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Chapter 1 : TC Forensic | ISSMGE

A complete, up-to-date guide for forensic engineers. Fully revised and packed with current case studies, Forensic Geotechnical and Foundation Engineering, Second Edition provides a step-by-step approach to conducting a professional forensic geotechnical and foundation investigation.

Innovations such as light weight fill for landslide stabilization and borehole shear testing have been used by Dr Burt Look. Soft Soil Construction on soft ground is an area of significant challenge and risk in the field of geotechnical engineering. Many engineering problems such as slope instability, bearing capacity failure, or excessive settlement are due to low shear strength and high compressibility of soils. The selection of geotechnical parameters and design approach are often critical in these types of soils. Engineering judgement is sometimes required in deciding which value is the most appropriate. Good engineering judgement comes from a sound understanding of soil behaviour and past experiences in dealing with similar types of soil and geotechnical problems.

Excavations While the steepening of a design slope angle may reduce both the amount of excavation and haulage of waste material, it also increases the risk of failure. Major slope failures incur significant cost, disruption to operation and damage to equipment. Engineers are often faced with a difficult task of balancing the slope formation cost and failure cost. At FSG, we have a holistic understanding of costs and risks associated with excavation works and with the advantage of the consolidated knowledge and experience, deliver the optimum design solution for each specific project. Construction sequence is also a significant parameter which affects the stresses induced in the retaining structure and has to be considered as part of the design in excavations.

Retention Systems FSG provides design services for various types of retention systems. Our geotechnical knowledge combined with extensive practical experience enables us to apply a real world understanding of soil-structure interaction and apply this to the design of complex retention systems. We design safe and cost effective retention systems based on robust analyses and sound judgment.

Ground Improvement Ground improvement is an area of significant growth and innovation. The knowledge and experience of our personnel in the design and construction of a broad range of ground improvement systems, including rigid inclusions, soil mixing, stone and sand columns, dynamic compaction, dynamic replacement and jet grouting is a significant asset in developing design solutions for difficult ground conditions. Again, practical experience and commercial understanding is used in conjunction with the most advanced computer modelling software and analytical techniques to optimise both design and constructability outcomes.

Temporary Works design Many construction sites need temporary works in order to facilitate permanent works construction. Temporary works design is an area of specialist engineering and an innovative, but rigorous approach is required. It is also an area of high risk, with failure of temporary access platforms observed far too often. FSG has shown a proven track record in designing temporary works for a wide variety of projects across Australia.

Numerical Analysis Numerical modelling of geotechnical problems can be highly beneficial if is undertaken with significant care. Incorporating geological models into state-of-the-art numerical analysis must be done by experienced engineers who have a robust understanding of soil characteristics and software limitations so the outputs can be assessed in a meaningful way. At FSG, we confidently utilise Numerical Analysis in conjunction with other methods to represent practical and cost effective solutions for complex geotechnical problems. Numerical modelling is performed as required to validate field observations. Risk assessment can be done in different stages of a project including design, construction, operation, and closure in wide range of sections like mines, dams, slopes, excavations, landslide management and geohazards.

Forensic Engineering Different types of damage can occur in a geotechnical structure or a foundation due to: Settlement of structures, expansive soil, lateral movement, erosion, deterioration, bearing capacity failures, shrinkage cracking of concrete foundations, groundwater and other causes. We provide a full range of forensic geotechnical and foundation engineering services including evaluating of the cause of damage and developing repair recommendations.

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Chapter 2 : Forensic Geotechnical and Foundation Engineering - Robert W. Day - Google Books

by: Robert W. Day Abstract: This up-to-date, all-in-one guide to geotechnical and foundation investigations in forensic engineering provides a step-by-step approach to conducting a professional forensic geotechnical and foundation investigation.

Contact Naviq Consulting Inc. Naviq provides forensic engineering and expert witness services to clients that include regulatory agencies and legal counsel in the following areas: Oswell has been in an expert witness in regulatory hearings for pipelines and an open-pit mine expansion, legal cases regarding pipelines, an arbitration hearings regarding foundation performance of structures on permafrost, and insurance claims regarding erosion and ground loss, performance of permafrost ground, and groundwater issues. Cold Lake Pipeline Litigation: Senior geotechnical engineer providing expert witness testimony concerning distress of a hot-emulsion pipeline, constructed in winter and buried in clayey soils and muskeg. Scope of expert testimony addressed use of soil parameters in the pipeline stress analysis, estimation of virtual anchor lengths for various soil conditions, appropriateness of geotechnical investigations performed prior to pipeline installation, and development of a working hypothesis of the causes of the pipeline distress. Issues considered included internal versus global stability of a multi-tier retaining wall system and potential for general slope instability of the adjacent escarpment slope, which encompasses the property. Residential Building Distress, Calgary: Senior geotechnical engineer retained to investigate the causes of structural and cosmetic distress in a residential building in northwest Calgary. The investigation included review of documentation, site inspections and installation of a slope indicator to assess the stability of a approximately 9 m high retaining wall along the property line. The investigation determined that the most likely cause of the structural distress was long-term self-weight settlement of fill placed in the back portions of the property on which the building foundations were placed. Senior geotechnical engineer and member of international multi-disciplinary team examining the root causes of two pipeline ruptures in mountainous regions of Colombia. In one case, the rupture resulted in an explosion with over 30 fatalities. Services included site reconnaissance, preparation of a preliminary assessment report, development of scope of work and specifications for geotechnical investigations and instrumentation, supervision of the geotechnical program and assessment of data, and reporting. Northwest Energy Explosion, Montana: Expert witness to assess the potential impact that frost heave may have played in the rupture, leakage and subsequent fatal explosion of a natural gas service line. Duties included examination of documents, expert witness reports, geotechnical data and completed evaluation of frost heave potential considering soil characteristics, geothermal conditions and other contributing factors. Senior geotechnical engineer and member of multi-disciplinary team evaluating the factors and causes of a pipeline rupture. Tasks included site reconnaissance, review of geological information and in situ instrumentation, development of soil parameters for numerical modeling of the pipeline and preparation of technical reports outlining geotechnical factors that contributed to the rupture. Results of the forensic investigation resulted in dismissal of charges against the pipeline operator. Expert witness to assess the causes for property damage related to a major rain event that induced surface erosion and soil sedimentation of properties downslope of an orchard property. Lead permafrost engineer to investigate the causes of the development of wrinkles at several locations on the Norman Wells crude oil pipeline in the Northwest Territories. Team included pipeline engineers, experts in pipeline-soil interaction modeling, pipeline operations staff. Prepared geotechnical evaluation report that was filed with the Federal regulatory agency with jurisdiction over the pipeline operations. Lead geotechnical engineer to evaluate the stability of slopes along the pipeline route and adjacent to the right-of-way. Evaluated movement data, provided recommendations for monitoring and mitigation measures, and prepared evaluation and inspection reports to be filed with the National Energy Board. Acted as a subject matter expert at annual review meetings between the pipeline operator and regulatory agencies and stakeholder groups. Inuvik Female Young Offenders Facility: Permafrost engineer and review expert as part of

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several teams to evaluate the causes for slab-on-grade movements of a structure constructed on permafrost. Evaluated geotechnical conditions at the site and performance of the buried cooling system, consisting of thermosyphons. Subject matter expert in an arbitration process between the contractor and facility owners regarding the performance of an ice rink slab-on-grade. Reviewed geotechnical information and thermosyphon performance. Participated as an expert witness to provide sworn testimony on the issues regarding the lack of performance of the foundation cooling system and construction activities. Undertook several evaluations of permafrost degradation that were impacting building foundations and slabs-on-grade at a site constructed on ice-rich permafrost. Conducted inspections of foundation systems and evaluated monitoring data to assess timelines for movement and provided mitigation options. Completed a forensic evaluation of apparent foundation movements at a large industrial housing complex constructed on permafrost. Conducted a site inspection and interviewed staff to determine the cause of the apparent foundation movements. Contrary to initial reports, the inspections and analysis concluded the issues were related to ground subsidence, not foundation heave. Bankers Hall Shoring Movement, Calgary: Reviewed all geotechnical information including expert testimony by defence and plaintiff experts, and assisted defence lawyers in preparation of witnesses and defence strategy. Outcome was the successful defence at trial and appeal.

Chapter 3 : Forensic Engineering | GZA GeoEnvironmental, Inc.

Forensic Geotechnical and Foundation Engineering, Second Edition, 2nd Edition by Robert Day () Preview the textbook, purchase or get a FREE instructor-only desk copy.

Chapter 4 : Geotechnical - FSG Geotechnics - Foundations

What Is Forensic Geotechnical Engineering? Geotechnical Engineering is a branch of Civil Engineering that deals with the behavior of earthen materials and how they interact with man-made elements such as foundations, flatwork, or pipelines.

Chapter 5 : Forensic Geotechnical and Foundation Engineering - PDF Free Download

Geotechnical Engineering: Principles and Practices of Soil Mechanics and Foundation Engineering (Civil and Environmental Engineering) Read more Elastic Analysis of Soil-foundation Interaction (Developments in Geotechnical Engineering).

Chapter 6 : Forensic Geotechnical and Foundation Engineering, Second Edition

Robert W. Day is a leading forensic engineer and the chief engineer at American Geotechnical in San Diego, California. The author of over published technical papers, he serves on advisory committees for several professional associations, including ASCE, ASTM, and NCEES.

Chapter 7 : Forensic Engineering and Expert Witness Services - Naviq Consulting Inc.

With expert advice on all aspects of the process--from accepting the assignment to delivering compelling testimony--this is a practical, all-in-one guide to geotechnical and foundation investigations in forensic engineering.

Chapter 8 : Online Masters in Geotechnical Engineering | calendrierdelascience.com

The work is the outcome of deliberations at various conferences in the area conducted by Prof. G.L. Sivakumar Babu

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and Dr. V.V.S. Rao as secretary and Chairman of Technical Committee on Forensic Geotechnical Engineering of International Society for Soil Mechanics and Foundation Engineering (ISSMGE).