

ORDER OF DESCRIPTIONS:

1. USCS Type 2. Group Name 3. Color 4. Density/Consistency 5. Plasticity 6. Moisture 7. Structure
8. Angularity/Mineralogy 9. Miscellaneous

Example Description:

SM Silty sand, pale brown (10YR6/3), loose, non-plastic, moist, laminated (4-mm thick laminations), sub-rounded quartz and feldspar

UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS <50% passes #200 sieve	GRAVELS <50% coarse fraction passes #4 sieve	GRAVELS <5% fines	GW	Well graded gravels, gravel-sand mixtures, little or no fines
		GRAVELS with >12% fines	GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
			GM	Silty gravels, poorly graded gravel-sand-silt mixtures
		SANDS ≥50% coarse fraction passes #4 sieve	SANDS with little or no fines	GC
	SW			Well graded sands, gravelly sands, little or no fines
	SANDS with >12% fines		SP	Poorly graded sands, gravelly sands, little or no fines
			SM	Silty sands, sand-gravel-silt mixtures
	FINE-GRAINED SOILS ≥50% passes #200 sieve	SILTS & CLAYS Liquid Limit <50		SC
ML				Inorganic silts and very fine sands, silty or clayey fine sands, silts with slight plasticity
CL				Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
OL				Organic silts and silty clays of low plasticity
SILTS & CLAYS Liquid Limit >50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silt	
		CH	Inorganic clays of high plasticity, fat clays	
		OH	Organic silts and clays of medium-to-high plasticity	
		PT	Peat, humus, swamp soils with high organic content	

NOTE: Well graded (wide range of grain sizes) = poorly sorted; poorly graded (predominantly one grain size) = well sorted

GRAIN SIZE

DESCRIPTION	SIEVE SIZE	GRAIN SIZE	
		mm	in.
Boulders	>12"	>300	>12
Cobbles	12" - 3"	300 - 75	12 - 3
Gravel - Coarse	3" - 0.75"	75 - 19	3 - 0.75
Fine	0.75" - #4	19 - 4.75	0.75 - 0.19
Sand - Coarse	#4 - #10	4.75 - 2	0.19 - 0.079
Medium	#10 - #40	2 - 0.425	0.079 - 0.017
Fine	#40 - #200	0.425 - 0.075	0.017 - 0.0029
Fines	Passing #200	<0.075	<0.0029

COLOR

Assign color using Munsell Soil Color Chart (1992) if possible. Provide name and color code in parentheses.

DEPTH TO WATER

▽ Depth to first water (time and date)
▽ Depth to water after drilling (time and date)

DENSITY

Granular	SPT, N (blows/ft)	Relative Density (%)	Field Test
Very loose	4	0-15	Easily penetrated with ½-in reinforcing rod pushed by hand.
Loose	4-10	15-35	Easily penetrated with ½-in reinforcing rod pushed by hand.
Medium dense	10-30	35-65	Penetrated a foot with ½-in reinforcing rod driven by 5-lb hammer.
Dense	30-50	65-85	Penetrated a foot with ½-in reinforcing rod driven by 5-lb hammer.
Very dense	50	85-100	Penetrated a few with ½-in reinforcing rod driven by 5-lb hammer.

Cohesive	Field Test For Cohesive Soil	SPT, N (blows/ft)	Undrained Shear Strength C (psf)	Uncon Comp Strength q _u (psf)
Very soft	Easily penetrated several inches by thumb. Extrudes between thumb and fingers when squeezed.	<2	250	500
Soft	Easily penetrated 1 inch by thumb. Molded by light finger pressure.	2-4	250-500	500-1000
Medium stiff	Penetrated over 1/2 inch by thumb with moderate effort. Molded by strong finger pressure.	4-8	500-1000	1000-2000
Stiff	Indented about 1/2 inch by thumb but penetrated only with great effort.	8-15	1000-2000	2000-4000
Very stiff	Readily indented by thumbnail.	15-30	2000-4000	4000-8000
Hard	Indented with difficulty by thumbnail.	>30	>4000	>8000

PLASTICITY

Description	Field Test
Non-plastic	Soil falls apart at any water content.
Slightly Plastic	Soil easily crushed with fingers; thread is rolled with difficulty.
Plastic	Soil difficult to crush with fingers; thread is rolled easily up to the plastic limit, failure after reaching the plastic limit.
Very Plastic	Soil impossible to crush with fingers; thread is rolled easily, does not fail after reaching the plastic limit.

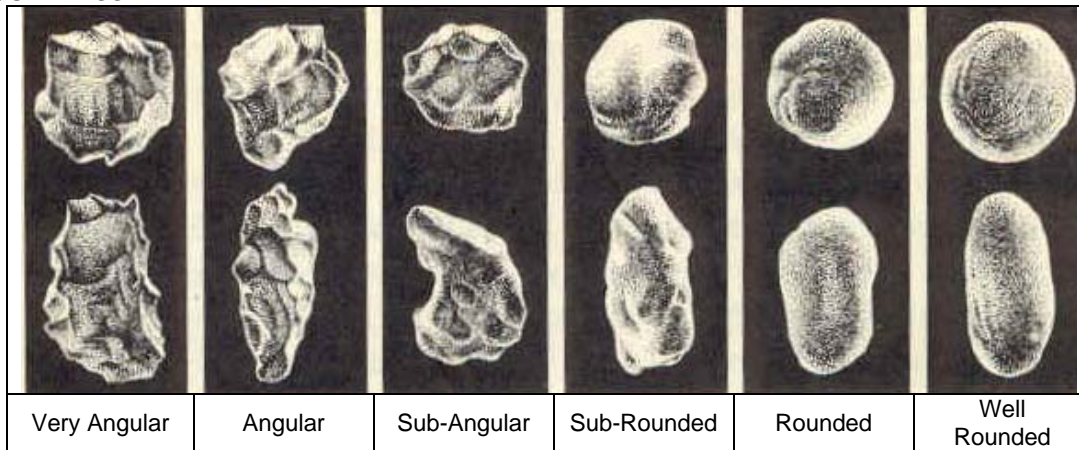
MOISTURE CONTENT

Description	Field Test
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water.

STRUCTURE

Stratified (layers ≥6 mm thick)	Columnar	Granular (single grain, massive)
Laminated (layers <6 mm thick)	Prismatic	Homogeneous
Platy	Blocky (angular, subangular)	

ANGULARITY/ROUNDNESS*



*Modified after Powers, M. C., 1953, Journal of Sedimentary Petrology, v. 23, p. 118

MISCELLANEOUS

Organics, carbon, vegetation	Cementation	Heaving sands
Coloration (staining, mottling)	Drilling rate	Loss of drilling fluid
Odor	Rig behavior	Caving/sloughing

Sch 40 PVC

CASING VOLUMES

Diameter (In)	Volume (Gal/Ft)
1	0.041
2	0.17
4	0.66
6	1.50

BORING VOLUMES

Hole Diameter (In)	Volume (Gal/Ft)
7.25	2.14
7.75	2.45
8.25	2.78
10.25	4.29
12.25	6.13

CONVERSIONS

MULTIPLY	BY	TO OBTAIN
in	2.54	cm
cm	0.3937	in
cm	3.2808 E-2	ft
ft	0.3048	m
m	3.2808	ft
mi	1.6093	km
km	0.6214	mi
cu in	5.79 E-4	cu ft
cu ft	7.48	gal
cu m	264.17	gal
gal	3.785	liter
liter	0.264	gal
°C	1.8(°C)+32	°F
°F	(°F-32)/1.8	°C
gal	8.33	lbs

WELL VOLUME CALCULATION EXAMPLE:

Well Volume = Annular Volume + Casing Volume

Annular Volume = (Boring Volume - Casing Volume) x Sand Pack Porosity

EXAMPLE: Assume 10.25" dia. hole, 4" dia. casing,

30% sand pack porosity, 8' water column

Annular Volume = (4.29 gal/ft - 0.66 gal/ft) x 0.30 x 8 ft = 8.71 gal.

Casing Volume = 0.66 gal/ft x 8 ft = 5.28 gal.

One Well Volume = 8.71 gal + 5.28 gal = 13.99 gal.