Building for the future while protecting our environment
✓ Stabilize Soils
✓ Manage flows
✓ Good Housekeeping
What-Where-When?
What is a BMP?

Schedule of activities
Physical structures
Other management practices to reduce pollution

- Prohibitions of practices
- Construction procedures
Design BMPs

• Minimize disturbance (foot print) of project.
• Maximize integration of existing land contours.
• Minimize length and gradient of slopes.
• Account for both onsite and offsite stormwater during construction.
Procedural BMPs

- Time major soil disturbance for dry season
- Complete project in phases
- Integrate erosion control and construction schedules (they don’t have to conflict)
Physical BMPs

• Implementation of erosion & sediment control practices in the field.

• Must be a supplement to and not a replacement for design & procedural BMPs.
NEWS FLASH
It’s about how you do, what you do, and when you do it!

Best BMP’s are FREE!
All Sites Require Multiple BMP’s

The trick is...
The right BMP,
in the right place, at the right time!
Phasing Stabilization
Finish as you Go!
Large bare areas for long periods of time increases the potential for erosion.

Exposure to Risk = Extent & Duration of Exposed Soils
Stabilization: Finish as you go!
Phasing Stabilization
Temporary seeding
Sequence or phase construction activities to minimize the extent and duration of exposed soils.
Seeding was a normal operation conducted as needed throughout the active construction period.
Blanket on dredge spoils pile
Vegetation coming in nicely after 45 days
Large wide rolls

✓ Speed up installation
✓ Reduce overlap
Gravel Road
Wattles
Seeding
Stockpiles Covered
Tree Protection

The Right BMP in the Right Place at the Right Time Takes Planning
Ready for the next phase
Lot prior to foundation
Added Safety Fence

Time for curb clean up!
Direct flows off slopes
Using Wattles to Direct Flows

Straw Coconut RECP
Pipe Slope Drains

- Convey stormwater away from or over bare soil
- Need Energy Dissipation
• Filter Sock
• Pipe Slope Drain
• Temporary Liner

Soldotna, AK
Avoid Water Contact with Soil
Keep Clean Water Clean
Temporary Downspouts
Temporary Rain Drains

Plastic Cover

Perimeter Silt Fence
Persistent
Consistent
Continuous
Constant
Trickle
FLOW
Before
During
After
✓ Low tech
✓ Simple
✓ Safe
✓ Easy
Turf reinforcement Mats
Functions Of TRMs

• Immediate unvegetated erosion control
• Enhance vegetation establishment
• Supplement erosion control once vegetation is established
• Reinforce the vegetation to enhance its resistance to erosive forces
Using 100% Biodegradable BMP’s
Inlet Protection
Where will this go?
Subcontractor cleaning up track-out, How much more damage will be done?
Street Sweeping
Mud Mats
Uncontrolled Construction Access are Major Sources for Stormwater Pollution
SINGLE FAMILY RESIDENCE
Individual Construction Entrance
Water From Wheel Washing is Process Water – not Stormwater
ALL MUD AND DEBRIS MUST BE REMOVED PRIOR TO LEAVING THE SITE
THANK YOU
Behold: The worlds most effective silt fence
Down-Slope Sediment Controls

- Silt Fence
- Vegetated Buffer
- Compost Berm
- Straw Wattle
Vegetated Strip

Reduce the transport of coarse sediment

Reduce the runoff velocities of overland flow
How Should We do Perimeter Control Here?
Gravel Berm Perimeter Control

Glacier HWY Juneau
INTRODUCING: The All NEW!

BERMANATOR
Describe the sequence and timing of activities that disturb soils and of BMP implementation and removal. Phase earth disturbing activities to minimize un-stabilized areas, and to achieve temporary or final stabilization quickly.

Prior to embankment fill:
1. Install Perimeter berm at OHW
2. Place 4” gravel filter layer on berm

Upon completion of the approach fill:
1. Place geotextile fabric
2. Place rip rap on slopes

See detail Plan sheet xxxxx
Filter Berm

Geotextile filter fabric

Fill area

Washed Pea Gravel

Existing Grade

Berm 4’ - 8’ Varies
Gravel Filter Berm & Embankment Stabilization
What should the inspection report say?

Have you signed reports stating that you are in compliance with the SWPPP & Permit?
Does the installation match the details?
What - Where - When?

- Wattles
- Seeding
- Plastic
- Silt Fence
- RECP’s
- Preserve Vegetation
- Channel Lining
• Finish as you go
• Turn Liabilities into Assets
• Manage Risk
Detail the planned process
Phase the Process
If Your not Nervous: Your Nuts!
Any Less Nervous?
Current Practices

- Strip topsoil & stockpile
- Compact the ground
- Haul & Spread topsoil
- Apply seed, fertilizer & erosion control,
- Sometimes irrigate…
Use existing equipment,
Simpler mobilization,
$$$ Saved $$$
✓ Standard Equipment
✓ Lower Operating Costs
✓ Contractor Profitability
Complicated Site Access
The Biotic Approach Asks…

Is importing topsoil really needed for establishing vegetation?
The Goal:

Not just Germination
Sustainable Revegetation
Why Focus on Vegetation

Mulch is Temporary
Vegetation is Permanent

The Goal:
Establish PERMANENT Erosion Control
Living in the soil are plant roots, bacteria, fungi, protozoa, algae, mites, nematodes, worms, ants, maggots, insects and grubs, and larger animals.

**Science of soil**
- Soil is made of about 45% minerals
- 25% water
- 5% organic matter
- 25% air

**What's underneath**

Healthy soil has amazing water-retention capacity. Every 1% increase in organic matter results in as much as 25,000 gal of available soil water per acre.

One teaspoon of healthy soil contains 100 million–1 billion individual bacteria.

All of the soil microbes in 1 ac/ft of soil weigh more than 2 cows.

Earthworm populations consume 2 tons of dry matter per acre per year, partly digesting and mixing it with soil.
What Happens to Soil During Construction?

• Organic matter, the soil’s food bank, is lost.
• Porosity, crucial for air and water exchange, is reduced.
• Microbes essential for nutrient cycling are absent.
If we’re adding topsoil to add organic matter, but organic matter is less than 5% of topsoil?

O) Organic matter: Litter layer of plant residues in relatively undecomposed form.
A) Surface soil: Layer of mineral soil
B) Subsoil: This layer accumulates iron, clay, aluminum
Topsoil & Compost

10 trucks per acre loaded with 26 cubic yards of soil in each.

Biotic Approach

Add Only What’s Needed!

Conventional approach to restoration.
Treated vs Untreated
Location

Location

Location

Location
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