

Amended Soils

Overview

Native soils that have been compacted by construction activity or where topsoil has been removed or eroded can become impermeable to water infiltration, causing high volumes of stormwater to run off your property into local water bodies, or cause flooding homes, sidewalks and roads. This rapid runoff carries sediment, nutrients and pesticides into local water bodies or storm sewers that harm aquatic habitat and cost municipalities a lot to treat. Soils impacted by construction can be improved by tilling in well-composted organic material improving soil health and allowing soils to absorb and retain more moisture and nutrients.



Careful protection of native soils saves you money, protects the drainage potential of your site, and provides optimal growing conditions for plants. [King County photo.](#)

Definitions

Soil Amendments - Natural additions to soil that improve both the structure and health of soils, increasing the space between particles, and allowing soils to absorb and retain more moisture and nutrients.

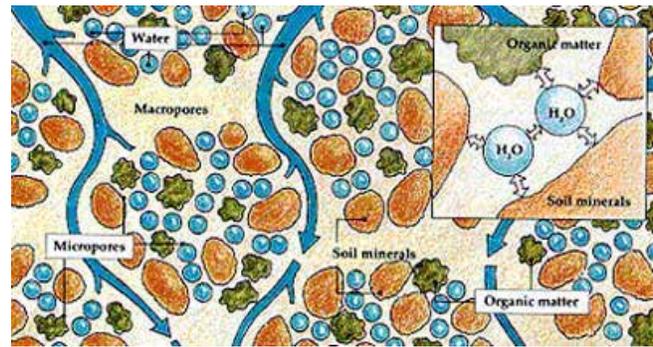
Integrated Pest Management (IPM) -

An approach to pest management that relies on a combination of healthy, biologically active soils and natural predators to minimize pest damage with few or no chemical pesticides.

When is This Applicable?

Amending soil is valuable any time you do site work. If your soil and landscaping are not healthy or thriving, or you are having problems with flooding, using best practices for amending soil may provide you with many cost-effective benefits.

King County's Clearing and Grading Regulations (King County Code 16.82) require that soil amendments be added to any new or significantly redesigned landscaping areas, as well as to any landscaping areas disturbed or compacted during construction. Soil amendments should be added once the area is free from compaction or disturbance, or when new soil is installed, and before planting.



Healthy soil structure includes plentiful pathways for water, mineral, and nutrients to migrate.

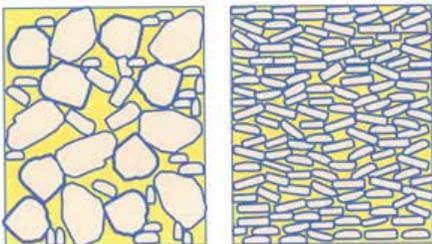
Source: [Food and Agriculture Organization.](#)



What Makes it Green?

Adding organic matter to soils enhances the function and performance of soils on your site in many ways.

- Improves structure, aeration and nutrient balance of the soil, which in turn supports more of the organisms and micro-organisms that improve soil function and makes more nutrients available to plants.
- Improves water absorption, reduces erosion and supports healthier plant growth and disease resistance, making the land more productive.
- Landscaped areas are easier to maintain, needing less frequent watering and less application of fertilizers and pesticides.
- Improves aquatic habitat and protects the health of salmon, trout and other species popular in King County.
- Helps you earn Built Green and LEED for Homes points for protect natural features and processes on site.



These illustrate the difference between healthy soil (left) vs compacted soil (right). The pore space shown in the healthy soil is important for effective drainage and optimal plant growth.

Source: [Colorado State University Extension](#).

Best Practices

Required Process:

SELECT Soil Management Option

[In prioritized order]

- 1) Leave native soil undisturbed
- 2) Amend existing soil in place
- 3) Import topsoil with five or ten percent organic matter for turf and planting beds, respectively
- 4) Stockpile site soil, reapply, and amend in place

PREPARE Soil Management Plan

- Review site conditions, landscape, and grading plan
- Select soil treatment option and suitable pH for planting areas
- Calculate compost and/or topsoil volumes for each area
- Identify compost and/or topsoils to be applied and retain records
- Turn in completed Soil Management Plan to DPER

IMPLEMENT the Soil Management Plan

- Depending on the Soil Management Option chosen, mix compost, import soil mixture, or reapply stockpiled soil to your disturbed site.
- Till compacted subsoils prior to amendments.**
- Only amend between May 1 and Oct. 1.**
- Save receipts of compost/soil purchase or delivery.
- Save test results for pH and soil mix percentages.

Design Guidelines for Amended Soils:

- Define clearing limits and restrict any compaction or disturbance beyond these.
 - Keep vehicles and machinery off of the planned landscape areas.
 - Limit impacts to specific areas to reduce the total area compacted. Compacting soil limits water and nutrient availability for plants and soil biology, and may hinder root development. It is extremely difficult, in the short term, to return compacted soils to their original hydrological and biological function.
- Within clearing limits, save topsoil/duff.
 - Retain the duff layer and native topsoil in an undisturbed state.
 - Stockpile any duff layer or topsoil removed during grading on-site in a designated, controlled area not adjacent to public resources and critical areas.
- After construction, replace duff after amending if needed.
 - Ensure areas that have been cleared and graded have the soil moisture holding capacity restored to that of the original undisturbed soil native to the site.
 - Amend soils only between May 1 and October 1.
 - Replace topsoil to a minimum of eight inches thick to ensure conditions equivalent to the soil moisture-holding capacity native to the site.

- Confirm replaced topsoil has organic matter content between five and ten percent dry weight and a pH suitable for the proposed landscape plants.

Buying compost or pre-amended topsoil:

Buy compost at your local nurseries, hardware stores, or home improvement stores. Use [EnviroStars](#) to find Landscape Supply Stores and Nurseries.

Ask suppliers for product test results to verify organic matter content and pH – you will need these results and receipts during your inspection.

Go Further: Implement an 'Integrated Pest Management' (IPM) system for landscaped areas; healthy, biologically active soils help to increase the success of using IPM – see [Resources](#) for more information.



The difference between heavily compacted and healthy amended soil from the same site is very apparent. Source: [Dirt Doctor](#).



Applicable References/ Standards

[King County - Achieving the Post-construction Soil Standard](#)

[2009 King County Surface Water Design Manual](#): (see especially: 4A - *Grading Code Soil Amendment Standard*, and 4C - *Landscape Management Plan Guidelines*).

DPER Bulletin #28, [Clearing and Grading Permits](#)

DPER [Residential Clearing & Grading Questionnaire](#)

Resources / Incentives

For the complete King County Green Building Handbook and individual Green Sheet PDF files, please visit our website at: <http://kingcounty.gov/property/permits/publications/greenbuild.aspx>. For additional information, please email dperwebinquiries@kingcounty.gov or call 206-296-6600.

See these related DPER Green Sheets (GS):

- Permeable Surfaces and Driveways, GS Number 3
- Routine Maintenance, GS Number 5

King County - [Composting Guidance](#)

City of Bellingham - Advanced Methods and Materials: [Amended Soils](#)

Seattle Public Utilities Integrated Pest Management (IPM): [IPM Fact Sheets](#)

Washington State University (WSU) 'Hortsense' - [IPM Fact Sheets](#)

Permit Tips

A grading permit is required if you are disturbing more than 100 cubic yards of soil (equivalent to a 900 square foot area, excavated three feet deep). The following tips will help ensure success with your permit and inspection process.

- Your site plan must show which soil amendment choice will be used.
- Plan ahead to save time and hassle; talk to a DPER Residential Engineer if you need clarification prior to submitting your application.
- DPER will conduct an onsite inspection to verify the depth of material and to check your documentation of material purchase.

