EROSION & SEDIMENT CONTROL ON CONSTRUCTION SITES

Doug McCluskey Assistant Erosion Control & Geoproduct Manager, EJ Prescott

SEDIMENT CONTROL

Why do I have to install a sediment control device?

- 1. There is a legal requirement to practice sediment & erosion control on most construction sites
- 2. Proper sediment & erosion controls will prevent expensive, time consuming rework
- 3. Keeping soil on the construction site will prevent polluted runoff from entering local streams, rivers, and lakes





IT'S THE LAW

Clean Water Ac (1972)

Cuyahoga River, Ohio: 1969



City pump station discharges sewage into Cuyahoga River

History Lesson

1948 – Federal Water Pollution Control Act

• Major Amendments to the FWPCA in 61', 66', 70', 72', 77', & 87'

1972 – Clean Water Act

- Made it unlawful to discharge any pollutant from a point source into navigable waters without a permit
- Established the National Pollutant Discharge Elimination System (NPDES)
- Enforced Nationally by the Environmental Protection Agency (EPA)

1987 – CWA Amended

To address pollutants from a non-point source



Arab terrorists take Israeli hostages at Munich Olympics, 11 athletes are killed



Nixon launches the Space Shuttle program



Goodyear Blimp flies for the 1st time



Air stewardess Vesna Vulovic survives a 33,340' fall without a parachute after a bomb was detonated on her flight



KISS is formed

History Lesson

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Spuds Mackenzie 1st appeared in Bud Light advertisements



The Cosby Show was #1 on TV





Bomb blamed on the Unabomber explodes by a computer store in Salt Lake City

Ben & Jerry's announce new Cherry Garcia ice cream flavor

Spaceballs released June 24th





What pollutant is currently the most significant threat to clean water in the United States?





Each year in the United States, about 8 billion metric tons of sediment reaches our ponds, rivers, and lakes

Roughly 2/3 comes from agriculture and forestry practices

1/3 comes from active construction or land development

Sediment & Erosion Control

First things First

Sediment results from erosion. Therefore, if you effectively apply erosion controls as a top priority on any project, you will eliminate the need to have to deal with sediment control



SEDIMENT CONTROL DEVICES

Source: US EPA
68% of Installations are INCORRECT
86% of Installations are NOT maintained





Silt Fence used in Concentrated Flows

Fabric NOT in Trench



NOT enough Stakes



Trench NOT Compacted



Repairs NOT Completed





Compost Filter Sock

- Mesh tubular sediment control & and stormwater filtration device that is filled onsite, or is palletized with a compost or composted media. Manufactured by Filtrexx
- SiltSoxx can be a continuous length, or cut into pieces to fit the application
- Remove turbidity through ponding and filtering





Material Characteristics



5 MIL HDPE

Material: *Hi Density Polyethylene* Material Characteristics: *Photodegradable* Mesh Opening: *3/8"* Tensile Strength: *26 psi* Functional Longevity: *9 months to 3 years*



Designed for optimum filtration and Hydraulic flow ANALYTICAL CHEVISTS and BACTER OLOGISTS Agreement by Stale of California

SOIL CONTROL LAB

40 + AA C AE WAY WARGEVILLE CALIFORNIA.

90076

ALC: N

42 Hangar Way Watsonville CA 95076 www.compostlab.com

Account No .: 8010710 1 4918 Batch Ja.-Feb-Misc.-08 6 CODE: Filtrexx FilterSoxx

Kevin Weaver Weaver Express 4205 Oakridge Rd. NW Sugarcreek OH 44681 Rod Tyler Filtrexx International 35481 Grafton Eastern Road Grafton OH 44044

| DATE RECEIVED: | 30 Jan. 08 | | | | | |
|------------------------------------|---------------------------|--------|--------------------------------|---------------|-------|-----|
| SAMPLE ID: | WW Soxx compost Main pile | | | | | |
| SAMPLE ID. No .: | 1 8010710 | | | | | |
| Filtrexx Berm and Se | diment Removal Te | est Pa | ckage | | | |
| Test Conditions | | | Test Material | | | |
| Berm Diameter (*) | | 8 | Bulk Density (lb/cu ft-wet wt) | | | |
| Berm Material: Filtrexx FilterSoxx | | | Bulk Density (lb/cu ft-dry wt) | | | |
| Slope (1:X) | | 3 | Bulk Density (g/cc dry) | | | (|
| Flow (gal/min/linear ft) | | 2.0 | MM | inches | | Pen |
| Time Duration (min) | | 10 | > 25 | > 1.0 | | |
| Run Number: | | 1 | 16 to 25 | 0.63 to 1.0 | | |
| Void Space (% vol.) | | 23 | 9.5 to 16 | 0.37 to 0.63 | | |
| Moisture (% wt) | | 55.2 | 6.3 to 9.5 | 0.25 to 0.37 | | |
| Tap Water start (EC umhos/cm) | | 450 | 4 to 6.3 | 0.16 to 0.25 | | |
| Tap Water after 10 min. run | | 462 | 2 to 4 | 0.079 to 0.16 | | |
| 6526 | | | <2 | < 0.079 | | |
| Methods A | STM 3977c - 2002 | | | | Total | |

Methods ASTM 3977c - 2002

Total

US EPA GreenScapes Cost Calculator

| | Gree | enScapes | | |
|--|--|--|-----------------------------------|--|
| Inputs | and the second second | | | |
| Denation of Project (Months) | 10 | Erosion Control C | oet Granh | |
| Cest for Silt Fence Installed | \$2.00 | - | | |
| Cost for 12" Filtence FilterSone Installed est. | \$2.40 | Total Broket Costs | | |
| Would Compost be Removed from Site? | | I deal Pro | liect Coata | |
| tenerally not required. | 10 | 1000000 | | |
| and the second | of the local division of the local divisiono | \$5,000.00 | | |
| 82* Diamotor Filtunce Filturfience | CentExposite | | 54,802,50 | |
| Materials and Installation Cost | \$3,500.000 | 95.000.00 | | |
| Repair and Replacement Cost | \$270.00 | 40.000.00 | | |
| Sack Removal and Disposal Cent | \$40.00 | \$3,879,90 | | |
| Compost Remeval Cast | \$0.00 | Pr.500.00 | | |
| 12" FilterSexx Cest | \$3,810.04 | | \$2,467.00 | |
| | | 43,000.00 | | |
| Still Ferriting | O Cart Estimate | | | |
| Materials and Installation Cost | \$2,000.000 | \$2,000.00 | | |
| Repair and Replacement Cost | \$2,000.00 | | | |
| Removal and Disposal Cost | \$802.50 | \$1,000,00 | | |
| SiltFence Cest | \$4,862.50 | | | |
| | | 10.00 | | |
| I" FilterSexe have been recognized to perform be | Her than 26" Silt Feed | a state of the sta | | |
| 1" Diameter Filtreice FilterSann Option | Cast Estimate | 12" FillerSexx Cent 5 | SillFeace Cost 8" FilterSoxx Cost | |
| 8" FilterSexx Cest | \$2,667.00 | | | |

Available from the US EPA at:

http://www.epa.gov/greenscapes/tools



ADAVANTAGES

1.8X Less Maintenance than Silt Fence 2. NO Trenching-NO Soil Disturbance **3. Easily Installed Easily Removed Easily Maintained** 4. Installed Anytime of Year 5. Available in 8", 12", 18", **&24**" Diameters 6. Additives to remove Oils, Heavy Metals, Nutrients, & **Bacteria**

Applications



INLET PROTECTION



CHECK DAMS



CONCRETE WASHOUTS SLOPE PROTECTION SEDIMENT TRAPS SLOPE INTERRUPTION BIOFILTRATION CHANNEL PROTETION VEGETATED WALLS BANK STABILIZATION RUNOFF DIVERSION BIOSWALES

Fiber Filtration Tubes

Fiber Filtration Tubes, Terra-Tubes, are engineered composites of wood fibers, man made fibers, and performance enhancing polymers, encased in heavy duty cylindrical tubes. Manufactured by Profile Products

Designed to trap, filter, and treat sediment laden runoff while reducing hydraulic energy

3 Primary Functions: Flow Filtration Flocculation





Downstream Upstream

99% Reduction in Turbidity!





ADVANTAGES

1. 15X More Effective at **Reducing Turbidity** 2.15X More Effective at **Controlling Sediment Loss 3. Lightweight, Easy to Handle** & Install 4. Available in 6", & 9" **Diameters** 5. Easily Installed **Easily Removed Easily Maintained**

Applications

DITCH CHECKS



PERIMETER/SEDIMENT CONTROL



SLOPE INTERRUPTION BIOSWALES STORMWATER TREATMENT SYSTEMS






Biodegradable Erosion Control Blankets



BioNet

Little to no risk of wildlife entrapment Easy to sprig or plant through

Increased water absorption with jute netting vs. polypropylene netting

Improved blanket conformance and adherence to soil vs. polypropylene netting

Enhanced erosion protection and mulching capabilities vs. polypropylene netting

Durable, flexible and 100% biodegradable Lightweight jute netting requires no direct sunlight exposure to initiate degradation



BioNet

Leno woven nets feature double twisted strands in the machine direction that provide higher strength and integrity to the BioNet blankets than that of cross-lay nets <u>LENO WOVEN</u> <u>CROSS-LAY</u>





Cumberland River, Tennessee: C125BN





Short Term

S75BN

Single Net Straw Blanket 100% Straw 12 Month Longevity *Typical Applications:*

4:1 – 3:1 Slopes

Low Flow Channels Permissible Shear: 1.6 lbs./Sq.Ft S150BN Double Net Straw Blanket 100% Straw 12 Month Longevity Typical Applications:

3:1 – 2:1 Slopes

Moderate Flow Channels Permissible Shear: 1.85 lbs./Sq.Ft

Extended Term

SC150BN Double Natural Fiber Net Blanket 70% Straw 30% Coconut 18 Month Longevity Typical Applications:

2:1 – 1:1 Slopes

Medium Flow Channels Permissible Shear: 2.10 lbs./Sq.Ft

C125BN

Double Jute Net Blanket 100% Coconut 24 Month Longevity *Typical Applications:*

1:1 & Greater Slopes

High Flow Channels PS: 2.35 lbs./Sq.Ft

Shorelines

C700BN

100% Coconut Woven Coir Fiber Netting—Top Net Woven Natural Fiber Jute Netting—Bottom Net 36 Months Longevity

Installation

Correct installation is CRITICAL for ultimate performance







Applications

Short Term S150BN

C125BN





Hydromulches



Types of Hydraulic Mulches

 Paper (Cellulose) **Paper (Cellulose) w/Tackifier** • Wood **Wood w/Tackifier** Wood w/ Synthetic Fibers **Paper and Wood Combination or Blends Blends w/Tackifier** Straw Straw and Reclaimed Cotton

•

Advantages

| Product Comparison: | Flexterra* FGM™ | Blankets |
|--|--------------------|----------|
| Effective without special site preparation | 1 | NO |
| Can be applied without direct access to site | 1 | NO |
| Eliminates costly, labor-intensive staking | 1 | NO |
| Bonds directly to the soil | 1 | NO |
| Rids site of messy, leftover netting | 1 | NO |



Better Intimate Contact with Soil





SOIL

Spray on Blankets

Rolled EC Blankets





Application is Critical

PROPER APPLICATION IMPROPER APPLICATION

3000 lbs/acre application rate





Adhesion to Soil

FRM unique combination of mechanical and chemical bonding creates an erosion control blanket with unequaled structure and adhesion to soil

Extrapolation of Soil Loss on a per Acre Basis

Utah State University Water Research Lab data



Single-Net Excelsior Blanket 16,561 lb



Single-Net Straw Blanket 16,071 Ib



Competitive BFM Product 7,322 lb



Flexterra 76 lb

Estimating soil loss using the RUSLE (or MUSLE for single storm event) equation and published "C" factors

Steep Slopes and Critical Sites

INSTALLATION GUIDELINES

Erosion Control and Revegetation:

Step One: Apply seed, fertilizer and other soil amendments with small amount of Flexterra" (FGM*) for visual metering.

Step Two: Mix 50 lbs of FGM" per 125 gallons (23 kg/475 liters) of water; confirm loading rates with equipment manufacturer.

| INSTALL PRODUCT AT THE FOLLOWING TYPICAL APPLICATION RATES: | | |
|---|------------|------------|
| Slope Gradient | English | 51 |
| s 3H to 1V | 3000 lb/ac | 3400 kg/ha |
| > 3H to 1V & <2H to 1V | 3500 lb/ac | 3900 kg/ha |
| > 2H to 1V & <1H to 1V | 4000 lb/ac | 4500 kg/ha |
| > 1H to 1V | 4500 lb/ac | 5100 ko/ha |
| Below ECB or TRM | 1500 lb/ac | 1700 kg/ha |
| As infill for TRM | 3500 lb/ac | 3900 kg/ha |

Correlation representation CM for method specification for additional details.

Strictly comply with equipment manufacturer's installation instructions and reconveendations. Use approved hydro-spraying machines with fan-type nozzle (50-degree tip). To achieve optimum soil surface coverage apply FGM™ from opposing directions to soil surface. Rough surfaces (rocky terrain, cat tracks and ripped solid may negaine higher application rates to achieve 100% cover. Bacommended maximum slope length 100 feet (30 meters). Not recommended for channels or areas with concentrated water flow. This product may be applied on saturated solid and does not require a curing period to be effective.

AVERAGE ANALYSIS

Dry Organic Matter 73% = 3% Molisture Content 12% = 3%

Cross-Linkest Techiller 18% - 1% Crimped Synthetic Fibers 5% - 1%

NET WEIGHT 50 LBS (22.7 Kg) NET DRY WEIGHT 44 LBS (20 Kg



CoverGrow Spread or Spray

The Best Pellet to Quickly and Easily Establish Vegetation



Advanced technology improves performance and ease of application

Easily applied via

- Hydroseeders
- Spreader
- By Hand

Our 40# bag covers the same area as other 50# bags and outperforms them



Covergrow Through Spreader or by Hand

- Increased swelling, dispersion and coverage compared to leading applied pellets
- Smoother flowing for easy spreader application
- Stays in place due to advanced tackifier technology
- 25% greater coverage for fast and easy application!

CoverGrow Mulching Granules give you 50 lbs. of coverage in a 40-lb. bag



Dispersion 60 seconds after receiving 40 mls of water





Inlet Protection





Storm drain inlet protection is designed to increase the time it takes for sediment-laden water to enter the storm sewer system, through the use of shortterm ponding, and ponding and filtration.

Designed to prevent sediment from entering drainage systems

MUST be maintained!!


Poorly installed & Poorly maintained BMP's can result is significant quantities of sediment being discharged to storm drains

Inlet Protection Types

EXTERNAL

INTERNAL

Designed to intercept stormwater before it enters the storm drain structure Designed to filter stormwater after it enters the structure





External Inlet Protection



Blocksom & Company

Wood/Fiber Logs



PHOTO: SOUTHLAND CONSTRUCTION



Silt Saver



Dandy Bags



Silt Fence





Compost Filter Sock "SiltSoxx"

Internal Inlet Protection



Inlet Filter: *Metal frame & Geotextile Filter*



Silt Bag: Internal filter device



Dandy Sack

Sack/Log Combo

Maintenance

Inspect Inlet Protection Devices Routinely & After Each Rain Event

1. Check for tears that can result in sediment entering the inlet

- 2. Check for improper installation
- 3. Look for displaced BMP's that are no longer protection the inlet
- 4. Monitor sediment accumulation







Assessment of Learning

1. Considering soil loss, which product performs best on construction sites

a. Rip Rap

- b. High performance hydromulches
- c. Straw Erosion Control Blankets
- 2. True or False : Sediment is the most significant threat to clean water in the U.S.
- 3. Which perimeter control product is easier to install, maintain, and remove?

a. Silt Fence

b. Compost Filter Sock

- 4. What was significant about 1972?
 - a. Kiss is formed
 - b. Goodyear Blimp flew for the 1st time
 - c. Clean Water Act is established
 - d. All of the above
- 5. What was significant about 1987?
 - a. CWA Amended to include non point source pollutants
 - b. Spuds Mackenzie appears is bud light commercials
 - c. Spaceballs was released
 - d. All of the above

Assessment of Learning Cont.

- 6. True or False: Because of the durable yet flexible nature of a biodegradable erosion control blanket, it is very difficult to install.
- True or False: Compost Filter Socks are designed to perform one function on a construction site......perimeter control
- 8. True or False: When installing Biodegradable ERB's the installation is NOT very critical. A couple of staples is all you need!
- True or False: When considering inlet protection devices the choice is easy because silt fence is your only option

QUESTIONS

Compost Filt Terra Tubes Bionet Hydromulche **Inlet Protectic**



This is my Thank You dance!



