Green Alternatives to Rip Rap for Streambank Protection Shoreline Stabilization

Joe Koziell CESSWI
Northeast Manager – Erosion Control
North American Green

Rip Rap Issues

- Eliminates Vegetation
- Mineral Content
- Large Stone – Big Equipment
- Availability
- Installation
- Safety/Liability
- Cost
- Maintenance
- It's Just Plain Ugly

RIPRAP FOR STREAMBANK PROTECTION

Produced by
Cumberland County SWCD
Knox-Lincoln SWCD
Maine Dept. of Environmental Protection
Maine Soil & Water Conservation Commission
Portland Water District
Time & Tide RC&D Area
US Environmental Protection Agency
USDA Soil Conservation Service

WHAT IS IT?

Riprap is a heavy stone facing (armor) on a shorebank used to protect it and the adjacent upland against wave scour. Riprap depends on the soil beneath it for support and should be built only on stable shores or bank slopes.

ENVIRONMENTAL CONSIDERATIONS

Stabilizing streambanks with shrub and tree vegetation provides excellent habitat for fish and wildlife species. Maine's fisheries rely on a combination of shading and leaf drop by the plants. Shading protects fish species from "thermal pollution" -- when the water heats up too much for fish to thrive. Leaf litter provides the first link in the food chain – a food source for the insects that young fish feed on. Avoid at all costs using riprap if vegetation can solve your erosion problem. If riprap is unavoidable, use a combination of riprap and plantings to provide the vegetative cover needed.

WHAT IS RIPRAP COMPOSED OF?

Riprap is composed of three sections: the armor or stone layer, the filter layer, and the toe protection.

Typical armor is composed of rough, angular rock. The second component, the underlying filter layer, supports the stone against settlement, allows groundwater to drain through the structure, and prevents the solid beneath from being washed through the armor layer by waves or groundwater seepage. The toe protection prevents settlement or removal of the lower edge of the riprap.

In certain cases overtopping of the top of the riprap slope bay be a factor which needs to be considered. The top of the slope can be protected by including a stone overtopping apron in the design.

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Green Alternatives

VEGETATION IS YOUR PERMANENT EROSION PREVENTION

Shear Stress Comparison

Material	Shear Stress (lbs/ft^2)
Most Grasses	~ 8
4” Riprap	~1.5
8” Riprap	~3
12” Riprap	~8

Coir Biodegradable ECB's

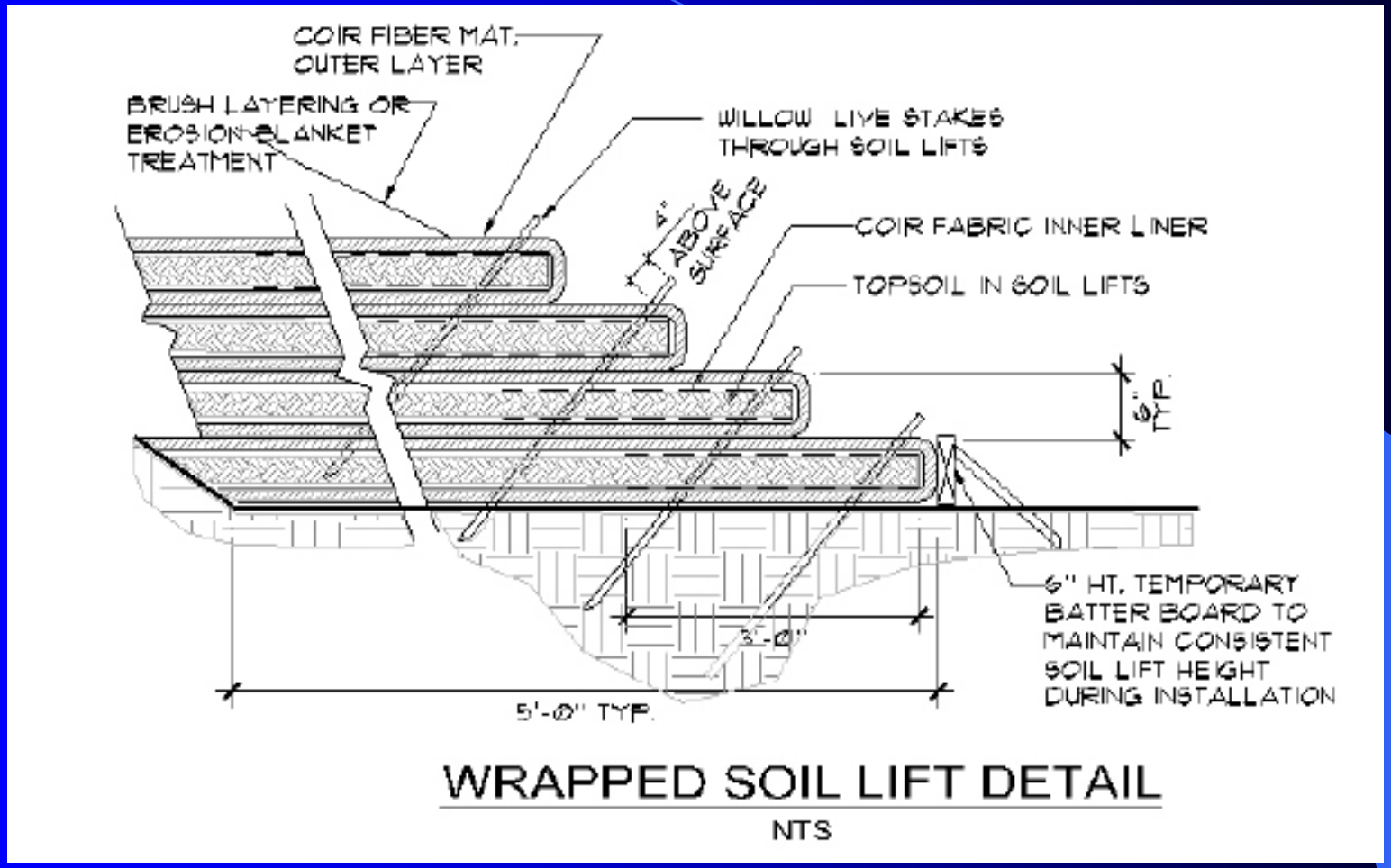

JUL 7 2006


AUG 30 2006


DANGER
KEEP OFF
EROSION AREA


RICK


VOLVO

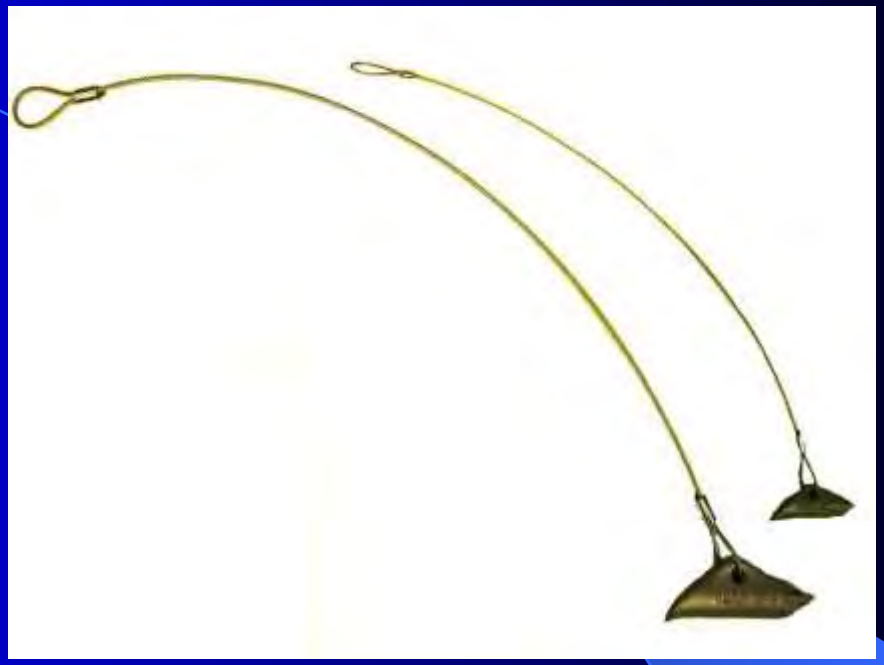


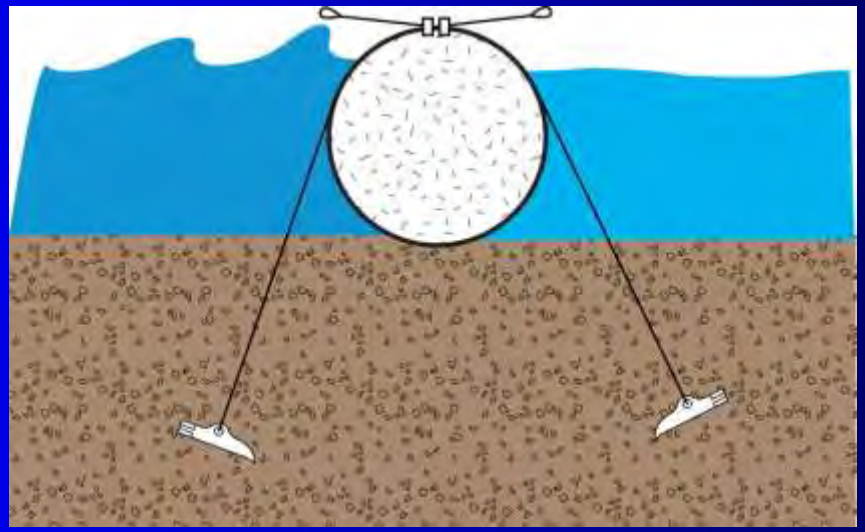
WRAPPED SOIL LIFT DETAIL

NTS

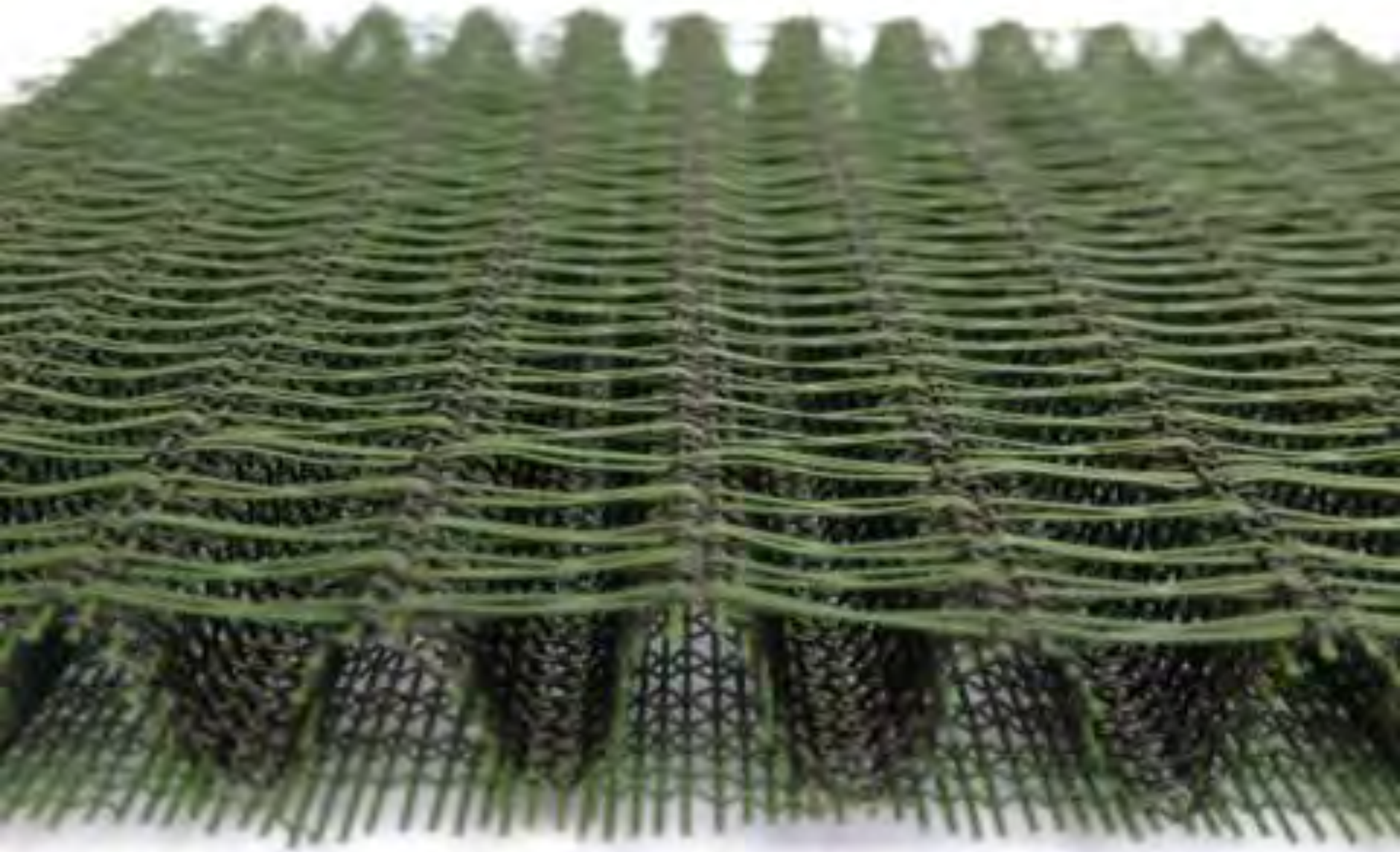
COIR LOGS

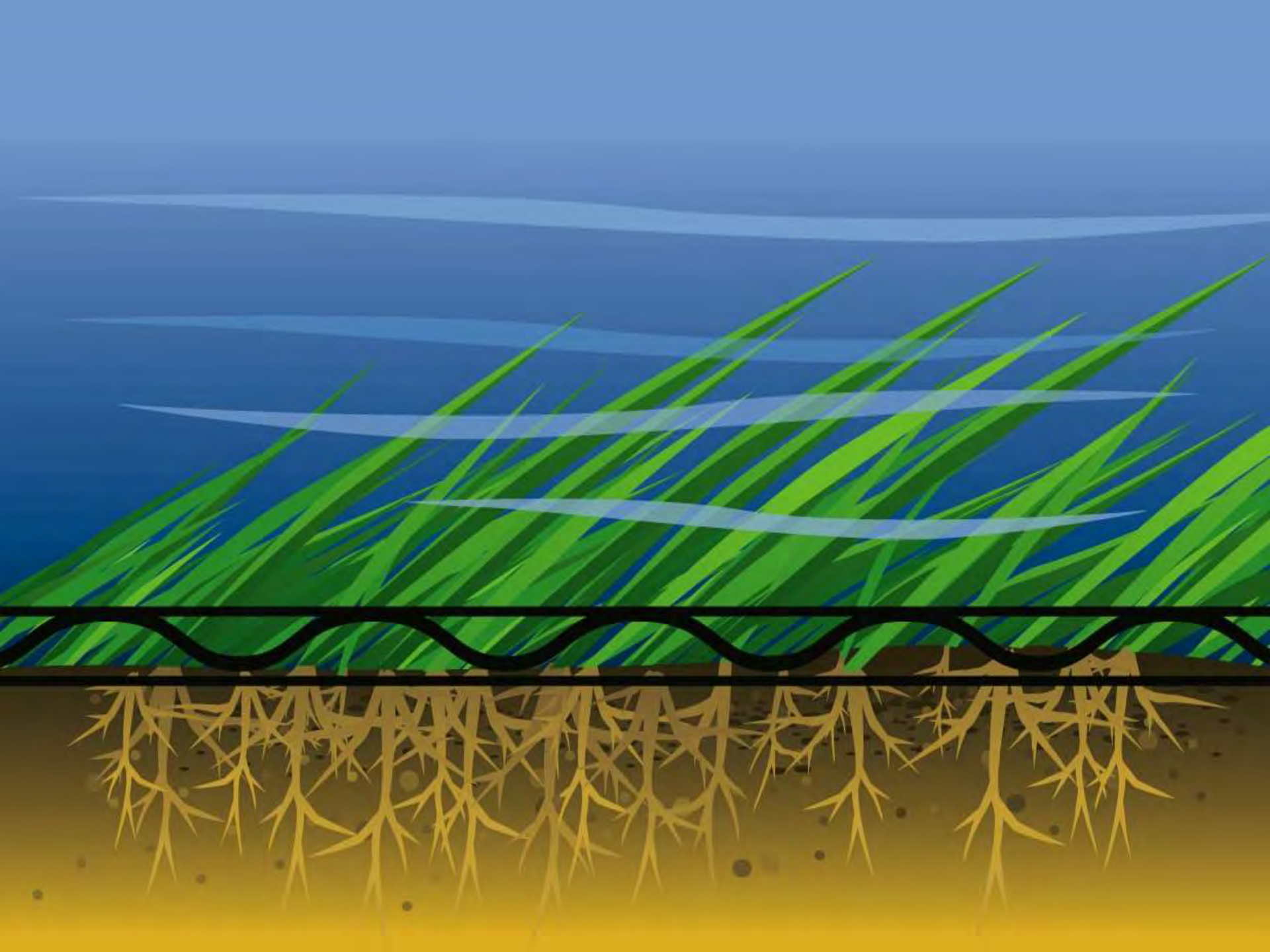
- Density
  - 5 / 7 / 9 lbs.
- Life Cycle
- Netting
  - Poly
  - Biodegradable
    - Possible metal thread in machine made netting





Turf Reinforcement Mats





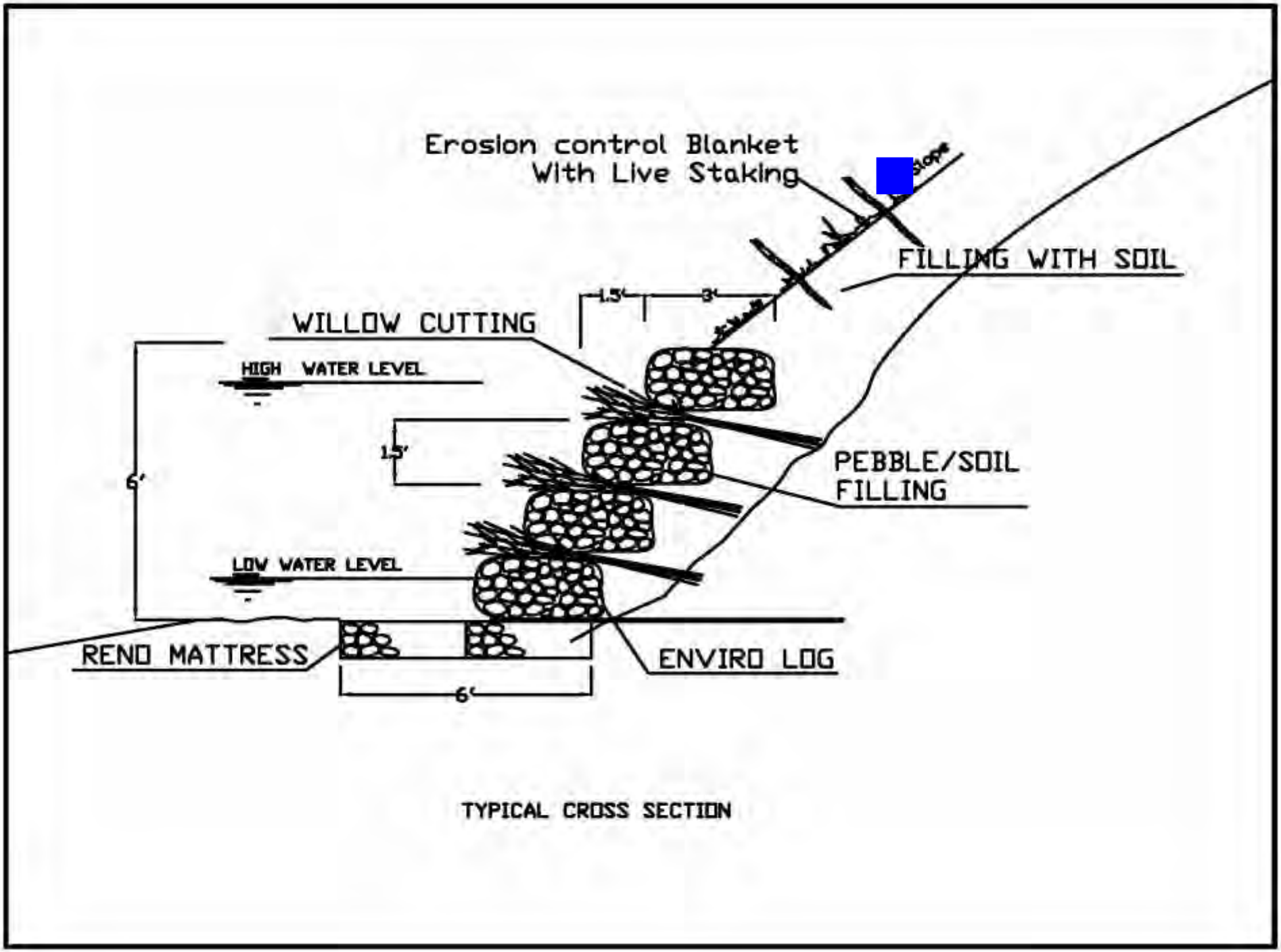
TRM's

- **Max Velocity**
  - **25 ft./sec.**
- **Max Permissable Shear Stress**
  - **16 lbs./ft.2**
  - **40" rock riprap**
- **Tensile Strength**
  - **3800 x 5000**

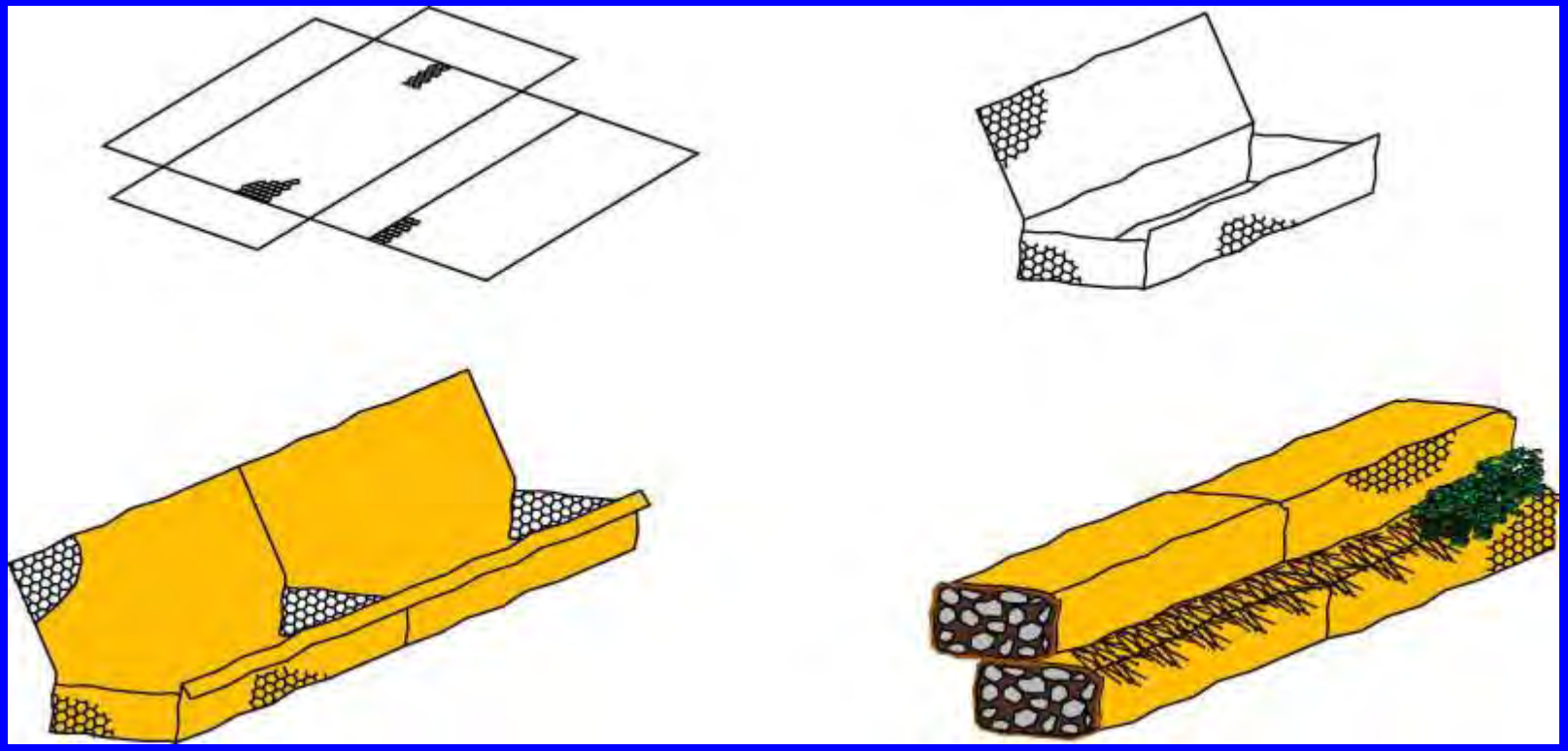
Maplecrest Left Spillway - after storm

Vanes

Envirologs / Biologs



TYPICAL CROSS SECTION




06/23/2011

Marine / Reno Mattresses

Soft Revetment Protection Mats


KOMATSU


05.10.2012


05.21.2012


05.30.2012


Bank erosion pins


QUESTIONS?

"This really is an innovative approach, but I'm afraid we can't consider it. It's never been done before."

THANK YOU