Erosion & Sediment Control for Small Construction Sites <2500 m²

Why is sediment a problem?

Soil particles washed off the land into our waterways are called sediment. Sediment contains pollutants and reduces water quality. This threatens the many social and economic benefits our waterways provide, including recreation, tourism and the security of our drinking water supply.

The release of sediment from construction and building sites is one of the primary sources of sediment in our waterways.

Benefits for construction site managers

Adopting Erosion and Sediment Control (ESC) best practice not only helps keep sediment pollution out of our waterways, it also provides the following benefits:

- Saves time and money by not having to clean up sediment or replace lost materials after rain.
- Reduces the likelihood of a fine or prosecution for polluting the environment.
- Reduces complaints related to dust and stormwater pollution.
- Improves relationships and trust with the local Council and the community.
- Promotes and associates your business with protecting the environment.

It's the law!

The Queensland *Environmental Protection Act 1994* sets out a number of legal requirements and offences relating to sediment pollution and water contamination. Find out more at www.qld.gov.au/environment/land/management/soil/erosion

5 principles of ESC

There are 5 key principles to ensure you are achieving your legislative and best practice ESC requirements. These principles are explained further in the following checklists and factsheets for small construction sites (<2500 m²).

For more information refer to the Water by Design website (**www.waterbydesign.com.au**) and IECA *Best Practice Erosion and Sediment Control* (2008) at **www.austieca.com.au**.

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Erosion & Sediment Control Checklist for Small Construction Sites <2500 m²

This checklist has been prepared as a guide to best practice Erosion and Sediment Control (ESC) for small construction sites (<2,500 m²). If you answer 'NO' to any of the questions below, you might not have adequate ESC measures in place. Refer to this factsheet suite for more information on how to adequately plan and install best practice ESC on your site.

PLANNING YOUR SITE

1	Plan your site		
1.1	Have all staff, trades and suppliers been made aware of the pollution prevention requirements on this site and the consequences if they breach these requirements?	Yes	No
1.2	Has the client been advised in writing of their obligations to have adequate ESC measures in place?	Yes	No
1.3	Has an ESC plan been developed for your site by a suitably qualified professional?	Yes	No
1.4	Is your ESC plan on display in an easily accessible location?	Yes	No
1.5	Have drainage and sediment control measures been installed on site prior to the commencement of site works?	Yes	No
1.6	Have onsite ESC measures been installed as per the plan?	Yes	No
1.7	Has the ESC plan been updated to suit any changes to site conditions?	Yes	No
1.8	Have all areas of exposed soil been covered at the time of handover to the client?	Yes	No

EROSION PROTECTION

2	Soil cover		
2.1	Has all exposed soil around the site been covered to minimise erosion?	Yes	No
3	**Kerb to lot groundcover**		
3.1	Is the road verge fully covered by turf or other groundcover?	Yes	No
3.2	Are vehicles and materials being kept off the verge?	Yes	No
3.3	Is the road and verge outside my site clean of loose soil and sediment?	Yes	No
4	**Stockpile protection**		
4.1	Are erodible stockpiles securely covered if not in use?	Yes	No
4.2	Are stockpiles located behind an appropriate sediment barrier?	Yes	No

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DRAINAGE CONTROL

5	Stormwater diversion		
5.1	If significant stormwater runoff from adjacent lots is likely to enter your site (i.e. area greater than 1,500 m^2 or 3 house lots), have adequate drainage diversions been installed and maintained to divert runoff from adjacent sites?	**Yes**	**No**
5.2	If the roof has been laid, are all temporary or permanent downpipes appropriately connected to the stormwater system?	**Yes**	**No**
5.3	Are the downpipes free of kinks and rips, and securely connected at each end?	**Yes**	**No**

SEDIMENT CONTROL

6	Stormwater inlet protection		
6.1	Are all onsite stormwater inlets adequately protected and maintained against sediment entry?	**Yes**	**No**
6.2	Are sediment controls that are in the roadside gutter installed in a way that does not pose a traffic safety hazard for pedestrians, cyclists and vehicles?	**Yes**	**No**
7	**Entry/exit rock pad**		
7.1	Has a stabilised entry/exit rock pad been installed to the correct specifications for each entry?	**Yes**	**No**
7.2	Is sediment or loose soil prevented from being tracked onto the road?	**Yes**	**No**
8	**Coarse sediment controls**		
8.1	Have effective sediment barriers been installed on site and to the correct specifications?	**Yes**	**No**
8.2	Are the sediment barriers free of excessive sediment buildup, rips or gaps?	**Yes**	**No**
8.3	Is built up sediment removed from sediment barriers directly after rain events and are they maintained in good working order?	**Yes**	**No**

OTHER POLLUTANT CONTROLS

9	Cement and wet trades		
9.1	Has wastewater from 'wet trades' (e.g. painting, plastering, concreting) been prevented from entering stormwater inlets or from flowing off site?	**Yes**	**No**
9.2	Are the controls adequate to prevent concrete slurry and wastewater from entering stormwater inlets (e.g. from exposed aggregate, driveway washdown, acid washing)?	**Yes**	**No**
9.3	Has all concrete waste material been cleaned from the road and gutter?	**Yes**	**No**
10	**Waste management**		
10.1	Is there a covered waste skip bin or cage located on site?	**Yes**	**No**
10.2	Is all building waste (including waffle pods) and food and drink containers, going into the skip bin or cage to prevent these from being washed or blown off site?		

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1 Planning your site
Plan your site

A good erosion and sediment control plan sets the site up for success. This factsheet includes useful tips and templates to help you plan your site right, however it is recommended that you seek advice from a qualified professional in ESC when preparing site plans.

An ESC plan should:

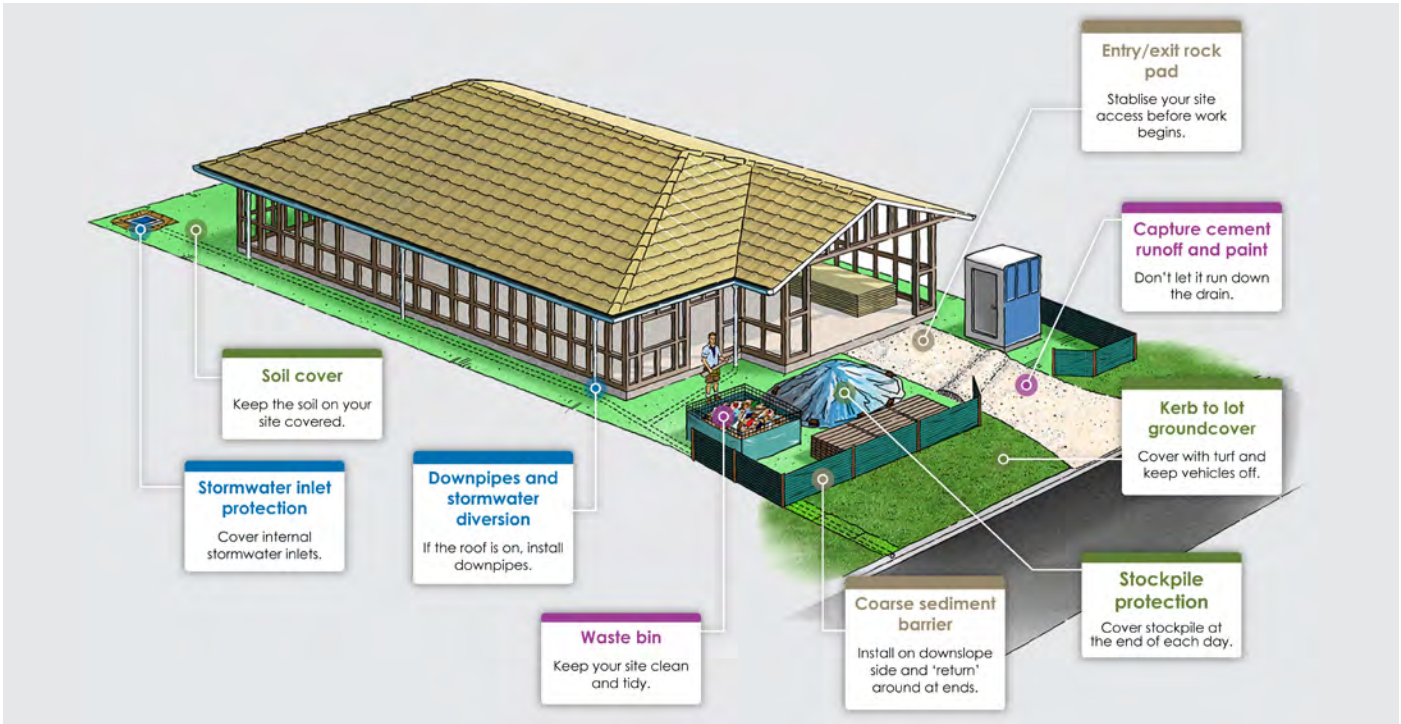
- Be prepared by a suitably qualified and experienced professional in ESC.
- Be staged, with a separate plan for bulk earthworks and operational works and include drainage, erosion and sediment controls appropriate to the size and erosion risk of your site.
- Be displayed at all times on site with the contact information of the responsible parties, including the ESC plan preparer and site ESC manager.
- Include maintenance requirements and technical notes.
- Be checked and updated as the site evolves.

Example ESC plans

The following pages include example ESC plans for small construction sites (<2500 m^2) showing best practice ESC measures for each stage of works.

ESC planning tips

- Plan your site from job start to job finish with separate plans for bulk earthworks and operational works phases.
- Design the site to match its conditions, including soil type, topography and vegetation.
- Avoid unnecessary land clearing to minimise the extent and duration of soil disturbance and allow for quick site re-establishment.
- Plan for the civil earthworks to take place outside of the wet season, especially in high rainfall areas.
- Install drainage and ESC measures early and prior to bulk land clearing and commencement of site works.
- Adapt the ESC plan and onsite ESC measures to any changes in site topography and conditions.
- Keep all ESC measures in place until site works are complete.
- Once construction is complete, revegetate and stabilise your site as soon as possible.



Erosion protection | Sediment control | Drainage control | Other pollutant controls

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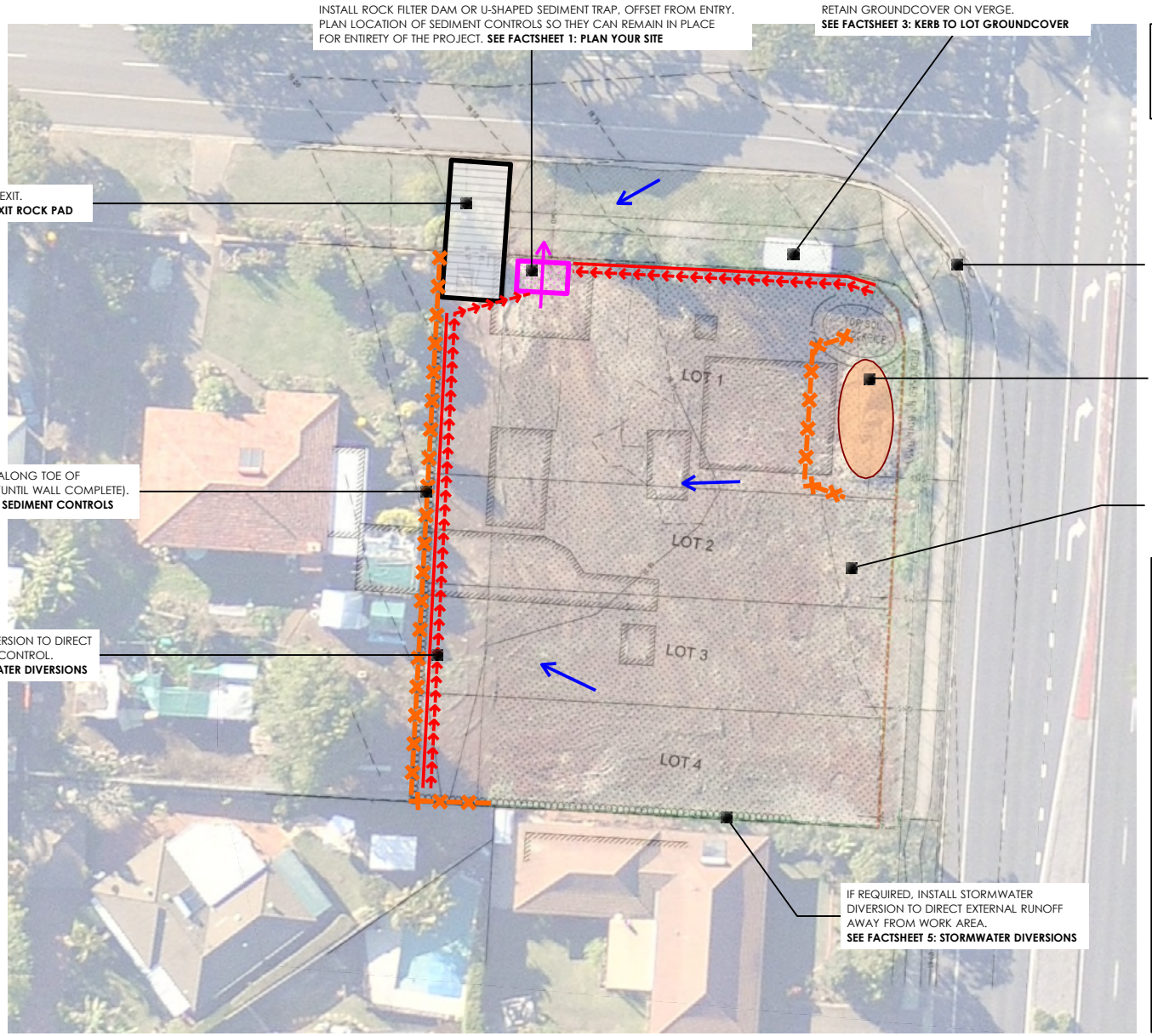
EXAMPLE EROSION AND SEDIMENT CONTROL PLAN FOR RECONFIGURATION OF A LOT – BULK EARTHWORKS STAGE



(Source: Topo Group).

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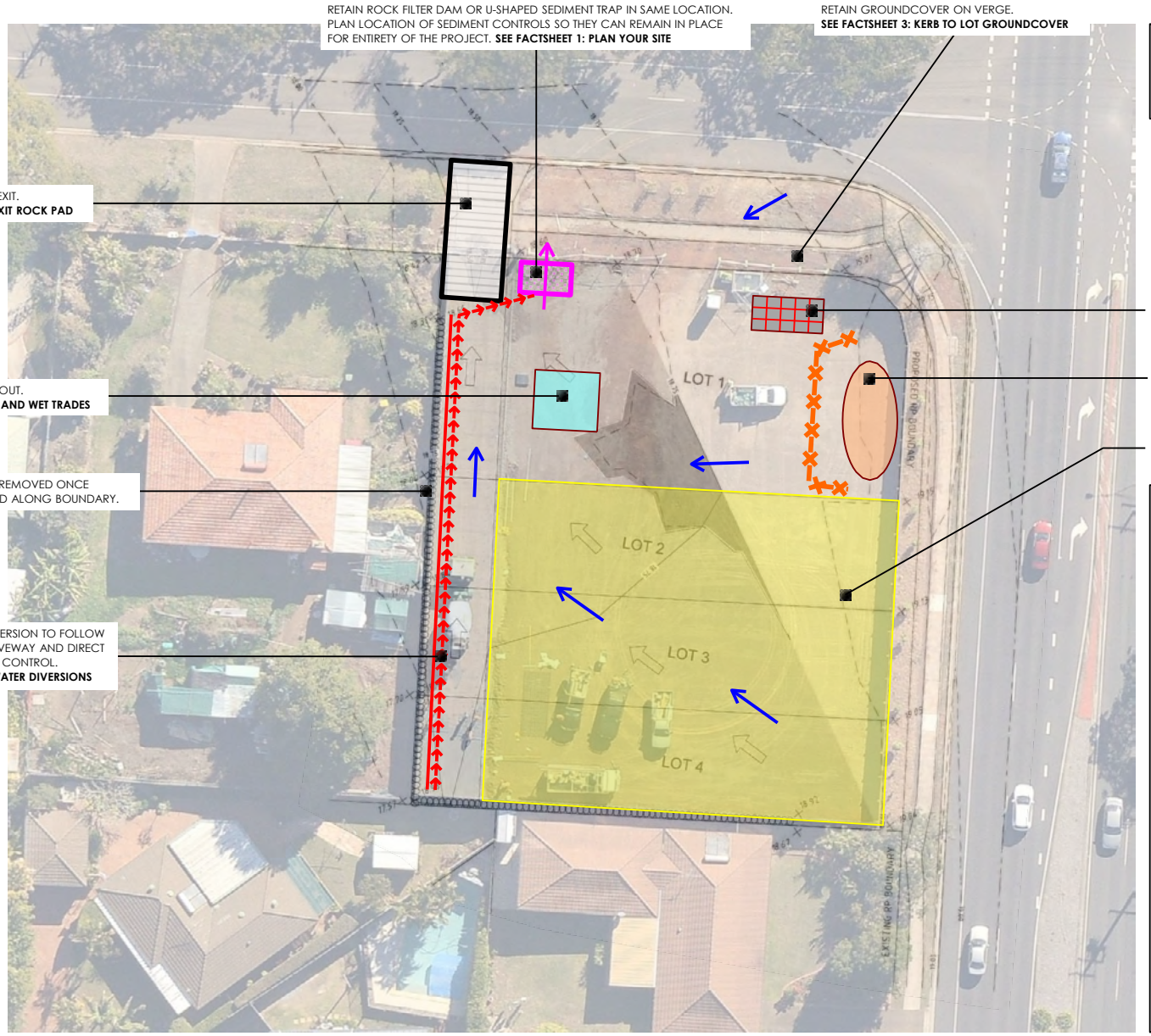
EXAMPLE EROSION AND SEDIMENT CONTROL PLAN FOR RECONFIGURATION OF A LOT – FINAL LEVEL STAGE



(Source: Topo Group).

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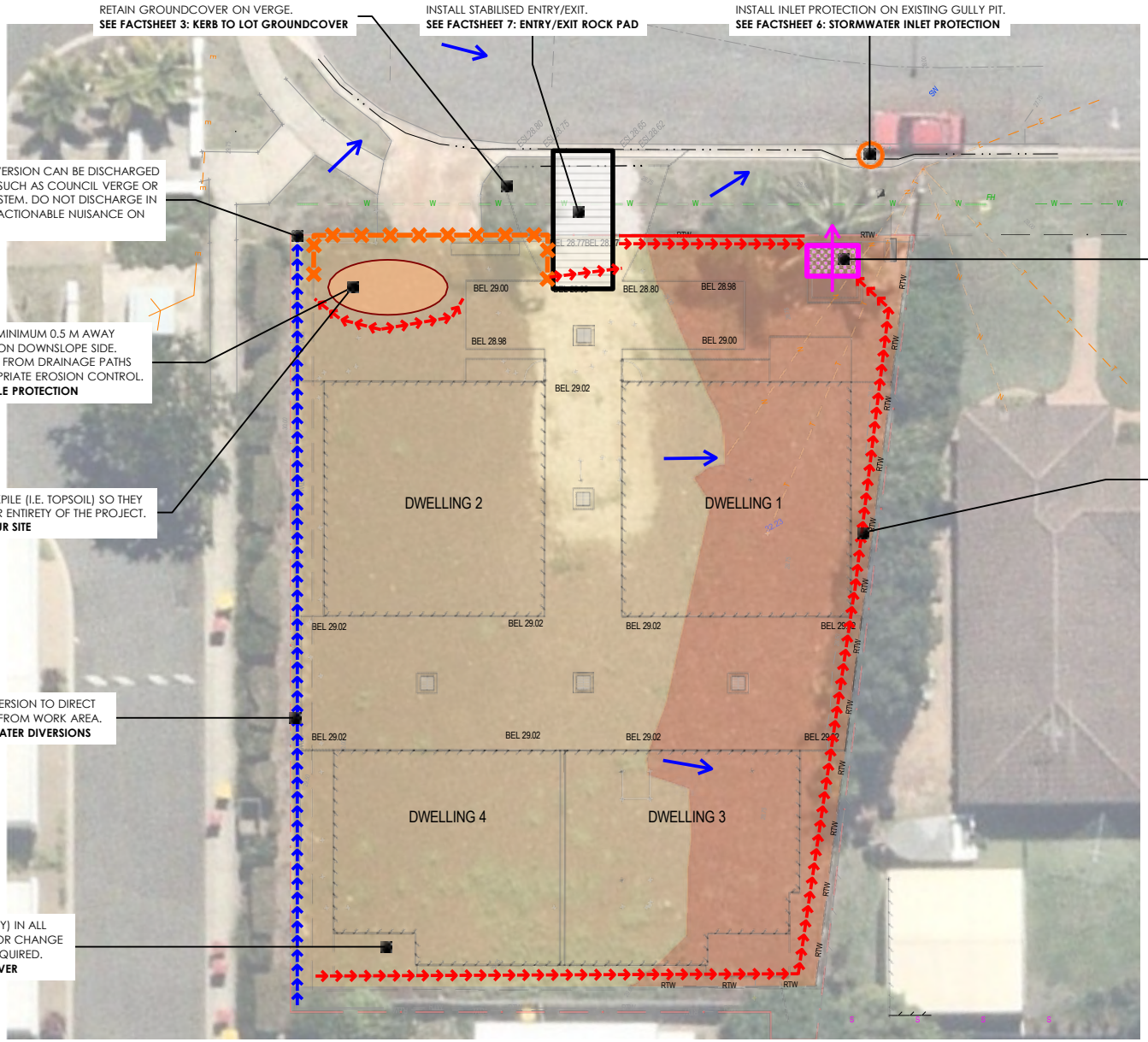
EXAMPLE EROSION AND SEDIMENT CONTROL PLAN FOR MATERIAL CHANGE OF USE – EXISTING LEVEL STAGE



LEGEND:

- EXISTING CONTOURS
- STABLE SITE ENTRY/EXIT
- DIRTY WATER DRAIN
- CLEAN WATER DRAIN
- DIRTY WATER DIVERSION BERM
- CLEAN WATER DIVERSION BERM
- FLOW DIRECTION
- SEDIMENT FENCE OR MULCH BUND
- ROCK FILTER DAM OR EXCAVATED SEDIMENT TRAP
- STORMWATER INLET PROTECTION
- TEMPORARY EROSION CONTROL
- STOCKPILE AREA

(Source: Topo Group).

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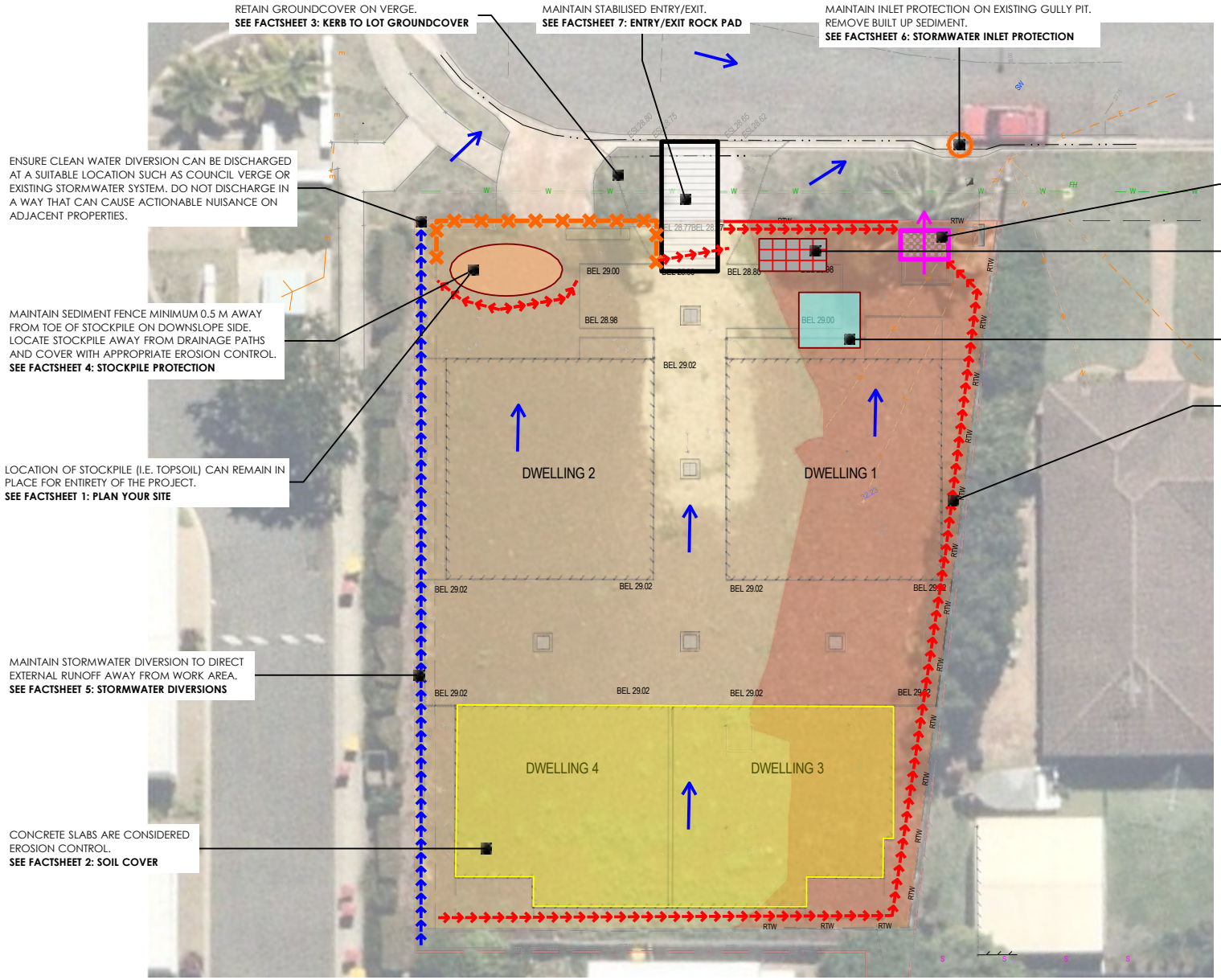
EXAMPLE EROSION AND SEDIMENT CONTROL PLAN FOR MATERIAL CHANGE OF USE – BULK EARTHWORKS STAGE



LEGEND:

- DESIGN CONTOURS
- STABLE SITE ENTRY/EXIT
- DIRTY WATER DRAIN
- CLEAN WATER DRAIN
- DIRTY WATER DIVERSION BERM
- CLEAN WATER DIVERSION BERM
- FLOW DIRECTION
- SEDIMENT FENCE OR MULCH BUND
- ROCK FILTER DAM OR EXCAVATED SEDIMENT TRAP
- STORMWATER INLET PROTECTION
- TEMPORARY EROSION CONTROL
- WASTE MANAGEMENT AREA
- CONCRETE WASHOUT
- STOCKPILE AREA

(Source: Topo Group).

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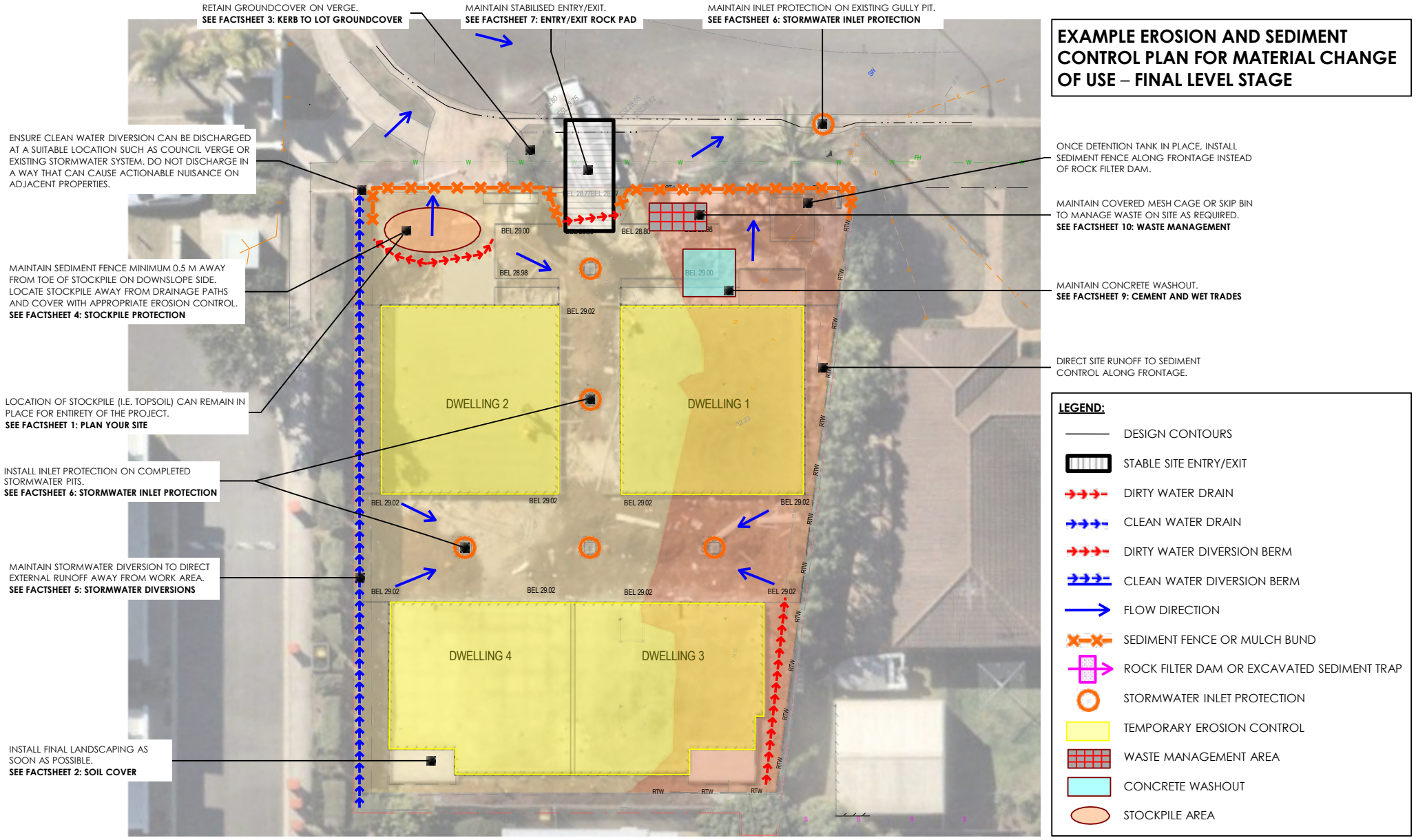

EXAMPLE EROSION AND SEDIMENT CONTROL PLAN FOR MATERIAL CHANGE OF USE – FINAL LEVEL STAGE

(Source: Topo Group).

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2 Erosion protection
Soil cover

Covering soil is the best way to stop erosion caused by rain and wind. Unlike sediment barriers, such as sediment fences, which capture eroded coarse sediment, erosion controls can stop both coarse and fine sediment from eroding in the first place.

How

- Only clear the area necessary to undertake the works. Keep as much existing soil cover on your site as possible.
- Only clear immediately before commencing works, not weeks or months in advance.
- Cover bare soil as soon as possible. Rather than waiting for works to finish, find a temporary covering that can be walked on during the building stage.

Types

Surface type	Soil cover type
Slopes and batters	• Erosion control blankets • Turf and vegetation • Hydromulch
Service trenches	• Turf • Gravel
Stockpiles	• Tarps • Geofabric • Builders plastic
Area between kerb and lot	• Turf
All other exposed soil around the site	• Mulch and gravel • Turf • Spray-on soil binders

Maintenance

Regularly check your soil cover before and after rain. If bare soil is visible and erosion is occuring, add more soil cover.

Site rehabilitation

Revegetate and landscape your site as soon as the works are complete.

ESC tip

Choose cover types that can withstand the expected traffic movements, such as mulch, gravel or turf.

Straw mulch (Source: Catchments & Creeks).

Hydromulch after application (Source: Healthy Land & Water).

Hydromulch after watering and grass establishment (Source: Healthy Land & Water).

Spray on soil binder (polymer) (Source: Healthy Land & Water).

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3 Erosion protection
Kerb to lot groundcover

Using a kerb to lot groundcover prevents soil from eroding, filters overland flow and helps keep your site looking clean and tidy.

How

- Cover any bare ground between the kerb and the lot with turf.
- Avoid storing stockpiles of soil within this zone where it can easily wash into stormwater drains.
- Check your local Council's requirements before storing materials outside the lot.

Maintenance

Protect your groundcover by keeping vehicles and materials out of this zone. This will reduce the need to replace turf, saving you time and money.

Did you know...

The area between your lot and the kerb is public land. If you need to store materials or equipment in this area, talk to your local Council first as a footpath closure permit may be needed.

Parking or storing materials on the grass verge or footpath is not recommended as it will damage the turf and increase erosion and sediment runoff. That could mean a fine!

ESC tip

Protect the road verge against erosion and sediment runoff.

Turf covering kerb to lot (Source: Healthy Land & Water).

Site without adequate kerb to lot cover (Source: Healthy Land & Water).

Site without adequate kerb to lot cover (Source: Healthy Land & Water).

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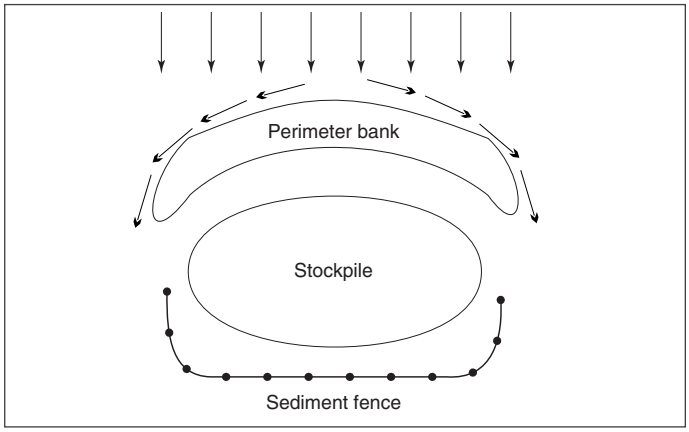
4 Erosion protection
Stockpile protection

Building materials and topsoil are expensive. Save money and time by protecting your stockpiles.

How

- Keep stockpiles within your lot boundary and well away from drainage paths.
- Ideally place them in a location where they can remain for the entirety of the works.
- Install a sediment fence on the downslope side of the stockpile with returns on both ends to capture any sediment runoff.
- Keep stockpiles at least 0.5 metres away from sediment barriers (e.g. sediment fences).
- Cover and secure stockpiles against wind and rain.
- Cover topsoil stockpiles with breathable fabrics, such as hessian or geofabric, to protect microorganisms.
- If the topsoil needs to be stored for longer periods of time, consider applying a hydromulch or other temporary groundcover for maximum benefit.
- Keep stockpiles out of overland flow paths. If this is not possible, direct water runoff around the stockpile with a perimeter bank made of compacted soil, or a row of sandbags on the upslope side. Refer to the diagram below.



A perimeter bank used to direct water around a stockpile (Source: Catchments & Creeks).

Maintenance

Conduct a daily check to ensure stockpiles are covered and contained. Remove any built-up sediment from behind the sediment fence.

ESC tip

Cover it when not in use.

Construction materials covered (Source: Healthy Land & Water).

ESC tip

Bag it if space is tight.

Construction materials stored in bags to save space (Source: Catchments & Creeks).

Remember! Your topsoil is full of living organisms that are critical to soil health and will help with the establishment of plants on your site. To protect the health of your topsoil, only use breathable covers such as hessian or geofabric or groundcovers such as hydromulch or grass.

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5 Drainage control
Stormwater diversion

Diverting offsite stormwater

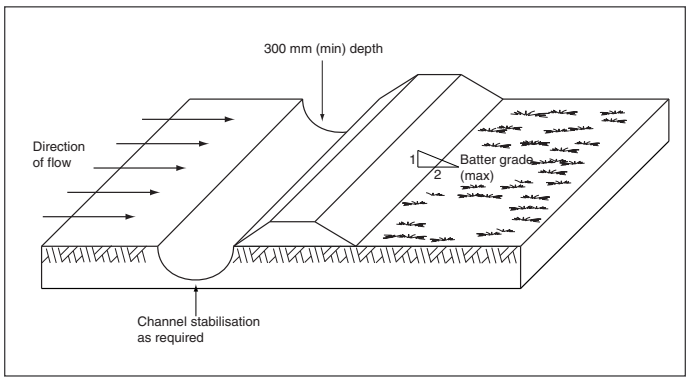
Stormwater entering a site from outside the lot boundary can increase soil erosion on your site and increasing sediment that must be cleaned up.

If the area of land upslope of your site is greater than 1,500 m^2 (approximately three typical house lots), or if runoff becomes an erosion problem, divert this water away from your site by using a catch drain.

The catch drain should:

- Be lined to prevent erosion, for example with geotextile fabric, UV resistant builders plastic or turf.
- Be located within your site, not your neighbour's.
- Be a minimum of 300 mm in depth.
- Be discharged safely to the roadside gutter or a stormwater drain, without causing erosion.
- Not be discharged onto neighbouring properties, or in a way that could cause a nuisance.

Refer to the diagram below for typical catch drain design.



Catch drain design (Source: Catchments & Creeks).

Did you know...

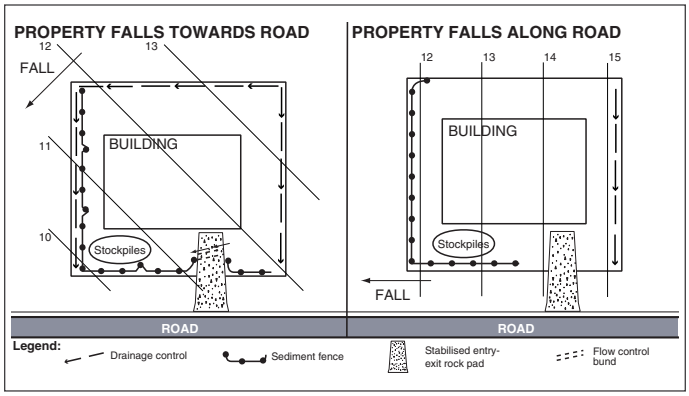
If water flows onto your site, then you are responsible for managing it.

This includes any erosion or sediment it produces. That is why diverting stormwater around your site can save you time and money over the duration of the build.

ESC tip

The diagram below shows typical locations for drainage controls in situations where water is entering your site.

If water is entering your site from one concentrated point, instead of using a catch drain, you could use a PVC pipe laid horizontally across the ground to collect and convey stormwater to the road or drain.



Drainage channel location examples (Source: Catchments & Creeks).

Directing onsite dirty water

You can also use catch drains to direct dirty water from within your site to a sediment control where coarse sediment will be captured before leaving your site. See *Factsheet 1 – Plan your site*, and *Factsheet 8 – Coarse sediment controls* for more information.

Diverting roof stormwater

As soon as the roof goes on, connect either permanent or temporary downpipes securely to the gutter drops and the underground stormwater system.

Without downpipes, rainwater gushes from the roof onto bare soil, which increases erosion on your site.

Installing downpipes can remove over 50% of the water that falls on your site, resulting in less erosion and less mud, so you get back onto site quicker after rain.

If you see a downpipe not connected, connect it back up or report it to the site supervisor.

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6 Sediment control
Stormwater inlet protection

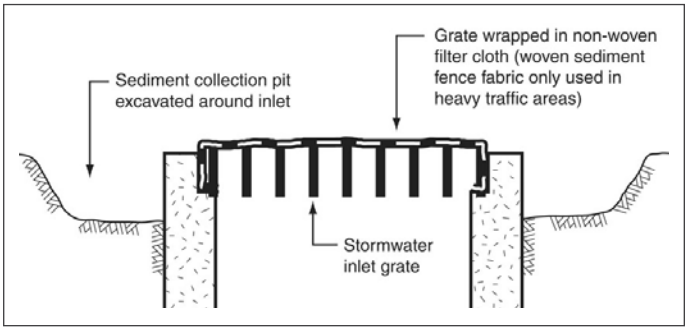
If your lot drains to an internal stormwater inlet pit, it needs to be protected. Stormwater inlet protection prevents coarse sediment from entering and blocking stormwater pipes, which can flood properties. Protect your stormwater inlets to avoid the cost and hassle of unblocking drains and explaining the problem to your customer and the local Council.

As this control device only captures coarse sediments and not fine sediments, it should only be used after erosion and drainage controls have been installed.

Onsite stormwater inlet pit protection

If you have an inlet pit within the lot boundary, protect it by:

- Wrapping filter cloth over the stormwater inlet grate.
- Digging a trench around the pit to allow water to pool and the sediment to settle out.
- Stabilising all other areas around the pit, for example with geofabric or turf.
- Removing any sediment on, in or around the pit directly after rain events.



Stormwater inlet protection design (Source: Catchments & Creeks).

Maintenance

Inspect and remove built up sediment after each rain event.

Don't wash the soil into the stormwater drain – it's against the law and you could face a fine!

If soil or sediment gets onto the road an offence may have already been committed. It is better to stop the sediment before it gets to the road by following the simple steps in these factsheets.

Stormwater inlet coarse sediment protection (Source: Brisbane City Council).

Roadside stormwater inlet pit protection

- Check with your local Council about using sediment controls in road reserves, as some do not allow it due to the risk of blocking stormwater inlets and creating a potential safety hazard.
- If permission from Council has been granted, refer to the Council guidelines for suitable controls.
- Ensure any controls within the roadside gutter are installed in a way that does not pose a traffic safety hazard for pedestrians, cyclists and vehicles.
- Remove any built up sediment from the controls after rain and always maintain in good working order.

Stormwater inlet coarse sediment protection (Source: Brisbane City Council).

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7 Sediment control
Entry/exit rock pad

Entry/exit rock pads prevent the site entrance from becoming boggy and reduces sediment from being tracked onto the road.

This not only helps avoid Council fines, but makes your site look clean and tidy for potential home buyers.

How

- Install the rock pad before allowing vehicles to move on and off the site.
- Prepare an area at least 2 metres wide from the kerb to the building slab, or a minimum of 10 metres long.
- Lay geotextile filter cloth on the base to help stop clayey soils from coming up through the pad.
- Cover the geotextile filter cloth with 40 mm to 75 mm diameter crushed rock at least 150 mm to 200 mm thick.
- Make the rock pad safe for pedestrian footpath traffic by covering the larger rocks with smaller 25 mm to 50 mm aggregate or gravel.

The key dimensions for an entry/exit rock pad are shown in the diagram below.

ESC tip

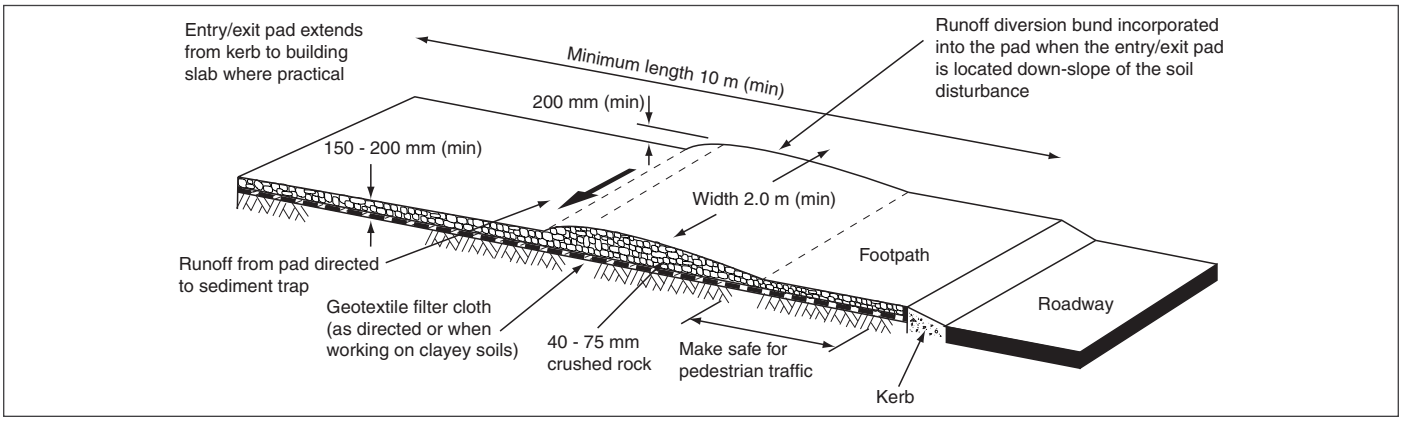
On clayey soils, laying geotextile filter cloth under the rock pad can significantly increase its lifespan, reducing maintenance time and money.

Entry/exit rock pad (Source: Brisbane City Council).

Erosion of site without rock pad (Source: Healthy Land & Water).

Maintenance

- Avoid placing stockpiles on the rock pad.
- If the rocks become clogged with sediment, refresh or replace them.
- Should any dirt get into the gutter or on the road, sweep it up and place the dirt behind a sediment barrier.
- Do not wash dirt down the gutter or into drains. It is against the law and you could face a fine!



Entry/exit rock pad design (Source: Catchments & Creeks).

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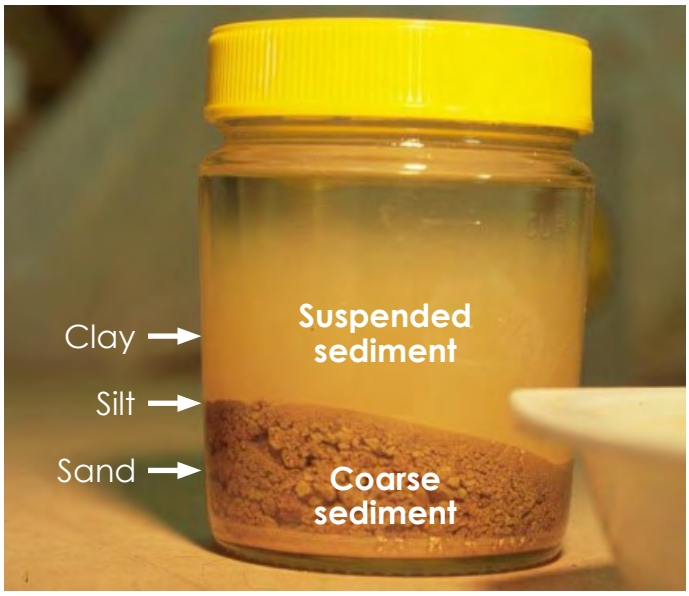
8 Sediment control
Coarse sediment controls

Covering the exposed soil on your site with erosion controls is the best way to stop sediment pollution. Where this is not possible across the entire site, effective sediment control measures will be needed.

Soil on your site is made up of different sized sediment particles, from very fine clay to large sand and gravel.

While sediment basins are the most effective sediment control measure for capturing all sizes of sediment, they are not practical on most small sites (<2,500 m^2) due to space constraints. Other sediment control measures which are typical for small sites are limited to the capture of coarse sediments only, such as sand and gravel. They are not as effective as erosion control measures, which cover exposed soil and stop both coarse and fine sediment runoff.

Therefore, sediment controls should not be solely relied upon or considered sufficient to prevent erosion or stop sediment pollution.



Sediment particle sizes (Source: Catchments & Creeks).

How

There are a number of different sediment control measures which could be considered for a small site.

All sediment control measures typically work by ponding water like a dam, which allows the heavier coarse sediment particles to settle to the bottom. To do this, they need to be capable of holding water behind or within the control.

Types

All sites are different in some way. The size, steepness and direction your site slopes will affect which type of sediment control best suits your site.

The effectiveness of sediment controls in capturing sediment particles varies. Sediment fence, whilst a very common option and suitable for small areas, is considered less effective than rock filter dams, mulch berms or excavated traps.

All sediment controls require correct installation and ongoing maintenance to be effective. If in doubt, check with your local Council or a qualified ESC professional.


Sediment fence correctly installed (Source: Healthy Land & Water).

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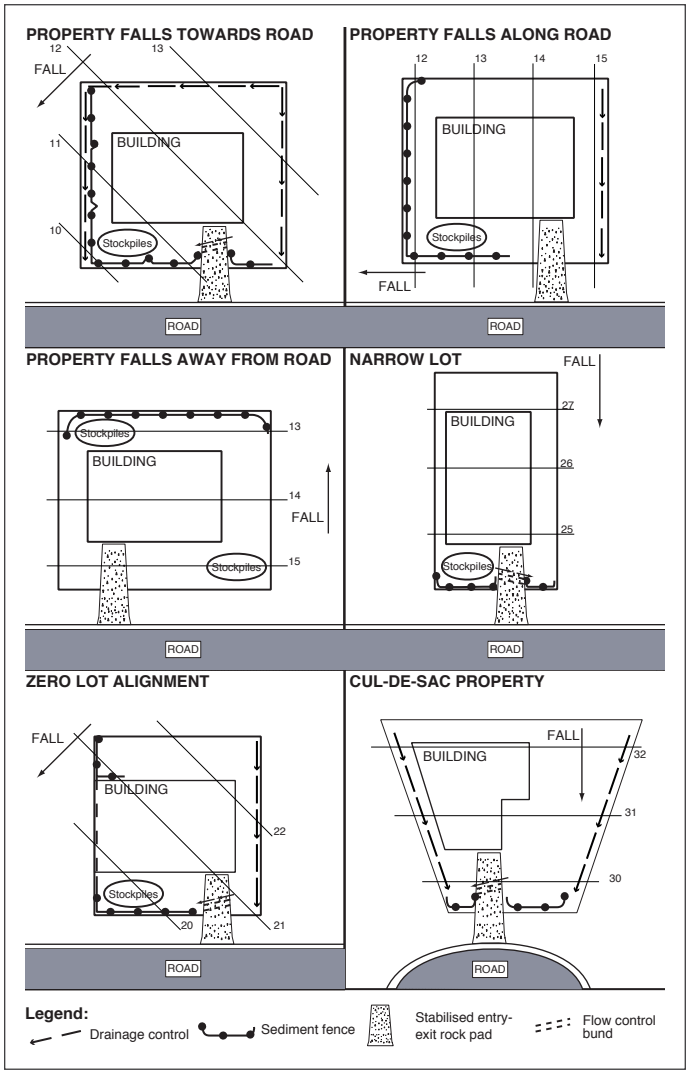
Location

- Sediment controls should be installed on the downslope side of the disturbed area and, where possible, parallel to the contour along a line of constant land level.
- Make sure the sediment control is within your lot boundary and overtops or outlets to a suitable and stable location, such as a Council verge or existing stormwater system such as a roadside gutter or drain.
- Sediment controls should be installed prior to the commencement of site works.

Use the following diagrams and the ESC plan templates in *Factsheet 1 – Plan your site*, as a guide to work out where to put the sediment control measures on your site.

Maintenance

All sediment barriers need to be regularly checked and properly maintained in full working order to remain effective. Remove any built-up sediment and repair or reinstate any damaged controls directly after rain events.



Sediment control location examples (Source: Catchments & Creeks).

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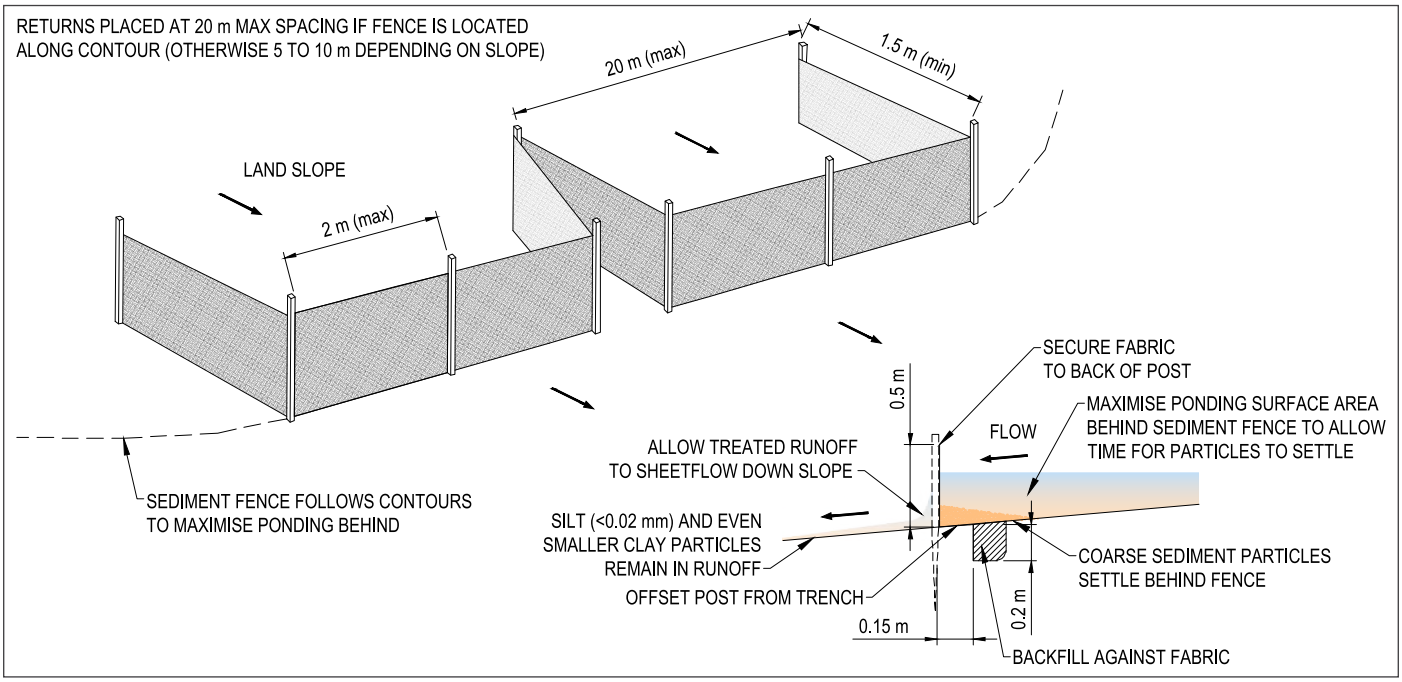
Sediment fences

Sediment fences are suitable for small disturbance areas on your site, surrounding stockpiles of erodible material or where other more effective sediment control options are not practical. Sediment fences should only be used in instances where water is able to be captured and ponded behind the sediment fence through the use of returns. Sediment fences should not be installed in drainage channels or concentrated flow paths as they could be damaged and wash away.

Installation

1. Identify a location for the sediment fence within your lot boundary. It should be installed on the downslope side of the disturbed area and, where possible, parallel to the contour.
2. Identify the location of the returns. Returns are essential to enable the ponding of water. They should be installed at each end of the fence, for example at the corners of the lot and the driveway entrance, and at regular intervals along its length. Returns should be a minimum of 1.5 m long, placed in an upslope direction, and be at intervals of no more than 20 m apart if the sediment fence is positioned along the contour, or 5 – 10 m apart if the fence is at an angle to the contour.
3. Dig a trench 200 mm deep where you want the sediment fence to go, including a trench for the returns. Place the excavated soil on the upslope side of the trench so it is easier to backfill the trench once the fence is in place.
4. Install support posts along the downslope side of the trench using 40 mm square hardwood. The posts should be no more than 2 metres apart and driven at least 300 – 400 mm into the ground.
5. Attach the fabric to the support posts using heavy duty staples or tie-wire, starting at one end of the fence line and ensuring that the lower 300 mm of fabric lays down into the trench on the upslope side. Ensure that the fabric is drawn taught between each post as it is secured. Try and use one continuous roll of sediment fence fabric to avoid joins and gaps that can let water flow through. The finished height of a sediment fence should be at least 500 mm above ground level.
6. Backfill the trench to cover the bottom of the fabric with soil and compact as needed to firmly anchor the fabric to stop water flowing under the sediment fence.

Sediment fence (Source: Topo Group).



Sediment fence installation and anchoring design (Source: Topo Group).

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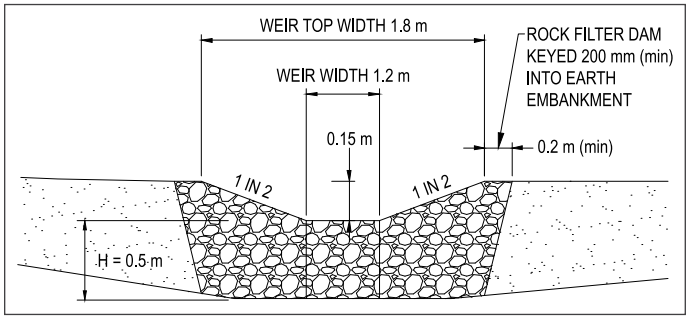
Rock filter dam

Rock filter dams are a robust sediment control measure that can be used in minor concentrated flow paths to capture coarse sediment from a site. They are made from rock material wrapped in geotextile fabric, and function by forming a small dam that ponds water, enabling coarse sediment to settle out.

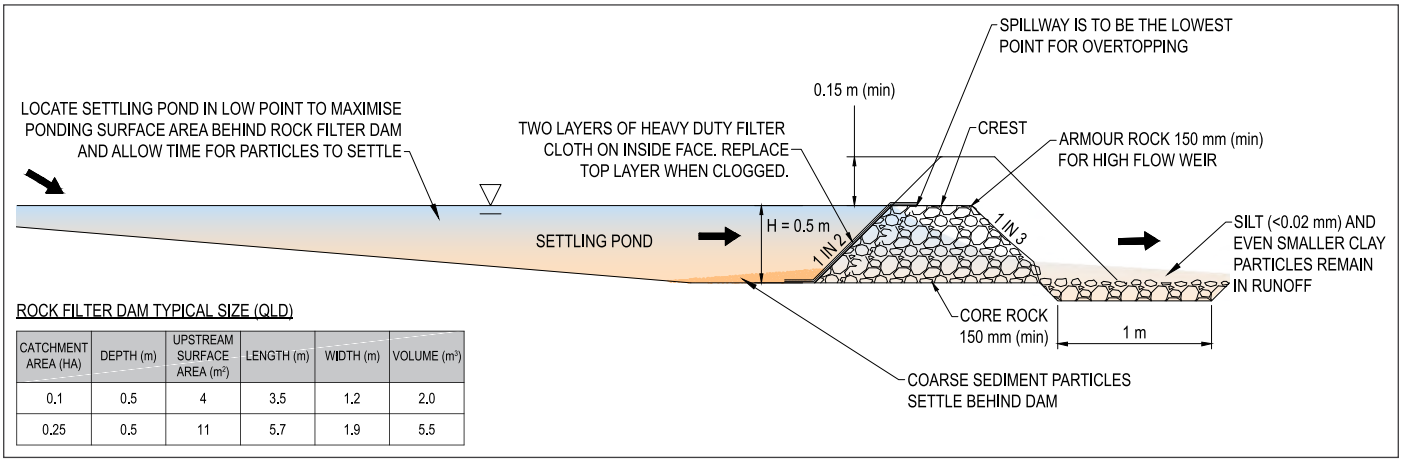
Installation

1. Locate the rock filter dam in a suitable location at the downslope/low point of a site where site runoff will be directed to.
2. The discharge point should be at a suitable location, such as a Council verge or existing stormwater system.
3. Place heavy-duty geotextile fabric, minimum 'bidim' A34 or equivalent, on the ground where the rocks will go. Ensure there is enough fabric to wrap over the top of the rock material.
4. Place well graded rock which is hard, angular and erosion resistant, with a mean size of approximately 225 mm diameter, onto the fabric to form the dam.
5. The height of the rock filter dam should be approximately 0.5 m, the width approximately 2 m with a 1 in 2 batter, and the length at least 2 meters.
6. Install 1.5 m long returns at both ends to enable ponding behind the dam.
7. Form a spillway at the center of the rock filter dam, approximately 100 – 150 mm below the top of the rock. This will convey overflow water during high rainfall events.
8. Wrap the fabric over the rocks ensuring it is secure.
9. Maximise the area where water can pond behind the rock filter dam by excavating a pit on the upslope side of the dam. See the rock filter dam typical size table below for dimensions.

Rock filter dam (Source: Topo Group).



Rock filter dam design – weir details (Source: Topo Group).



ROCK FILTER DAM TYPICAL SIZE (QLD)

CATCHMENT AREA (HA)	DEPTH (m)	UPSTREAM SURFACE AREA (m^2)	LENGTH (m)	WIDTH (m)	VOLUME (m^3)
0.1	0.5	4	3.5	1.2	2.0
0.25	0.5	11	5.7	1.9	5.5

Rock filter dam design – long section (Source: Topo Group).

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Mulch berms

Mulch berms function on the same principle as sediment fences and rock filter dams by forming a barrier behind which runoff ponds, allowing coarse sediment particles to settle out under gravity.

An advantage over sediment fences is that mulch berms can be more effective at capturing coarse and medium sized sediment particles and may limit the amount of runoff exiting the site by absorbing a portion of water.

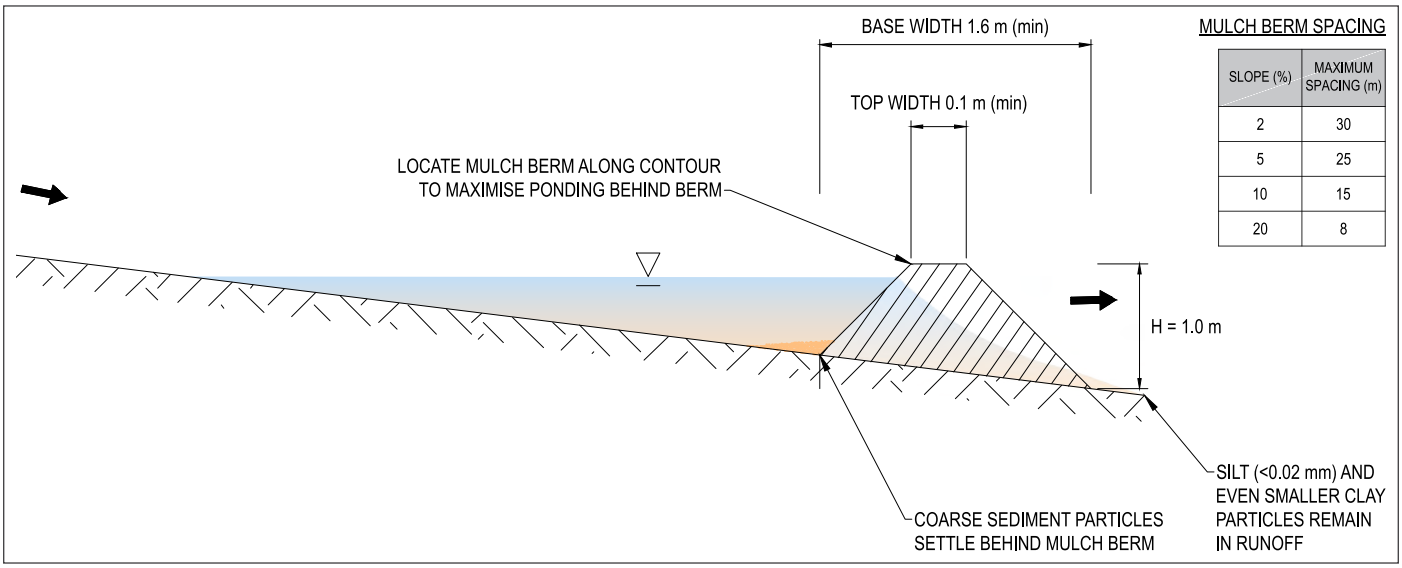
Mulch berms should be limited to sheet flow conditions on flat sites and should not be used in concentrated flow paths or where mulch material can be washed off the site.

Mulch berm (Source: Topo Group).

Installation

1. Install mulch berm across the contour to maximise surface area available for ponding. Only install on flat sites and not in concentrated flow paths.
2. The mulch berm should be a minimum 300 mm high and at least 1.5 – 2 m wide.
3. Returns at least 1.5 m long should be placed at the ends of the mulch berm in an upslope direction to enable ponding.
4. Returns should also be placed at regular intervals along the berm length. See the mulch bund spacing table below for indicative spacing.
5. Ideally, and where available, use mulch formed from onsite vegetation and free of weed seed.

Mulch berm with upslope 'return' being used on a small construction site (Source: Catchments and Creeks).



MULCH BERM SPACING

SLOPE (%)	MAXIMUM SPACING (m)
2	30
5	25
10	15
20	8

Mulch berm design (Source: Topo Group).

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Excavated sediment trap

Excavated sediment traps are essentially an undersized basin, operating on the same ponding principle as the other coarse sediment control measures.

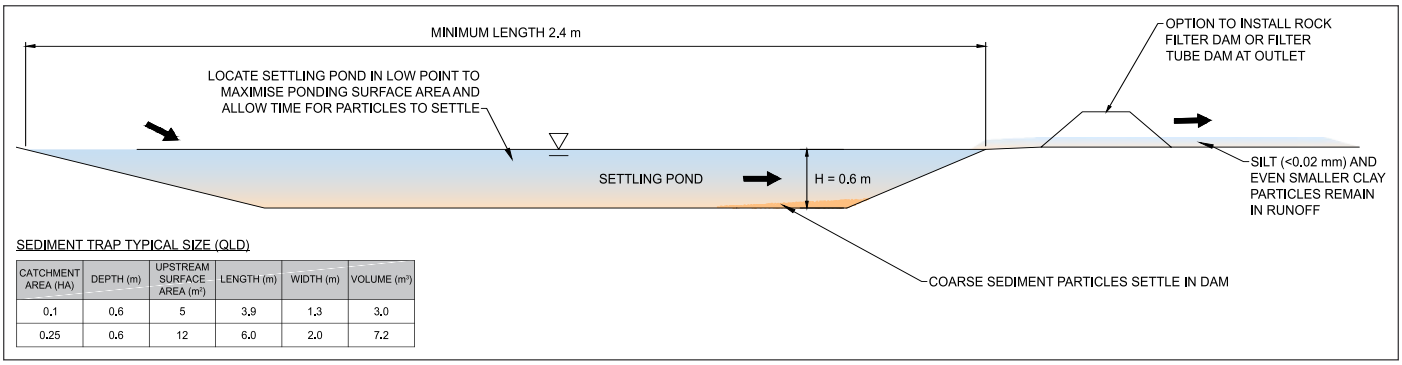
Sediment traps must be of sufficient size to allow short-term detention of runoff to allow time for coarse sediment particles to settle via gravity.

Future site stormwater infrastructure may require excavation on site within the lowest point, which can possibly be used in the interim as an excavated sediment trap. If concrete washout is to occur within the excavation, then it cannot be used as a coarse sediment control measure.

Installation

1. Locate in a suitable location at the downslope point on site where site runoff will be directed.
2. Excavate a sump to the maximum capacity practical. See the sediment trap typical size table below for dimensions. Excavated material can be used to form a bund adjacent, providing greater storage capacity.
3. Form a spillway to convey overtopping runoff onto a stable and non-erosive surface at a suitable discharge location. For example, a suitable discharge location might be at the edge of a lot where the water can flow over a grassed Council verge to the roadside stormwater system.

Excavated sediment trap (Source: Topo Group).



SEDIMENT TRAP TYPICAL SIZE (QLD)

CATCHMENT AREA (HA)	DEPTH (m)	UPSTREAM SURFACE AREA (m^2)	LENGTH (m)	WIDTH (m)	VOLUME (m^3)
0.1	0.6	5	3.9	1.3	3.0
0.25	0.6	12	6.0	2.0	7.2

Excavated sediment trap design (Source: Topo Group).

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9 Other pollutant controls
Cement and wet trades

Sediment is not the only pollutant generated from sites. Preparing or finishing new concrete surfaces can clog stormwater infrastructure and pollute our waterways. Allowing pollutants to enter stormwater drains and waterways without effective controls in place is an offence under the *Environmental Protection Act 1994*.

Prevent wash-off from concreted surfaces by capturing all residue and wastewater before it enters the roadside gutter or the stormwater system. If this is not possible an alternative product or finish should be used.

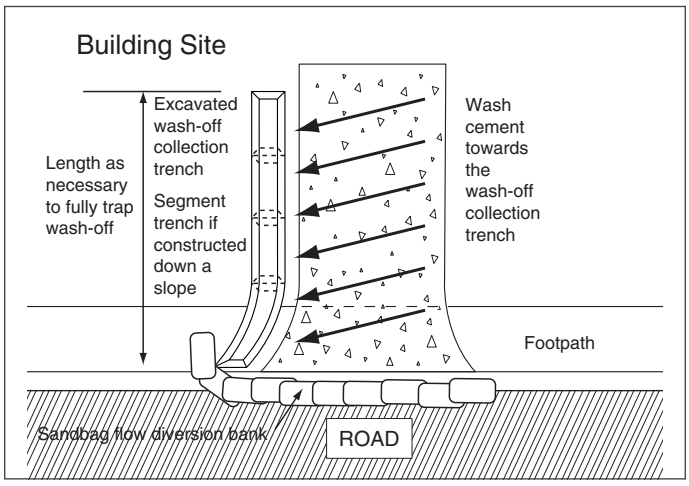
Exposed aggregate driveways are a common example of where both the solid residue (i.e. sand/ cement slurry) and the water runoff can clog stormwater pipes and pollute waterways. Some examples of how you can manage exposed aggregate surfaces to prevent stormwater pollution can be found below and are shown in the diagram on the right.

How

- Dig a trench along the length of the driveway.
- Place sandbags around the bottom end of the driveway trench to form a small dam. Ensure the dam is large enough to capture all runoff and ensure there are no gaps between the sandbags.
- Wash cement residue into the collection trench and the dam using the least amount of water necessary.
- Capture all residue on site and do not let it wash down the roadside gutter or stormwater drains.
- Remove all residue and put it in a suitable location where it can be disposed of. You may need to stop occasionally to remove residue from the trench to prevent it overtopping your controls.
- Contain all wastewater on site and appropriately

Did you know...

Wash-off from wet concrete and exposed aggregate surface can have a very high pH, which means the water is very alkaline and can impact fish and other organisms in our waterways. Follow the instructions in this factsheet to avoid impacting waterways.



Wastewater management design on an exposed aggregate driveway (Source: Catchments & Creeks).

Other site pollutants

Paint, plaster and other waste materials are harmful to our waterways. Prevent them from entering the stormwater system by:

- Washing equipment, tools and paint brushes/ rollers only within a contained area that cannot reach the stormwater system.
- Containing runoff from water-cooled saws used to cut bricks, tiles and masonry.
- Always do this within the property boundary on a permeable surface and upslope of a sediment barrier.
- Contain all wastewater on site and appropriately dispose of any residue at a refuse facility.

Exposed aggregate driveway (Source: Catchments & Creeks).

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10 Other pollutant controls
Waste management

Proper waste management not only maintains a clean and tidy work site, it keeps litter and building waste off the street and out of our waterways.

A clean and tidy site promotes quality and professionalism to your clients.

How

- Minimise waste generation where possible – the less waste generated the less you need to manage.
- Put rubbish in onsite covered waste bins, such as a skip bin or a mesh cage.
- Wrap and cover mesh cages to keep small items from falling or blowing out (e.g. with sediment fence fabric).
- Cover the waste bin when not in use and at the end of each work day to prevent litter blowing away.
- Remember to empty waste bins when full.

Did you know...

Dumping leftover concrete or building waste on a vacant block without the consent of the owner of the block is illegal. Fines for illegal dumping apply.

Other people dumping waste in your skip bin without your permission is also illegal.

Illegal dumping can be reported to the Department of Environment and Science: **https://report-littering-dumping.ehp.qld.gov.au/**

ESC tip

A clean site sends a positive message about your business.

Fabric wrapped mesh cage (Source: Healthy Land & Water).

Keep all rubbish in covered skip bins or mesh cages (Source: Healthy Land & Water).

A messy site could turn potential clients away (Source: Healthy Land & Water).

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