Protecting Watersheds thru Erosion & Sediment Control Methods

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TEAM EJP
STORMWATER SOLUTIONS

Maine Temperature Conversion Chart

60 above zero:
People in Tennessee are still turning on the Heat in the house
People in Maine are planting gardens

20 above zero:
Floridians wear coats, gloves and woolen hats
Mainers start breaking out sweatshirts

Zero degrees:
People in Miami cease to exist….
Mainers have their last cook-out before it gets cold

-40 Below:
Hollywood disintegrates…
Maine Girl scouts start selling cookies outside of grocery stores

-100 Below:
Santa Claus abandons the North Pole
Maine-iacs get frustrated when they can't thaw the Keg!

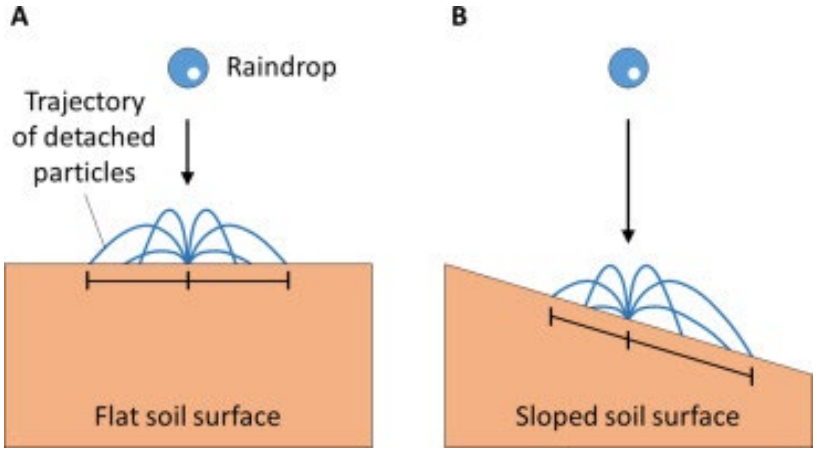
-460 Below
All atomic motion stops…
People in Maine Start saying…"Cold 'nuff for ya?"

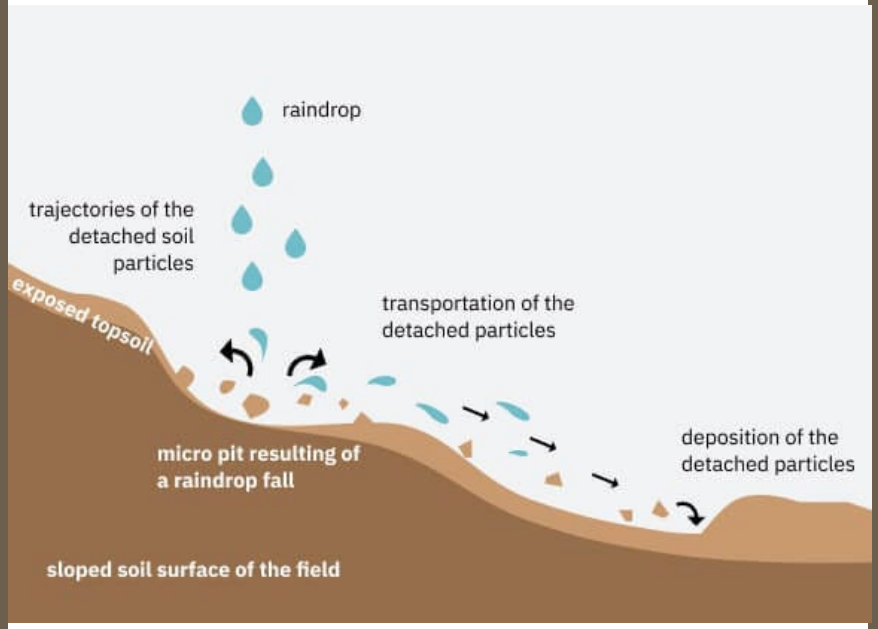
Erosion Control

- Erosion is the action of a surface process that moves soil, rock and dissolved material from one location to another. Typical cause is either water flow or wind.
- Many erosion control methods stem around creating sustainable vegetation. To help protect against detachment and transportation of soil particles.

Sediment Control

- Sediment Loss is the result of erosion. When you have erosion, you will have sediment runoff.
- Sediment control is the process of trying to keep sediment from leaving a site.


A
Raindrop
Trajectory of detached particles
Flat soil surface
B
Sloped soil surface

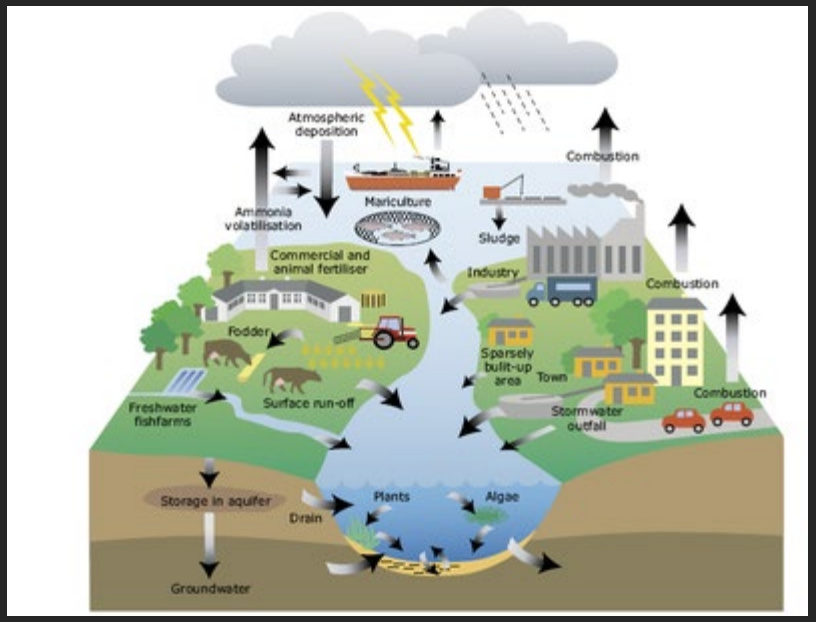

raindrop
trajectories of the detached soil particles
exposed topsoil
transportation of the detached particles
micro pit resulting of a raindrop fall
deposition of the detached particles
sloped soil surface of the field

Sediment loss from erosion is one of the leading causes of water pollution

Water quality affects all of us


CAT

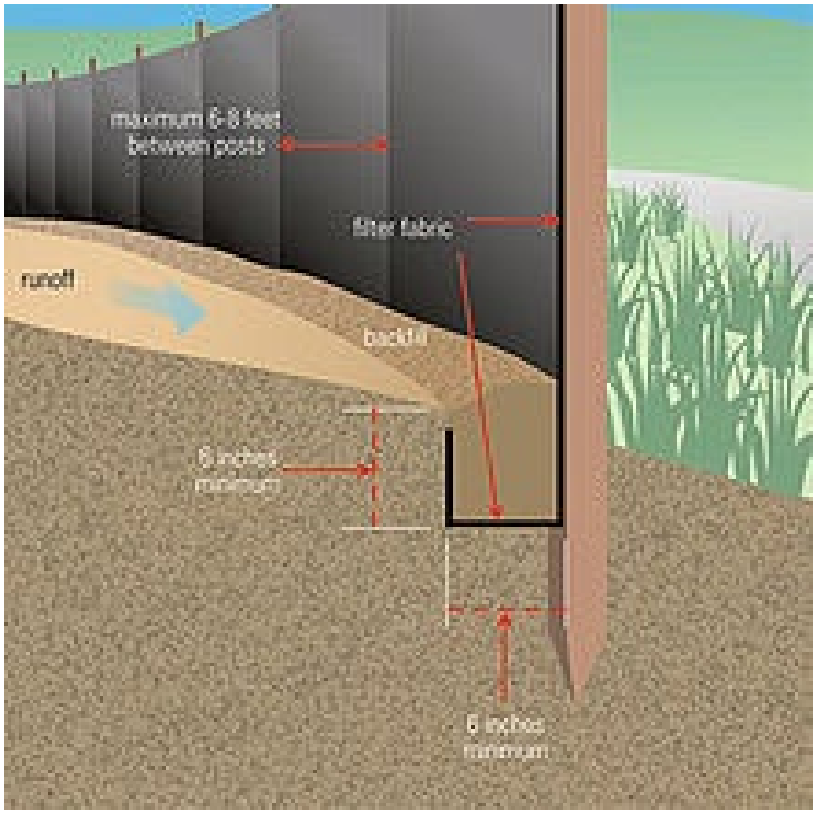
What goes in, must come out

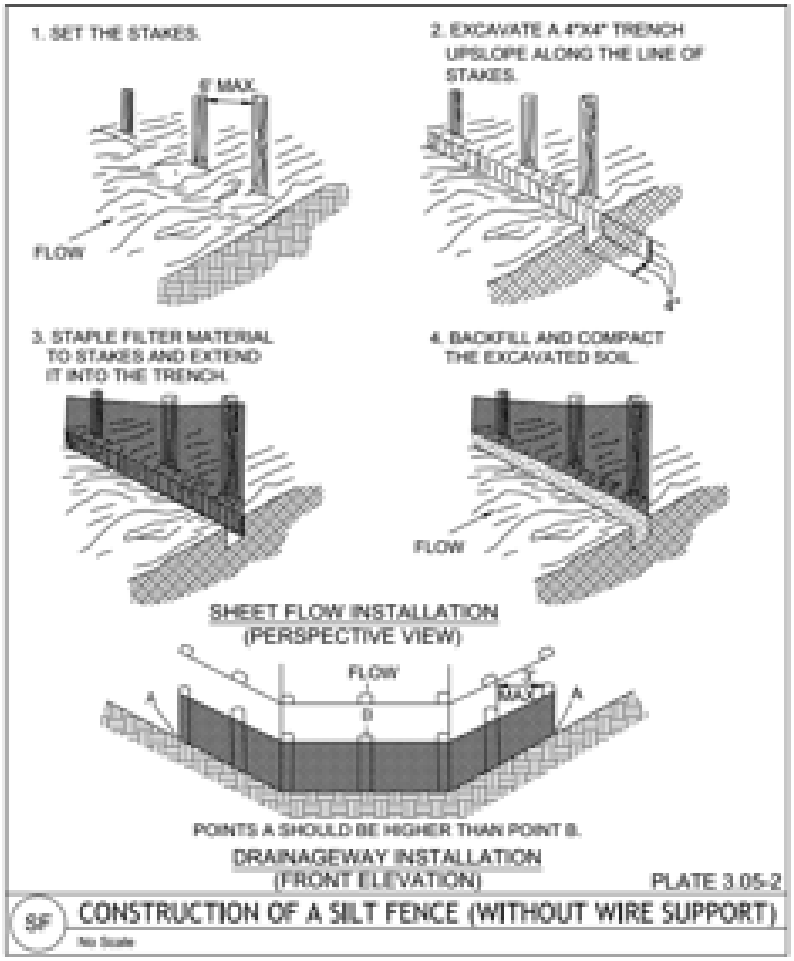


Impacts on Watersheds Water Quality

- Nutrient overloading
- Sediment runoff
- Toxic Chemicals
- Organic loading
- Thermal loading
- Stream Channel Alteration
- Altered Hydrology
- Pathogens
- Metals
- Road Salt

Types of Sediment Control?


maximum 6-8 feet
between posts
filter fabric
runoff
backfill
6 inches
minimum
6 inches
minimum


1. SET THE STAKES.
8' MAX.
FLOW
2. EXCAVATE A 4"X4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.
4. BACKFILL AND COMPACT THE EXCAVATED SOIL.
FLOW
SHEET FLOW INSTALLATION
(PERSPECTIVE VIEW)
FLOW
MAX.
A
B
POINTS A SHOULD BE HIGHER THAN POINT B.
DRAINAGEWAY INSTALLATION
(FRONT ELEVATION)
PLATE 3.05-2
SF
CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)
No Scale

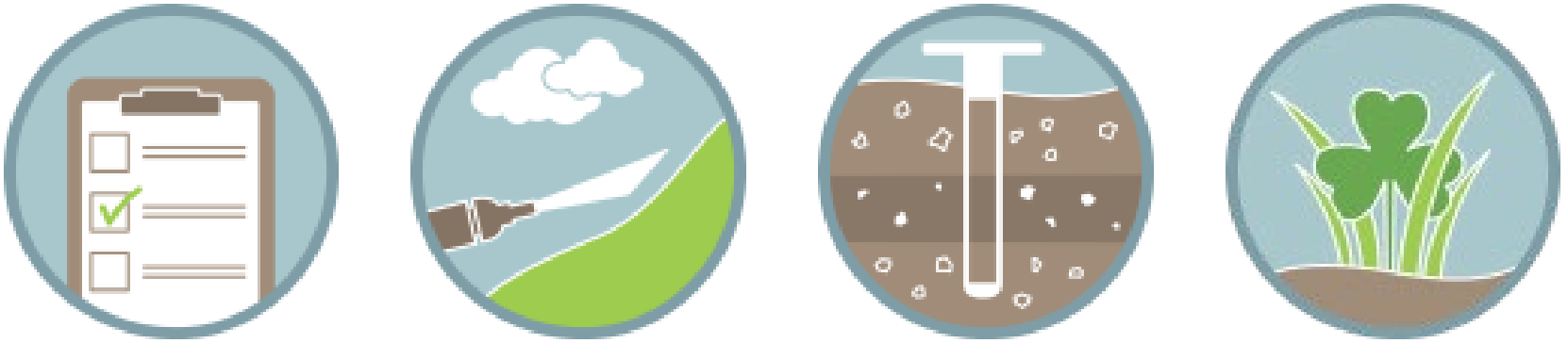

contour
lines


PUBLIC TRANSPORTATION
IN MAINE

What is the best form of Erosion Control?


Sustainable vegetation!

So, What makes it grow?



How do we Establish Sustainable Vegetation

Create Optimal Soil Conditions

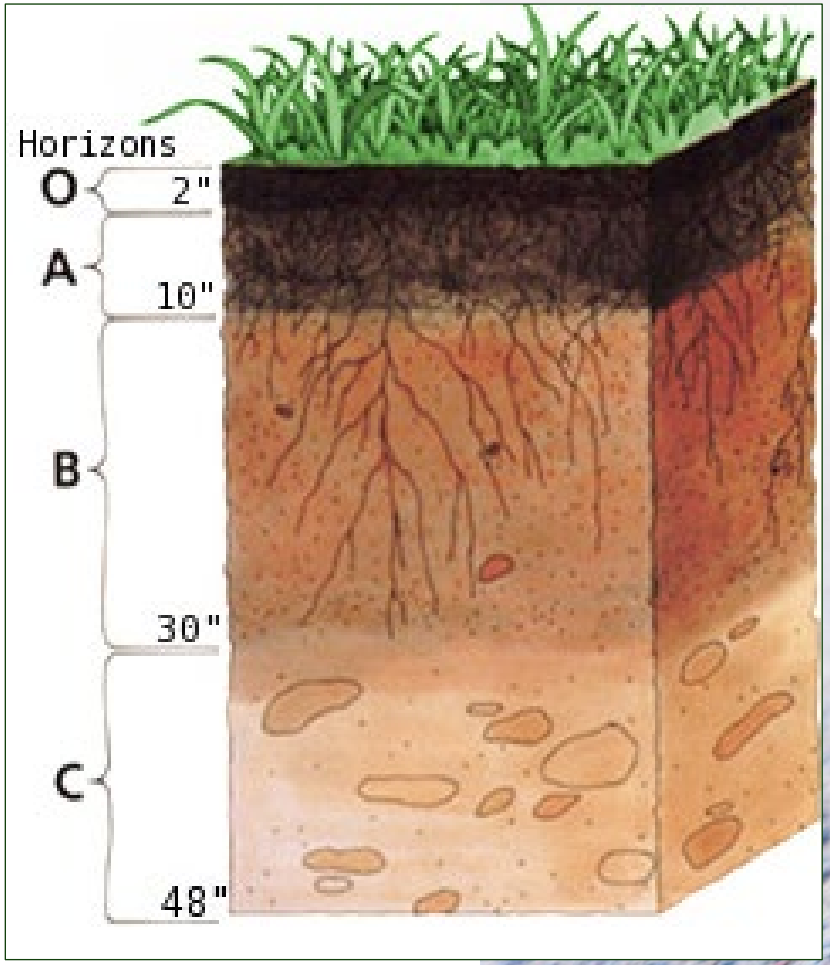
Select the Correct Erosion Control Material

Ensure Proper Installation

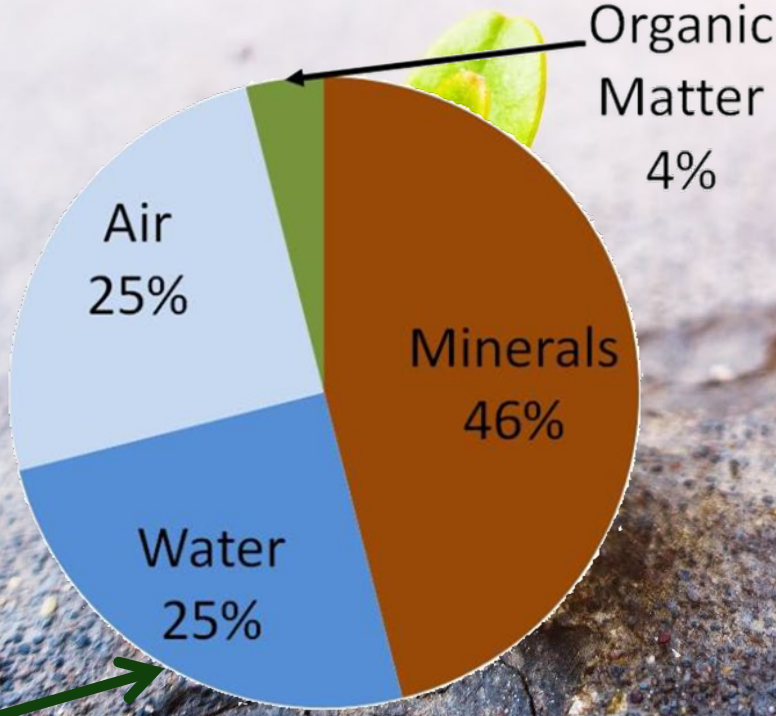
Create Optimal Soil Conditions

- Evaluate soil fertility
- Provide a basis for amendment recommendations
- Help ensure appropriate plant species selection
- Predict probability of desired outcome

Ideal Soil Profile



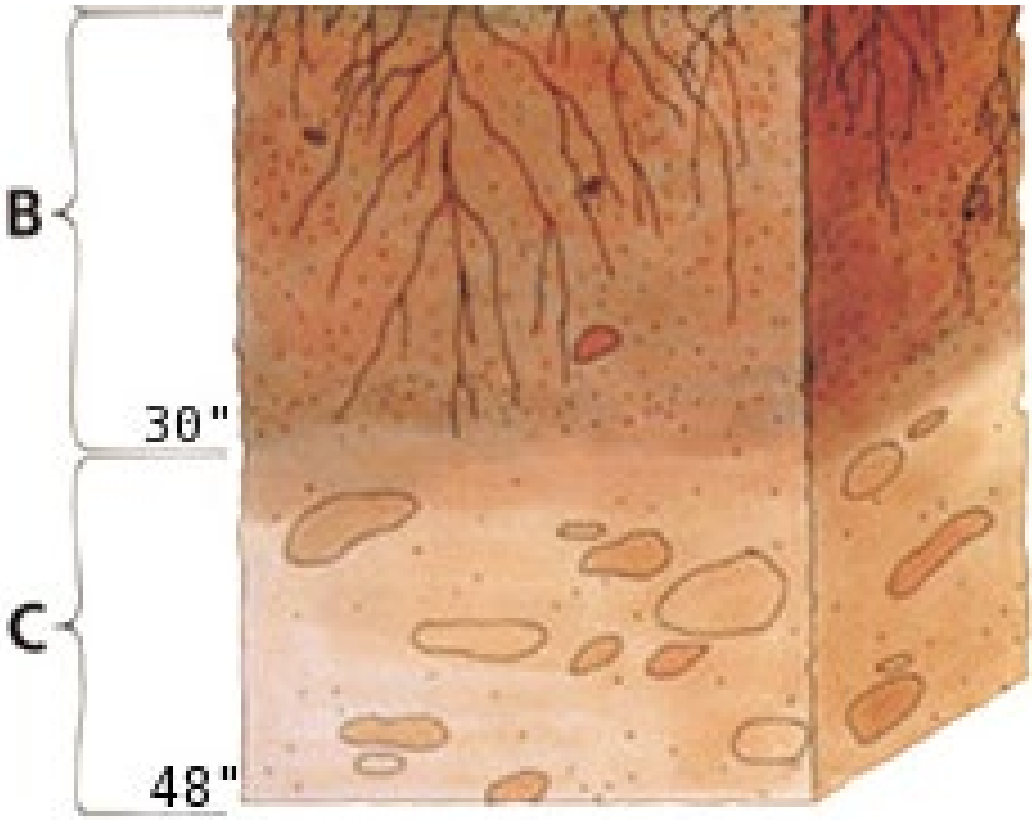
An ideal soil composition contains a balance of components as shown below.



Ideal Soil Composition

Typical Construction Site Soil Profile

- Most projects start with “B” or “C” horizons, perhaps even worse:
  - Low organic environments
  - pH values out of range
  - High soil erodibility values
  - Toxic environments
  - Saline Soils



Do you routinely conduct soil testing for agronomic potential when designing or installing a project?

- ❑ Yes
- ❑ No

Historically, 72% of attendees said "no"

What we are looking for in a Soil Test

- Texture/Type – sand, silt, or clay?
- pH – to determine soil acidity or alkalinity
- % Organic Matter and Organic Acids
- Nitrogen, Phosphorus and Potassium (N, P, K)
- Electrical Conductivity (EC)
- Total Dissolved Salts (TDS)
- Cation Exchange Capacity (CEC)
- Sodium Adsorption Ratio (SAR)
- Excess metals and salts

Do you know where your soil needs to be?

Ideal pH?

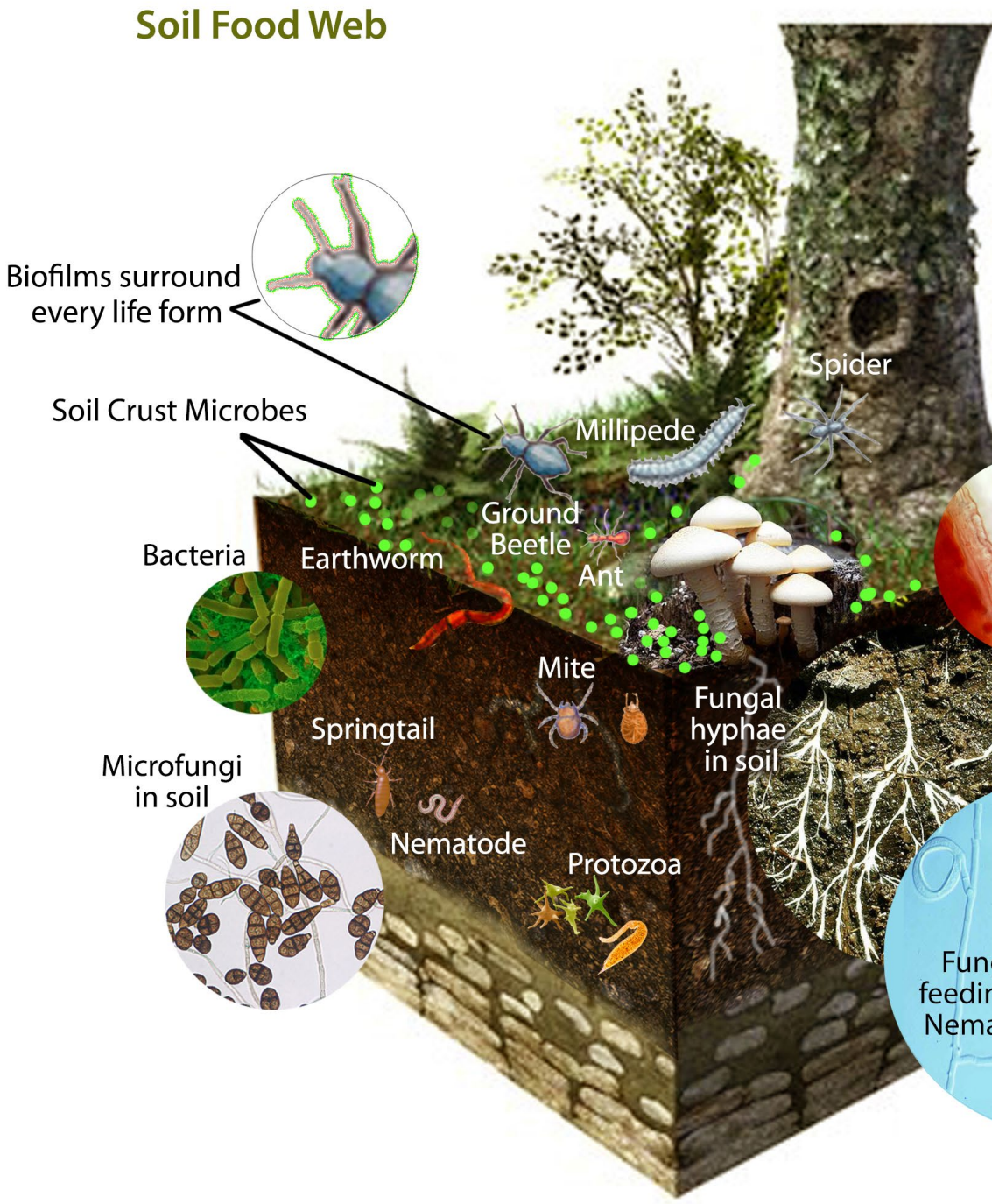
6.3 to 7.3

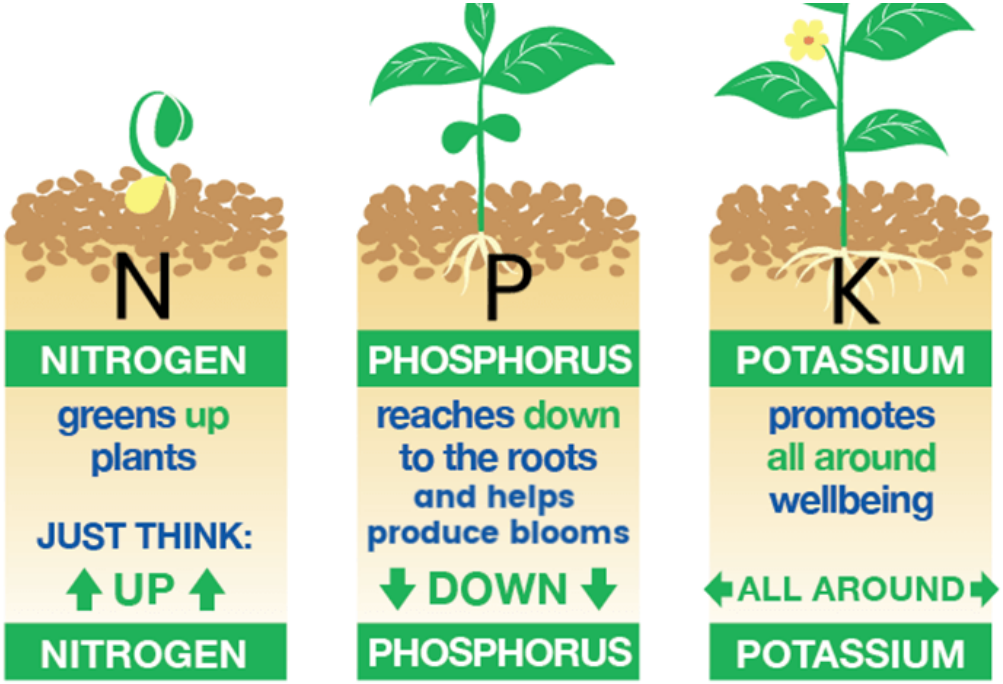
Ideal Organic Matter?

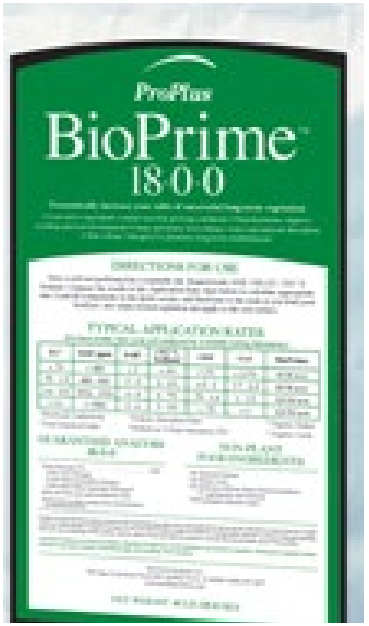
5% or more

Soil Ecology

Maintaining or developing healthy soil ecology is important to soil & vegetation health.




N
NITROGEN
greens up plants
JUST THINK:
UP
NITROGEN
P
PHOSPHORUS
reaches down to the roots and helps produce blooms
DOWN
PHOSPHORUS
K
POTASSIUM
promotes all around wellbeing
ALL AROUND
POTASSIUM


ProPlus
BioPrime
1800


BIOSOL
FORTE
THE ECONOMICAL WAY TO A GREENER WORLD

7-2-1


0-0-20

Possible Soil Amendments

- **Fertilizers**
- **Soil Neutralizers**
- **Organic Matter**
- **Growth Stimulators and Enhancers**
- **Biotic Soil Amendments/ Biotic Soil Media**

What fast acting growth stimulants can do

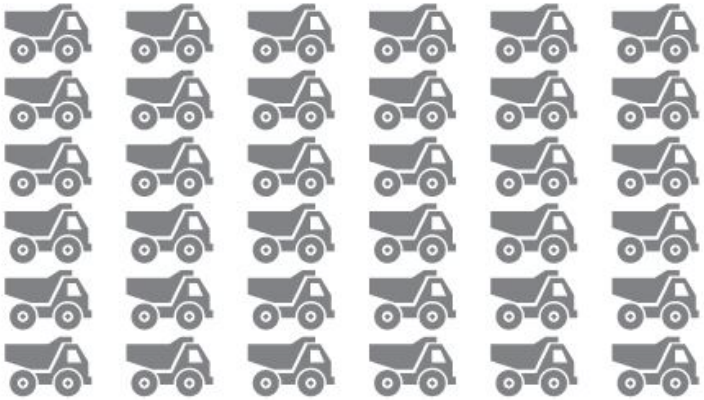
Without treatment

With treatment


BIOTIC SOIL MEDIA™

— GAME-CHANGING ADVANTAGES —

Many construction sites have depleted soils with low organic matter that require more than just fertilizer and other amendments to establish sustainable vegetation. Placing costly imported topsoil over depleted soils has historically been the preferred option to establish vegetation. Using ProGanics Biotic Soil Media in place of topsoil on challenging and difficult-to-access sites will not only save money and time, but will also provide a growing medium that helps establish vegetation.



*Amount needed to cover 1 acre (0.4 ha) with 4 in (10 cm) of topsoil; based on a 15 cubic yard capacity dump truck.

36 TRUCKS — OF — TOPSOIL*

5,000 pounds of ProGanics provides the same amount of organic and soil building components per acre as 36 loads of rich topsoil. *Separation layer will be required on highly deficient soils.*

=

2 TANKLOADS — OF — Biotic Soil Media

3,500–5,000 lb/ac · 3,900–5,600 kg/ha

*3,000-gallon capacity hydroseeder equipped with gear or positive displacement pump.

- Recycled Thermally Refined
- Bark & Wood Fibers
- Biopolymers
- Biochar
- Seaweed Extract
- Humic Acid
- Endomycorrhiza
- Bacteria Microbes
- Non-Toxic
- Phyto-Sanitized

Department of Transportation Site

Slopes prior to application, Sept. 21st

Installation date, Sept. 21st

Established Vegetation on Oct. 31st, 2016

Situation

In order to establish vegetation, it's important to identify why grass isn't growing. When Profile Products was asked to assist with this problematic site in New Hampshire, performing a soil test was the very first step. The results of the soil test clearly showed that ProGanics® Biotic Soil Media™ was needed to modify the soil chemistry and jump start vegetation establishment.

ProGanics BSM™ is an alternative to topsoil and unlike traditional organic material, ProGanics is a high-quality consistent product that's easy to use. It doesn't have the variability that's found in topsoil.

Challenges

- Unable to achieve sustainable results
- Short steep slope (≤2H:1V)
- Low pH
- Needed an alternative to trucking in topsoil as access to site was limited

Solution & Application

- Soil test performed to determine the nutrient value at the site
- NeutraLime™ Dry at 160 lbs./acre
- Soluble Gypsum at 500 lbs./acre
- ProGanics® BSM™ at 3,500 lbs./acre
- Hydro-Blanket® BFM at 3,500 lbs./acre

Results

After the installation of ProGanics, skepticism on whether or not vegetation could be established was answered. Using the results from the soil test, combined with ProGanics that provided a fundamental base of organic material on a highly deficient soil site, Profile and ProGanics delivered results on this challenging site.

The local engineer will be working with their DOT to ensure that ProGanics is used on all future projects where needed.
Spray it. Don't spread it!

ProGanics™
BIOTIC SOIL MEDIA™

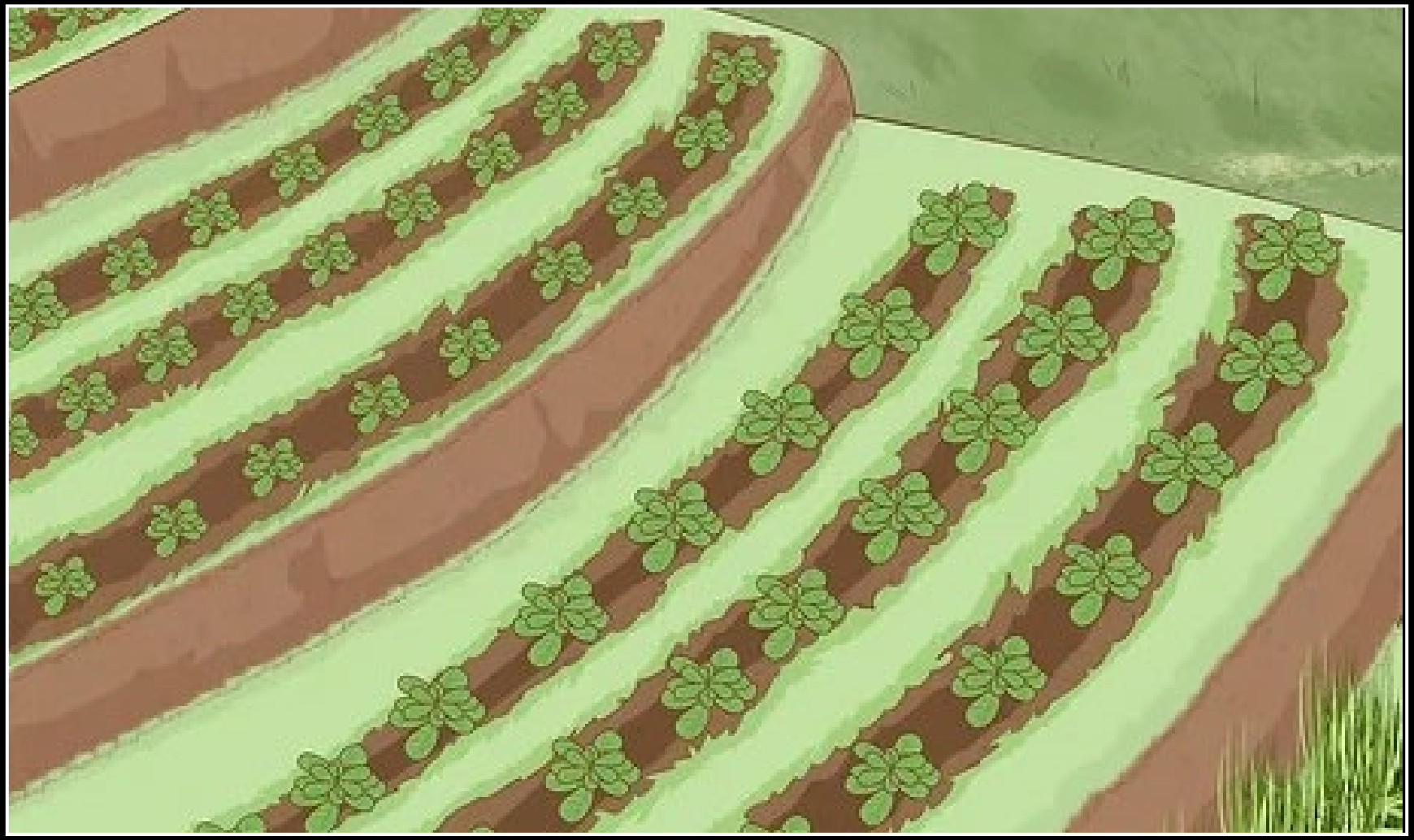
For help on your next project site, contact Profile® Sales Support at 800-508-8681 or Technical Services at tech@profileproducts.com.

Profile Products | 750 W. Lake Cook Road, Suite 440 | Buffalo Grove, IL 60089 | profileproducts.com | 800-508-8681

NHDOT

I-93

Exit 3



Erosion Control Methods

Erosion Control Methods

- Ground Manipulation (terracing, tracking, etc.)
- Loose Mulches (blown straw, compost, wood)
- Chemical Erosion Control, promotes aggregation of soil (PAM)
- Hydraulic Erosion Control Products (HECPs)
- Rolled Erosion Control Products (RECP)
    - Temporary Erosion Control Blankets (ECB)
    - Permanent Turf Reinforcement Mats (TRM)
- Revetment Systems
- Hard Armor
    - Rock Riprap
    - Rock filled baskets (gabions, reno mattresses, Triton)
    - Articulated Concrete block
    - Poured Concrete

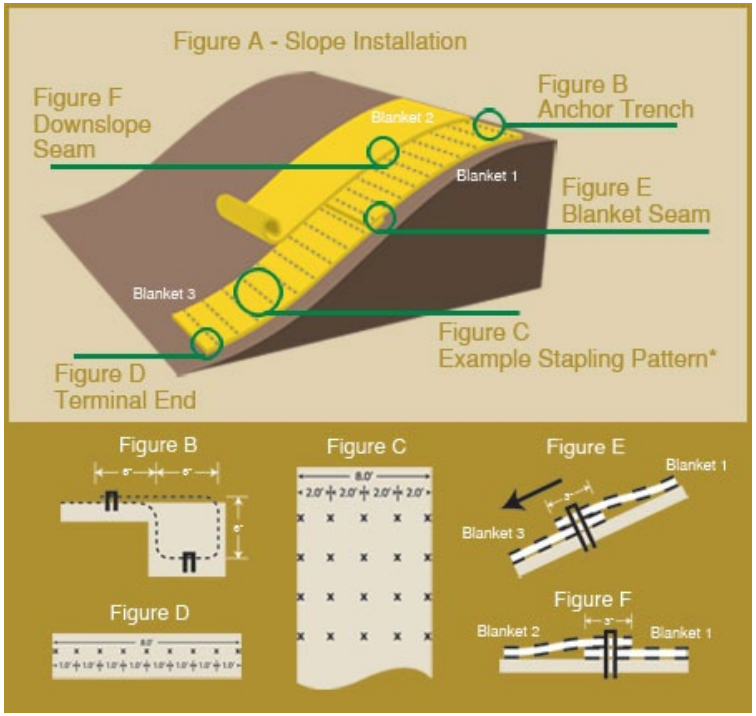
Erosion Control Blankets




Erosion Control Blankets

Erosion Control Blankets

Proper Installation of Erosion Control Blankets



Step to take when using ECB's

- **Start 1-2 feet behind crest of slope**
- **Trench for keying in Blanket**
- **Seeding and amendments prior to installation of ECB**
- **Staple ECB in Trench**
- **Backfill Trench**
- **Roll ECB down slope**
- **Pull ECB tight while stapling down slope**
- **Verify 100% ground contact**

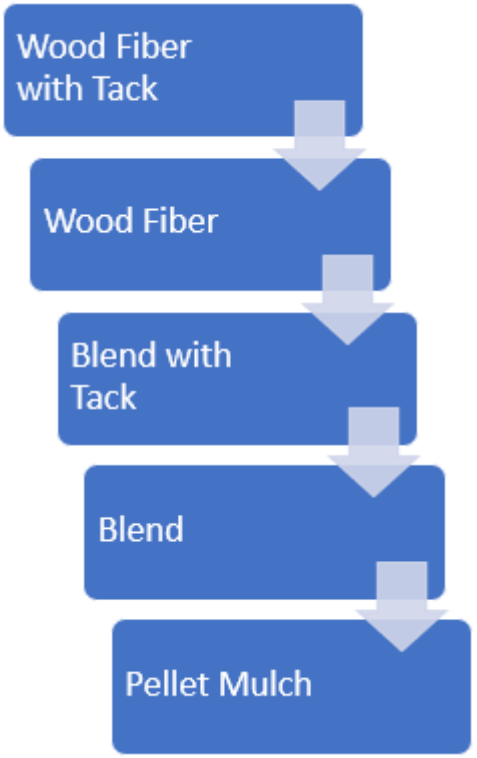
Erosion Control Blankets

What Failures Look Like

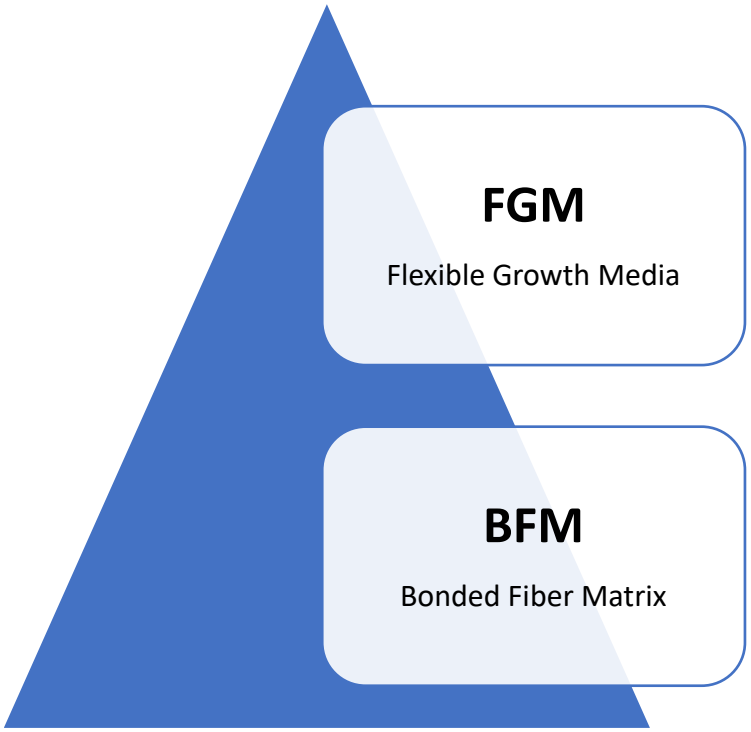
Hydraulically-Applied Erosion Control Products

- **Customized to site specific conditions**
- **Minimal labor required**
- **Economical way to control erosion and establish vegetation**
- **Wide range of performance platforms**
- **Safe for environment**

Types of Hydraulic Mulch



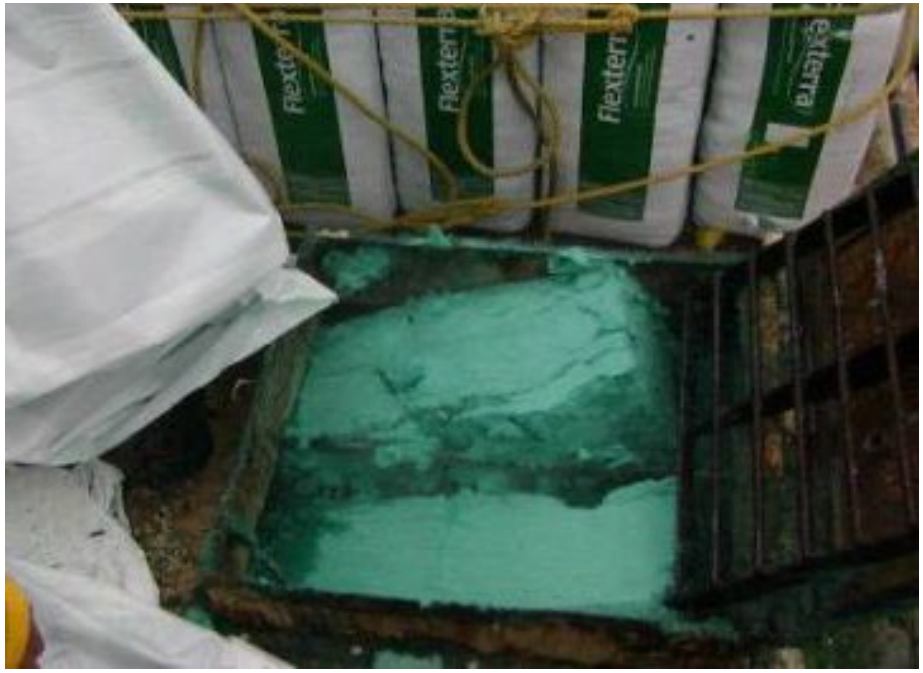
Seeding Mulch Products

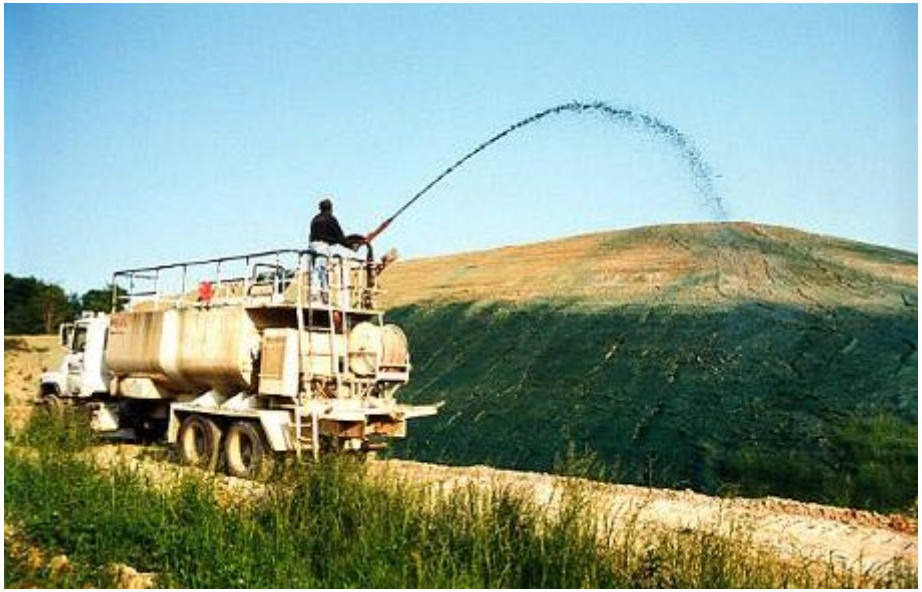


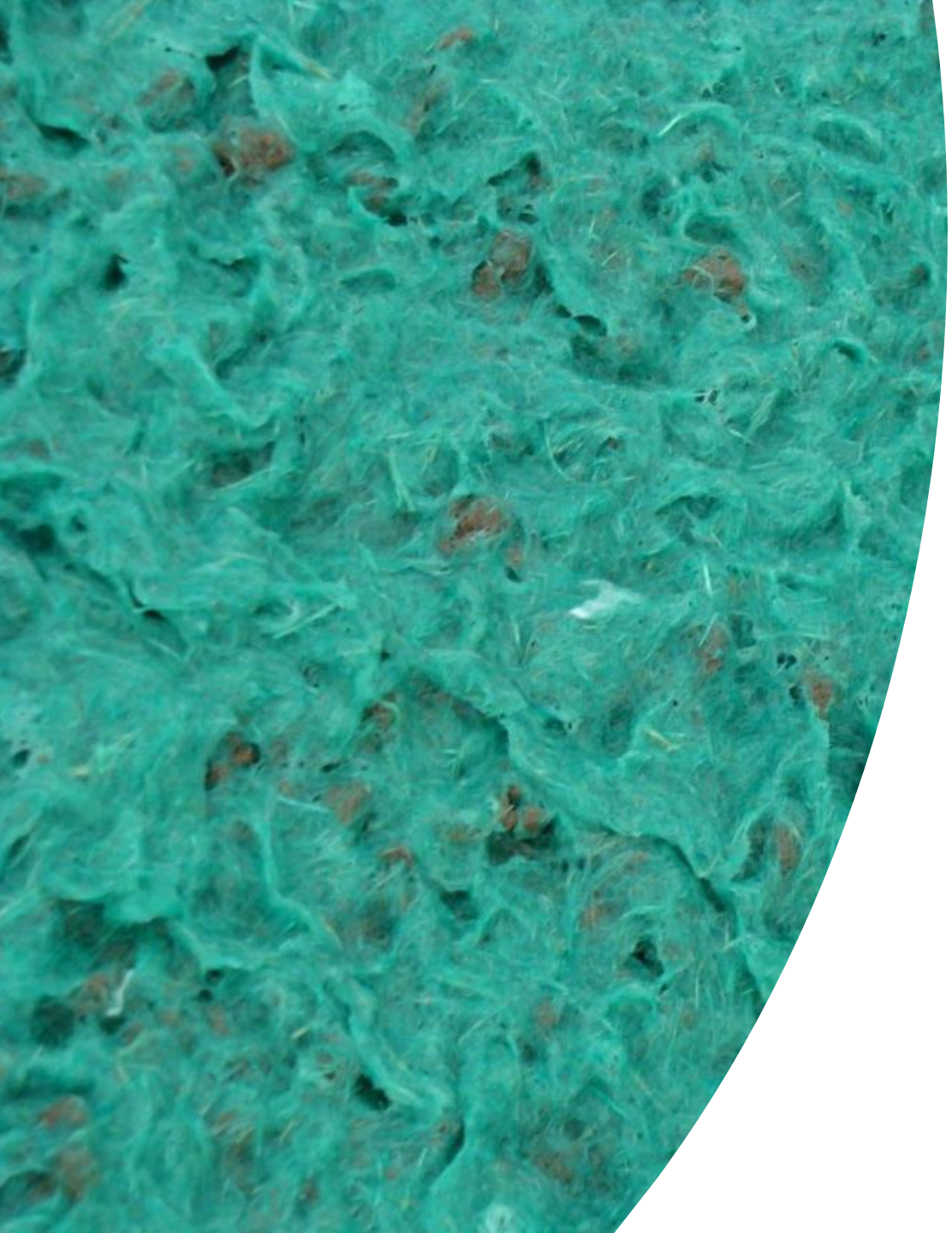
Erosion Control Mulch Products

Enhanced Environmental Benefits

- **100% Biodegradable**
  - **Including interlocking man-made fibers**
  - **Verified via ASTM D5338 testing**
- **100% Recycled Wood Fibers**
  - **Verified via ISO 14021**
- **100% non-toxic and safe for aquatic and terrestrial life**
  - **Verified via EPA 2021.0 Testing**
- **Phyto-Sanitized wood fibers (weed and pathogen free)**
  - **Thermally refined process heats wood fibers to >380^{o} F**







You should see no exposed soil at a 3,500 lb./acre rate of a erosion control mulch like FGM

Superior Technology Drives Higher Performance

HP-FGM™

- **Patented Flexterra® High Performance-Flexible Growth Medium™ (HP-FGM™):**

- **Immediately effective upon application—bonds directly to soil**
- **Superior erosion control—99% effective at multiple large-scale testing laboratories**
- **Excellent functional longevity that lasts through grow-in**
- **Ideal for dormant seeding and long-term protection and steep slopes**
- **Less soil preparation lower installed cost**
- **Faster vegetative establishment and greater biomass production**
- **Minimizes soil loss and turbidity of effluent runoff**
- **Environmentally friendly**

Mulch Rates Makes a Big Difference in Results

- Test Plot 1 After 18 Days (1,500 lbs. mulch)
- Test Plot 2 After 18 Days (2,500 lbs. mulch)
- Test Plot 3 After 18 Days (3,500 lbs. mulch)

HECP's are a very small part of the over-all project cost!

Case Study-Club Motorsports Tamworth, NH

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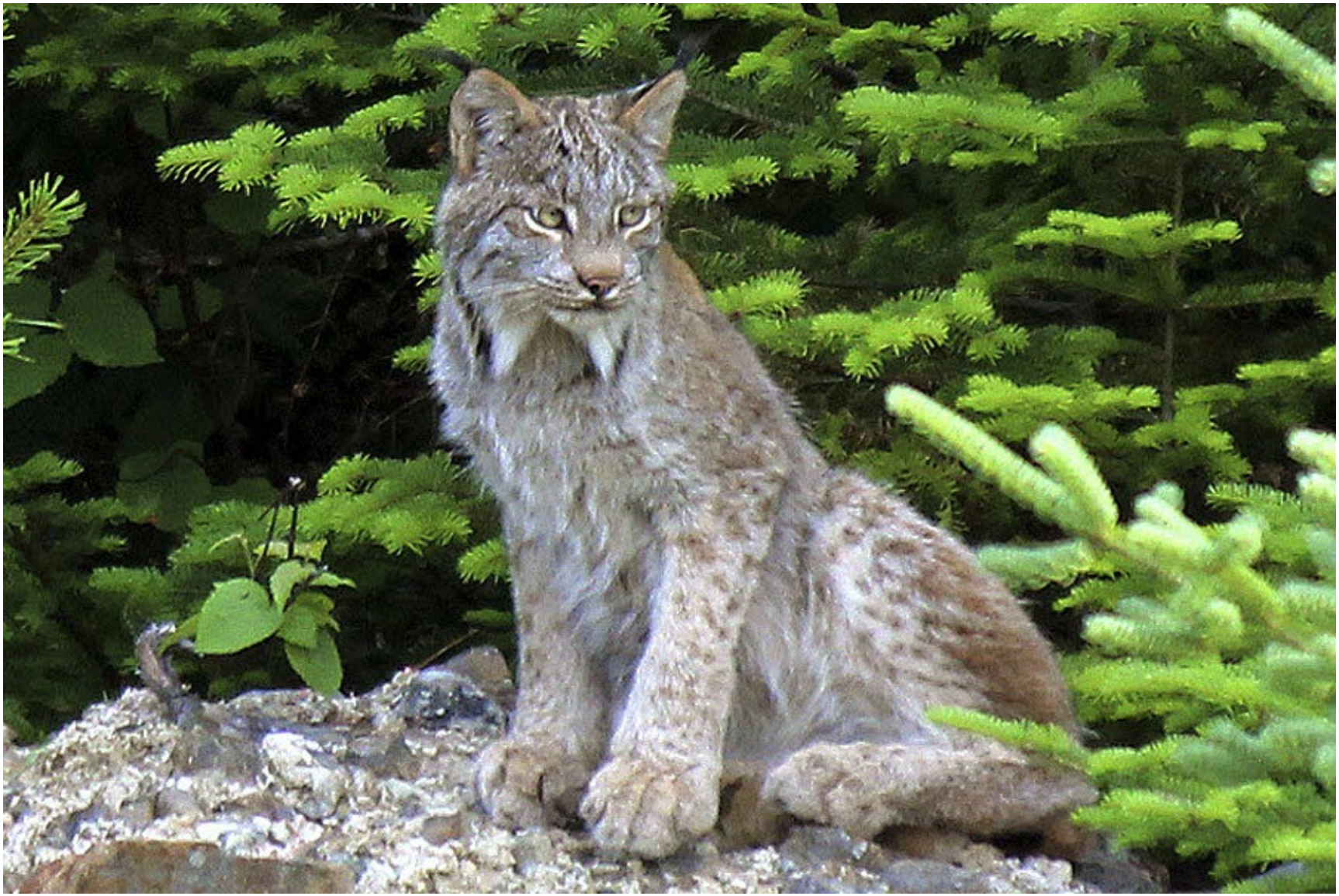


Plymouth, MA

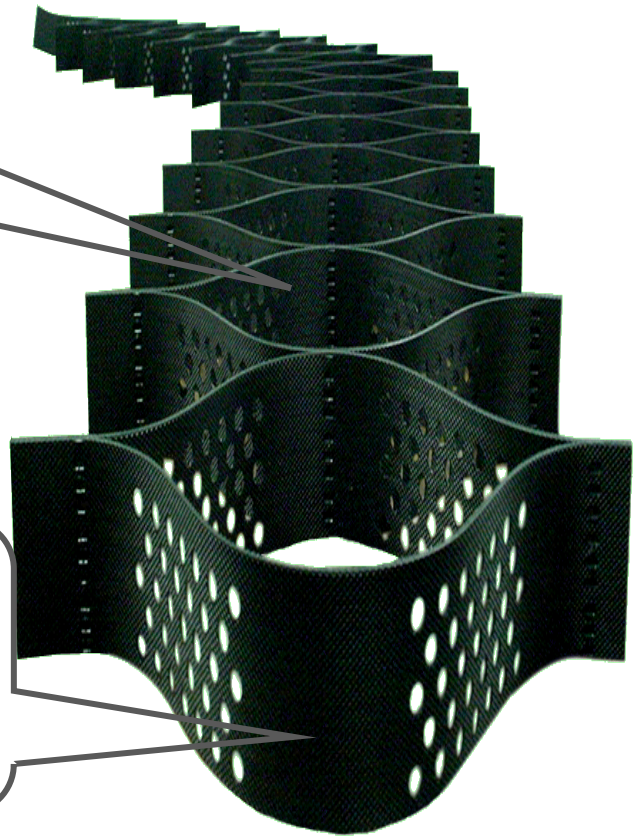
Plymouth, MA

Plymouth, MA

Evaluating a Site

The Container

3 Sizes
5 Depths
5 Section Lengths



The Content

Topsoil
Aggregate
Concrete
Engineered Fill

Alton Bay, NH

They cut the slope back at the base. It left them with a 1:1 slope that was approximately 48’ High.

Alton Bay, NH

They had one of the guys repel down the slope to put in the connectors in.

Alton Bay, NH

3 days to put the section together and install it on the slope

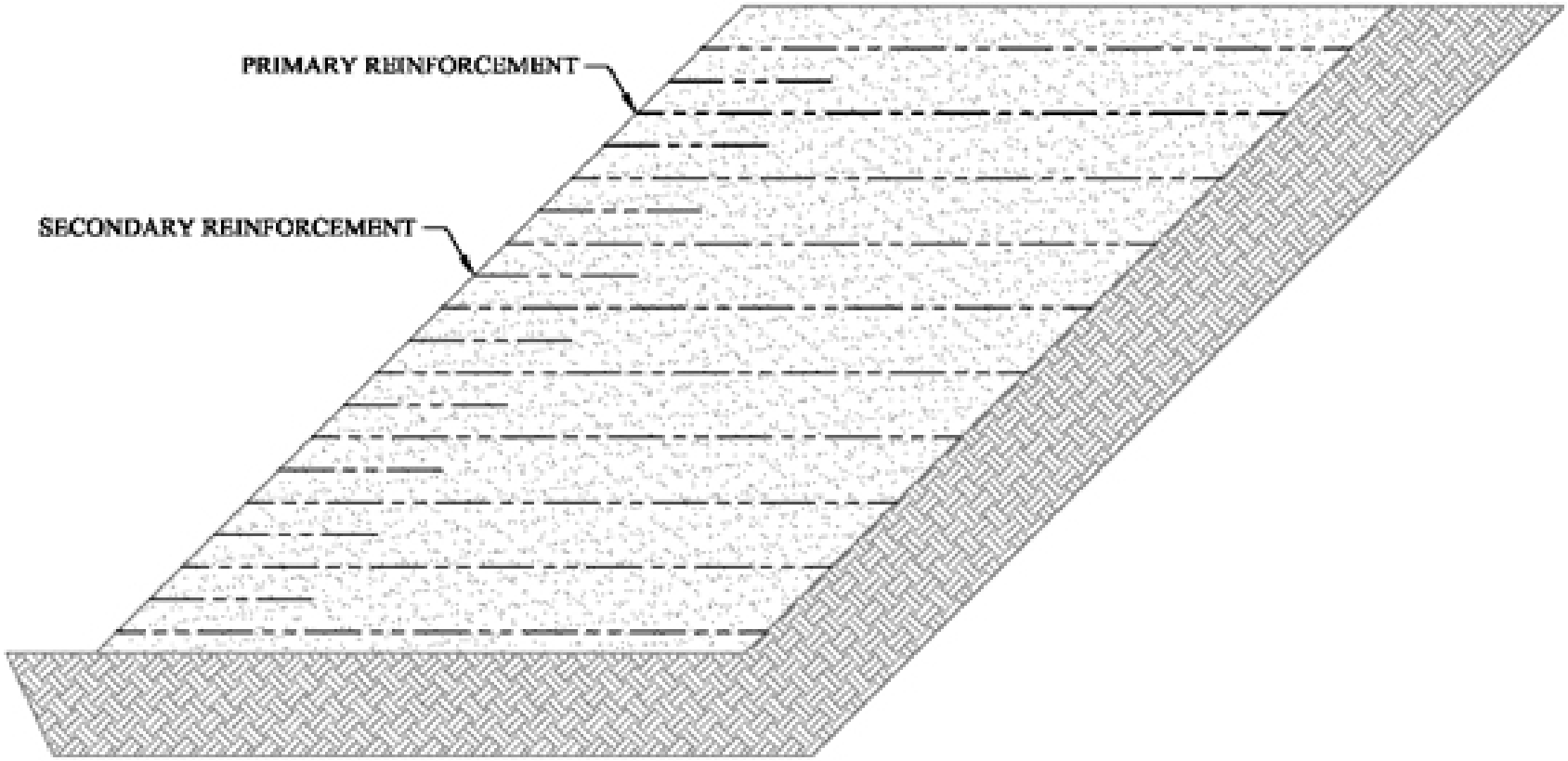
Alton Bay, NH

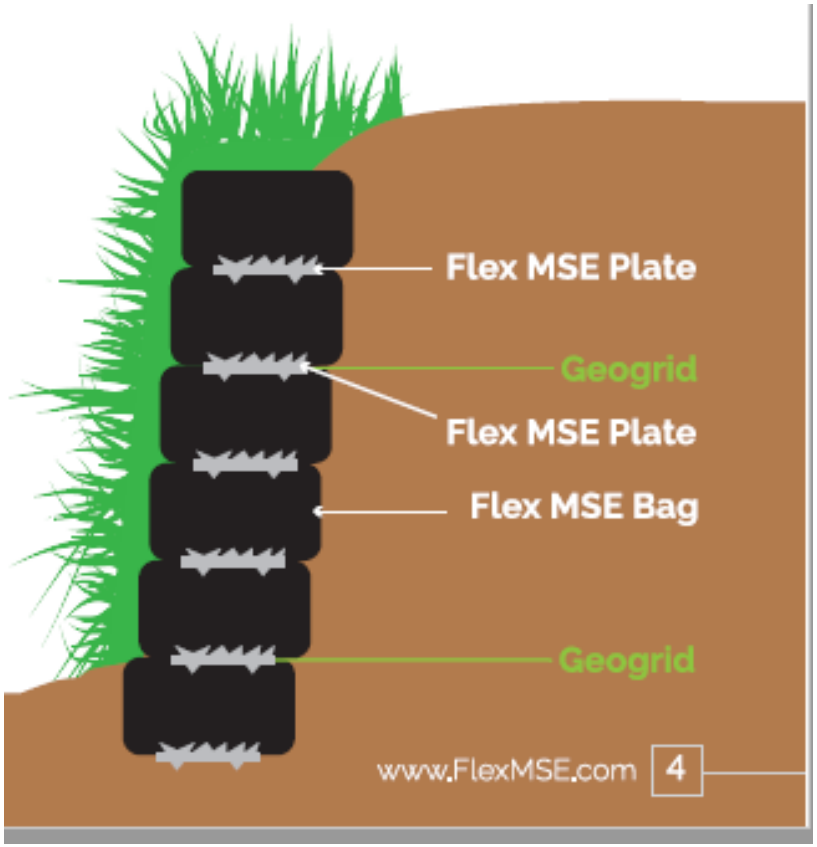
Alton Bay, NH

8-9 weeks after Hydro Seeding

Alton Bay, NH

Fall


PRIMARY REINFORCEMENT
SECONDARY REINFORCEMENT



10m (33ft) tall municipal roadway

Erosion & Sediment Control Methods for Keeping Contaminants on your Project Site

Thank You

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