(4) Soil Categories: Residual, Transported

(Ref : Essential of Soil Mechanics and Foundations, David F. McCarthy,, pp. 6-19)

- Soils can be grouped into two broad categories depending on the method of deposition. — Residual soil
  — Transported soil

- **Residual soils**

  - Have formed from mostly the weathering of rock and remain at the location of their origin.
  - Weathering process may be attributed to mechanical weathering, chemical weathering and biological weathering.
  - Residual soils can include particles having a wide range of sizes, shapes, and composition depending upon the amount and type of weathering and the minerals in the parent rock.
  - The rate of weathering is generally greater in warm, humid regions than in cool, dry regions.
  - A profile of residual material lying above the unweathered rock

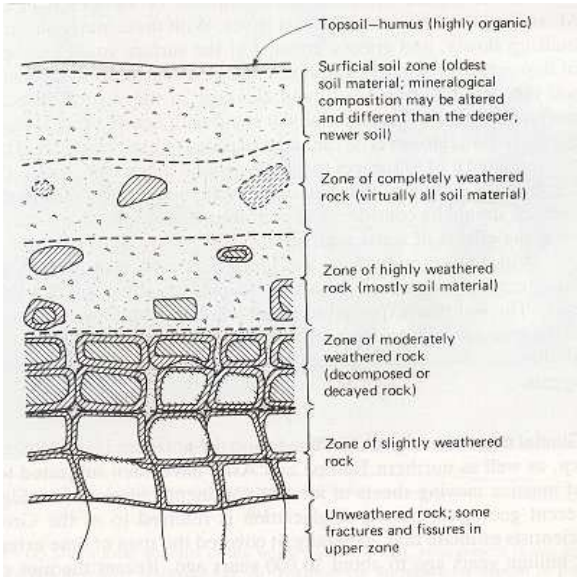

Fig 1-1. Profile for residual soil area, indicating stages of transition from rock to soil

- Index properties of weathered residual soils in Korea
  i. % finer than #200 sieve : mostly 5 – 20 %
  ii. Soil classification(USCS) : SM, SP

- Transported soils

  - Transported soils are those materials that have been moved from their place of origin, by gravity, wind, water, glaciers, or human activity – either singularly or in combination.
  - The method of transportation and deposition has great effect on the properties of the resulting soil mass.

① Gravity and wind transported soils

  - Gravity : transporting aggregate particles only limited distance, such as down a hill or mountain slope.
  - Dunes : wind deposited sands on the beach and the desert areas
  - Loess : wind-blown silts, slowly built up with rootholes and grass channels. If the soil is exposed to excessive water or is subjected to severe ground vibration, the soil's stable structure can be broken down.

② Glacial deposits

  - Deposited by or because of glacial action.
  - Glacial till : Debris aggregated and deposited directly by glacier ice without disaggregation by other agencies, such as melt water.
  - Various soil types resulting from built-up environments exist. (Outwash, Moraine, Glaciofluvial deposits et al)

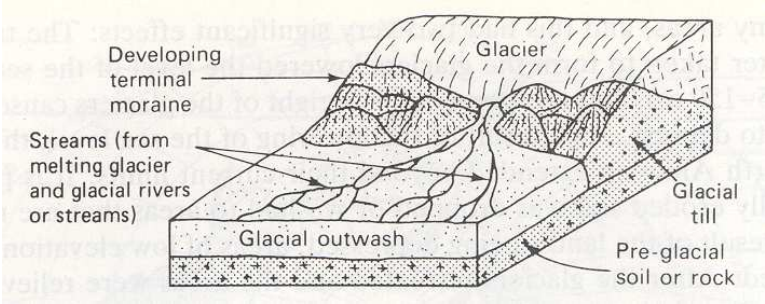

Fig 1-2. The development of a terminal moraine and outwash plain in front of a glacier

③ River deposits

- Are segregated according to particle size.
- Alluvial deposits : all soils carried and deposited by rivers.
- Alluvial fans : triangular-shaped coarse soil deposits at locations where a heavily loaded natural river broadened or encountered flatter terrain so that its velocity decreased.
- Natural levees : gravel and sand particles in the vicinity of the bank
- Floodplain deposits : the fine-grained soils at the broad lowland areas

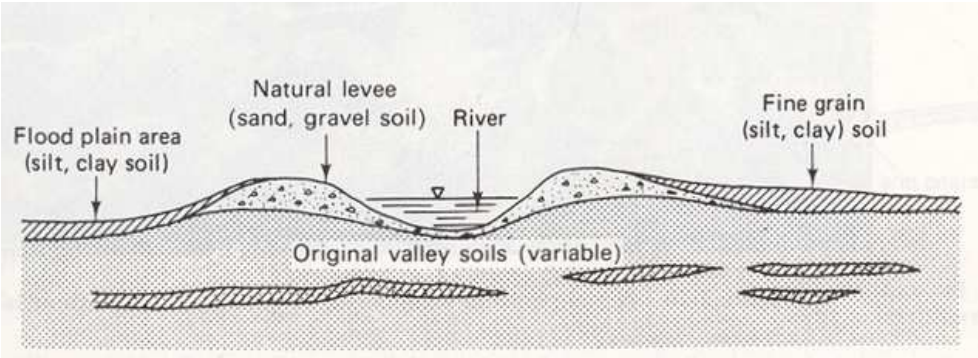

Fig 1-3. Cross-section of flood plain deposit

- Note: Soft soils in Korea

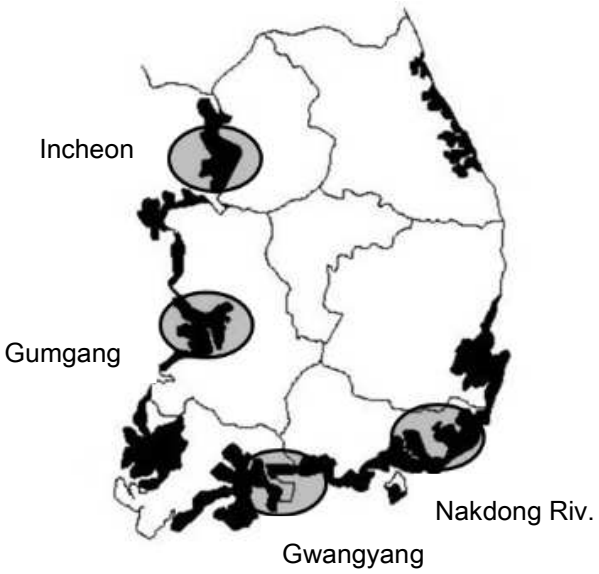

Fig 1-4. Locations of soft soils in Korea(Cheong, Cheol-ho, 1990)

Table 1-1. Mechanical properties of soft soils in Korea

	Nakdong Riv.	Gwangyang	Gum Riv.	Incheon (Songdo)
Thickness	20~40.9(28.2)	8.0~28.5(21.0)	6.5~32.5(18.2)	8.2~31.4(19.7)
PI(%)	25.01~42.67(27.9)	20.5~63.1(40.0)	6.8~32.7(15.4)	3.9~27.1(13.3)
W_n(%)	38.17~58.29(42.9)	45.4~90.5(67.7)	21.2~53.4(32.2)	21.6~40.8(31.2)
% finer than #200	84.1	89	74.2	85
USCS	CH, CL, ML	CH, CL	CH, CL, ML	CL, ML
OCR*	0.78~1.25(0.95)	0.43~0.98(0.54)	0.42~0.96(0.69)	0.56~2.41(0.90)
C_c	0.51~0.71(0.62)	0.67~1.26(0.86)	0.13~0.52(0.33)	0.09~0.36(0.29)
S_u(kg/cm^2)	0.30~0.64(0.35)	0.06~0.49(0.31)	0.072~0.489(0.33)	0.21~0.50(0.35)

* Estimated value right after reclamation of the fill