to project financing issues or unsatisfactory environmental protection.

Procedures for initiating a site shutdown, whether planned or unplanned, must incorporate the revegetation of all soil disturbances unless otherwise approved by the regulatory authority. Use of non-vegetated erosion control blankets or soil binders is generally not considered adequate treatment, unless it is known that the shutdown period will be less than three (3) months and the proposed soil stabilisation measures are appropriate for the expected weather conditions.

Revegetation activities associated with a planned site shutdown must commence at least 30 days prior to the nominated shutdown date.