926216
Applicability of the Marchetti dilatometer test to soft ground in Japan
Iwasaki, K; Tsuchiya, H; Sakai, Y; Yamamoto, Y
Proc International Conference on Geotechnical Engineering for Coastal Development, GEO-COAST'91, Yokahama, 3-6 September 1991 P29-32. Publ Japan: Coastal Development Institute of Technology, 1991

The applicability of DMTs for site investigation in soft alluvial soils in Japan has been examined by comparing DMT results with those from self boring pressuremeters and conventional laboratory soil tests. Soil type, constrained modulus, coefficient of earth pressure at rest, and undrained shear strength from the dilatometer test agree well with reference values. Coefficient of consolidation is consistent with oedometer values for highly plastic clays, but not for clays of low plasticity.

926217
Offshore soil investigation at the Kansai International Airport
Kanda, K; Suzuki, S; Yamagata, N
Proc International Conference on Geotechnical Engineering for Coastal Development, GEO-COAST'91, Yokahama, 3-6 September 1991 P33-38. Publ Japan: Coastal Development Institute of Technology, 1991

Kansai airport, the world's first full-scale offshore airport, is being founded on a man-made island over 500ha in area, reclaimed on a soft sea bed at depth 18m below sea level in Osaka Bay. Stress levels up to 490 kPa are expected during construction. Site investigation techniques, based on wireline sampling, are described and the results obtained compared to those from conventional methods. Geological structure of the sea bed is illustrated. Consolidation characteristics of the alluvium and diluvium have been examined and it is expected that the structure will settle in the normal manner.

926218
Geotechnical investigation in coastal region of soft alluvial deposits
Mehta, B J
Proc International Conference on Geotechnical Engineering for Coastal Development, GEO-COAST'91, Yokahama, 3-6 September 1991 P39-43. Publ Japan: Coastal Development Institute of Technology, 1991

Problems in site investigation for foundation design and some solutions for the western coastal belt of India are discussed. The case of a major port development on fine silty sands over clayey silt then fine sand is described. Static cone penetration tests to 8m depth were carried out. Skin friction, point resistance, and friction ratio were evaluated and used to predict behaviour of friction piles. Pressuremeter test data were used to verify these values and to calculate foundation settlements, which were similar to values estimated from plate load tests. The most conservative data were used in design criteria.

Presentation and interpretation of data

See also: 926030, 926487

926219
Computer-aided well log correlation
Fang, J H; Chen, H C; Shultz, A W; Mahmoud, W
Bull Am Assoc Petrol Geol V70, N3, March 1992, P307-317

Correlation of well logs is one of the essential steps in establishing subsurface geology. Manual correlation can be subjective and nonreproducible and so a computer assisted scheme has been developed. It is based on sequence comparisons originally developed for molecular biology and a dynamic programming technique used in operations research. The resulting Dynamic Waveform Matching (DWM) method, implemented using the computer program XCORR, enables comparison and matching of log attributes in a single pass. It is demonstrated, applied to real and synthetic log data.

926220
Neural-network approach to the determination of aquifer parameters
Aziz, A R A; Wong, K F V
Ground Water V30, N2, March-April 1992, P164-166

The pattern matching capability of a neural network has been applied to determine aquifer parameters from aquifer test data. Normalised drawdown data are input and corresponding aquifer parameters returned as output. Theis and Hantush-Jacob solutions for confined and leaky-confined aquifer conditions are used to derive the training input patterns. Results using this approach are in good agreement with published results from other techniques. This method allows automated computation of aquifer parameters plus the ability to associate drawdown to the corresponding Theis and Hantush-Jacob solutions.

926221
Two-stage stochastic model applied to a North Sea reservoir
Damsieth, E; Tjolsen, C B; Omre, H; Haldorsen, H H
J Pet Technol V44, N4, April 1992, P402-408, 486

Because of high costs in offshore areas, field development decisions are made on the basis of a minimum of exploration and appraisal wells. The use of unrealistic and oversimplified geological models to interpret the sparse data must be avoided. A two stage stochastic model which caters for large scale geological heterogeneities and the inherent spatial variations in rock properties is presented. It can generate several geologically sound realizations of a reservoir. Stage 1 preserves important geological architecture, stage 2 provides small scale variations. At both stages the stochastic models are conditional to actual values returned from wells.

926222
Spatial averaging of hydraulic conductivity in three-dimensional heterogeneous porous media
Desbarats, A J
Math Geol V24, N3, April 1992, P249-267

The problem of assigning hydraulic properties to grid blocks discretizing flow fields in numerical models is addressed. Simulator parameter assignment involves determination of parameters at block scale using sparse data from core or well-scale experiments. A geostatistical model for hydraulic conductivity, based on a power-averaging method of up-scaling point values, is described. The block conductivities predicted are in good agreement with effective conductivities obtained from a numerical flow model.

926223
Interpretation of multi-method geophysical borehole logging data from KTB Oberpfalz VB using multivariate statistical analyses
Eberle, D
Sci Drilling V3, N1/3, 1992, P16-26

Borehole logging produces high resolution geophysical data. Multivariate statistical analysis has been applied to eleven downhole data sets describing total magnetization, vertical magnetic field intensity, magnetic susceptibility, density, resistivity, induced polarization, P wave velocity, natural gamma radiation, and concentrations of U, Th, and K-40. Analysis

indicates logs collected independently of each other can be evaluated simultaneously to yield a lithology profile. It is possible to reduce the number of data sets without sacrificing accuracy, but both geochemical and geophysical components should be used.

926224
Estimation of porosity in crystalline rock by a multivariate statistical approach
Zimmermann, G; Burkhardt, H; Melchert, M
Sci Drilling V3, N1/3, 1992, P27-35

A multivariate statistical approach is presented which allows estimation of the porosity of crystalline rocks from standard borehole logs. Calibration against laboratory measured porosities from cores enables a continuous porosity log to be generated. Initial results are presented for biotite gneiss, amphibolite, and metagabbro rocks from the KTB pilot bore. The particular logs used in each instance and the statistical methods applied are described.

926225
Thermolog - a new method for log display of geothermal parameters
Zoth, G
Sci Drilling V3, N1/3, 1992, P76-82

A new method of log presentation is illustrated which correlates the 11 most important geothermal parameters: depth; mineral composition; density;borehole inclination; foliation; dip; thermal conductivity; specific heat capacity; radioactive heat production rate and heat production; temperature and corrected temperature; thermal diffusivity; and terrestrial heat flow density. Derivations are explained for parameters which are not directly or indirectly measured. Other parameters can be included in THERMOLOG for specific projects.

926226
Levelling data management for the monitoring of land subsidence
Bitelli, G; Russo, P
Proc 4th International Conference on Land Subsidence, Houston, 12-17 May 1991 P453-462. Publ IAHS Press: Wallingford, 1991

Levelling generally provides the main source of geodetic measurements for detection of vertical ground movement. Data are assembled from a variety of sources and may differ in quality, time of measurement, and spacing. The many potential problems associated with levelling data and their management are described. The use of a relational data base for storage, retrieval, and handling of these data and mitigation of some of the problems is suggested. This can be incorporated with a GIS as part of a multidisciplinary approach to subsidence.

926227
Geomechanical model of seabed profile
Fukue, M; Nakamura, T
Proc 10th International Conference on Offshore Mechanics and Arctic Engineering, Stavanger, 23-28 June 1991 V1-Part B, P623-628. Publ New York: ASME, 1991

A model to generate the standard profile of a seabed from index properties of surface sediments is presented. It is analogous to the density-height profile of the atmosphere derived using statistical mechanics. It can provide profiles of such properties as void ratio, water content, density, effective stress, and undrained strength. The assumptions made are described. Examples of profiles generated by the model are illustrated.

926228
Survey and taking into account of discontinuities in rocky surroundings of engineering constructions
Galos, M; Kertesz, P
Proc International Conference on Mechanics of Jointed and Faulted Rock, Vienna, 18-20 April 1990 P859-864. Publ Rotterdam: A A Balkema, 1990

The extent and nature of joint systems around underground structures is of great importance in stability analysis and design. A system for survey and spatial analysis of discontinuity spectral data is presented. Fracture propagation along joints and in the intact rock and methods of classifying joint systems according to block shapes are taken into account. The importance of fracture mechanics is emphasised.

926229
Comparison of procedures for defining orientation domains in jointed rock
Cravero, M; Iabichino, G; Mahtab, A
Rock Mechanics as a Multidisciplinary Science, Proc 32nd US Symposium, Norman, 10-12 July 1991 P1095-1103. Publ Rotterdam: A A Balkema, 1991

Rock engineering design requires quantification of joint orientations. Five schemes for partitioning joint orientations at a site into homogeneous domains are presented then applied to data from an underground marble quarry and a fluorite mine. Structural data were collected at points along mine drifts in both cases. Comparison of results shows that the construction of generally applicable criteria for similarity tests is a difficult task. Sequential use of several schemes may be advantageous.

Suggested testing methods and standards

926230
Model specification for radial displacement measuring pressuremeters
Clarke, B G; Smith, A
Ground Engng V25, N2, March 1992, P28-37

Specifications are presented for the use of self boring pressuremeters for soft ground and weak rock and the high pressure dilatometer. Calibration, operator requirements, installation, test procedures for stress and strain controlled tests, on-site data processing and analysis, report data processing and analysis, and information to be submitted are described.

926231
Specifications for constructing and load testing stone columns in clays
Stark, T D; Yacyshyn, B M
In: Deep Foundation Improvements: Design, Construction, and Testing (Papers to a Symposium Presented at Las Vegas, 25 January 1990) P73-84. Publ Philadelphia: ASTM, 1991 (ASTM Special Technical Publication N1089)

Introduction of stone columns is one of the many techniques used to improve soft clay ground. Guidelines for writing a specification for construction and testing of stone columns in cohesive soils have been developed after studying specifications from 5 different sources (3 contractors and 2 agencies). Soil improvement objectives, contractor qualifications, scope of work, requirements of regulatory agencies, submittals, construction of the columns, materials, obstructions, quality control and assurance, payment, and testing are discussed. Primary components of the specification are performance criteria and testing procedures.