Properties of Aquifers - Chapter 2

Grain Size Distribution Silt, Fine to Medium Sand

$$C_u = \frac{d_{60}}{d_{10}}$$

$d_{60} \approx 0.15$ mm $d_{10} \approx 0.015$ mm

$\therefore C_u \approx 10 > 6$ ~ poorly sorted

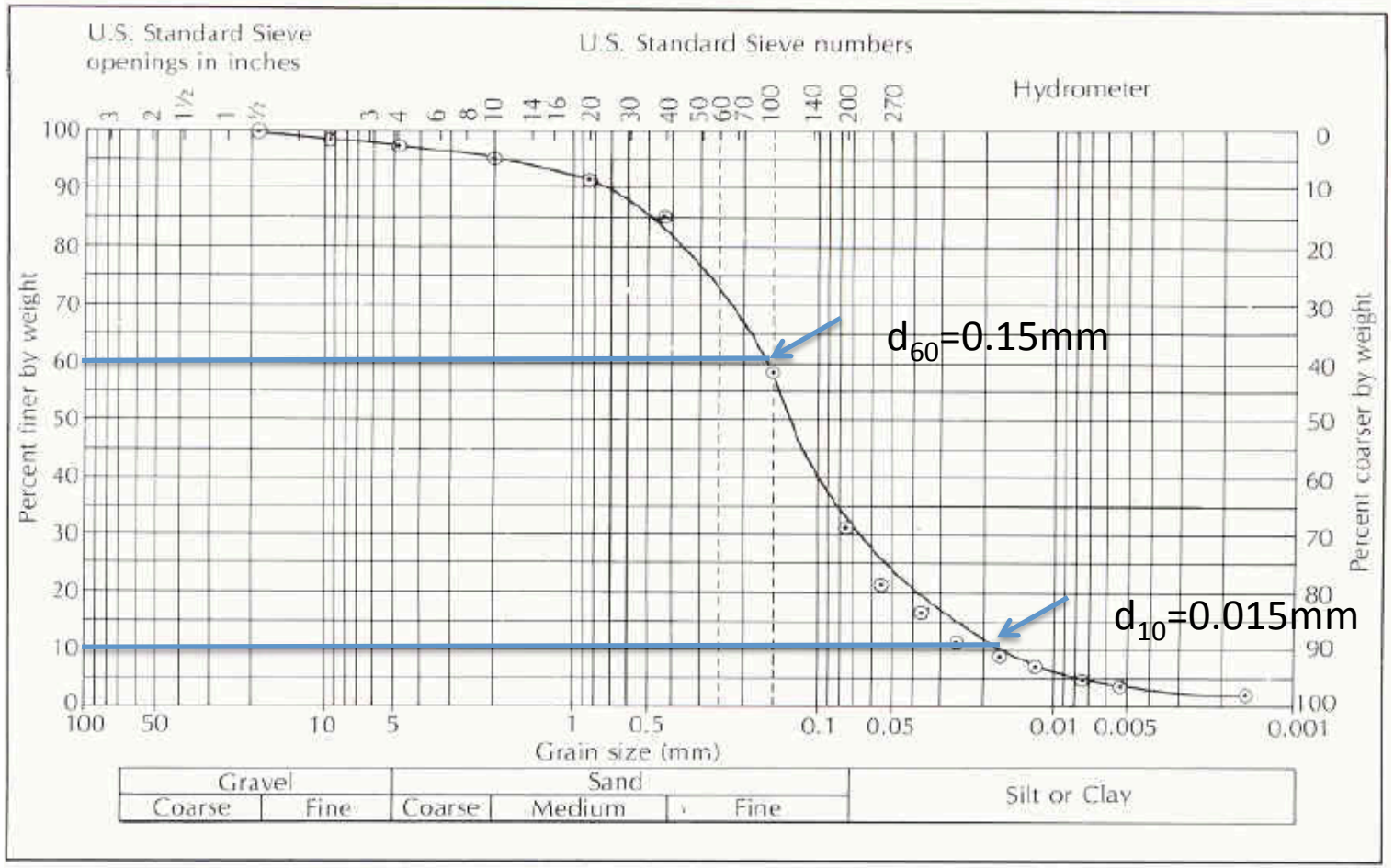
Grain Size Distribution fine sand

$d_{60} = 0.2$ mm $d_{10} = 0.15$ mm

$C_u = \frac{2}{1.5} \approx 1.33 < 4 \Rightarrow$ well sorted

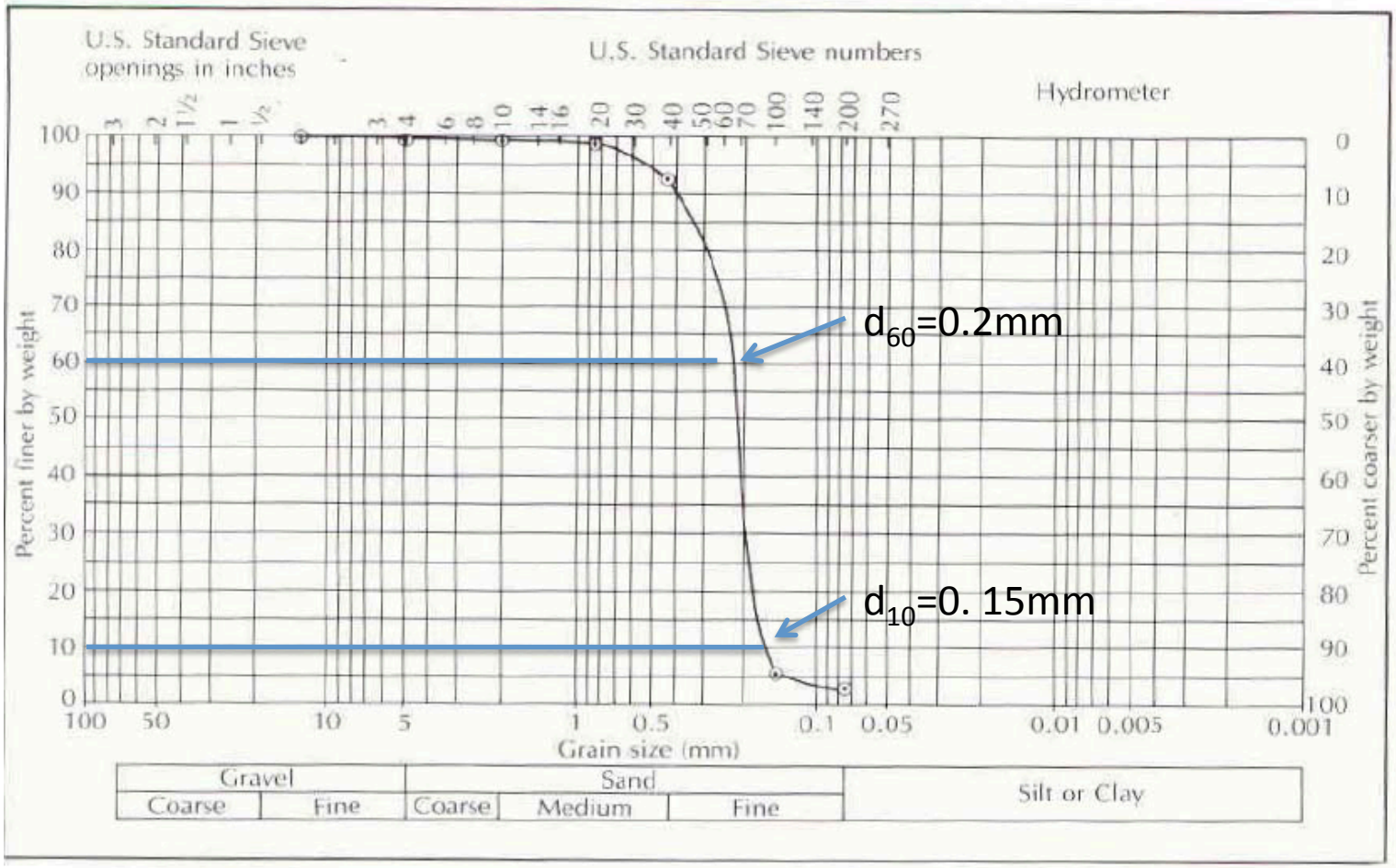
See following 2 pages for pictures

Typical GSD



GSD of silty fine to medium sand – What is C_U

Typical GSD



GSD of fine sand – What is C_U

Darcy's Law Tensor

$$\underline{\underline{K}} = \begin{bmatrix} 4 & 3 \\ 3 & 2 \end{bmatrix} \times 10^{-4} \ m/s$$

$$\nabla h = \begin{pmatrix} 1.3 \\ -2.1 \end{pmatrix} \times 10^{-3}$$

notice that I have enforced the minus here

$$\underset{\sim}{q} = -\underline{\underline{K}} \nabla h = \begin{pmatrix} 4 & 3 \\ 3 & 2 \end{pmatrix} \begin{pmatrix} -1.3 \\ 2.1 \end{pmatrix} \times 10^{-7} \ m/s$$

$$= \begin{pmatrix} 4(-1.3) + 3(2.1) \\ 3(-1.3) + 2(2.1) \end{pmatrix} \times 10^{-7} \ m/s$$

$$= \begin{pmatrix} 1.1 \\ 0.3 \end{pmatrix} \times 10^{-7} \ m/s$$