



UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	FIELD IDENTIFICATION PROCEDURES (excluding particles larger than 3 inches and basing fractions on estimated weights)			INFORMATION REQUIRED FOR DESCRIBING SOILS	
1	2	3	4	5			6	
Coarse-grained Soils More than half of material is larger than No. 200 sieve size. The smallest particle visible to the naked eye.	Gravels More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the 1/4-in. size may be used as equivalent to the No. 4 sieve)	(Clean Gravels Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions, and drainage characteristics. Give typical name: Indicate approximate percentage of sand and gravel, maximum size, angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information, and symbol in parentheses. Example: <u>Silty sand</u> gravelly; about 20% hard, angular gravel particles 1/2in. maximum size; rounded and subangular sand grains, coarse to fine; about 15% non plastic fines with low dry strength; well compacted and moist in place; alluvial sand (SM).
		(Gravels with Fines Appreciable amount of fines)	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines	Predominantly one size or a range of sizes with some intermediate sizes missing			
		(Clean Sands Little or no fines)	GM	Silty gravels, gravel-sand-silt mixtures	Nonplastic fines or fines with low plasticity (for identification procedures see ML below)			
			GC	Clayey gravels, gravel-sand-clay mixtures	Plastic fines (for identification see CL below)			
	Sands More than half of coarse fraction is smaller than No. 4 sieve size	(Clean Sands Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	Wide range in grain sizes and substantial amounts of all intermediate sizes missing			
			SP	Poorly graded sands or gravelly sands, little or no fines	Predominantly one size or a range of sizes with some intermediate sizes missing			
		(Sands with Fines Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures	Nonplastic fines or fines with low plasticity (for identification)			
			SC	Clayey sands, sand-clay mixtures	Plastic fines (for identification procedures see CL below)			
Fine-grained Soils More than half of material is smaller than No. 200 sieve size. The No. 200 sieve size is about the smallest particle size.				Identification Procedures on Fraction smaller than No. 40 Sieve Size				
				<i>Dry Strength (Crushing Characteristics)</i>	<i>Dilatancy (Reaction to Shaking)</i>	<i>Toughness (Consistency near PL)</i>		
	Silts and Clays Liquid limit is less than 50.	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	None to slight	Quick to slow	None	For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions. Give typical name, indicate degree and character or plasticity, amount and maximum size of coarse grains, color in wet conditions, odor (if any), local or geologic name, and other pertinent descriptive information, and symbol in parentheses. Example: <u>Clayey silt</u> , brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry and place; loess (ML).	
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Medium to high	None to very slow	Medium		
		OL	Organic silts and organic silty clays of low plasticity	Slight to medium	Slow	Slight		
	Soils and Clays Liquid limit is greater than 50.	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	Slight to medium	Slow to none	Slight to medium		
		CH	Inorganic clays of high plasticity, fat clays	High to very high	None	High		
		OH	Organic clays and silts of medium to high plasticity	Medium to high	None to very slow	Slight to medium		
Highly Organic Soils		Pt	Peat and other highly organic soils	Readily identified by color, odor, spongy feel and frequently by fibrous texture				