EROSION CONTROL BLANKETS: HYDRAULIC APPLICATION BEATS ROLLED

Erosion control on civil earthwork projects has traditionally been accomplished with Rolled Erosion Control Blankets (RECBs). While RECBs are technically very effective in providing ground cover, their erosion control effectiveness depends on proper installation. Site grading challenges, installation quality control problems and severely limited budgets all contribute to a nearly universal phenomenon: Improperly installed rolled blankets. This improper installation results in soil erosion below the blanket, where it goes unnoticed until problematic erosion rills and gullies are formed and require repair.

Nilex MulchMax Ultra is a hydraulically-applied erosion control blanket that can be depended upon to perform in erosion protection without the problems of RECBs. It is Cheaper, Faster, Safer and Better than rolled erosion control blankets.

Cheaper

For projects approximately 3,000 m² or larger, MulchMax Ultra will be supplied and installed more cost effectively than an RECB, based on labour requirements alone. Likewise, for projects of any size where hydraulic seeding is specified below the rolled blanket, MulchMax Ultra hydraulically applied erosion control blanket will always install more cost-effectively than the rolled blanket.

Faster

MulchMax Ultra is installed at rates significantly faster than RECBs. The reasons are simple:

• MulchMax Ultra is installed by high volume hydraulic application machines, whereas
• Rolled blanket installation is limited by manual labour fastening blankets with staples or stakes.

One hectare of MulchMax Ultra can be applied in a single workday with a high-production hydraulic machine. Even larger areas can be treated with extra-large machines, combined with water tanker support. By comparison, it would take an experienced blanket installation crew of four at least three days to install a similar area.

Safer

As a function of being faster to install, jobsite safety is increased; fewer hours on-site equals fewer hours of site risk.

continued...
**Better**

Erosion control product effectiveness is measured as “Cover Factor”. This product performance value is derived using ASTM 6459 “Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hillslopes from Rainfall-Induced Erosion”.

MulchMax Ultra, when placed at 3,920 kg/ha, performs with a cover factor of 0.003, which can also be expressed as 99.7% effectiveness. By comparison, properly installed RECBs perform within a range of 0.1 to 0.03*, or 90% to 97% effective, assuming proper installation.

The erosion control industry uses the Revised Universal Soil Loss Equation (RUSLE) to predict the impact of soil erosion from a construction site. Within the RUSLE equation, Cover Factor “C” has tremendous influence on calculated erosion.

Every construction site is different. The following example reflects a 3:1, 25m-long slope in Prince George, British Columbia, where site-specific rainfall and soil erosivity is derived from Agriculture Canada RUSLEFAC – RUSLE for Application in Canada:

<table>
<thead>
<tr>
<th>RUSLE equation</th>
<th>R</th>
<th>K</th>
<th>LS</th>
<th>C</th>
<th>P</th>
<th>Soil Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Runoff</td>
<td>Erosivity</td>
<td>Slope length angle</td>
<td>Cover</td>
<td>Practice</td>
<td>tonne/ha/year (tons/acre/year)</td>
</tr>
<tr>
<td>510</td>
<td>0.4</td>
<td>4.57</td>
<td>1.0</td>
<td>1.3</td>
<td>445 (1,212)</td>
<td></td>
</tr>
<tr>
<td>Rolled Blanket</td>
<td>510</td>
<td>0.4</td>
<td>4.57</td>
<td>0.06</td>
<td>1.3</td>
<td>26 (72)</td>
</tr>
<tr>
<td>MulchMax Ultra</td>
<td>510</td>
<td>0.4</td>
<td>4.57</td>
<td>0.003</td>
<td>1.3</td>
<td>1.5 (4)</td>
</tr>
</tbody>
</table>

*Cited values from American Association of State Highways and Transportation Officials (AASHTO), National Transportation Product Evaluation Program (NTPEP)
Germination is measured under ASTM D7322 “Standard Test Method for Determination of Rolled Erosion Control Product Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions.” Nilex MulchMax Ultra performs to >500% improvement in seed germination and >1000% improvement in seed biomass after the ASTM 21-day trial at 27°C, as compared to an unprotected control.

Real world construction site grade preparation is rarely smooth and ideally should not be smooth! In fact, an excellent erosion control practice is to cat-track the final grade perpendicular to water flow. In order to depend on the C value of 0.003 for design purposes, one has to consider that real world grades have 20% to 25% more surface area than a perfectly smooth grade. To help visualize that, consider the back of your hand, with the palm facing down, as an ideal flat grade. When you make a fist with the thumb on top to simulate the rough surface of a real grade, now look at how much extra surface you have to cover — front, top and sides of fingers, new top surface of hand, back of hand, etc.

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3,920 \text{ kg/ha} + 25\% (1,080 \text{ kg/ha}) = 5,000 \text{ kg/ha}
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(ASTM rate) (Grade Adjustment) (Ideal rate)

Nilex is pleased to work with proponents to arrive at a site-specific application rate.

Limitations of Mulch
MulchMax Ultra Hydraulically-Applied Erosion Control Blanket is intended to function on general slopes and grades subject to surficial forces by wind and rainwater. However, it’s important to remember:

Sites with grade water presenting, saturated grades, or those that experience concentrated flow (ditch and swale bottoms) must be otherwise treated.

Application Rate
ASTM 6459 uses a hydraulic application rate of 3,920 kg/ha. The ASTM test is executed under laboratory conditions with as close to a perfectly smooth surface preparation as possible.