

# Trees and Topsoil

Best Practice and Recommendations  
respect, protect, reuse and restore local soil

## What is Topsoil

Topsoil is the uppermost layer of soil and nutrients regularly exposed to air and rain.

Topsoil is made up of broken down organic matter, minerals and important microorganisms that help to circulate nutrients for tree and plant use.



## Caring for Topsoil

- Protect, retain, reserve native topsoil if possible
- Restore disturbed soil
- Don't over compact soil
- Use mulch to protect and hold soil in place
- Protect soil from flood erosion with healthy tree and plant roots

Well-Structured Soil



Compacted Soil



Topsoil Requirements (City of Vancouver 2016)

## Co-Benefits of Healthy Topsoil

Healthy soils can help reduce rainwater runoff by absorbing and storing water on site. Retained water hydrates local trees and vegetation, reducing demand for irrigation and watering. Well maintained soil also holds more nutrients and biodiversity to feed vegetation and maintain local ecosystems. Strong soil practices foster successful plants that are more resilient to pests, diseases, and climate shocks.

## Topsoil and Tree Planting

Strong soil management practices that ensure adequate soil volume, protection, and reuse of native soils, are an important part of nurturing healthy, hardy trees over long periods of time.

The amount of soil volume provided for municipal street trees has a significant affect on community urban tree canopy. The table below provides recommended soil volume minimums for street trees.

(Metro Vancouver, 2017)

TREE SIZE	Minimum soil volume (m <sup>3</sup> )	Shared or irrigated soil volume (m <sup>3</sup> )
Small tree canopy spread is up to 6 m	8	6
Medium tree canopy spread is up to 10 m	20	15
Large tree canopy spread is greater than 10 m	35	30

Soil volume shall be calculated as:

- Soil: Surface area (Length x Width) of connected pervious x 1
- Soil under hardscape:
  - Soil: Volume of soil (Length x Width x Depth)
  - Soil cells: Volume of soil cell installation (Length x Width x Depth) x .92

Table from Metro Vancouver Tree Regulations Toolkit 2024, page 20.

## Planting Trees and Soil Volume in Streetscapes

Attention to soil volume minimums is essential to ensuring newly constructed streetscapes can accommodate existing or planted trees over time.

Soil volumes can be met if sufficient native soils have been retained, or with a combination of topsoil and soil cells or structural soil approaches.

Creating ample soil volume and connecting root zones underneath street or sidewalk paving can help to increase overall root system viability and tree health over the short and long term.

## Topsoil, Climate & Environment

Climate change is projected to create drier, hotter summers and magnified rainfall events during fall and winter months in Coastal BC. Healthy topsoil supports a healthy water cycle in both hotter dryer and wetter months, which also supports local tree health.

When regional topsoil is healthy and plentiful it can act like a sponge to hold and retain water when it rains or during irrigation. Water is then slowly released into local subsoil, and cycles water into local streams or groundwater systems in controlled ways.

Thriving topsoil also creates the foundation for thriving Urban Forests which provide important community services, like urban cooling, air purification of smog or wildfire smoke, and helps to dissipate heavy rainfall.

## British Columbia Landscape & Nursery Association (BCLNA) Standards

The BCLNA standard outlines specifications of minimum topsoil depth of:

- 150mm for lawns
- 300mm for beds
- 450-900mm for shrubs/trees
- Recommended drainage should be 20mm/hour
- 150mm of subsoil scarification
- 50mm of mulch recommended



## Prior to Development

- Analyze the existing on site soil for texture, organic matter content, porosity, and pH
- Conserve as much native soil and vegetation as possible for reuse
- Take measures to protect soil from disturbance and compaction (e.g. temporary fencing)
- Determine appropriate areas where existing topsoil can be stored and stockpiled
- When stripping soil, use appropriate measures to not damage soil structure (e.g. over compacting)
- Provide effective soil erosion control during development processes

## After Development

- Scarify subsoil to 150mm to increase rainwater infiltration into subsoil
- If importing soil, match soil to native soil texture and amend for organic matter
- Engage rainwater management techniques (e.g. gentle sloping areas)
- Blend subsoil with topsoil to create transition in soil texture and enhance water infiltration
- Recommended soil depths range from 150mm to 450mm, depending on landscaping type (see BCLNA Standards above)
- Add 50mm of mulch to exposed soil
- Provide erosion control (e.g. vegetation, rocks, sediment control logs, perimeter fencing, until vegetation is established)

### Sources:

[Okanagan Basin Water Board, Topsoil Bylaw Toolkit \(2012\)](#)

[City of Vancouver, Topsoil Requirements in Vancouver: The Needs, Benefits, and The Next Steps \(2016\)](#)

[Topsoil: Just How Do You Obtain a Performing Topsoil Layer, to Advance Rainwater Management & Water Conservation Goals?: A Law and Policy Primer for Municipal Staff and Designers.\(2010\)](#)