RUSLE APPLICATION 2024

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AGENDA

Introduction

Online Demonstration

Notice of Termination

RUSLE APPLICATION DEVELOPMENT INTRODUCTION

NOT

- Notice of Termination
- Needed to terminate Construction General Permit coverage
- Either demonstrate 70% uniform background vegetative cover
- Or Demonstrate post-construction erosion is less than our equal to pre-construction using RUSLE or RUSLE2

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PROBLEMS WITH RUSLE2

- Limited acceptance by RWQCBs for NOT
- Glitchy and hard to use
- Not transparent

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CALTRANS AND CAL STATE UNIVERSITY SACRAMENTO

- Worked with CSUS Course to develop application
- Selected the best application developed

RYAN B0NOMO

- Developer and website host
- Seeking sponsors

Contact me to get Ryan's contact information

REVISED UNIVERSAL SOIL LOSS EQUATION (RUSLE)

$A = R \times K \times LS \times C \times P$

Soil loss = Erosion (sheet and rill)

R factor = Erosivity

K factor = Erodibility

LS factor = Length/Steepness

C factor = Cover

P factor = Practices, other

R FACTOR

- Based on schedule and rainfall (local)
- Annual but can be broken down for portion of year
- Is the same before and after construction
- Doesn't affect the comparison before and after construction. Insert annual R factor to keep calculated erosion realistic.

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K FACTOR

- Erodibility
- Based mostly on silt content
- Silt is most mobile (clay sticks together, sand and gravel settle and heavier or less mobile)
- May change slightly if grading removes top layer of soil or if there is fill.
- Typically between 0.26 and .40 in CA
- Not a big change expected between most construction sites before and after construction

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LS FACTOR

- Length of slopes and steepness
- Use table form permit (included in application)

C FACTOR

- Can be weeds, pavement, plants, trees, spray mulches, etc.
- C factor availability limited.

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Table H-1. Reported RUSLE C-Factor Cover Values

Types of Cover Material/ Cover Condition	Reported C-Factor Values	Site Slope	Additional Technology Description	References
Physical Roughing of Bare Soil				
Surface roughening, disking, and tracking with and across contours	Greater than 0.3	< 5 percent		TRB, 1980
	Greater than 0.3	5 to 15 percent		
	Greater than 0.3	> 15 percent		
Straw/Fiber Freely Dispersed				
Straw/Fiber applied by hand or mechanical without anchoring	Less than 0.1	< 5 percent	2 tons dry wt/ac (92% cover)	Wischmeier and Smith, 1978
	See Note 1	5 to 15 percent		
	See Note 1	> 15 percent		
Straw/Fiber with Tackifier or Binder				
Straw/Fiber anchored with Tackifier (eg. Hydrophilic polymers and Guar Gum)	Less than 0.1	< 5 percent	2 tons dry wt/ac (92% cover)	Wischmeier and Smith, 1978; and EPA, 1979
	Less than 0.1	5 to 15 percent		
	Less than 0.3	> 15 percent		
Straw/fiber with Netting				
Straw/Fiber anchored with Netting	Less than 0.1	< 5 percent	2 tons dry wt/ac (92% cover)	Wischmeier and Smith, 1978; and EPA, 1979
	Less than 0.1	5 to 15 percent		
	Less than 0.3	> 15 percent		
Soil Stabilizers [See Note 2]				
Applying soil bonding agents such as the anionic form of polyacrylamide (PAM) directly to soil to minimize bare soil erosion.	Insufficient Data Available	< 5 percent	Dry and wet PAM applications include in C-Factor value range	StormwaterAutho 2010; and Filtrex 2010
	0.13 to 0.65	5 to 15 percent		
	0.13 to 0.65	< 15 percent		

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Types of Cover Material/ Cover Condition	Reported C-Factor Values	Site Slope	Additional Technology Description	References
Hydromulch/Tackifier Combinations [See Notes 1 and 2]				
Mechanically applied fiber mulch with tackifier (e.g. Guar Gum or Latex-based)	From less than 0.1 to 0.4	< 5 percent	Between 0.5 and 2 tons/ac	ENCAP 2010; EPA 1979; and North America Green 2010
	From less than 0.1 to 0.4	5 to 15 percent		
	0.1 to 0.6	> 15 percent		
Hydromulch with Netting [See Notes 1 and 2]				
Mulch hydraulically applied upon previously installed netting.	From less than 0.1 to 0.4	< 5 percent	Between 0.5 and 2 tons/ac	ENCAP 2010; EPA 1979; and North America Green 2010
	From less than 0.1 to 0.4	5 to 15 percent		
	0.1 to 0.6	> 15 percent		
Rock Surface Covers				
1/4 to 1 1/2 inch crushed stone	Less than 0.05	< 5 percent	135 tons/acre or more	Wischmeier and Smith, 1978
	Less than 0.05	5 to 15 percent		
	Less than 0.05	> 15 percent		
Vegetative Surface Covers				
Mature crop (growth covers 75 to 96%)	Less than 0.05	< 5 percent		Wischmeier and Smith, 1978
	Less than 0.05	5 to 15 percent		
	Less than 0.05	> 15 percent		
Thin stalk grass (>60% density) w/mulch	Less than 0.05	< 5 percent		Wischmeier and Smith, 1978
	Less than 0.05	5 to 15 percent		
	Less than 0.05	> 15 percent		
Sod	Less than 0.05	< 5 percent		Wischmeier and Smith, 1978
	Less than 0.05	5 to 15 percent		
	Less than 0.05	> 15 percent		

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Types of Cover Material/ Cover Condition	Reported C-Factor Values	Site Slope	Additional Technology Description	References
Netless Rolled Erosion Control Blankets (ECBs)				
ECBs are constructed of various degradable organic/synthetic fibers that are woven, glued or structurally bound with nettings or meshes. Open weave jute and woven coir (coconut husk) are examples.	Less than 0.1	< 5 percent	C-Factor range represents a range of blanket thickness and composition	Beltron Ind, 2010; and Filtrex 2010
	Less than 0.1	5 to 15 percent		
	From less than 0.05 to 0.5	> 15 percent		
Single-Net Erosion Control Blankets (ECBs)				
Processed degradable natural and/or polymer fibers mechanically bound together by a single rapidly degradable, synthetic or natural fiber netting	Less than 0.1 [See Note 3]	< 5 percent	C-Factor range represents a range of blanket thickness and composition	KY BMP Manual; American Excelsior 2010; East Coast Erosion, 2010; and Filtrex 2010
	Less than 0.3 [See Note 3]	5 to 15 percent		
	From less than 0.3 to 0.6	> 15 percent		
Double-Net Erosion Control Blankets (ECBs)				
Processed degradable natural and/or polymer fibers mechanically bound together between two degradable, synthetic or natural fiber nettings.	Less than 0.1 [See Note 3]	< 5 percent	C-Factor range represents a range of blanket thickness and composition	KY BMP Manual; and Filtrex 2010
	Less than 0.3 [See Note 3]	5 to 15 percent		
	From less than 0.2 to 0.44	> 15 percent		

Specific Notes on Cover Materials:

[1] On steep slopes (> 15 percent) or where mulch is susceptible to movement by wind or water, the mulch material should be appropriately anchored.

[2] Many State Environmental and Transportation Agencies have developed guidelines relating features such as soil type and slope with a minimum application rate.

[3] Probable performance, see Manufacture for specifics.

General Notes:

Values above provide information for assessing erosion control products targeted at meeting EPA's minimum C-factor criteria for stabilization covers. The performance of a stabilization cover is to be considered independently of any additional protection provided by erosion and sediment controls such as silt fences and sediment basins.

P FACTOR

- Practices
- Can include track walking, fiber rolls left after construction.
- Referenced P factors – very limited

NOT

- Notice of Termination
- Compare before and after construction
- Post-construction erosion potential must be less than or equal to pre-construction erosion

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WEBSITE

- https://rusle.rbonomo.us/
- Home - Soil Erosion Modeler (rbonomo.us)

OTHER NOT REQUIREMENTS

- Most important is Maintenance and Operations Plan
- RUSLE relies on BMPs being implemented/maintained
- Photos
- Site Map
- Other requirements for completion of construction, removal of construction materials and equipment.

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THANK YOU

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