

Gully Head Erosion Control

The Battering Solution

Battering the gully head at 1:10 slope provides an earth ramp from the natural land surface above the gully head to the gully floor downstream. The earth ramp must then be quickly vegetated to reduce the chance of the 'waterfall effect' reoccurring.

The most effective measure of all the various soil erosion control measures is to maintain good groundcover at all times. Therefore it is recommended that any groundcover issue be addressed before starting gully restoration works.

Key Points for Design & Construction

- Assess gully to identify actively eroding parts (head, floor, sides).
- If required, construct diversion banks before work begins.
- Ensure topsoil is stockpiled before construction starts.
- Batter should start above the gully head to ensure coring in of materials used. Batter length needs to be 1:10.
- Side batters should be no steeper than a 1:3 grade.
- Once battering is complete, spread topsoil back over the exposed area to ensure the rapid establishment of vegetation.
- Plant stoloniferous grasses such as kikuyu and Rhodes grass to stabilise the area. Annual crops such as millet (summer), oats and barley (winter) at a rate of 10–20 kg/ha can be used to provide a quick cover until the grasses establish.
- The area should be temporarily fenced (solar powered electric fence is a good option).
- Minimise stock and vehicle movements around the exposed area.
- Where possible, do not undertake works during storm season. Autumn is generally a suitable time.
- Irrigate with water if necessary to establish groundcover.



Image 1: Large gully up to 3 m deep before battering.



Image 2: Same area photographed after battering.

Optional Suggestions

- Roll out round bales of straw or other hay to form a cover/mat over the battered down area.
- Cover area with chicken netting and secure with star pickets.
- If dispersive soils are present, do not disturb them unless there are no other options available. Dispersive soils require specific management e.g. adding organic matter and gypsum.

Monitoring & Maintenance

- Monitor and check gully head and floor areas after storm events.
- If rills occur it will be necessary to fill them and revegetate them as quickly as possible.
- If vegetation at the rehabilitation site gets above 150 mm in height, a light grazing, slashing or cool burn may be necessary.
- Be careful not to let the area become bare earth.

For more information on gully battering, refer to Chapter 13 of the *Soil Conservation Guidelines for Queensland and Gully Erosion: Options for Prevention and Rehabilitation*.

Cost Considerations

Controlling a gully once it has started generally requires a combination of engineering structures, earthworks and re-vegetation. Gully control works are expensive, have a high risk of failure, and are only justifiable where the gully threatens valuable assets (such as infrastructure or highly fertile land).

Knowing how much to spend on gully restoration works while getting the maximum benefit is hard to define. The amount of money that could be spent depends on the size of the gully, catchment, landscape factors and the type of gully restoration method used. Table 1 provides some indicative prices. Please consult your local contractor for figures of relevance to your situation and location.

Table 1: Approximate cost of gully head restoration work (worked out on a price of \$2 per cubic metre to move earth around, not including revegetation costs and fencing costs).

Gully Head Size	Approximate Cost
Small (1 m deep X 5 m across)	\$2000
Medium (3 m deep X 10 m across)	\$4000
Large (More than 3 m deep X 20 m across)	\$6000



Image 3: Forming an earth ramp to batter the gully head.

Glossary

- **Stoloniferous grass** – a grass with a creeping above ground stem that produces roots/shoot at the nodes.
- **Battering** – is the process where the soil/earth is excavated by earth moving machinery (such as a dozer or excavator) to form a soil/earth ramp from the natural land surface above the gully head to the gully floor downstream.
- **Dispersive soils** – structurally unstable soils which readily break down into individual clay particles when water is added to them. Dispersive soils are highly erodible, present problems for earth works and cause turbidity in water.