

## Protecting Your Soil During Construction

Protecting topsoil on your property during construction helps with future stormwater management and saves money by reducing the amount of soil to be imported after construction

WHEN TOPSOIL + PLANTS  
ARE REMOVED DURING  
CONSTRUCTION...



FUTURE PROBLEMS ARISE WITH  
DRAINAGE + PLANT GROWTH



*The use of heavy construction equipment, combined with the clearing of most vegetation and topsoil, leaves homeowners with damaged, compacted soil and future problems.*

We all know that good soil is the foundation for a beautiful landscape. Many people don't realize that uncompacted, healthy soil also helps rainwater soak into the ground and helps to filter out pollutants - in addition to supporting landscape plants.

Protecting your soil during construction is an easy way to save money and take care of your property. Existing soil can be stored onsite rather than hauled away, replacement soil won't need to be purchased and hauled in, post-construction landscaping will be simpler, and plant survival rates should be higher because of the deeper layer of topsoil.

Unfortunately, soil is rarely treated with the respect it deserves, despite the many services it provides. Typical construction practices on undeveloped sites often involves removal of most existing vegetation and topsoil to facilitate the building process. Unfortunately, this approach causes serious problems for future stormwater management and plant growth, and it often involves expensive "fixes." A better approach is to preserve as much undisturbed soil and vegetation as possible. This guide offers a few simple tips for protecting one of your property's greatest overlooked assets: its soil.

### HOW CAN SOIL BE DAMAGED DURING CONSTRUCTION?

- Heavy equipment repeatedly driving over and parking on soil leads to compaction.
- Stockpiled construction materials compact the soil below.
- Improper cleaning of construction equipment (especially cement wash out) pollutes soil.

Healthy soil contains roughly 50% pore space (filled with air and water), 50% mineral (sand, silt or clay) and a small amount of organic matter and soil biology.

When this air space is compacted during construction, the soil acts like concrete. Water can't soak in, so it ponds on the surface or rapidly drains off. Plants often struggle to get established in the shallow layer of replacement topsoil left on new building sites, and homeowners have to spend a significant amount of money attempting to recreate original site soil conditions.

It is difficult and expensive to break up or attempt to restore compacted soil. Instead, avoid soil compaction wherever - and whenever - possible.

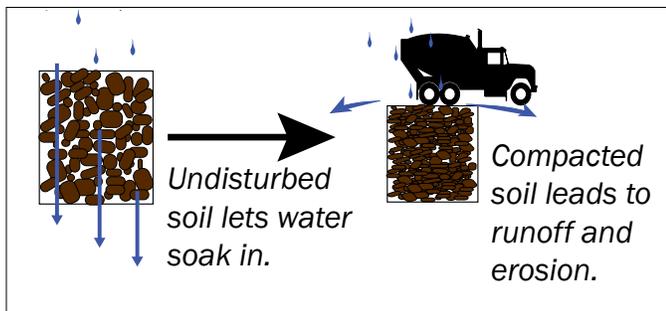
## HOW CAN I PROTECT MY SOIL DURING CONSTRUCTION?

The best way to protect your soil is to plan ahead, before construction starts. Begin with the goal of minimizing disturbance to your property.

- Limit the “construction footprint” as much as possible while still providing space to achieve construction goals. As a rule, the less impact to your site, the less money and time will be spent trying to fix it later.

- Identify areas of soil/vegetation to be protected and areas where soil must be removed. Collaborate with your contractor to develop a strategy that you agree on.
- If possible, store all removed topsoil so it can be reused on your property after construction is complete.

**GOAL:** Retain as much undisturbed soil and vegetation as possible on the project site; this will provide the greatest long-term benefit to the property. For those areas that must be disturbed by construction equipment, plan to restore the soils afterward.



*Driving + parking heavy equipment on your property without careful planning will damage soil and result in compaction. This can limit water infiltration and contribute to future stormwater management problems.*

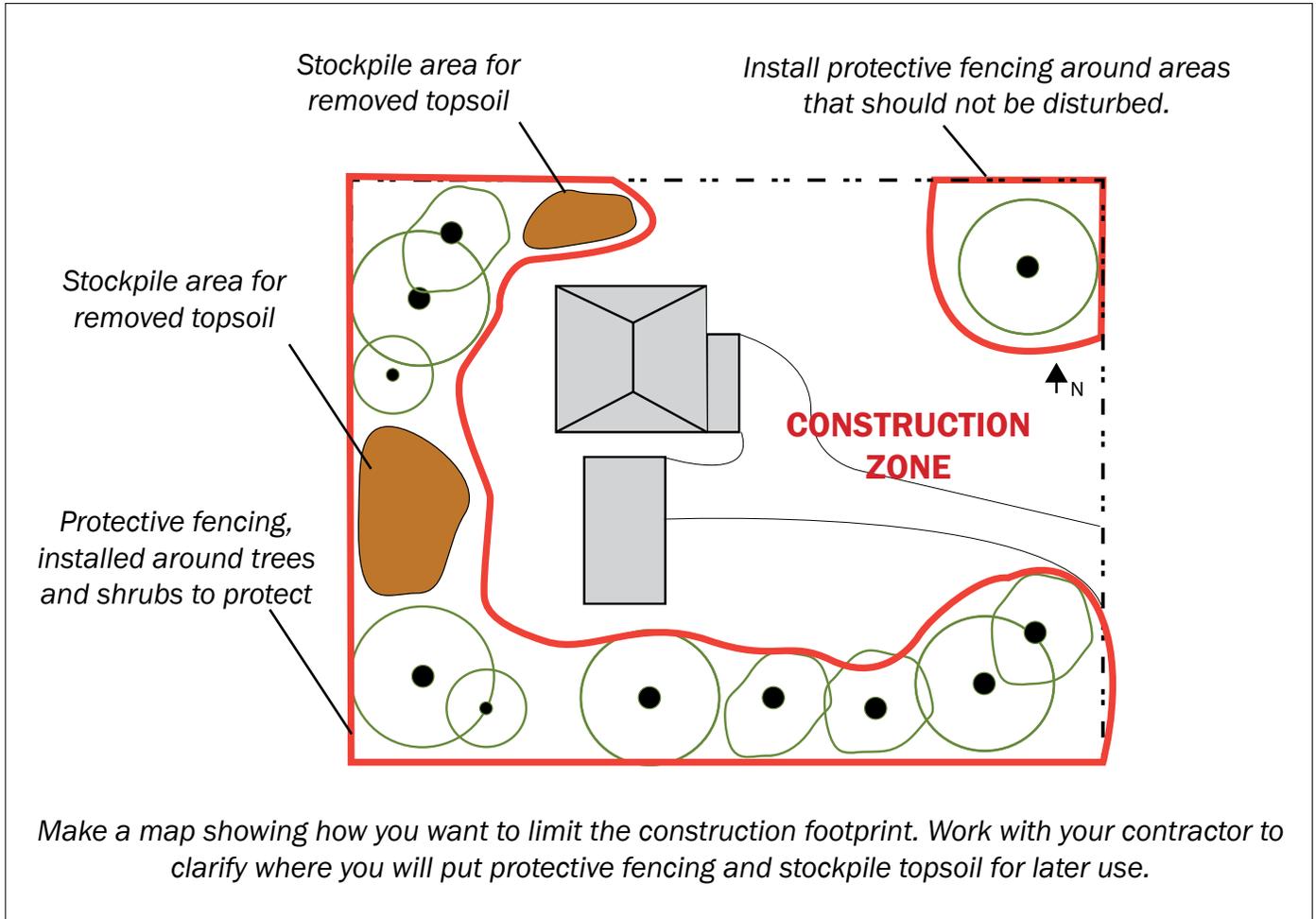
### I PLANNING PHASE: DEVELOP A SITE PROTECTION PLAN

- Develop a site protection plan showing (1) areas to be protected, (2) areas that will be disturbed and later restored, and (3) the amount of soil, compost, and mulch that will be imported for each area.
- Before construction begins, review your plan with contractors to make certain that everyone agrees with the strategy.

### II CONSTRUCTION: FOLLOW YOUR SITE PROTECTION PLAN

- For soil that will be protected in place, install high-visibility fencing to indicate area that are off-limits to vehicle traffic, material storage, or disturbance (typical orange construction fencing works well). Clearly mark the areas on a property map and review it with all contractors.
- For topsoil and forest duff (the topmost layer of leaves, fungi, etc.) to be removed (from the construction zone or building footprint, for example), pile the duff and topsoil in separate piles, in a location outside of the construction zone. Protect it.
- Cover all stockpiled materials with woven weed barrier sheeting or other breathable cover (geotextile fabric) weighted down with sandbags, boards or other heavy objects. Overlap edges if you use multiple sheets to cover the piles.
- Surround the stockpiles with a silt fence to ensure that water doesn't wash soil away, causing water quality problems.

**EXAMPLE: A SITE PROTECTION PLAN**



**III ADDITIONAL TIPS**

- Do earth work and soil preparation during the dry season to avoid damaging soil.
- Balance cut and fill wherever possible. Avoid radical alterations to the original topography of your property.
- If you add compost to amend soil after construction, use a high-quality product. Check with the WA Department of Ecology for a list of certified compost suppliers.
- Expect post-construction amended soils to “settle,” or sink a little bit over time. To plan for this, place amended soils a bit higher than final grade.
- Where possible, replant, compost, or chip removed plants to reuse onsite as mulch. This saves the effort of hauling and dumping a resource that you would otherwise need to go out and purchase.
- Avoid tilling through tree roots or raising the soil height around the base of trees.
- Mulch all planting beds and continue to protect restored soils from compaction in the future (by vehicles, etc.).
- Talk to your contractor about using compost-based erosion control practices where possible. The compost can then be reused as a soil amendment, saving money and



## IV POST-CONSTRUCTION: RESTORE AREAS WITH DAMAGED SOIL

After construction you want to have at least 12 inches of finished, uncompacted soil depth in the areas that were disturbed. In general, it is beneficial to break up compacted soils as deeply as possible. At a minimum include at least 8" of compost-amended topsoil. This will benefit long term stormwater infiltration, plant health and growth, and the function of your property as a whole.



to 12 inches below the surface. Next, till in 3 inches of compost to an 8 inch depth.

You can also import quality topsoil. Before placing imported soil, first till subsoil to a minimum depth of 4 inches. Next, place 8" of compost-amended topsoil (35% compost by volume for planting beds; 20% for turf). Ideally, rototill some topsoil into the subsoil before placing the rest on top. This avoids the creation of distinct layers with different soil characteristics, which can limit plant growth and water movement between layers.

For detailed guidance, refer to the manual, *Building Soil*, available at [www.soilsforsalmon.org](http://www.soilsforsalmon.org). This document offers additional instructions as well as calculators to help you determine material quantities (such as how much compost you might need to buy to amend your soil).

### SOIL RESTORATION OPTIONS

If you stockpiled original topsoil onsite, reuse this valuable resource. Place the soil on areas compacted by construction equipment, such as haul roads, materials storage areas, and anywhere that the soil was damaged. First, till subsoils to a minimum depth of 4 inches. Next, place topsoil over tilled subsoils to reach a minimum depth of 8 inches. Amend stockpiled topsoil with 3 inches of compost. The finished, uncompacted soil depth should be 12 inches.

If there was no room to save and stockpile your original topsoil, you will need another method to restore damaged soil. First, break up, or "rip" compacted soil (using a tractor or an excavator)

### RESOURCES

"Soils for Salmon" website, [www.soilsforsalmon.org](http://www.soilsforsalmon.org) (accessed 11.2015)

- BUILDING SOIL: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WA
- Detailed "How-To" guidance documentation, calculators and other useful materials

Low Impact Development Manual for Puget Sound, 2012: [http://www.psp.wa.gov/downloads/LID/20121221\\_LIDmanual\\_FINAL\\_secure.pdf](http://www.psp.wa.gov/downloads/LID/20121221_LIDmanual_FINAL_secure.pdf) (accessed 11.2015).

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