

## **ABSTRACT**

This final project represents hydraulic head simulation of groundwater flow for one-dimensional system and two-dimensional system. Hydraulic head is the difference in groundwater level. Mathematical model steady-state groundwater flow used to predict hydraulic head. Numerical solution is calculated with finite element method. The result of hydraulic head simulation for one-dimensional validated with the exact solution. The system test result showed the smallest error on one-dimensional finite element method is 4.2%, with the number of elements is 199 elements and the number of nodes is 200 nodes. Simulation result for two-dimensional shows the distribution of hydraulic head which can indicate the direction of groundwater flow and the water quantity in ground.

*Keywords: groundwater flow, hydraulic head, finite element method, groundwater flow model, simulation.*