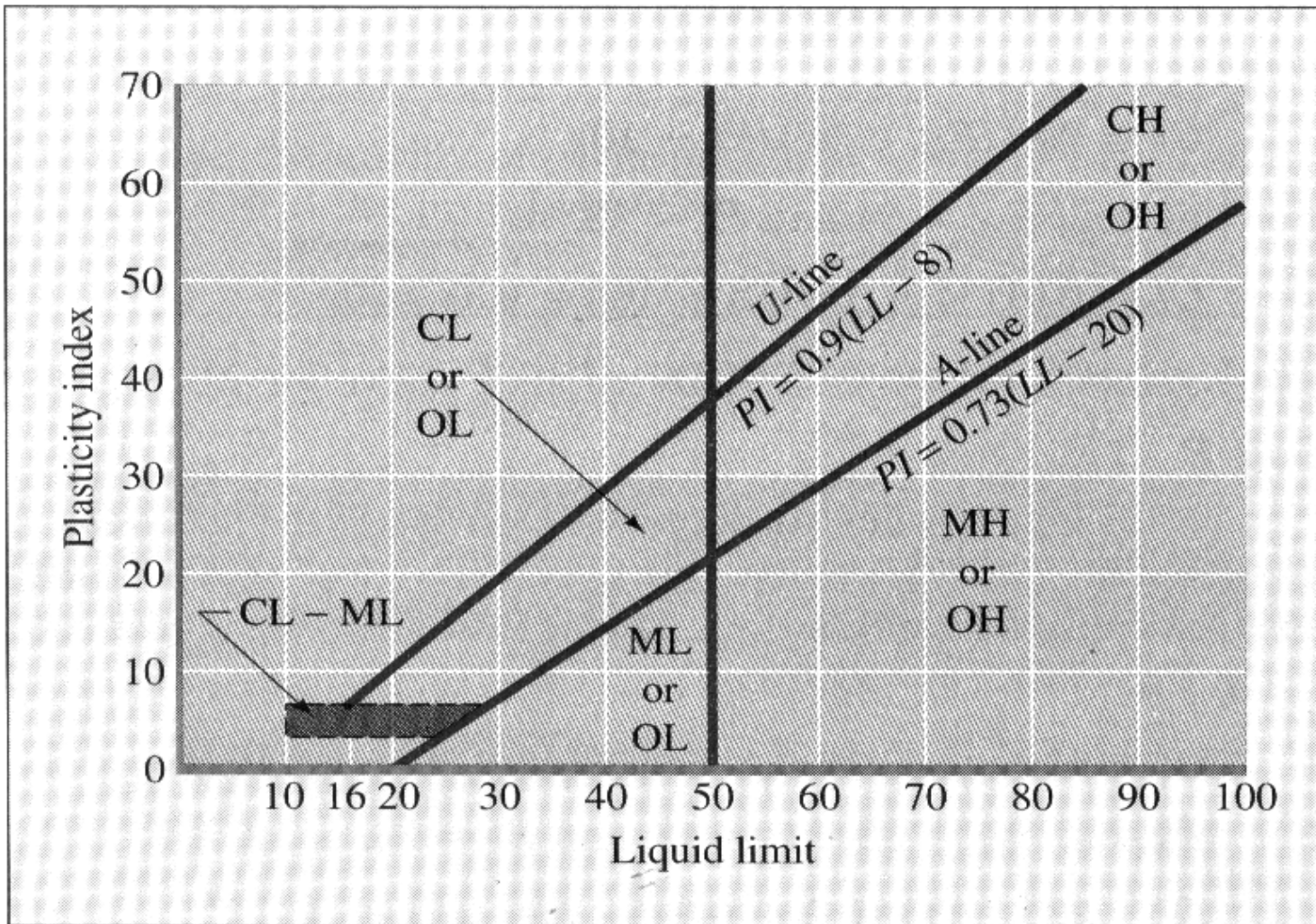


ตารางที่ใช้ในเรื่อง Soil classification



ຮູບທີ່ 3.1 Plasticity chart

Group symbol	Criteria
GW	Less than 5% passing No. 200 sieve; $C_u = D_{60}/D_{10}$ greater than or equal to 4; $C_c = (D_{30})^2/(D_{10} \times D_{60})$ between 1 and 3
GP	Less than 5% passing No. 200 sieve; not meeting both criteria for GW
GM	More than 12% passing No. 200 sieve; Atterberg limits plot below A-line (Figure 3.3) or $PI < 4$
GC	More than 12% passing No. 200 sieve; Atterberg limits plot above A-line (Figure 3.3); $PI > 7$
GC-GM	More than 12% passing No. 200 sieve; Atterberg limits fall in hatched area marked CI-ML in Figure 3.3
GW-GM	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for GW and GM
GW-GC	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for GW and GC
GP-GM	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for GP and GM
GP-GC	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for GP and GC

Note: See Eq. (3.3) for the definition of R_{200} and Eq. (3.4) for the definition of R_4 .

ตารางที่ 3.1 Group symbols for gravelly soil ($R_{200} > 50; R_4/R_{200} > 0.5$)

Group symbol	Criteria
SW	Less than 5% passing No. 200 sieve; $C_u = D_{60}/D_{10}$ greater than or equal to 6; $C_c = (D_{30})^2 / (D_{10} \times D_{60})$ between 1 and 3
SP	Less than 5% passing No. 200 sieve; not meeting both criteria for SW
SM	More than 12% passing No. 200 sieve; Atterberg limits plot below A-line (Figure 3.3) or $PI < 4$
SC	More than 12% passing No. 200 sieve; Atterberg limits plot above A-line (Figure 3.3); $PI > 7$
SC-SM	More than 12% passing No. 200 sieve; Atterberg limits fall in hatched area marked CL-ML in Figure 3.3
SW-SM	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for SW and SM
SW-SC	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for SW and SC
SP-SM	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for SP and SM
SP-SC	Percentage passing No. 200 sieve is 5 to 12; meets the criteria for SP and SC

ตารางที่ 3.2 Group symbols for sandy soil ($R_{200} > 50; R_4/R_{200} < 0.5$ or = 0.5)

Group symbol	Criteria
CL	Inorganic; $LL < 50$; $PI > 7$; Atterberg limits plot on or above <i>A</i> -line (see CL zone in Figure 3.3)
ML	Inorganic; $LL < 50$; $PI < 4$ or Atterberg limits plot below <i>A</i> -line (see ML zone in Figure 3.3)
OL	Organic; $(LL - \text{oven-dried}) / (LL - \text{not dried}) < 0.75$; $LL < 50$ (see OL zone in Figure 3.3)
CH	Inorganic; $LL \geq 50$; Atterberg limits plot on or above <i>A</i> -line (see CH zone in Figure 3.3)
MH	Inorganic; $LL \geq 50$; Atterberg limits plot below <i>A</i> -line (see MH zone in Figure 3.3)
OH	Organic; $(LL - \text{oven-dried}) / (LL - \text{not dried}) < 0.75$; $LL \geq 50$ (see OH zone in Figure 3.3)
CL-ML	Inorganic; Atterberg limits plot in the hatched zone in Figure 3.3
Pt	Peat, muck, and other highly organic soils

ตารางที่ 3.3 Group symbols for silty and clayey soils ($R_{200} < 50$ or $= 50$)

Group symbol	Criteria for group name: GF^a	Group name
SW	<15	Well-graded sand
	≥ 15	Well-graded sand with gravel
SP	<15	Poorly graded sand
	≥ 15	Poorly graded sand with gravel
SM	<15	Silty sand
	≥ 15	Silty sand with gravel
SC	<15	Clayey sand
	≥ 15	Clayey sand with gravel
SC-SM	<15	Silty, clayey sand
	≥ 15	Silty, clayey sand with gravel
SW-SM	<15	Well-graded sand with silt
	≥ 15	Well-graded sand with silt and gravel
SW-SC	<15	Well-graded sand with clay
	≥ 15	Well-graded sand with clay and gravel
SP-SM	<15	Poorly graded sand with silt
	≥ 15	Poorly graded sand with silt and gravel
SP-SC	<15	Poorly graded sand with clay
	≥ 15	Poorly graded sand with clay and gravel

* Based on ASTM D-2487
^a GF = gravel fraction = R_4

ตารางที่ 3.5 Group names for sandy soil

Group symbol	Criteria for group name				Group name
	R_{200}	SF/GF	GF	SF	
CL	<15	—	—	—	Lean clay
	15–29	≥ 1	—	—	Lean clay with sand
		<1	—	—	Lean clay with gravel
	≥ 30	≥ 1	<15	—	Sandy lean clay
		≥ 1	≥ 15	—	Sandy lean clay with gravel
		<1	—	<15	Gravelly lean clay
<1		—	≥ 15	Gravelly lean clay with sand	
ML	<15	—	—	—	Silt
	15–29	≥ 1	—	—	Silt with sand
		<1	—	—	Silt with gravel
	≥ 30	≥ 1	<15	—	Sandy silt
		≥ 1	≥ 15	—	Sandy silt with gravel
		<1	—	<15	Gravelly silt
<1		—	≥ 15	Gravelly silt with sand	
CL-ML	<15	—	—	—	Silty clay
	15–29	≥ 1	—	—	Silty clay with sand
		<1	—	—	Silty clay with gravel
	≥ 30	≥ 1	<15	—	Sandy silty clay
		≥ 1	≥ 15	—	Sandy silty clay with gravel
		<1	—	<15	Gravelly silty clay
<1		—	≥ 15	Gravelly silty clay with sand	
CH	<15	—	—	—	Fat clay
	15–29	≥ 1	—	—	Fat clay with sand
		<1	—	—	Fat clay with gravel
	≥ 30	≥ 1	<15	—	Sandy fat clay
		≥ 1	≥ 15	—	Sandy fat clay with gravel
		<1	—	<15	Gravelly fat clay
<1		—	≥ 15	Gravelly fat clay with sand	
MH	<15	—	—	—	Elastic silt
	15–29	≥ 1	—	—	Elastic silt with sand
		<1	—	—	Elastic silt with gravel
	≥ 30	≥ 1	<15	—	Sandy elastic silt
		≥ 1	≥ 15	—	Sandy elastic silt with gravel
		<1	—	<15	Gravelly elastic silt
<1		—	≥ 15	Gravelly elastic silt with sand	

* Based on ASTM D-2487

ตารางที่ 3.6 Group names for fine-grained inorganic soil

Group symbol	Criteria for group name					Group name
	Plasticity index	R_{200}	SF/GF	GF	SF	
OL	$PI_{NOD} \geq 4$ and $PI_{NOD} \geq 0.73 \times$ $(LL_{NOD} - 20)$	<15	—	—	—	Organic clay
		15–29	≥ 1	—	—	Organic clay with sand
			<1	—	—	Organic clay with gravel
		≥ 30	≥ 1	<15	—	Sandy organic clay
			≥ 1	≥ 15	—	Sandy organic clay with gravel
			<1	<15	<15	Gravelly organic clay
			<1	<1	≥ 15	Gravelly organic clay with sand
OL	$PI_{NOD} < 4$ and $PI_{NOD} < 0.73 \times$ $(LL_{NOD} - 20)$	<15	—	—	—	Organic silt
		15–29	≥ 1	—	—	Organic silt with sand
			<1	—	—	Organic silt with gravel
		≥ 30	≥ 1	<15	—	Sandy organic silt
			≥ 1	≥ 15	—	Sandy organic silt with gravel
			<1	<15	<15	Gravelly organic silt
			<1	<1	≥ 15	Gravelly organic silt with sand
OH	$PI_{NOD} \geq 0.73 \times$ $(LL_{NOD} - 20)$	<15	—	—	—	Organic clay
		15–29	≥ 1	—	—	Organic clay with sand
			<1	—	—	Organic clay with gravel
		≥ 30	≥ 1	<15	—	Sandy organic clay
			≥ 1	≥ 15	—	Sandy organic clay with gravel
			<1	<15	<15	Gravelly organic clay
			<1	<1	≥ 15	Gravelly organic clay with sand
OH	$PI_{NOD} < 0.73 \times$ $(LL_{NOD} - 20)$	<15	—	—	—	Organic silt
		15–29	≥ 1	—	—	Organic silt with sand
			<1	—	—	Organic silt with gravel
		≥ 30	≥ 1	<15	—	Sandy organic silt
			≥ 1	≥ 15	—	Sandy organic silt with gravel
			<1	<15	<15	Gravelly organic silt
			<1	<1	≥ 15	Gravelly organic silt with sand

* Based on ASTM D-2487

Note: The subscript NOD means "not oven-dried."

ตารางที่ 3.7 Group names for fine-grained organic soil