Excerpted from *Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington*, 2005 Edition, available at www.SoilsforSalmon.org

# FIELD GUIDE TO VERIFYING SOIL QUALITY AND DEPTH IN NEW LANDSCAPES

This guide is provided to help professional inspectors verify implementation of soil improvements to fulfill BMP T5.13 "Post Construction Soil Quality and Depth" in the Washington Department of Ecology's Stormwater Management Manual Western Washington.

**The main conditions to be confirmed are:**

1. Provision of eight inches of topsoil containing 10% organic matter in planting beds, or 5% in turf areas.
2. Scarification of compacted subsoil four inches below the topsoil layer (for a total uncompacted depth of 12 inches).
3. Placement of two inches of mulch on all planting beds.

**Site Inspection Supplies**

- A copy of the approved Soil Management Plan (SMP) for the site, with site drawing.
- A sturdy shovel
- Tape measure or 12" ruler
- 3/8 inch diameter 3-4 foot stainless steel "rod penetrometer" with a 1/8" bevel cut into the tip at 30 degrees from the side, and a 90 degree bend at top to form a handle (*see illustration, next page*).
- Field Verification Form to record results

**The following steps** may be completed at multiple visits as a project progresses or in one final project approval inspection, depending on local practices:

## STEP 1: Compare site conditions with approved Soil Management Plan (SMP).

The SMP approved with the site permit describes soil treatments approved for each area. Make sure site conditions match these details in the SMP:

- Site location and permit holder.
- Turf and planting areas match approved drawings.
- Areas to remain as undisturbed native soil and vegetation have been fenced off during construction to prevent soil compaction or damage to plants.

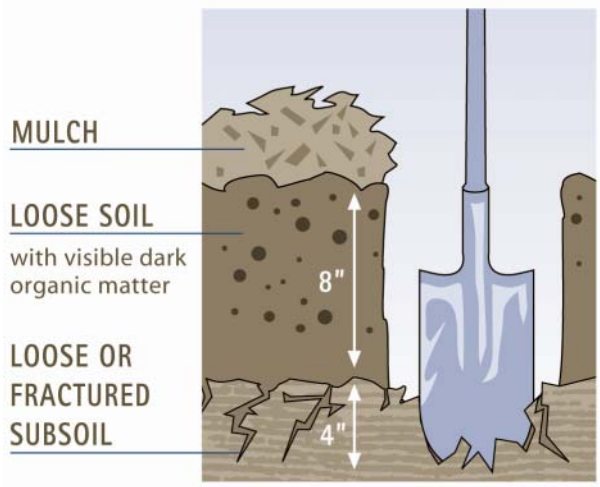
## STEP 2: Inspect delivery tickets for compost, topsoil and mulches.

Permitee must provide original delivery tickets for all soil and mulch products. Compare delivery tickets with the SMP to match the following information:

- Delivery location.
- Total quantities for each soil product and mulch.
- Product descriptions and sources.
  If materials other than those listed in the SMP were delivered, laboratory test results must be provided to confirm that they are equivalent to approved products.

## STEP 3: Verify depth of amended soil and scarification.

**Use a shovel** to dig at least one test hole per acre for turf and one per acre for planting beds to verify eight inch topsoil depth (below mulch layer), incorporation of amendments, and four inches of uncompacted subsoil.




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

**Eight Inch Depth of Amended Soil.** The top eight inches of soil should be easy to dig using a garden spade driven solely by your weight. The soil should be darker than the unamended soil below, and particles of added organic

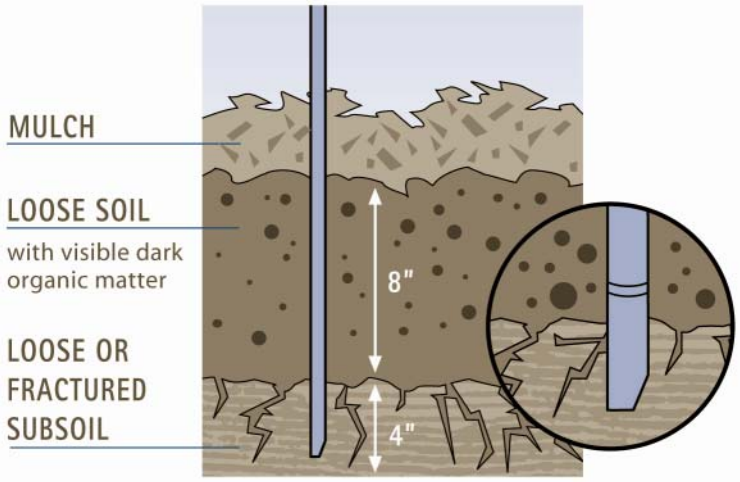
matter are likely to be visible. Clay soil that been saturated and then dried may require jumping on the shovel step to penetrate, but the soil should yield easily when moist. Soil that requires vigorous chipping with the shovel to penetrate probably does not meet the specification.

**Four Inch Depth of Scarified Subsoil.** The next four-inch depth of soil should be loose enough to penetrate with the shovel. It may be rocky, and the loosened depth may vary due to the pattern of scarifying equipment – but some sections of subsoil in a one foot square hole should be loose four inches deep into the subsoil (that is, to a total 12 inch depth from the soil surface).

**STEP 4: Check soil depth in several spots.**

**Use a simple "rod penetrometer"** (illustration below) to confirm that the soil is uncompacted twelve inches deep at ten locations per acre – with a minimum of ten on smaller sites. To locate test spots, imagine a line dividing the site (or each acre) in half lengthwise, then divide each half into five nearly equal sections. Conduct tests near the middle of each section. Additional test locations are encouraged.

The rod penetrometer should enter the soil twelve inches deep, driven solely by the inspector's weight. Irregular scarification or rocks in the lower layer may require probing a few spots at each location to reach the full depth.




**A rod penetrometer** is a 4 foot long, 3/8 inch or 10 mm diameter stainless steel rod with a 90 degree bend 5 inches form the top to make a handle, and a 30 degree bevel cut 1/8 inch or 3 mm into the side of the tip.

**STEP 5: Check mulch depth.**

**Use a shovel to scrape away and reveal surface mulch thickness.** A two inch layer of organic material (mulch) such as composted sawdust, wood chips, or ground bark should be distinguished from the underlying soil on all planting beds.

**FINAL STEP: Record results on "Field Verification Form" or similar document *(see sample form at www.SoilsforSalmon.org).***

## *What should be attached to the Soil Management Plan?*

- Scale drawings showing layout of turf and planting beds, and identifying where soil treatments described in the SMP will be applied.
- Copies of compost and topsoil test results demonstrating that products contain adequate organic matter, and meet carbon to nitrogen ratio and stability standards.
- Where custom calculated amendment rates are used, include laboratory analyses of the soil and organic matter sources plus calculations by a qualified professional showing that the organic matter requirement will be achieved.

## *What If A Site Does Not Meet the Soil Management Plan Requirements?*

If inspection indicates that an installation does not fulfill the approved SMP, the permit holder or their agent should be notified of what steps are needed to comply. When results are unclear or disputed, an independent consultant should conduct sampling for analytical testing of organic matter as described in the project specifications.
Qualified consultants include: Certified Soil Scientists, Crop Advisors or Agronomists; or Licensed Landscape Architects, Civil Engineers or Geologists.

The Soil Management Plan, Field Inspection Form, and the entire Soil BMP manual referred to in this inspection guide are available online at www.SoilsforSalmon.org