

MAP CODE
SOIL

TOPSOIL MANAGEMENT

USE
Dust
Erosion
Sediment
Visual

What

➤ Salvaging, storing and using topsoil for rehabilitation.

Purpose

- To retain site topsoil for rehabilitation and/or permit requirements.
- To preserve topsoil quality during moving and storage.



Topsoiling
Perspective View

Source: US Department of Agriculture

Where

YES: All areas with well-developed topsoil (i.e., thickness greater than 7 centimeters).

Materials, Equipment & Costs

- None required.
- Earth moving equipment.
- Low.

Plans & Specs

Materials

- Determine depth of topsoil on 10-metre spacing.
- The depth of material should be at least 7 centimetres. Soil factors such as rock fragments, slope, depth to water table and layer thickness affect the ease of excavation and spreading of topsoil.
- Keep topsoil separate from overburden, and store layers separately to ensure that material is restored in the same order that it was removed.
- Generally, the upper part of the soil that is richest in organic matter is most valuable.
- Organic soils such as muck and peat do not make good topsoil. They can be identified by their extremely light weight when dry.

Stripping

- Strip topsoil only from those areas that will be disturbed by excavation, filling, road building or compaction by equipment. A 1.0 to 1.5 metre stripping depth is common, but depth will depend on the soil profile at the site. Determine depth of stripping by taking soil cores at several locations within each area to be stripped. Topsoil depth generally varies along a gradient from hilltop to toe of slope. Put sediment basins, diversions and other controls into place to manage stormwater before stripping.

Stockpiling

- Select stockpile location to avoid slopes, natural drainage ways and traffic routes. At large sites, re-spreading is easier and more economical when topsoil is stockpiled in small piles near the areas where they will be used.
- Sediment barriers - use sediment fences or other barriers where necessary to retain sediment.
- Temporary seeding - protect topsoil stockpiles by temporarily seeding as soon as possible, within 30 days after the formation of the stockpile.
- Permanent vegetation - if stockpiles will not be used within 12 months they should be stabilized with permanent vegetation to control erosion and weeds.

Installation

Site Preparation

- Before spreading topsoil, establish erosion and sedimentation control structures such as diversions, berms, dikes, waterways and sediment basins.
- Maintain grades on the areas to be topsoiled according to the approved plan. Adjust grades and elevations for receipt of topsoil.
- Roughening - Immediately prior to spreading the topsoil, loosen the subgrade by disking or scarifying to a depth of at least 100 millimetres to ensure bonding of the topsoil and subsoil.
- Ensure that soil horizons are replaced in the same order that they were removed.
- Uniformly distribute topsoil to pre-mining thickness. If sufficient topsoil is available, a minimum compacted depth of a half metre on 3:1 slopes and one metre on flatter slopes is suggested. To determine the volume of topsoil required to various depths, use the table below. Do not spread topsoil while it is frozen or muddy.

Volumes of topsoil required for various depths

Depth (millimetres)	Cubic metres per 100 square metres	Cubic metres per hectare
25	2.5	250
50	5.0	500
75	7.5	750
100	10.0	1000
125	12.5	1250
150	15.0	1500

- Compact the topsoil enough to ensure good contact with the underlying soil, but avoid excessive compaction, as it increases runoff and inhibits seed germination. Light packing with a roller is recommended where turf is to be established.
- On slopes and areas that will not be mowed, the surface may be left rough after spreading topsoil.

Options

Live Topsoiling

- Live topsoiling is extracting topsoil from its place of origin and placing it directly onto an area that has already been mined, backfilled and graded for reclamation.
- This is the most desirable topsoil management option, as the topsoil is handled only once and does not compact during storage within stockpiles.

Maintenance

- Minimize erosion with timely planting of temporary or permanent vegetation.
- Ensure that temporary or permanent plantings are well watered until established.
- Inspect stockpiles regularly, especially after large storms. Stabilize any areas that have eroded.

Sources

Austin, L. (2001): **Construction Stormwater Pollution Prevention**; Stormwater Management Manual for Western Washington, Volume II. *Washington State Department of Ecology*, page 81, Publication 9912, URL <<http://www.ecy.wa.gov/biblio/9912.html>>, June 2001.

Norman, D.K., Wampler, P.J., Throop, A.H., Schnitzer, E.F. and Roloff, J.M. (1997): **Best Management Practices for Reclaiming Surface Mines in Washington and Oregon**; *Washington State Department of Natural Resources* Open File Report 96-2 and *Oregon Department of Geology and Mineral Industries* Open File Report O-96-2, page 3-13, URL <<http://www.wa.gov/dnr/htdocs/ger/pdf/bmp.pdf>>, June 2001.

United States Department of Agriculture and Mississippi State University. (1999): **Topsoiling**; in Water Related BMP's in the Landscape/Best Management Practices/Water Runoff Control/ A. Construction Site Impact Reduction. *Watershed Science Institute United States Department of Agriculture and Mississippi State University*, <<http://abe.msstate.edu/csd/NRCS-BMPs/contents.html>>, October 2001.

United States Department of Agriculture, (1994): **Planning and Design Manual for the Control of Erosion, Sediment, and Stormwater, Best Management Practice Standards.**