865082
Monte Carlo method for studying thermal conductivity and thermal anisotropy in aggregates
van Stone, L J
In: Research and Engineering Applications in Rock Masses (paper to the 26th US Symposium on Rock Mechanics, Rapid City, 26-28 June 1985) V2, P917-923. Publ Rotterdam: A. A. Balkema, 1985

Using a material model initially developed for composite materials, the Monte Carlo method has been used to study the thermal conductivity and thermal anisotropy of aggregates. This method is intended to substitute for three dimensional finite element analysis where there are time or financial constraints. Results are compared with other simulations.

Permeability and capillarity

See also: 865013, 865258

865083
Three dimensional unsteady seepage through an earth dam with accretion
Gupta, C S; Bruch, J C; Comincioli, V
Engng Comput V3, N1, March 1986, P2-10

A numerical solution is presented for the free boundary problem of three-dimensional transient seepage through an earth dam with accretion. An example problem of seepage caused by a sudden rise in water level on one side of the dam is solved. The effects of varying accretion, effective porosity and hydraulic conductivity are studied.

865084
Permeability testing in the triaxial cell
Carpenter, G W; Stephenson, R W
Geotech Test J V9, N1, March 1986, P3-9

This technique prevents permeant transport along the cell-sample interface. It has been used to measure the permeability of low permeability clay soils. The experimental technique, apparatus and specimen preparation are described. The results indicate that specimen size and geometry should be within set limits and that a standard permeant should be used. The triaxial falling head permeability test should be conducted at a gradient which results in applied effective stress at the outflow end of the sample less than the preconsolidation stress of the material.

865085
Effective pressure law for permeability of Westerly granite under cyclic loading
Morrow, C A; Zhang Bo-Chong; Byerlee, J D
J Geophys Res V91, NB3, 10 March 1986, P3870-3876

The permeability of Westerly granite was measured under cyclic loading conditions for confining pressures to 96MPa and pore pressure to 86MPa in order to determine the coefficient of the effective pressure. Two methods of determining the coefficient are described, based on the cubic root law,which relates permeability to effective pressure in fractures. Pressure cycling had significant effects on the permeability of the granite, as demonstrated by the large variations in the coefficients of the cubic root law.

865086
Mathematical modelling of radionuclide migration in groundwater
Herbert, A W; Hodgkinson, D P; Lever, D A; Rae, J; Robinson, P C
Q J Engng Geol V19, N2, 1986, P109-120

Dissolution of radioactive waste and subsequent transport in flowing groundwater is a potential source of pollution. Multi-dimensional flow has been modelled for permeable media, and by taking an average over a large area containing many fractures in a fractured medium. Recent advances in the description of transport through fractured rock masses are considered. Results of field experiments on single fractures are examined. The possibilities of modelling transport through fractured rock by an equivalent permeable medium model are assessed and discussed.

865087
Simulation of gas and oil flow in hydrocarbon reservoirs
Cole, P; Collins, P A
Q J Engng Geol V19, N2, 1986, P121-132

The mathematical basis of hydrocarbon reservoir modelling is introduced and comparisons are made with multidimensional groundwater modelling. Both finite difference and finite element methods are used to solve the equations of motion. Two powerful models, PORES and PROGRESS, illustrate the use of simulation during the development of the Morecambe and Rough gas fields.

865088
Parameter estimation of unconfined aquifer by measuring change of groundwater level. Technical note
Arai, K; Ohnishi, Y; Kasagawa, M
Soils Found V25, N4, Dec 1985, P129-134

A numerical procedure is presented to predict the average permeability of homogeneous ground from the time history of the groundwater level. A combination of saturated and unsaturated seepage analysis is used with the finite element method and a mathematical programming technique which allows the unknown permeability parameters to be altered step by step until good agreement is reached between known and predicted water levels.

865089
Saturated and unsaturated hydraulic conductivity of swelling clays
Nakano, M; Amemiya, Y; Fujii, K
Soil Sci V141, N1, Jan 1986, P1-6

Movement of water in a swelling system is movement of water relative to the solid phase of the system. The flow theory in a space coordinate system is described, assuming the flow equation of clay particles, and a method of estimating the hydraulic conductivity of swelling clay within this system is demonstrated. The hydraulic conductivity of saturated and unsaturated swelling clays is defined and measured from the water and clay content profiles from infiltration experiments into unsaturated bentonite. Hydraulic conductivity is seen to increase by 5 orders of magnitude as volumetric water content increases from 0.05 to 0.95. Results agree well with those analysed by the existing theory, developed in the material coordinate system.