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Source to Stream

March 26 & 27, 2025

Improving Site ESC:

Transitioning to Filter Sock from Silt Fence

Rod Anderton – SCS Consulting Group

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01 **Who is SCS?**
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01

Who is SCS ?

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- SCS Consulting Group Ltd. is a consulting engineering firm providing services to the land development industry and public agencies;
- In our 20th Year, SCS was established in 2005 by Steve Schaefer, Malcolm Catto, and Blair Seeley, and has grown to a staff of over 150 professionals;
- Head office in Markham, Ontario; with 3 Southern Ontario satellite offices east (Brooklin), north (Barrie), and west (Burlington) of the Greater Toronto Area (GTA)

- SCS Consulting Group provides municipalities and the land development industry with professional engineering services, studies, detail design, planning, administration, and project management, including:
  - Servicing Feasibility for Land Acquisition;
  - Preliminary Engineering for Planning Applications;
  - Stormwater Management Study and Design;
  - Subdivision Detailed Design;
  - Public Sector Engineering, Review, and Standards;
  - Site Plan Infrastructure and Grading;
  - Contract Administration and On-Site Services and Supervision;
  - Developer Group Cost Sharing and Project Management;
  - Group Engineering Services; and
  - UAV (Drone) Surveys and Inspections.

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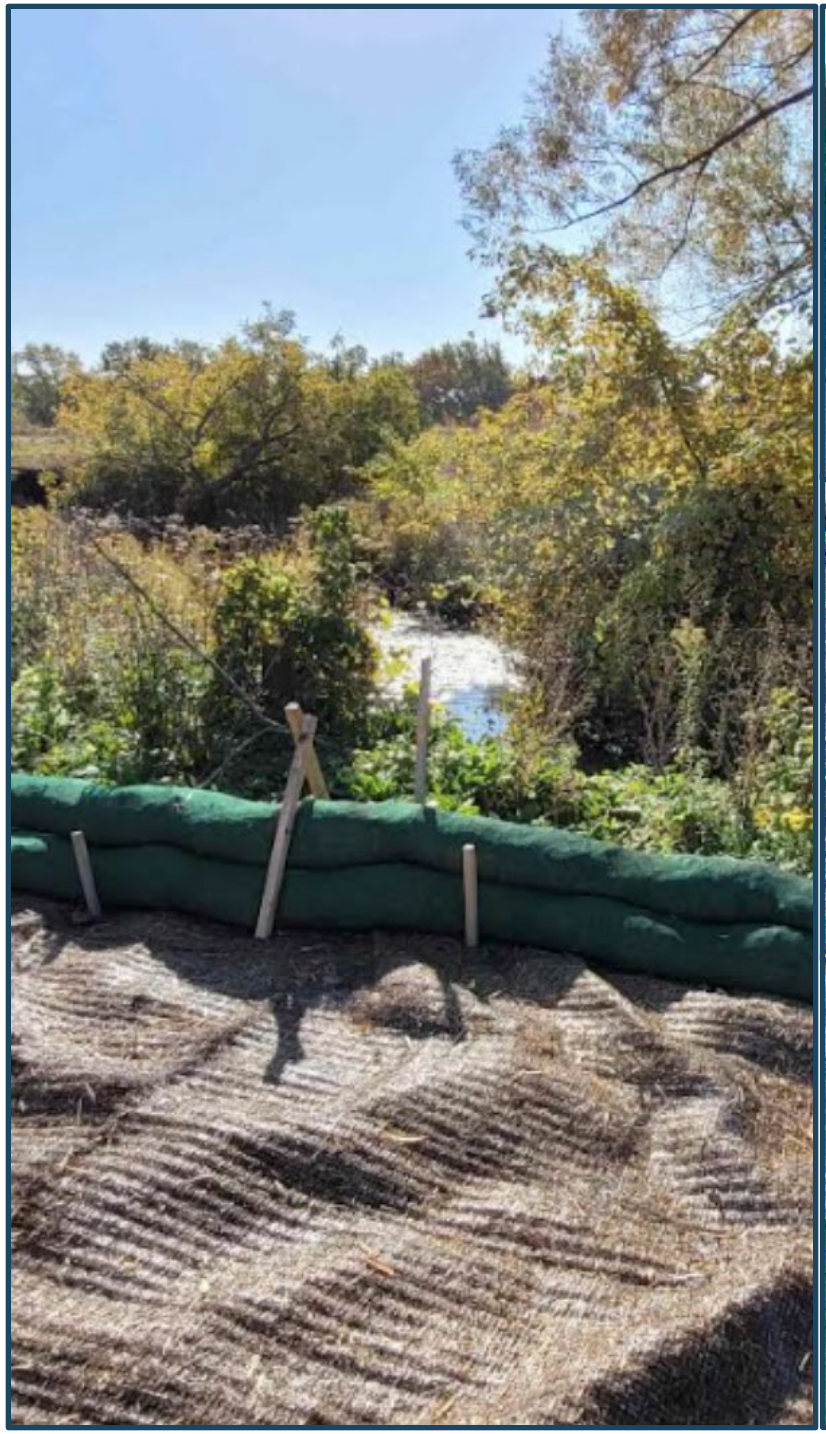
02

Project ESC



- SCS has almost 150 projects in their construction phase;
- SCS develops Erosion and Sediment Control (ESC) Plans for all our projects;
- Detailed ESC Drawings are produced for approval by regulatory agencies (e.g., municipalities, CAs);
- SCS Project Managers meet with the Client and ESC Contractors prior to ESC installations;
- SCS Site Supervisors ensure ESC measures are correctly installed and as per the Drawings;
- SCS Staff perform ESC inspections weekly or as required based on the contract or site conditions;
- ESC inspections are completed prior to and after all large (>10mm/24hrs) rainfall and/or melt events;
- ESC reports are generated to flag deficiencies and provide due dates for repairs/upgrades.

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03

Silt Fence Problem

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- ⊗ High maintenance frequency and cost, poor durability;
- ⊗ Susceptible to wind damage;
- ⊗ Aesthetic / site optics concerns;
- ⊗ Excessively disruptive to ground during installation and removal;
- ⊗ Poor filtering capability;
- ⊗ Easily undermined;
- ⊗ Trench compaction concerns (Static Slicing better);
- ⊗ Requires costly / wasteful support (straw bales);




⊗ Silt fence is typically more costly over the life of the project versus filter sock.

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- ⊗ Excessive waste generated upon removal;
- ⊗ Cannot be installed in concentrated flow;
- ⊗ Destroyed upon impact with equipment;
- ⊗ Time consuming and very labour intensive to install and remove – requires heavy equipment;
- ⊗ Difficult to repair quickly and properly;
- ⊗ Not adjustable or easily moveable;
- ⊗ Wildlife hazard and migration barrier;
- ⊗ Often not removed causing long term impact.

- ⊗ Double row wire-backed silt fence with straw bale support is more costly than double row 300 mm filter sock with page wire fence. Even before repairs / restoration.

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⊗ Must be replaced when clogged (rarely done);

⊗ **Catastrophic failures.**

⊗ Clogged geotextile at ESC Pond EOW retained excessive run-off - resulting in catastrophic silt fence collapse.

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04

Filter Sock Solution

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- ☑ Filter sock does NOT require trenching-in;
- ☑ Simple install with no heavy equipment required;
- ☑ Repairs within minutes with just hand tools;
- ☑ Quick install reduces costs and frees up labour;
- ☑ Able to install in hard-to-reach locations;
- ☑ No need for expensive straw bale silt fence support;
- ☑ No need to stake on low slope / hard surfaces;
- ☑ Able to keep skids of sock on site for easy repairs;
- ☑ Extremely versatile / multi-purpose and used for:
  - ☑ Inlet / CB sediment control;
  - ☑ Swale check dams;
  - ☑ Sediment trap level weirs;
  - ☑ Pond spillway and emergency overflow filtering;
  - ☑ Repairs to silt fence or gaps in perimeter ESC;
  - ☑ Slope interruption;
  - ☑ Flow dispersal dam for outfalls / sediment bags;
  - ☑ Lot level sediment control;
  - ☑ Outfall and plunge pool discharge polishing.

- ☑ Simple reset and reuse once sediment collects;
- ☑ Functions even after being driven over / crushed;
- ☑ Easy to move and/or relocate for access or resetting;
- ☑ Reusable;
- ☑ Comes in biodegradable versions;
- ☑ Functions in concentrated flows;
- ☑ Higher flow rate than silt fence while removing more TSS;
- ☑ Removes contaminants in addition to solids;
- ☑ Not damaged by wind or high flow rates;
- ☑ Extremely slow to clog vs silt fence geotextile;
- ☑ Minimal waste upon removal (just poly webbing);
- ☑ No heavy / high volume of waste to haul off site;
- ☑ Removal does not require heavy equipment; and
- ☑ Removal does not damage restored areas.

☑ AGAIN… filter sock is typically less costly over the project life versus silt fence.

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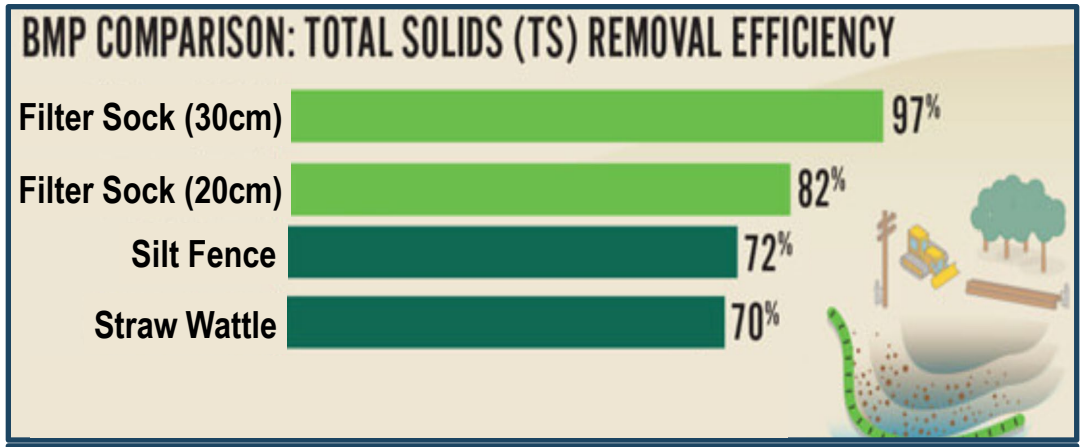
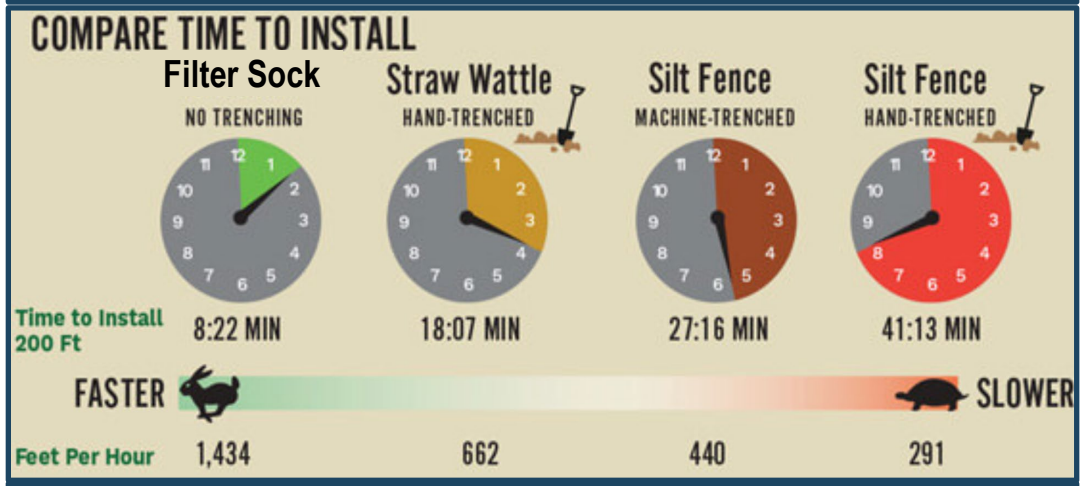
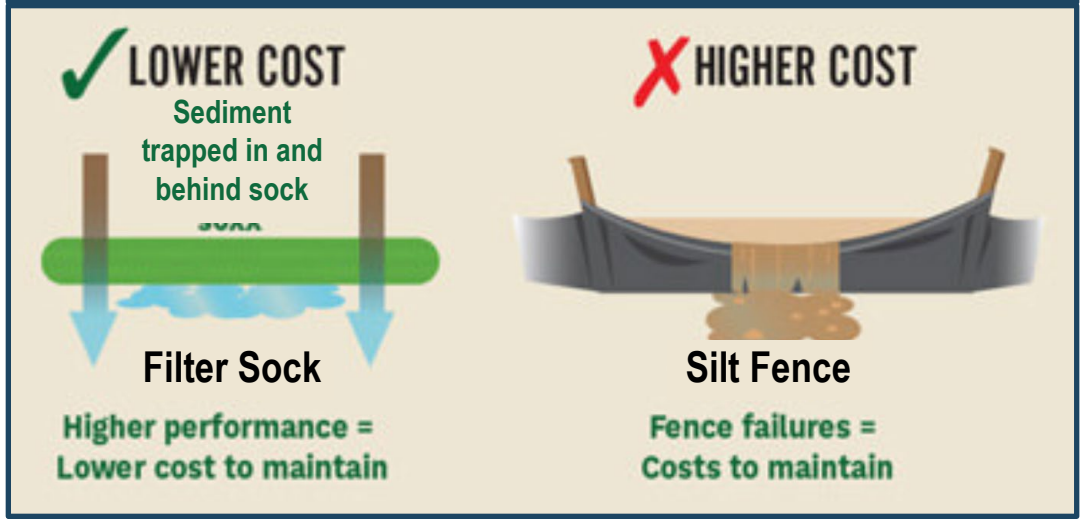
05

Change Challenges







- Fear of change – moving away from traditional Erosion and Sediment Control practices:
  - "But we have always done it this way.";
- Fear of (imagined) risk and higher costs:
  - New ESC measures actually reduce risk and costs;
- Lack of knowledge of new products and the studies proving updated ESC measures outperform older practices:
  - Training and education for everyone involved in the ESC process to improve support for the switch to sock;
- Convincing Designers of ESC Plans and Drawings there are better alternatives:
  - Changing design habits, drawing templates, and upgrading tables, graphics, and ESC Details;
  - Ensuring the Designers are well informed on what actually works in the field versus on paper;
- Developer preference for the black geotextile fencing around their sites as an indicator of construction progress:
  - Replace with cleaner look filter sock and page wire.

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06

Regulatory Concerns

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- Concern with obtaining Conservation Authority, Region, and Municipal approvals of our ESC Plans and Drawings due to the switch to filter sock:
  - Regulatory has responded with full approval, and even voiced their preference to use filter sock over silt fence under most conditions;

- Antiquated Municipal and Region ESC General Notes and ESC Drawing Details:
  - Evidenced by frequently incorrect silt fence Drawing Details - which we substitute with updated versions and also include filter sock Details;
  - ESC measures are often not updated to STEP's 2019 ESC Guide for Urban Construction standards and preferred ESC measures;
  - SCS has worked with multiple municipalities to update their ESC Drawing Details and ESC inspection and reporting protocols;
  - Municipal staff usually grant approvals once justification for the updated and typically more effective ESC measures (filter sock) have been provided.

- Redside Dace Habitat Protection:
  - 2007 Ontario Endangered Species Act (O.Reg. 242/08) states that for the protection of Redside Dace habitat:
    - "…double row of sediment control fencing consisting of staked straw bales shall be installed…"; other wording suggests equivalent measures would be allowed;
  - 2016 MNRF Guidance for Development Activities in Redside Dace Protected Habitat requires a different and updated approach for ESC at construction sites:
    - "Sediment from the construction site should be captured through measures including a multi-barrier approach to prevent sediment entering the stream and methods to trap sediment (i.e., filter berms, sediment traps, vegetation, etc.)";
    - No mention of silt fence in the document;
    - Document references the ESC Guide for Urban Construction - which supports the use of filter socks as a superior alternative to silt fence;
  - SCS has yet to encounter Regulatory resistance to using double row filter sock versus silt fence for the protection of Redside Dace habitat.

07

Designs and Details

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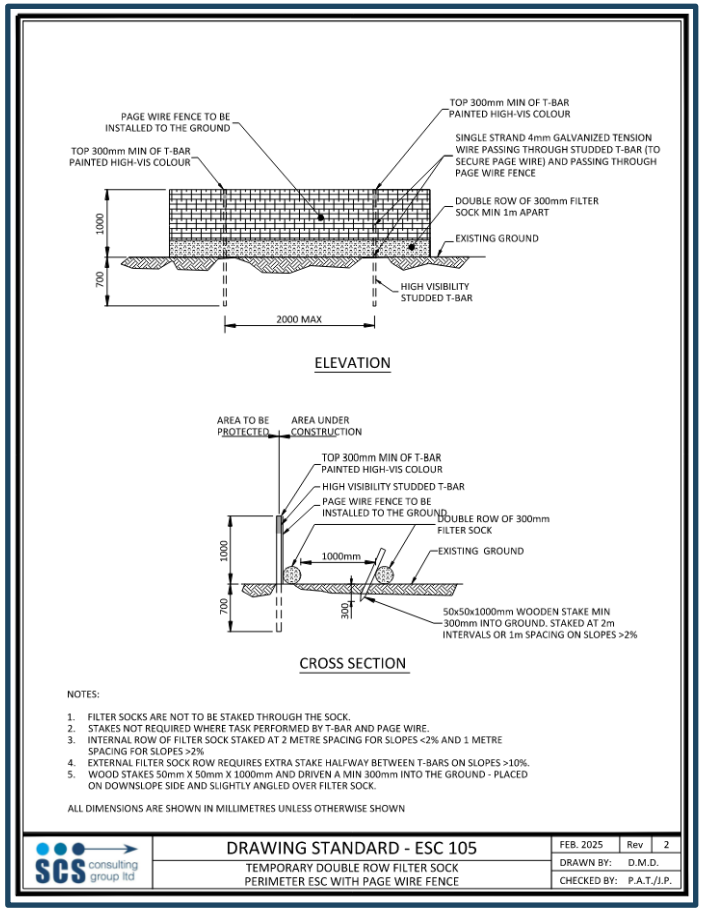
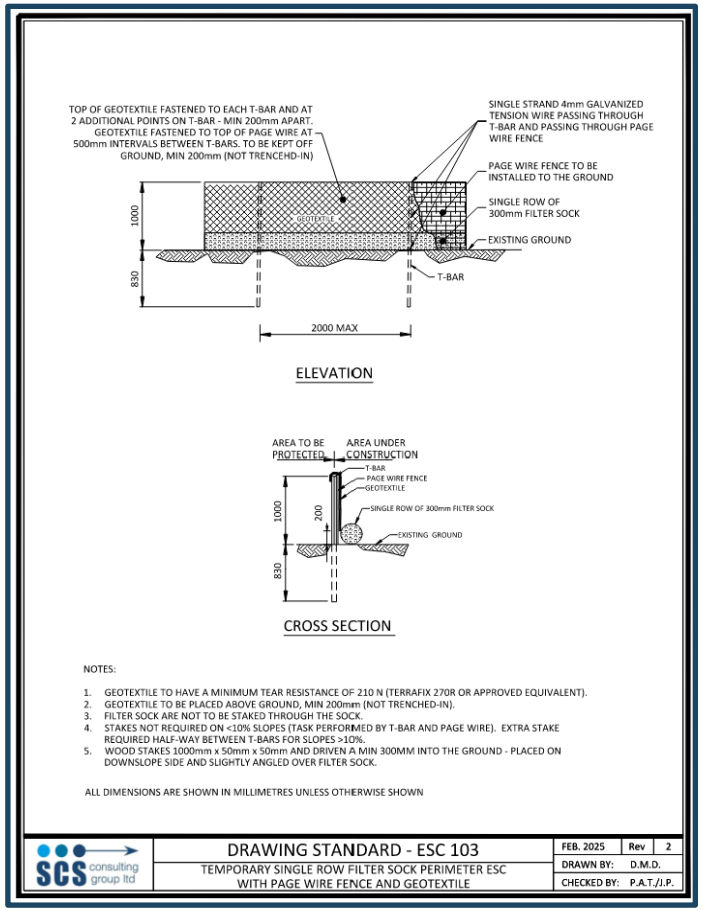
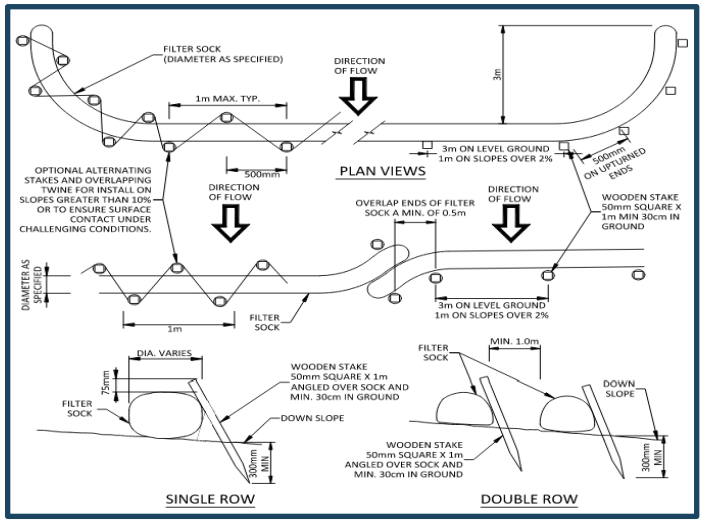
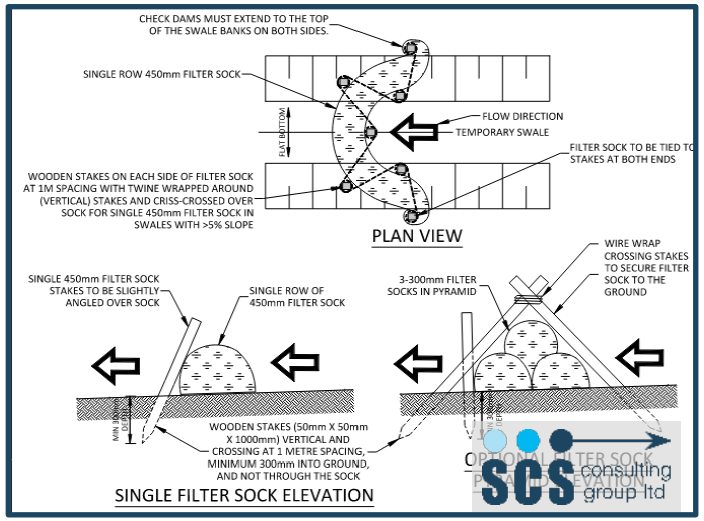


- OPSD do not have updated filter sock Standard Drawings – only three exist, stakes pierce socks, incorrect end overlap, and called “fibre rolls”;
- Supplier/Manufacturers have very limited installation Drawing Details without stakes piercing through the socks;
- Requests were made to have Installation Details updated by the manufacturers – limited success;
- SCS ended up making custom Drawing Details to allow for filter sock as perimeter ESC with Page Wire fencing as site delineation;
- Filter sock installation Drawing Details were generated to ensure there is no confusion with the proper installation methods when using filter sock instead of silt fence or rock;
- ESC Drawings needed to have new symbols created to identify filter socks for use as perimeter sediment control, lot level controls, check dams, flow dispersal dams, sediment trap level weirs, outfall discharge polishing, etc.







08

Client Buy-In

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- Some Clients were quicker to understand and recognize the in-field and cost benefits of carrying filter sock in our Drawings, Tender Items, and ESC Plans;
- Few Clients were aware that silt fence geotextile must be replaced when clogged; as it is designed to filter run-off, not hold back run-off – only survives a few large events. USEPA indicates silt fence only has a 6 mth life;
- Clients often want site delineation (silt fence double duty), so SCS's ESC Plans offer a low maintenance and low-cost page wire fence with filter sock combination;
- Incorrect belief that expensive HD Silt Fence (with 4X4 posts) will hold back sediment when the real issue is erosion control upslope (and the HD silt fence still fails due to undermining and/or geotextile damage);
- Our Clients have different Project Managers at each site, with their own preferences and experiences – need to have the PM on-board for a successful switch to filter sock;
- A few Clients preferred silt fence because they felt it symbolized progress towards construction.

- Educating Clients on the reduced costs and higher efficiencies of filter sock was crucial – including ease of install, simplicity of repair, greater durability, better optics (fewer complaints and less regulatory attention), lower removal costs, ability to relocate, and reuse potential;
- Key to stress overwhelmed silt fence repairs are often challenging, quite costly, and of minimal effectiveness due to saturated sediments; routine repairs often twice the price of filter sock repairs;
- Clients often do not factor in the high costs for frequent silt fence repairs, removal, and ground and/or landscaping restoration due to highly disruptive trenching install/removal operations – looking only at upfront installation costs;
- SCS has partnered with ESC Contractors to show life cycle cost savings of filter sock versus silt fence – reducing overall ESC expenses:
  - Single silt fence is an additional $3 to $5 per metre over 300mm filter sock;
  - Double silt fence with straw bales is $10 to $15 additional cost per metre vs double 300mm filter sock with page wire fence;
  - Plus the cost of ground restoration upon removal.

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09

ESC Contractors

- Some ESC Contractors have only invested in silt fence installation equipment (not Static Slicers unfortunately) and do not promote filter sock use, often inflating quotes for sock installation, or use sub-contractors which elevate costs;
- Filter socks are not new to the industry (invented in 2001 and in common use since 2003), but several ESC Contractors still don't seem to know how to install them properly;
- Key installation mistakes:
  - Staking through the filter socks – damages sock, impedes resetting, limits relocation, and prevents reuse;
  - Install parallel rows of sock side-by-side – does not allow settling of sediment or pooling of run-off between sock rows;
  - Poorly secured – poor staking or need to criss-cross twine over top of sock to better anchor on slopes and in heavier flows;
  - Installed without proper overlap – ends of filter socks must overlap with each other and connected silt fence to avoid gaps;
  - Allow for undermining – need to pack mulch / fill media along the upslope toe-of-sock when installed on erodible surfaces.

- Key installation mistakes cont'd:
  - Mesh not properly filled – reduces filtering efficacy;
  - Installed too close to silt fence – submerge filter socks;
  - Placed on uneven surfaces/debris – undermining of sock;
  - Allow accumulated sediment to exceed half of the filter sock height – causes less filtering and more overtopping;
  - Stakes barely into the ground – stakes fail and socks shift;
  - Failure to turn downstream ends upslope – untreated run-off flanks ends of sediment control;
  - Install filter sock on aggregate – run-off flows under sock.
- Ensure SCS Project Managers meet with ESC Contractors prior to any work commencing to discuss the ESC Drawings and Details, and offer advice as needed to clear up any confusion;
- Have SCS Site Supervisors / ESC Inspectors on location during the installation of ESC measures to document the work and ensure proper install is implemented. Experienced SCS staff on site are able to intercept and correct installation issues before they become a costly error or cause a delay to the project.

10

Filter Sock Success

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- **Saving our Clients ESC Costs;**
- Reducing repair costs and delays;
- Decreasing repair frequency;
- Improving perimeter sediment control;
- Enhancing site optics;
- Minimizing regulatory attention;
- Lessening public complaints;
- Simplifying ESC repairs;
- Upgrading run-off treatment;
- Easing end of project ESC removals;
- Cutting waste and disposal costs;
- Eliminating ground disturbance;
- Protecting sensitive hazard lands;
- **A win/win for both the environment and our Clients.**

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March 26 & 27, 2025

Improving Site ESC: Transitioning to Filter Sock from Silt Fence

THANK YOU

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