# Soil Horizons Reference Guide

Compiled by: Gage Linville
Created: April 5th, 2023
Revised: March 27th, 2025
v1.5.0

# Master Horizons

---

**O** Predominantly organic material, leaves, moss, and other plant materials may be identifiable or may be extensively altered.

**A** Predominantly mineral, mixed with lesser amounts of accumulated organic matter. Typically a surface horizon but often below an **O** horizon.

**B** Subsurface horizon with illuvial (washed in) accumulation of one or more clay, Fe, Al, Si, humus, carbonates, gypsum, or a horizon with other specific subsoil features.

**C** Parent material, unconsolidated earthy material with little or no evidence of horizon development or pedogenic alteration.

**E** Mineral horizon, usually light in color, from which some combination of fine clays, Fe, Al, and organic matter has been eluviated (washed out).

**L** Limnic layer including organic and inorganic materials deposited through the actions of aquatic organisms.

**M** Root-limiting layer of human-manufactured material such as asphalt, concrete, or plastic.

**R** Continuous bedrock, too hard for hand-digging with a spade.

**V** Mineral horizons formed at the soil surface or below a layer of rock fragments. They are characterized by the predominance of vesicular pores and have platy, prismatic, or columnar structure.

**W** Rarely used. A layer of liquid or frozen water within or beneath, but not above, the soil.

**AE** Transition horizon, dominated by properties of an **A** horizon with subordinate properties of an **E** horizon. Similarly, the first letter designates the dominant properties in other transition horizons: **AB, BA, BE, EA, EB, BC,** and **CB.**

**A/E** Combination horizon, dominated by properties of an **A** horizon with discrete intermingled bodies of **E** horizon. Similarly, the first letter designates the dominant horizon in other combination horizons: **A/B, A/C, B/A, B/E, B/C, E/A, E/B, C/A,** and **C/B.**

# Subordinate Designators

| | |
|---|---|
| **a** | Highly decomposed organic matter. Example: **Oa.** |
| **b** | Buried horizon that developed before burial. Example: **Ab.** |
| **c** | Concretions or nodules. Example: **Bc.** |
| **co** | Coprogenous earth (sedimentary peat). Example: **Lco.** |
| **d** | Dense horizon physically restricting roots. Example: **Bd.** |
| **di** | Diatomaceous earth. Example: **Ldi.** |
| **e** | Organic material of intermediate decomposition. Example: **Oe.** |
| **f** | Frozen soil or water. Example: **Wf.** |
| **ff** | Dry permafrost, permanently below 0°C, but little water present. Example: **Aff.** |
| **g** | Strong gleying, iron is reduced, usually having a chroma below 2. Example: **Cg.** |
| **h** | Illuvial accumulation of organic matter. Example: **Bh.** |
| **i** | Slightly decomposed organic matter. Example: **Oi.** |
| **j** | Accumulation of jarosite, a yellow sulfate mineral. Example: **Bj.** |
| **jj** | Evidence of cryoturbation (soil horizon disruption from freezing). Example: **Ajj.** |
| **k** | Accumulation of carbonates. Example: **Bk.** |
| **kk** | Engulfment of horizon by secondary carbonates. Example: **Bkk.** |
| **m** | Pedogenic cementation. Example: **Bm.** |
| **ma** | Marl. Example: **Lma.** |
| **n** | Accumulation of sodium. Example: **Bn.** |

**o** Residual accumulation of sesquioxides. Example: **Bo.**

**p** Tillage or other disturbance of the surface soil. Example: **Ap.**

**q** Accumulation of silica. Example: **Bq.**

**r** Weathered or soft bedrock. Example: **Cr.**

**s** Illuvial accumulation of metals complexed with organic matter. Examples: **Bs.**

**se** Presence of sulfides. Example: **Bse.**

**ss** Slickensides. Example: **Bss.**

**t** Accumulation of silicate clay. Example: **Bt.**

**u** Presence of human-manufactured materials (artifacts). Example: **Au.**

**v** Plinthite. Example: **Bv.**

**w** Development of color or structure, without accumulation of colloids. Example: **Bw.**

**x** Fragipan, dense, firm, and brittle. Example: **Bx.**

**y** Accumulation of gypsum. Example: **By.**

**yy** Dominance of horizon by gypsum. Example: **Byy.**

**z** Accumulation of salts more soluble than gypsum. Example: **Bz.**

**References:**

1. Soil Survey Staff. 2022. Keys to Soil Taxonomy, 13th ed. USDA-Natural Resources Conservation Service (pp. 377-382).