

ENVIRONMENTAL ASPECTS OF ROADS (Ch.8)

SOIL CONSERVATION FROM UNPAVED ROADS (p42)

The National Environmental Management Act 107 of 1998 (NEMA)

Section 28 provides that every person has a duty of care to take reasonable measures to prevent significant degradation of the environment and/or stop it from occurring/reoccurring. Allowing continual soil erosion from unpaved roads could be classified as such. Persons not taking reasonable measures may be directed to do so. Non-compliance may result in prosecution should the authorities find significant degradation of the environment.

The Conservation of Agricultural Resources Act 43 of 1983, (CARA), as amended

Section 18 states, an authorised person may at any reasonable time enter upon any land in order to: 1. determine whether and to what extent soil erosion or other damage occurs on that land; and, 2. ascertain whether a soil conservation work should be constructed on that land, and whether a directive should be served on the land user of that land.

Roads

Unpaved roads are a source of man-made erosion by acting as water channels that increase the concentration of run-off water and disperse it over a much smaller area thereby altering the hydrological cycle and natural water movement.

1. Erosion

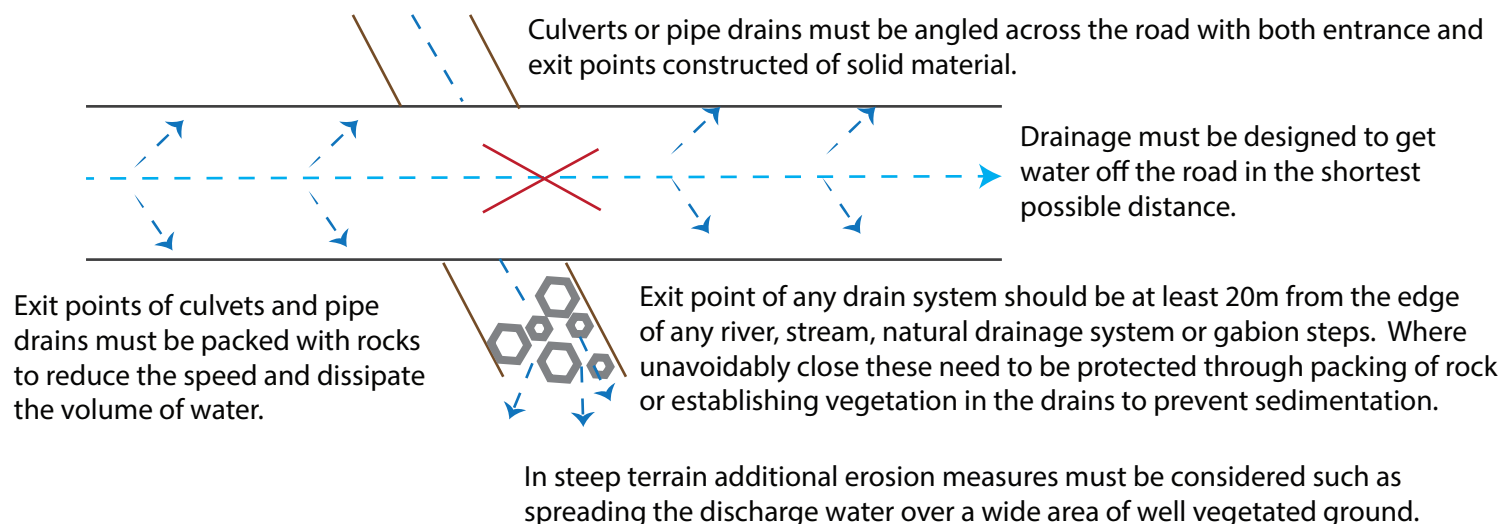
- **Physical erosion of the road:** usage can result in the gravel and underlying soil of unpaved roads being eroded, creating larger and deeper road channels.
- **Erosion of the road verge:** collapse of road verges due to water runoff resulting in increased road width.
- **Erosion as a result of channelled water:** channelling run-off water increases the water concentration and flow rate, while decreasing the area over which it is dispersed. This can lead to erosion of the channel, increase the risk of landslides and alter the morphology of any natural water courses into which the water flows.

2. Sedimentation

- **Sedimentation of road structure:** soil eroded by channelled water presents a high risk of drains being blocked, which exacerbates the situation.
- **Sedimentation of natural watercourses:**
 1. Reduce light penetration and primary production
 2. Increases decomposition by microorganisms reducing the availability of dissolved oxygen
 3. Increases stream water temperatures
 4. Chokes filtering biota

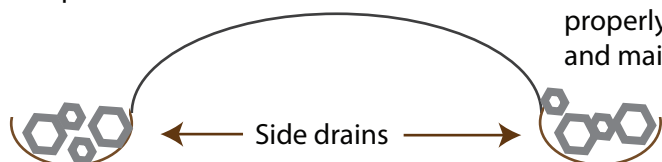
SOLUTION

Drainage from roads must **NEVER** be directed into a water course



The surface of side drains must be packed with rocks to reduce the speed and dissipate the volume of water.

Side drains must be properly sized, spaced and maintained.



The road must have a proper camber and side drains.

TAKE HOME MESSAGE

- Reduce speed of water over the shortest practical distance
- Avoid concentrated volumes of water
- Divert water over the widest possible width
- Use rocks to break up the speed of the water in drains or steep embankments