Module 3.11 SOIL CONSERVATION: EXTRACTION		STATEMENT OF INTENT Soil erosion is minimised
Measures		**Notes**
Better Management Practice	**Roads are sited to minimise soil loss.** • All roads are included in the land-use plan • Land-use plan specifies road drainage for each road • Farm roads follow the crestlines and/or conservation structures except under specified circumstances • Crest roads are on crests of 12% gradient or less • Diagonal roads are on slopes of greater than 12% • Soil erosion is minimised on unusually steep (>12%) areas where roads are constructed • Routes are selected to minimise impacts on sensitive areas • Primary roads (5m in width) are not constructed within 20m of a stream, river or wetland, except where they cross • Secondary roads (at least 4m wide) are used for field access and cane haulage	**Siting of Roads** Adequate steps should be taken to cater for road drainage as specified in the LUP. • Farm roads other than those listed as follows should be at the crest lines and/or the conservation structures. Roads such as diagonal roads, boundary roads, cut-off or slope break roads can be used wherever they are necessary to ensure the rational use of land. • Particular attention should be paid to the protection and drainage of roads. The correct siting of mitre drains is therefore essential. • Diagonal roads should be sited where the slope is too steep for crest roads, i.e. greater than 12% land slope. Their gradient should be constant, preferably between 1:12 (8%) to 1:8 (12%). At least two cross drains should be located between adjacent and correctly spaced conservation structures. Maximum spacing between cross drains are: • Routes should be selected to avoid sensitive areas such as indigenous forests, special natural communities, wetlands, archaeological or historical sites and other natural areas. Construction of river crossings should not result in concentration of the flow of the water in the river, and roads should not interrupt the hydraulic flow of a wetland (e.g. drying up the wetland below the crossing). A water licence may be required in terms of section 21 (c) and 21 (i). • Primary roads, e.g. hilo roads, which are 5 m in width must not be constructed within 20 m of a steam, river or wetland, except where they cross. • Secondary roads, e.g. terrace roads, are used for field access and cane haulage, and should not be less than 4 m wide.

Diagonal road gradient	Spacing: moderate to resistant soil	Spacing: erodible shallow soil
8-10%	50 m	40 m
12%	30 m	20 m

<table>
<tr><td>Better Management Practice</td><td>• Tertiary roads (at least 3.5m wide) are used for infield access
• Roads cross watercourses at right-angles
• Water drained off primary roads flows through a minimum of 10 m of natural vegetation or cane field before entering the water course
• Discharge points are provided to protect the upper road channel
• Roadside drains are grassed or paved</td><td>• Tertiary roads are used for infield access, and should not be less than 3.5 m wide.
• Where it is imperative to construct unusually steep roads, special surface protection must be provided. Otherwise, re-asses the desirability of planting the catchment area.
• Roads should cross watercourses at right angles.
• No water is to be led off primary roads directly into watercourses, but must flow at least through 10 m of vegetation/cane field before entering the watercourse.
• Protection of the road upper channel is vital and discharge points should be catered for
• Roadside drains should be grassed or paved.</td></tr>
<tr><td>Legal requirement</td><td>Roads are constructed to minimise soil loss
• New roads, or upgrades to existing roads, in sensitive areas or exceeding prescribed thresholds constructed after 8 September 1997, are authorised</td><td rowspan="2">Road Construction
New roads, or the upgrading of existing roads, in sensitive areas or exceeding prescribed widths constructed after the 8 September 1997 may require environmental authorisation under NEMA. Furthermore, should road construction affect a watercourse in terms of section 21(c) and 21(i) of the National Water Act, 36 of 1998, it may be necessary to apply for a Water Use Licence. However, there is a provision under the General Authorisations (e.g. for altering the bed, banks, course or characteristics of a watercourse under GN 1198 of 18 December 2009) which may ease the need for licensing under certain conditions. Farmers should check these conditions before building a road.

• Drifts should be confined to sites where there is solid rock, or should be constructed of suitable durable material, e.g. concrete or Reno mattress.
• Cut and fills should be stabilised with suitable grasses.</td></tr>
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• Cut and fills are stabilised with suitable grasses</td></tr>
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