

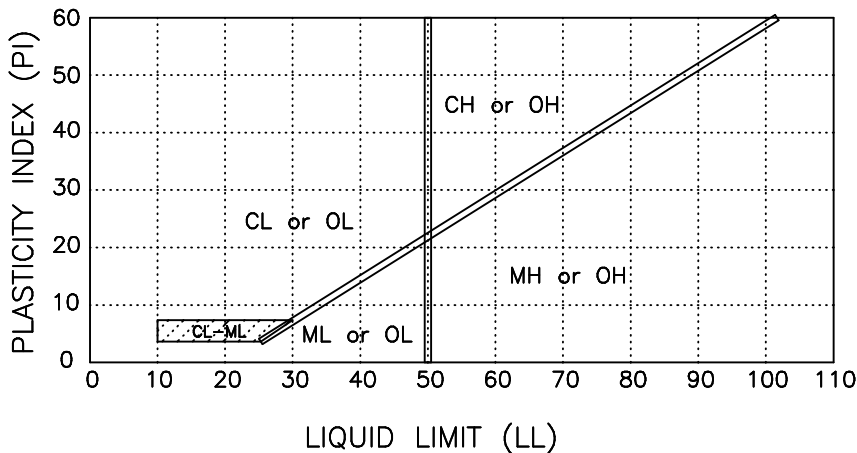
# UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the United Soil Classification System (USCS) on the boring logs presented in this report. Grain size analysis and Atterberg limits tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corps of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

MAJOR DIVISIONS		GROUP SYMBOL	TYPICAL NAMES		
<b>COARSE - GRAINED SOILS</b> (Less than 50% passes No. 200 sieve)	<b>GRAVELS</b> (50% or less of coarse fraction passes No. 4 sieve)	<b>CLEAN GRAVELS</b> (Less than 5% passes No. 200 sieve)		GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		<b>GRAVELS WITH FINES</b> (More than 12% passes No. 200 sieve)		GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
				GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures.		
	<b>SANDS</b> (More than 50% of coarse fraction passes No. 4 sieve)	<b>CLEAN SANDS</b> (Less than 5% passes No. 200 sieve)		SW	Well graded sands, gravelly sands.
		<b>SANDS WITH FINES</b> (More than 12% passes No. 200 sieve)		SP	Poorly graded sands, gravelly sands.
				SM	Silty sands, sand-silt mixtures.
		SC	Clayey sands, sand-clay mixtures.		
<b>FINE - GRAINED SOILS</b> (50% or more passes No. 200 sieve)	<b>SILTS</b> (Limits Plot Below "A" Line & hatched Zone on Plasticity Chart)	<b>SILTS OF LOW PLASTICITY</b> (Liquid Limit Less Than 50)		ML	Inorganic silts, non-plastic or slightly plastic.
		<b>SILTS OF HIGH PLASTICITY</b> (Liquid Limit More Than 50)		MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	<b>CLAYS</b> (Limits Plot Above "A" Line & hatched Zone on Plasticity Chart)	<b>CLAYS OF LOW PLASTICITY</b> (Liquid Limit Less Than 50)		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		<b>CLAYS OF HIGH PLASTICITY</b> (Liquid Limit More Than 50)		CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

**NOTE:**  
 Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with Atterberg limits plotting in the hatched zone on the plasticity chart shall have dual symbol. In Arizona, local streams contain sand, gravel & cobble type material, which are locally known as SGC or riverrun material. The USCS is not used to divide and symbolize this material.

## PLASTICITY CHART



## DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to 3/4 in.
Fine gravel	3/4 in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt & clay)	Below No. 200 sieve
Clay	Smaller than 2 microns
Colloid	Smaller than 5 microns