Principals for lowering ground-water (NB! For more extensive informations see FOUNDATIONDESIGN AND CONSTRUCTION by MJ Tomlinson 7. edition page 481-516)

11.3 Methods of ground-water control

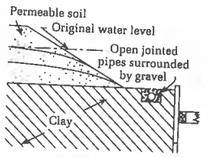
11.3.1 Effects of site and ground conditions

The following methods of ground-water control and associated geotechnical processes can be used in excavation work:

(1) Pumping from open sumps
(2) Pumping from wellpoints

(1)

11.3.2 Pumping from open sumps



Used if lowering is small and water flow is moderate

(2)

11.3.3 Pumping from wellpoints

A common used method, where lowering depth can become deep and water flow is moderate to high.

Principales in building pit with moderate depth:

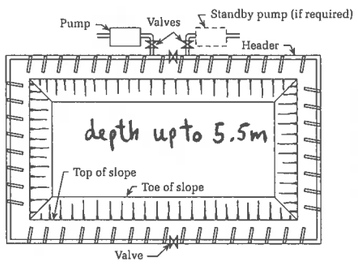


Figure 11.17 Single-stage wellpoint installation by the ring system.

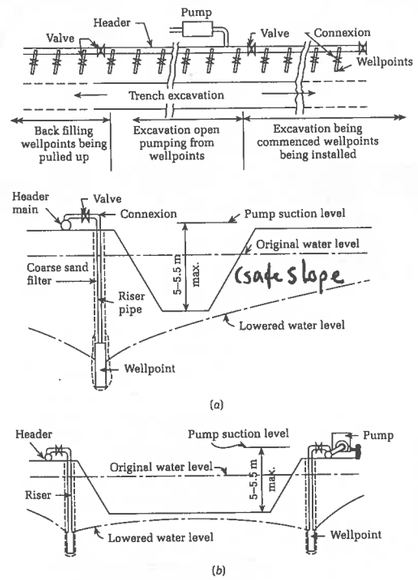
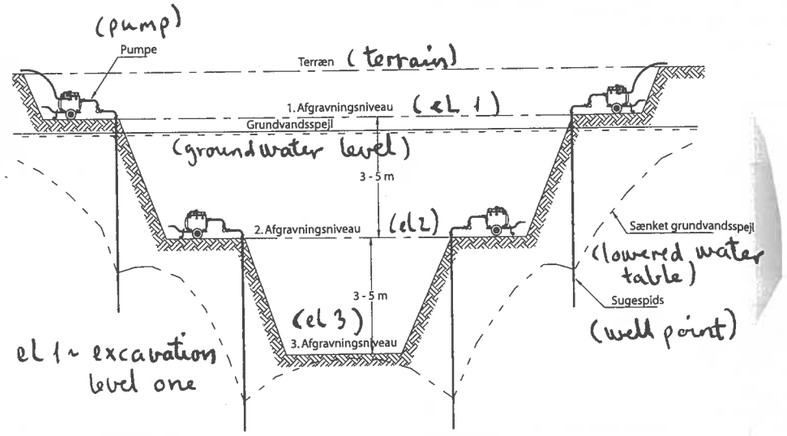


Figure 11.16 Single-stage wellpoint installation by the progressive system. (*a*) Wellpoints on one side of trench. (*b*) Wellpoints on both sides of wide excavation.

Principales in building pits with deep excavation



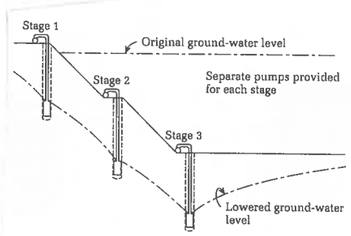


Figure 11.18 Three-stage wellpoint installation.

Two real case scenarios:

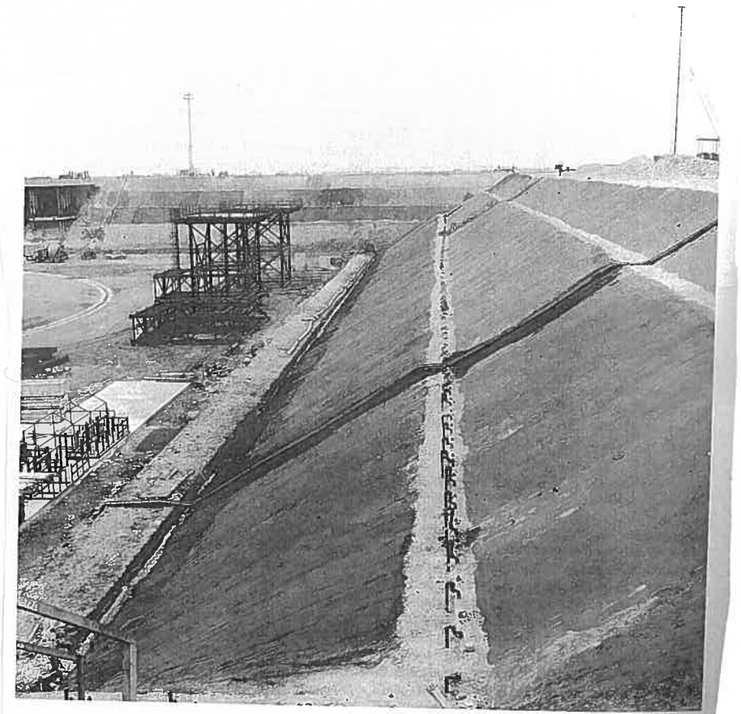
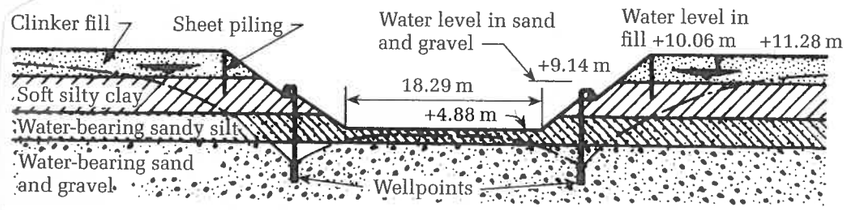


Figure 11.21 Wellpoint installation for the dry dock at Nigg, Scotland. (The upper stage has been removed, only the lower stage is working; note the garland drain at rockhead level.)



Wellpoint installation for intake pumphouse, Ferrybridge 'B' Power Station.