



Excel Erosion Education Circular, Volume - 3 Introducing Excel Erosion Design

E³C is an informational circular developed and distributed by Western Excelsior. Volume 3 has been dedicated to providing an introduction to Western Excelsior's RECP design software.

Success of any erosion control project starts with solid planning. Each project must be rooted in stable design to ensure performance. Starting in 2004, Western Excelsior has conducted research, analyzed field installations and coordinated computational methods with the objective of creating and providing a stable design platform for all types of users. The synthesis of this three year effort has led to Excel Erosion Design (EED).

EED is a web-based computer program designed and implemented to aid an erosion control professional in predicting erosion, selecting materials to efficiently counter erosion and provide documentation for applicable materials. EED was designed, developed and maintained by Western Excelsior using state of the practice design methods. The objective in developing EED was to establish a computational tool that was simple to use, however, provided sufficient manual control to allow advanced users to create detailed designs and erosion predictions.

EED Features:

- User Friendly
- State of the Practice Procedures (Developed by Federal Agencies)
- Web-based, Always Current
- Utilizes Performance Tested Western Excelsior Products
- Quick to Use, Robust Results
- Provides Documentation for Regulatory Requirements

Erosion control professionals are typically confronted with two primary modes of erosion: slope erosion caused by rainfall and erosion in channels caused by the forces of flowing water. EED includes a computational algorithm to predict erosion and determine the stability

of Western Excelsior RECPs for both scenarios. Additionally, EED includes calculations to determine stability of vegetated linings and vegetated Turf Reinforcement Mats (TRMs). Computational methods follow procedures provided by federal agencies with the most significant research, testing and engineering support.

In order to determine the stability of Western Excelsior RECPs as applied to a hillslope and subjected to rainfall/rainsplash, EED utilizes concepts, methods and procedures provided by the USDA Agricultural Handbook 703 (USDA 703), USLE / RUSLE / RUSLE2 / MUSLE in an unvegetated condition. However, quantification of performance of the engineered material and overall stability of the project is expressed utilizing alternate methods. The hybrid approach was developed specifically to address the high performance of RECPs in hillslope/rainfall conditions and provide a standardized, familiar output to minimize complexity and confusion. Additionally, research allowing the specification of a product by consideration of only a single storm, as opposed to annual, average rainfall have been incorporated.

Unlike hillslope/rainfall analysis, channelized analysis is conducted in an unvegetated and vegetated condition. Evaluation of the stability of an RECP in an unvegetated and vegetated condition is executed utilizing the same principle, reduction of boundary shear stress (tractive force) and comparison to maximum, permissible shear stress of the project soil. This method is presented and supported within Hydraulic Engineering Circular 15 (HEC 15) (2006). By evaluating boundary shear stress dissipation, EED determines the stability of nearly any project condition. EED utilizes the project inputs to ascertain the stability of the RECP in an unvegetated condition,

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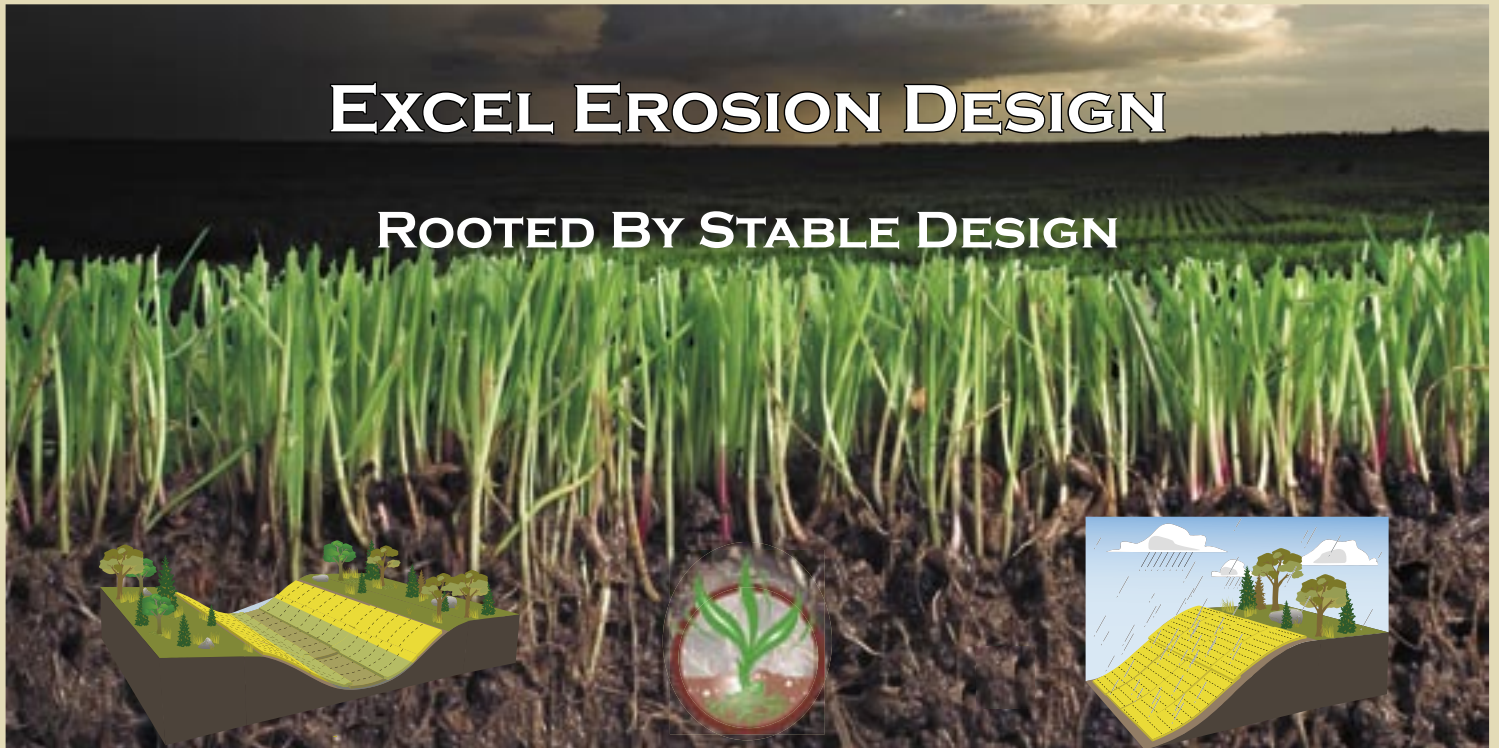
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the vegetated channel in unreinforced condition and in a reinforced, vegetated condition.

EED is an easy to use, step by step method to select RECPs. Estimates of field conditions may be utilized or explicit computations may be executed with detailed data entry. Flexibility in user entry allows a wide variety of users to benefit from stable design analysis provided by EED. Contractors can find suitable products for small installations and engineers and landscape architects may formulate detailed comparisons of materials to utilize specific product advantages and provide cost savings and performance.

For first time users, each parameter within EED

EED also provides considerable detail in the means of program output. Upon completion of project execution, the user may select to view a summary of all program inputs. In order to properly assess the results, it is always helpful to recall and consider the inputs. This option allows the user fast access to review the current project. A full listing of all computations executed may be displayed, printed and saved from a browser link. Thus, the user may print, print to *.pdf (Adobe Acrobat required) or save the project as *.txt file. However, EED does not utilize printed or saved results to recall a project. Finally, with support from www.westernexcelsior.com, EED provides a link to product comparisons,



EXCEL EROSION DESIGN

ROOTED BY STABLE DESIGN

is identified and defined on each data acquisition form. In addition to standard troubleshooting and reference help, EED's "What's This" links provide immediate access to the definition of each input parameter. Instant access to data entry requirements minimizes the difficulty in preparing erosion control designs. EED saves all projects for each user under a secure login system. Thus, users are not required to save and archive projects. Rather, all previous projects are available when logged in. Finally, Western Excelsior Technical support is available by phone, fax or email to assist in any project completion.

Western Excelsior distributors and a complete suite of product documentation.

Ensuring your project is rooted in stable design is the first step to project success. EED provides a state of the practice, user friendly platform for a contractor, specifier or designer to root any project in a foundation of stable design. **Log on to www.westernexcelsior.com to have unlimited use of EED.**



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