bers of each group having similar load bearing values and engineering characteristics under normal service conditions. The overall quality as a subgrade material decreases with increasing classification number; however, this is not true for all service conditions. Groups A-1 to A-3 soils possess in the densified state an effective granular skeleton formed of sand-size and larger grains. Group A-4 to A-7 soils possess no such bearing skeleton and their engineering behavior is governed essentially by the amount and water affinity of its silt-clay components (−200 sieve fraction). The A-2 group is subdivided into A-2-4 to A-2-7 subgroups; the last number identifying the type of −200 sieve fraction present.

The classification is based on the results of sieve tests employing sieves Nos. 200, 40, 10 and/or larger openings where indicated, and of consistency tests (liquid limit and plasticity index) performed on the fraction passing the No. 40 sieve. Differentiation between the quality within a certain group is made by the group index (GI) which is calculated as follows:

$$GI = (F - 35)\,[0.2 + 0.005(LL - 40)] + 0.01(F - 15)(PI - 10) \qquad (2.6)$$

where F is the percent passing the No. 200 sieve, LL is the liquid limit, in percent, and PI is the plasticity index, also in percent. The group index is given in parentheses after the soil group, e.g., A-6(7).

General quality of subgrade soil as indicated by the group index:

Excellent	A-1-a (0) soils
Good	(0–1)
Fair	(2–4)
Poor	(5–9)
Very poor	(10–20)

The AASHO subgrade soil classification is shown in Table 2.14; Figs. 2.8 and 2.9 give charts for graphical determination of the group index.

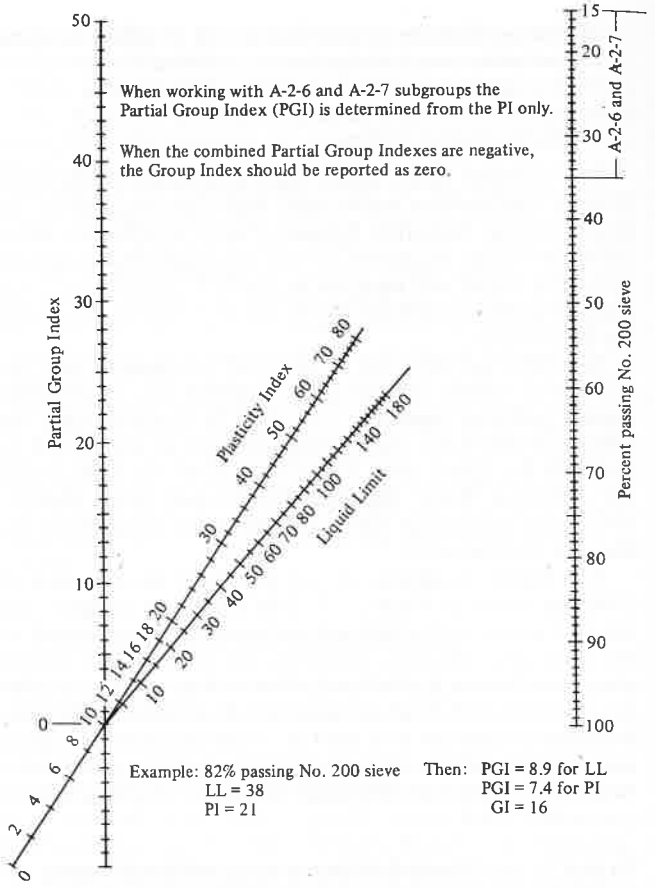

Fig. 2.8 Group index chart. (After PCA, 1971.)

3. Federal Aviation Agency (FAA) Classification

This classification was originally based on mechanical analysis, plasticity characteristics, expansive qualities, and California bearing ratio. It included evaluation of the quality

TABLE 2.14 CLASSIFICATION OF SOILS AND SOIL-AGGREGATE MIXTURES. (AASHO 1970; after PCA 1971.)

General classification	Granular Materials (35% or Less Passing No. 200)							Silt-Clay Materials (More than 35% Passing No. 200)			
	A-1			A-2							A-7
Group classification	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7-5, A-7-6
Sieve analysis, percent passing:											
No. 10	50 max	—	—	—	—	—	—	—	—	—	—
No. 40	30 max.	50 max.	51 min.	—	—	—	—	—	—	—	—
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.	36 min.	36 min.	36 min.
Characteristics of fraction passing No. 40:											
Liquid limit	—		—	40 max.	41 min.	40 max.	41 min.	40 max.	41 min.	40 max.	41 min.
Plasticity index	6 max.		N.P.	10 max.	10 max.	11 min.	11 min.	10 max.	10 max.	11 min.	11 min.*
Usual types of significant constituent materials	Stone fragments, gravel and sand		Fine sand	Silty or clayey gravel and sand				Silty soils		Clayey soils	
General rating as subgrade	Excellent to good							Fair to poor			

*Plasticity index of A-7-5 subgroup is equal to or less than L.L. minus 30. Plasticity index of A-7-6 subgroup is greater than L.L. minus 30.