

CPOW SOIL OBSERVATION LOG

Client/Address:	Project #:	Profile Pit #:	Date:
Company Name:	Evaluator Name:	Excavation Equipment Used:	
Landscape Position (Circle one):	Summit	Shoulder	Back/Side slope
Notes:	Foot Slope	Toe Slope	Slope Shape:
Vegetation:	Elevation:	Slope (%):	Slope Direction:
Weather Conditions/Time of Day:	Vegetation:	Depth to Standing Water:	

Soil (Less than 35% Rock)

Depth (in)	Texture	Structure Type	Structure Grade	Rock Frag%	Rupture Resistance	Soil Color	Soil Type and LTAR
		Single Grain Prismatic Blocky Granular Massive Platy	0 Structureless 1 Weak 2 Moderate 3 Strong		Loose Non-cemented Extremely weakly cemented Very weakly cemented Weakly cemented Moderately cemented <u>Strongly cemented</u> <u>Very strongly cemented</u> <u>Indurated</u>	Matrix color: () Mottle color: () Concentrations Depletions Gleyed	(Circle All That Apply) Limiting Layer Restrictive Layer Seasonal High Groundwater
		Single Grain Prismatic Blocky Granular Massive Platy	0 Structureless 1 Weak 2 Moderate 3 Strong		Loose Non-cemented Extremely weakly cemented Very weakly cemented Weakly cemented Moderately cemented <u>Strongly cemented</u> <u>Very strongly cemented</u> <u>Indurated</u>	Matrix color: () Mottle color: () Concentrations Depletions Gleyed	(Circle All That Apply) Limiting Layer Restrictive Layer Seasonal High Groundwater
		Single Grain Prismatic Blocky Granular Massive Platy	0 Structureless 1 Weak 2 Moderate 3 Strong		Loose Non-cemented Extremely weakly cemented Very weakly cemented Weakly cemented Moderately cemented <u>Strongly cemented</u> <u>Very strongly cemented</u> <u>Indurated</u>	Matrix color: () Mottle color: () Concentrations Depletions Gleyed	(Circle All That Apply) Limiting Layer Restrictive Layer Seasonal High Groundwater

R-Soils and Bedrock (Greater than 35% Rock)

Depth (in)	Matrix Texture	Structure Type	Structure Grade	%Rock Frag.	Excavation Difficulty	FBR Code	Soil Color	R-Soil Type & LTAR
		Single Grain Prismatic Blocky Granular Massive Platy	0 Structureless 1 Weak 2 Moderate 3 Strong	FBR (circle) DBR (circle) (OR) %2-20mm = () %>20mm = ()	Low Moderate <u>High</u> <u>Very High</u> <u>Extremely High</u>	1 - <4" 2 - 4" to 18" 3 - 18" to 40" 4 - 40" to 80" 5 - ≥ 80"	Matrix color: () Mottle color: () Concentrations Depletions Gleyed	(Circle All That Apply) Limiting Layer Restrictive Layer Seasonal High GW
		Single Grain Prismatic Blocky Granular Massive Platy	0 Structureless 1 Weak 2 Moderate 3 Strong	FBR (circle) DBR (circle) (OR) %2-20mm = () %>20mm = ()	Low Moderate <u>High</u> <u>Very High</u> <u>Extremely High</u>	1 - <4" 2 - 4" to 18" 3 - 18" to 40" 4 - 40" to 80" 5 - ≥ 80"	Matrix color: () Mottle color: () Concentrations Depletions Gleyed	(Circle All That Apply) Limiting Layer Restrictive Layer Seasonal High GW
		Single Grain Prismatic Blocky Granular Massive Platy	0 Structureless 1 Weak 2 Moderate 3 Strong	FBR (circle) DBR (circle) (OR) %2-20mm = () %>20mm = ()	Low Moderate <u>High</u> <u>Very High</u> <u>Extremely High</u>	1 - <4" 2 - 4" to 18" 3 - 18" to 40" 4 - 40" to 80" 5 - ≥ 80"	Matrix color: () Mottle color: () Concentrations Depletions Gleyed	(Circle All That Apply) Limiting Layer Restrictive Layer Seasonal High GW

Graphic Log

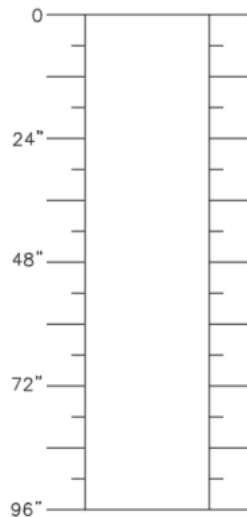


Table 5-1: Rupture Resistance: Blocks, Peds, Clods – Estimate the class by the force required to rupture (break) a soil unit.

Dry Cementation Class	Specimen Falls Under
Loose	Intact specimen not obtainable
Non-cemented	Very slight force between fingers
Extremely weakly cemented	Slight force between fingers
Very weakly cemented	Moderate force between fingers
Weakly cemented	Strong force between fingers
Moderately cemented	Moderate force between hands
Strongly Cemented	Foot pressure by full body weight
Very Strongly Cemented	Blow of > 4.5 lbs., but not body weight
Indurated	Blow of ≥ 4.5 lbs. weight dropped at 6 inches

Source: NRCS Field Book for Describing and Sampling Soils, Version 3.0; 2021 Reprint; Consistence section, pg. 2-63.

Dry Rupture Resistance applies to soils that are moderately dry or drier.

Table 10-1B: Fractured Bedrock (FBR), LTAR Guidance

FBR: Distance between fractures*	Code	LTAR
<4 inches	1	Soil Type 1
4 to < 18 inches	2	Soil Type 1
18 to < 40 inches	3	Soil Type 2
40 to < 80 inches	4	Soil Type 3
≥ 80 inches	5	Soil Type 4

Table 10-1C: LTAR Determination for Deteriorated Bedrock (DBR)

Excavation Difficulty: The relative force or energy required to excavate the soil/rock.

Class	Criteria
Low	Excavation by tile spade requires arm pressure only; impact energy or foot pressure is not needed
Moderate	Excavation by tile spade requires impact energy or foot pressure; arm pressure is insufficient
High	Excavation by tile spade is difficult but easily done by pick using over-the-head swing
Very High	Excavation by pick with overhead swing is moderately to markedly difficult. Backhoe excavation by 50 – 80 hp tractor CAN be made in moderate time.
Extremely High	Excavation by pick is nearly impossible. Backhoe excavation by 50 – 80 hp tractor CANNOT be made in a reasonable time.

Note: Depending on the "Excavation Difficulty" in a DBR soil, the proposed LTAR must increase by the following: one soil type for "moderate", two soil types for "high", and three soil types for "very high" or "extremely high" excavation difficulty from the soil type of the observed soil texture; with a maximum soil type 5 LTAR. Soil types provided in Table 10-1.

(Designer)

Textures:

c-clay
sic-silty clay
sc-sandy clay
cl-clay loam
sicl-silty clay loam
scl-sandy clay loam
si-silt
sil-silt loam
l-loam
sl-sandy loam*
ls-loamy sand*
s-sand*

* Sand Modifiers
co-coarse
m-medium
f-fine
vf-very fine

Soil Structure

Grade:

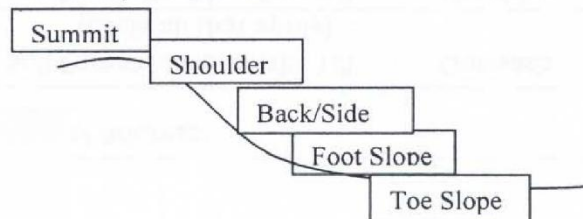
Weak-poorly formed, indistinct peds, barely observable in place

Co Soils
Moderate-Well formed, distinct peds, moderately durable and evident, but not distinct in undisturbed soil

Strong-durable peds that are quite evident in un-displaced soil, adhere weakly to one another, withstand displacement, and become separated when soil is disturbed

Loose-no peds, sandy soil

Landscape Position:



Soil Structure

Shape:

Granular-the peds are approximately spherical or polyhedral and are commonly found in topsoil. These are the small, rounded peds that hang onto roots when soil is turned over.

Platy-the peds are flat and plate like. They are oriented horizontally and are usually overlapping. Platy structure is commonly found in forested areas just below the leaf litter or shallow topsoil.

Blocky-the peds are block-like or polyhedral, and are bounded by flat or slightly rounded surface that are casting of the faces of surrounding peds. Blocky structure is commonly found in the lower topsoil and subsoil.

Prismatic- flat or slightly rounded vertical faces bound the individual peds. Peds are distinctly longer vertically, and faces are typically cast or molds of adjoining peds. Prismatic structure is commonly found in the lower subsoil.

Single Grain-the structure found in a sandy soil. The individual particles are not held together.

Massive-no observable aggregates, or no orderly arrangement of natural lines of weakness

Consistence:

Loose-intact specimen not available

Friable-slight force between fingers

Firm-moderate force between fingers

Extremely firm-moderate force between hands or slight foot pressure

Rigid-foot pressure

Subsoil Indicator(s) of Saturation:

S1. Depleted matrix (value ≥ 4 and chroma ≤ 2)

S2. Distinct gray or red redox features

S3. 5Y chroma ≤ 3

S4. 7.5 YR or redder faint redox concentrations or redox depletions

If yes to one of the above indicators then:

Topsoil Indicator(s) of Saturation:

T1. Wetland vegetation

T2. Depressional landscape

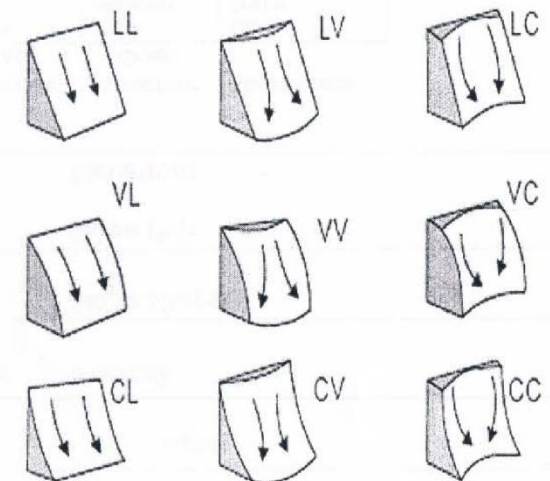
T3. Organic texture or organic modifiers

T4. N 2.5/ 0 color

T5. Redox features in topsoil

T6. Hydric soil

Slope Shape - Slope shape is described in two directions: up-and-down slope (perpendicular to the contour), and across slope (along the horizontal contour); e.g., Linear, Convex or LV.



(adapted from Wysocki, et al., 2000)

L = Linear
V = Convex
C = Concave

→
Surface flow
pathway