



REQUIREMENTS FOR CONSTRUCTION SITE SOILS FOR RESIDENTIAL LOTS

**The Manual requires Sites, at time of and during Construction,
to provide Erosion Control Elements**

From October 1 through April 30, no soils shall remain exposed and unworked for more than 2 days. From May 1 to September 30, no soils shall remain exposed and unworked for more than 7 days. This stabilization requirement applies to all soils on site, whether at final grade or not.

Soils shall be stabilized at the end of the shift.

Applicable practices include, but are not limited to:

- Temporary and permanent seeding
- Sodding
- Mulching
- Plastic covering
- Erosion
- Control fabrics and matting

Soil stockpiles must be stabilized from erosion, protected with sediment-trapping measures, and located away from storm drains, waterways, or drainage channels.

**The Manual requires Sites at time of Post-Construction specific
Soil Quality and Depth**

Implementation Options: The soil quality design guidelines can be met by using one of the methods listed below:

- Leave undisturbed native vegetation and soil, and protect from compaction during construction
- Amend existing site topsoil or subsoil either at default “preapproved” rates, or at custom calculated rates based on specifiers’ tests of the soil and amendment
- Stockpile existing topsoil during grading, and replace it prior to planting. Stockpiled topsoil must also be amended if needed to meet the organic matter or depth requirements, either at a default “pre-approved” rate or at a custom calculated rate.
- Import topsoil mix of sufficient organic content and depth to meet the requirements.

More than one method may be used on different portions of the same site. Soil that already meets the depth and organic matter quality standards, and is not compacted, does not need to be amended.

Soil Amendment Preparation Method:

1. Till the sub grade soil to an 8-inch depth; those areas subjected to vehicle traffic shall be tilled to a depth of 12 inches. Do not scarify or till within the drip line of existing trees that will be retained.
2. Place 3 inches of compost material and till into 5 inches of soil (a total amended depth of about 9.5 inches, for a settled depth of 8 inches). Soils shall be graded ¼ -inch per foot from the bottom of the foundation vent at all locations.
3. Rake the area smooth and remove surface rocks larger than 1 inch in diameter.
4. Place 2 inches of AA compost and rake.

Compost Amendment Quality Standards:

1. The organic content for “pre-approved” amendment rates can be met only by using compost that meets the definition for “composted materials” in WAC 173-350, Section 220, available online at <http://www.ecy.wa.gov/programs/swfa/organics/soil.html>
2. The compost must also have an organic matter content of 35 to 65 percent, carbon to nitrogen ratio below 25:1.
3. The carbon to nitrogen ratio may be as high as 35:1 for plantings composed entirely of plants native to the Puget Sound Lowlands region.

Compost Resources:

The following is a list of local compost resources available to date, September 2017:

LRI Compost Factory	Puyallup	(253) 847-7555
North Mason Fiber Company	Belfair	(360) 275-0228
Silver Springs Organics Compost LLC	Rainier	(360) 446-7645
Wilcox Farms Inc	Roy	(360) 458-7774

Preparation for Inspection:

Provide **six** holes per site; **two** for the front yard, **one** each for side yards, and **two** for the backyard. All holes shall be evenly placed throughout the property to demonstrate augmentation has been completed.

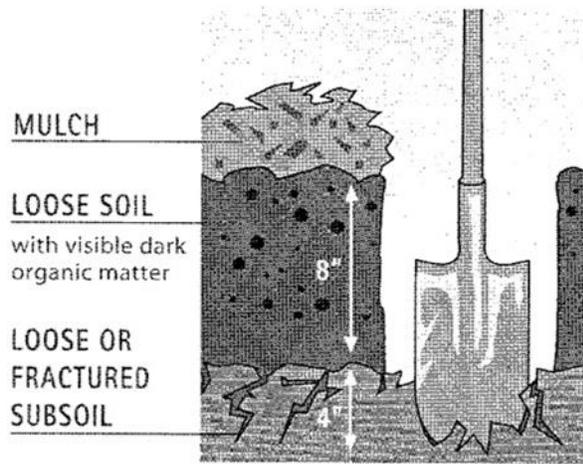
- Test holes shall be a minimum of **1 foot** deep and **1 foot** square.
- Permittee shall provide documents for the AA compost volume delivered to the site to confirm compost origin and quality.

Inspection Verification:

- The **2 inches** of compost on all disturbed surfaces.
- Loose soil for **8 inches** with visible dark organic matter.
- Loose fractured sub soils should not be easy to penetrate with a shovel **4 inches** below the **8 inches**. Total depth of augmented and loosened soil shall be **12 inches**.

Healthy soils provide the following important stormwater management functions:

- Provide high rates of water infiltration and retention
- Minimize surface water runoff and erosion
- Trap sediments, heavy metals and excess nutrients, and biodegrade chemical contaminants
- Encourage vigorous protective vegetative cover
- Support beneficial soil life that fight pests and disease and supply plant nutrients, reducing the need for fertilizers and pesticides that may contaminate waterways
- Reduce the need for landscape chemicals, thus reducing pollution through prevention



Test holes should be about one foot deep (after first scraping away any mulch) and about one foot square.

BMP T5.13
POST CONSTRUCTION
SOIL QUALITY AND DEPTH
In the Stormwater Management Manual for Western Washington

Excerpted from the Washington State Department of Ecology's Stormwater Management Manual for Western Washington, Vol. V: Runoff Treatment BMPs, Chapter 5, pages 5-13 to 5-15 (or pages 100 to 102 in the online PDF file) as revised May 2005. The Manual can be found online at www.ecy.wa.gov/programs/wq/stormwater/manual.html. Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 is available online at www.SoilsforSalmon.org

PURPOSE AND DEFINITION

Naturally occurring (undisturbed) soil and vegetation provide important stormwater functions including: water infiltration; nutrient, sediment and pollutant absorption; sediment and pollutant biofiltration; water interflow storage and transmission; and pollutant decomposition. These functions are largely lost when development strips away native soil and vegetation and replaces it with minimal topsoil and sod. Not only are these important stormwater functions lost, but such landscapes themselves become pollution-generating pervious surfaces due to increased use of pesticides, fertilizers and other landscaping and household/industrial chemicals, the concentration of pet wastes, and pollutants that accompany roadside litter.

Establishing soil quality and depth regains greater stormwater functions in the post development landscape, provides increased treatment of pollutants and sediments that result from development and habitation, and minimizes the need for some landscaping chemicals, thus reducing pollution through prevention.

APPLICATIONS AND LIMITATIONS

Establishing a minimum soil quality and depth is not the same as preservation of naturally occurring soil and vegetation. However, establishing a minimum soil quality and depth will provide improved onsite management of stormwater flow and water quality.

Soil organic matter can be attained through numerous materials such as compost, composted woody material, biosolids, and forest product residuals. It is important that the materials used to meet the soil quality and depth BMP be appropriate and beneficial to the plant cover to be established. Likewise, it is important that imported topsoils improve soil conditions and do not have an excessive percent of clay fines.

DESIGN GUIDELINES

Soil retention. The duff layer and native topsoil should be retained in an undisturbed state to the maximum extent practicable. In any areas requiring grading, remove and stockpile the duff layer and topsoil on site in a designated, controlled area, not adjacent to public resources and critical areas, to be reapplied to other portions of the site where feasible.

Soil quality. All areas subject to clearing and grading that have not been covered by impervious surface, incorporated into a drainage facility or engineered as structural fill or slope shall, at project completion, demonstrate the following:

- 1) A topsoil layer with a minimum organic matter content of 10% dry weight in planting beds, and 5% organic matter content in turf areas, and a pH from 6.0 to 8.0 or matching the pH of the original undisturbed soil. The topsoil layer shall have a minimum depth of eight inches except where tree roots limit the depth of incorporation of amendments needed to meet the criteria. Subsoils below the topsoil layer should be scarified at least 4 inches with some incorporation of the upper material to avoid stratified layers, where feasible.
- 2) Planting beds must be mulched with 2 inches of organic material.
- 3) Use compost and other materials that meet these organic content requirements:
 - a) The organic content for "pre-approved" amendment rates can be met only using compost meeting the compost specification for [BMP T7.30: Bioretention Cells, Swales, and Planter Boxes](#), with the exception that the compost may have up to 35% biosolids or manure.

The compost must also have an organic matter content of 40% to 65%, and a carbon to nitrogen ratio below 25:1.

The carbon to nitrogen ration may be as high as 35:1 for plantings composed entirely of plants native to the Puget Sound Lowlands region.

- b) Calculated amendment rates may be met through use of composted material meeting (a.) above; or other organic materials amended to meet the carbon to nitrogen ratio requirements, and not exceeding the contaminant limits identified in Table 220-B, Testing Parameters, in [WAC 173-350-220](#).

The resulting soil should be conducive to the type of vegetation to be established.

AMENDMENT OPTIONS

These specifications are designed to achieve an 8-inch depth of soil with 10% "Soil Organic Matter" (SOM) content in planting beds, and 5% organic content in turf areas.

More than one treatment may be used on different areas of the same site. Soil that already meets the depth and organic matter quality standards, and is not compacted, does not need to be amended.

Select the soil preparation options that best suit each area of the project site.

Either choose a pre-approved default amendment rate, or have a qualified professional calculate a custom rate based on soil and amendment test.

OPTION 1: Leave native vegetation and soil undisturbed, and protect from compaction during construction.

Identify areas of the site that will not be stripped, logged, graded or driven on, and fence off those areas to prevent impacts during construction. If neither soils nor vegetation are disturbed, these areas do not require amendment.

OPTION 2: Amend existing site topsoil or subsoil either at default "pre-approved" rates, or at custom calculated rates based on specifier's tests of the soil and amendment

Scarification. Scarify or till subgrade to 8 inches depth (or to depth needed to achieve a total depth of 12 inches of uncompacted soil after calculated amount of amendment is added). Entire surface should be disturbed by scarification. Do not scarify within drip line of existing trees to be retained. Amend soil to meet required organic content.

<p>A. Planting Beds</p> <ol style="list-style-type: none"> 1. PRE-APPROVED RATE: Place 3 inches of composted material and rototill into 5 inches of soil (a total amended depth of about 9.5 inches, for a settled depth of 8 inches). 2. CALCULATED RATE: Place calculated amount of composted material or approved organic material and rototill into depth of soil needed to achieve 8 inches of settled soil at 10% organic content. <p>Rake beds to smooth and remove surface rocks larger than 2 inches diameter.</p> <p>Mulch planting beds with 2 inches of organic mulch.</p>	<p>B. Turf Areas</p> <ol style="list-style-type: none"> 1. PRE-APPROVED RATE: Place 1.75 inches of composted material and rototill into 6.25 inches of soil (a total amended depth of about 9.5 inches, for a settled depth of 8 inches). 2. CALCULATED RATE: Place calculated amount of composted material or approved organic material and rototill into depth of soil needed to achieve 8 inches of settled soil at 5% organic content. <p>Water or roll to compact to 85% of maximum dry density.</p> <p>Rake to level, and remove surface woody debris and rocks larger than 1 inch diameter.</p>
---	---

OPTION 3: Stockpile existing topsoil during grading. Replace it before planting. Stock piled topsoil must also be amended if needed to meet the organic matter or depth requirements, either at a pre-approved default rate or at a custom calculated rate.

Scarification. If placed topsoil plus compost or other organic material will amount to less than 12 inches: Scarify or till subgrade to depth needed to achieve 12 inches of loosened soil after topsoil and amendment are placed. Entire surface should be disturbed by scarification. Do not scarify within drip line of existing trees to be retained.

Stockpile and cover soil with weed barrier material that sheds moisture, yet allows air transmission, in approved location, prior to grading.

Replace stockpiled topsoil prior to planting. Amend, if needed, to meet required organic content.

<p>A. Planting Beds</p> <ol style="list-style-type: none"> 1. PRE-APPROVED RATE: Place 3 inches of composted material and rototill into 5 inches of replaced soil (a total amended depth of about 9.5 inches, for a settled depth of 8 inches). 2. CALCULATED RATE: Place calculated amount of composted material or approved organic material and rototill into depth of replaced soil needed to achieve 8 inches of settled soil at 10% organic content. <p>Rake beds to smooth and remove surface rocks larger than 2 inches diameter.</p> <p>Mulch planting beds with 2 inches of organic mulch or stockpiled duff.</p>	<p>B. Turf Areas</p> <ol style="list-style-type: none"> 1. PRE-APPROVED RATE: Place 1.75 inches of composted material and rototill into 6.25 inches of replaced soil (a total amended depth of about 9.5 inches, for a settled depth of 8 inches). 2. CALCULATED RATE: Place calculated amount of composted material or approved organic material and rototill into depth of replaced soil needed to achieve 8 inches of settled soil at 5% organic content. <p>Water or roll to compact to 85% of maximum dry density.</p> <p>Rake to level, and remove surface rocks larger than 1 inch diameter.</p>
--	--

OPTION 4: Import topsoil mix of sufficient organic content and depth to meet the requirements.

Scarification. Scarify or till subgrade in two directions to 6 inches depth. Entire surface should be disturbed by scarification. Do not scarify within drip line of existing trees to be retained.

<p>A. Planting Beds</p> <p>Use imported topsoil mix containing 10% organic matter (typically around 40% compost). Soil portion must be sand or sandy loam as defined by the USDA.</p> <p>Place 3 inches of imported topsoil mix on surface and till into 2 inches of soil.</p> <p>Place second lift of 3 inches topsoil mix on surface.</p> <p>Rake beds to smooth, and remove surface rocks over 2 inches diameter</p> <p>Mulch planting beds with 2 inches of organic mulch.</p>	<p>B. Turf Areas</p> <p>Use imported topsoil mix containing 5% organic matter (typically around 25% compost). Soil portion must be sand or sandy loam as defined by the USDA.</p> <p>Place 3 inches of imported topsoil mix on surface and till into 2 inches of soil.</p> <p>Place second lift of 3 inches topsoil mix on surface.</p> <p>Water or roll to compact soil to 85% of maximum.</p> <p>Rake to level, and remove surface rocks larger than 1 inch diameter.</p>
---	--

This form has been approved for use by the Olympia Community Planning and Development (CPD) Department.



Keith Stahley, Director,
Community Planning and Development

12/14/2017

Date