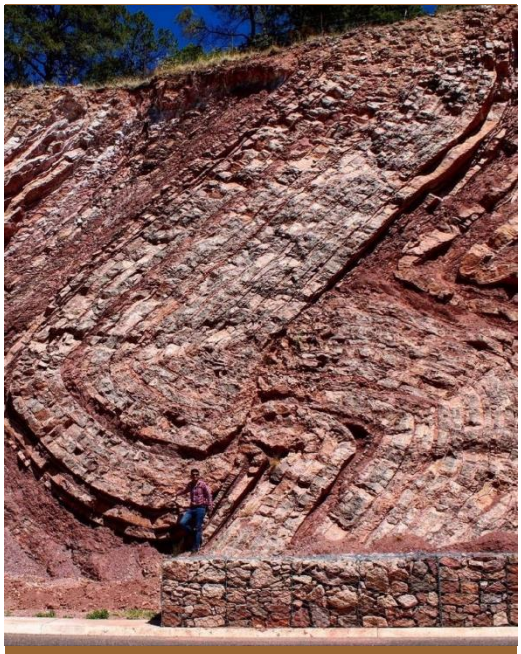

Mexico

Αρ. 178 – ΑΥΓΟΥΣΤΟΣ 2023

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

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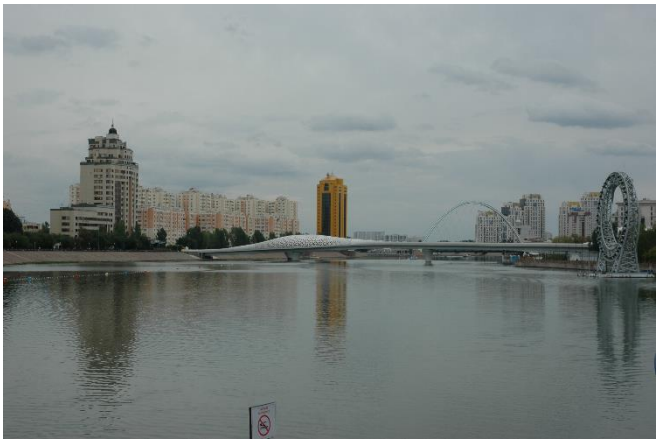


Εικόνες από Astana, Kazakhstan

ΑΡΘΡΑ

A tale of two explanations (for heaving claystone)

[A summary for the paper "The positive history of an error. Modelling the heave of a nuclear power station" accompanying the 3rd Blight Honor Lecture delivered by Eduardo Alonso at UNSAT2023]

BACKGROUND

1. The construction of a nuclear power plant started in early 1970s in the Ebro basin in northeast Spain. The importance of the constructed facility was a factor in the detailed monitoring and studies that followed.

2. The large excavation at a valley slope of horizontally layered claystone created a much steeper slope and horizontal parts at varied elevations. Figure 1 shows the soil profile before and after excavation. The slope was difficult to drain, but eventually a phreatic level was established. Later studies made clear that the excavation (performed by blasting) damaged the claystone layers close to the excavation surfaces and created fissures, which will play an important but different role in the two explanations.

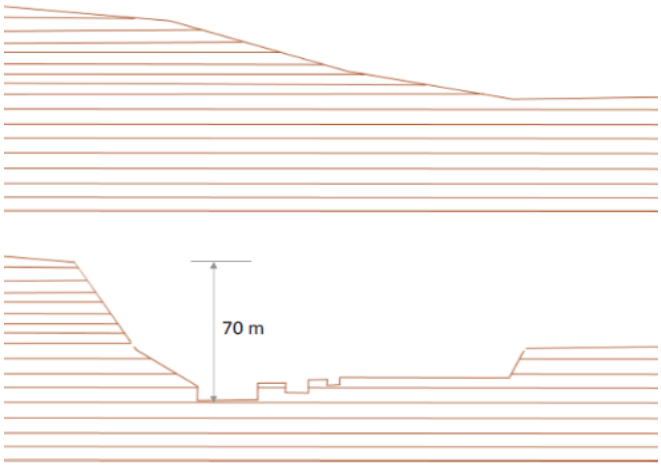


Figure 1. Original profile of valley and geometry of excavation [Fig. 2 in Alonso (2023)].

3. Heaving displacements of buildings were observed around mid 70's. Extensometers identified an active swelling layer under the power plant and piezometers within this active layer recorded all possible states: negative pressures (i.e. suction) and positive pressures, some of which at equilibrium with the post-excavation phreatic level.

4. Long-term 1-D swelling tests showed swelling to occur in two phases, or in two time scales, i.e. an initial swelling followed by a second phase of delayed swelling, as shown in Figure 2.

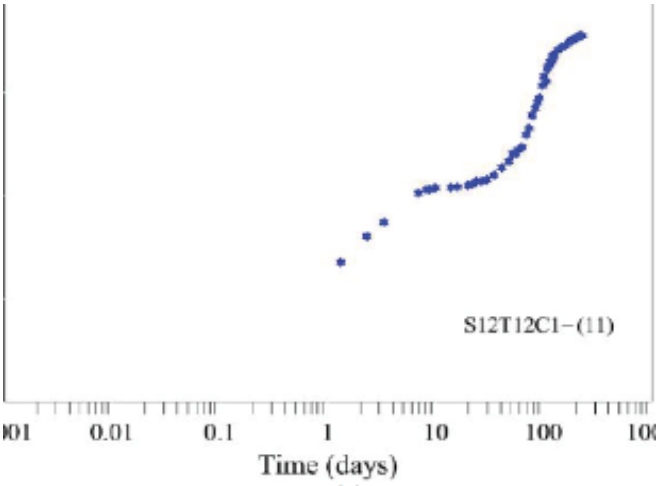


Figure 2. Long term oedometer swelling test at vertical confining stress σ = 0.01 MPa, with swelling in the Y axis reaching a maximum value of about 140 microns. [Fig. 5a in Alonso (2023)].

EXPLANATION NO 1

5A. The first explanation attributed the two-phase swelling to the dual structure of the unsaturated clay, as shown in Figure 3, which was hypothesized to consist of clay particles at the micro scale, under micro-suction (s_m), and clay aggregates (of clay particles) and other inert grains at the macro scale, under macro-suction (s_w). Water permeating the fissures formed due to the excavation infiltrated first between aggregates, resulting in the first phase of swelling, at the macro scale. Water moving within the aggregates contributed to the delayed swelling of the clay particles, at the micro scale.

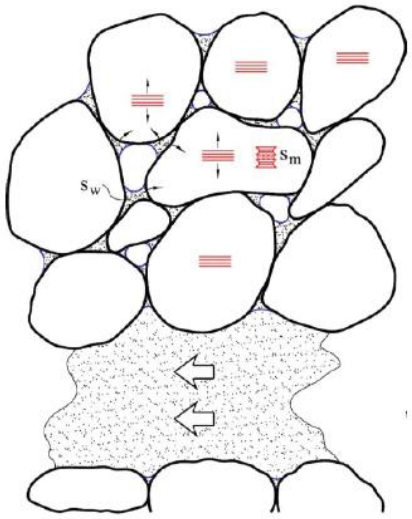


Figure 3. Representation of clay aggregates in an unsaturated expansive clay and a water conducting fissure [Fig. 7 in Alonso (2023)].

5B. This dual-structure model accounts for two sources of volumetric deformation. The volumetric deformation of the aggregates themselves, which depends of the prevailing stress and the micro-suction. And the volumetric deformation of the arrangement of aggregates, which depends on the prevailing stress and the macro-suction. A key parameter of the model accounts for the movement of water between the macro and micro domains that will take place when the micro-suction and macro-suction are different. Depending on

the magnitude of this parameter, the two deformation mechanisms proceed sequentially or concurrently.

5C. The model was implemented in a finite element code that was very successful in replicating the 1-D heave observed in the laboratory (see Fig. 12 in the paper). The code also matched a 12-year long field record (~mid 70's to ~mid 80's) and predicted heave at a continuously decreasing rate, equal to 1mm/y 60 years after the beginning of swelling (see Fig. 15 in the paper).

REASONS TO THINK AGAIN

6. Mineralogical analysis of the composition of the clay at the site of the nuclear power plant indicated a 5 to 10% content of phyllosilicates and only 0.8% of montmorillonite, which made unlikely the double structure of Explanation No 1. In addition, it was found that the clay contained 0-30% anhydrite (calcium sulfate, $CaSO_4$) and 20-30% gypsum (dihydrate calcium sulfate, $CaSO_4 \cdot 2H_20$).

7. What is more, during the first two decades of this century, infrastructure projects built in the sulfated claystones of the Ebro basin experienced damages due to rock expansivity. Hence, a new model was sought to explain the heave at the power plant site, which takes into account the clay composition.

EXPLANATION NO 2

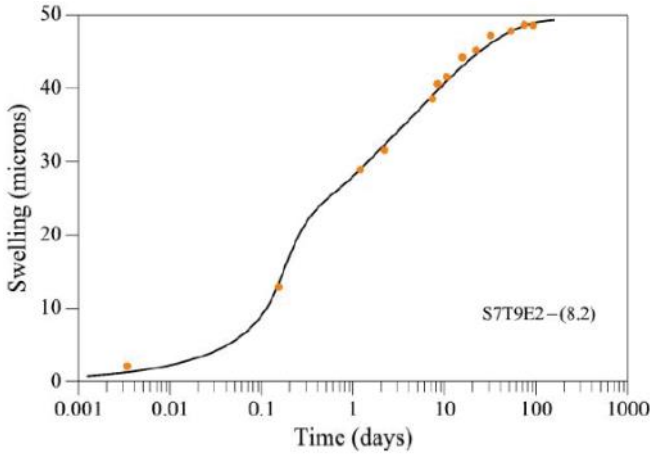
8A. The fissures mentioned in points (2) and (5A), again facilitate infiltration of water, causing an initial short-term swelling upon wetting. According to Explanation No 2, the long-term expansion is due to the dissolution of anhydrite and the precipitation of gypsum crystals that apply stresses on fissure walls (see Fig. 21 in the paper). The movement of water in the fissures is not even necessary for this explanation, since diffusion of ions alone would also lead to the formation of gypsum crystals. However, the presence of fissures is a required element of this model too, since crystal growth initially needs some empty space to get started. Tellingly, as Alonso (2023) notes, "Crystals growing in a dense claystone matrix have not been observed".

8B. The crystal-growth model that was developed to describe this alterative mechanism for the observed heave is a complex chemo-thermo-hydro-mechanical model. Emphasis was given to the long-term heave, which is of main interest, which depends to a large extent on the initial content of anhydrite (mainly) and gypsum.

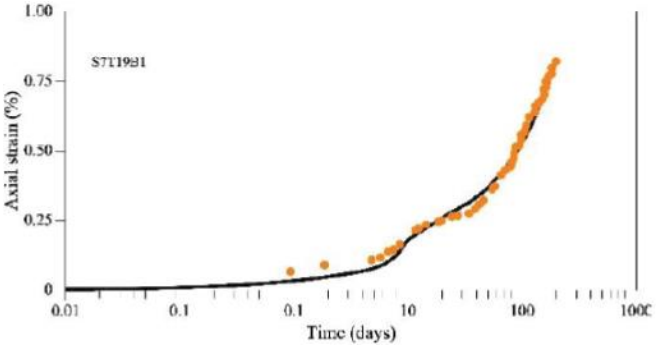
8C. Results obtained with this model were in good agreement with both laboratory (see Fig. 28 in the paper) and field measurements (see Fig. 32 in the paper). When records of heave measured at several locations over a 24-year period were used in the comparison, the observed heave at 24 years was at places either over-predicted or under-predicted by the model (see Fig. 33 in the paper), since the observed spatial heterogeneity of sulfate mineral content in the claystone is expected to affect the accuracy of the prediction. According to this model, heave will stop when the anhydrite will be exhausted by dissolution.

EPILOGUE

9. In Alonso's own words from the 2nd of the three concluding bullets of the 3rd Blight Lecture: *It is somewhat disturbing that widely different interpretations and conceptual models may be justified and "adapted" to reproduce the actual laboratory and field behaviour.* As a visual reminder, Figure 4 gives an example of the good fit of each model.



(a)



(b)

Figure 4. Comparison of laboratory data with predictions of (a) model based on Explanation No 1 and (b) model based on Explanation No 2 [Fig. 12b and Fig. 28 in Alonso (2023)].

REFERENCE

Alonso, E. (2023). The positive history of an error. Modelling the heave of a nuclear power station, 8th International Conference on Unsaturated Soils (UNSAT 2023), https://doi.org/10.1051/e3sconf/202338200002

https://www.issmge.org/news/a-tale-of-two-explanations

Paper summary prepared by Marina Pantazidou (mpanta@central.ntua.gr), August 2023

What is Pump Storage Project?

Pump Storage Project is closed loop hydropower project and considered as a storage battery. It usually formed between two dams forming two reservoirs. One is at higher altitude and other is at lower elevation.

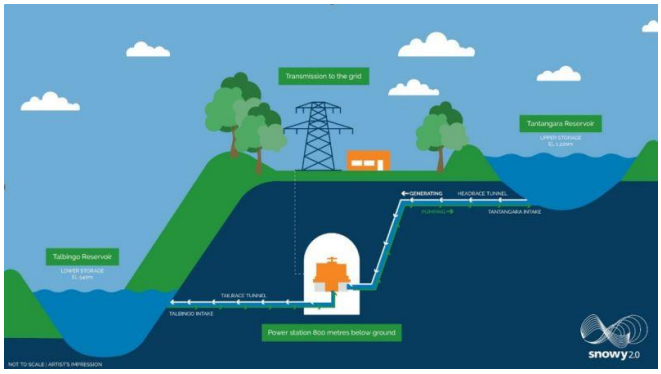
Upstream reservoir has ability to store water and generate power on demand by running the turbines by releasing water in downstream reservoir.

Water from lower reservoir is pumped back to u/s reservoir using excess electricity in the system at times of low demand. Then, when energy is needed most, the stored water will be used to generate electricity within minutes.

For example, if the wind is blowing in the middle of the night when consumers are asleep, PSP can use the wind energy to pump and then store the water in the upper dam. When households wake up and the demand for energy soars, PSP can quickly generate energy for the grid.

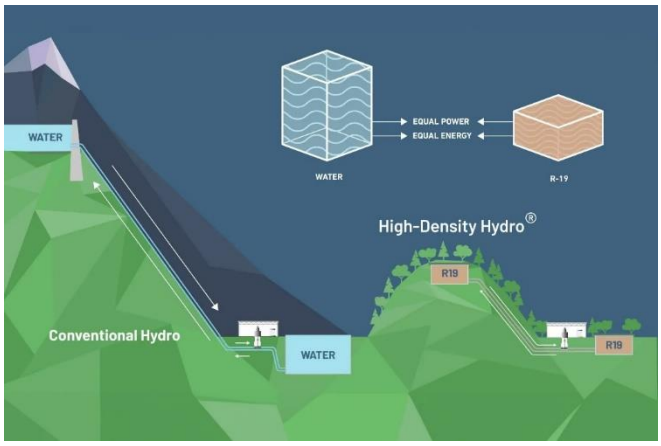
Most renewables are intermittent, so their generation doesn't always coincide with the energy demands of households and businesses. Therefore, this intermittent energy can be used to pump the water to upper reservoir and store the water for generating energy, when there will be demand.

Therefore, PSP are also called as batteries because they are used as storing energy from intermittent energy sources like wind and solar.



Small Hydro Shaloo Puri

British company introduces waterless pumped storage hydropower technology



Comparison between conventional and high-density pumped hydro (credits: RheEnergise)

A UK-based company has developed a waterless pumped storage hydropower technology, and recently teamed up to deliver 100MW energy storage capacity projects by 2030.

Furthermore, this technology works within the basic framework of pumped storage hydro, which currently accounts for 95% of the world's energy storage capacity, but uses a new material called R-19 instead of water.

R-19 is 2.5 times denser than water, which reduces the amount of height and volume needed by about 40%. The material's composition has not yet been made public, but it is claimed to be very cheap and environmentally neutral.

Such projects will be capable of achieving 5MW to 100MW storage capacity, while about 6,500 possible locations for deployment have been identified in the UK.

Last November, the company was awarded a £8.25m grant from the UK government to develop a 250kW demonstration project within a mine in Devon.

The new partnership with another UK organization involves the development of 100MW worth of such energy storage projects by 2030.

It is worth mentioning that the European Union requires 200GW of energy storage to become available by 2030 and 600GW by 2050.

This technology aims to pump up the fluid when renewable energy production is available in abundance and then release it and create electricity when needed.

Sources: thenextweb.com, techyrise.com, newatlas.com

(Geoengineer.org, Aug, 15, 2023, https://www.geoengineer.org/news/british-company-introduces-waterless-pumped-storage-hydropower-technology)

Tunnel Construction Methods: TBM vs NATM

A. INTRODUCTION

Tunnels significantly contribute to the development, connectivity and functionality of modern societies, providing critical infrastructure for transportation and utilities, enhancing economic growth, and quality of life for people globally. Because of the tunnels economic significance, construction costs and design risks, the evaluation and selection of the best tunnel design and construction technique is important. From safety and serviceability to construction costs, geological conditions and construction efficiency, there are many parameters that need to be carefully evaluated by experienced tunneling professionals, engineers, and geotechnical experts when it comes to the selection of the most suitable tunnel construction method.

This article focuses on the analysis of two major tunnel construction methods – the TBM (Tunnel Boring Machine) and the NATM (New Austrian Tunneling Method), exploring the advantages, disadvantages and limitation of each method, as well as, how these are implemented in our DeepEX – Shoring & Tunnel Design Software.

B.1. TBM TUNNELS

The Tunnel Boring Machine (TBM) method is a common method for the construction of tunnels in soft soils in urban areas. It involves the use of specialized machines called tunnel boring machines, or TBMs, to excavate the tunnel. The TBM is launched from a starting point, typically referred to as the "launching shaft." The cutting head of the TBM excavates the soil or rock as it advances forward. As the TBM advances, temporary support measures, such as steel ribs or shotcrete (sprayed concrete), may be installed to stabilize the tunnel face until permanent lining is installed. Once the TBM has passed a section, permanent lining materials, such as concrete segments, are installed to provide structural stability to the tunnel.

Advantages of TBM Tunnels:

1. Speed and efficiency: TBMs are suitable for large-scale tunneling projects, because of their rapid excavation rates ability. A tunnel boring machine can bore through various soil types, including rock, soil, and mixed-face conditions.

2. Precision: TBMs create smooth tunnel walls, which can reduce the need for additional lining materials. They also ensure precise alignment and reduce the risk of deviations.

3. Reduced surface disruption: TBMs minimize surface disruptions, noise, and vibrations, making them suitable for urban areas and sensitive environments.

4. Safety: TBMs offer a safer working environment for construction workers as they minimize the risk of ground collapse and exposure to hazardous conditions.

Disadvantages of TBM Tunnels:

1. Limitations in challenging ground conditions: While TBMs can be the ideal solution for softer soil layers (sands, gravel, silt, clays and more), they may face challenges in highly fractured rock, water-bearing strata, and other complex ground conditions.

2. High acquiring, operating and maintenance costs: TBMs are expensive pieces of machinery, requiring specialized equipment, personnel, and ongoing maintenance to ensure their effectiveness.

3. Tunnel Size: TBMs are suitable for larger-diameter tunnels, but may not be suitable for small tunnels or irregular tunnel shapes. The accessibility to TBM tunnels for maintenance and repairs can be more challenging.

B.2. NATM TUNNELS

The New Austrian Tunneling Method (NATM), also known as the Sequential Excavation Method (SEM), is a tunnel construction method that is popular for its adaptability to varying geological conditions. Developed in the 1960s in Austria, the NATM approach revolutionized tunneling by introducing a flexible and systematic process that responds to the encountered ground conditions.

NATM involves a comprehensive assessment of the geological conditions through core drilling, testing, and monitoring. The ground is classified into different types based on strength, stability, and deformation characteristics. In NATM, initial support is provided by applying temporary support elements such as rock bolts, wire mesh, or shotcrete immediately after excavation. This initial support helps stabilize the tunnel face and prevent ground movements. Instrumentation and measurement techniques are used to assess deformations, stress changes, and groundwater conditions. According to the measurements, additional steps can be taken for the application of additional support measures.

Advantages of NATM Tunnels:

1. Adaptability: NATM allows for flexibility during construction as it can be adjusted to the encountered geological conditions. This method is particularly useful in complex ground conditions with variable rock quality.

2. Reduced environmental impact: NATM minimizes surface disruption during construction, leading to lower environmental impacts compared to other methods.

3. Cost-effectiveness: NATM can be cost-effective for smaller tunnel projects or projects with uncertain ground conditions, as it reduces the need for specialized equipment and resources.

4. Accessibility: NATM tunnels are relatively more accessible for maintenance and repairs due to their smaller size and construction.

Disadvantages of NATM Tunnels:

1. Longer construction duration: NATM tunnels generally have a longer construction duration compared to TBMs since the excavation is typically done in smaller sections, requiring more time for construction and support installation.

2. Engineering expertise: NATM tunnel construction techniques require experienced engineers and skilled workers who can accurately assess ground conditions and make informed decisions regarding the support systems.

3. Ground Stability Challenges: NATM relies on proper ground support systems to ensure stability during and after construction. If the ground conditions are not properly assessed or managed, there is a risk of ground deformation and instability.

4. Surface Settlement: NATM construction can lead to larger surface settlements compared to other methods, especially in urban areas, if not properly managed.

C. CONCLUSION

It is important to note that the selection between TBM and NATM methods depends on various factors, including the geological conditions, project requirements, budget, and exper-

tise available. In some cases, a combination of both methods may be used, such as using a TBM for main tunnels and NATM for cross-passages or smaller sections.

(DEEP EXCAVATION, 2 Aug. 2023, https://www.deepexcavation.com/en/resources/case-studies/tunnel-construction-methods-tbm-vs-natm)

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

International Society for Soil Mechanics and Geotechnical Engineering Council Meeting

Η Γενική Συνέλευση της ISSMGE (Council Meeting) διεξήχθη την Κυριακή 13 Αυγούστου 2023 στην αίθουσα της Συγκλήτου της Πρυτανείας του Nazarbayev University στην πρωτεύουσα του Kazakhstan Nursultan (Astana) την παραμονή του 17th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering με την ακόλουθη ημερήσια διάταξη:

1. Opening remarks by President and agreement of the Agenda - Marc Ballouz
2. Report by President - Marc Ballouz
3. List of Delegates and other persons present - Apologies for absence - Neil Taylor
4. Confirmation of quorum (Statute 12K) - Neil Taylor
5. Confirmation of Minutes of the Sydney Council Meeting - Neil Taylor
6. Membership. Report by Secretary General - Neil Taylor
7. Regional Reports by Vice-Presidents on Regional Activities - Marawan Shahien, Keh-Jian (Albert) Shou, Graham Scholey, Lyesse Laloui, Walter Paniagua, André Assis.
8. Presentation of Audited Accounts 2021, 2022 by Secretary General - Neil Taylor
9. Budget 2023 – 2026 - Graham Scholey

   Reports on activities by Chairs of the Board Level Committees
10. Innovations and Development Committee - Jennifer Nicks
11. Technical Oversight Committee - Marcelo Sanchez
12. Young Members' Presidential Group - Ashe Cooper
13. Corporate Associates' Presidential Group -Peter Day
14. Award Committee - Loretta Batali
15. Professional Image Committee - Mona Badr El Din
16. International Journal of Geo-Engineering Case Histories - - Dimitris Zekkos
17. The ISSMGE Foundation - Neil Taylor
18. The ISSMGE Bulletin - Anthony Leung, Editor-in-Chief
19. Heritage Time Capsule - Sukumar Pathmanandavel
20. Geo-Engineers without Borders - Pierre Delage
21. XXI ICSMGE, Vienna 2026. Oral report by Austrian Geotechnical Society - Helmut Schweiger
22. Any Other Business - Marc Ballouz
23. Date and Venue of next meeting - Marc Ballouz
24. Thanks and closure - Marc Ballouz

17:30 Adjourn

Στο ISSMGE Council Meeting συμμετείχαν εκπρόσωποι 30 επιστημονικών εταιρειών μελών της ISSMGE, ενώ 20 εταιρείες εκπροσωπήθηκαν δι' αντιπροσώπου. Η ΕΕΕΕΓΜ εκπροσωπήθηκε στο ISSMGE Council Meeting από τον Α' Αντιπρόεδρο και Εκδότη της Δρ. Χρήστο Τσατσανίφο.

Σύντομη αναφορά στις εργασίες του ISSMGE Council Meeting δίνεται στη συνέχεια στην ενότητα της ISSMGE.

Στο Council Meeting έγινε πρόταση από τον ISSMGE President Marc Ballouz για την θέσπιση του Mediterranean Conference on Geotechnical Engineering. Ο Χρήστος Τσατσανίφος υπενθύμισε στον Marc Ballouz ότι 10 χρόνια πριν είχε γίνει η πρόταση αυτή από την ΕΕΕΕΓΜ, όπως φαίνεται στην ακόλουθη επιστολή που απευθύνθηκε στις Επιστημονικές Γεωτεχνικές Εταιρείες των χωρών της Μεσογείου και γειτονικών περιοχών:

HELLENIC SOCIETY FOR SOIL MECHANICS & GEOTECHNICAL ENGINEERING

17th June 2013

To the
Geotechnical Societies
members of ISSMGE and ISRM
and the Chambers of Engineers
of the countries around and close to the Mediterranean Sea

Dear Colleagues,

The Hellenic Society for Soil Mechanics and Geotechnical Engineering has the honour to propose the foundation of the "Mediterranean Conferences on Geomechanics and Geoengineering" (MCGG).

The Mediterranean Sea is surrounded by three continents: Europe, Africa and Asia. The Latin Solinos gave the name "Mare Mediterraneum" as the sea separating two continents. However, Mediterranean did not separate the people of the continents, but eased and fostered close cultural, scientific, economic and personal relations among the people around since 4,000 years ago.

Mediterranean is a place of constant flux. Frontier societies and particularly shores share an amalgam of cosmopolitan socio-economic and political structures. Classical historiography highlights the region as one "source" for many ideas, species, social organizations and religions. Shifts of ideas, modes of production, methodology, science, religion, language are among dynamics brought about successively by the various influxes to the region and yield hybrid outcomes.

And this should continue by closer relationship between the Mediterranean and the adjacent countries, especially after the discovery of giant oil and gas fields in the Eastern Mediterranean, which pose many geotechnical problems to be solved for their exploitation.

The aim of the proposed Conferences is to bring together colleagues from the countries surrounding the Mediterranean Sea, as well as from adjacent countries, to share experiences on their latest developments in geomechanics and geoengineering; to provide a platform for technical knowledge exchange and networking opportunities; to help to disseminate our science and technical knowledge; to promote and support education for geoengineers; and to advance the development of tools and procedures required for our profession.

The Conferences will examine geotechnical problems common in the Mediterranean countries, arising from similar geological formations and geomorphological hazards, dense cities along coasts, shallow sea and islands near to the coast without connections to the mainland, environmental problems, numerous historical monuments above and under the ground, oil and gas fields onshore and offshore, etc.

"The Mediterranean is not only a cultural and historical, neither a mystic and lyric space… One must chase the manifold Mediterranean paths, those of the traffics of the pilgrimage, of the extension of lives and the rivers' courses; the borders will then become fluctuant and blurred, even concentric and coherent by drawing ideal curves like ripples in the sea"- C. Magris

We call you, the Geotechnical Societies of the countries around and close to the Mediterranean Sea, members of the International Society for Soil Mechanics and Geotechnical Engineering and the International Society for Rock Mechanics, as well as the Chambers of Engineers of the countries without Geotechnical Societies, to share with us the idea of these conferences and start the journey of Ulysses towards the Ithaca of the geomechanics and geoengineering knowledge. Our first safe haven could be Crete in the summer – autumn 2016.

In anticipation of your response and hopping to exchange ideas on the MCGG in details during the Paris 18th International Conference on Soil Mechanics and Geotechnical Engineering,

Wishing you for a nice summer,

Best regards,

Dr. Christos Tsatsanifos
President

To:

1. National Geotechnical Society of Albania
2. l'Union Nationale des Scientifiques et Technologues d' Algérie
3. Geotechnical Society of Bosnia and Herzegovina
4. Bulgarian Society for SMGE
5. Croatian Geotechnical Society
6. Scientific Technical Chamber of Cyprus
7. Egyptian Geotechnical Society
8. Macedonian Association for Geotechnics
9. Comité Français de Mécanique des Sols et de Géotechnique & Comité Français de Mécanique des Roches
10. Israeli Association of Civil Engineers / Geotechnical Chapter & Israel Rock Mechanics Association
11. Associazione Geotecnica Italiana
12. Lebanese Geotechnical Engineering Society
13. Libyan Syndicate of Engineers
14. Chamber of Engineers of Malta
15. Engineers Chamber of Montenegro - Civil Engineers Chamber
16. Comité Marocain de la Mécanique des Sols et des Roches
17. Sociedade Portuguesa de Geotecnica
18. Romanian Society for SMGE
19. Serbian Society for Soil Mechanics and Geotechnical Engineering & Serbian Society for Rock Mechanics
21. Slovenian Geotechnical Society
22. Sociedad Española de Mecanica del Suelo e Ingenieria Geotécnica & Sociedad Española de Mecanica de las Rocas
23. Order of Syrian Engineers and Architects / Geotechnical Department
24. Association Tunisienne de Mécanique des Sols
25. Turkish National Committee for ISSMGE & Türk Ulusal Kaya Mekanigi Dernegi
26. Hellenic Society for Soil Mechanics and Geotechnical Engineering

Η πρόταση αυτή δεν υποστηρίχθηκε από την τότε ηγεσία της ISSMGE, η οποία επικαλέσθηκε την πληθώρα περιφερειακών συνεδρίων. Αυτή την φορά υπήρξε ανταπόκριση από τις περισσότερες προσκληθείσες εταιρείες και κατ' αρχή επιλογή διεξαγωγής του πρώτου συνεδρίου στην Βηρυτό του Λιβάνου το 2025.

Στο (14-17 Αυγούστου) ο Χρήστος Τσατσανίφος ήταν προσκεκλημένος ομιλητής στην Θεματική Ενότητα 5 με τίτλο «Preservation and Restoration of Monuments: The Authenticity Principle in Geotechnical Interventions».

Οι σύνεδροι αμέσως μετά την λήξη του 17ARC

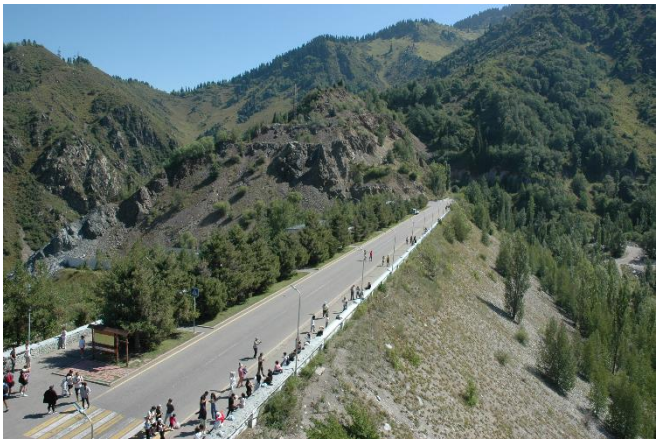
Στις 18 Αυγούστου έγινε Τεχνική Επίσκεψη σε εργοτάξια στη Astana [κατασκευής πασσάλων, Light Rail Transport (LRT) και LLP NIPI "Astanagenplan" (research design institute) like as Astana Master Plan].

Στις 19 Αυγούστου έγινε Τεχνική Επίσκεψη στα ακόλουθα τεχνικά έργα στην Almaty (η προηγούμενη πρωτεύουσα του Kazakhstan και η μεγαλύτερη πόλη του):

1. Medeo (dam for protection of debris floors)

2. Shymbulak (ski resort)

3. Sunkar International *Ski Jumping* Complex



Το Medeo dam και οι μετάσχοντες στην Τεχνική Επίσκεψη στην Almaty στο Shymbulak και στο Sunkar International *Ski Jumping* Complex

Η Τεχνική Επίσκεψη στην Almaty ολοκληρώθηκε με γεύμα στο ουζμπεκικό εστιατόριο Alasha

International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE Council Meeting 13th August 2023 Highlights

At the Council Meeting in Astana, Kazakhstan a decision was made to instruct lawyers to produce draft Articles of Association with a view to the ISSMGE becoming an Incorporated Society. Incorporation will establish the ISSMGE as a legal entity and enable the Society to continue to hold bank accounts. The aim is to circulate draft Articles of Association to Member Societies prior to seeking a unanimous vote to proceed with Incorporation late in 2023.

Neil Taylor, Paloma Peers, Marc Ballouz, Andrew McNamara in front of the participants in the ISSMGE Council Meeting

Other key points from the Council Meeting are:

The budget 2023 -2026 was presented by Graham Scholey (VP for Australasia) and received majority support from Council.

The term of appointment of the Secretary General, Professor R Neil Taylor has ended and Professor Taylor has stepped down after 24 years of service receiving thanks from Council, led by the President. Dr Andrew McNamara is now the Secretary General of ISSMGE.

Neil Taylor and the ISSMGE Board members

The next in-person Council meeting will be held on the occasion of the quadrennial international conference (21 ICMSGE) to be held in Vienna, Austria 14-19 June 2026.

Participants in the ISSMGE Council Meeting in the Senate Building of the Nazarbayev University

ISSMGE News & Information Circular August 2023

www.issmge.org/news/issmge-news-and-information-circular-August-2023

1. ISSMGE Council Meeting

The ISSMGE Council Meeting will be held on Sunday 13th August at the Senate Hall, Nazarbayev University, Astana, Kazakhstan on the occasion of the 17th Asian Regional Conference. All Member Societies have been invited to send a delegate to the meeting and we look forward to meeting you there.

2. Message from Prof. Pierre Delage, Chair of the ISSMGE Geo-Engineers without Barrier Committee (GeoWB)

Dear Member Society Officers,

This is a message from Pierre Delage, former TOC Chair. I am now in charge of a new committee proposed by ISSMGE Pdt Marc Ballouz called Geo-engineers without barriers (GeoWB). The basic idea of the Committee is to do in our domain of geotechnical engineering and natural risks what "Medecins sans frontieres" do for health issues and sanitary disasters in some countries: in link with local ISSMGE Member Societies, relevant organisations and local contacts, to propose to countries affected by geo-disasters to rapidly send some volunteer experts in charge of rapidly providing a short report (3 pages or more). The report would describe the observations and conclusions drawn on the ground (more details here). Geo-disasters may be earthquakes, landslides, floods, failure of dykes, dam and tailing dams, collapse of geotechnical structures, foundations, tunnels. This message is to let you know the existence of this ISSMGE Committee, within various perspectives:

- Some members of your Member Society (SM) may be willing to act as volunteer expert for some geo-disaster, preferably in a region close to yours.

- Your country might be, unfortunately, affected by some geo-disaster. In this case, it would be good that, if you wish, you inform GeoWB that you would like to have such a support. Note that, in the case you have local experts able to intervene and prepare the report, the ISSMGE could support

their travel expenses.

- Your country has close links with a country affected by a geo-disaster but without any SM. Your links with the country and local knowledge (including speaking the local language) would then be quite useful for GeoWB experts (either from your country or from another one, preferably close and from the same region).

Note that the GeoWB committee is still in constitution and that motivated candidates can apply to participate to the GeoWB activities.

The ISSMGE thinks that mobilising our ISSMGE competent worldwide network will definitely help the Society in case of geo-disasters.

Thank you for your help, we look forward to receiving your feedback.

Best wishes,

Pierre Delage
Chair of the ISSMGE Geo-Engineers without Barrier Committee (GeoWB)

3. ISSMGE BULLETIN

The latest edition of the ISSMGE Bulletin (Volume 17, Issue 3, June 2023) is available from the website.

4. ISSMGE FOUNDATION

The next deadline for receipt of applications for awards from the ISSMGE Foundation is the 30th September 2023. Click here for further information on the ISSMGE Foundation.

5. CONFERENCES

Member Societies, Technical Committees, Sister Societies and related organisations may add their events directly to the ISSMGE Events database via the link + Submit Event at the top of the EVENTS page

For a complete 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. For updated information please refer to that specific events website.

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

ISSMGE EVENTS

GEO-EXPO 2023 SCIENTIFIC AND EXPERT CONFERENCE - MOSTAR, BOSNIA AND HERZEGOVINA 19-10-2023 - 20-10-2023 Faculty of Civil Engineering, Architecture and Geodesy, University of Mostar., Mostar, Bosnia & Herzegovina; Languages: Bosnian, Croatian, Serbian and English; Organiser: Geotechnical Society of Bosnia and Herzegovina; Contact person: Sabrina Salkovic; Address: Urfeta Vejzagia 2; Phone: +38761451701; Email: geotehnika@geotehnika.ba; Website: https://www.geotehnika.ba;

2ND INTERNATIONAL CONFERENCE ON CONSTRUCTION RESOURCES FOR ENVIRONMENTALLY SUSTAINABLE TECHNOLOGIES 20-11-2023 - 22-11-2023 Fukuoka International Congress Center, Fukuoka, Japan; Language: English; Organiser: Prof. Hemanta Hazarika Graduate School of Engineering, Kyushu University Fukuoka, Japan, TC307; Contact person: Secretariat; Address: CREST 2023 Room No. 1124, West Building 2, Kyushu University 744 Motooka, Nishi-ku, Fukuoka 819-0395, Japan; Email: info@ic-crest.com; Websitehttps://www.ic-crest.com/index.html:

THE 2ND GEOMANDU: GEOTECHNICS FOR SUSTAINABLE INFRASTRUCTURES 28-11-2024 - 29-11-2024 Kathmandu, Nepal; Language: English; Organiser: Nepal Geotechnical Society; Contact person: Mandip Subedi (Dr.); President of Nepal Geotechnical Society; Phone: +977 9851124192; Email: mandip.subedi@gmail.com; Website: https://geomandu.ngeotechs.org/; Email: ngeotechs@gmail.com

NON-ISSMGE EVENTS

9TH GEOTECHNICAL SYMPOSIUM - 22-11-2023 - 24-11-2023 ITU Süleyman Demirel Cultural Center, Ayazaga Campus, Maslak, Istanbul, Turkey; Languages: English and Turkish; Organiser: Istanbul branch of the UCTEA Turkish Chamber of Civil Engineers supported by The Turkish Geotechnical Society for ISSMGE; Contact person: umutdagar@gmail.com; Address: Istanbul Branch of Chamber of Civil Engineers, Karakoy, Istanbul; Phone: 00902122932492; Email: 9geoteknik@imo.org.tr; Website: https://9geoteknik.org/ Email: 9geoteknik@imo.org.tr

INTERNATIONAL SYMPOSIUM ON INNOVATIONS IN GEOTECHNICAL ENGINEERING TOWARDS SUSTAINABILITY 30-11-2023 - 04-12-2023 Hong Kong; Language: English; Organiser: The Hong Kong Polytechnic University; Contact person: Weijian Liang; Address: ZS928, BlockZ, PolyU, Hung Hom, Kowloon, Hong Kong; Email: weijian.liang@polyu.edu.hk; Website: https://iges2023.github.io; Email : iges.2023dec@polyu.edu.hk

1st Scott Sloan Lecture

Francesca Ceccato / TC103 / 04-08-2023

On June 27th the 1st Scott Sloan honour lecture was held in London during the Scott Sloan Memorial Session of the NUMGE conference.

Prof. David Potts gave a lecture entitled "*Using Nonlocal Strains to Achieve Objectivity in Finite Element Analyses*".

TC103 thanks and congratulates with the organizers and the speakers.

ICSE-11 Programme

Shinji Sassa / TC213 / 13-08-2023

The programme for the 11th International Conference on

Scour and Erosion (ICSE-11) is now available at http://icse11.org/programme.

Highlights of Astana Council Meeting held on 13 August 2023

Neil Taylor / General / 19-08-2023

Lecture Series on Field Monitoring

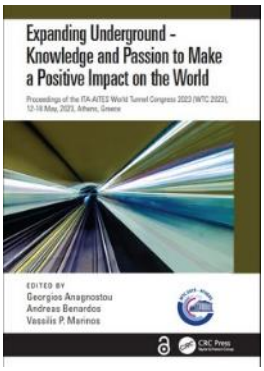
Andrew Ridley / TC220 / 22-08-2023

ISSMGE TC220 is pleased to announce the launch of a new lecture series on Field monitoring in Geomechanics. The first lecture delivered by Dr. Anl Yunatc (GeoDestek Ltd. ti., Türkiye) is titled "HARNESSING THE GEMS IN INSTRUMENTATION AND MONITORING PROJECTS: POWER OF COLLECTIVE PLANNING AND INCREASING COMMUNITY AWARENESS" and will take place at 3.30pm IST on Friday 25th August 2023. The lecture will cover innovative strategies for successful instrumentation and monitoring projects, emphasizing collaborative planning and community engagement.

Access the lecture using the following Zoom meeting link: https://us02web.zoom.us/j/89218536845?pwd=Si9EK2ZLcm9XbHhZdGJVL0R5bnlOZz09 Meeting ID: **892 1853 6845** Passcode: **811156**

ΕΛΛΗΝΙΚΗ ΕΠΙΤΡΟΠΗ ΣΗΡΑΓΓΩΝ ΚΑΙ ΥΠΟΓΕΙΩΝ ΕΡΓΩΝ (ΕΕΣΥΕ)

Πρακτικά WTC2023



Τα Πρακτικά του Παγκοσμίου Συνεδρίου Σηράγγων WTC2023 που διεξήχθη στην Αθήνα 12-18 Μαΐου 2023 διατίθενται δωρεάν # OpenAccess => ΕΔΩ

Scooped by ITA-AITES #98, 8 August 2023

In Switzerland, self-driving pods could transport freight in underground tunnels

Vegas Loop greenlit for 68-mile underground tunnel network | United States of America

HS2: First 1.6km of twin bored tunnel completed in London despite ground issues | UK

Zojila tunnel completion deadline extended: Check out new deadline and the cause of delay | India

Silvertown Tunnel under Thames - Newham to Greenwich near O2 Arena: See two massive boreholes in east London | UK

Loo Gardens: Hidden subterranean garden in London's Super Sewer | UK

New Zealand plans three Auckland harbor tunnels for $27 billion

Auckland plans up to 33km of new transport tunnels | Australia

Cleveland's project clean lake features large-scale storage tunnels | USA

Tunnel Updates – June 2023 | United States of America & Canada

Scooped by ITA-AITES #99, 22 August 2023

Tunnel progress as HS2's 'Florence' and 'Cecilia' reach Little Missenden | UK

Stockholm metro: 10 best stations in Sweden's underground art gallery

Tunnelling works completed for Phase 2 of Singapore's sewage 'superhighway'

India's largest tunnel boring machine 'Mavala' successfully dismantled after historic coastal road project

Amtrak moves to take land via eminent domain for $6 billion Baltimore tunnel | USA

Discover the longest train tunnel in Canada

FS begins excavation of the Naples-Bari line's Grottaminarda tunnel | Italy

Harbour Island wastewater project in full swing with new underground tunnel | USA

9th ITA Tunnelling Awards draws 53 entrants

What you need to know about the Silvertown Tunnel | UK

INTERNATIONAL GEOSYNTHETICS SOCIETY

News

Geotextile Filters Focus For 2023 Giroud Lecture August 1, 2023

The scope, potential and pitfalls of using geotextile filters in a range of scenarios will be explored in the next Giroud Lecture. Ennio Marques Palmeira, Read More »

IGS Strategy Goal Series – Future-Proofing The IGS August 3, 2023

Developing a leading geosynthetics organization with engaged members on a bedrock of financial stability will be crucial for the longevity of the IGS. Sustainability then Read More »

Book your hotel now for the 12th ICG before it's too late! August 7, 2023

Hotel rooms for the 12th International Conference on Geosynthetics (12th ICG) are booking fast. Don't miss out on accommodation close to the conference centre at Read More »

Book webinar on the impact of post-welding thickness on geomembrane durability August 8, 2023

Join esteemed barrier systems expert Professor Kerry Rowe later this month for a virtual talk on geomembrane fusion seams. Hosted by the IGS Technical Committee Read More »

Join Celebrations For The 40th Anniversary Of The IGS August 14, 2023

The IGS this year celebrates an incredible four decades advancing, developing and championing geosynthetics around the world. Founded in Paris, France, on November 10, 1983, Read More »

Notice to IGS Members: General Assembly Voting Information August 15, 2023

Dear IGS Member, We look forward to seeing many of you at the upcoming 12th International Conference on Geosynthetics in Rome during which we have Read More »

Book now for 12th ICG Short Courses August 17, 2023

Don't miss out on learning from some of the geosynthetics industry's most renowned experts in person by booking the Short Courses day at the 12th Read More »

Beat The Deadline For 12th ICG Online Registration August 22, 2023

There's just three weeks left before online registration for the 12th International Conference on Geosynthetics (12th ICG) closes. The remarkable event gathers experts from across Read More »

Containing Coal Mining By-Product Sustainably August 24, 2023

Bituminous geomembrane has helped protect ecosystems from by-products created by the mining industry. Our latest sustainability case study showcases how Axter's Coletanche ES3HFA geomembrane liner Read More »

Don't Miss IGS General Assembly at 12th ICG August 29, 2023

Be the first to hear the IGS's latest initiatives by attending the important IGS General Assembly at the 12th International Conference on Geosynthetics (12th ICG). Read More »

ΔΙΑΚΡΙΣΕΙΣ ΕΛΛΗΝΩΝ ΓΕΩΤΕΧΝΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

Σταματίνα Μαρινάτου
Ground Engineering Rising Star 2023

The Ground Engineering Awards are the UK's most prestigious annual geotechnical event. They bring together the leaders of the industry to celebrate achievements in terms of projects, people and business. The 2023 awards were announced on 12 July in an evening event with approximately 1000 attendees.

Stamatina received the Rising Star award, which is awarded to an individual who demonstrated innovative thinking, astute business acumen, made a significant contribution to a project and/or showed technical ability through research. The judges said:

"Stamatina delivered an excellent presentation, demonstrating competence and confidence in the subject area. She showcased clear initiative and practical application of theoretical research in a highly specialised field over a challenging career to date. This was demonstrated through relevant testimonials and clear noted achievements in the shown career progression. She shows passion for supporting and developing others, as well as helping clients and stakeholders alike understand a technical subject in a well-grounded way."

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

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

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

6th Meeting of EWG Dams and Earthquakes Workshop on Case studies, September 5, 2023, Interlaken, Switzerland, guillaume.veylon@inrae.fr

12th ICOLD European Club Symposium "Role of dams and reservoirs in a successful energy transition", 5 to 8 September 2023, Interlakes, Switzerland, www.ecsympo-sium2023.ch

NGS 2023 10th Nordic Grouting Symposium, 11 - 13 September, 2023, Stockholm, Sweden www.ngs2023.se

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/

TKZ2023 XX Technical Dam Control International Conference Safety of Hydraulic Structures, 12-15 September 2023, Chorzów Poland https://tkz.is.pw.edu.pl

Underground Singapore 2023, 14 -15 September 2023, Singapore, www.tucss.org.sg/ugs/2

The 11th International Conference on Scour and Erosion 17-21, September 2023, Copenhagen, Denmark, https://icse11.org

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

GROUND ENGINEERING SUSTAINABILITY, 21 September 2023, London, U.K., https://sustainability.geplus.co.uk/sustainability/en/page/home

Underground Built Heritage as Catalyser for Community Valorisation, 21 September 2023, Brussels, Belgium, www.underground4value.eu

Charles-Augustin COULOMB : A geotechnical tribute, 25 – 26 September 2023, Paris, France, www.cfms-sols.org/organisees-par-le-cfms/charles-augustin-coulomb-geotechnical-tribute

GEOCASE 2023 International Conference on "Case Histories In Geotechnical Engineering" & 4th AsRTC6 Urban Geoengineering Symposium, September 25 - 28, 2023, Bandung, Indonesia, www.geocase2023.com

InFUM - 1st International Symposium on Fiber Shotcrete for Underground Mining, October 1st to 4th, 2023, Rio de Janeiro, Brazil, https://infum.com.br

AFTES 2023 17th International Congress "Underground space at the heart of transitions", 2-4 October 2023, Paris, France, https://aftes2023.com/en

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

Contact person: PhD Ivan Luzin
Address: NR MSUCE, 26 Yaroslavskoye shosse
Phone: +7-495-287-4914 (2384)
Email: youngburo@gmail.com

GROUND ENGINEERING BASEMENTS AND UNDERGROUND STRUCTURES, 5 October 2023, London, U.K., https://basements.geplus.co.uk/basements2023/en/page/home

GROUND ENGINEERING SMART GEOTECHNICS, 5 October 2023, London, U.K., https://smartgeotechnics.geplus.co.uk/smartgeotechnics2023/en/page/home

MSL 2023 The Second Mediterranean Symposium on Landslides "Slope Stability in Stiff Fissured Clays and Soft Rocks", October 5-7, 2023, Hammamet, Tunisia, https://msl-2023.webnode.fr

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/

11th International Symposium on Ground Freezing (ISGF), 13 October 2023, London, United Kingdom, www.iom3.org/events-awards/11th-international-symposium-on-ground-freezing.html

HYDRO 2023 New Ideas for Proven Resources, 16-18 October 2023, Edinburgh, Scotland, www.hydropower-dams.com/hydro-2023

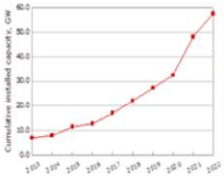
1-ICGTMW2023 1st International Conference on Geotechnics of Tailings and Mine Waste & GEOMIN 2023, 24th to 26th, October 2023, Ouro Preto, Minas Gerais, Brazil, https://geominouropreto.com.br/2023/icgtmw2023

SEAGC-AGSSEA 2023 21st Southeast Asian Geotechnical Conference & 4th AGSSEA Conference, 25th to 27th October 2023, Bangkok Thailand, https://seagcagssea2023.com

https://confit.atlas.jp/guide/event/geotechwind2023/static/program

The generation of electricity from offshore wind stared in Denmark in 1991 and has grown rapidly around the world, as shown below through data taken from the World Forum Offshore Wind's 2023 annual report.

While much of the development over the last ten years has occured in Northern Europe, major projects are now being developed offshore Asia and the USA - as well as other countries. Included in this are multiple Japanese projects that are generating great interest among local and international developers, regulators and designers. Foundations can account up to 30% of total capital costs, especially at sites with challenging ground conditions and subject to earthquake and typhoon loading. High quality geotechnical engineering is critical to safe and economic projects that support the worldwide drive to lower CO_2 energy.



These considerations led TC-209 of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) to convene a one-day workshop on Geotechnics for Offshore Wind at the University of Tokyo's Institute of Industrial Science (IIS) in Meguro Tokyo, an event supported by the Japanese Geotechnical Society (JGS) and the International Society for Underwater Technology (SUT). Individual Sessions will address recent advances in:

Site characterisation for offshore wind projects

Fixed wind turbine foundation design methods and project examples

Future trends and challenges

More details of technical sessions are shown in Program.

Join us on 30 October 2023 for this event where local and international experts will discuss key advances, recent case histories and future challenges in geotechnical for offshore wind.

Note that official language of this workshop is in English. For Japanese participants, workshop handouts will be provided both in English and in Japanese. Also an interpretor will be available for the panel discussion sessions for communication support.

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

ATC 2023 18th Australasian Tunnelling Conference: Trends and Transitions in Tunnelling, 5-8 November, 2023, Auckland, Aotearoa New Zealad https://atc2023.com

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

4th International Tunnelling and Underground Space Conference- Lagos, 2023, 15-16 November 2023, Lagos, Nigeria, www.tunnellingnigeria.org

CREST 2023 – 2nd Construction Resources for Environmentally Sustainable Technologies, November 20-22, 2023, Fukuoka, Japan, https://www.ic-crest.com

TUNNELLING ASIA 2023 International Conference on Climate Resilience and Sustainability in Tunnelling and Underground Space, 22-23 November 2023, Mumbai, India, https://www.tai.org.in

1st SLRMES Conference on Rock Mechanics for Infrastructure and Geo-Resources Development - an ISRM Specialized Conference, Colombo, Sri Lanka, December 2-7, 2023, www.slrmes.org

GEOTEC HANOI 2023 The 5th International Conference on Geotechnics for Sustainable Infrastructure Development, December 14-15, 2023 - Hanoi, Vietnam, https://geotechn.vn

9th International Symposium on RCC Dams and CMDs December, 2023, Guangzhou, China, www.chincold-smart.com/meetings/rcc2023

ICSGE 16th International Conference on Structural and Geotechnical Engineering, 27 – 28 December 2-23, New Cairo, Egypt, https://eng.asu.edu.eg/icsge

ISGHS 2024 International Symposium on Geotechnical Aspects of Heritage Structures, 14-16 Feb 2024, Tiruchirappalli, India, www.isghs2024.in, www.igstrichy.org

IEMTA Southeast Asian Conference and Exhibition on Tunnelling and Underground Space 2024 (SEACETUS2024), 05 - 07 March 2024, Kuala Lumpur, Malaysia, https://submit.confbay.com/conf/seacetus2024

7th International Conference Series on Geotechnics, Civil Engineering and Structures (CIGOS)

April 4-5, 2024, Ho Chi Minh City, Vietnam

Organiser: Association of Vietnamese Scientists and Experts (AVSE Global) and University of Architecture Ho Chi Minh City (UAH)

Contact person: cigos2024@sciencesconf.org
Email: cigos2024@sciencesconf.org

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

iCGE'24 International Conference of Geotechnical Engineering, April 25-27, 2024, Hammamet, Tunisia www.icge24.com

GEO AMERICAS 2024 5th Pan-American Conference on Geosynthetics Connecting State of the Art to State of Practice April 28 – May 1, 2024, Toronto, Canada, www.geoamericas2024.org

IFCEE 2024 International Foundation Congress and Equipment Expo, May 7 –10, 2024, Dallas, USA https://web.cvent.com/event/c42dd622-dd91-409f-b249-2738e31c9ef5/summary

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

GeoShanghai 2024 Interantional Conference on Geotechnical Engineering, May 26 – 29, 2024, Shanghai, China, www.geoshanghai.org

2nd annual Conference on Foundation Decarbonization and Re-use, May 28-30 2024, Amsterdam, The Netherlands, https://foundationreuse.com

IS-Macau 2024 11th International Symposium of Geotechnical Aspects of Underground Construction in Soft Ground, June 14-17, 2024, Macao SAR, China, https://is-macau2024.skliotsc.um.edu.mo

ISC'7 7th International Conference on Geotechnical and Geophysical Site Characterization "Ground models, from big data to engineering judgement", June 18-21, 2024, Barcelona, Spain, https://isc7.cimne.com

28th European Young Geotechnical Engineers, Conference 2024
25 to 29 June 2024, Skopje, North Macedonia

Contact person: Ms. Elena Angelova
Address: Blvd. Partizanski odredi No.24,
Email: mag@gf.ukim.edu.mk
Website : https://mag.net.mk

WCEE2024 18th World Conference on Earthquake Engineering, June 30 - July 5, 2024, Milan, Italy, www.wcee2024.it

WCEE2024 18th World Conference on Earthquake Engineering, June 30 - July 5, 2024, Milan, Italy, www.wcee2024.it / Session SHR-7: When science meets industry: advances in engineering seismology stemming from engineering practice, olga.ktenidou@gmail.com

3rd ICPE 2024 Third International Conference on Press-in Engineering, 3-5 July 2023, Singapore, https://2024.icpe-ipa.org

IS Landslides 2024 International Symposium on Landslides "Landslides across the scales: from the fundamentals to engineering applications" & IS Rock Slope Stability 2024, July 7-12th, 2024, Chambéry, France, www.isl2024.com

EUROCK 2024 ISRM European Rock Mechanics Symposium New challenges in rock mechanics and rock engineering July 15-19, 2024, Alicante, Spain, www.eurock2024.com

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

ISIC 2024 4th International Conference of International Society for Intelligent Construction, 10 – 12 September 2024, Orlando, United States, www.is-ic.org/conferences/2024-isic-international-conference

NGM 2024 19th Nordic Geotechnical Meeting, 18th - 20th of September 2024, Göteborg, Sweden, www.ngm2024.se

ISRM International Symposium 2024 and 13th Asian Rock Mechanics Symposium (ARMS13), 22 to 27 September 2024, New Delhi, India, https://arms2024.org

IS-Grenoble 2024 Geomechanics from Micro to Macro, September 23-27, 2024, Grenoble, France, https://is-grenoble2024.sciencesconf.org

5th European Conference on Physical Modelling In Geotechnics
02 to 04 October 2024, Delft, Netherlands

Organiser: Deltares & Delft University of Technology

Contact person: Suzanne van Eekelen & Miguel Cabrera

Email: organisation.ecpmg24@gmail.com

XVIII African Regional Conference on Soil Mechanics and Geotechnical Engineering

06 ÷ 09 October 2024, Algiers, Algeria
https://algeos-dz.com/18ARC.html

On behalf of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), the Algerian Geotechnical Society (ALGEOS) in collaboration with the Water, Environment, Geomechanics and Structures Laboratory (LEEGO) of the University of Sciences and Technology Houari Boumediene (USTHB) are pleased to invite you to the 18th African Regional Conference on Soil Mechanics and Geotechnical Engineering to be held in Algiers, Algeria from Sunday October 06 to Wednesday October 09, 2024. The event shall be held at the Algiers Marriot Hotel. The conference will provide keynote lectures, technical sessions and panel discussions on diverse topics. The conference will provide a forum for exchange and discussion between engineers, professionals, scientists, researchers, equipment or solution providers operating in the field of soil mechanics and geotechnical engineering. In addition, social activities and technical tours will be organized including gala dinner. A large exhibition is planned and will bring the maximum of professional partners to animate the conference and allow participants to exchange about the solutions offered by professionals and to answer to their eventual concerns. The proceedings of the conference will be published with open access. The conference will provide awards for best papers, best presentations, and best industrial project. ALGEOS are pleased to offer a warm welcome to the participants and accompanying persons and to suggest an enriched and successful social program. We look forward to your technical contributions and participation.

Conference Themes

- Laboratory testing and soil characteristics and properties
- In- situ testing and site characterization
- Unsaturated soils
- Lateritic soils
- Ground improvement
- Soil dynamics and geotechnical earthquake engineering
- Shallow and deep foundations
- Landslide, slope stability and embankments
- Underground space and deep excavations
- Dams
- Geotechnical Infrastructures
- Design and Modeling
- Numerical analysis of soil-structure interaction
- Geoenvironmental engineering
- Geotechnical reliability, risk assessment and management
- Geosynthetics
- Engineering geology and rock engineering
- Case History
- Investigation of foundations of historical structures, buildings and monuments
- Others

Contact

Adress: USTHB-Houari Boumediene, B.P 32 El-Alia 16111 - Bab Ezzouar
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RMCC2023 1st International Rock Mass Classification Conference "Rock Mass Classification meets the Challenges of the 21st Century", 30-31 October 2024, Oslo, Norway,

www.rmcc2024.com

PANAMGEO CHILE 2024 17th Pan-American Conference on Soil Mechanics and Geotechnical Engineering, 12-17 November 2024, La Serena, Chile, https://panamge-ochile2024.cl

ICTG 2024 5th International Conference on Transportation Geotechnics 2024 "Sustainable and Evolving Technologies for Urban Transport Infrastructure", 20 – 22 November 2024, Sydney, Australia www.ictg2024.com.au

World Tunnel Congress 2025 "Tunnelling into a sustainable future – methods and technologies", 9-15 May 2025, Stockholm, Sweden, www.wtc2025.se

Eurock 2025
ISRM European Rock Mechanics Symposium
Expanding the underground space - future development of the subsurface - an ISRM Regional Symposium
16–20 June 2025, Trondheim, Norway

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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

16th International Congress on Rock Mechanics
Rock Mechanics and Rock Engineering Across the Borders
17-23 October 2027, Seoul, Korea

Scope

The scope of the Congress will cover both conventional and

emerging topics in broadly-defined rock mechanics and rock engineering. The themes of the Congress include but not be limited to the following areas:

- Fundamental rock mechanics
- Laboratory and field testing and physical modeling of rock mass
- Analytical and numerical methods in rock mechanics and rock engineering
- Underground excavations in civil and mining engineering
- Slope stability for rock engineering
- Rock mechanics for environmental impact
- Sustainable development for energy and mineral resources
- Petroleum geomechanics
- Rock dynamics
- Coupled processes in rock mass
- Underground storage for petroleum, gas, CO2 and radioactive waste
- Rock mechanics for renewable energy resources
- Geomechanics for sustainable development of energy and mineral resources
- New frontiers & innovations of rock mechanics
- Artificial Intelligence, IoT, Big data and Mobile (AICBM) applications in rock mechanics
- Smart Mining and Digital Oil field for rock mechanics
- Rock Engineering as an appropriate technology
- Geomechanics and Rock Engineering for Official Development Assistance (ODA) program
- Rock mechanics as an interdisciplinary science and engineering
- Future of rock mechanics and geomechanics

Our motto for the congress is "Rock Mechanics and Rock Engineering Across the Borders". This logo embodies the interdisciplinary nature of rock mechanics and challenges of ISRM across all countries and generations.

ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

Utah using geofoam blocks to build freeway ramp

© Utah DOT

The Utah Department of Transportation (UDOT) is using geofoam blocks to build a freeway ramp that will connect the future West Davis Highway with southbound I-15 in Farmington.

The blocks are similar to the Styrofoam used in packaging materials and ice chests. They allow the new ramp to be built in close proximity to I-15, the Union Pacific Railroad and Utah Transit Authority tracks without causing additional shifting or settlement.

Settlement is typical during construction and can range from several inches to a few feet.

For this project, the existing rail lines and the interstate's close proximity meant settling could negatively affect their structural integrity.

Approximately 3,000 geofoam blocks, each weighing approximately 200 pounds and measuring approximately 4 feet by 5 feet by 9 feet, will be used to build the ramp.

Once brought to the construction site, the blocks are either placed as-is or cut to fit. Then a concrete slab is poured on top to evenly distribute the load of the ramp pavement and traffic. Finally, concrete walls are installed along the sides.

"Sometimes there are unique challenges on our projects, and they require innovative solutions," said Rex Harris, UDOT West Davis Highway project director. "Geofoam is another tool in our toolbox to efficiently build the roads, trails and bridges we all need to get where we want to go."

(Melina Druga / Transportation Today News, August 16, 2023, https://transportationtodaynews.com/news/31022-utah-using-geofoam-blocks-to-build-freeway-ramp)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΠΕΡΙΒΑΛΛΟΝ

MIT: Νέος τύπος σκυροδέματος, αποθηκεύει ενέργεια!

Τα οχήματα θα μπορούν να φορτίζουν εν κινήσει και η οικιακή ενέργεια να αποθηκεύεται στα θεμέλια

Το μελλοντικό σας σπίτι θα μπορούσε να έχει **θεμέλια που θα αποθηκεύουν ενέργεια** από τα ηλιακά πάνελ στην οροφή σας, χωρίς την ανάγκη για ξεχωριστές μπαταρίες, ενώ το **ηλεκτρικό σας όχημα** θα μπορούσε να **φορτίζει στο δρόμο**!

Μηχανικοί του MIT ανέπτυξαν μια νέα τ**εχνολογία αποθήκευσης ενέργειας** - έναν **νέο τύπο σκυροδέματος** - που βασίζεται σε δύο αρχαία υλικά: το **τσιμέντο**, που χρησιμοποιείται εδώ και χιλιάδες χρόνια και τον **μαύρο άνθρακα**, μια μαύρη σκόνη που χρησιμοποιείτο ως μελάνι για τα χειρόγραφα της Νεκράς Θάλασσας περίπου 2.000 χρόνια πριν.

Ο μαύρος άνθρακας άγει τον ηλεκτρισμό και οι μηχανικοί ανακάλυψαν ότι αν αναμειχθεί με τσιμέντο και νερό με συγκεκριμένο τρόπο, σχηματίζει ένα μακρύ, διακλαδισμένο δίκτυο από «σύρματα» άνθρακα, καθώς το τσιμέντο σκληραίνει. Αυτό μετατρέπει το υλικό σε **υπερπυκνωτή**, μια συσκευή που αποθηκεύει ένα ηλεκτρικό φορτίο.

«Ξαφνικά, έχουμε ένα υλικό που, όχι μόνο μπορεί να μεταφέρει φορτίο, αλλά μπορεί επίσης να αποθηκεύσει ενέργεια», λέει ο Franz-Josef Ulm, καθηγητής πολιτικός μηχανικός στο **MIT** και ένας από τους συγγραφείς μιας νέας μελέτης για την τεχνολογία αυτή.

Σε αντίθεση με μια μπαταρία, η οποία λειτουργεί μετατρέποντας τη χημική ενέργεια σε ηλεκτρική ενέργεια, ένας πυκνωτής **δεν υποβαθμίζεται με την πάροδο του χρόνου** και δεν χάνει την ικανότητα να κρατά φορτίο. (Ο υπερπυκνωτής είναι ένας τύπος πυκνωτή που μπορεί να κρατήσει πολύ μεγάλο φορτίο.)

Ένας πυκνωτής επίσης δεν απαιτεί τα ακριβά, ηθικά αμφισβητήσιμα υλικά που χρησιμοποιούνται σε μπαταρίες ιόντων λιθίου όπως το κοβάλτιο και το λίθιο. Επειδή η αιθάλη είναι φθηνή, οι ερευνητές λένε ότι η διαδικασία θα πρόσθετε ελάχιστα στο κόστος κατασκευής σκυροδέματος.

Θα μπορούσε να είναι μια λύση για μια από τις μεγαλύτερες προκλήσεις στην κλιμάκωση των ανανεώσιμων πηγών ενέργειας: Δεδομένου ότι η ηλιακή και η αιολική ενέργεια δεν είναι πάντα διαθέσιμη, η γρήγορη δημιουργία πιο προσιτών αποθηκευτικών χώρων είναι απαραίτητη, προκειμένου να απομακρυνθούμε από τα ορυκτά καύσιμα.

Οι μηχανικοί εμπνεύστηκαν να δουλέψουν με το τσιμέντο εν μέρει επειδή η παραγωγή τσιμέντου έχει μεγάλο αποτύπωμα άνθρακα και η παροχή ενός δεύτερου σκοπού στην υποστήριξη των ανανεώσιμων πηγών ενέργειας μπορεί να την κάνει πιο βιώσιμη. Η διαδικασία θα μπορούσε επίσης να χρησιμοποιηθεί με νεότερες εναλλακτικές λύσεις τσιμέντου που μειώνουν τις εκπομπές της παραγωγής, όπως μια έκδοση του τσιμέντου Portland από την startup Brimstone που έχει σχεδιαστεί για να είναι αρνητική σε άνθρακα.

Σε ένα σπίτι, ένα θεμέλιο κατασκευασμένο από το υλικό θα μπορούσε ενδεχομένως να αποθηκεύσει τόση ηλιακή ενέργεια - συνδεδεμένη μέσω καλωδίων στην οροφή - όση θα χρησιμοποιούσε το σπίτι σε μια μέρα.

Σε ένα **αιολικό πάρκο**, θα μπορούσε να χρησιμοποιηθεί στη βάση των ανεμογεννητριών.

Το σκυρόδεμα θα μπορούσε επίσης να χρησιμοποιηθεί για την **κατασκευή δρόμων που μπορούν να φορτίζουν ηλεκτρικά οχήματα** καθώς οδηγούν.

Στη νέα μελέτη, οι ερευνητές διαπίστωσαν ότι οι πυκνωτές θα μπορούσαν να σχεδιαστούν για να φορτίζουν αργά, όπως σε ένα σπίτι, ή να εκφορτίζονται γρήγορα, όπως σε έναν φορτιστή ΕV.

Μετά τη δοκιμή μιας μικρής έκδοσης στο εργαστήριο, η ομάδα σχεδιάζει τώρα να κλιμακώσει σε μεγαλύτερα μεγέθη. Το πρώτο πρωτότυπο θα μπορούσε ενδεχομένως να είναι έτοιμο εντός 18 μηνών, λέει ο Ulm.

(ΣοφοκλέουςIn, 08 Αυγούστου 2023, https://www.sofokleousin.gr/mit-neos-typos-skyrodematos-apothikeyei-energeia)

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

Geo-Trends Review

www.mygeoworld.com/geotrends/issues/24-august-2023

Κυκλοφόρησε το Τεύχος 24 του GeoWorld / Geo-Trend Review Αυγούστου 2023 με τα ακόλουθα περιεχόμενα:

31 Aug 2023

DCOdes: Platform for Infrastructure Software and Scripts allowing you to find the right computational tools easier! 30 Aug 2023

Passionate about groundbreaking geotech solutions? Join DCOdes, share your scripts with fellow experts and shine! Whether it's analysis tools or design innovations, this is your moment ... Read More

Rockfall Hazard Mitigation 30 Aug 2023

Rockfall protection measures fall into two main categories: engineered and non-engineered. Engineered measures reduce rockfall impact or occurrence, while non-engineered ones include maintenance and monitoring... Read More

Bulletin Vol. 17, Issue 3 - June 2023 published 06 Jul 2023 Read More

The Journal of Geomechanics and Geoengineering 12 Aug 2023 12 Aug 2023

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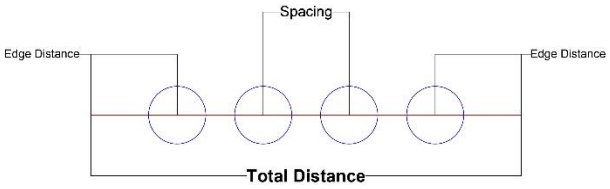
Highlights of Astana Council meeting held on 13 August 2023 19 Aug 2023 Read More

Open source code of "Spacing Modeler" 05 Aug 2023



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ISSMGE Interactive Technical Talk Episode 7: Preservation of Historic Sites (TC301) 10 Jul 2023

The seventh episode of International Interactive Technical Talk has just been launched and is supported by TC301. Dr. Christos Tsatsanifos, Dr. Durgadevagi Shanmugavel, Dr. Efrain Ov... Read More

Teaching material samples for Environmental Geotechnics: The collection is growing! 07 Jun 2023

In the context of the collaboration between TC215 (Environmental Geotechnics), which organizes the 9th Int. Congress on Environmental Geotechnics (9ICEG) in June 25-28, 2023, in Chan... Read More

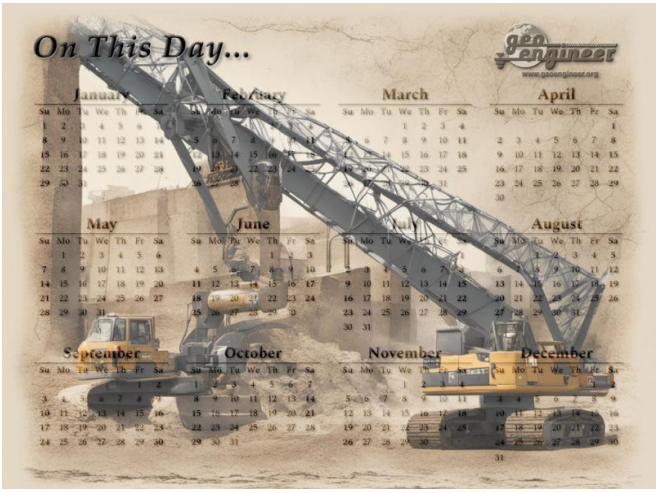
Proud Advisor Moment 01 Aug 2023

Warmest congratulations to my PhD student Weibing Gong for completing his doctoral thesis and becoming a #Faculty member at #Missouri #Science & #Technology. Weibing's research developed ... Read More

New TC211 Webinar on "Concrete for Rigid Inclusions" by Dr. Martin Larisch 30 Jun 2023

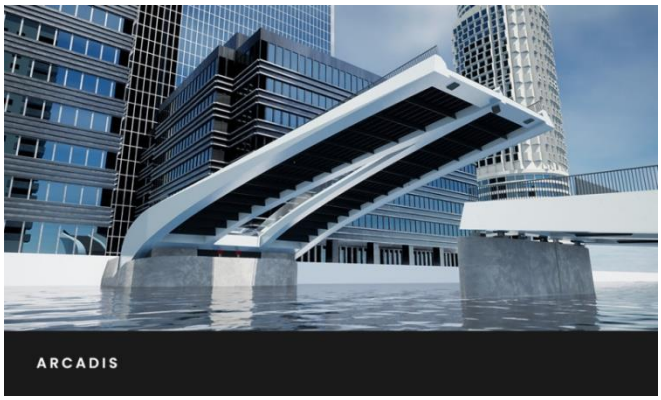
View for free Concrete for Rigid Inclusions Webinar at ISSMGE Virtual University About this Webinar Rigid inclusions are used for ground improvement works and they are o... Read More

Discover the Fascinating Moments in Geotechnical History! 31 Aug 2023



Attention Geotech Enthusiasts! Did you know that within our archives lies "On This Day" which invites you to embark on an exhilarating journey through time, uncovering captivating stories and pivotal moments in the history of geotechnical engineering? Imagine unearthing the groundbreaking milestones ... Read More

Subsurface Modeling and Analysis Finalists in the 2023 Going Digital Awards in Infrastructure 01 Sep 2023

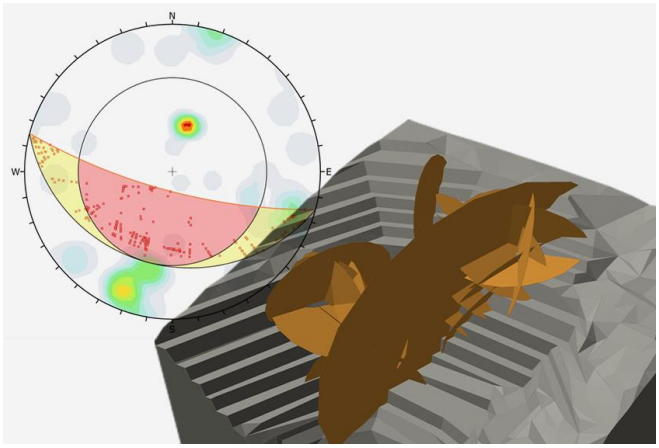


The annual awards program honors the extraordinary work of Bentley software users advancing infrastructure design, construction, and operations throughout the world. Twelve independent jury panels, re... Read More

Exploring Data Management Excellence Across Industries: Seequent's Geoprofessionals Data Management Report 20 Jul 2023

Over 70% of respondents say data is vital to their organisation... but which industries are handling it well? Seequents latest Geoprofessionals Data Management Report is out now, offering a window... Read More

Integrating Geotechnical Analysis Software: Dips & RocSlope 30 Aug 2023



The integration between Dips and RocSlope is designed to streamline your geotechnical analysis and provide you with a comprehensive solution for structurally-controlled slope stabi... Read More

ICSE-11 Programme 13 Aug 2023

The programme for the 11th International Conference on Scour and Erosion (ICSE-11) is now available at http://icse11.org/programme. Read More

Geoenvironmental Engineering: Evolution, Challenges and Opportunities 31 May 2023

Webinar given on July 26, 2021 by Dr. Krishna Reddy, University Scholar, Distinguished Researcher, and Professor, Department of Civil, Materials, and Environmental Engineering, University of Illinois... Read More

1st Scott Sloan Lecture 04 Aug 2023

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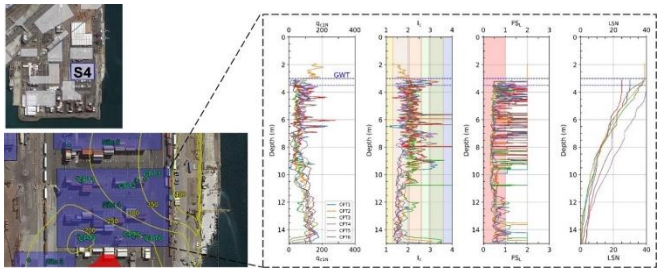

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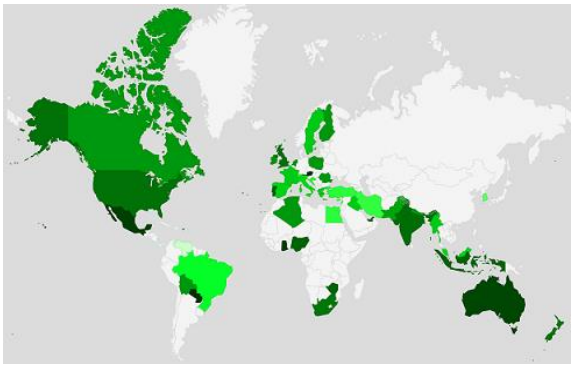
Influence the Geotechnical Confidence Index Results for 2023 Q3!



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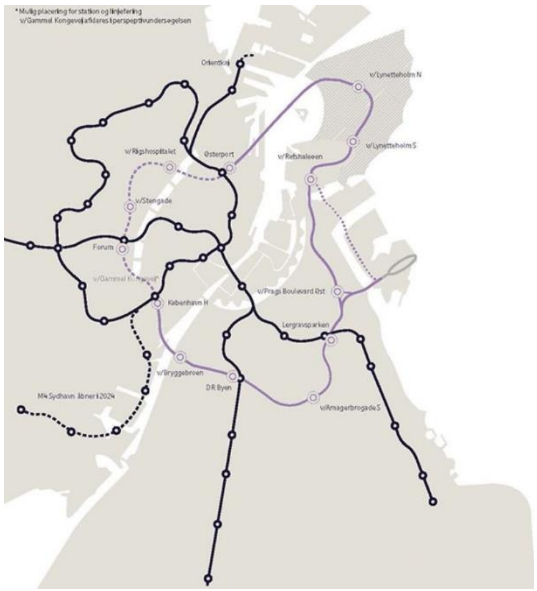
Copenhagen's new M5 metro aims to have half the carbon footprint of existing lines 16 Jun 2023



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Design and Construction of a Cost-Effective Post-Tensioned #Raft Foundation on Spatially Variable Ground Conditions in #Bahrain 08 Jun 2023

We're excited to share that our latest article, "Design and Construction of a Cost-Effective Post-Tensioned #Raft Foundation on Spatially Variable Ground Conditions in #Bahrain... Read More

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Slope stability publications and books 16 Jul 2023

After going through a lot of research publications and books on slope stability, Michael Duncan's book "Soil Strength and Slope Stability" is the... Read More

ISSMGE Interactive Technical Talk Episode 8: Reinforced Fill Structures (TC218) 18 Jul 2023

The eighth episode of International Interactive Technical Talk has just been launched and is supported by TC218. Dr.-Ing. Oliver Detert, Dr. Jorge G. Zornberg and Brobbey Daniel Acka... Read More

BNBC-2020 27 Aug 2023

Recently BNBC-2020 (section 1.8.5.2) adopted provision to provide tie beam between pile cap in both horizontal direction. What is your opinion on that as a Geotechnical Designer? Read More

INTERNATIONAL GEOSYNTHETICS SOCIETY

IGS NEWSLETTER – August 2023

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

Helping the world understand the appropriate value and use of geosynthetics

www.geosyntheticssociety.org/newsletters

- Join Celebrations For The 40th Anniversary Of The IGS READ MORE
- IGS Strategy Goal Series: Strengthening Trust In The IGS READ MORE
- IGS Strategy Goal Series: Future-Proofing The IGS READ MORE
- NOTICE TO MEMBERS: GENERAL ASSEMBLY VOTING INFO READ MORE
- Geotextile Filters Focus For 2023 Giroud Lecture READ MORE
- Book Your 12th ICG Hotel Now Before It's Too Late! READ MORE
- Register For 12th ICG Short Courses READ MORE
- In Memoriam 2018-2023: At the IGS General Assembly in Rome, we wish to pay tribute to those Members from our worldwide community who have sadly passed away since the General Assembly last met in September 2018. We invite you to share with us details of Members whose memory you would like us to honor when we gather in Rome. Please send the name of the individual and ideally a photograph to the IGS Secretariat's office: igssec@geosyntheticssociety.org.
- IGS Colombia Hosts Geosynthetic Reinforcement Talk READ MORE
- Job Shadow Program Launch For IGS Morocco READ MORE
- Book webinar on the impact of post-welding thickness on geomembrane durability READ MORE
- IGS Foundation Adds Online Donation Tool READ MORE
- Calendar of Events

www.icevirtuallibrary.com/toc/jgein/30/4

Κυκλοφόρησε το Τεύχος 4 του Τόμου 30 (Αυγούστου 2023) του Geosynthetics International της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

Reliability assessment of reinforced slopes with unknown probability distribution, E. Agarwal, A. Pain, 30(4), pp. 337–349

Reliability-based design of geogrid reinforced soil foundation using kriging surrogates, K. M. Nazeeh, G. L. Sivakumar Babu, 30(4), pp. 350–363

Analytical solution for solute transport in a triple liner under non-isothermal conditions, J. Qiu, Y. He, D. Song, J. Tong, 30(4), pp. 364–381

Numerical investigation of the interaction of back-to-back MSE walls, Y. Zheng, F. Li, X. Niu, G. Yang, 30(4), pp. 382–397

Reinforced soil design using the combined electrokinetic and mechanical properties of soil, C. J. F. P. Jones, J. Lamont-Black, 30(4), pp. 398–414

Effects of reinforcement arrangements on load transfer in spring-based trapdoor tests, G. Li, C. Xu, C. Yoo, P. Shen, T. Wang, Q. Wang, 30(4), pp. 415–431

Probabilistic stability analysis of reinforced soil slope with non-circular RLEM, H. Liu, J. Zheng, R. Zhang, P. Xie, 30(4), pp. 432–448

www.sciencedirect.com/journal/geotextiles-and-geomembranes/vol/51/issue/4

Κυκλοφόρησε το Τεύχος 4 του Τόμου 51 (Αυγούστου 2023) του Geotextiles and Geomembranes της International Geosynthetics Society με τα ακόλουθα περιεχόμενα:

Editorial Board, Page ii

Effect of fabric structure on in-plane and through-plane hydraulic properties of nonwoven geotextiles, Ghazaleh Eskandarnia, Parham Soltani, Pages 1-14

Vibration response of machine foundations protected by use of adjacent multi-layer geocells, A. Amiri, S.N. Moghaddas Tafreshi, A.R. Dawson, Pages 15-35

DIA of centrifuge model tests on geogrid reinforced soil walls with low-permeable backfills subjected to rainfall, M. Jayanandan, B.V.S. Viswanadham, Pages 36-55

Effect of gas-oil contamination on the mechanical behavior of sand-woven geotextile interface: Experimental investigation and constitutive modeling, M.R. Shoushtari, A. Lashkari, A. Martinez, Pages 56-71

Effects of transverse members on geogrid pullout behavior considering rigid and flexible top boundaries, Zhijie Wang, Qiushi Xia, Guangqing Yang, Weiyao Zhang, Guowei Zhang, Pages 72-84

Effect of geosynthetic component characteristics on the potential for GCL internal erosion, Jiying Fan, R. Kerry Rowe, Pages 85-94

Sand-geogrid interfacial shear response revisited through additive manufacturing, Hasthi Venkateswarlu, Allam SaiKumar, G. Madhavi Latha, Pages 95-107

Experimental and numerical investigations on buffer performance of geofoam subjected by the impact of falling rocks with respect to different shapes, Peng Zhao, Jun Liu, Yu Zhang, Pages 108-124

Model test study on the protection of expansive soil slope with polymer waterproof coating, Shaokun Ma, Min Ma, Zhen Huang, Benfu He, Yu Hu, Pages 125-136

Long-term Performance of Conductive-backed multilayered HDPE Geomembranes, M. Zafari, F.B. Abdelaal, R. Kerry Rowe, Pages 137-155

Centrifuge modeling on the effect of mechanical connection on the dynamic performance of narrow geosynthetic reinforced soil wall, Wen-Yi Hung, Ida Agustin Nomleni, Dicky Pratama Soegianto, Atika Praptawati, Pages 156-172

Modified method for predicting lateral displacement of PVD-improved ground under combined vacuum and surcharge loading, Fang Xu, Yangfa Peng, Yitian Lu, Yang Zhou, ... Yipeng Guo, Pages 173-187

Investigation of initial hydration and rehydration of geosynthetic clay liners from sandy subgrades via X-ray computed tomography images, Ta Thi Hoai, Toshifumi Mukunoki, Nguyen Thi Hoang Ha, Mai Trong Nhuan, Pages 188-200

ΕΚΤΕΛΕΣΤΙΚΗ ΕΠΙΤΡΟΠΗ ΕΕΕΕΓΜ (2019 – 2023)

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