

# Flow-Net Examples

## Example 1 Find water pressure on sheet pile wall

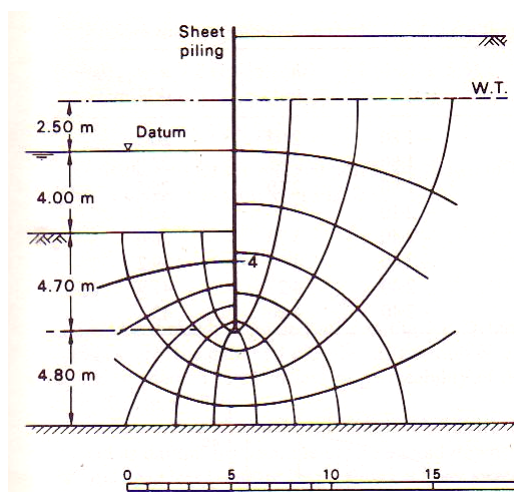
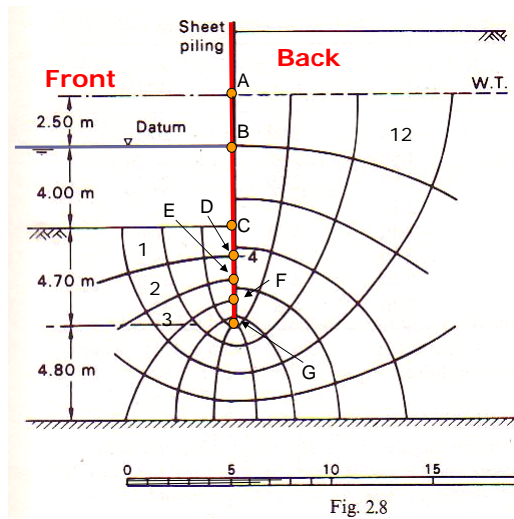


Fig. 2.8

## Example 1 Find water pressure on sheet pile wall



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$$\begin{aligned} \text{Total Head} &= 2.5 \text{ m} \\ \text{Nd} &= 12 \\ \text{dH} = \text{Total head}/\text{Nd} &= 0.20 \end{aligned}$$

Location	Elevation Head (m)	Back of Wall				Front of Wall				Net Water Pressure kPa
		nd	Total head (m)	Pressure head (3-1)	Water Pressure (kPa)	nd	Total head (m)	Pressure head (7-1)	Water Pressure (kPa)	
	1	2	3	4	5	6	7	8	9	10
A	2.5	12	2.5	0.00	0.00	0	0	0.00	0.00	0.00
B	0	11	2.3	2.29	22.48	0	0	0.00	0.00	22.48
C	-4.0	9.5	2.0	5.98	58.66	0	0.00	4.00	39.24	19.42
D	-5.5	8.8	1.8	7.33	71.94	1	0.21	5.71	56.00	15.94
E	-6.6	8.3	1.7	8.33	81.71	2	0.42	7.02	68.83	12.88
F	-7.8	7.6	1.6	9.38	92.05	3	0.63	8.43	82.65	9.40
G	-8.7	6	1.3	9.95	97.61	5	1.04	9.74	95.57	2.04

## Example 2 Find flow under dam

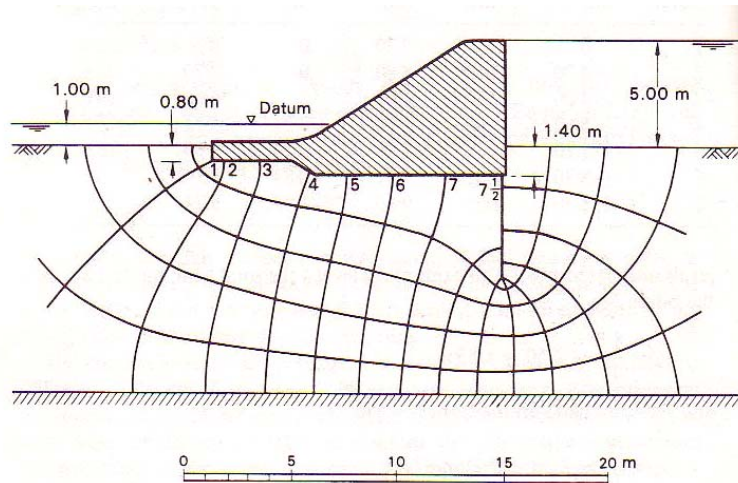


Fig. 2.9

## Example 2 Find flow under dam

### Example 2.2

The section through a dam is shown in Fig. 2.9. Determine the quantity of seepage under the dam and plot the distribution of uplift pressure on the base of the dam. The coefficient of permeability of the foundation soil is  $2.5 \times 10^{-5}$  m/s.

The flow net is shown in the figure. The downstream water level is selected as datum. Between the upstream and downstream equipotentials the total head loss is 4.00 m. In the flow net there are 4.7 flow channels and 15 equipotential drops. The seepage is given by:

$$q = kh \frac{N_f}{N_d} = 2.5 \times 10^{-5} \times 4.00 \times \frac{4.7}{15}$$

$$= 3.1 \times 10^{-5} \text{ m}^3/\text{s (per m)}$$

The pore water pressure is calculated at the points of intersection of the equipotentials with the base of the dam. The total head at each point is obtained from the flow net and the elevation head from the section. The calculations are shown in Table 2.3 and the pressure diagram is plotted in Fig. 2.9.

## Example 2 Find flow under dam

Point	$h$ (m)	$z$ (m)	$h - z$ (m)	$u = \gamma_w(h - z)$ (kN/m <sup>2</sup> )
1	0.27	-1.80	2.07	20.3
2	0.53	-1.80	2.33	22.9
3	0.80	-1.80	2.60	25.5
4	1.07	-2.10	3.17	31.1
5	1.33	-2.40	3.73	36.6
6	1.60	-2.40	4.00	39.2
7	1.87	-2.40	4.27	41.9
7 $\frac{1}{2}$	2.00	-2.40	4.40	43.1