

Research summary on Silt Fence Installation Methods

WHAT: An independent verification report evaluating the effectiveness of two silt fence installation methods –

- The traditional trench-based specification
- The static slicing specification

WHO: The Environmental Technology Evaluation Center (EvTEC), an affiliate of the EPA and CERF (Civil Engineering Research Foundation), contracted with **TRI / Environmental, Inc., an independent third party laboratory**, to evaluate and verify the performance of the installation methods.

WHY: Users and specifiers, including regulatory agencies, had no efficacy data on silt fence installation. Research data was needed to evaluate trench-based installations, and static slicing as an alternative. In the process, factors determining effectiveness were identified.

HOW: A panel of professionals from the erosion and sediment control industry determined what factors were important in evaluating the installation methods and how to implement that evaluation process.

The objectives:

- Determine if the slicing method is superior to the trenching method;
- Determine if the slicing method is more cost-effective than trenching;
- Detail the implementability, including ease of operation and installation.

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THE RESULTS:

- The static slicing method provided storm water retention as good as or better than the ‘best’ trenched installation, and far superior to common installations. The ‘best’ trenched installations required nearly triple the time and effort to achieve this comparable result.

Trenching techniques meeting only marginally enhanced specification requirements fared quite poorly. The conclusion was clear: when the enhancements of the ‘best’ trench installations were not performed, the trench method performed poorly.

The ‘best’ trench far exceeded standard ASTM and ASHTO specifications.

- Performance trends provide a clear indication that a greater level of compaction corresponds to better performance (greater water retention). System comparisons showed that static slicing installations had both higher densities and greater water retention than all trench-based installations.

Trench installations were adversely affected by the inability to compact effectively when the posts were installed first and when insufficient backfill material was placed in the trench.

- The static slicing method offers practical advantages over trenching, such as maneuverability, minimal soil-handling and hand labor, consistent depth and compaction, and ease of installation in windy conditions, on steep side slopes, through rocky soils, and in saturated soils. Slicing can be expected to provide uniform, dependable installations.
- The static slicing method was found to be a much more efficient, thus cost-effective, technique for silt fence installation when compared to a range of trench procedures.
- From the field-testing performed in this evaluation, there appears to be two possible ways to achieve maximum silt fence performance – static slicing or the “best” trench-based installation. Yet there is no clear, generally accepted specification to obtain this “best” trench-based installation. **This finding provides an important argument for toughening trench-based specifications with more specific requirements for chronological installation order, backfilling, and mechanically compacting the soil.**
- The combination of maximum performance and maximum productivity was achieved by static slicing in the EvTEC testing. Static slicing is specified in ASTM D6462.

See: Verification of Performance, EvTEC report at www.cerf.org/evtec click on Evaluations