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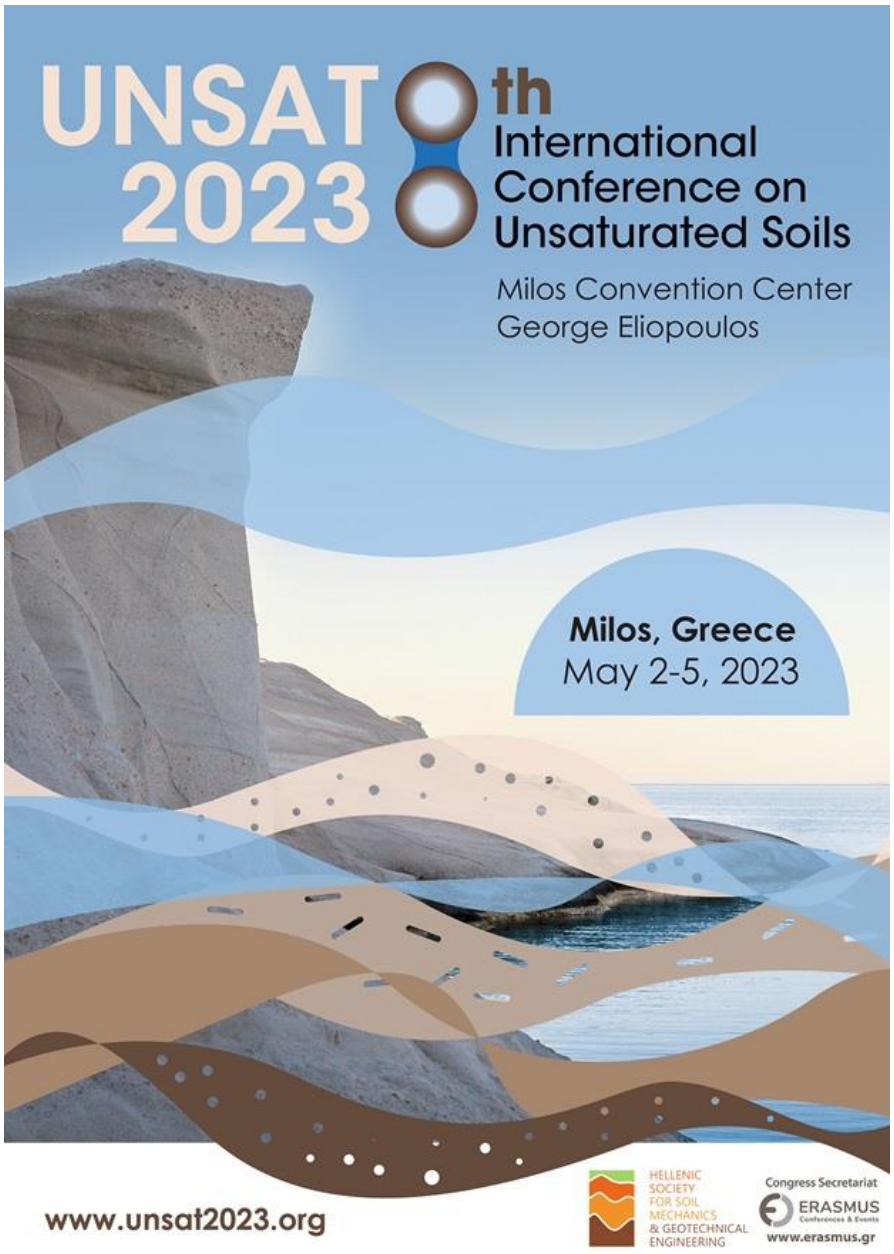

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ISSN: 2732-7248

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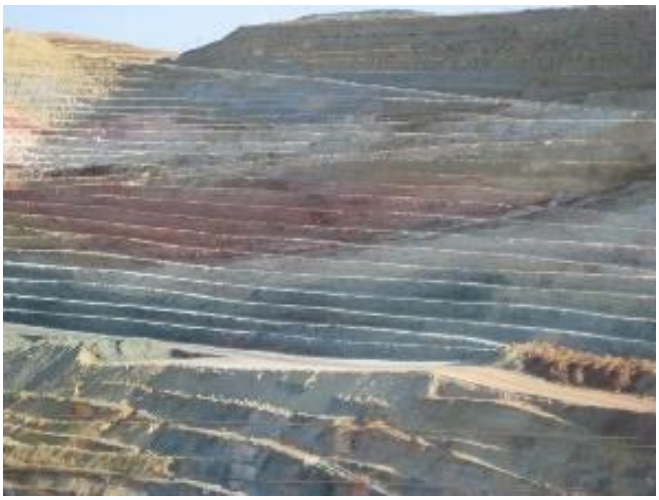
The Hellenic Society for Soil Mechanics and Geotechnical Engineering (HSSMGE) invites you to submit your abstracts for the 8th International Conference on Unsaturated Soils "**Towards Unsaturated Soils Engineering**" to be held on the island of Milos, Greece, between 3 and 5 May 2023. The UNSAT2023, organized under the auspices of the ISSMGE Technical Committee TC106, follows the successful past UNSAT conferences held in Hong Kong (2018), Sydney (2014), Barcelona (2010), Phoenix (2006), Recife (2002), Beijing (1998) and Paris (1995).

As past UNSAT conferences, UNSAT2023 aims at providing researchers and practitioners alike with a unique opportunity of sharing up-to-date knowledge on Unsaturated Soil Mechanics and Engineering. The 3rd Blight Lecture by Prof. Eduardo Alonso from UPC, several keynote lectures by renowned experts in the field, numerous papers and a parallel technical exhibition in a relaxed environment will make for a most fruitful scientific event and a unique opportunity for the unsaturated soils community to meet again in person after several years of Covid restrictions. Recent experience in Greece has shown that in-person events are now possible provided nothing new emerges with the world pandemic.

On May 2nd 2023 the pre-conference seminar on the "**Long-term measurement of soil suction in the field and its modelling**" will also be held in the same venue.

Conference Themes:

- Fundamental soil behaviour (water retention, stress-strain behaviour, micro- and macro-structure etc)
- **Behaviour of naturally occurring unsaturated soils, especially unsaturated hard soils-weak rocks**
- Cyclic/dynamic behaviour of unsaturated soils
- **Multi-phase media and multi-physical couplings (thermal, chemical, biological etc)**
- Advances in testing techniques, methods and equipment
- **Advances in suction and water content measurement sensors and their use especially in the field**
- Physical, numerical and constitutive modelling
- **In-situ/Field testing**
- **Long-term measurements of suction in the field and their relation to climatic parameters**
- Geoenvironmental and geo-energy applications of unsaturated soil mechanics
- **Applications of unsaturated soil mechanics in geotechnical practice, especially simple and straightforward cases showing the importance of unsaturated soil mechanics for the introduction of unsaturated soils in geoengineering education**
- Introduction of unsaturated soil mechanics in undergraduate courses: methods, experiences, material to assist geotechnical engineering educators
- **Unsaturated soil mechanics in the preservation and pathology of historic monuments**
- Unsaturated soil mechanics principles in the context of rammed earth applications and mudbricks
- **Unsaturated soil mechanics in slope stability/landslides with emphasis on open pit mining**
- The importance of unsaturated soils in many problems of forensic geotechnical engineering
- **Hydro-mechanical and thermal properties of bentonites and bentonite-based mixtures, especially Milos Bentonite**
- Unsaturated soils for foundations, fills, levees, embankments, dams, roads & pavements, railways and other pieces of infrastructure
- **Understanding the effect of climate change on the environment and infrastructure through unsaturated soil behaviour**
- Codes and regulations including unsaturated soils mechanics principles
- **Any other possible application in the field of unsaturated soils**



SHANGHAI RANKING

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Ranking 2022 Global Ranking of Academic Subjects

2022 Global Ranking of Academic Subjects 2022

ShanghaiRanking began to publish world university ranking by academic subjects in 2009. By introducing improved methodology, the Global Ranking of Academic Subjects (GRAS) was first published in 2017. The 2022 GRAS contains rankings of universities in 54 subjects

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World Rank	Institution	Country/Region	Total Score	Q1
1	Tongji University		366.3	100.0
2	ETH Zurich		256.5	42.9
3	Tsinghua University		233.4	79.0
4	The Hong Kong Polytechnic University		227.4	74.6
5	National Technical University of Athens		220.7	33.4
6	Polytechnic University of Madrid		219.0	38.3
7	Southeast University		218.7	78.6
7	University of Notre Dame		218.7	20.3
9	Lehigh University		218.4	20.3
10	The University of Texas at Austin		217.7	35.0
11	University of Canterbury		216.7	23.4
12	Technical University of Denmark		210.8	44.8
13	Nanyang Technological University		200.4	52.9
14	Chongqing University		200.0	60.3
15	Hunan University		199.9	57.8
16	Zhejiang University		199.6	59.1

ΑΡΘΡΑ

Adaptive Management in Geotechnics The Observational Method in Action

Richard J. Finno, Ph.D., P.E., D.GE, L.M.ASCE

Among the many innovations developed by Karl Terzaghi and Ralph Peck in the early days of geotechnical engineering is the observational method, wherein construction and design procedures and details of a geotechnical project are adjusted based upon observations and measurements made as construction proceeds. The method has been applied to tunnels, embankments constructed over soft ground, and deep urban excavations, among other types of projects. Geotechnical uncertainties in these projects arise when predicting settlements caused by tunneling operations, rate of settlement of embankments constructed over soft soils, and ground movements arising during excavation. For example, when excavation support for a project in an urban area (Figure 1) is conducted under a design-bid-build contract, design-stage uncertainties related to prediction of ground movements include construction procedures and strength and stiffness of the affected soils. When attempting to predict rates of settlements — for example, when considering a staged process of embankment construction — there are substantial uncertainties in the field hydraulic conductivity as well as the compressibility of the affected soils. The observational approach allows for a design to be adjusted based on the observed performance of the actual construction process.

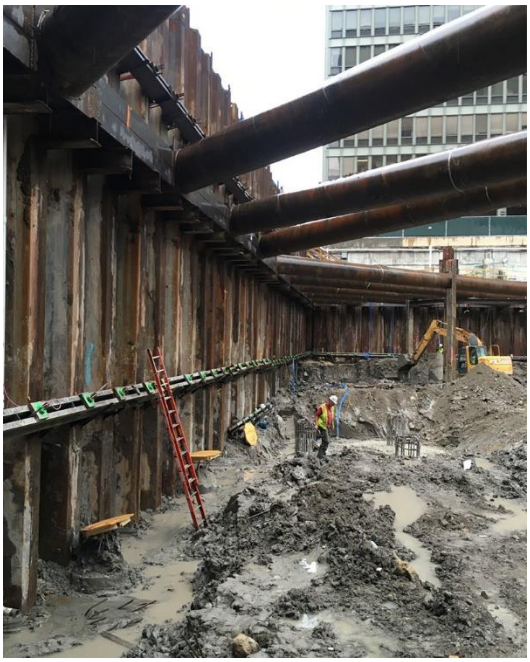


Figure 1. Excavation at the Louis A. Simpson and Kimberly K. Querry Biomedical Research Center, where adaptive management was employed. Hayward Baker, Inc. was the excavation support subcontractor, and GETEC provided the website with real time access to the autonomously collected data. (Courtesy Keller North America Inc.)

The observational method was conceived and developed when instrumentation was crude and computing power was minimal. Both have advanced beyond the imagination of those who used the approach when it was first developed. Because of advancements in sensors and information technology, it's not uncommon in large infrastructure projects to have performance data collected autonomously and displayed on a project website to inform stakeholders in real time. This approach allows rapid dissemination of key information and improved decision-making. By linking a numerical model with the data collection system, design performance predictions can then be updated. In this automated observational approach, also known as adaptive management, the observations at selected stages of construction can be used to update performance predictions. An additional benefit is that information can be obtained regarding key in-situ soil parameters so they can be compared to those used in design.

The process is illustrated in Figure 2. A numerical simulation of the problem is made, and the outputs are stored. The computed results are then compared to the field observations, and a regression analysis is performed to minimize a weighted least squares objective function to quantify the fit between computed and measured results.

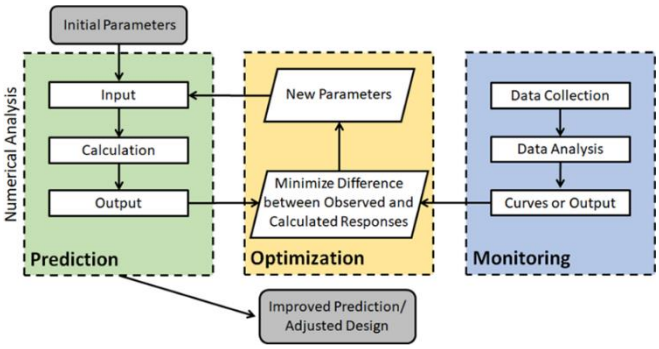


Figure 2. Adaptive management methodology.

The model fit is considered an "optimal solution," either when parameter values change less than a preset fractional amount between iterations or when perturbations in the input parameters change the objective function values by less than a preset fractional amount (e.g., 0.1 percent). Regressions are repeated until an optimum fit is reached. An important check in the process is to make sure that the adjusted parameter falls within the expected range of the parameter being optimized that reflects past experience. It's beyond the scope of this article to provide a detailed discussion of each of these components, but some abbreviated remarks are presented below.

Numerical Analyses

In general, numerical analyses have become key elements in a geotechnical engineer's toolbox. Whether it be finite element, finite difference, or a spreadsheet calculation, their users must assume a particular soil behavior and define appropriate parameters needed for the design. For example, compression and extension testing may be required to develop constitutive and strength parameters that are appropriate to model the planned construction and sequencing. To be successful with the more numerically advanced approaches, it's important to understand the limitations of each method, including purely numerical implementation issues, constitutive modeling questions, and accurate simulation of a particular construction process. While computing power continues to increase, knowledge of in-situ stress-strain behavior of soil and detailed understanding of the relation between construction activities and ground response lag behind. Results of adaptive management can provide quantitative information in this regard.

Monitoring

Accurate and timely monitoring data are a key to the success

of adaptive management. Presently, it's possible to autonomously operate robotic total stations to monitor the displacement of strategically placed optical prisms, deploy in-place inclinometers to remotely measure ground lateral movements with depth, monitor pore-water pressures with vibrating wire piezometers, measure strains with gauges mounted on structural supports, and attach tiltmeters to structural elements to compute the angular distortion of an affected structure. Additionally, load cells on anchors, extensometers to measure vertical ground deformations, and liquid level sensors for differential settlements can also be collected autonomously. All these data can be sent to a host computer for processing, display, and use in the optimization process. It's imperative that the accuracies of these devices be established, as they affect the optimization results through the standard deviation of the error of the measurements found in the objective function.

Optimization is the process of finding the parameters that result in the "best fit" between the computed and observed results.

An important aspect of monitoring is that the results need to be linked specifically to the construction activities at the site. For example, when evaluating ground movements caused by construction of a deep basement, the numerical analysis usually only considers movements caused by stress relief arising from the excavation of the soil. Unless a construction activity is explicitly modeled in the numerical analysis, then observed movements caused by such activities will be implicitly and incorrectly attributed to the excavation process. It's well established that movements caused by support wall and deep foundation installation, poor workmanship, and removal of existing foundations can occur during construction. These activities are not readily modeled in a finite-element simulation of the problem, and, in fact, aren't even possible during the design stage. As construction proceeds, these factors become known with careful consideration of the activities at the site and the observed responses, and the activities can be modeled in a simplified way, if necessary. In any case, one must relate the construction conditions to the observations while evaluating the results of the approach.

Furthermore, while 3D analyses can be used for some types of problems (e.g., tunneling and embankment construction), most excavation analyses assume 2D conditions. However, planestrain conditions do not generally exist throughout an excavation, so data must be selected that represent times when plane-strain conditions are applicable.

Optimization

Optimization is the process of finding the parameters that result in the "best fit" between the computed and observed results. In an inverse problem, the main features of a real system are incorporated into a numerical model, and some of the input parameters, usually soil parameters, are refined on the basis of field measurements so a more accurate stress and deformation analysis can be carried out with the refined parameters. A gradient method of solution is appropriate for finding the "best fit" when only a few parameters are being optimized. The key to the efficacy of the method is to select a model that captures the important aspects of the soil response, as well as identify the parameters that are to be optimized. This process is, of course, problem dependent. Many times, optimization comes down to identifying deformation parameters associated with a problematic soil stratum. Inverse analyses may be accomplished by coupling a statistical package, such as the optimization toolbox in MATLAB, with a finite-element code, as noted in Figure 3. A program can be written in PYTHON to transfer data between the finite-element code and MATLAB so that the iterations between the finite element code and the optimization proceed automatically without operator intervention until a converged result is obtained.

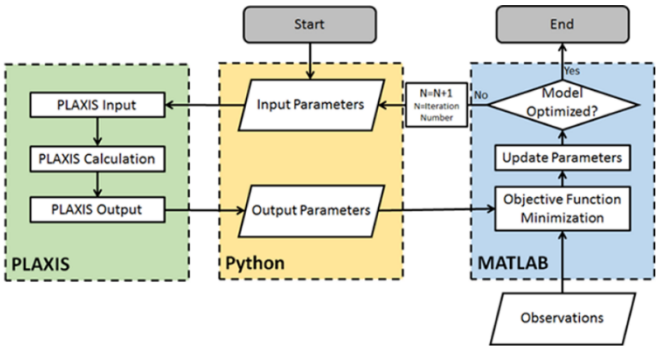


Figure 3. Optimization process.

Guidance concerning the initial selection of parameters to be optimized can be found in values of Composite Scaled Sensitivity and the Parameter Correlation Coefficient, optimizationrelated statistics for a particular set of field observations. The relative importance of the model parameters being simultaneously estimated can be defined using the CSS. Values of PCC indicate whether the estimated parameter values are likely to be unique, and whether the parameters may be optimized at the same time.

Case History

Construction of the 14-story Louis A. Simpson and Kimberly K. Querry Biomedical Research Center, known locally as the SQBRC on the Northwestern campus and to locals in Chicago, included a 13- to 18-m-deep cut for two basement levels. Subsurface conditions and the typical lateral movements of the support system are shown in Figure 4. During the bidding and design phases of the project, the designer, Hayward Baker, Inc., recognized the risks associated with potential excess ground movements developing during excavation. HBI opted to use the observational method enhanced by adaptive management during excavation to monitor the support system performance and use pre-planned measures if movement exceeded thresholds. The firm employed an autonomous monitoring system with results displayed in real time on a project website, allowing designers and contractors to knowledgeably react quickly. A near real-time feedback loop of observation and updated predictions of ground movements was incorporated into the system as the project progressed. A key component of the monitoring system was Shape Acceleration Arrays placed adjacent to the sheet-pile walls to measure lateral movements that developed below grade.

The main uncertainty anticipated during design was the incremental ground movements during excavation from Stage 3 to Stage 5 (Figure 4). This relatively large excavation stage was the point at which excavation began to significantly stress the soft to medium clays. Figure 4 also illustrates the observed responses during excavation by showing the lateral movements that developed throughout construction at one of the SAAs. As anticipated, the largest incremental movements occurred as the excavation was lowered from the Stage 3 to the Stage 5 level. To manage the uncertainty associated with the ultimate magnitude of these movements, the design called for the excavation during this stage to progress in two equal steps. If movement was too large after the first step, the contract provided for an automatic trigger of an alternate of support consisting of internal wales and cross-lot struts at the level noted on the figure. Fortunately, these incremental movements were within design expectations, so the additional support was not required. As a result, construction was not delayed while making decisions because of the automated monitoring system and planning during design.

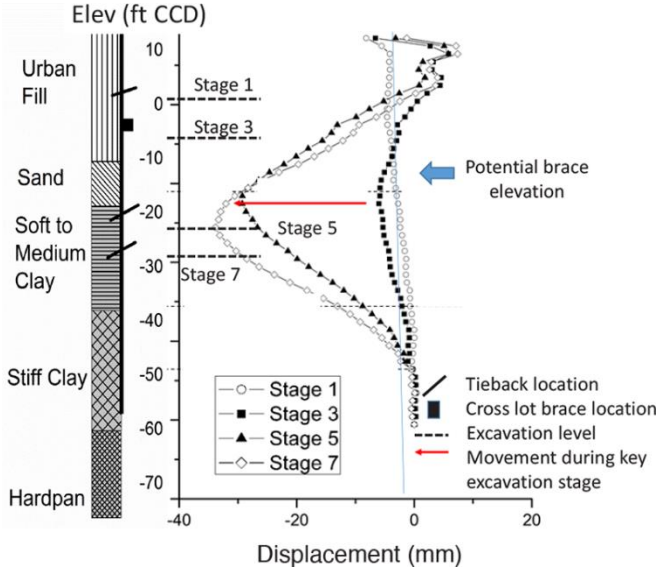


Figure 4. Subsurface conditions and typical lateral movements at SQBRC project.

Another uncertainty was that movements measured at the end of excavation would be as predicted in the design stage because this uncertainty could be reduced before the end of excavation using the results of the inverse analyses made when the excavated level was at Stage 5. For the results shown herein, the Hardening Soil model with small-strain stiffness was used to represent stress-strain behavior of medium clay and stiff clay layers. Initial parameters were based on previous inverse analysis studies that have been carried out for excavations in Chicagoarea soils. Based on the values of composite-scaled sensitivities and correlation coefficients, one large-strain and one small-strain parameter were selected for optimization for each of the soft to medium stiff and stiff clay strata. The primary loading stiffness parameter, E_{50}^{ref}, and the $\beta_{0.7}$ parameter, the shear strain level at which the secant shear modulus was reduced to 70 percent of its initial value, were optimized for the medium and stiff clays. Two additional stiffness parameters for both layers, E_{oed}^{ref} and E_{ur}^{ref}, were optimized indirectly.

The results of the optimization process are shown in Figure 5. SAA-1 data, the SAA located in the middle of the north wall of the excavation, from both Stages 3 and 5 formed the observations for the inverse analyses in this case. The fit based on these optimized parameters is shown on the left side of Figure 5. As expected, a very good fit was obtained. The predicted deformations at Stage 7 (i.e., the bottom of the excavation), based on the optimized parameters from Stages 3 and 5, are compared in the right side of Figure 5 to the observed measurements at Stage 7. These predicted movements agree well with the observed values and were within the allowable limits of 50 mm.

> *The observational method was conceived and developed when instrumentation was crude and computing power was minimal. Both have advanced beyond the imagination of those who used the approach when it was first developed.*

Another benefit of the automated system was the ability to help promptly identify the cause of unexpected movements observed at one of the SAAs. A movement toward the excavation of 7 mm occurred at a time when no excavation was ongoing while the excavation remained at the Stage 3 level. Because this movement happened before the critical excavation period, it was important to identify the cause of the movement before a decision was made concerning the additional level of support. During this time, micropiles supporting a reinforced-concrete work platform were being installed. The particular SAA was located close to one of the micropiles, and the movement developed as that micropile was being installed. All other SAA data from instruments located at further distances from any micropiles did not respond to the micropile installations. This phenomenon was localized and did not affect the overall response of the ground to the excavation.

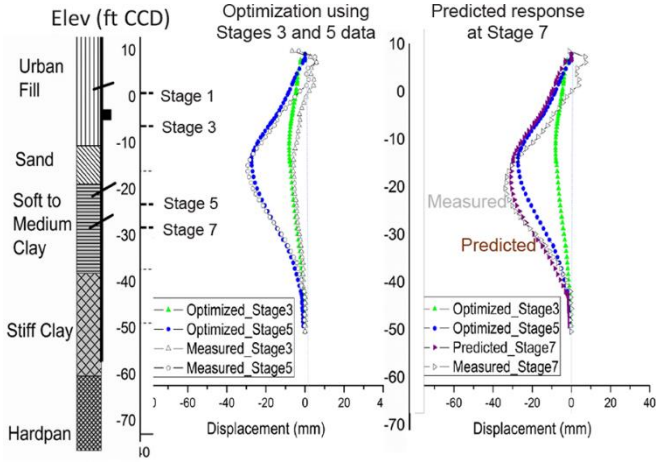


Figure 5. Predicted lateral movements at end of excavation based on parameters optimized based on Stages 3 and 5 observed values.

Key Takeaways

For inverse analysis to be viable, field observations must be reliable, accurate, and obtained in a timely fashion, and the constitutive model must have the capability to replicate the observed behavior(s). Note that any uncertainty that's caused by the construction procedures not being known when a design is developed no longer applies because the process will become known by the time of the update.

One key issue is selecting the soil model to be used in the optimization scheme when making an update. It's important to quickly determine how a particular construction process is affecting the soil and rock materials because the accuracy of the updates depends on the movements measured during the early stages of construction when the deformations and shear strain levels are small. The constitutive model must then include this feature of behavior, or the optimized parameter will change until the strains are large enough so that further degradation is accurately represented in the model. If the goal is to obtain reasonable performance predictions throughout construction, the constitutive model used in the analyses to represent the soil behavior in the critical soil strata must represent the behavior at all expected strain levels. As was the case for the SQBRC example, when applying the method to deep excavations where limiting excavation-induced movements are an important design issue, then a model that explicitly represents very small to relatively large strains is appropriate. Alternatively, when considering embankments constructed on soft ground, the small-strain stiffness capability will not be required because of the large strains expected in the soft strata.

Current capabilities of the adaptive management method include plane strain simulations and near real-time updates of performance. For example, updated predictions of support wall movements were available six hours after in-place inclinometer readings were transmitted to a project website at the SQBRC project. Another important benefit of the method is that optimized parameters derived from one project can provide a starting point, adjusted for site-specific data, for a similar project in the same geology. While more complicated

soil models imply either more parameters or more assumptions regarding soil behavior, the statistical output from the optimization process provides information about which parameter(s) have the biggest impact on the solution. Other parameters needed in the model are thus less important and can be identified through experimental results or experience with sufficient accuracy for a particular problem.

Adaptive management using inverse analysis is an advanced extension of the observational method espoused by Terzaghi and Peck that takes advantage of the vast improvements in monitoring, information technology, and computing power. Because construction and performance of geotechnical projects are so interrelated, the method forces a designer to consider explicitly this relationship during the design stage, thereby minimizing the potential for unexpected surprises during construction. An important byproduct of the method is the identification of in-situ soil parameters for the important soil strata affected by the constructed facility and, as such, tabulating said parameters for a particular geologic stratum, which can result in a database of parameters that represent that strata's in-situ response based on full-scale performance.

GEOSTRATA, June / July 2022,
https://www.readgeo.com/geostrata/june_july_2022/MobilePagedArticle.action?articleId=1795339#articleId1795339

The world's oldest underground station, Baker Street, London, 159 years apart

It is one of the original stations of the Metropolitan Railway, the world's first underground railway, which opened in 1863.

https://www.linkedin.com/feed/hashtag/?keywords=architectanddesign

Recycled tyre rubber used as aggregate for concrete

Engineers at RMIT University have uncovered a way to replace conventional concrete aggregates with rubber from discarded tyres, an advance that meets building regulations and reduces manufacturing and transportation costs.

Concrete mixing using recycled tyre rubber particles for the complete replacement of traditional coarse aggregates - *Mohammad Islam, RMIT*

The team in Melbourne, Australia said small amounts of rubber particles from tyres are already used to replace concrete aggregates, but efforts to replace all of the aggregates with rubber have produced weak concretes that failed to meet the required standards.

The study published in the *Resources, Conservation & Recycling* journal describes a manufacturing process for structural lightweight concrete where the traditional coarse aggregates in the mix were completely replaced by rubber from used car tyres.

Lead author and PhD researcher from RMIT University's School of Engineering, Mohammad Momeen Ul Islam, said the findings debunked a popular theory on what could be achieved with recycled rubber particles in concrete.

"We have demonstrated with our precise casting method that this decades-old perceived limitation on using large amounts of coarse rubber particles in concrete can now be overcome," Islam said in a statement. "The technique involves using newly designed casting moulds to compress the coarse rubber aggregate in fresh concrete that enhances the building material's performance."

"As a major portion of typical concrete is coarse aggregate, replacing all of this with used tyre rubber can significantly reduce the consumption of natural resources and also address the major environmental challenge of what to do with used tyres," said study co-author and team leader, Professor Jie Li.

Used tyres in Australia cannot be exported, making new methods for recycling and reprocessing them locally increasingly important. About 1.2 billion waste tyres will be disposed of annually worldwide by 2030.

The greener and lighter concrete could also greatly reduce manufacturing and transportation costs, Li said.

"This would benefit a range of developments including low-cost housing projects in rural and remote parts of Australia and other countries around the world."

The team's manufacturing process could be scaled up cost effectively within a precast concrete industrial setting in Australia and overseas, Islam said.

Following testing in the workshop, the team is now looking into reinforcing the concrete to see how it can work in structural elements.

(THE ENGINEER, 12 Aug 2022, https://www.theengineer.co.uk/content/news/recycled-tyre-rubber-used-as-aggregate-for-concrete)

Design and strength optimization method for the production of structural lightweight concrete: An experimental investigation for the complete replacement of conventional coarse aggregates by waste rubber particles

Mohammad Momeen Ul Islam, Jie Li, Yu-Fei Wu, Rajeev Roychand, Mohammad Saberian

Abstract

End-of-life tires are a challenging waste because of their non-biodegradable properties, high production volume, and low utilization rate. Extensive research is currently being undertaken to look for various applications of waste tire rubber in the concrete industry to improve their utilization rate and significantly increase the uptake of this waste material. However, low strength and poor bond performance between rubber aggregates and cement matrix are hindering its application in the concrete industry. This paper introduces an innovative method of prestressing the coarser rubber aggregates (RAs) to address these challenges and limitations found in the critical literature review. Two steel mould rigs were newly designed for manufacturing the rubberized concrete (RuC). Three different mix designs containing 100% replacement of conventional coarse aggregates were prepared using (i) two different sizes of rubber particles and (ii) the addition of steel fibers. Density, SEM-EDS analysis, compressive strength, splitting tensile strength, flexural strength, and modulus of elasticity were undertaken to evaluate mechanical performances. The experimental results depict that this novel preloading method can bring a maximum of 97%, 59%, and 20% increase in compressive strength, flexural and tensile strength compared to that of the normal RuC, respectively. In addition, it provides a significant improvement in the interfacial transition zone between the matrix and RAs. This study demonstrates the efficient scientific recycling procedures in manufacturing the RuC with a maximum compressive strength of 18 MPa (density of 2000 kg/m^3), which can be considered structural lightweight concrete as per ACI 213R-14 and Eurocode 2 recommendations.

Introduction

Enormous amount of waste tires is thrown away to be buried or burned throughout the world, which has added more challenges to climate change and environmental pollution control. Disposal of waste tire rubber has become a crucial ecological issue worldwide (Li et al., 2018). It is reported that each year, approximately 1.5 billion waste tire rubbers are generated globally (Saberian and Li, 2019). Most notably, this number will reach around 5 billion per year by 2030 (Thomas and Gupta, 2016). Presently, approximately 4 billion waste tire rubbers are present in landfills and stockpiles all around the world (Danon et al., 2015). Australia alone disposed of approximately 51 million waste tires each year (Li et al., 2018), and it is expected that this number is likely to increase correspondingly with continuing population expansion. Stockpiling and landfilling of waste tire rubbers may also lead to illegal dumping, exporting, or burial in the surroundings (Sebastian and Louis, 2022). Therefore, stockpiling and

landfilling of waste tire rubbers are not feasible options because of the depletion of landfill sites and various environmental problems (Saberian et al., 2021; M.M.U. Islam et al., 2016).

With these restrictions in place, researchers have been introduced with a prospect to investigate alternative uses of waste tire rubbers and explore sustainable measures. Previously, researchers utilized waste rubber as crumb rubber (Mehdipour et al., 2020), chip rubber (Bompa and Elghazouli, 2019), and tire rubber ash (Al-Akhras and Smadi, 2004) in conventional concrete to replace fine aggregate, coarse aggregate, and cement, respectively. However, the inclusion of rubber leads to poor performance of concrete (Wang et al., 2019), and approximately 85% and 50% reduction of compressive strength and splitting tensile strength were observed for 100% replacement of natural coarse aggregate (NCA) with waste chip rubbers, respectively (Siddique and Naik, 2004). Similarly, the reduction of 65% and 50% was observed for compressive strength and splitting tensile strength for the 100% replacement of NCA with crumb rubbers, respectively (Siddique and Naik, 2004). Hernández et al. (2020) reported that the strength reduction in RuC depended significantly on the size and amount of rubber granular added in concrete.

Researchers have been trying to develop the performance of RuC by adopting various pre-treatment methods for waste rubber particles in terms of physical and chemical treatments (Rostami et al., 2000; Abd-Elaal et al., 2019). Some researchers reported that washing rubber with water could slightly enhance the compressive strength of the RuC in comparison to the untreated rubber (Najim and Hall, 2013; Youssf et al., 2020). Pre-coating of rubber particles with cement paste is another physical method to improve the strength of RuC (Kashani et al., 2018). This procedure enhances the elasticity of rubber particles, reduces the elasticity modulus difference between cement matrix and rubber surface, and decreases further stress concentration in RuC (Huang et al., 2013). However, pre-coating of rubber particles with cementitious paste is not always effective in increasing the strength of RuC (Zhang and Poon, 2018). Another method, i.e., surface treatment method, was applied to enhance the performance of RuC, where the surface of rubber particles was treated with various chemicals prior to the casting. Among these pre-treatment methods, surface treatment with NaOH is considered the most effective one (Guo et al., 2017) due to its functions as an agent to increase the roughness of rubber surface and a heavy-duty dirt cleaner. The NaOH solution pre-treatment can help in increasing the strength up to 17% than the untreated rubber particles in RuC (Youssf et al., 2016). Nevertheless, treating rubber surfaces with NaOH may not always be effective.

Marques et al. (2008) reported that NaOH solution decreased the strength or did not significantly change the strength of RuC. Recently, Wu et al. (2020) developed a casting method where NCA was replaced by 0% to 100% with waste chipped rubber contents to produce RuC. Their study has a very limited scope of work, and broader studies are required before this casting method can be applied in engineering practice.

The partial replacement (>5%) of conventional coarse aggregate in NSC (Ganjian et al., 2009) with coarser rubber aggregates (RAs) may cause non-uniform distribution of coarse aggregates, leading to surprising concrete failure or cracks. Rubber particles possess lower specific gravity than traditional coarse aggregates, such as granites, limestone, and sandstone (Alexander and Mindess, 2005), and their incurporated implementation in RuC may cause the accumulation of rubber particles at the upper portion of casting mould for higher w/c ratios (Khorrami et al., 2010; Huemer et al., 2001). A similar phenomenon was also reported in another study (Ganjian et al., 2009), where rubber particles moved to the upper surface of mould when compacted/vibrated due to their lower specific gravity compared to natural coarse aggregates. Furthermore, conventional coarse aggregates are brittle materials and react differently from rubber particles when subject to compressive loads. For instance, traditional coarse aggregates exert resistance to the applied compressive load (Vasconcelos et al., 2009), whereas coarser rubber particles exhibit elastic deformations (Rivlin and Saunders, 1997). Hence, these contradictory characteristics dissuade the cooperative implementation of these two materials in concrete production.

Although there has been extensive research works carried out to improve the strength of RuC; still, there is limited knowledge for the complete (100%) replacement of natural coarse aggregates (NCA) by RAs as an alternative coarse aggregate in concrete production. Current literature is limited to physical and chemical pre-treatments of waste tire rubber, whereas these methods are vulnerable to the source and composition of rubber particles (Y. Li et al., 2019; Y. Li et al., 2019; Mohammadi et al., 2016). This research introduces two newly designed mould rigs to increase the strength of RuC without considering complex, time-consuming, and cost ineffective pre-treatments. Additionally, this novel method is independent of considering chemical composition, source, and surface of rubber particles for the production of RuC, which encompasses all the required standard mechanical tests for concrete materials. Most importantly, these mould rigs were designed in a way to improve the RuC strength significantly along with other mechanical properties for the 100% replacement of NCA by rubber particles. There is no available method in the existing literature that can be implemented in manufacturing the structural lightweight concrete (SLWC) with 100% waste rubber content as coarse aggregate. Three different concrete mixes were cast for 100% replacement of NCA with different rubber particle sizes. The concrete mixes were comprised of three different variables, such as two different rubber particle sizes, addition of steel fibers, and regular and compressed concrete samples. Fresh and dry concrete densities were determined for each concrete mix. Initially, an analytical study on the microstructural behaviors was carried out to manifest the improved bonding properties at interfacial transition zone (ITZ) for the newly developed structural lightweight concrete (SLWC). The mechanical properties, i.e., compressive strength, splitting tensile strength, flexural strength, and modulus of elasticity, were determined. Furthermore, cost-effectiveness, eco-efficiency, and applications of the newly developed SLWC are discussed. This study focuses on stimulating the utilization of waste tire rubber to a greater extent for the concrete industry, promoting sustainable development.

Section snippets

Research hypothesis

Excessive pores inside the rubber aggregate cause higher water demand for proper concrete mixing (Gupta et al., 2019). Nevertheless, the entrapped air inside the pores of rubber particles displaced required water at the very beginning of drying, leading to poor hydration process (Roychand et al., 2021). Moreover, existing water inside pores evaporates along with the hydration process of RuC, which increases the number of voids inside the concrete and weakens the bond between the rubber surface …

Materials

Two different sizes of rubber particles (RPs) were collected from a local recycling plant with a maximum size of 15 mm (Fig. 2a) and 25 mm (Fig. 2b), respectively, for the complete replacement of conventional coarse aggregate (CCA). Table 1 shows the physical characteristics of collected rubber particles used in this research. The bulk density of the chipped

rubber granular was about 2.35 times lower than the CCA. Ordinary Portland cement (OPC) and river sand were used as binding material and …

Fresh and hardened density

Fresh concrete density changed significantly with the inclusion of rubber granular compared to the normal strength concrete (NSC). Fig. 8 presents the fresh concrete density for different concrete mixes. A maximum fresh density of 2545.65 kg/m^3 was found for the NSC-C mix. Fresh concrete density for different rubberized concrete mixes ranged from 1772.60 kg/m^3 to 2229.90 kg/m^{3,} depending on the rubber particle sizes, steel fiber, and additional water. It was observed that fresh density reduced …

Conclusion

This study aims to develop usable sustainable concrete recycling the waste tire rubbers for the complete replacement of CCA. The following conclusions are drawn based on the investigations performed in this novel study.

1. This study has successfully managed to improve the rubberized concrete strength significantly along with other mechanical properties for the complete replacement of natural coarse aggregates by rubber particles …

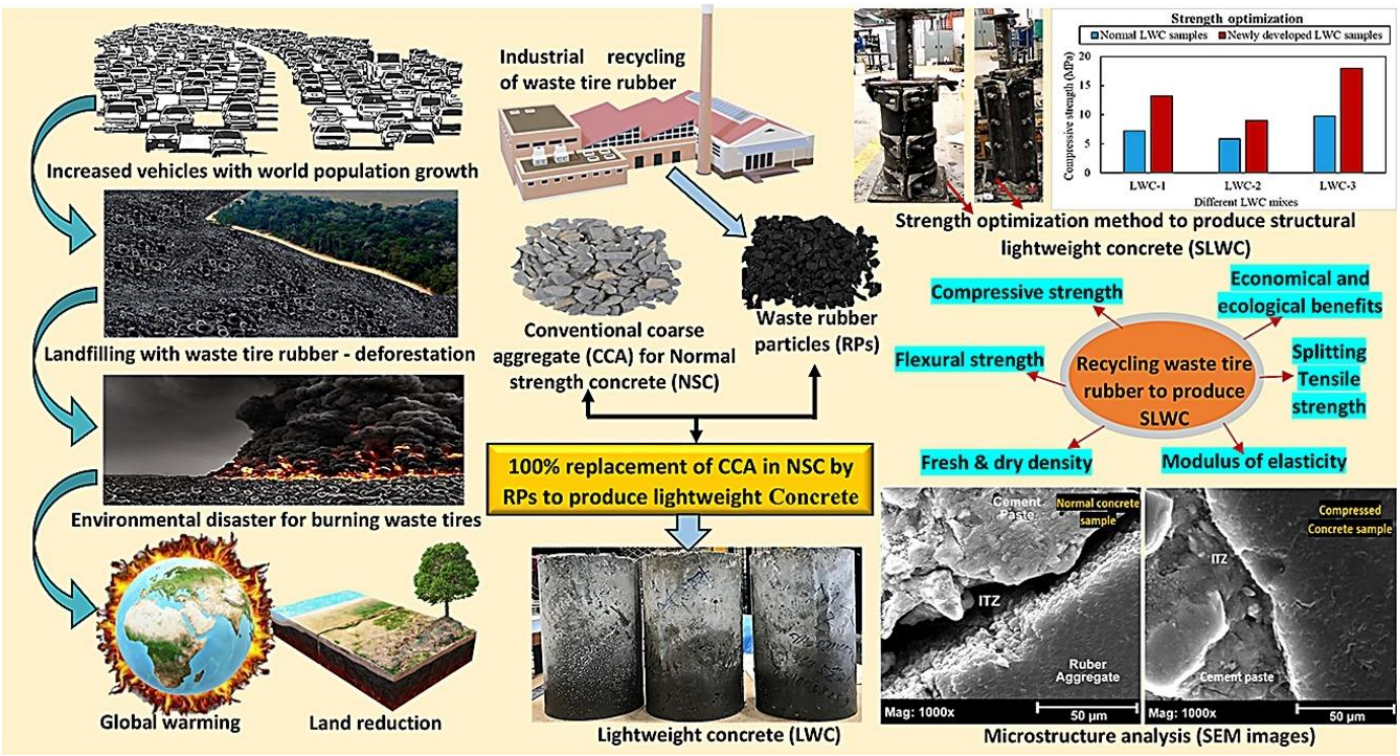
2. The denser and reduced void gaps were found for the compressed …

…

Recommendations

Considering the improved mechanical performances and significant ecological and economic advantages of this newly developed SLWC, this study recommends further investigations on the durability properties, thermal and microstructural analysis, and performances in structural element analysis. These recommended investigations will be conducted and reported in further publications …

Graphical abstract



Resources, Conservation and Recycling, Volume 184, September 2022, 106390, https://www.sciencedirect.com/science/article/abs/pii/S0921344922002348?via%3Dihub

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE News & Information Circular August 2022

www.issmge.org/news/issmge-news-and-information-circular-August-2022

1. PRESIDENTIAL REPORT MAY 2022

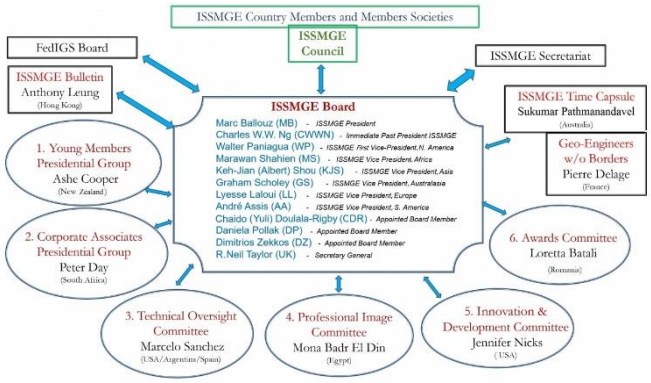
The President of the ISSMGE, Dr Marc Ballouz, has prepared a short video report on his activities during May 2022, available from https://youtu.be/_R7xcvZfnTM.

2. ISSMGE INTERACTIVE TECHNICAL TALKS: A NEW EDUCATIONAL INITIATIVE BY THE PRESIDENT OF ISSMGE

The President of ISSMGE Dr. Marc Ballouz has just launched a new educational initiative titled ISSMGE Interactive Technical Talks (IITT). It represents a series of technical talks to bring together geo professionals from around the world, young and renowned, from both the academia and the industry, to discuss a certain subject of geotechnical engineering. For more information and to view the first episode please go to https://www.issmge.org/news/issmge-interactive-technical-talks-a-new-educational-initiative-by-the-president-of-issmge.

3. NEW ISSMGE WORKING STRUCTURE

The President, Marc Ballouz, is pleased to announce the new working structure of ISSMGE



4. ISSMGE BULLETIN

The latest edition of the ISSMGE Bulletin (Volume 16, Issue 3, June 2022) is available from the website.

5. ISSMGE FOUNDATION

The next deadline for receipt of applications for awards from the ISSMGE Foundation is the 30th September 2022. Click **here** for further information on the ISSMGE Foundation.

6. CONFERENCES

For a listing of all ISSMGE and ISSMGE supported conferences, and full information on all events, including deadlines, please go to the Events page at https://www.issmge.org/events. However, for updated information concerning possible changes due to the corona-virus outbreak (ie. postponements, cancellations, change of deadlines, etc), please refer to that specific events website.

As might be expected, many events have been rescheduled and we update the Events page whenever we are advised of changes.

The following are events that have been added since the previous Circular:

NON-ISSMGE EVENTS

3RD SYMPOSIUM FOR YOUNG TUNNELLERS OF ASIA (OCTOBER 27-28, 2022) School of Civil Engineering, Railway campus, Central South University, No. 68, Shaoshan Road, Changsha, China; Organiser: Central South University; Contact person: Qiujing PAN, Address: No.22, Shaoshan South Road, Phone: +8618174451388, Email: qiujing.pan@csu.edu.cn; Website: http://www.syta2022.com

Only 7 weeks to go - ICPMG 2022, Daejeon, Korea, 19 - 23 September 2022

There are only 7 weeks left until the opening of the 10th International Conference on Physical Modelling in Geotechnics - ICPMG 2022, which will be held in Daejeon, Korea, 19 - 23 September 2022.

On behalf of the Local Organizing Committee and 12,300 members of the Korean Geotechnical Society (KGS), we welcome all the physical modelling specialists and geotechnical engineers from all over the world and want to have precious time for the future of physical modelling in geotechnics in the city of Daejeon. We appreciate your participation and contributions in advance.

ICPMG 2022 will be a fully in-person conference, the first face-to-face TC104 event since ICPMG 2018 in London, and a virtual participation option is provided as well for those who are restricted from international travel due to COVID-19 related issues.

For more information, please visit the official website of ICPMG2022; https://icpmg2022.org

Please get registered and stay tuned for further updates.

We look forward to seeing you in Daejeon.

Nam-Ryong Kim / TC104, 02-08-2022

TC103 Organized a Minisymposium in WCCM-APCOM 2022

TC103 organized a mini-symposium in the international con-

ference of the 15th World Congress on Computational Mechanics and the 8th Asian Pacific Congress on Computational Mechanics in 2022 (WCCM-APCOM 2022, https://www.wccm2022.org), which was held in a fully virtual manner during July 31 August 5, 2022.

Here you can see a short summary of the event: https://unipdit-my.sharepoint.com/:w:/g/personal/francesca_ceccato_1_unipd_it/EXdAQqHiwAtKmY7THnDykaIBiThocbZT1Jq8TjR8jTFFaw?e=JTxlSx

Francesca Ceccato / TC103, 04-08-2022

TC103 Organized Sessions at ICSMGE 2022

TC103 (Numerical Methods in Geomechanics) organized technical sessions in the 20th International Conference on Soil Mechanics and Geotechnical Engineering (ICSMGE 2022) (https://icsmge2022.org/).

Here the summary of the activity: https://unipdit-my.sharepoint.com/:w:/g/personal/francesca_ceccato_1_unipd_it/EVPytZkC_CRMljBEd1eK8O8B8HERCjhrUPY_wxwc00gPOQ?e=AQ2Tho

Francesca Ceccato / TC103, 04-08-2022

The passing of Dr Elie Absi

We learn with sadness of the passing of Dr. Elie ABSI, honorary member of the CFMS.

Technical Director of the CEBTP, his work on the theory of plasticity and limit equilibrium led him to write with J. Kerisel the latest edition of the active and passive earth pressure tables, an essential document for geotechnicians.

Elie Absi has worked hard for the creation and development of national construction laboratories in French-speaking African countries; he was at the origin of the group for the advancement of digital engineering techniques, and of the international union of French-speaking engineers and scientists.

Élie Absi has taught at the École Centrale de Paris, the École d'Architecture des Beaux-Arts and the Centre des Hautes Études de la Construction. He has supervised some forty doctoral theses.

Neil Taylor / General Secretary, 15-08-2022

ISCE 11 Call for Abstracts

Dear all,

It is my pleasure on behalf of the local and international organizing committee to announce the opening of the abstract submission for the 11th International Conference on Scour and Erosion (ICSE11) and invite you to submit your abstract for the conference now.

The ICSE11 will be organized in Copenhagen, Denmark, during 17th 21st September 2023.

We urge you, your colleagues and people in your professional network working on related topics (see full list if topics within scour and erosion at the abstract submission or provided below) to submit an abstract and to attend this conference.

We in the local organizing committee (comprising professionals from NIRAS, DHI and DTU) are dedicated to make it great event with a substantial conference program including technical papers, key notes and technical tours during the week in Denmark.

You may find all relevant information about the conference here: icse11.org

The abstract submission for the conference may be found here: Abstract submission - icse11.org

The submission deadline for the abstracts is September 30th 2022.

We look forward to receiving you abstract well in advance of the deadline, and learning about your inspiring work to be presented during the conference.

All the best from the local organizing committee, chaired by

Erik, Martin and Thor

PhD positions in Geotechnical Engineering (environmental/sustainability)

The following PhD positions are available for our colleagues:

1. At the Norwegian Geotechnical Institute (NGI), Prof. Smaavik is looking to employ someone who would start directly on a PhD in environmental geotechnics. **The application deadline is October 9th, 2022**. The link for the project is- https://candidate.hr-manager.net/ApplicationInit.aspx?cid=388&ProjectId=175695&MediaId=5

Mizanur Rahman / TC307, 30-08-2022

The 3rd ERTC10 Webinar on "Pile design in the second generation of Eurocode 7"

The ISSMGE European Regional Technical Committee ERTC10 "Evaluation of Eurocode 7", together with CEN TC250/SC7 (standardization committee responsible for EC7 under CEN and CENELEC) and NEN (Dutch national standardization organization), are organizing the 3rd Webinar related to the ongoing evolution of Eurocode 7, our main European standard on geotechnical design.

This time, the event will be focused on the subject of "**Pile design in the second generation of Eurocode 7**". It will be held online on the **19th of October 2022 at 15:00-17:00 CEST** (2h).

Participation is free of charge, but the maximum number of participants is limited.

The agenda and the team of presenters for this event will include:

1. Pile design according to EN 1997-3: 202x - Overview of Clause 6: Pile foundations

Prof Christian Moormann, University of Stuttgart, Germany

2. Axial behaviour of piles

Dr Sébastien Burlon, Terrasol-Setec, France

3. Lateral behaviour of piles and other special considerations

Dr Witold Bogusz, Jacobs Engineering Group, Poland

4. The new Eurocode 7 in practice - experience from first applications

Mr Patrick IJnsen, Van 't Hek Group, The Netherlands

5. Q&A session

For those who might miss the Webinar, but would be interested in this subject, the recording of the presentations and the materials will be made available after the event.

Registration details and more information can be found at the website dedicated to the seminar:

https://eurocode7-piling.nen-evenementen.nl/

We would like to kindly ask you to join us for this event and provide us with your opinions and feedback on the changes proposed in the new generation of Eurocode 7.

Witold Bogusz / ERTC10, 30-08-2022

ISRM International Society for Rock Mechanics and Rock Engineering

News
https://www.isrm.net

RocDyn-4 - latest updates and programme overview 2022-08-04

The 4th International Conference on Rock Dynamics and Applications (RocDyn-4), an ISRM specialized conference (HYBRID), will be held on 17-19 August 2022 in Xuzhou, China. This follows the successful series of RocDyn conferences since 2013 (RocDyn-1 in Switzerland, RocDyn-2 in China, RocDyn-3 in Norway). The overseas attendees are encouraged to register online and participate this conference through our virtual channel via Zoom as the effect of Covid-19. If you are interested in this conference, please refer to the enclosed information and more details will be updated soon.

The conference program overview is available now. You can access the following link to view it: http://www.rocdyn.org/programme_overview.html.

Conference on-line/off-line registrations: http://www.rocdyn.org/registration.html.

Hotel reservation for domestic delegates: http://www.rocdyn.org/hotel.html.

Thanks again for your concern on RocDyn-4 and we look forward to seeing you in Xuzhou or at the virtual platform to share the knowledge in Rock Dynamics.

With best regards,

RocDyn-4 Organizing Committee

8th ISRM Young Members' Seminar (YMS) on 26 August 2022-08-24

The ISRM Young Members' Seminar (YMS) Series is a new ISRM Young Members Group initiative. It consists of a series of virtual events to provide a global platform for ISRM young members to share knowledge, experiences, and ideas. More details on the YMS are available on this page.

After seven very successful editions, the 8th ISRM Young Members' Seminar will take place on 26 August at 2 P.M. GMT, with two speakers from USA:

- 4D computed tomography of granular force chains - Dr. Wei Li (The New York State University at Stony Brook, USA)
- Coupled Thermo-Hydro-Mechanical Modeling of Radioactive Waste Disposal in Rock Salt - Dr. Hafssa Tounsi (Lawrence Berkeley National Laboratory, USA)

You can join using the Zoom link created for each Seminar and participate in the question and answers period. The Seminars will also be live-streamed to the ISRM YM's YouTube channel, where they will be stored. **Click here to download the flyer**.

Stay tuned for details on the next edition from the YMS organising committee.

Sevda Dehkhoda
Chair of the ISRM Young Members Committee

ASSOCIATION INTERNATIONALE DES TUNNELS ET DE L'ESPACE SOUTERRAIN AITES | ITA INTERNATIONAL TUNNELLING AND UNDERGROUND SPACE ASSOCIATION

Scooped by ITA-AITES #73, 16 August 2022

Tunnel of hope: Breakthrough achieved in construction under Karnaphuli | Bangladesh

Hinkley Point C tunnelling completed | UK

Brahmaputra twin-tunnel expected to be complete within 2 years once work starts | India

Brenner Base Rail Tunnel | Italy & Austria

History made as Dorothy – HS2's state-of-the-art tunnel boring machine – completes the project's first tunnel after 8 months underground | UK

Concrete segment production completed for Snowy hydro dry access tunnels | Australia

Ministerial endorsement for Suburban Rail Loop (SRL) East | Australia

Cross-sea immersed tunnel completes tube installation in northern China

World's largest underground hydrogen storage project | United States of America

North-west Brisbane transport woes could be solved by tunnel, bus network, study shows | Australia

Scooped by ITA-AITES #74, 30 August 2022

Major contract awarded for construction on the second Gotthard road tunnel | Swizerland

Valley Transportation Authority -VTA- backs 20% bigger San Jose BART tunnel | United States of America

Bengaluru Metro: TBM Vindhya covered 900 metres before breakthrough at proposed Pottery Town station | India

HS2 completes first tunnel cross passages | UK

GLOBALink | Longest high-risk tunnel in Guangxi section of Guiyang-Nanning high-speed railway drilled through | China

Gov't defends plan for water tunnel from Wulai to Taoyuan | Taiwan - Republic of China

Bristol underground: Mayor says studies show it is viable | UK

New tunnel broken through on Maribor-Šentilj railway | Slovenia

Solutions for deadlocked underground parking projects in HCM City | Vietnam

Process Continues toward building Line Five Tunnel in straits of Mackinac | United States of America

MESSAGE FROM THE IGS PRESIDENT

Dear IGS Colleagues,

The time for passing the torch has come.

I have been truly humbled, delighted and privileged to serve you as President of the IGS for the past four years (2018-2022). It has been my greatest honor to have your support; earning your trust has not only been a professional effort but a personal one too.

During my endeavor, I have had the full support from my outstanding fellow Officers - Vice President Nathalie Touze-Foltz, Secretary Edoardo Zannoni, Treasurer Ian Fraser, and Past President Russell Jones - as well as the Council members who represented the major regions of the world. Thanks to the support from the leadership and from Executive Director John Kraus and IGS Secretariat Manager Elise Oatman, I have been able to make significant strides in achieving the goals I set four years ago to help take the society to the next level.

These were 1) Enhance activities of Technical Committees (TC), 2) Improve education and knowledge sharing through up-to-date communication tools, 3) Enhance awareness of geosynthetics, 4) Get connected with members, 5) Get Young Members involved.

IGS Officers and Council members have worked tirelessly to achieve these goals, despite the Covid-19 disruptions. For example, our TCs were still able to deliver resources to members, such as specialty workshops, webinars, and online educational materials. Furthermore, the creation of our open access IGS Digital Library is making a significant impact on education and knowledge sharing, not only for our members but the general public too.

We have also been diligent in delivering the important message that geosynthetics make significant contributions to the UN Sustainable Development Goals. The Sustainability Committee launched the 'Did You Know…?' series, which has been very effective in communicating messages to the members as well as the general public about how geosynthetics can benefit sustainable development. Electronic versions of the IGS Newsletter and Chapter Chat have also enhanced our communication offering. Additionally, the Educate the Educators programs have been successfully executed, many virtual, by Chapters in different regions despite the pandemic.

Another of my top priorities was expanding the involvement of Young Members in IGS activities. As part of that, chair of the Young Members Committee Dawie Marx has been involved in Council activities as an invited member to incorporate young minds for leadership development in the IGS.

Through these dedicated efforts, the IGS has successfully redefined its shape and capacity as a global leader in the fields of geosynthetics and beyond. All these achievements have been the result of concerted efforts by each and every member of the IGS, including the leadership, Council members, and Individual and Corporate members. More importantly, when carrying out my presidential duties, my focus has always been to bring all the members together, while integrating each and every member's voice to lead this society in harmony.

Now, I can pass the torch to my successor Sam Allen. I am confident our new President and leadership will lead the society to an even higher level and I wish them the best of luck. I will still be around supporting the IGS in any way I can and very much look forward to seeing you all at EuroGeo7 next month where I will host the Extraordinary General Assembly as President.

My dear fellow IGS members, I once again thank you for giving me the opportunity to serve and represent you. I wish you all the best!

Sincerely,

Chungsik Yoo

Chungsik Yoo
IGS President

Chungsik Yoo Elected FedIGS President

Geo-engineering advocate the Federation of International Geo-Engineering Societies (FedIGS) has a new President – Chungsik Yoo.

Professor Yoo is outgoing President of the IGS and will be leaving post in September, this year, when he will begin his four-year tenure leading the FedIGS.

The IGS is a member of the FedIGS, a collaborative organization linking professional societies involved in geo-engineering to encourage learning, collaboration and advancement in the field. Other members are:

- The International Society of Soil Mechanics and Geotechnical Engineering
- The International Society for Rock Mechanics and Rock Engineering
- The International Association of Engineering Geology

It also has three Joint Technical Committees: JTC 1 – Natural Slopes and Landslides, JTC 2 – Representation of geo-engineering data in electronic form, and JTC 3 – Education and Training.

Prof. Yoo said: "As the world experiences unprecedented global crisis and continues to navigate the challenges of climate change, the role of the FedIGS, as a collaborative forum for geo-engineering professionals, is never more crucial in finding solutions to these technical and societal challenges.

"I'm proud to have the opportunity to lead the FedIGS over the next few years. My priorities will include strengthening interaction between member societies through joint technical activities, and proactively engaging in geo-engineering-related global issues by communicating with the general public through various digital communication platforms."

"I look forward to meeting members old and new and thank outgoing FedIGS President Xia-Ting Feng for all his hard work."

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

Για τις παλαιότερες καταχωρήσεις περισσότερες πληροφορίες μπορούν να αναζητηθούν στα προηγούμενα τεύχη του «περιοδικού» και στις παρατιθέμενες ιστοσελίδες.

16th International Conference of the International Association for Computer Methods and Advances in Geomechanics – IACMAG 30-08-2022 – 02-09-2022, Torino, Italy, www.iacmag2022.org

WTC 2022 World Tunnel Congress 2022 - Underground solutions for a world in change, 2-8 September 2022, Copenhagen, Denmark, www.wtc2021.dk

11th International Symposium on Field Monitoring in Geomechanics, September 4 - September 7, 2022, London, UK, https://isfmg2022.uk

7th European Geosynthetics Conference, 4 to 7 September, 2022, Warsaw, Poland, https://eurogeo7.org

3rd European Conference on Earthquake Engineering & Seismology, September 4 – September 9, 2022, Bucarest, Romania, https://3ecees.ro

Eurock 2022 Rock and Fracture Mechanics in Rock Engineering and Mining, 12÷15 September 2022, Helsinki, Finland, www.ril.fi/en/events/eurock-2022.html

IAEG XIV Congress 2022, Chengdu, China September 14-20, 2022, https://iaeg2022.org

28th European Young Geotechnical Engineers Conference and Geogames, 15 – 17 – 19 September 2022, Moscow, Russia, https://www.eygec28.com/?

International Workshop on Advances in Laboratory Testing of Liquefiable Soils, 17 September 2022, Kyrenia, North Cyprus, https://nce2022.ktimo.org

10th International Conference on Physical Modelling in Geotechnics (ICPMG 2022), September 19 to 23, 2022, KAIST, Daejeon, Korea, https://icpmg2022.org

11th International Conference on Stress Wave Theory and Design and Testing Methods for Deep Foundations, 20 - 23 September 2022, De Doelen, Rotterdam, The Netherlands, https://www.kivi.nl/afdelingen/geotechniek/stress-wave-conference-2022

10th Nordic Grouting Symposium, 4 - 6 October, 2022, Stockholm, Sweden, https://www.ngs2022.se/

V CENTRAL ASIAN CONFERENCE ON SOIL MECHANICS AND GEOTECHNICAL ENGINEERING

05 – 07 October 2022 Samarkand, Uzbekistan
http://conference.geotechnics.uz

The main purpose of holding this conference in Uzbekistan is to review and exchange of experience in geotechnical problems related to erection and construction high-rise buildings and transport structures in seismic conditions and on soft soils, engineering and geological problems of historical cities, problems tailings, industrial and household waste, water-saving technologies and alternative energy sources, etc. Along with this, we consider it important to consider issues in the field of soil mechanics and contact problems in structural mechanics during static and dynamic (seismic) loads.

We hope that your participation in our conference will provide an opportunity not only to discuss scientific and practical issues of geotechnics, but will also give you great pleasure from visits to world famous monuments, museums, theaters and religious centers temples of the ancient cities Samarkand, Bukhara and Khiva.

The conference is planned to be held in the following areas:

- Problems of geotechnical construction
- Problems of preservation of monuments of historical cities and related to them geotechnical issues
- Soil mechanics
- Contact problems of structural mechanics

Smart Geotechnics 2022, 6 October 2022, London UK, https://smartgeotechnics.geplus.co.uk/smartgeotechnics/en/page/home

II Seminario Reparación y Restauración de Taludes | II Seminario Carreteras de Montaña
6 y 7 de octubre, 2022 Hotel Radisson, Costa Rica

II Conference on Slope Repair and Remediation
II Conference of Mountain Roads
6 – 7 October 2022, San José, Costa Rica (+ virtual)
www.geotecniacr.com/seminario/index.html

Con esta actividad la Asociación Costarricense de Geotecnia da continuidad a dos eventos de gran interés para la comunidad de geotécnica, el Primer Seminario de Reparación y Restauración de Taludes realizado en setiembre del año 2014 y el Primer Seminario de Carreteras de Montaña realizado en setiembre de 2017. El avance tecnológico en esas dos áreas justifica la necesidad de nutrir a los profesionales en geotéc-

nica, con los nuevos conocimientos que a nivel mundial se han venido desarrollando.

Para difundir los avances en la tecnología, se han invitado expertos internacionales de amplio prestigio; quienes expondrán el estado del arte en el tema de estabilización de taludes, tanto en áreas urbanas como en las carreteras de montañas.

El "Seminario de Reparación y Restauración de Taludes" pretende dar un espacio para que las Empresas expongan sus experiencias, mediante casos prácticos. De esta manera contribuiremos con la transmisión de conocimientos y experiencias. Aspectos como: nuevas tecnologías para estabilización de taludes, nuevos tipos de muros, técnicas recientes de construcción, reforzamiento de taludes, control de erosión, drenaje superficial y subterráneo, entre otros, son de gran interés.

Con el Seminario de Carreteras de Montaña esperamos generar un foro de transmisión de conocimientos donde se ex

pongan y discutan temas como: gestión de riesgos de deslizamientos, selección de corredores viales, reforestación, manejo de aguas superficial y subterráneas, control de erosión superficial, sistemas de alerta temprana, relación beneficio costo en la inversión en obras geotécnicas, estabilización de grandes deslizamientos, estabilización de taludes en carreteras de montaña frente a eventos extremos como huracanes, ciclones o terremotos, relación peaje - seguridad en carreteras concesionadas, normas de diseño y otros.

Contáctenos

Reparación y Restauración de Taludes
Carreteras de Montaña
Tel. (506) 2224 4191, (506) 2224 0028
Emai: info1@geotecniacr.com

IX Latin American Rock Mechanics Symposium - Challenges in rock mechanics: towards a sustainable development of infrastructure, an ISRM International Symposium, 16-19 October 2022, Asuncion, Paraguay, http://larms2022.com

5ο Πανελλήνιο Συνέδριο Αντισεισμικής Μηχανικής και Τεχνικής Σεισμολογίας, 20-22 Οκτωβρίου 2022, Αθήνα, https://5psamts.eltam.org

Scientific and Expert Conference
GEO-EXPO 2022
PRIJEDOR, BOSNIA AND HERZEGOVINA
Key topic: Geotechnics in Energy Sector

21st October 2022, Prijedor, Bosnia and Herzegovina
https://www.geotehnika.ba/naslovnica/Third%20GEO-EXPO%202022%20-%20new.pdf

Geotechnical Society of Bosnia and Herzegovina organises 12th Scientific and Expert Conference GEO-EXPO 2022 in Prijedor, Bosnia and Herzegovina. A one-day event will be held at the Hotel Prijedor on 21st October 2022.

The conference will be an opportunity for geo-experts and researchers from the region, involved in underground engineering, mining, civil engineering, geology, landslides, geotechnics, infrastructure, hazards and risks, to exchange the experience.

The key topic is "Geotechnics in Energy Sector".

Conference Topics: underground structures, mining, civil and environmental engineering, landslides, geotechnical investigation and monitoring, geotechnical hazard and risk, infrastructure, foundations and landfills.

Organiser: Geotechnical Society of Bosnia and Herzegovina
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Email: geotehnika@geotehnika.ba
Website: https://www.geotehnika.ba

2022 GEOASIA7 - 7th Asian Regional Conference on International Geosynthetics Society, October 31 – November 4, 2022, Taipei, Taiwan, www.geoasia7.org

cGts 50th jubilee Annual conference
GEOTECHNICAL ENGINEERING AROUND US AFTER 50 YEARS
14th and 15th November 2022, Brno, Czech Republic
www.cgts.cz/en

The CZECH GEOTECHNICAL SOCIETY CICE has a great pleasure to invite you to join 50th jubilee Annual conference with international participation FOUNDATION ENGINEERING Brno 2022 on 14th and 15th November 2022.

Theme of the conference:

GEOTECHNICAL ENGINEERING AROUND US AFTER 50 YEARS

Main conference sections:

1. Geotechnical Investigation
2. Earth Structures
3. Foundation Structures
4. Underground Structures
5. Significant geotechnical structures realized in the Czech Republic and abroad

CouFrac 2022 - 3rd International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application, November 14-16, 2022, Berkeley, California, USA, https://coufrac2022.org

Piling & Ground Improvement Conference 2022, November 16-18, 2022, Sydney, Australia, https://events.american-tradeshow.com/pilingconference2022

AUSROCK Conference 2022, 6th Australasian Ground Control in Mining Conference –an ISRM Regional Symposium, 29 November – 1 December 2022, Melbourne, Australia, www.ausimm.com/conferences-and-events/ausrock/

16th ICGE 2022 – 16th International Conference on eotechnical Engineering, Lahore, Pakistan, 8-9 December, 2022, https://16icge.uet.edu.pk/

ATA GEOSYNTHETICS CONFERENCE

Feb. 5-8, 2023, Kansas City, MO USA
https://geosyntheticsconference.com

Geosynthetics 2023 features a robust program comprised of technical paper sessions, energetic panel discussions, workshops, half-day short courses and special sessions organized by our supporting organizations. On the showfloor a wide variety of suppliers to the geosynthetic industry will be showcasing their products and services and for those new to the industry a stop at the educational zone provides samples of geosynthetics and basic geosynthetic education.

Geosynthetics 2023 is co-located with the IECA Annual Conference. This unique opportunity will allow attendees to view the combined showfloor and explore education from both shows.

The technical sessions, educational programs and exhibition have been carefully crafted to bring together civil engineers, contractors, architects, environmental and geotechnical consultants, manufacturers and suppliers, academics and students, and regulatory agencies from around the world. As an attendee at Geosynthetics 2023, you have an impressive array of exhibits, four workshops, eight special sessions, six short courses, 75 technical papers, and student research posters to explore.

Geosynthetics 2023 is the second time the geosynthetics industry's premier conference is co-located with the International Erosion Control Association's (IECA) Annual Conference. Attendees from both conferences have equal access to all technical sessions and exhibits, based on their registration. When you look through the schedule and select the event you wish to attend, be sure to look through both programs and take advantage of this great opportunity to expand your educational options.

4th African Regional Conference on Geosynthetics – Geosynthetics in Sustainable Infrastructures and Mega Projects, 20-23 February 2023, Cairo, Egypt, www.geoafrica2023.org

ASIA 2023, 14 - 16 March 2023, Kuala Lumpur, Malaysia, www.hydropower-dams.com/asia-2023

3rd International Conference TMM_CH "Transdisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage: Recapturing the World in Conflict through Culture, promoting mutual understanding and Peace", 20-23 March 2023, Athens, Greece, www.tmm-ch.com

88th ICOLD Annual Meeting & Symposium on Sustainable Development of Dams and River Basins, April 2023, New Delhi, India, https://www.icold2020.org

Rocscience International Conference 2023
April 24-26, 2023, Toronto, Canada
www.rocscience.com/events/rocscience-international-conference-2023

Rocscience is delighted to announce the Rocscience International Conference 2023 (RIC2023), an in-person gathering to be held from April 24-26, 2023, in Toronto, Canada. RIC2023's primary objective is to bring geotechnical professionals together to meet and exchange ideas on important issues and developments in geotechnical engineering, particularly combinations of emerging and mature technologies.

The geotechnical industry is rapidly evolving. Engineers are more connected through technology, technology is becoming more integrated than ever, and methods combining these technologies are becoming more prevalent. This movement towards combining technologies led us to the conference theme, "Synergy in Geotechnical Engineering – Success Beyond Individual Technologies." We believe the time is right to highlight how far the industry has come with various technologies and continues to develop. The conference aims to create an environment that fosters new perspectives and helps attendees delve deeper into innovative approaches.

During RIC2023, Rocscience will award the 2023 Lifetime Achievement Medal to Dr. Norbert Morgenstern, an internationally recognized authority in the engineering community. As both a practitioner and educator, Dr. Morgenstern's contributions to the geotechnical community continue to benefit engineers worldwide, and he will give an address on his career.

In addition to keynotes by Dr. Morgernstern and four other distinguished speakers, there will be several technical and networking sessions.

Conference Themes

- Tunnelling in challenging environments

- Slope stability analysis
- Numerical modelling of excavations
- Analysis of underground excavations
- Computational geomechanics
- Foundation engineering
- Artificial intelligence and virtual reality technologies in geomechanics
- Advancements in probabilistic geotechnical analysis
- Advancements in three-dimensional geotechnical analysis
- Dynamic analysis of soils and liquefaction modelling
- Continuous and discontinuous rock mechanics
- Innovative approaches and technologies for tailings storage facilities design
- Soil-structure interactions
- Settlement analysis and ground improvements
- Groundwater flow and seepage analysis
- Advanced geotechnical monitoring technologies – slope stability and underground
- Site investigations

UNSAT 2023 - 8th International Conference on Unsaturated Soils, 2-5 May 2023, Milos island, Greece, www.unsat2023.org

World Tunnel Congress 2023 Expanding Underground Knowledge & Passion to Make a Positive Impact on the World, 12 - 18 May 2023, Athens, Greece, https://wtc2023.gr

NROCK2022 - The IV Nordic Symposium on Rock Mechanics and Rock Engineering, 24 – 25 May 2023, Reykjavic, Iceland, www.nrock2023.com

May 29 – 31, 2023, Prague, Czech Republic
www.ucprague.com

The Czech Tunnelling Association ITA-AITES cordially invites you to 15th International Conference entitled "**Underground Construction Prague 2023**", which will take place from **29 to 31 May 2023** in Prague with the support of the International Tunnelling Association ITA-AITES, ISSMGE and ISRM.

This international conference is one of the series of conferences "Underground Construction Prague", which are held regularly every three years. Due to the pandemic, this year has been postponed by one year. Participants of past conferences enjoyed the scientific programme, venue and social programme. The conferences have been attended by distinguished international experts in the field and we look forward to prominent guests also in 2023. For these reasons, "Underground Construction Prague" can be considered as one of the key events of 2023 in the discipline of underground construction.

Thematic Sessions

Session 1: Conventionally excavated tunnels
Session 2: Mechanically excavated tunnels
Session 3: Other underground structures, repositories, reconstructions and history
Session 4: Geotechnical investigation and monitoring
Session 5: BIM, numerical modelling, research and development
Session 6: Equipment, operational safety and maintenance
Session 7: Risk management, contractual relationships and funding

Open Session

Tunnel failures - causes, risks, mitigation

Contacts

Czech Tunnelling Association ITA-AITES

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Phone: +420 284 001 444, **e-mail:** ps2023@guarant.cz, **website:** www.guarant.com

European Geotechnical Engineering – Unity and diversity
7-9 June 2023, Bucharest, Romania
https://17decge.ro

The 17th edition of DECGE will be held in Bucharest, 7 – 9 of June 2023, at Ramada Parc hotel, under the auspices of the Romanian Society for Soil Mechanics and Foundation Engineering (SRGF) and the main technical universities involved in this field in Romania.

The theme of the Conference is: **European Geotechnical Engineering – Unity and diversity** meaning to get together the Danube – European countries, each one with its specificity and finding the way for having unified practices within the European context.

The general objectives of 17DECGE are to disseminate the knowledge and the national practices toward all stakeholders in the field, to approach both research and practical topics, but also trans-disciplinary ones and to ensure a forum of discussion for all.

17DECGE proposes interesting and diverse topics under the general theme of the conference, plenary and discussion sessions, as well as a technical exhibition.

TOPICS

I. Geotechnical investigation and ground modelling

I.1. Site investigation
I.2. Laboratory testing
I.3. Experimental and numerical modelling
I.4. Geotechnical parameters

II. Geotechnical design

II.1. Eurocodes
II.2. Geotechnical structures
II.3. Ground improvement
II.4. Ground reinforcement / geosynthetics
II.5. Infrastructure works
II.6. Rehabilitation of geotechnical structures

III. Geo-hazards

III.1. Landslides
III.2. Seismic geotechnical engineering and soil dynamics
III.3. Risk management

IV. Environmental geotechnics, hydrogeology and energy

IV.1. Environmental geotechnics
IV.2. Hydrogeology
IV.3. Energy geotechnics

V. Information technology in Geotechnical Engineering

V.1. Building Information Modelling (BIM) in Geotechnical Engineering
V.2. Application of Artificial Intelligence (AI) and Machine Learning (ML) in Geotechnical Engineering
V.3. New geotechnical instrumentation, sensors and sensing technologies
V.4. Big data and databases in geotechnical engineering
V.5. Imaging technologies in geotechnical engineering

Get in touch

Address: Ramada Parc Hotel, Poligrafiei Str. 3-5, Sector 1 , Bucharest

Email: srgf@utcb.ro

3rd JTC1 Workshop on "Impact of global changes on landslide risk",7 – 10 June 2023, Oslo, Norway, https://jtc1-2023.com

9th International Congress on Environmental Geotechnics Highlighting the role of Environmental Geotechnics in Addressing Global Grand Challenges, 25-28 June 2023, Chania, Crete island, Greece, www.iceg2022.org

8th International Conference on Debris Flow Hazard Mitigation
26-29 June 2023, Torino, Italy
http://dfhm8.polito.it

We are pleased to announce the **8th edition of the International Conference on Debris-Flow hazard Mitigation**. The event is jointly organized by **Politecnico di Torino** and the **University of Turin**, and will be held on **June 26-29, 2023** in the beautiful city of Turin, Italy, on the downtown campus of Politecnico di Torino.

For thousands of years the Alps have held a strategic importance at the heart of Europe, and are nowadays one of the most intensively urbanized and regulated mountain ranges in the world. In this context, the conference will gather international researchers and practitioners in the field of debris-flow, fostering cooperation, communication and exchange of knowledge.

Previous editions have been held in San Francisco, USA (1997), Taipei, Taiwan (2000), Davos, Switzerland (2003), Chengdu, China (2007), Padua, Italy (2011), Tsukuba, Japan (2015), and Golden, USA (2019).

DFHM8 aims to gather international researchers and practitioners, fostering cooperation, communication and exchange of knowledge.

Topics

- Debris-flow triggering
- Debris-flow entrainment and motion
- Debris-flow deposition and fan morphology
- Hydrology and debris flows
- Laboratory and numerical modeling
- Field investigation
- Remote sensing and monitoring techniques
- Assessment of debris-flow susceptibility, hazard and risk
- Application of mitigation technologies
- Best practice guidelines
- Forensic debris flow studies
- Emergency management
- Integration of multidisciplinary viewpoints
- Risk management by local governments and legislation

Main contact

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Conference Chair

Prof. Marina Pirulli (she/her)
Politecnico di Torino
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Organizing Secretariat

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Numerical Methods in Geotechnical Engineering 2023

26 - 28 June 2023 Imperial College London, UK
www.imperial.ac.uk/numerical-methods-in-geotechnical-engineering

The 10th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE 2023) will be held at Imperial College London, on 26 - 28 June 2023.

This series of conferences, organised by the ERTC7 (European Regional Technical Committee 7 for Numerical Methods) under the auspices of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), started in 1986 (Stuttgart, Germany), followed by conferences every four years: Santander, Spain, in 1990, Manchester, United Kingdom, in 1994, Udine, Italy, in 1998, Paris, France, in 2002, Graz, Austria, in 2006, Trondheim, Norway, in 2010, Delft, The Netherlands, in 2014 and Porto, Portugal, in 2018.

NUMGE 2023 will provide a forum for academics, researchers and engineering practitioners to meet and discuss the current state-of-the-art in numerical methods in Geotechnical Engineering and highlight current challenges faced in their application to geotechnical problems. In particular, NUMGE 2023 will deliver an opportunity to anticipate, conceive and discuss future developments in this dynamic and ever-evolving field of knowledge.

The conference will feature a special tribute to the late Professor Scott Sloan who was a long-serving member of ERTC7.

Conference topics

Authors are invited to submit abstracts covering a broad range of topics listed below. Particularly welcome are case studies, numerical analysis-based design and automation of workflow in geotechnical design.

- Constitutive modelling for saturated and unsaturated soils
- Finite element, finite difference, discrete element, material point and other methods
- Coupled analysis
- Geotechnical earthquake engineering
- Probabilistic and inverse analysis
- Machine learning and artificial intelligence
- Dams, embankments and slopes
- Excavations and retaining structures
- Shallow and deep foundations
- Tunnels and mining applications
- Reinforcements and ground improvement
- Offshore geotechnics
- Geo-energy & energy geotechnics
- Regulations and codes

Email: numge2023@imperial.ac.uk

17ARC 17th Asian Regional Geotechnical Engineering Conference, 14-18 August 2023, Nur-Sultan, Kazakhstan, https://17arc.org

ISMLG 2023

4th International Symposium on Machine Learning & Big Data in Geoscience

29 August - 1 September 2023, University College Cork, Ireland
www.ismlg2023.com

Dear Friends and Colleagues,

It is a great pleasure and an honour to host the **4th International Symposium on Machine Learning & Big Data in Geoscience** at University College Cork.

A Conference Proceeding of extended abstracts will be provided. Selected abstracts and papers will be recommended to some special issues in peer-reviewed journals:

- Tunnelling and Underground Space Technology Special Issue: Machine Learning and Big Data Acquisition in Underground Infrastructure
- Underground Space Special issue: innovative sensing tools and big data acquisition in subsurface engineering

Underground Science and Engineering (DUSE) Special Issue: Machine Learning and Big Data in Deep Underground Engineering

Topics will include:

- Development of benchmark datasets for geoscience and geo-industries
- Development and application of innovative geotechnical monitoring technologies to subsurface engineering and geoscience
- Gathering and processing of big data and metadata in geoscience and geoengineering
- Big geodata mining, generation of big geodata by computational methods and etc.
- Development and optimisation of machine learning algorithm for geoscience and geotechnics

- Applying artificial intelligence to site investigation and geo-materials behaviour
- Application of machine learning and data analytics for design, construction, maintenance of geotechnical assets during the whole-life cycle
- Role of visual data analytics, virtual reality and data-centric technology in geosciences and beyond

Special Sessions

Special Session 1: AI in offshore geotechnics and geoscience

Special Session 2: Big data and machine learning in life-cycle design, construction and maintenance of tunnel and underground engineering

Special Session 3: Application of Machine Learning and Big Data in Geotechnical and Geohazard Investigations

Special Session 4: Machine Learning for the Mapping of Marine Geology, Geomorphology and Habitats

Special Session 5: Machine Learning & Data-driven based TBM Tunnelling

Special Session 6: Big data and machine learning for ageing tunnels and underground infrastructures

Special Session 7: Image Analysis and Machine Learning for Geomechanics

Special Session 8: Deep Learning & Computer Vision Aided Characterization of Geotechnical Processes

Special Session 9: Innovative monitoring technologies and artificial intelligence for underground space

Special Session 10: Back Analysis using Machine Learning for the Observational Method – Lessons Learnt and Future Directions

Special Session 11: IoT & AI-based intelligent construction and maintenance of shield tunnels

Special Session 12: Data-driven solutions for underground built heritage modeling, preservation and valorization

Special Session 13: Emerging technologies in geotechnics and urban systems

Special Session 14: Data Quality Assurance and Pre-processing in Geoscience

Special Session 15: Machine Learning in offshore wind

Conference Secretariat:

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For Scientific Programme Queries Please Email - ismlg2023@gmail.com

IS-PORTO 2023 8th International Symposium on Deformation Characteristics of Geomaterials, 3rd - 6th September 2023, Porto, Portugal, www.fe.up.pt/is-porto2023

SUT OSIG 9th International Conference "Innovative Geotechnologies for Energy Transition", 12-14 September 2023, London, UK, www.osig2023.com, www.sut.org

SAHC 2023 13th International Conference on Structural Analysis of Historical Constructions "Heritage conservation across boundaries", 12-15 September 2023, Kyoto, Japan, https://sahc2023.org/

XII ICG - 12th International Conference on Geosynthetics, September 17 – 21, 2023, Rome, Italy, www.12icg-roma.org

SEG23 Symposium on Energy Geotechnics, 3-5 October 2023, Delft, The Netherlands, https://seg23.dryfta.com

28th European Young Geotechnical Engineers Conference and Geogames
04 – 07 October 2023, Moscow, Russia

Organiser: Russian Society for Soil Mechanics, Geotechnics and Foundation Engineering

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2023 15th ISRM Congress, International Congress in Rock Mechanics Challenges in Rock Mechanics and Rock Engineering, 9÷14 October 2023, Salzburg, Austria, https://www.isrm2023.info/en/

ACUUS SINGAPORE 2023 18th Conference of the Associated Research Centers for the Urban Underground Space "Underground Space – the Next Frontier", 1 - 4 Nov 2023, Singapore, www.acuus2023.com

6th World Landslide Forum "Landslides Science for sustanaible development", 14 to 17 November 2023, Florence, Italy, https://wlf6.org

CREST 2023

2ND International Conference on CONSTRUCTION RESOURCES FOR ENVIRONMENTALLY SUSTAINABLE TECHNOLOGIES
November 20-22, 2023 | Fukuoka, Japan

https://www.ic-crest.com

The aim of CREST 2023 is to disseminate information and exchange ideas on issues related to natural disasters and disasters associated with anthropogenic activities, as well as to provide solutions through the use of alternative resources, disruptive technologies and soft type disaster mitigation measures for building a sustainable and resilient society from the perspective of geoengineering. The conference aims to bring together engineers, researchers, scientists and policy-makers from around the world under one umbrella for debates and discussions on wide range of interdisciplinary themes mentioned in this bulletin. The conference focuses on commitment to Sustainable Development Goals (SDGs) No. 9, No. 11, No. 13 and No. 17 by promoting new ideas and innovations in infrastructure design, construction and maintenance, as well as policy making and implementation with the aim of contributing to climate change adaptation and disaster resilience.

Conference Themes

Theme 1 : Natural Geo-Disasters and Resiliency

1. Climate change related natural disasters
2. Climate change independent natural disasters
3. Disasters associated with anthropogenic activities
4. Economic aspects of disaster risk assessment and modelling

Theme 2 : Climate Change Adaptation and Innovation from the Perspective of Geoengineering

1. Innovative techniques towards low carbon footprint
2. Innovative case studies for sustainable design and construction
3. Socio–economic and environmental aspects in sustainable construction
4. Geological and hydrological aspects

Theme 3 : Geo-Sustainnovation through Disruptive Technologies

1. Information based (AI, IoT, VR, etc.) measures for natural disaster mitigation
2. Application of DX and i-Construction
3. Physical and numerical modelling of disasters and disaster mitigation techniques
4. Smart energy harvesting techniques

Theme 4 : Use of Recycled and Waste Material in Geoengineering

1. Advancement in low cost and low carbon construction techniques
2. Recycled materials (alternative geomaterials) in geotechnical constructions
3. Mechanical and constitutive properties of recycled materials
4. Management and utilization of disaster wastes

Theme 5 : Policies and Implementation for Resilient Society

1. Disaster and environment
2. Community outreach through soft type disaster mitigation measures
3. Education for sustainable development goals
4. Measures for achieving Society 5.0 goals

Correspondence

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The 5th International Conference on Geotechnics for Sustainable Infrastructure Development

December 14-15, 2023 - Hanoi, Vietnam

https://geotechn.vn

The series of International Conference on Geotechnics for Sustainable Infrastructure Development (GEOTEC HANOI) was organized successfully in 2011, 2013, 2016 and 2019 in Hanoi and it has become a well-known event not only in Vietnam but also internationally for its excellent quality and organizational scale. The number of accepted papers and attendees increased significantly over the times. In the latest event, GEOTEC HANOI 2019 (GH2019), there were 186 published papers and more than 800 attendees from 37 countries and territories. More remarkably, GEOTEC HANOI has welcome world-class experts to deliver keynote lectures: Prof. Sven Hansbo (Sweden), Prof. Kenji Ishihara and Dr. Hiroshi Yoshida (Japan), Prof. Harry G. Poulos (Australia), Prof. Pieter A. Vermeer (Netherlands), and Prof. Alain Guilloux (France) in GH2011; Prof. Rolf Katzenbach (Germany), Prof. Alain Guilloux (France), Prof. Fumio Tatsuoka (Japan), Prof. Kenichi Soga (United Kingdom), Prof. Helmut Schweiger (Austria), and Prof. Sven Hansbo (Sweden) (honorable lecture) in GH2013; Prof. Bengt H. Fellenius (Canada), Prof. Buddhima Indraratna (Australia), Prof. Chang-Yu Ou (Chinese Taipei), Dr. Jamie Standing (United Kingdom), and Prof. Kazuya Yasuhara (Japan) in GH2016; and Prof. Harry Poulos (Australia), Prof. Adam Beruijen (Belgium), Prof. Masaki Kitazume (Japan), Prof. Delwyn Fredlund (Canada), Prof. Lidija Zdravkovic (The UK), and Prof. Mark Randolph (Australia) in GH2019. In addition, GH2019 conference was hornored to have two special invited lectures: Prof. Charles Ng (Hong Kong, China), President of ISSMGE; Prof. Eun Chul Shin, (South Korea), V. President of ISSMGE for Asia.

Following the success of the four previous events, the 5th International conference, GEOTEC HANOI 2023 (GH2023) will be organized by FECON Corporation, the Vietnamese Society for Soil Mechanics and Geotechnical Engineering (VSSMGE), Japanese Geotechnical Society (JGS), Thuyloi University (TLU), and Vietnam Petroleum Institue (VPI) on December 14-15, 2023 at the National Convention Center (NCC), Hanoi, Vietnam. GH2023 will be honorably patronized by the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and Japan International Cooperation Agency (JICA).

For the 5th conference, besides the five known themes of GEOTEC HANOI series, i.e., Deep foundations, Tunnelling and underground spaces, Ground improvement, Geotechnical modelling and monitoring, Landslide and erosion, one new and imperative topic on sustainable development, namely Offshore wind power and Coastal geotechnics, is also included.

Themes

The conference key themes are as follows.

- Deep Foundations
- Tunnelling and Underground Spaces
- Ground Improvement
- Geotechnical Modelling and Monitoring
- Landslide and Erosion
- Offshore Wind Power and Coastal Geotechnics

Supporting

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World Tunnel Congress 2024 19 to 25, April, 2024, Shenzhen, China, www.wtc2024.cn

8th International Conference on Earthquake Geotechnical Engineering (8ICEGE), 7-10 May, 2024 Osaka, Japan, https://confit.atlas.jp/guide/event/icege8/top?lang=en

ECSMGE 24 XVIII European Conference on Soil Mechanics and Geotechnical Engineering, 26-30 August 2024, Lisbon, Portugal, www.ecsmge-2024.com

PANAMGEO CHILE 2024
17th PAN-AMERICAN CONFERENCE ON SOIL MECHANICS AND GEOTECHNICAL ENGINEERING | 2nd LATIN-AMERICAN REGIONAL CONFERENCE OF IAEG

La Serena, Chile
https://panamgeochile2024.cl

On behalf of the Chilean Geotechnical Society (SOCHIGE), you are cordially invited to participate in the **17th Pan-American Conference on Soil Mechanics and Geotechnical Engineering (XVII PCSMGE) and 2nd Latin-American Regional Conference of the International Association of Engineering Geology and the Environment (IAEG)** to be held in Chile in November 2024. We are delighted to organize this event, for the second time, after hosting it back in 1991. With an average width of 180 kilometers and a length of about 5000 kilometers, Chile is bordered by the Pacific Ocean to the west and the majestic Andes Mountains to the east. These characteristics result in a country with a wide variety of climates and vegetation, as well as both soil and rock conditions along its territory. As part of the Circum-Pacific Belt, Chile is one of the great seismically active regions in the world, which is of particular interest to geoscentists and geotechnical engineers worldwide. The Panamerican congress will serve as a unique platform for dissemination of knowledge and fruitful interactions among researchers and practitioners from different generations and nationalities. We are excited to keep growing as a community and your attendance is essential to the success of this conference.

Topics

Geotechnical Characterization

- Lab and in situ testing
- Physical and constitutive soil modeling
- Unsaturated soils
- Soft soils
- Residual and saprolitic soils
- Rockfill
- Soil geochemistry

Geotechnical Design

- Numerical modeling
- Seismic analysis of natural soil deposits and geotechnical structures
- Mining structures
- Talings dams
- Infrastructure and transport works
- Foundation of buildings and large works
- Transportation geotechnics
- Monitoring and observational method

Geotechnologies

- Soil improvement
- Use of geosynthetics
- Special foundations
- Rehabilitation of geotechnical structures
- Advances in instrumentation and sensing systems
- New image-based technologies in geotechnics

info@panamgeochile2024.cl

21st International Conference on Soil Mechanics and Geotechnical Engineering
14 – 19 June 2026, Vienna, Austria

Organisers:

Austrian Geotechnical Society and Austrian Society for Geomechanics

Contact person: Prof. Helmut F. Schweiger

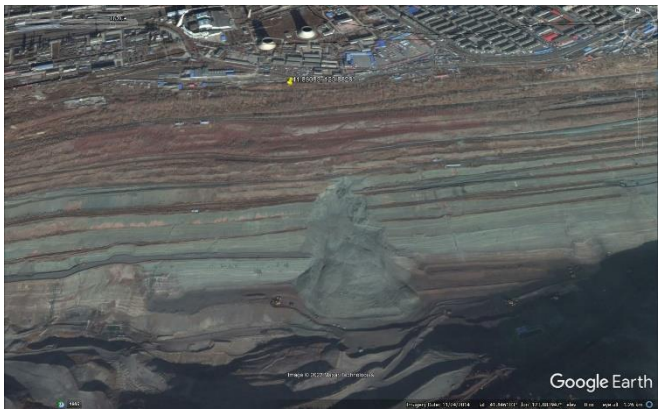
Email: helmut.schweiger@tugraz.at

ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

The 26 July 2016 landslide at Fushun west pit in China

On 26 July 2016 a large landslide occurred in a highwall at a large coal mine in Fushun, China. The landslide, which is described in a paper just published in Landslides (Sun *et al.* 2022), caused extensive damage.

The impact of the landslide is nicely captured on Google Earth. he site is at 41.8508, 123.8828 – this is an image from November 2014:-



Google Earth image of the site of the 2016 landslide at Fushun in China.

Whilst this is an image taken in October 2016, after the landslide:-

Google Earth image of the aftermath of the 2016 landslide at Fushun in China.

This was the largest in a series of landslides that occurred in this coal mine – Sun *et al.* (2022) describes over 100 landslides over the life of the mine, which seems like a surprisingly high total, especially given the proximity of infrastructure to the edge of the workings. The authors note that these landslides caused "severe damage to buildings, underground pipelines, roads, and railways".

The 26 July 2016 landslide was on a different scale however. The landslide was 350 m long and 500 m wide, with a volume of 3.1 million cubic metres. It destroyed 40 houses as well causing damage to roads, railway lines, equipment, and buildings.

The landslide itself was a rotational failure in the upper part of the highwall, with a fragmented debris trail on the lower slopes. The image below, from Sun *et al.* (2022), shows the aftermath of the rotational failure:-

The aftermath of the major landslide at Fushun City in July 2016. Image from Sun *et al.* (2022).

It is interesting to note that the Google Earth imagery shows a substantial landslide on the lower slopes prior to the this very large failure. Sun *et al.* (2022) do not appear to consider this to have been a factor in the main landslide event, which is interesting. The final trigger for the landslide was heavy rainfall.

The July 2016 Fushun landslide is a very good example of the ways in which long wall mining can trigger destructive instability. In a site with houses located so close to the mining operations, there is a particular responsibility to manage the slopes. The paper rather carefully reports multiple destructive landslide events in this mine; I hope that lessons have been learnt since this major failure.

Reference

Sun, S.W., Liu, L., Hu, J.B. *et al.* 2022. Failure characteristics and mechanism of a rain-triggered landslide in the northern longwall of Fushun west open pit, China. *Landslides* (2022). https://doi.org/10.1007/s10346-022-01926-3

((Dave Petley / THE LANDSLIDE BLOG, 4 August 2022, https://blogs.agu.org/landslideblog/2022/08/04/fushun-1/)

High temperatures lead to spike in subsidence

The record high temperatures seen across the UK this summer are likely to result in an increase in subsidence, a leading home insurance company has warned.

LV= General Insurance (LV= GI), which was bought by the German insurer Allianz in 2019, has said that subsidence cases are already up 205% between June and July.

It is currently dealing with claims costs totalling £1.2M which are related to fire and subsidence incidents between 17-20 July following the extreme heat.

Most of these claims were linked to fires. However, the insurance company expects to see more claims linked to subsidence this month as the hose pipe ban takes hold and the soil becomes increasingly dry.

Currently, soil moisture deficit is at the same levels seen in 2018, which could result in properties sinking because the soil is unstable. LV= GI analysis also indicates that southern and central England have had lower rainfall levels in 2022 than 2018.

Given these factors, it is expecting to see a spike similar to 2018 where subsidence claims rose 51% from the previous year due to exceptionally hot weather.

LV=GI head of home underwriting Sarah Smith said: "We're really starting to see the effects of climate change and the impact this is having on homes – whether that be storm, flood, fire or subsidence claims – which have all risen in recent years depending on the season.

"This summer we've really seen the effects of extreme heat, even from leaving items out in the garden which in usual conditions you wouldn't expect to catch fire. As a country we're going to need to adapt and ensure existing houses are better protected, as well as really consider the locations planned for new houses."

To help prevent subsidence, the insurance company has advised home owners to prune trees and large shrubs to prevent soil from drying out and check water pipes and guttering for leaks which can wash away or soften soil.

It has also suggested laying porous materials around the home, like gravel or grass, to allow water to drain naturally, and avoid using artificial grass as this reduces the amount of water getting to the soil and will dry it out.

Last week two large cliff collapses and a number of rockfalls were reported at East Beach in Sidmouth, Devon. The incident comes after the British Geological Survey (BGS) warned that high temperatures in the UK this summer could increase the potential for rockfalls.

(Thames Menteth / GROUND ENGINEERING, 15 August, 2022, https://www.geplus.co.uk/news/high-temperatures-lead-to-spike-in-subsidence-15-08-2022)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΓΕΩΛΟΓΙΑ

World celebrates the birthday of the volcanic eruption of Krakatoa!

(Sunday, August 28) On this date in 1883, the Indonesian island of Krakatau exploded after its volcano erupted. The island lies along the convergence of the Indian-Australian and Eurasian tectonic plates, south of the island of Java, and it was formed from the cones of three dormant volcanoes, which had fused. One of the cones became active again in May 1883, producing rumbling explosions and sending ash clouds miles into the air. It settled down again by the end of May, but resumed again on June 19. On the afternoon of August 26, a series of increasingly violent explosions rocked the island, and at 10 a.m. on the 27th, a cataclysmic explosion sent ash 50 miles into the air, produced atmospheric pressure waves that were recorded around the globe for almost five days. It triggered tsunamis that killed nearly 40,000 people. The explosion was so loud that it was heard in Perth, Australia, 2,200 miles away, and it rocked buildings 500 miles away. Ash fell over a 300,000-square-mile area, and the seas were choked with floating pumice. The sky in the area was dark for two and a half days, and fine dust drifted over the entire world creating red sunsets for several years, as seen in Turner's paintings in England. Weather pat-terns also were disrupted for years. All that remained of the island of Krakatau was a small islet. The volcano was quiet by the next morning, and remained more or less so until 1927, when a new series of eruptions formed a new island, which is called Anak Krakatau, the Child of Krakatau.

The accuracy of local events is owed to Captain Watson on an Irish merchant ship who recorded and survived the ordeal.

A similar volcanic event happened to the island of Santorini, Greece, 1600 years ago. Apparently, the Minoan civilization did not survive.

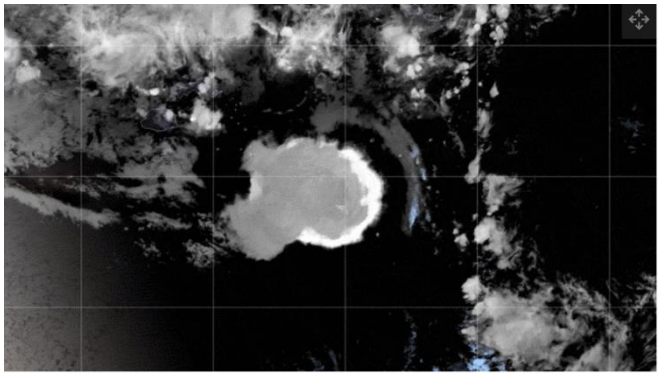
IAEG Connector E-News, August 31, 2022

Lithograph of the eruption c. 1888

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΠΕΡΙΒΑΛΛΟΝ

Tonga's eruption injected so much water into Earth's atmosphere that it could weaken the ozone layer

The atmospheric water vapor could also contribute to global warming.



The GOES-17 satellite captured images of an umbrella cloud generated by the underwater eruption of the Hunga Tonga-Hunga Ha'apai volcano on Jan. 15, 2022. (Image credit: NASA Earth Observatory image by Joshua Stevens using GOES imagery courtesy of NOAA and NESDIS)

When an underwater volcano in Tonga erupted in January, it belched out more than ash and volcanic gases; it also spewed 58,000 Olympic-size swimming pools' worth of water vapor into Earth's atmosphere, a new study finds.

This water vapor could end up being the most destructive part of the volcano's eruption because it could potentially exacerbate global warming and deplete the ozone layer, according to the study.

When the Hunga Tonga-Hunga Ha'apai volcano erupted on Jan. 15, it became the most powerful explosion on Earth in more than 30 years, with an equivalent force of 100 Hiroshima bombs. The explosion sent shock waves around the planet, causing the atmosphere to ring like a bell and generating tsunamis that battered nearby coasts. A plume of ash and dust reached higher into the atmosphere than any other eruption on record and triggered more than 590,000 lightning strikes in three days.

In the new study, researchers used data collected by NASA's Aura satellite to assess the amount of water that was thrust into the stratosphere, the second layer in Earth's atmosphere, which extends from 4 to 12 miles (6 to 20 kilometers) up to 31 miles (50 km) above the planet's surface. The results revealed that 160,900 tons (146,000 metric tons) of additional water vapor had entered the stratosphere since the volcano erupted, reaching a maximum altitude of 33 miles (53 km), which is in the mesosphere, the layer of the atmosphere that extends from the top of the stratosphere to an altitude of 53 miles (85 km).

This makes it the largest and highest injection of water into the stratosphere since satellites began taking measurements.

"We estimate that the excess water vapor is equivalent to around 10% of the amount of water vapor typically residing in the stratosphere," which is the biggest increase scientists have ever seen, researchers wrote in the new paper, published online July 1 in the journal Geophysical Research Letters. The water vapor may remain in the stratosphere for around half a decade, the researchers wrote.

It is not totally surprising that the Tonga eruption injected a large amount of water vapor into the atmosphere, considering the explosion ignited around 492 feet (150 meters) below the ocean's surface, the researchers said. When the volcano erupted, seawater that came into contact with erupting magma was rapidly superheated, which resulted in large amounts of "explosive steam," they wrote. This is one of the main reasons the explosion was so powerful. However, this is the first time the amount of water has been accurately measured, and it turned out to be much more than scientists had expected.

The Tonga eruption launched 58,000 Olympic swimming pool's worth of water into the stratosphere. (Image credit: Shutterstock)

Normally, big volcanic eruptions release large amounts of ash and gases, such as sulfur dioxide, which can create reflective compounds in the atmosphere. These volcanic byproducts can block sunlight from reaching the planet's surface, which can cool the atmosphere. However, the Tonga eruption produced surprisingly low levels of sulfur dioxide compared with similarly sized explosions, and most of the ash it ejected quickly fell to the ground.

As a result, experts initially estimated that the underwater explosion would have minimal effects on Earth's climate. But these estimates were based on the amount of ash and gases that the volcano emitted and did not account for all of the excess water vapor, which could be just as problematic.

This excess water, the researchers warned, could have a radiating effect that could warm the atmosphere much as greenhouse gases do. Because the water is likely to stick around longer than other volcanic gases, like sulfur dioxide — which normally fall out of the atmosphere within two to three years — the water's warming effect will likely outlast any cooling effects the gases create.

This means the Tonga explosion will likely be the first eruption on record to cause a warming effect, rather than a cooling effect, on the planet, researchers wrote.

The researchers also pointed out that such a sharp increase in water vapor could decrease the amount of ozone in the stratosphere, thus potentially weakening the ozone layer that protects life on Earth from damaging ultraviolet radiation from the sun. Stratospheric water, or H2O, can break down into OH ions over time. Those ions could react with ozone, which is made of three oxygen atoms, to create water and oxygen. However, it is unclear how this will affect the ozone layer as a whole, researchers wrote.

Researchers warn that the additional water vapor in the stratosphere could contribute to global warming or potentially weaken the ozone layer. (Image credit: Shutterstock)

However, the researchers also think the increased water vapor could decrease the amount of methane in the atmosphere, which is one of the main greenhouse gases responsible for climate change. The same OH ions that react with ozone can also react with methane to produce water and a methyl radical (methane with one less hydrogen atom), which traps much less heat in the atmosphere than methane. Hopefully, this potential reduction in methane might offset some of the warming caused by the water vapor, researchers wrote.

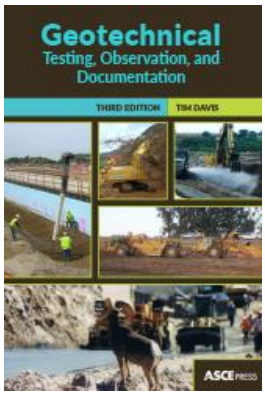
However, the study authors think it's still too early to predict the exact climatic effects of the Tonga eruption. "It is critical to continue monitoring volcanic gases from this eruption and future ones to better quantify their varying roles in climate," the researchers wrote.

Originally published on Live Science.

(Harry Baker / LIVE SCIENCE, Aug. 1, 2022, https://www.livescience.com/tonga-eruption-water-vapor)

Ο Εφιάλτης της Ξηρασίας.....!!! Λίγηρας, Γαλλία

ΝΕΕΣ ΕΚΔΟΣΕΙΣ ΣΤΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΠΙΣΤΗΜΕΣ



Geotechnical Testing, Observation, and Documentation, Third Edition

Tim Davis

An in-depth field manual, *Geotechnical Testing, Observation, and Documentation, Third Edition,* by Tim Davis is an indispensable reference guide for soil technicians, inspectors, and geotechnical engineers. It is designed for use during the investigation, grading, and construction phases of geotechnical projects.

This new edition covers common laboratory and field tests, sampling methods, field soil classification, jobsite soil construction, geologic considerations, LID features, and standard to innovative foundations. From site investigation and field work, through documentation during construction, project management, pre-con and preparation, site safety, to a comprehensive sample geotechnical report.

Studious test questions are provided at the end of each chapter, while three appendices with more than 500 geotechnical related terms are included. An answer key to chapter questions and an example of municipal standards is provided.

This updated edition is beneficial for training new technicians and offers a refresher course for veterans of the profession. Those considering additional certifications will find this book an essential test preparation aid.

Tim Davis's career has involved multiple phases of geotechnical construction, including investigation, lab and field testing, observation, inspection, report writing, supervision and training. Davis holds a NICET Level IV as a geotechnical engineering technology generalist and is certified as a qualified construction stormwater inspector.

(2022 / American Society of Civil Engineers)

Recommendations for the Application of ISO 19650 - Information Management Process and Responsibility Matrix – Vol 1

Working Group 22

Information Modelling (BIM), Digital Engineering, Asset Information Modelling or Virtual Design and Construction. This document adopts the broadest possible interpretation of 'BIM', and therefore covers all the above principles.

BIM is not only a digital representation of physical and functional characteristics of a building, piece of physical infrastructure or environment but also a comprehensive environment for all information fully referenced and indexed to allow multiple access points for users of information to find relevant content. As such, BIM serves as a shared knowledge resource for information about an asset throughout its lifecycle—supporting decision making—from strategic appraisal and planning, design and construction to operation, maintenance, and renewal. BIM enables a collaborative way of working using digital processes to facilitate more productive methods of planning, designing, constructing, operating, and maintaining assets through their lifecycle.

Governments globally recognise the importance of BIM in the delivery and management of infrastructure assets as it offers many benefits throughout the asset lifecycle and has the potential to drive efficiency, value for money, productivity, innovation, and safety.

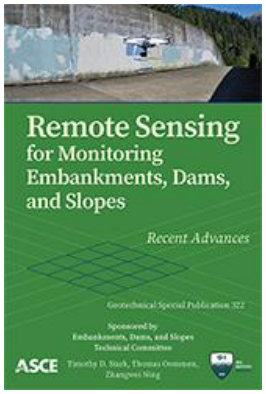
However, a clear framework is required to help adoption, integration, and application of BIM processes in construction industry. In this context, the ISO 19650 series propose a standard framework for information management of built assets using information modelling processes applicable throughout the asset life cycle.

In current Information Management Systems used throughout the different stages of a built asset development, the information is captured, represented, produced, processed, and stored in documents, databases, analysis, and design tools, and other "information containers" using processes, methods and tools specified separately for each given project and each milestone by the information owner or receiver. These containers are exchanged between different parties involved in the project for different purposes such us analysis, interpretation, review, check, approval, quantity take-off, construction, management, planning, budgeting, pricing, forecasting, predicting, or other activities carried out during the asset life cycle. The ISO 19650 series propose to use 3D models as part of a "central information container" of the asset information. The models inherently contain the geometrical information of the asset entities and parts and their special locations. Other information can be added to each part of the model, these are called meta-data. Other type of information containers like reports, factual data, specifications, suppliers or other data sheets, drawings, (etc., referenced, or using hyperlinks) to each part of the model to complement the meta-data information. The information details required to be captured and stored in the model depends on the required activity (to be performed using the model) and the stage of the asset life cycle. For example, if design check activity is carried out using the model, the modelled information, the associated meta-data, and the linked documentation should be attributed to a package containing the design information needed the design information needed to perform the required design check activity. To carry out scheduling activity using a model, the production rates of each part of the model are needed to be added as meta-data. As such, every information contained in the model, either geometrical, meta-data or linked documentation responds to a need to carry out a design, construction, operational or other asset related activity at a given stage of the asset life cycle. The need, the type of activity and the stage during which the activity is carried out define the level of details to be brought into the model.

The following sections summarise the ISO 19650 concepts and propose a high-level process for information manage-

ment and an information Management a stage-by-stage Responsibility Matrix to ISO 19650 applicable for underground assets

(2022 / ITA, https://about.ita-aites.org/publications/wg-publications/2131/recommendations-for-the-application-of-iso-19650-series-during-the-delivery-of-underground-projects-and-assets-information-management-process-and-responsibility-matrix-vol-1?tmpl=component)



Remote Sensing for Monitoring Embankments, Dams, and Slopes: Recent Advances

GSP 322

Embankments, Dams, and Slopes Technical Committee; Timothy D. Stark, Thomas Oommen, Zhangwei Ning

Sponsored by the Embankments, Dams, and Slopes Technical Committee of the Geo-Institute of ASCE

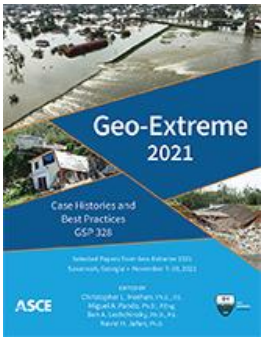
Remote Sensing for Monitoring Embankments, Dams, and Slopes: Recent Advances, GSP 322, provides information on selecting and deploying a monitoring network to assess the behavior, geometry, total and differential EDS movement, and potential risks of the EDS movement on people and infrastructure.

Topics include general technologies used for EDS monitoring, selection and installation of networked sensors for predictive analytics and image recognition, application of monitoring techniques in the design of early warning systems, case studies, and support for decision-makers in implementing early warning systems.

Information on a broad range of technologies, such as radio detection and ranging (radar), synthetic aperture radar (SAR), interferometric synthetic aperture radar (InSAR), light detection and ranging (LiDAR), digital photogrammetry and image processing, microelectromechanical systems (MEMS), automatic motorized total stations (AMTS), and unmanned aircraft systems (UAS) to deploy the remote sensing technologies is also included.

This Geotechnical Special Publication will be useful to both practitioners and researchers to understand and utilize currently available remote sensing technology and to advance and refine the monitoring of embankments, dams, and slopes.

https://ascelibrary.org/doi/book/10.1061/9780784415726



Geo-Extreme 2021: Case Histories and Best Practices

GSP 328

Edited by Christopher L. Meehan, Miguel A. Pando, Ben A. Leshchinsky, and Navid H. Jafari

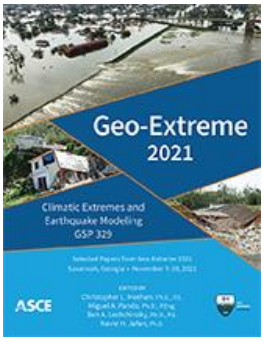
Proceedings of sessions of Geo-Extreme 2021, held in Savannah, Georgia, November 7–10, 2021. Sponsored by the Geo-Institute of ASCE.

GSP 328 contains 49 peer-reviewed papers addressing extreme geotechnical events following hurricanes, floods, droughts, debris flows, and earthquakes.

Topics include: instrumentation and remote sensing of extreme events; coastal sustainability and resilience; preparedness, response, and recovery from extreme events; and case histories and best practices.

This GSP will be of interest to geotechnical engineers, climate scientists, emergency managers, insurance professionals, and policy makers working to address a wide variety of extreme events.

https://ascelibrary.org/doi/book/10.1061/9780784483688



Geo-Extreme 2021: Climatic Extremes and Earthquake Modeling

GSP 329

Edited by Christopher L. Meehan, Miguel A. Pando, Ben A. Leshchinsky, and Navid H. Jafari

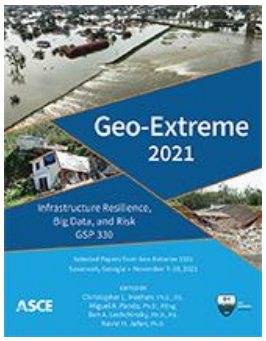
Proceedings of sessions of Geo-Extreme 2021, held in Savannah, Georgia, November 7–10, 2021. Sponsored by the Geo-Institute of ASCE.

GSP 329 contains 46 peer-reviewed papers on climate extremes and earthquake modeling.

Topics include: climate model simulation and predictions; assessing and modeling compound and cascading events; instrumentation for modeling and assessment; climate-resilient and adaptive infrastructure; natural and man-made earthquakes and associated geo-hazards; and seismic event case histories and lessons learned.

This GSP will be of interest to geotechnical engineers, climate scientists, emergency managers, insurance professionals, and policy makers working to address a wide variety of extreme events.

https://ascelibrary.org/doi/book/10.1061/9780784483695



Geo-Extreme 2021: Infrastructure Resilience, Big Data, and Risk

GSP 330

Edited by Christopher L. Meehan, Miguel A. Pando, Ben A. Leshchinsky, and Navid H. Jafari

Proceedings of sessions of Geo-Extreme 2021, held in Savannah, Georgia, November 7–10, 2021. Sponsored by the Geo-Institute of ASCE.

GSP 330 contains 37 peer-reviewed papers on infrastructure resilience, big data, and risk.

Topics include: geo-materials under extreme loading; cold regions and the Arctic; decision making and planning for extreme events; big data and modeling; and risk management.

This GSP will be of interest to geotechnical engineers, climate scientists, emergency managers, insurance professionals, and policy makers working to address a wide variety of extreme events.

https://ascelibrary.org/doi/book/10.1061/9780784483701

Geo-Congress 2022: Soil Improvement, Geosynthetics, and Innovative Geomaterials

GSP 331

Edited by Anne Lemnitzer and Armin W. Stuedlein

Selected papers from sessions of Geo-Congress 2022, held in Charlotte, North Carolina, March 20–23, 2022. Sponsored by the Society of Exploration Geophysicists and the Geo-Institute of ASCE.

This Geotechnical Special Publication contains 66 peer-reviewed papers on geosynthetics, innovative geomaterials, and soil improvement techniques.

Topics include: rigid inclusions and stone columns; soil stabilization; bio-grouting and bio-inspired solutions; geo-synthetics; and innovative geomaterials and methods.

GSP 331 will be valuable to practitioners and researchers working in the area of soil improvement.

https://ascelibrary.org/doi/book/10.1061/9780784484012

Geo-Congress 2022: Deep Foundations, Earth Retention, and Underground Construction

GSP 332

Edited by Anne Lemnitzer and Armin W. Stuedlein

Selected papers from sessions of Geo-Congress 2022, held in Charlotte, North Carolina, March 20–23, 2022. Sponsored by the Society of Exploration Geophysicists and the Geo-Institute of ASCE.

This Geotechnical Special Publication contains 62 peer-reviewed papers on deep foundations, underground construction, and earth retention.

Topics include: deep and shallow foundations; underground engineering and construction; building code issues; earth retention systems; and rock mechanics.

GSP 332 will be valuable to practitioners and researchers working with the design of foundations and earth retention systems.

https://ascelibrary.org/doi/book/10.1061/9780784484029

Geo-Congress 2022: Site and Soil Characterization, Computational Geotechnics, Risk, and Lessons Learned

GSP 333

Edited by Anne Lemnitzer and Armin W. Stuedlein

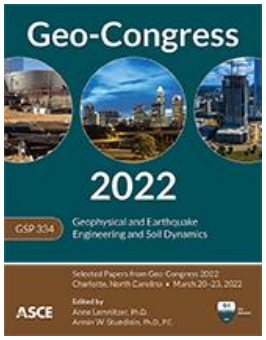
Selected papers from sessions of Geo-Congress 2022, held in Charlotte, North Carolina, March 20–23, 2022. Sponsored by the Society of Exploration Geophysicists and the Geo-Institute of ASCE.

This Geotechnical Special Publication contains 71 peer-reviewed papers on site and soil characterization and computational geotechnics.

Topics include: site and soil characterization and modeling; computational geotechnics; risk assessment and management in geotechnical engineering; and lessons learned.

GSP 333 will be valuable to practitioners and researchers working in the area of site and soil characterization.

https://ascelibrary.org/doi/book/10.1061/9780784484036



Geo-Congress 2022: Geophysical and Earthquake Engineering and Soil Dynamics

GSP 334

Edited by Anne Lemnitzer, and Armin W. Stuedlein

Selected papers from sessions of Geo-Congress 2022, held in Charlotte, North Carolina, March 20–23, 2022. Sponsored by the Society of Exploration Geophysicists and the Geo-Institute of ASCE.

This Geotechnical Special Publication contains 70 peer-reviewed papers on soil dynamics and earthquake engineering.

Topics include: liquefaction behavior of soils; laboratory and in situ studies of dynamic soil properties; regional seismic issues specific to the central and eastern United States; and the use of geophysical methods and tools for subsurface characterization and geo-structural design.

GSP 334 will be valuable to practitioners and researchers working in the area of geophysical engineering.

https://ascelibrary.org/doi/book/10.1061/9780784484043

Geo-Congress 2022: Geoenvironmental Engineering; Unsaturated Soils; and Contemporary Topics in Erosion, Sustainability, and Coal Combustion Residuals

GSP 335

Edited by Anne Lemnitzer and Armin W. Stuedlein

Selected papers from sessions of Geo-Congress 2022, held in Charlotte, North Carolina, March 20–23, 2022. Sponsored by the Society of Exploration Geophysicists and the Geo-Institute of ASCE.

This Geotechnical Special Publication contains 55 peer-reviewed papers on geoenvironmental engineering and unsaturated soils.

Topics include: modeling in unsaturated soils; barriers, walls, and liners; geotechnics of soil erosion; and coal combustion residuals.

GSP 335 will be valuable to practitioners and researchers working in the area of geoenvironmental engineering

https://ascelibrary.org/doi/book/10.1061/9780784484050

Geo-Congress 2022: Advances in Monitoring and Sensing; Embankments, Slopes, and Dams; Pavements; and Geo-Education

GSP 336

Edited by Anne Lemnitzer, and Armin W. Stuedlein

Selected papers from sessions of Geo-Congress 2022, held in Charlotte, North Carolina, March 20–23, 2022. Sponsored by the Society of Exploration Geophysicists and the Geo-Institute of ASCE.

This Geotechnical Special Publication contains 56 peer-reviewed papers on monitoring and sensing and embankments, dams, and slopes.

Topics include: monitoring and remote sensing for geo-systems; geotechnics of resilient infrastructure; pavements; geotechnical engineering education; and data and software in geotechnical engineering.

GSP 336 will be valuable to practitioners and researchers working in the areas of pavements and remote sensing and monitoring of geo-systems.

https://ascelibrary.org/doi/book/10.1061/9780784484067

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

Κυκλοφόρησε το Τεύχος 16, Αυγούστου 2022 του ISSMGE Bulletin με τα ακόλουθα περιεχόμενα:

Conference reports
- 20th Int. Con. on Soil Mechanics and Geotechnical Engineering (ICSMGE2022)
- 7th Int. Young Geotechnical Engineers Conference
- 5th Symposium of MAG and 2nd conference on regional geotechnical societies
- 2nd Int. Conf. on Advances in Rock Mechanics (TuniRock 2022)

TC corner
ISSMGE Foundation reports
Event Diary
Corporate Associates
Foundation Donors

GEO-TRENDS REVIEW

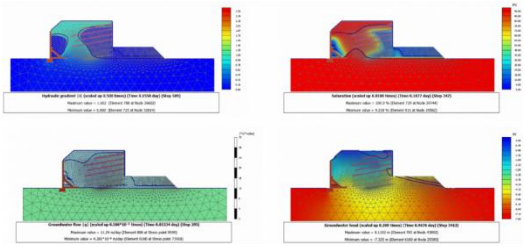
www.mygeoworld.com/geotrends/issues/20-august-2022

Κυκλοφόρησε το Τεύχος 20, Αυγούστου 2022 με τα ακόλουθα περιεχόμενα:

Announcing the Publication of the 2022 Geotechnical Business Directory

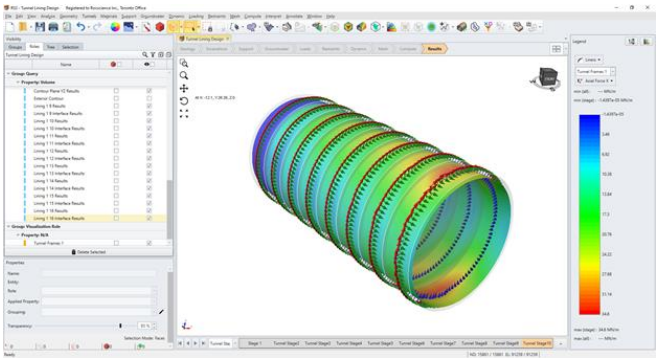
The directory is published with the support of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). This is the eighth year for the Geotechnical Business Directory, the most comprehensive directory in the geotechnical engineering field! The 2022 index has grown significantly since last year and includes 26,000+ members, and 1,000+ geo-companies and geo-organizations from a total of 162 countries. Read More

Reinforced Slope Analysis Using the Finite Element Method



In mainstream applications, slope stability analysis is generally a choice between limit equilibrium or finite element. PLAXIS demonstrates that finite element can be a more straight forward and l... Read More

Liner Local Coordinates in RS3



by Daniel Wai RS3 is well known for its capabilities to analyze and design complex 3D models. This Finite Element Analysis program is a powerhouse of features, and its applications include tunnelin... Read More

Seequent named NZ HiTech Company of the Year 2022

Seequent, The Bentley Subsurface Company, has been named the PwC Hi-Tech Company of the Year at the 2022 NZ Hi-Tech Awards. The awards celebrate New Zealands most successful high-tech companies an... Read More

Efficient RBD-via-FORM using the Excel Forecast function

There are 4 slides. Slide 1 shows where to download Excel solution files from the publisher's website of my book, https://www.routledge.com/9780367631390. Slides 2, 3 and 4 illustrate, in thre... Read More

Launch of ISSMGE Interactive Technical Talks (IITT)

President of ISSMGE Dr. Marc Ballouz has just launched a new educational initiative titled ISSMGE Interactive Technical Talks (IITT). It represents a series of technical talks to bring together geo pr... Read More

Soil Compaction Test

Compaction of soils is a procedure in which a soil sustains mechanical stress and is densified. Soil consists of solid particles and voids filled with water or/and air. A more detailed explanation of the three-phase nature of soils is provided in Soil as a three-phase System Read More

ISSMGE President June 2022 Report Read More

Survey trip to Elimbari Movi Road in Chuave District, Chimbu province, Papua New Guinea

Issac Stanley

Geotech Investigation:Field Recon. Survey trip to Elimbari Movi Road in Chuave District, Chimbu province, Papua New Guinea. The survey was conducted on 20 May 2022 on a 40 km span of rural road start... Read More

Muhammad Arif

looking for Tunnelling professionals Read More

Scholarship of Teaching and Learning: Formally recognized by ASEE

The American Society for Engineering Education (ASEE) amended its Constitution and added a Vice President for Scholarship to the Board, as voted by the ASEE Board of Directors in Feb... Read More

Bulletin Vol. 16, Issue 3 - June 2022 circulated Read More

Submarine Internet cables can monitor seismic activity and predict earthquakes Read More

Geotechnical Engineering Education "Time Capsule" Report

The contribution of TC306 to the Time Capsule Project has been uploaded under the tab "Reports" of the TC306 webpage. The contents of the TC306 Time Capsule Report were discussed at... Read More

Tourists hit by avalanche in Kyrgyzstan's Tian Shan mountains Read More

Characterization of the Body Wave Anisotropy of an Interbedded Sandstone-Shale at Multi Orientations and Interlayer Ratios

Characterizing the elastic response from body waves propagating through an interbedded shale-sandstone geological formation with multiorientation joints and various interlayer ratios is extremely cha... Read More

Influence the Geotechnical Confidence Index Results for 2022 Q3! Learn more

Fifth TC309/TC304 Student Contest (groundwater time-series forecasting)

The machine learning competition is organized as an event at the MLRA2021 (Machine Learning and Risk Assessment in geoengineering) Conference in Wroclaw, Poland, in October 2021 (con... Read More

Reference List for Machine Learning and its Applications in Geotechnical Engineering - PART III: APPLICATIONS IN GEOTECHNICAL ENGINEERING

1 Artificial neural networks [1] Shahin, M. A., Jaksa, M. B., and Maier, H. R. (2001). Artificial Neural Network Applications in Geotechnical Eng... Read More

Dam Project in China to Be World's Largest Robotic 3D Print

Read More

Only 7 weeks to go - ICPMG 2022, Daejeon, Korea, 19 - 23 September 2022

Dear colleagues and friends, There are only 7 weeks left until the opening of the 10th International Conference on Physical Modelling in Geotechnics - ICPMG 2022, which will be he... Read More

International Geosynthetics Society

Κυκλοφόρησε το IGS Newsletter της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

IGS NEWSLETTER – August 2022

Helping the world understand the appropriate value and use of geosynthetics

www.geosyntheticssociety.org/newsletters

- Why You Can't Miss EuroGeo7 READ MORE
- Extraordinary General Assembly: 6 September 2022 READ MORE & REGISTER
- IGS Australasia Hails 'Milestone' Conference READ MORE
- GeoAfrica 2023 – Venue And More Confirmed READ MORE
- IGS North America Celebrates ICG Win READ MORE
- Chungsik Yoo Elected FedIGS President READ MORE
- UK Conference Puts Containment Centre Stage READ MORE
- My Engineer Life With…Sarah Stern READ MORE
- IGS Awards: Call for Nominations 2018 – 2021 READ MORE
- Upcoming Webinars
  - Aplicación de Geosintéticos en la Construcción y Crecimiento de Tranque de Relaves (*Application of Geosynthetics in the Construction and Growth of Tailings Dams)* - August 11 at 3pm (GMT-4) Presented by

César Roberto Torres Chung in Spanish REGISTRATION INFORMATION
- Estructuras de contención y protección con geosintéticos (*Containment and protection structures with geosynthetics)* - August 11 at 6pm (GMT-5) Presented by Ing. José Hardy Huamán Flores in Spanish REGISTRATION INFORMATION
- Strain hardening testing of HDPE geomembranes - August 17, repeated on August 23 Presented by Helmut Zanzinger REGISTRATION INFORMATION
- Geosynthetic Barrier Systems used for Flood Protection August 18 at 10am (GMT+10) Presented by Dr. George Koerner REGISTRATION INFORMATION
- Raising the Bar: High Technical and Environmental Performance with Multifunctional and Sustainable Geosynthetics - August 23 at 6:30pm (GMT+7) Presented by Eng. Pietro Rimoldi REGISTRATION INFORMATION

- **Calendar of Events**

www.icevirtuallibrary.com/toc/jgein/29/43

Κυκλοφόρησε το Τεύχος 4 του Τόμου 29 (Αυγούστου 2022) του Geosynthetics International της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

A quantification of the short-term reliability of HDPE geomembrane seaming methods, A. Gilson-Beck, J. P. Giroud, 29(4), pp. 337–341

Novel application of machine learning for estimation of pullout coefficient of geogrid, A. Pant, G.V. Ramana, 29(4), pp. 342–355

Influence of physical clogging on filtration performance of soil-geotextile interaction, A. Markiewicz, M. Kiraga, E. Koda, 29(4), pp. 356–368

Analytical model for the design of piled embankments considering cohesive soils, T.A. Pham, K. Wijesuriya, D. Dias, 29(4), pp. 369–388

Effects of processing type on shear modulus and damping ratio of waste tire-sand mixtures, A. Edinçliler, O. Yildiz, 29(4), pp. 389–408

Effect of reinforcement stiffness on response of back-to-back MSE wall upon infiltration, G. Rajagopal, S. Thiyyakkandi, 29(4), pp. 409–425

Vertical stability of geotextile-encased sand columns without and with surrounding soil, S. T. Kadhim, R. L. Parsons, J. Han, 29(4), pp. 426–441

Influence of cyclic load on pullout stiffness of geogrid embedded in well-graded gravel, K. Watanabe, K. Kojima, A. Kudo, 29(4), pp. 442–456

www.sciencedirect.com/journal/geotextiles-and-geomembranes/vol/50/issue/4

Κυκλοφόρησε το Τεύχος 4 του Τόμου 50 (Αυγούστου 2022) του Geotextiles and Geomembranes της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

Editorial Board, Page ii

Regular Articles

Performance of two-tiered reinforced-soil retaining walls under strip footing load, Majid Yazdandoust, Atanaz Bahrami Balfeh Taimouri, Pages 545-565

Effect of basal reinforcement on performance of floating geosynthetic encased stone column-supported embankment, Jian-Feng Chen, Xu Zhang, Chungsik Yoo, Zi-Ang Gu, Pages 566-580

Evaluation of geosynthetic reinforcement in unpaved road using moving wheel load test, Meenakshi Singh, Ashutosh Trivedi, Sanjay Kumar Shukla Pages 581-589

Influence of polymer enhancement on water uptake, retention and barrier performance of geosynthetic clay liners, Zhi Chong Lau, Abdelmalek Bouazza, Will P. Gates, Pages 590-606

Effectiveness of a Geocomposite-PVD system in preventing subgrade instability and fluidisation under cyclic loading, Joseph Arivalagan, Buddhima Indraratna, Cholachat Rujikiatkamjorn, Andy Warwick, Pages 607-617

Mechanical property and deformation behavior of geogrid reinforced calcareous sand, Xuan-ming Ding, Zhao-gang Luo, Qiang Ou, Pages 618-631

Experimental study on the load bearing behavior of geosynthetic reinforced soil bridge abutments with different facing conditions, Jun Zhang, Yafei Jia, Wenhao Guo, Jianbin Zhao, ... Yewei Zheng, Pages 632-643

An analytical solution for contaminant extraction from multi-layered soil using PVD-enhanced system, Xue Zhou, Heng-Yu Wang, Dao-Sheng Ling, Xiao-Wu Tang, Pages 644-654

Field trial of a reinforced landfill cover system: performance and failure, Giampaolo Cortellazzo, Luis E. Russo, Stefano Busana, Laura Carbone, ... Hartmut Hangen, Pages 655-667

Experimental study of PVD-improved dredged soil with vacuum preloading and air pressure, Yajun Wu, Rong Zhou, Yitian Lu, Xudong Zhang, ... Quoc Cong Tran, Pages 668-676

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