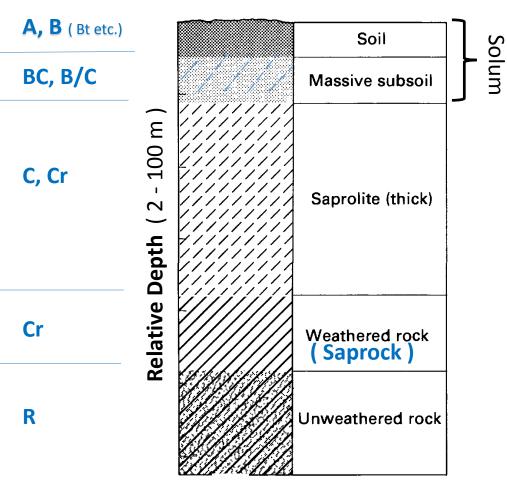
Soil, Saprolite, Weathered Rock (saprock), Unweathered Rock

Horizons

Materials



Key Attributes

Soil: Earthy (wide range of soil textures possible, contains clay maximum); Friable; soil structure; extensive roots; leached; bulk density maximum in B horizon; low permeability. Subsoil: Earthy (wide range of textures, reduced clay); Friable; massive (nominal soil structure); non-isovolumetric weathering; no remnant rock structure; faint rock

pseudomorphs (e.g. ghosts) possible; extensive roots; well leached; reduced bulk density and clay content; moderate permeability.

Earthy (loamy textures grading to sandy textures with depth); Firm to Very Firm, possibly brittle; massive; **prominent remnant rock structure**; highly and isovolumetrically weathered (extensive inter-crystalline weathering and secondary pore space development within the matrix); extensive fine / very fine root exploitation of the matrix, moderate to well leached; reduced bulk density and clay content; moderate to high permeability.

Semi-coherent (difficult to auger); Very Hard (commonly crumbles into grus); massive, slightly weathered (dominantly intra-crystalline weathering and pore space primarily along mineral cleavage faces); **prominent remnant rock structure & fabric**; primarily very fine roots & mycorrhiza in matrix; moderate leaching of soluble materials; moderate permeability.

Coherent, continuous bedrock (igneous, metamorphic, sedimentary); Rigid to Very Rigid; weathering & root penetration limited to widely spaced rock joints; exclusively rock structure & fabric; no appreciable leaching of soluble materials (CaO); minimal permeability

Generalized weathering profile and attributes developed in acid crystalline (e.g. piedmont of Virginia). - Modified from Figure 2, Pavich et al., 1989)

		ZONE	HORIZON	MAJOR MINERALS	STRUCTURE AND FABRIC	MAJOR WEATHERING PROCESS	
c		Soil	A Kaolinite, vermiculite, B quartz		Pedogenic	Chemical and mechanical	
		Massive subsoil	с	Kaolinite, muscovite,	Massive	Mechanical	
6 (a 10		Saprolite	!_ Inert	quartz Halloysite, muscovite, quartz	Macroscopoically rocklike; some mineral etching and disaggregation on microscale	Slight chemical	
DEPTH, IN METERS			Reactive	Halloysite, muscovite, quartz, plagioclase	Macroscopically rocklike	Chemical (plagioclase dissolution)	
20		Weathered rock		Quartz, muscovite, plagioclase, biotite	Macroscopically rocklike	Chemical (oxidation of mafic minerals and hydration)	
		Unweathered rock					

FIGURE 17.-Generalized weathering profile for thick regolith developed on upland quartzofeldspathic tocks.

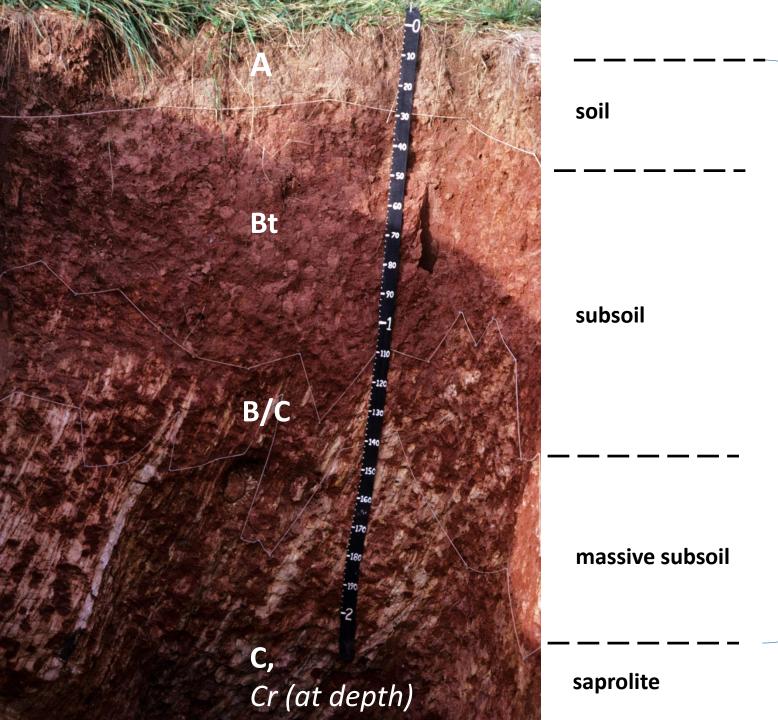
GENERAL PROPERTIES OF WEATHERING PROFILES

TABLE 1.—Description of weathering profile for igneous and metasedimentary rocks in Fairfax County, Va.(modified from Deere and Patton, 1971)

Zo	ne	Description ¹	RQD ² (NX core percent)	Percent core recovery (NX core)	Relative permeability	Relative strength	Common thickness (meters)
Soil	A Horizon	Top soil, roots, organic material. Zone of leaching and eluviation. Generally porous and sandy.	Not applicable.	0	Medium to high	Very low	0.1-0.2
	B Horizon	Characterically clay enriched, also accumulations of Fe and Al. No relict structures present.	Not applicable.	0	Low	Commonly low, medium if very dry.	0.3–1.0
Massive subsoil		No relict rock structure. Less dense than soil B horizon. Less clay than soil B horizon. Depleted in cations and silica relative to Fe and Al. May contain clasts of saprolite.	Not applicable.	0	Medium	Low	0.5–1.0
Saprolite		Relict rock structures retained. Clay-bearing silt or clay-bearing sand grading to sand at depth. Commonly micaceous; feldspars and mafic minerals altered to clays. Less than 10 percent core stones. Joints strongly cemented with oxides at many places.	0 or not applicable.	Generally 0–10 percent.	Medium	Low to medium (relict structures very significant.	1–15
Weathered rock	Transition (from saprolite to partly weathered rock).	Highly variable, saprolitelike to rocklike. Fines commonly fine to coarse sand (grus). 10–95 percent core stones. Feldspars and mafic minerals altered in part.	Variable, generally 0–50 percent.	Variable, generally 10–90 percent.	High (water losses common during drilling).	Medium to low where weak structures and relict structures are present.	0.3-3
	Partly weathered rock.	Rocklike, soft to hard rock. Joints stained to altered. Slight alteration of feldspars and mafic minerals.	Generally 50-75 percent.	Generally 90 percent.	Medium to high	Medium to high ³ .	0.3-3
Unweathered rock		No iron stains to trace along joints. No weathering of feldspars and micas. No sheared zones.	>75 percent (generally >90 percent.	Generally 100 percent.	Low to medium	Very high ³ .	_

¹The descriptions provide the only reliable means of distinguishing the zones. ²RQD stands for Rock Quality Designation, described in Deere and others (1967). RQD in percent equals length of core pieces 4 in. (10.3 cm) and longer divided by length of run times 100. NX core diameter in 1.75 in. (4.5 cm).

³Considering only intact rock with no adversely oriented geologic structures.



Saprolite & Related Terms

solum

Pacolet soil, saprolite from felsic crystalline bedrock (*e.g. gneiss, schist*)

Raleigh, NC. Source: P. Schoeneberger