

UNIFIED SOIL CLASSIFICATION

MAJOR DIVISION	TYPE	LETTER SYMBOL	SYM BOL	TYPICAL NAMES	
COARSE GRAINED SOILS <small>More than half the material is larger than No. 200 sieve size</small>	GRAVEL <small>More than half of coarse fraction is larger than No. 4 sieve size</small>	CLEAN GRAVEL <small>(Little or no fines)</small>	GW	GRAVEL, Well Graded, gravel-sand mixtures, little or no fines	
			GP	GRAVEL, Poorly Graded, gravel-sand mixtures, little or no fines	
		GRAVEL WITH FINES <small>(Inappreciable amount of fines)</small>	GM	SILTY GRAVEL, gravel-sand-silt mixtures	
			GC	CLAYEY GRAVEL, gravel-sand-clay mixtures	
	SAND <small>More than half of coarse fraction is larger than No. 4 sieve size</small>	CLEAN SAND <small>(Little or no fines)</small>	SW	SAND, Well Graded, gravelly sands	
			SP	SAND, Poorly Graded, gravelly sands	
		SAND WITH FINES <small>(Inappreciable amount of fines)</small>	SM	SILTY SAND, sand-silt mixtures	
			SC	CLAYEY SAND, sand-clay mixtures	
		FINE GRAINED SOILS <small>More than half the material is smaller than No. 200 sieve size</small>	SILTS AND CLAYS <small>(Liquid Limit < 50)</small>	ML	SILT & very fine sand, silty or clayey fine sand or clayey silt with slight plasticity
				CL	LEAN CLAY; Sandy Clay; Silty Clay; of low to medium plasticity
OL	ORGANIC SILTS, and organic silty clays of low plasticity				
SILTS AND CLAYS <small>(Liquid Limit > 50)</small>	MH		SILT, fine sandy or silty soil with high plasticity		
	CH		FAT CLAY, inorganic clay of high plasticity		
	OH		ORGANIC CLAYS of medium to high plasticity, organic silts		
HIGHLY ORGANIC SOILS		Pt	PEAT, and other highly organic soil		
WOOD		Wd	WOOD		
MIXED SAMPLE		VM	Variable mixed silts, clays and sands		
NO SAMPLE					

NOTE: Soils possessing characteristics of two groups are designated by combinations of group symbols.

DESCRIPTIVE SYMBOL

COLOR		CONSISTENCY FOR COHESIVE SOILS			MODIFICATIONS	
COLOR	SYMBOL	CONSISTENCY	COHESION IN LBS./SQ. FT. FROM UNCONFINED COMPRESSION TEST	SYMBOL	MODIFICATION	SYMBOL
TAN	T	VERY SOFT	< 250	vSo	Traces	Tr -
YELLOW	Y	SOFT	250 - 500	So	Fine	F
RED	R	MEDIUM	500 - 1000	M	Medium	M
BLACK	BK	STIFF	1000 - 2000	St	Coarse	C
GRAY	Gr	VERY STIFF	2000 - 4000	vSt	Concretions	cc
LIGHT GRAY	lGr	HARD	> 4000	H	Rootlets	rT
DARK GRAY	dGr				Lignite fragments	lo
BROWN	Br				Shale fragments	sh
LIGHT BROWN	lBr				Sandstone fragments	sds
DARK BROWN	dBr				Shell fragments	sif
BROWNISH - GRAY	brGr				Organic matter	O
GRAYISH - BROWN	grBr				Clay strata or lenses	CS
GREENISH - GRAY	gnGr				Silt strata or lenses	SIS
GRAYISH - GREEN	grGn				Sand strata or lenses	SS
GREEN	Gn				Sandy	S
BLUE	Bl				Gravelly	G
BLUE - GREEN	BlGn				Boulders	B
WHITE	Wh				Stickensides	SL
MOTTLED	Not				Wood	Wd
					Oxidized	Ox
					Saturated	sat
					Lumps of Clay	Clo

PI - PLASTICITY INDEX

LL - LIQUID LIMIT

PLASTICITY CHART

For classification of fine-grained soils

NOTES:

FIGURES TO THE LEFT OF BORING UNDER COLUMN "W OR D₁₀"
Are natural water contents in percent dry weight
When underlined denotes D ₁₀ size in mm *
FIGURES TO THE LEFT OF BORING UNDER COLUMNS "LL" AND "PL"
Are liquid and plastic limits, respectively
SYMBOLS TO THE LEFT OF BORING
∇ Ground water surface and date observed
⊙ Denotes location of consolidation test * *
⊕ Denotes location of consolidation - drained direct shear test * *
⊖ Denotes location of consolidation - undrained triaxial compression test *
⊗ Denotes location of unconsolidated - undrained triaxial compression test
⊙ Denotes location of sample subjected to consolidation test and each of the above three types of shear tests * *
FW Denotes free water encountered in boring or sample
○ Denotes channel grade
FIGURES TO THE RIGHT OF BORING
Are values of cohesion in lbs./sq. ft. from unconfined compression tests
In parenthesis are driving resistances in blows per foot determined with a standard split spoon sampler (1 1/8" I.D. 2" O.D.) and a 140 lb. driving hammer with a 30" drop
Where underlined with a solid line denotes laboratory permeability in centimeters per second of undisturbed sample
Where underlined with a dashed line denotes laboratory permeability in centimeters per second of sample remolded to the estimated natural void ratio

* The D₁₀ size of a soil is the grain diameter in millimeters of which 10% of the soil is finer, and 90% coarser than size D₁₀.

* * Results of these tests are available for inspection in the U. S. Army Engineer District Office if these symbols appear beside the boring logs on the drawings.

GENERAL NOTES:

While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local variations characteristic of subsurface materials of the region are anticipated and if encountered, such variations will not be considered as differing materially within purview of the contract clause entitled, "Differing Site Conditions".

Ground water elevations shown on boring logs represent ground water surfaces encountered in such borings on the dates shown. Absence of water surface data on certain borings indicates that no ground water data are available from the borings but does not necessarily mean that ground water will not be encountered at the locations or within the vertical reaches of such borings.

Consistency of cohesive soils shown on the boring logs is based on driller's log and visual examination and is approximate, except within those vertical reaches of the borings where shear strengths from unconfined compression tests are shown.

STANDARD BORING LEGEND

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS