

Sediment containment system design

Sediment containment systems, such as large sediment ponds, small sediment traps, or storage ditches with cross-check structures, intercept and store sediment laden water, giving soil particles time to settle out. They're a cost-effective way to leverage existing skill sets and equipment found on most construction sites. With a long seasonal installation window, they are well worth considering on your next project.

They can give you a P-value

When used with other practices such as surface roughening, sediment containment systems can reduce the amount of soil that gets transported off construction sites. This ability to intercept sediment laden water, allowing sediments to settle out, results in a P-value that is used in soil loss calculations when developing erosion and sediment control plans.

They also influence slope length

Containment systems offer another benefit. They influence a second component of the soil loss calculation, the slope length (LS-value). Sediment containment systems are unique and valuable in their ability to influence two components of the soil loss calculation; the P-value through storage volumes and the LS-value by changing slope lengths.

Photo 1: V-ditch with berms and mulch and tackifier cover



Photos 2 and 3: V-ditch with berms containing sediment laden water

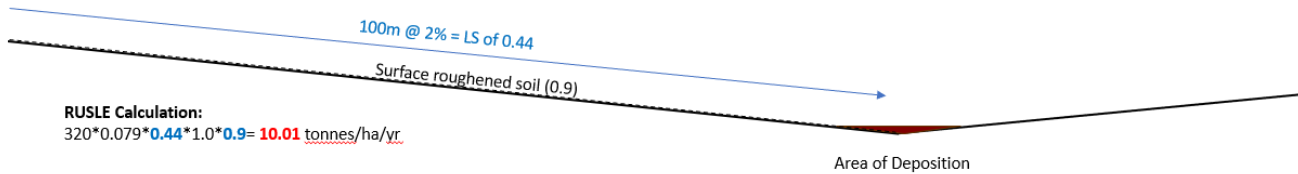


Soil loss comparisons based on controls and practices used

The figures below show Revised Universal Soil Loss Equations (RUSLE) that calculate the soil loss from the slope using rainfall erosivity, soil types, slope length and steepness, erosion controls (which prevent sediment displacement), and sediment practices (which capture sediment after it has become mobile). Soil loss tolerances in Calgary require slopes to be equal to, or less than 2 tonnes/ha/yr. The figures demonstrate how different controls and practices impact the estimated soil losses.

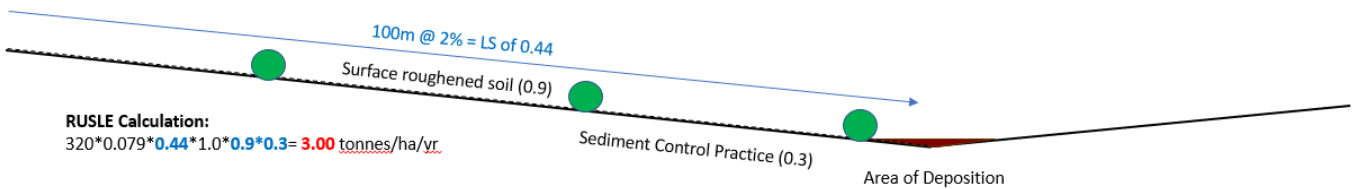
Slope with surface roughening

A 100-meter surface roughened slope with a high soil loss estimate of 10.01 tonnes/ha/yr.



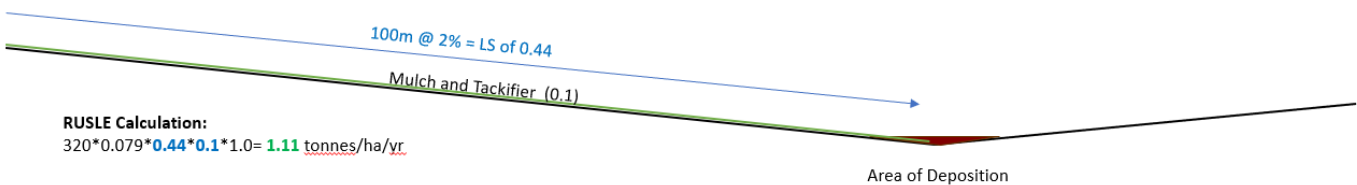
Slope with surface roughening and a sediment control practice

A 100-meter surface roughened slope with a wattle style sediment control practices with a high soil loss estimate of 3.00 tonnes/ha/yr.



Slope with surface roughening and an erosion control practice

A 100-meter slope covered with mulch and tackifier provides an acceptable soil loss estimate of 1.11 tonnes/ha/yr.



Slope with Sediment Containment Systems

Figure4: Four 20-meter slopes with 5-meter-wide sediment containment systems and surface roughening

