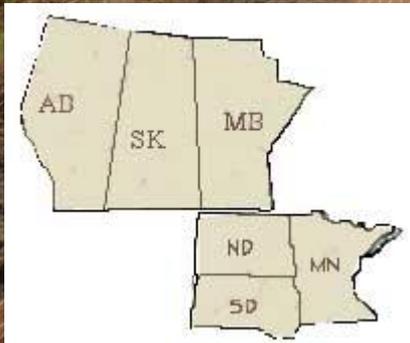


# Specifications for Erosion & Sediment Control



Winter Erosion & Sediment Control  
Northern Plains Chapter IECA





Can you specify  
critical thinking?

# Behold: The worlds most effective silt fence

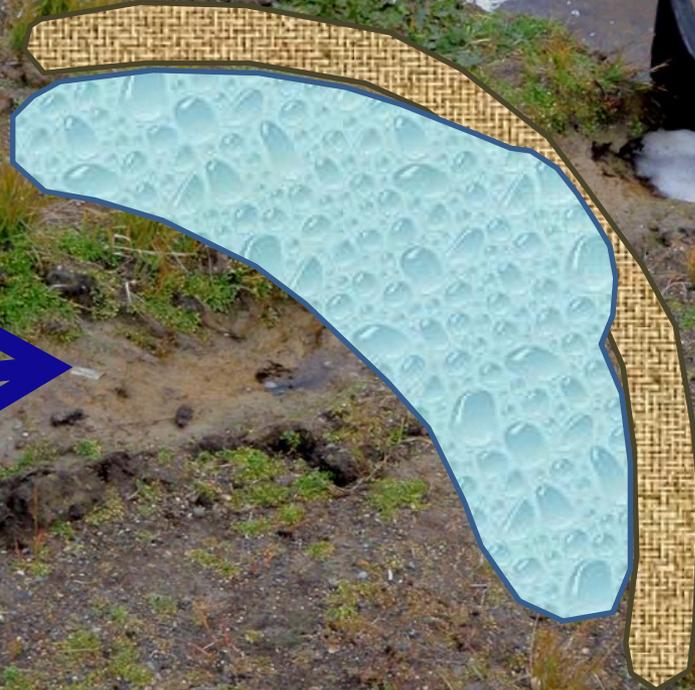


# Pity the BMP's on the edge of the earth

Receiving Water

BMP?

Site Discharge



# Really? A specification for doing nothing?

E-XX.XX

SHEET  
| of |

**VEGETATION BUFFER GENERAL NOTES:**

**MATERIAL**

**SITE DELINEATION MATERIAL:** SEE SPECIFICATION SECTION 6XX SITE DELINEATION.

**INSTALLATION**

1. INSPECT NATURAL EXISTING VEGETATION BUFFER AREAS TO ENSURE THAT THE FENCING, FLAGGING, FLASHING, OR STAKING USED TO DELINEATE NON-DISTURBANCE AREAS ARE IN PLACE.
2. CHECK FOR DAMAGE BY EQUIPMENT AND VEHICLES.
3. INSPECT NEW VEGETATION BUFFER AREAS FOR THE PROGRESS OF GERMINATION AND PLANT GROWTH.
4. ENSURE STORMWATER FLOWING THROUGH THE AREA IS NOT FORMING PONDS, RILLS, OR GULLIES.
5. INSPECT FOR SEDIMENT DEPOSITION THROUGHOUT THE BUFFER.

**MAINTENANCE**

1. REPLACE OR REPAIR SITE DELINEATION (SUCH AS FENCING, STAKING, OR FLAGGING) AS NECESSARY TO DELINEATE THE VEGETATION BUFFER AREAS.
2. REPAIR ANY DAMAGE BY EQUIPMENT OR VEHICLES.
3. PROVIDE ADDITIONAL SEED, FERTILIZER, AND WATER TO REPAIR SEEDED AREAS DAMAGED BY EROSION OR PONDING OF WATER.
4. IF SEDIMENT IS DEPOSITING IN THE BUFFER, INSTALL IMPROVED EROSION CONTROL MEASURES UPSLOPE OF THE BUFFER.

**REMOVAL**

1. PROVIDE THE NECESSARY PERMANENT STABILIZATION TO AREAS WITH TEMPORARY VEGETATION BUFFER AS REQUIRED BY PLANS.
2. SITE DELINEATION MATERIAL SHALL BE REMOVED AFTER FINAL STABILIZATION OF WORK AREAS. WORK TO REMOVE THE SITE DELINEATION MATERIAL SHALL NOT DAMAGE THE EXISTING VEGETATION OR ANY STABILIZATION MEASURE.

VEGETATION BUFFER TABLE	
AVERAGE SLOPE	BUFFER WIDTH (MIN.)
0%-2%	25 FEET
3%-5%	29-37 FEET
5%-10%	37-57 FEET
10%-20%	57-100 FEET
20% MAXIMUM	100 FEET

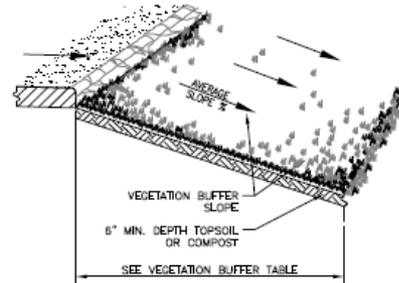
**VEGETATION BUFFER TABLE NOTES:**

1. THE MINIMUM WIDTH FOR ANY VEGETATION BUFFER IS 25 FEET. FOR EVERY 1% INCREASE OF THE SLOPE ADD 4 FEET TO THE VEGETATION BUFFER WIDTH.
2. FOR VEGETATION BUFFERS THAT ARE USED AS PERIMETER CONTROL (TYPE 1):
  - a. WHEN THE BUFFER WIDTHS LISTED IN THE TABLE ABOVE ARE NOT FEASIBLE THE MINIMUM WIDTH FOR ANY VEGETATION BUFFER IS 25 FEET.
  - b. ADDITIONAL BMPs SHOULD BE USED WHEN THE MINIMUM BUFFER WIDTH CANNOT BE ACHIEVED.
3. THE WIDTH OF VEGETATION BUFFERS THAT ARE NATURAL BUFFER AREAS AS REQUIRED BY THE COP (TYPE 1) MUST ALSO COMPLY WITH THE WIDTH REQUIRED BY LOCAL ORDINANCES, IF GREATER THAN 25 FEET.

REVISIONS		
Date	Description	By

State of Alaska DOT&PF  
**VEGETATION  
BUFFER**

A  
P  
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R  
O  
V  
E  
D



PERSPECTIVE

**NEW VEGETATION BUFFER**

NOT TO SCALE

**NEW VEGETATION BUFFER AREA NOTES:**

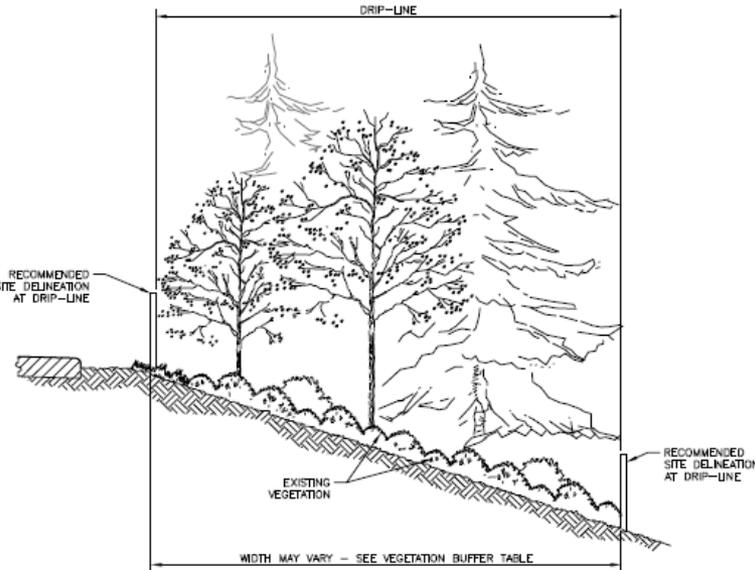
**MATERIAL**

**TOPSOIL OR COMPOST**

**SEED, FERTILIZER, MULCH**

**INSTALLATION**

1. ENSURE ALL SEDIMENT CONTROL MEASURES IDENTIFIED IN THE SWPPP (SUCH AS SILT FENCE AND DIMENSIONS) ARE IN PLACE TO PROTECT WATERS OF THE U.S. UNTIL THE VEGETATION BUFFER AREA IS ESTABLISHED.
2. ESTABLISH VEGETATION USING SPECIFIED SEED, FERTILIZER, AND MULCH. IF SEED MIX IS NOT SPECIFIED, USE PERMANENT SEED MIX. SEE SPECIFICATION 6XX PERMANENT SEEDING.)
3. MAINTAIN VEGETATION AND PROVIDE IRRIGATION AS NECESSARY TO ENSURE VIGOROUS GROWTH AND TO PREVENT DIEBACK.
4. DELINEATE VEGETATION BUFFER AREAS WITH TEMPORARY FENCING AT THE EDGE OF THE NEW VEGETATION BUFFER.
5. DO NOT ALLOW CONSTRUCTION MATERIALS, EQUIPMENT, OR PARKING ON THE VEGETATION BUFFER OR WHERE THE ROOT-ZONE MAY BE DAMAGED.



SECTION

**EXISTING VEGETATION BUFFER**

NOT TO SCALE

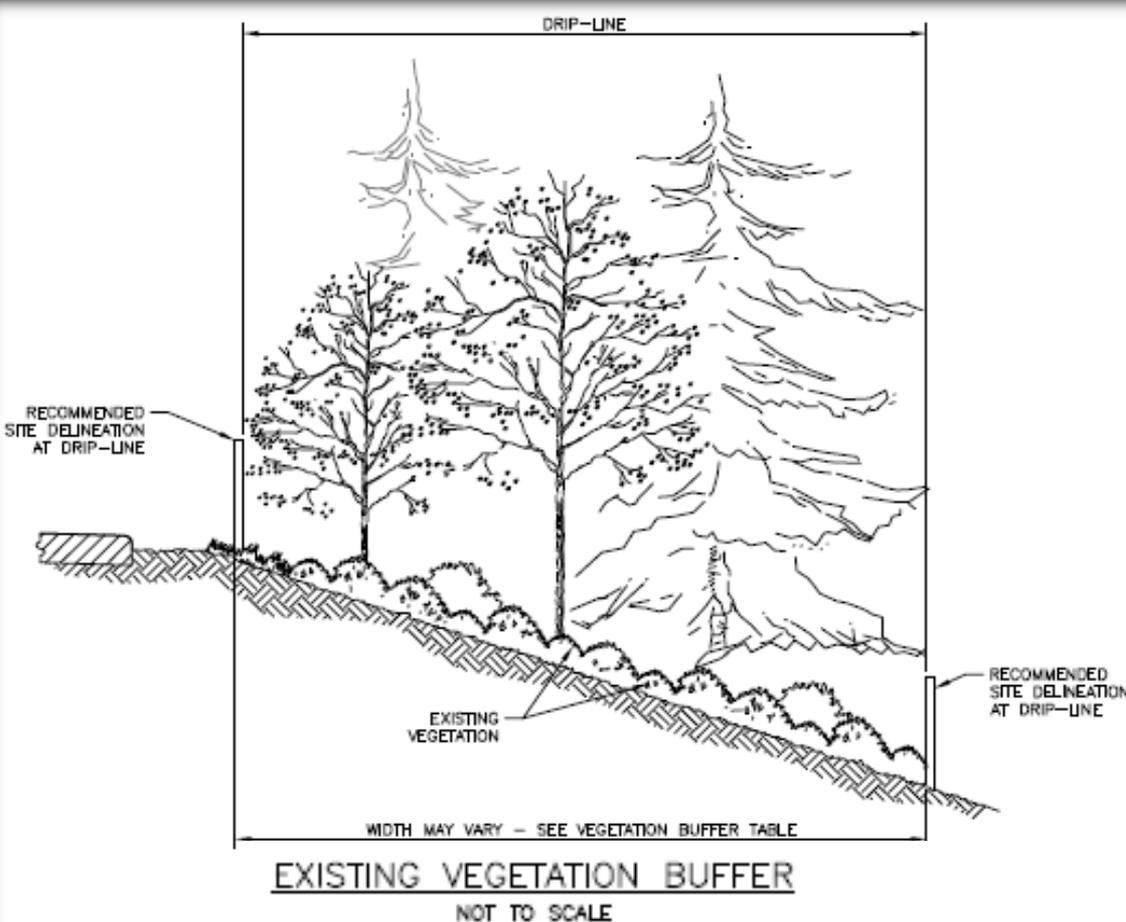
**EXISTING VEGETATION BUFFER AREA NOTES:**

**INSTALLATION**

1. PRIOR TO THE COMMENCEMENT OF CLEARING AND GRUBBING OPERATIONS OR OTHER SOIL-DISTURBING ACTIVITIES DELINEATE UNDISTURBED NATURAL AREAS OF VEGETATION THAT HAVE BEEN IDENTIFIED ON THE PLANS WITH FLAGGING OR STAKING.
2. ENSURE ALL OTHER SEDIMENT CONTROL MEASURES TO BE USED IN CONJUNCTION WITH THE VEGETATION BUFFER AREAS ARE IN PLACE AND FUNCTIONING PROPERLY.
3. CONSTRUCTION MATERIALS, EQUIPMENT, OR PARKING SHALL NOT BE ALLOWED ON THE VEGETATION BUFFER AREAS OR WHERE THE ROOT-ZONE OF THE VEGETATION MAY BE DAMAGED.

Whatever you specify:

Make sure your  
clear, direct,  
concise,  
complete,  
explicit, detailed...



**EXISTING VEGETATION BUFFER AREA NOTES:  
INSTALLATION**

1. PRIOR TO THE COMMENCEMENT OF CLEARING AND GRUBBING OPERATIONS OR OTHER SOIL-DISTURBING ACTIVITIES DELINEATE UNDISTURBED NATURAL AREAS OF VEGETATION THAT HAVE BEEN IDENTIFIED ON THE PLANS WITH FLAGGING OR STAKING.
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\*Pictures Help

**VEGETATION BUFFER GENERAL NOTES:**

**MATERIAL**

SITE DELINEATION MATERIAL: SEE SPECIFICATION SECTION 6XX SITE DELINEATION.

**INSTALLATION**

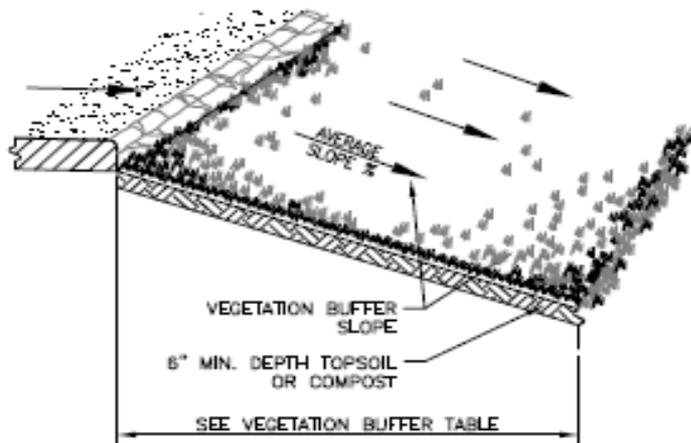
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3. INSPECT NEW VEGETATION BUFFER AREAS FOR THE PROGRESS OF GERMINATION AND PLANT GROWTH.
4. ENSURE STORMWATER FLOWING THROUGH THE AREA IS NOT FORMING PONDS, RILLS, OR GULLIES.
5. INSPECT FOR SEDIMENT DEPOSITION THROUGHOUT THE BUFFER.

**MAINTENANCE**

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PERSPECTIVE

NEW VEGETATION BUFFER

NOT TO SCALE

**NEW VEGETATION BUFFER AREA NOTES:**

**MATERIAL**

TOPSOIL OR COMPOST

SEED, FERTILIZER, MULCH

**INSTALLATION**

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2. ESTABLISH VEGETATION USING SPECIFIED SEED, FERTILIZER, AND MULCH. IF SEED MIX IS NOT SPECIFIED, USE PERMANENT SEED MIX. SEE SPECIFICATION 6XX PERMANENT SEEDING.)
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4. DELINEATE VEGETATION BUFFER AREAS WITH TEMPORARY FENCING AT THE EDGE OF THE NEW VEGETATION BUFFER.
5. DO NOT ALLOW CONSTRUCTION MATERIALS, EQUIPMENT, OR PARKING ON THE VEGETATION BUFFER OR WHERE THE ROOT-ZONE MAY BE DAMAGED.

**VEGETATION BUFFER TABLE**

AVERAGE SLOPE	BUFFER WIDTH (MIN.)
0%-2%	25 FEET
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  - b. ADDITIONAL BMPs SHOULD BE USED WHEN THE MINIMUM BUFFER WIDTH CANNOT BE ACHIEVED.
3. THE WIDTH OF VEGETATION BUFFERS THAT ARE NATURAL BUFFER AREAS AS REQUIRED BY THE CGP (TYPE 1) MUST ALSO COMPLY WITH THE WIDTH REQUIRED BY LOCAL ORDINANCES, IF GREATER THAN 25 FEET.

REVISIONS	
Date	Description

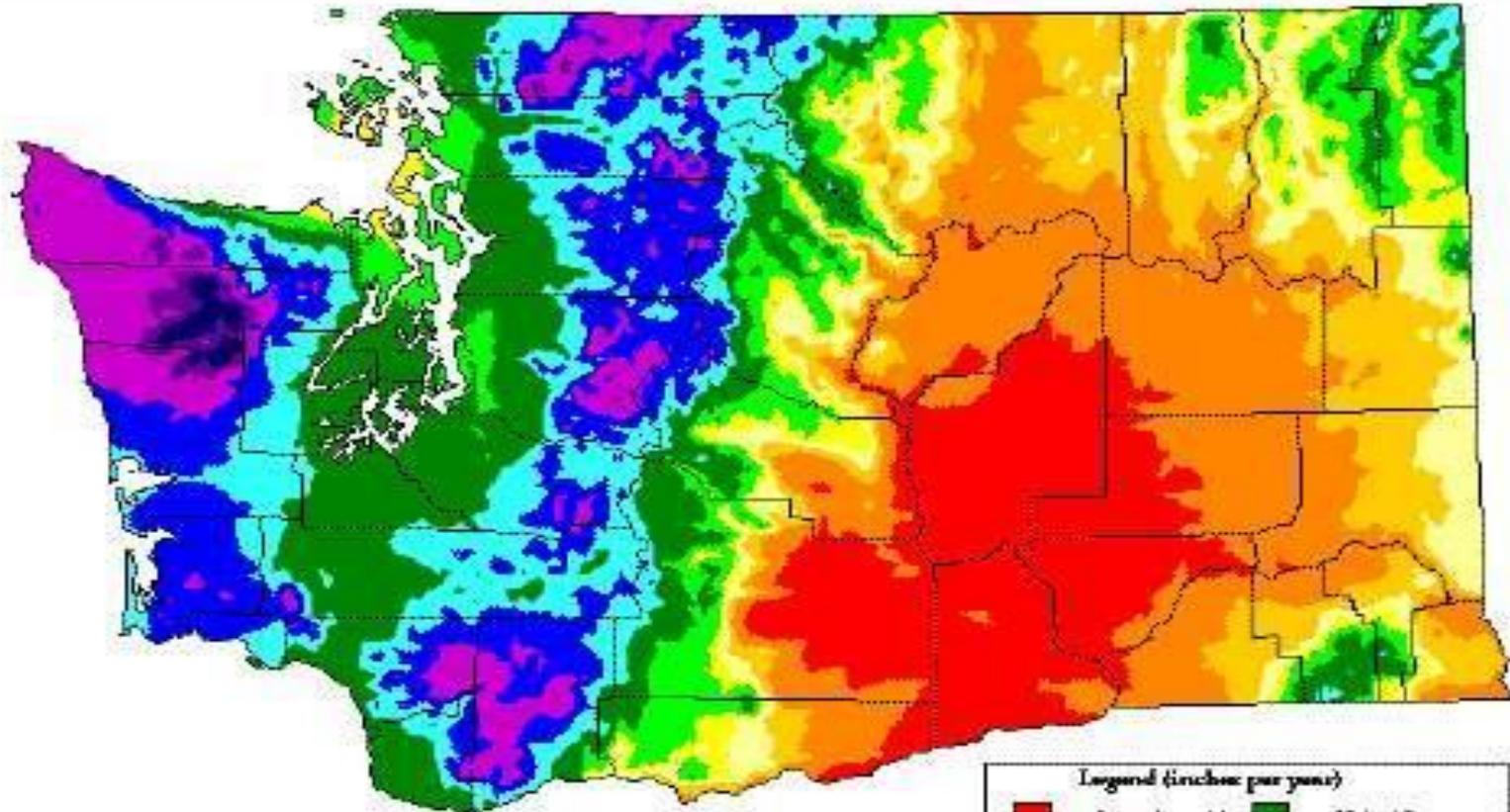
# Permit requirements:



## Exposed Soil Limitations;

Depending on the geographic location of the project, the Permittee must not allow soils to remain exposed and unworked for more than the time periods set forth below to prevent erosion:

- West of the Cascade Mountains Crest
  - During the dry season (May 1 - Sept. 30): 7 days
  - During the wet season (October 1 - April 30): 2 days
- East of the Cascade Mountains Crest, except for Central Basin\*
  - During the dry season (July 1 - September 30): 10 days
  - During the wet season (October 1 - June 30): 5 days
- The Central Basin\*, East of the Cascade Mountains Crest
  - During the dry Season (July 1 - September 30): 30 days
  - During the wet season (October 1 - June 30): 15 days



## Average Annual Precipitation

Washington

Period: 1961-1990 Units: inches

Legend (inches per year)



# Permit requirements:



- The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
- The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.
- The Permittee must minimize the amount of soil exposed during construction activity.
- The Permittee must minimize the disturbance of steep slopes.
- The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.



# Standard Specs

Clearing, grubbing, excavation, borrow, or fill within the Right of Way shall never expose more erodible earth than as listed below, without written approval by the Engineer:

Western Washington (West of the Cascade Mountain Crest)		Eastern Washington (East of the Cascade Mountain Crest)	
May 1 through September 30	17 Acres	April 1 through October 31	17 Acres
October 1 through April 30	5 Acres	November 1 through March 31	5 Acres

The Engineer may increase or decrease the limits based on project conditions.

Erodible earth is defined as any surface where soils, grindings, or other materials may be capable of being displaced and transported by rain, wind, or surface water runoff.

# Specs that mirror permit conditions



Erodible earth not being worked, whether at final grade or not, shall be covered within the specified time period (see the table below), using an approved soil covering practice.

<b>Western Washington (West of the Cascade Mountain Crest)</b>		<b>Eastern Washington (East of the Cascade Mountain Crest)</b>	
October 1 through April 30	2 days maximum	October 1 through June 30	5 days maximum
May 1 to September 30	7 days maximum	July 1 through September 30	10 days maximum

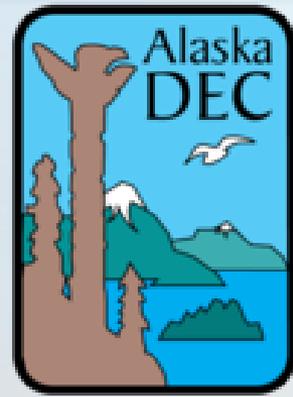
# Specs that mirror permit conditions



**6XX-3.02 SEED TIMING AND SEASONS.** Seed disturbed areas after permanent cessation of ground disturbing activities in that area, within the time period specified in the Alaska Department of Environmental Conservation (ADEC) Alaska Pollutant Discharge Elimination System (APDES) Construction General Permit (CGP) for Alaska, Section 4.4 Final Stabilization, and Section 641 Erosion, Sediment, and Pollution Control.

Do not seed during windy conditions or when climatic conditions or when ground conditions would hinder placement or growth.

# 4.1.2 Minimize the Amount of Soil Exposed during Construction Activity



Preserve Vegetation

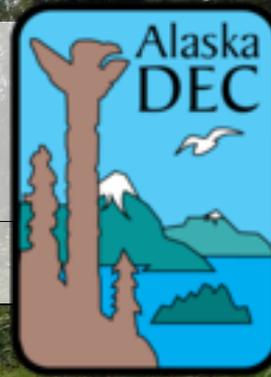
Mulch

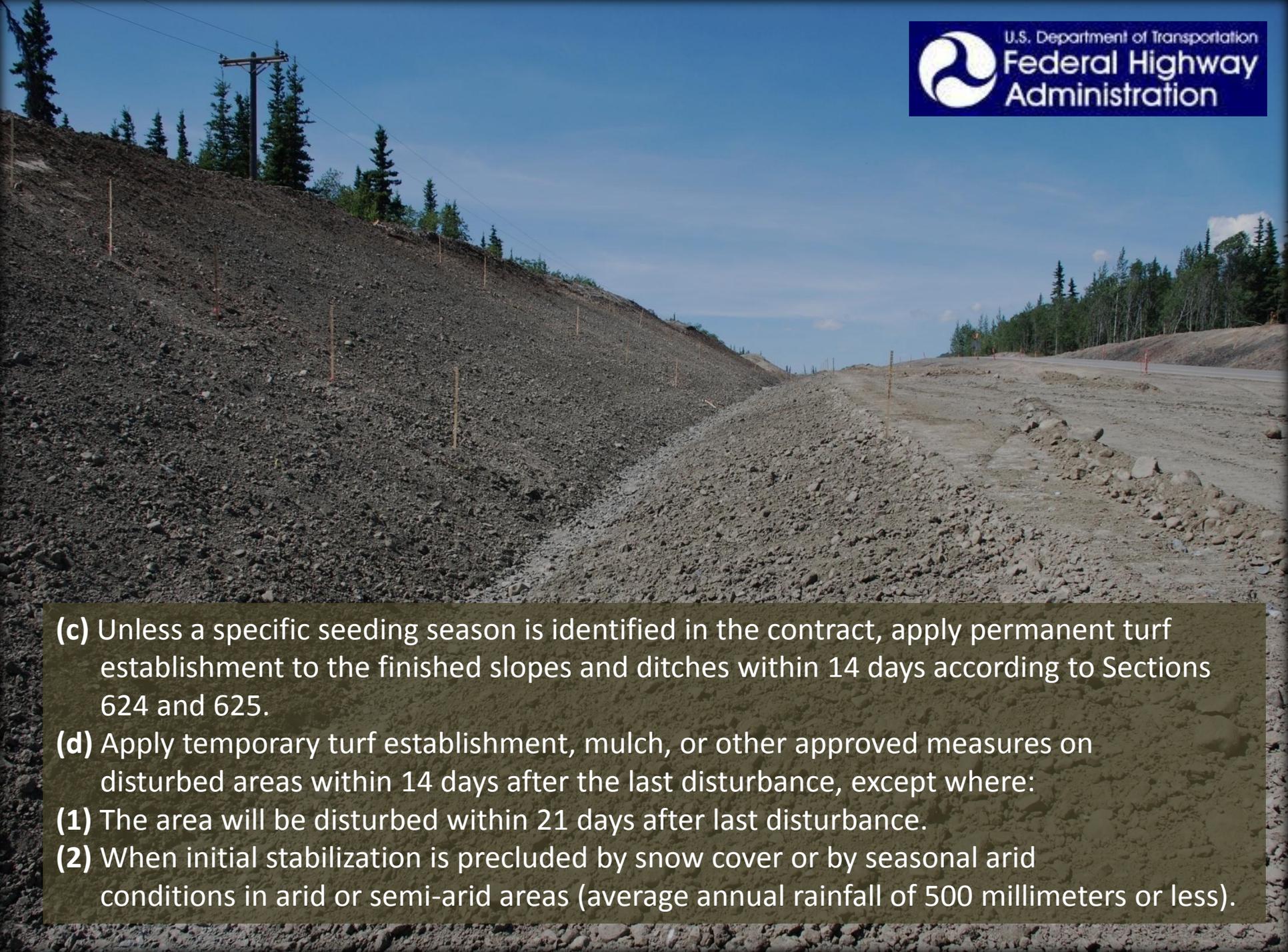
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Fort Yukon

## 4.1.2.2 Sequence or phase construction activities to minimize the extent and duration of exposed soils.

2011 AGCP 4.1.2.2



- 
- (c)** Unless a specific seeding season is identified in the contract, apply permanent turf establishment to the finished slopes and ditches within 14 days according to Sections 624 and 625.
- (d)** Apply temporary turf establishment, mulch, or other approved measures on disturbed areas within 14 days after the last disturbance, except where:
- (1)** The area will be disturbed within 21 days after last disturbance.
  - (2)** When initial stabilization is precluded by snow cover or by seasonal arid conditions in arid or semi-arid areas (average annual rainfall of 500 millimeters or less).



- (e) Construct outlet protection as soon as culverts or other structures are complete.
- (f) Construct permanent erosion controls including waterway linings and slope treatments as soon as practical or upon completion of the roadbed.
- (g) Construct and maintain erosion controls on and around soil stockpiles to prevent soil loss.
- (h) Following each day's grading operations, shape earthwork to minimize and control erosion from storm runoff.

# Standard Specs

Include in the “Stabilize Soils” section of the SWPPP, a description of how you will minimize the amount of disturbed and unstabilized ground in the fall season.

Describe how you will stabilize areas when it is close to or past the seasonal time of snow cover or frozen conditions, and before the first seasonal thaw.

Include a plan for final stabilization.



# Standard Specs

Describe the sequence and timing of activities that disturb soils and of BMP implementation and removal. Phase earth disturbing activities to minimize unstabilized areas, and to achieve temporary or final stabilization quickly. Whenever practicable incorporate final stabilization work into excavation, embankment and grading activities.





## 212.03 Construction Requirements.

- A. General.** Submit for approval by the Engineer a plan and schedule for installing temporary and permanent erosion and sediment control measures at the preconstruction conference or before the start of the applicable construction.

Incorporate ground disturbing activities including haul roads, material sources, staging areas, and excess material sites. Do not start work until the erosion and sediment control schedule and methods of operations for the applicable construction have been approved by the Engineer

Cease earthwork operations when erosion or sediment control features are determined by the Engineer to be inadequate. Resume only after demonstrating effectiveness of erosion and sediment control features. Provide temporary erosion control measures immediately when seasonal limits prohibit permanent measures.

# Standard Specs

## 5. Stabilization.

Stabilization may be accomplished using temporary or permanent measures. Initiate stabilization of disturbed soils, erodible stockpiles, disposal sites, and of erodible aggregate layers so that all of the following conditions are satisfied:

- As soon as practicable
- As soon as necessary to avoid erosion, sedimentation, or the discharge of pollutants
- As identified in the SWPPP
- No later than 14 days after the temporary or permanent cessation of land-disturbing activities on a portion of the site, according to the CGP



# Standard Specs

Land may be disturbed and stabilized multiple times during a project. Coordinate work to minimize the amount of disturbed soil at any one time. Do not disturb more soil than you can stabilize with the resources available.

Temporarily stabilize from wind and water erosion portions of disturbed soils, portions of stockpiles, and portions of disposal sites, that are not in active construction. Temporary stabilization measures may require a combination of measures including but not limited to vegetative cover, mulch, stabilizing emulsions, blankets, mats, soil binders, non-erodible cover, dust palliatives, or other approved methods.



When temporary or permanent seeding is required, provide a working hydro seeding equipment located within 100 miles of the project by road; with 1,000 gallon or more tank capacity, paddle agitation of tank, and the capability to reach the seed areas with an uniform mixture of water, seed, mulch and tackifier. If the project is located in an isolated community the hydro-seeder must be located at the project.

Before applying temporary or permanent seeding, prepare the surface to be seeded to reduce erosion potential and to facilitate germination and growth of vegetative cover. Apply seed and maintain seeded areas. Reseed areas where growth of temporary vegetative cover is inadequate to stabilize disturbed ground.

Apply permanent seed according to Sections 618 and 724, within the time periods allowed, at locations where seeding is indicated on the plans and after land-disturbing activity is permanently ceased.





FRONTIER  
FRONTIER

G.A.P.

820

Ford

GOODYEAR

# Performance Based Specifications



618-3.04 PLANT ESTABLISHMENT AND MAINTENANCE. Protect seeded areas against traffic and erosion.

Promptly repair surfaces that are gullied or otherwise damaged following seeding by regrading, reseeding, and remulching as needed.

Water and maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work. Use equipment that can water all seeded areas without damaging the seed bed.

Reseed any areas not showing evidence of satisfactory growth within 3 weeks of seeding.



Have vegetation ready for  
Breakup & Spring Feeding

# Standard Operating Procedure



Seeding was a normal operation conducted as needed throughout the active construction period.



Tuntutuliak



Tuntutuliak

# Maintenance Specifications



619-3.03 MAINTENANCE. Reshape and reseed any damaged areas and repair the mulch or matting as required.

Maintain the mulch or matting until all work on the project is complete and accepted.

# Payment Specifications



618-4.01 METHOD OF MEASUREMENT. Section 109 and as follows:  
Seeding by the Acre. By the area of ground surface acceptably seeded and maintained.

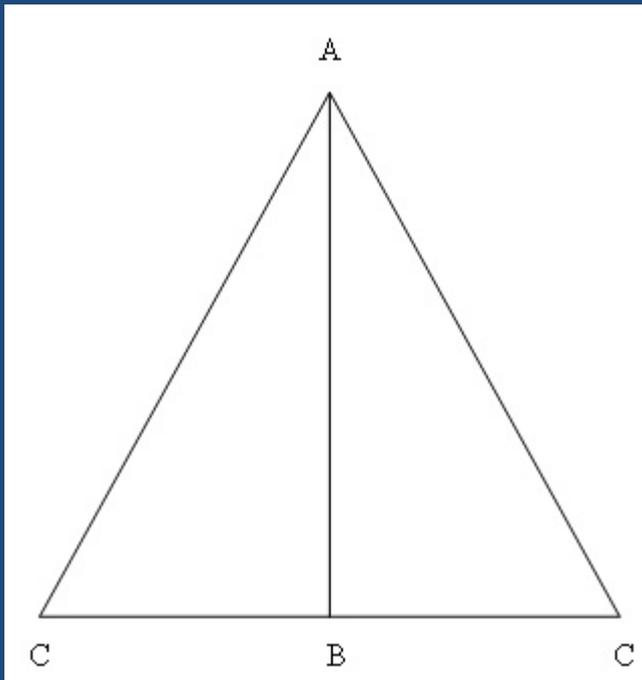
Seeding by the Pound. By the weight of seed acceptably placed.

Water for Seeding. If weighed, a conversion factor of 8.34 pounds per gallon will be used to convert weights to gallons.

618-5.01 BASIS OF PAYMENT. Mulching will be paid under Section 619.

Seeding by the Acre. Seed, water, and fertilizer are subsidiary.

Seeding by the Pound. Additional work required will be measured separately.

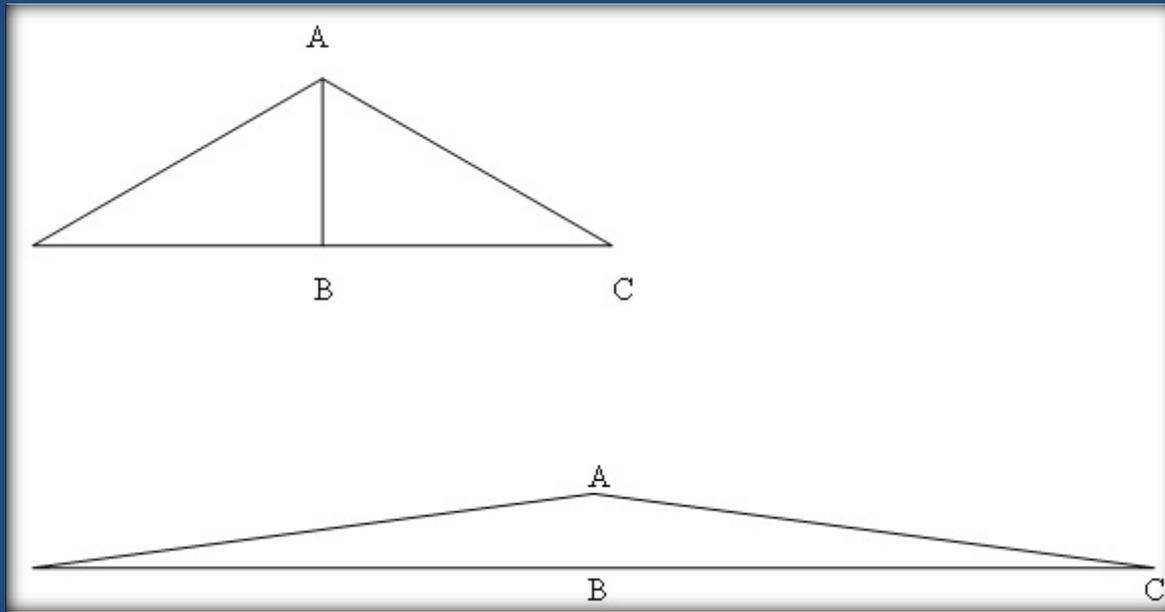


1. The horizontal, plan view or “run” length (B-C) is determined;
2. The height or “rise” of the slope is determined (A-B) by measuring the contour intervals;
3. The slope inclination is determined by comparing the horizontal measure (B-C) to the vertical measure (A-B) to; and finally,
4. The area is estimated by multiplying the run length (B-C) by the rise height (A-B) then by the multiplying factor in Figure 2.

**Figure 2. Slope Measurement Table and Calculations**

Vertical Measure	TO	Horizontal Measure	Multiplying Factor
1	to	3/4	1.6670
1	to	1	1.4142
1	to	1 1/2	1.2019
1	to	2	1.1180
1	to	2 1/2	1.0770
1	to	3	1.0541
1	to	4	1.0308
1	to	5	1.0198





If a multiplying factor is not used when estimating areas comprised of steep slopes, then the amount of area to be treated will be consistently underestimated and time, material and labor will most likely exceed the engineer's projections; and/or,

The contractor will under-apply the specified amount of mulch material in order to "stretch" the application to cover 100% of the designated area, albeit at a lower application rate.

## CONSTRUCTION REQUIREMENTS

**6XX-3.01 SURFACE PREPARATION.** Clear all areas to be stabilized of stones 4 inches in diameter and larger, and of all weeds, plant growth, sticks, stumps, and other debris or irregularities that might interfere with the stabilization operation, plant growth, or subsequent maintenance of the vegetative-covered area(s). According to the contract or as directed by the Engineer, provide sufficient surface roughening before placing compost to prevent sloughing of the Compost Blanket.

**6XX-3.02 INSTALLATION.** Apply compost uniformly to a thickness of 2 inches except as otherwise specified. Place compost before seeding or mix seed with compost.

**6XX-3.03 MAINTENANCE.** Maintain the Compost Blanket in a satisfactory condition for the term of the Contract. Correct any deficiencies as soon as practicable.

# Surface Roughness?



When installing a culvert or other drainage structure where stream bypass is not used, install temporary or permanent stabilization concurrently or immediately after placing the culvert or drainage structure in a manner that complies with the SWPPP, applicable project permits and prevents discharge of pollutants. Install temporary and permanent stabilization:

- At the culvert or drainage structure inlet and outlet
- In the areas upstream and downstream that may be disturbed by the process of installing the culvert, culvert end walls, culvert end sections, or drainage structure

Before deactivating a stream bypass or stream diversion used for construction of a bridge, culvert, or drainage structure, install permanent stabilization:

- At the inlet and outlet of the culvert, drainage structure, or bridge
- In the area upstream and downstream of the culvert, drainage structure, or bridge, that is disturbed during installation or construction of the culvert, drainage structure, or bridge
- Under the bridge



# Standard Specs

**203-3.01 GENERAL.** Perform all necessary clearing and grubbing prior to beginning excavation, grading, and embankment operations in any area.

Keep excavation and embankment areas free draining at all times as the work progresses.

Finish the excavation and embankments to reasonably smooth and uniform surfaces.

Excavate and embank material only within the limits on the Plans or as directed.

Prevent disturbing material and vegetation outside of the slope limits.



# Project Specific Specs

*Add: 203-3.01 to 3rd paragraph*

**Stabilize disturbed areas within 7 days of ceasing ground disturbing activities on an area. Areas used in Grading and Stabilization logs shall not be over 5 acres.**

*Add: 203-5.01 to list of subsidiary work*

**10. temporary stabilization of disturbed areas**



- Inlet Protection
- Conveyance Stabilization
- Flow Control

Where does this go?



SECTION 7XX

COMPOST

7XX-2.01 COMPOST

1. General Requirements Use compost products from biological degradation and transformation of organic materials under controlled conditions designed to promote aerobic decomposition. Compost shall be mature with regard to its suitability for serving as a soil amendment or an erosion control BMP. Compost shall be free of visible free water and have sufficient moisture content to prevent dust produced when handling the material.

2. Physical requirements:

a. Compost material shall be tested in accordance with U.S. Composting Council Testing Methods for the Examination of Compost and Composting (TMECC) 02.02-B, "Sample Sieving for Aggregate Size Classification". Meet gradation requirements in Table 7XX, with a maximum particle length of 6 inches or less.

TABLE 7XX COMPOST GRADATION

Sieve Size	FINE		MEDIUM		COARSE	
	Percent Passing Min	Percent Passing Max	Percent Passing Min	Percent Passing Max	Percent Passing Min	Percent Passing Max
2 in.	100		100		100	
1 in.	95	100	95	100	90	100
5/8 in.	90	100	90	100	70	100
1/4 in.	75	100	75	85	40	60



- b. The pH shall be between 6.0 and 8.5 when tested in accordance with U.S. Composting Council TMECC 04.11-A, “1:5 Slurry pH”.
- c. Medium and coarse Compost shall have a carbon to nitrogen ratio (C:N) between 18:1 and 30:1. The C:N shall be calculated using the dry weight of “Organic Carbon” using TMECC 04.01A divided by the dry weight of “Total N” using TMECC 04.02D.
- d. Manufactured inert material (plastic, concrete, ceramics, metal, etc.,) shall be less than 1 percent by weight as determined by U.S. Composting Council TMECC 03.08-A “Classification of Inerts by Sieve Size”.
- e. Soluble salt contents shall be less than 4.0 micromhos per centimeter (mmhos/cm) when tested in accordance with U.S. Composting Council TMECC 04.10 “Electrical Conductivity”.
- f. Maturity shall be greater than 80 percent in accordance with U.S. Composting Council TMECC 05.05-A, “Germination and Root Elongation”.
- g. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation.
- h. Compost shall not resemble the raw material from which it was derived.
- i. Biosolids Compost must meet the standards for class A biosolids outlined in 40 Code of Federal Regulations (CFR) Part 503.



## COMPOST BLANKET

6XX-1.01 DESCRIPTION. Furnish, install, inspect, and maintain Compost Blanket to stabilize bare soils and/or assist in revegetation of mineral soils as required. Compost Blanket includes Compost Blanket for erosion control and Compost Blanket as soil amendment.

6XX-1.03 SUBMITTALS. At least fourteen (14) days prior to application, submit a sample of the compost,  
a Seal of Testing Assurance (STA) test report dated within ninety (90) calendar days of the application,

including the following information to the Engineer for approval:

1. Lab analyses demonstrating the material complies with the processes, testing, and standards specified by the U.S. Composting Council Testing Methods for the Examination of Compost and Composting (TMECC) and Section 7XX. An independent STA Program certified laboratory shall perform the analyses.
2. A copy of the manufacturer's STA certification as issued by the U.S. Composting Council.
3. A list of feedstocks by volume for each compost type to the Engineer for review.

# Compost Blanket



Seward HWY

# Compost Certification Temperature to kill weed seed



Seward HWY

# What is the measurable metric here?

Ontario Provincial Standard Specifications for Topsoil,

“Topsoil shall be a fertile loam material that is free of roots, vegetation, or other debris of a size and quantity that prevents proper placement of the topsoil. The topsoil shall not contain material greater than 25 mm in size, such as stones and clods”.

“Imported topsoil shall not have contaminants that adversely affect plant growth”.



**213.02 Materials.** Provide topsoil that consists of fertile, friable soil of loamy character and that contains an amount of organic matter normal to the region. Obtain topsoil from well-drained arable land and reasonably free from subsoil, refuse, roots, heavy or stiff clay, large stones, coarse sand, sticks, brush, litter, and other deleterious substances. Incorporate vegetative matter into topsoil, except brush, trees, and noxious weeds.

Provide microorganism inoculants that contain a diverse mix of regional specific mycorrhizal species for specific condition, provide macronutrients and micronutrients to plants that are tolerant of chemical imbalances in the soil, produce humic compounds and binding compounds, and improve soil structure.

# 213.03 Construction Requirements.



Ensure topsoil stockpiles do not exceed 4 ft in height unless otherwise Engineer approved. If the stockpile is undisturbed for longer than 3 months, mix the top 1 ft with the remainder of the stockpile to ensure that living organisms are distributed throughout at the time of final placement, or add microorganism inoculants, after final placement, in accordance with manufacturer recommendations. Apply microorganism inoculants as dry granular mixes, tablets, or injectable soluble.

If I pile it 4 feet thick is it topsoil?



## New materials available on the market, What do we call it?



Mulch

*Add the following:*

### 4. Hydraulic Growth Medium and Biodegradable Growth Medium Method

Mulch shall be biotic-active hydraulically applied mulch such as 'Verdyol Biotic Black Earth', or an approved equal. Any approved equal must include the following material composition:

Material Composition:

40% by volume of thermally and mechanically processed straw and flexible flax fibers

57% by volume of professional grade sphagnum peat moss

1.26% by volume other valuable tracer minerals, sugars, starches, proteins, fiber and 16 amino acids including folic acid, Vitamin A, triaconnatol growth stimulants/regulators

1% by volume mycorrhizae

Laboratory Analysis:

Total Organic Matter Content = >95%

Carbon:Nitrogen Ratio = 31:1

Moisture Content = 44.5% +/- 5%

pH = 5.5 (Saturated Media Extract Method)





## Materials

Section 8-02.2 is supplemented with the following:

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### Soil Amendment

Soil amendment shall be a pre-packaged, commercially available, hydraulically applied blend of natural fibers, mycorrhiza, growth stimulants, and other biologically active material designed to improve seed germination and vegetation establishment.

Soil amendment shall be manufactured from thermally and mechanically processed straw and flexible flax fibers, sphagnum peat moss and other biological additives at the following volumes:

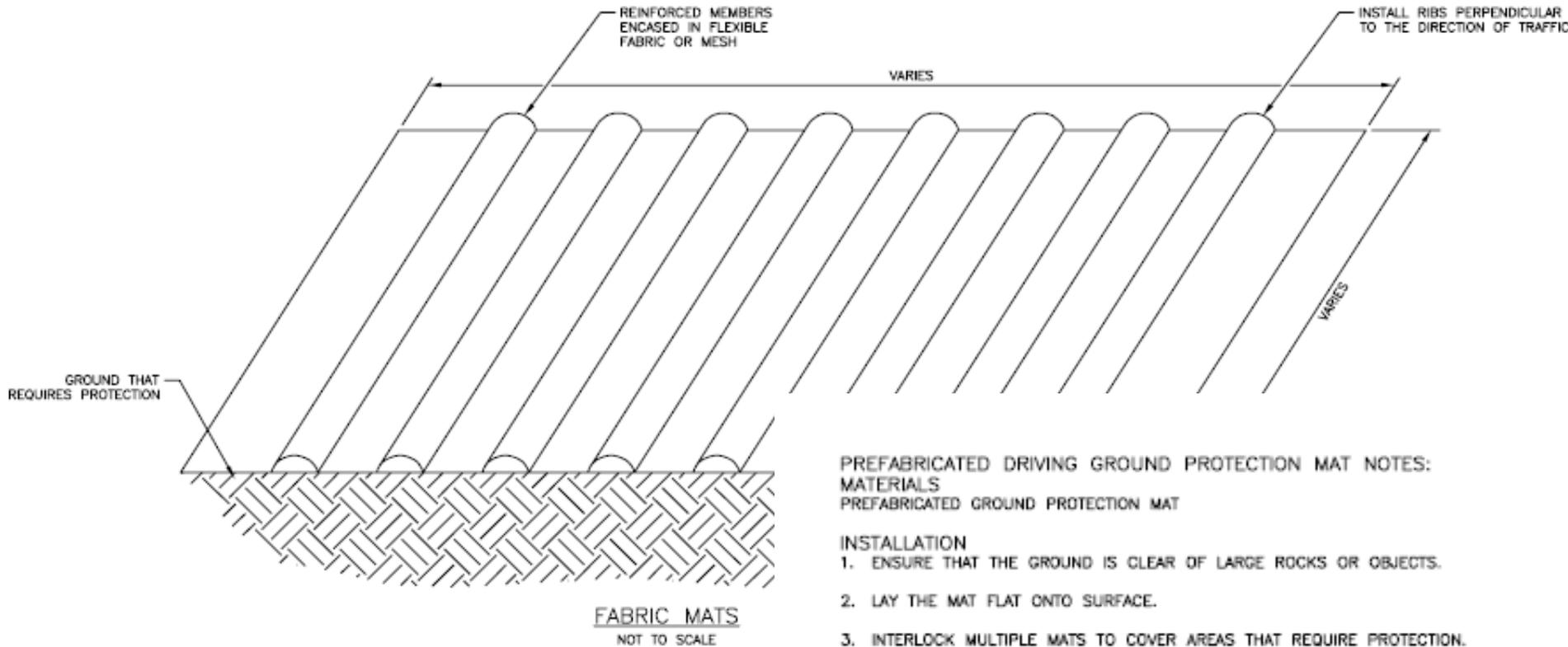
1. 40% by volume of thermally and mechanically processed straw and flexible flax fibers
2. 57% by volume of professional grade sphagnum peat moss
3. 1.26% by volume of other biological additives including trace minerals, sugars, starches, proteins, folic acid, vitamin A, triaconnatol and triacontanol growth stimulants/regulators
4. <1% by volume of fungal mycorrhiza and plant beneficial bacteria

Tackifier shall be a pre-packaged commercially available powder specifically designed and manufactured for use with the specified hydraulically applied soil amendment. Tackifier shall be formulated from long chain and cross-linking molecules in conjunction with a hydrocolloid vegetable gum.



## Mud Mats

Mechanical			
Grab Tensile Strength	ASTM-D4632	N (lbf)	3570 (802.6)
Apparent Breaking Elongation	ASTM-D4632	%	25 / 18
Puncture Resistance	ASTM-D4833	N (lbf)	1665 (374.3)
Mullen Burst	ASTM-D3786	kPa (psi)	3150 (456.88)
Trapezoidal Tearing Strength	ASTM-D4533	N (lbf)	2700 (607)
Apparent Opening Size	ASTM-D4751	mm (US Sieve)	0.212 (70)
Constant Head Permittivity	ASTM-D4491	l/min/m <sup>2</sup> (g/min/ft <sup>2</sup> )	821 (20.16)
Wide Width Tensile	ASTM-D4595	kg/cm lbs/in	122.5 (685.7)



**PREFABRICATED DRIVING GROUND PROTECTION MAT NOTES:**  
**MATERIALS**  
 PREFABRICATED GROUND PROTECTION MAT

**INSTALLATION**

1. ENSURE THAT THE GROUND IS CLEAR OF LARGE ROCKS OR OBJECTS.
2. LAY THE MAT FLAT ONTO SURFACE.
3. INTERLOCK MULTIPLE MATS TO COVER AREAS THAT REQUIRE PROTECTION.
4. CONNECT THE MATS ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

**INSPECTION**

1. LOOK FOR SPLIT, TORN, OR UNRAVELING FABRIC OR BROKEN UNITS.
2. ENSURE THAT THE MATS ARE COVERING AREAS THAT REQUIRE PROTECTION.
3. ENSURE VEHICLES ARE NOT DRIVING ON SURFACES OUTSIDE OF THE MATS.

**MAINTENANCE**

1. REPLACE DAMAGED MATS.
2. REMOVE SEDIMENT THAT HAS ACCUMULATED ON THE MATS.

**REMOVAL**

1. REMOVE AND DISPOSE OF THE ACCUMULATED SEDIMENT THEN REMOVE THE MAT.
2. IF NOT IN WETLANDS, DISTURBED GROUND SHOULD BE FILLED TO BLEND WITH THE ADJACENT GROUND AND REVEGETATED AS NECESSARY, AFTER REMOVAL OF MAT.

# Plan Sheet Specifications & Standard Drawings: "The Picture Page"

Will your choices come back to haunt you?



*Photo Courtesy Stoney Wright*

# Biodegradable Specifications



\*Not photodegradable

- 9-14.5(2) Biodegradable Erosion Control Blanket
- Biodegradable erosion control blankets shall be natural plant fibers, and all netting material, if present, shall biodegrade within a life span not to exceed 2 years.
- The Contractor shall provide independent test results from the National Transportation Product Evaluation Program (NTPEP) meeting the requirements of Section 9-14.5(2)B, 9-14.5(2)C and 9-14.5(2)D;



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