Project Summary

Texas Department of Transportation

0-5948: Roadside Sediment Control Device Evaluation Program

Background

Preventing erosion and sediment loss on maintenance and construction sites is a critical step in maintaining regulatory compliance with the U.S. Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ). Despite the common contracting practice of specifying sediment retention devices (SRDs) there is a lack of impartial, non-biased, quantifiable data to assist in the selection of effective sediment control best management practices (BMPs). Because of this, SRD specifiers must often rely on marketing claims. The objective of this project was to develop a formal test protocol to evaluate the performance of SRDs, which will assist engineers and designers in selecting the most effective products.

What the Researchers Did

To develop the SRD evaluation program, researchers used the following approach:

- investigate current state-of-the-art sediment control practices,
- develop a standard performance testing protocol for SRDs,
- design and construct a full-scale test facility for evaluating the performance of SRDs, and
- conduct pilot tests to determine proposed tests are effective at calculating SRD performance.

The work was conducted at the TxDOT/TTI Hydraulics, Sedimentation, and Erosion Control Laboratory at Texas A&M University Riverside Campus. Figure 1 shows one of the SRD evaluations in progress.

Figure 1. Sediment Retention Device Evaluation Flume.

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Project Completed: 8-31-09

What They Found

Researchers determined the performance test for SRDs should quantify the ability of the individual SRD to retain eroded sediment caused by sheet-flow water under full-scale conditions by measuring and comparing the amount of sediment that passes through, over, and/or under the SRD. It was also determined that it would be necessary to evaluate and compare SRDs and identify the physical characteristics that contribute to their control effectiveness. The final test results will be reported by listing SRDs and their calculated retention effectiveness.

These full-scale tests will not only quantify the effectiveness of the SRD but also identify any limitations (such as installation problems and failure risk).

What This Means

The SRD performance evaluation program will allow the identification of SRDs that are likely to provide a high retention effectiveness. The results will give Texas Department of Transportation (TxDOT) designers and engineers quantifiable data to assist in the selection of SRDs to be used on TxDOT projects.

The soil sediment data that will be generated at this facility will also allow TxDOT to set minimum performance standards for sediment control products and will be used to develop an Approved Products List for sediment control materials. The Approved Products List will be used by design and construction engineers to choose sediment control materials that have been proven to be effective in controlling soil sediment loss that otherwise would be released from construction and maintenance projects.

Product evaluation at this facility is an important step in meeting more stringent EPA standards that are expected concerning pollutant discharge from construction and maintenance activities. The Approved Product List for erosion control materials and the Approved Products List for sediment control materials will greatly assist TxDOT engineers in complying with EPA regulations in the future.

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