

## **ANNEXURE 8 EARTHWORKS**



# EARTHWORKS IN AUCKLAND CITY

Uncontrolled earthwork activities can remove or smother valuable vegetation and cause silt run off into streams and coastal waters. This silt can smother biological life and affect fish feeding and breeding areas. By choosing the right methods you can prevent unnecessary soil erosion and help the community protect the streams, beaches and coastal areas of the Auckland region. This pamphlet is aimed at helping you make those choices when planning and carrying out earthworks.

***The land owner is responsible for making sure that any activity disturbing the soil is carried out in a way to prevent soil erosion and to stop sediment entering waterways.***

To carry out earthworks a resource consent may be needed, depending on the area where the work is to take place and the size of the job. You should enquire with Auckland City Council, to find out whether a consent is needed. For very large earthworks you may also need a consent from the Auckland Regional Council. The ARC has comprehensive guidelines (Technical Publication No 2) which will be helpful for larger projects.

***Regardless of the size of the earthworks, you are required to take the appropriate measures to prevent soil loss and erosion.***

Some facts about siltation

- earthworks sites generate up to 1000 times as much silt as undisturbed land
- doubling the angle of the slope produces a 4 fold increase in silt
- doubling the area of earthworks can produce a 3 fold increase in silt

## METHODS TO PREVENT EROSION AND SEDIMENT LOSS

- a) Prevent silt run off by employing erosion control measures
  - i) expose only as much ground as needed at any one time
  - ii) provide run off diversion channels, contour drains, or earth bunds to divert clean water away from the site onto stable ground (grassed or sealed)
- b) Use one of more of these sediment control measures to capture silt
  - i) silt fences
  - ii) hay bales

iii) vegetation buffer strips

iv) sediment ponds

v) earth bunds

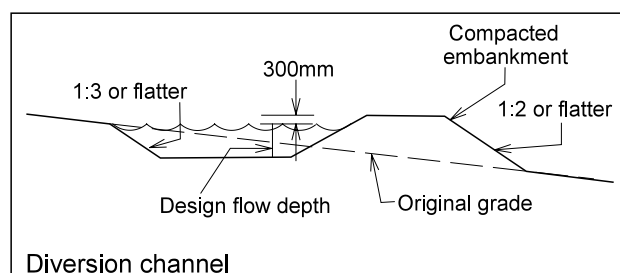
c) To finish

i) topsoil and regrass the exposed ground, or cover with a mulch, as soon as possible.

## EROSION CONTROL METHODS

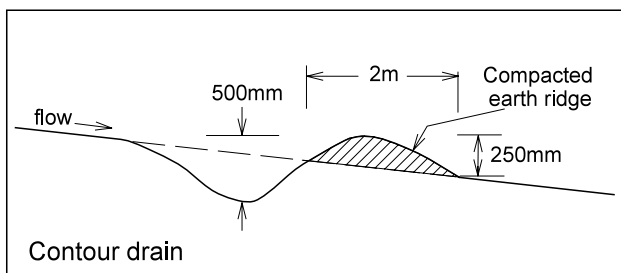
### Run off diversion channels

- a) used to protect work areas from up-slope run off
- b) water from channel can be discharged to areas of vegetation
- c) can be used to divert water to other sediment retention systems
- d) have shallow grades on channel to prevent scouring (1%-2%)
- e) may need to be stabilised against erosion by regrassing



### Contour Drains

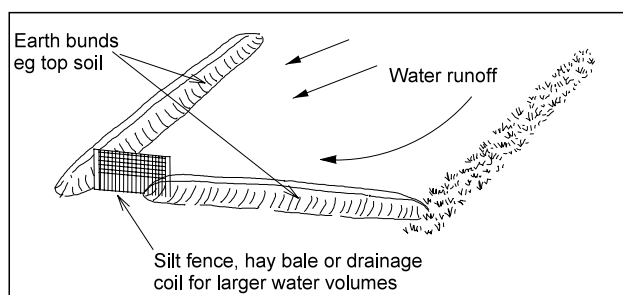
- use across earthworks area to break up slope
- use more than one drain on steeply sloping sites
- decrease spacing of drains as slope increases
- water can be discharged to vegetation or into sediment control structures



## SEDIMENT CONTROL METHODS

### Earth bunds

- construct across slope to control and detain run off
- use near edge of site to prevent sediment from leaving area
- can use topsoil from site to create bund

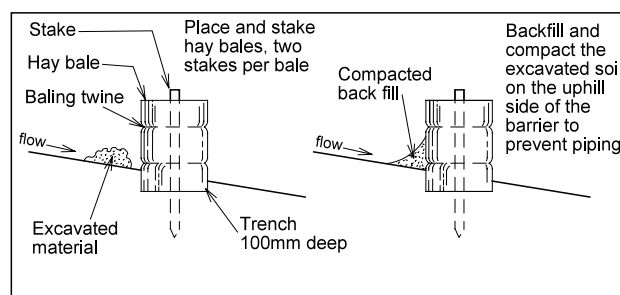
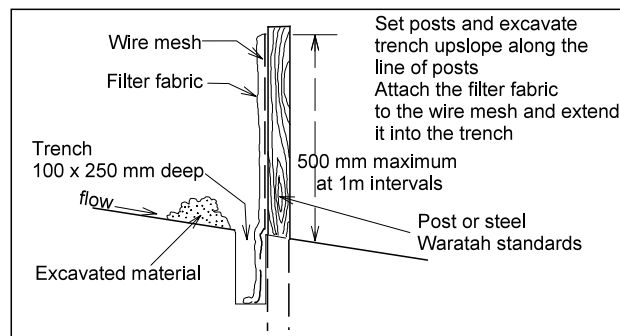


### Silt Fences

- for small disturbed areas or low slope angles
- use more than one on steeply sloping sites
- decrease spacing between fences with increasing site slope
- filter fabric is stretched between posts at max spacing of 1 metre

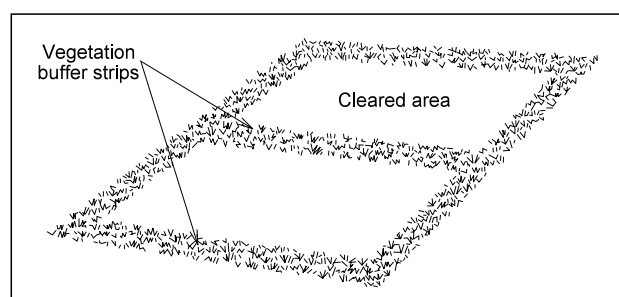
### Hay Bales

- for small sites and short term control
- should be dug into ground, tied together and anchored by staking
- regular inspection and maintenance is essential



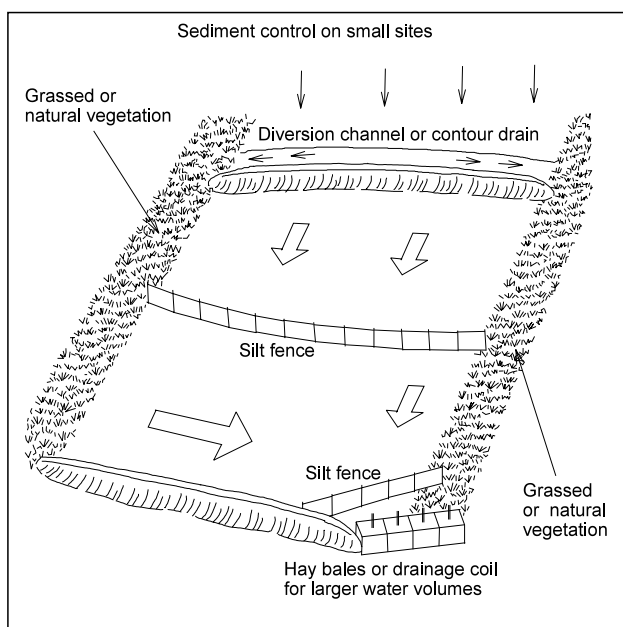
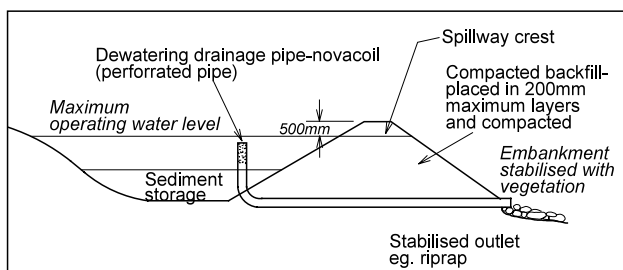
### Vegetation Buffer Strips

- should always be provided along watercourses
- to filter sediment from overland flow where run off rates are low and not concentrated
- use more than one buffer strip on steep slopes
- decrease buffer strip spacing with increasing slope
- to keep machinery away from watercourses



## Sediment Ponds

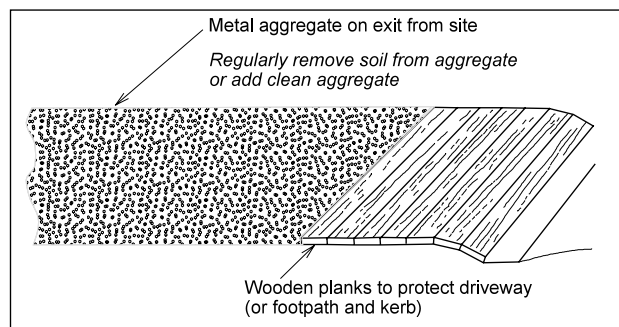
- do not construct in streams
- size at 1-2% of site area (ie  $1-2\text{m}^3/100\text{m}^2$ )
- clean out sediment regularly
- must have dewatering/drainage facility



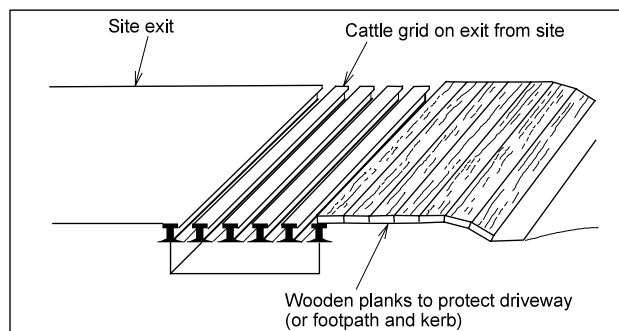
*For more details see the Auckland Regional Council publication "Erosion and Sediment Control Guidelines for Earthworks" (Technical Publication Number 2).*

## KEEPING THE ROADS CLEAN

It is important that soil from the site is not spread onto the road by vehicle tyres. To prevent this from occurring a stabilised entranceway must be built. The simplest method is to spread metal aggregate on all exitways from the site, where the soil will have a chance to fall off before the vehicle enters the road. Other methods for larger sites are cattle grids or wheel washes. The site manager or site owner is responsible for cleaning up any spilt soil to other materials that get on to the road from the site.



Remember also to protect the footpath, berm and kerb from damage by crossing vehicles.



## PUMPING WATER FROM THE SITE

If it is necessary to remove water from trenches or other areas of the site, then this should be done in a manner to prevent sediment in the water from entering any drain or watercourse. Water should not be taken from the bottom of any trench and sediment should be properly filtered out from the dirty water by some appropriate means such as the use of hay bales. Once the sediment has been filtered out it can then be discharged to a cesspit or a grassed area, or a watercourse if no other disposal point is available.



