

Appendix 4.4 – Unified Soil Classification Chart

Appendix 4.4

UNIFIED SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION									
FIELD IDENTIFICATION PROCEDURES			GROUP SYMBOLS		TYPICAL NAMES		INFORMATION REQUIRED FOR DESCRIBING SOILS		
<p>(Excluding particles larger than 3 inches and testing fractions on estimated weights)</p> <p>Wide range in grain size and substantial amounts of intermediate particle sizes</p> <p>Predominantly one size or a range of sizes with some intermediate sizes missing</p> <p>Two plastic fines (for identification procedures see CL below)</p> <p>Plastic fines (for identification procedures see CL below)</p> <p>Wide range in grain sizes and substantial amounts of all intermediate particle sizes</p> <p>Predominantly one size or a range of sizes with some intermediate sizes missing</p> <p>Non-plastic fines (for identification procedures see ML below)</p> <p>Plastic fines (for identification procedures see CL below)</p>			GW, GP, GM, GC, SW, SP, SM, SC		Well graded gravels, gravel-sand mixtures, silty and fine; Poorly graded gravels, gravel-sand mixtures, little or no fines; Silty gravels, poorly graded gravel-sand mixtures; Clayey gravels, poorly graded gravel-sand-clay mixtures; Well graded sands, gravelly sands, little or no fines; Poorly graded sands, gravelly sands, little or no fines; Silty sands, poorly graded sand-silt mixtures; Clayey sands, poorly graded sand-clay mixtures		<p>Give typical name, indicate appropriate type of soil, plasticity, amount and maximum size of coarse grains, color, moist or dry strength, permeability, descriptive information, and symbol in parentheses.</p> <p>For undisturbed soils add information on structure, stratification, degree of compaction, cementation, moisture conditions and drainage characteristics.</p> <p>EXAMPLE: Silty sand, gravelly, about 20% hard angular gravel particles, in 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, gravelly sand, (SU).</p>		
<p>(The No. 200 sieve size is about the smallest particle visible to the naked eye)</p> <p>More than half of material is larger than No. 200 sieve size</p> <p>More than half of material is finer than No. 200 sieve size</p> <p>More than half of coarse fraction is finer than No. 4 sieve size</p> <p>(For visual classification, the size may be used as equivalent to the No. 4 sieve size)</p>			ML, CL, OL, MH, CH, OH		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity; Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays; Organic silts and organic silt-clays of low plasticity; Inorganic silty, micaceous or aluminaceous fine sandy or silty soils, elastic silts; Inorganic clays of high plasticity, fat clays; Organic clays of medium to high plasticity		<p>Use grain size curve in identifying the fraction given under this identification.</p> <p>Determine percentage of gravel and sand from grain size curve depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse gravel (fraction smaller than No. 4 sieve size) or fine gravel (fraction smaller than No. 40 sieve size).</p> <p>Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, color in wet condition, odor, if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses.</p> <p>For undisturbed soils add information on structure, stratification, consistency, moisture and drainage conditions.</p> <p>EXAMPLE: Clayey silt, brown, slightly plastic, 20% non-plastic fines, 10% fines, 70% clay, firm and dry in place, (SC).</p>		
<p>(The No. 200 sieve size is about the smallest particle visible to the naked eye)</p> <p>More than half of material is larger than No. 200 sieve size</p> <p>More than half of material is finer than No. 200 sieve size</p> <p>More than half of coarse fraction is smaller than No. 4 sieve size</p> <p>(For visual classification, the size may be used as equivalent to the No. 4 sieve size)</p>			PT		Peat and other highly organic soils		<p>Use grain size curve in identifying the fraction given under this identification.</p> <p>Determine percentage of gravel and sand from grain size curve depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse gravel (fraction smaller than No. 4 sieve size) or fine gravel (fraction smaller than No. 40 sieve size).</p> <p>Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, color in wet condition, odor, if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses.</p> <p>For undisturbed soils add information on structure, stratification, consistency, moisture and drainage conditions.</p> <p>EXAMPLE: Clayey silt, brown, slightly plastic, 20% non-plastic fines, 10% fines, 70% clay, firm and dry in place, (SC).</p>		

