Summer School HYDRO 2024

Université de Lille

TP HYDROGEOLOGY

Flow Modeling and Seepage under a weir (dam) with PMWIN5.3

Overview of the problem

A dam is partially embedded in an unconfined aquifer. The aquifer is assumed to be homogeneneous

- thichness 9 m (Top : 9m ; bottom : 0 m)
- length of the dam base L = 13m,
- Depth embeddement p = 1m
- hydraulic conductivity =0.0005 m/s
- effective porosity =0.15

The boundary conditions are shown in the Fig. 1, the fixed head boundary at the upstream H = 12m (left) and the fixed head boundary at the downstream H = 10 m (right)

The aquifer bottom and the dam itself are modelled as no-flow boundaries

To compute the head distribution and the corresponding flowlines it is sufficient to consider vertical cross section of the aquifer with a uniform thickness of 1m

A- Calculate the flow and the flux through the aquifer for the cases:
   1. the aquifer is isotropic
   2. the aquifer us anisotropic with an anisotropy factor of 0.2

B- What we can place to protect/preserve the dam from the water pressure?
   a. Where?
   b. Various scenarios
   c. Which incidence?

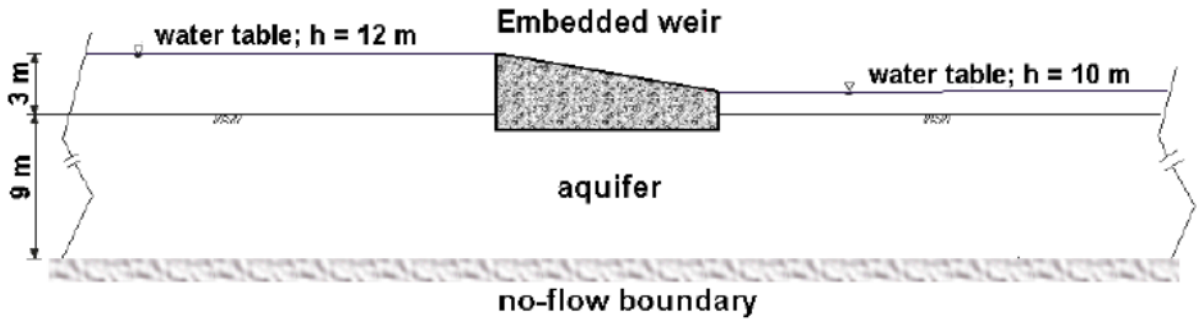

Fig.1 Problem description