

IGS NEWS

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Message from President



Dear Distinguished Members,

I hope you all are in good health and safe with your family. As we embrace the vibrant festival season, I want to take a moment to extend my heartfelt wishes to each of you. This time of year, rich with celebrations, brings an opportunity to reflect on our achievements, cherish our traditions, and strengthen the bonds within our community. Let us also remember the importance of unity and collaboration as we navigate the challenges and opportunities in our field. Together, we can continue to make strides in geotechnical engineering, contributing to the betterment of our society and environment. I am happy to connect with you in this edition of our IGS newsletter.

As we are in the process to elect the new executive committee for the term 2025-26, I am thrilled to share that we have an impressive slate of 50 enthusiastic members contesting for positions in National Executive committee. The exceptional degree of involvement indicates a genuine desire of our members to advance the Indian Geotechnical Society. I hope the new election process will be user friendly and I kindly seek the support in embracing this new approach, as your participation is vital in shaping the future leadership of our society. Your voice matters, and every vote counts! I want to acknowledge the

invaluable contributions of Prof. N.K. Samadhiya, Immediate Past President of IGS, as the returning officer, Prof. J.T. Shahu, Immediate Past Hon. Secretary of IGS and Ms. Aarti Bhargava who have graciously taken on the responsibilities of election officers. The webinar series initiated by the Professional Forum under the guidance of Prof. Jay Kumar Shukla is progressing well. The second session of the series was delivered by Mr. Tejas Belani, Principal Engineer (Geotechnical), Civil and Structural Department, Air Products – Vadodara on the topic on “Case Studies-Geotechnical Challenges, its Assessment and Mitigation” on July 13, 2024. The 13th Annual Conference on “Deep Foundation Technologies for Infrastructure Development in India”, was held on 19-21 September 2024 at Kala Academy, Goa organized by Deep Foundation Institute (India) (DFI) in association with Indian Geotechnical Society-Goa Chapter. The event featured Dr. Pramod P Sawant, Hon. Chief Minister of Goa and Prof. Omprakash R. Jaiswal, Director, National Institute of Technology Goa as the Chief Guest and Guest of Honor respectively. During the inaugural event a book on “Eco-Friendly Sustainability” authored by Dr. N.V. Nayak and Prof. Purnanand P. Savoikar was released by Dr. Pramod P. Sawant as a tribute to Dr. N.V. Nayak. Kudos to Prof. Purnanand P. Savoikar, organizing chair and IGS Goa Chair, Er. Mohan Ramanathan, Chairman - DFI, Er. B. Umesh Kulkarni and entire organizing team for the excellent conference and for the collaboration of DFI and IGS. Budget management and provision of financial supports for local chapters for various events are effectively taken care by the Financial Committee led by Er. Ravi Kiran Vaidya and I appreciate the team's effort.

I attended the 18th World Conference on Earthquake Engineering in Milan, which brought together about 4,000 participants from over 100 countries, and participated in a networking event hosted by

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the Indian Society of Earthquake Technology. I thank Prof. B.K. Maheshwari and team for the collaboration between ISET and IGS for showcasing India as a potential venue for hosting International conferences in Engineering. I had the opportunity to attend the 14th International Symposium on Landslides 2024 in Chambéry, France, from 8-12 July, 2024 where we had the opportunity to promote India's bid to host the 15th International Symposium on Landslides in 2028. During the conference, we extended invitations to delegates for attending the upcoming 1st Geotech Asia conference in Goa, India in 2025 and the International Symposium on Field Monitoring and Geomechanics in Indore, India in 2026. I would like to express my appreciation for the efforts of Prof. Neelima Satyam, Prof. N.K. Samadhiya, and the team for their contributions to the India's bid for ISL 2028. Attended the Asian Technical Committee meeting of ISSMGE on August 8, 2024 in online mode and updated about the International activities of the Indian Geotechnical Society and preparation for first Geotech Asia 2025. Had the opportunity to attend the 18th European Conference on Soil Mechanics and Geotechnical Engineering (ECSMGE) in Lisbon, Portugal from 26-30th August 2024. The Portugal Geotechnical Society team provided valuable platform by sharing their stall facilities to promote the 1st Geotech Asia conference and the 12th International Symposium on Field Monitoring and Geomechanics (ISFMG). I also had the opportunity to attend the ISSMGE TC 220 and TC 305 meetings at Lisbon. Visited Indore on 14th September 2024 in connection with the planning of 12th ISFMG scheduled from August 6-10, 2026 along with Honorary Secretary Dr A.P. Singh. I thank Prof. Neelima Satyam and team for their sincere efforts for the planning of symposium. Prof. Ashish Juneja, Prof. Dasaka S. Murty and team is working hard for the build-up for 1st Geotech Asia 2025. The abstract submission is open, and I encourage all members to share this information with your peers both in India and abroad. Please submit your abstracts through the website and help ensure that Geotech Asia 2025 will be a grand success! A one-day Indo US workshop titled "Advances in Geotechnical Engineering: Infrastructure and Technology" is being planned in conjunction with Geo-Frontiers 2025 which will take place in Louisville, Kentucky in March 2025. This workshop aims to gather leading experts from academia, industry, and government to discuss recent advancements in geotechnical engineering and their applications across various infrastructure sectors. I extend my appreciation to Prof. Sireesh Saride, Prof. Anand J. Puppala, and Prof. Bhaskar Chittoori for their dedicated efforts for the same.

A One Day Seminar on "Advances in Geotechnical Engineering-2024 (AGE-2024)" was organized by IGS Agartala Chapter in association with Civil Engineering Department, NIT Agartala on September 6, 2024, IGS Indore chapter organized a lecture series – "GeoHorizons: Geotechnical Innovation and Sustainable Developments" on September 14, 2024. I appreciate the efforts of all the local chapter office bearers for their tremendous efforts for the well conducted events of IGS across the country. Planning for the formation of new local chapters at Dehradun, Lucknow, Madurai, Gorakhpur and Aligarh is progressing. During this period a few new student's chapters were opened and various activities were conducted by numerous student chapters across India. A new student chapter of the Indian Geotechnical Society (IGS) at Government Engineering College, Thrissur, under the IGS Kochi chapter was inaugurated on August 30, 2024. The 7th student chapter under IGS Raipur local chapter at Guru Ghasidas Vishwavidyalaya, Bilaspur was inaugurated on the auspicious Engineers day on September 15, 2024. I wish success to the budding student chapters for their future endeavors and look forward to seeing their growth and

contributions to the field of geotechnical engineering. The planning for conducting GeoVisleshana 2024 to promote opportunity for learning, networking, and showcasing the latest advancements in our field for students is in progress. I greatly encourage all our student members to make use of this opportunity to participate in the event. I appreciate the efforts of the team led by Prof. G. Sridevi for making the students' chapters active by conducting various events. The IGTJ editorial team is doing an excellent job in timely review and publication of papers. A substantial progress is noted in the overall growth of the journal. I applaud the efforts of the team led by Prof. Deepankar Choudhury.

The team under the guidance of Prof. Ravi Jakka is working hard for the timely publishing of IGS newsletter with good quality content useful for the IGS community. A brain storming session of the Technical committee of Civil Engineering Division of Bureau of Indian Standards was held at National Institute of Training for Standardization, Noida on August 5, 2024 and I was able to attend the same. Our members of various panels in CED committee are regularly contributing to the development of codes. A two-day National Workshop on NBC 2016 and its revision was organized by BIS and Institution of Engineers India, Palghat Chapter at Hotel Indraprastha, Palakkad on August 9-10, 2024. I had the opportunity to deliver a technical talk on NBC 2016 and its revision on Section 6/Part 2 – Soils and Foundation. I applaud the efforts of Prof. H.N. Ramesh and team for their assistance with BIS activities.

The ninth IGS-Ferroco Terzaghi Oration (IFTO), organized by the IGS-Hyderabad Chapter, is set for October 5, 2024, at IIT-Hyderabad. This year's Oration will be presented by the distinguished Prof. Giulia M.B. Viggiani, Professor of Infrastructure Geotechnics at the University of Cambridge, U.K., on the topic "Line 1 of Napoli Underground: An Exercise in Sustainable Infrastructure." I encourage all members to participate in this prestigious event. The 240th EC meeting also will be held at IIT Hyderabad on the same day. I appreciate the efforts of Prof. Sireesh Saride and team for the excellent planning for the events.

I am eagerly anticipating the upcoming events organized by the local chapters of the Indian Geotechnical Society (IGS) and the Indian Geotechnical Conference (IGC) 2024, scheduled to take place at MIT Aurangabad. The Indian Geotechnical Society (IGS) and the Japanese Geotechnical Society (JGS) have partnered to enhance knowledge exchange in geotechnical engineering, resulting in successful workshops that foster collaboration between researchers from both countries. The 4th Indo Japan Pre-Conference Workshop on "High Speed Rail and Challenges Associated" is scheduled for December 18, 2024 during IGC 2024, addressing the geotechnical aspects of high-speed rail design and operation. This workshop will provide a platform for researchers and practitioners to discuss critical issues such as stability, safety, noise reduction, and overall system reliability, contributing to the development of a world-class high-speed rail system in India. I encourage all members to participate in our Annual Conference IGC 2024. I extend my heartfelt gratitude to the organizing team, led by Prof. Manish Dixit, for their dedication and hard work in promoting IGC 2024. As we move forward, let's commit to supporting one another, nurturing collaboration, and pushing the boundaries of innovation in Geotechnical Engineering. In the spirit of collaboration, let's remember the wisdom of Helen Keller: "Alone we can do so little; together we can do so much." Together, We Can and We Will!

Wishing you all good health and happiness.

Dr. Anil Joseph

Consequences of Ignoring Overconsolidation and its Effects on Settlement

Myth of Soil being Normally Consolidated

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Introduction

Alluvial, marine, lacustrine and glacial deposits are formed by sedimentation in rivers, sea, lakes, and other areas over a long period of time. At the time of deposition and soon afterwards they would be in a state of normal consolidation. However, these sites are subject to post-depositional changes, viz., geological, tectonic, climatic and various other effects. The site could be affected by loading and unloading, desiccation, groundwater lowering, chemical changes, diurnal variations in temperature (highest and lowest temperatures that could occur in a day), time, etc. Post-deposition the site could thus get altered to an overconsolidated state.

Causes of Overconsolidation

Geotechnical practitioners appear to be of the belief that the overconsolidated (OC) state is predominantly achieved due to unloading possibly because of the semantics of the term 'consolidation'. The ground was subjected to a higher stress than the current one in the geologic past, a typical example being glaciation during ice age. Post ice age, the melting of glaciers led to the soils below to be in a state of overconsolidation. This is particularly true for soils in North America and Europe and definitely not for the Indian subcontinent, South-East Asia, etc.

In the Indian subcontinent, especially along the coast and in the alluvial plains, the deposits or strata exhibit characteristics similar to those due to unloading but because of (i) long-term effect due to creep or secondary compression; (ii) desiccation; (iii) fluctuating groundwater level; (iv) chemical changes, e.g., cementation; (v) erosion; (vi) vegetation; (vii) preloading, etc. The term 'pseudo-overconsolidation' probably better describes the situation in terms of the effects, i.e., overconsolidation but not because of unloading. Erosion could probably be a major factor for the lower Himalayas and in the Sivaliks where steep hill slopes continuously get denuded due to deforestation and run-off from snowmelt and rain. Alluvial plains also could be subject to deposition in the post-peak flow condition and erosion during the flood season.

Pseudo-overconsolidation due to Long-Term Creep

Fig. 1 depicts the settlement versus log time plot from a typical oedometer test. The early part of the test denotes the primary

consolidation due to dissipation of excess porewater pressure. The latter part of the curve to which a straight line with a slope defined as 'coefficient of secondary compression', C_α , represents the response of the soil to creep or 'secondary compression' as referred to in Geotechnical literature. The longer the sample is allowed to deform under a constant effective stress of p_0 , larger would be the creep settlement. Bjerrum (1967) used this concept to plot the void ratio – log effective stress curves for soils subjected to 0.1, 1.0, 10.0, 100.0, 1000.0, etc. duration for each increment. All the curves are parallel and shift to the left of the instantaneous loading curve. It should be noted that the effective stress remains constant during creep or secondary compression as primary consolidation would have been completed by then.

If the deposit that existed for 10,000 years is freshly loaded, the path it would take is demarcated as a horizontal line (p_0 to p_c) (Fig.2) indicating reloading with minimal reduction in void ratio till the line meets the young normally consolidated line at a stress level p_c . Thus, the deposit has developed a 'pseudo-overconsolidation' effect as it transforms into a normally consolidated state at an effective stress of p_c which is more than the past stress, p_0 , it was subjected to. The conventional overconsolidation ratio, $OCR = p_c/p_0$. Bjerrum (1967) proposed an alternate term 'pseudo-overconsolidation' and a simple plot

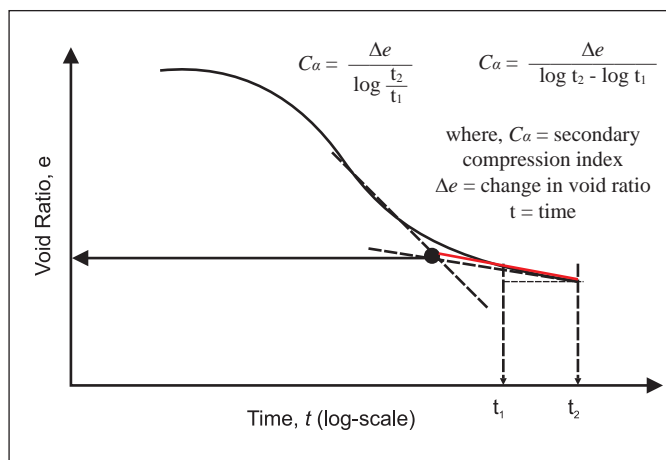


Fig. 1: Settlement – Time plot from a typical loading (Results of 1D consolidation Test at one load increment)

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to estimate the pseudo-OCR as a function of Plasticity Index. OCR due to long term creep for normal soils with I_p of 30 can be of the order of 1.6 to 1.7, a significant value.

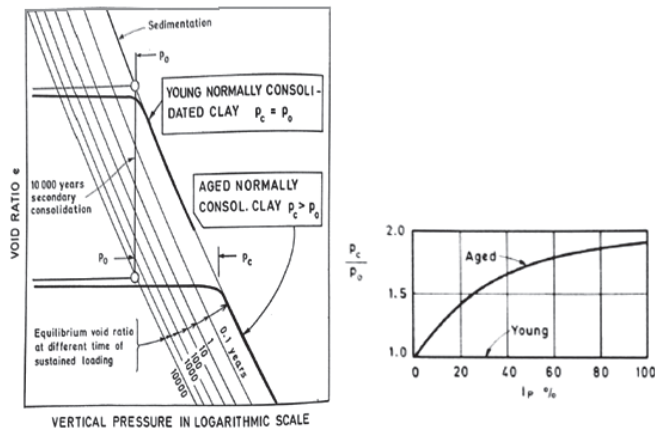


Fig. 2: Concept of Pseudo-Overconsolidation due to Long Term Creep or Secondary Compression and Pseudo-OCR vs PI (Bjerrum, 1967)

Lowering of Groundwater Level

It is reasonable to consider the groundwater level to be at or above the ground level at the time of deposition of the soft soil. Subsequently, in the geologic epoch, it would move down and rise annually because of climatic factors. The saturated and buoyant unit weights are assumed to be 17 kN/m^3 and 7 kN/m^3 for the purpose of the analysis. The effective stress, with GWL at the surface increases at the rate of $7z$ where z is the depth from GL. If the GWL moves down to a depth, H , the soil above the GWL would have total unit weight of 17 kN/m^3 (Lambe and Whitman, 1969).

The total and effective stresses in the top zone above GWL increase to $17z$ and $17z + \text{capillary pressure}$ depending on the degree of saturation and suction. However, the total and effective stresses are considered to be equal to $17z$, conservatively, for the purpose of calculations. The deposit in the upper zone above the GWL ($z < H$) would develop OCR as

$$\text{OCR} = \frac{17z}{7z} = 2.4, z < H \quad (5)$$

OCR of the deposit below GWL, i.e., for $z > H$ becomes

$$\text{OCR} = \frac{[17H + 7(z-H)]}{7z} = 1 + \frac{10H}{7z} \quad (6)$$

Thus, OCR decreases from 2.4 at $z = H$, the depth of GWL, inversely with increasing depth, z to 1.7 and 1.48 at depths of $2H$ and $3H$, respectively.

Desiccation

Desiccation as a phenomenon that occurs due to climatic effects, viz., alternate heating and cooling, alternate drying and wetting, and due to evapo-transpiration from vegetation as soil moisture is drawn by the roots into plant stem and leaves. The ground/soil in the near surface zone would thus be subject to capillary pressures or suction. The negative porewater pressure leads to increased effective stresses as a consequence of which soils become stronger and stiffer. Fig. 3 illustrates the effect of

desiccation on a typical soft soil deposit. Unit weight increases from about 16.0 kN/m^3 at depth to about 17.5 kN/m^3 near GL, water content decreases from near LL to closer to PL, undrained strength increases from about 20 kPa to close to 40 kPa , and OCR from about 1.3 to close to 5.0.

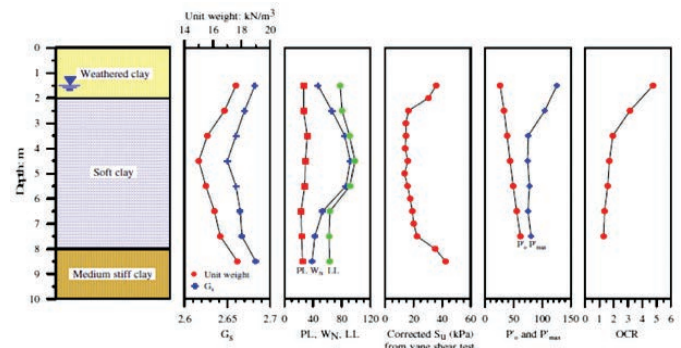
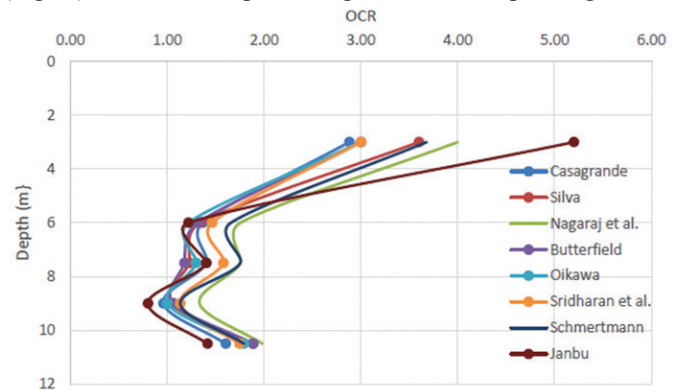


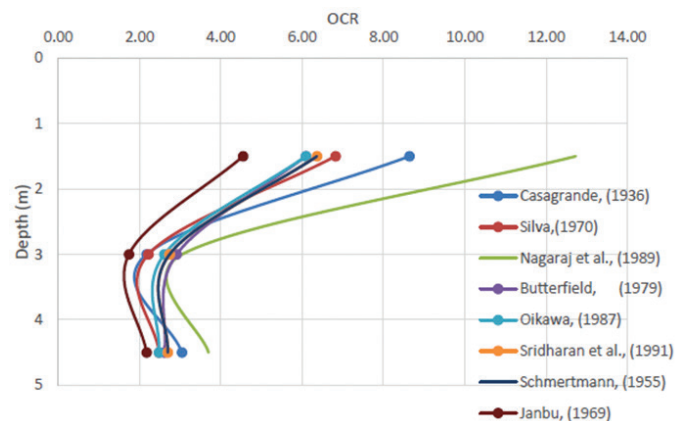
Fig. 3: Variations of Unit weight, Natural Water content, Undrained Strength, Maximum Past Consolidation Stress and OCR with Depth at a Site (Bangkok, Khan et al., 2015)

Estimation of Maximum Past Pressure and OCR

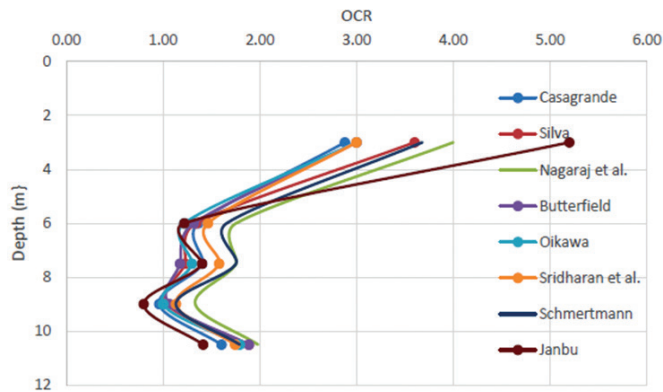
Several methods apart from Casagrande (1936) were developed in the last fifty years to estimate the maximum past pressure or the 'yield stress' as some authors term it. The following methods, viz., Casagrande (1936), Schmertmann (1955), Janbu (1969), Silva (1970), Oikawa (1987), Nagaraj et al. (1989), and Sridharan et al. (1991) were used to estimate OCR with depth at several sites, Kerala, West Bengal, Ghatkopar and Egypt (Fig. 4). In all these plots, large OCR corresponding to the



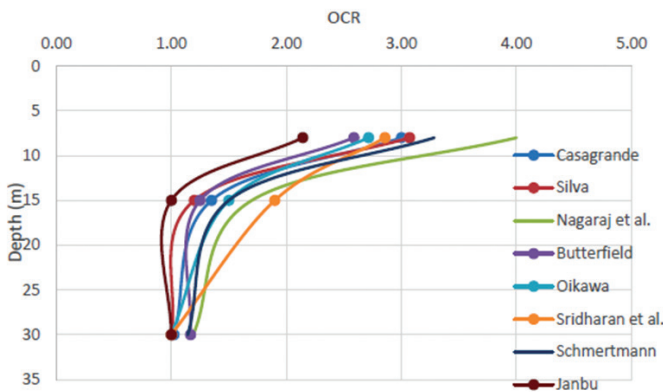
(a)



(b)



(c)



(d)

Fig. 4: OCR vs Depth from (a) Kerala, (b) West Bengal, (c) Ghatkopar and (d) Egypt

effect of desiccation in the top 2.0 m to 3.0 m depths can be noted as also near close variation of OCR with depth. At Ghatkopar, Mumbai, (Fig. 5) OCR was as high as 7.0 at 1.5 m depth compared to lightly overconsolidated (LOC) value of 1.5 at 8.0 m to 10.0 m.

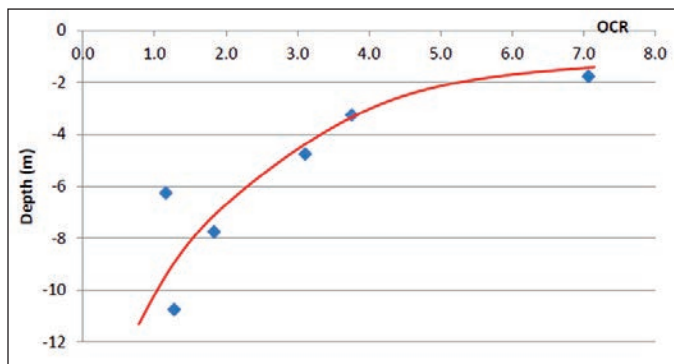


Fig. 5: Variation of OCR (Casagrande) with Depth

Sample Disturbance

It is a well-known fact that there is no such thing as an 'undisturbed' sample though most of the geotechnical investigation agencies claim they are collecting them. The process of drilling and extracting the sample causes significant changes in the state of the sample. Results of series of tests conducted by Bronham are shown in Fig. 6 (Nhan 1981). Void ratio – log effective stress curves 'P' and 'E' correspond to 'True In Situ' and completely 'Remoulded' samples respectively.

Curves 'A', 'J' and 'H' corresponds to samples subject to some degree of disturbance. It is author's contention that the samples extracted and tested in India are most probably closed to curve A as most agencies do not possess 'thin-walled samplers'.

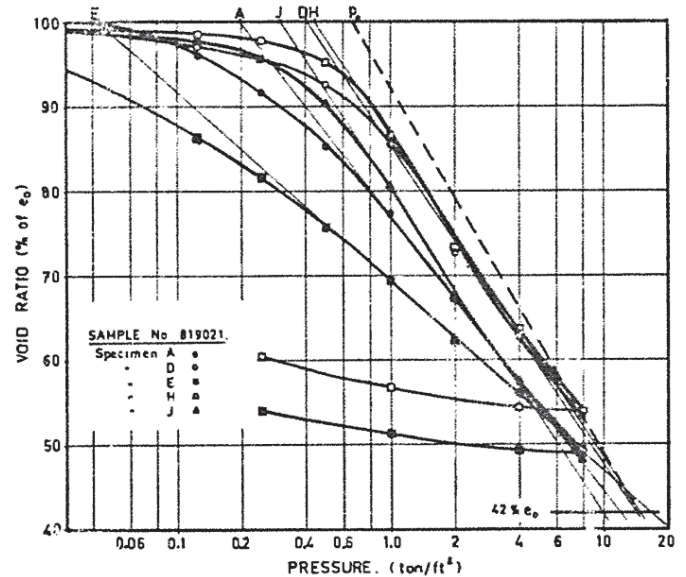


Fig. 6: Void ratio-Log Effective Stress Plots, Effect of Sample Disturbance

Fig. 7 illustrates the basis of constructing the 'True In Situ' response. It is presumed that the void ratio changes for the stress increasing from the current overburden stress to

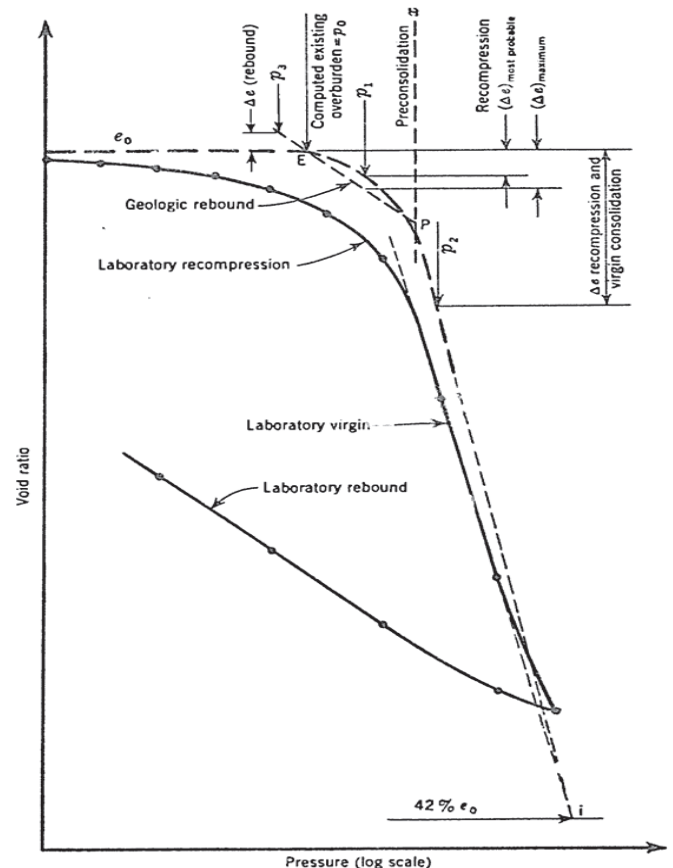


Fig. 7: True one-dimensional consolidation behaviour reconstruction

maximum past pressure is due to recompression. This change is valid for samples subjected to increased overburden stress in the geologic past but not due to ‘pseudo-overconsolidation’ effect that governs the Indian deposits. For the deposits in India, South-East Asia, void ratio remains near-constant till the yield stress due to pseudo-overconsolidation. It implies no void ratio change and Swell Index, C_s , is zero. Nagaraj et al. (1990) proposed the TIS curve based on this premise.

Schmertmann (1955) method (Fig. 8) available in IS 8009 (Part 1) – 1976 and reaffirmed in 2003 is strangely and unfortunately not used by most testing agencies and consultants. Not only is the ‘True In Situ’ (TIS) behavior not considered nor the actual overconsolidated state of the soil. The method incorporates recompression and reduction in void ratio as represented by points GH, the slope corresponding to Swell Index, C_s . The current practice in India even by several reputed agencies is to estimate settlement with the deposit assumed as normally consolidated leading to over-estimation of settlements. Even though IS 8009 (Part 1) – 1976 is in vogue, Schmertmann method is hardly used. The consequence of this practice is over-conservatism, sometimes adopting expensive ground improvement measures which are probably unwarranted.

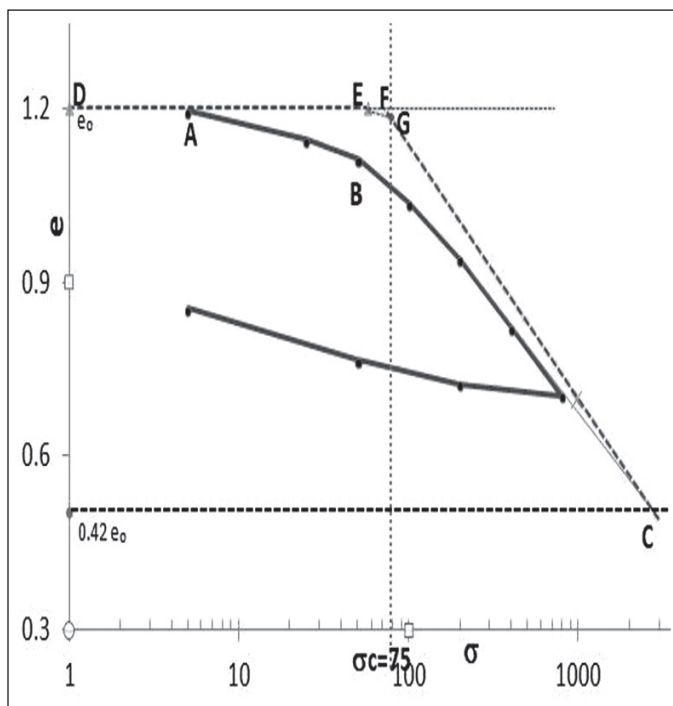


Fig. 8: True In Situ Void ratio – Log Effective Stress Plot (Schmertmann, 1955)

Schmertmann method can be easily modified (Fig. 9) to suit Indian conditions which obviates the need to consider the rebound due to unloading since Indian Subcontinent wasn't subject to glaciation and loading from large thickness of ice.

Nagaraj et al. (1990) proposed a very simple and elegant method (Fig. 10) to locate the yield stress or the pseudo-overconsolidation stress. The intersection of the line normal to the $e - \log \sigma'_v$ curve at the point of maximum curvature and the horizontal line from e_0 identifies the yield stress, σ'_{yf} .

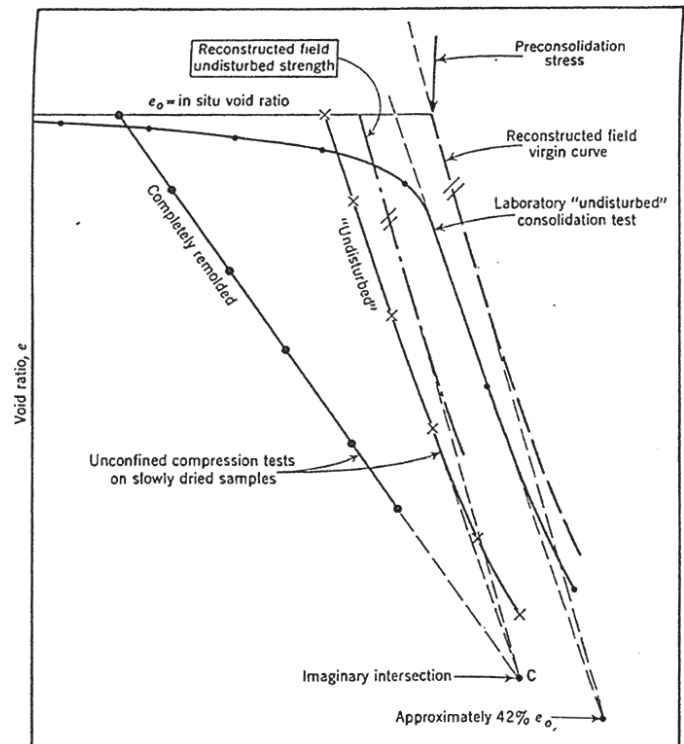


Fig. 9: True In Situ Curve for Pseudo-Overconsolidated Deposits – Modified Schmertmann Method

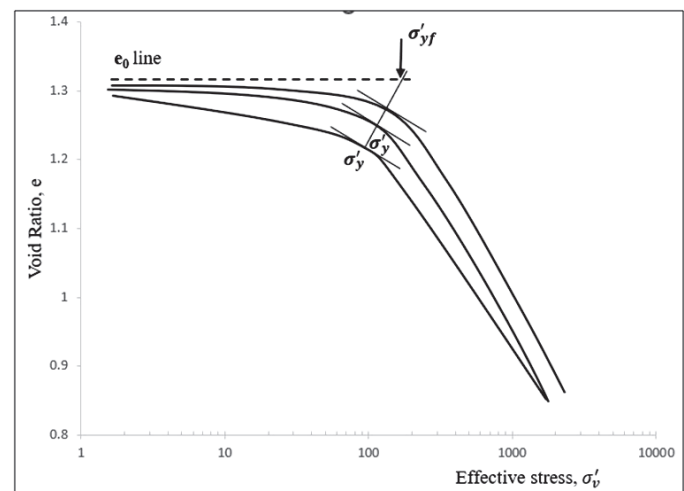


Fig. 10: Estimation of True In Situ Void Ratio vs Log Effective Stress Response by Nagaraj et al. (1990)

Settlement

To quantify the effect of ignoring the true in situ characteristics of the ground, settlements are estimated by (i) ignoring the overconsolidated state but treating the deposit as normally consolidated, (ii) using the laboratory measured void ratio – log effective stress relations of the ‘so called undisturbed’ samples and (iii) considering the ‘True In Situ’ state as suggested by Schmertmann (1955) for a deposit of 10.0 m thickness subjected to 80 kPa uniform load. Table 1 collates the settlements so obtained for the four sites and for the three approaches considered. Table 1 also lists the over-estimation of settlements by the first two approaches, i.e., non-consideration of OC state

and uncorrected void ratio – log effective stress relations of the samples. The overly conservative settlements, S_{NC} , of 504 mm, 182 mm (for only 5.0 m thick layer), 592 mm and 1,030 mm are obtained at the four sites, viz., Kerala, West Bengal, Ghatkopar and Egypt. Corresponding settlements based on uncorrected $e - \log \sigma'_v$, S_{UC} , and True In Situ, S_{TIS} , settlements for the four sites are respectively 484 mm and 385 mm, 158 mm and 96 mm, 592 mm and 314 mm, and 940 mm and 704 mm. Current practice based on ignoring the overconsolidation effect on the strata leads over estimation of settlements by 30-90 percent. If the deposit is considered to be truly tropical, and Nagaraj et al. (1990) method is adopted, the over-estimation of settlements is 100-500 percent, the ratio S_{NC}/S_N ranging from 2 to 6.

Table 1. Settlement Estimates and Ratios

Site	Settlement, mm				Ratios		
	S_{NC}	S_{UC}	S_{TIS}	S_N	S_{NC}/S_{UC}	S_{NC}/S_{TIS}	S_{NC}/S_N
Kerala	504	484	385	248	1.0	1.3	2.0
West Bengal (5 m)	182	158	96	44	1.1	1.9	4.1
Ghatkopar	592	548	314	94	1.1	1.9	6.3
Egypt	1030	940	704	337	1.1	1.5	3.0

Note: S_{NC} – Settlement considering deposit as Normally Consolidated; S_{UC} – Settlement using Uncorrected $e - \log \sigma'_v$ curve; S_{TIS} – True In Situ Settlement (Schmertmann 1955); S_N – Settlement based on Nagaraj et al. (1990) Method.

The conservatism with the assumption of normally consolidated soil instead of TIS or by Nagaraj et al. (1990) method reduces with increasing applied stress as illustrated in Table 2. The ratio, S_{TIS}/S_{NC} increases from 0.57 at a stress of 80 kPa to 0.86 at nearly twice the applied stress of 150 kPa. With the more rational approach of Nagaraj et al. (1990) that considers the deposits to have pseudo-overconsolidation, the ratio, S_N/S_{NC} increases from a low 0.086 to 0.45 for the two stress levels.

Table 2. Settlement Ratios –Effect of Applied Stress Intensity

GHATKOPAR SITE $\Delta\sigma'$ kPa	Settlement ratios			
	S_{UC}/S_{NC}	S_{TIS}/S_{NC}	S_N/S_{NC}	S_N/S_{UC}
80	0.53	0.57	0.08	0.086
100	0.62	0.66	0.14	0.15
120	0.73	0.77	0.27	0.28
150	0.82	0.86	0.43	0.45

Conclusions

Causes for the development of overconsolidation of deposits in the Indian subcontinent are identified and listed. Contrary to popular belief, overconsolidation of these deposits is not due to unloading. Based on select data from three sites in India and one from Egypt, the variation of Pseudo-OCR with depth is estimated and presented. Settlements of a typical 10.0 m thick deposit with the above pseudo-OCR profiles were then estimated for a uniform stress increment of 80 kPa. Treating

the deposits as normally consolidated (current practice in India) leads to an overestimation of settlements by 50% to 90%, and 100% to 500% for estimation by Schmertmann (1955) and Nagaraj et al. (1990) methods respectively. ***There is an urgent need to adopt the proposed rational concepts and approaches to avoid costly alternatives being practiced because of overly conservative method.***

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SUMMARY OF Ph.D THESES

Title of Thesis:

A Study on Use of Phosphogypsum Neutralized by Lime Mixed Selected Alkali Industrial By-Products and Geosynthetic Clay Liner in Composite Base Lining System of Phosphogypsum Ponds



Name of the Student: Dr. K. Tulasi

Supervisor: Prof. C.N.V. Satyanarayana Reddy

Department & Institute: Department of Civil Engineering, College of Engineering, Andhra University, Visakhapatnam

SUMMARY: The research addressed the challenges of phosphogypsum disposal management, offering potential solutions to mitigate environmental risks and promote sustainable practices. The study also investigated subsoil contamination from phosphogypsum open dumping. CPCB recommends a composite base lining system comprising neutralised phosphogypsum in upper part and compacted clay layer in lower part. However, no stringent specifications for neutralisation of phosphogypsum layer are given. Hence, the research work explored the scope for using alkali industrial by-products such as fly ash, pond ash and red mud to reduce lime dependency in formation of upper part of base lining system. Additionally, the suitability of geosynthetic clay liners (GCL) for use as an alternative to conventional compacted clay liner is assessed for adoptability in areas where suitable clay is unavailable.

Title of Thesis:

Vibration control of Wind Turbine Towers: Analytical studies and reduced scaled experiments



Name of the Student: Dr. Somya Ranjan Patro

Supervisor: Prof. G.V. Ramana and Prof. Arnab Banerjee

Department & Institute: Department of Civil Engineering, Indian Institute of Technology Delhi

SUMMARY: Offshore wind turbines (OWTs) offer advantages like higher wind speeds and reduced land use but face significant environmental challenges, necessitating vibration control. This study develops a comprehensive analytical model of monopile-supported offshore wind turbines (MSWTs) using Euler-Bernoulli beam theory, fluid-soil-structure interaction, and spectral element methods. Novel omnidirectional TMDs and dynamic vibration absorbers (DVAs) are proposed for effective vibration control and are optimized using the H2 optimization technique when subjected to wind and wave loads. The study also explores the effects of foundation conicity, flexibility, and the strategic placement of TMDs on vibration attenuation.

Title of Thesis:

Performance of Black Cotton Soil Reinforced with Banana Fibers



Name of Student: Dr. Lalita B. Patil

Supervisor: (Prof.) Dr. Sunil S. Pusadkar

Department & Institute: Department of Civil Engineering, Governemnt College of Engineering, Jalgaon. Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon

SUMMARY: The research evaluates use of banana fibers for improving the geotechnical properties of expansive soil. The different laboratory tests such as standard Proctor test, unconfined compression strength test, CBR test, direct shear test and UU Tri-axial test were carried out on soil and soil mixed with banana fiber in different proportions. The banana fibers of 10 mm, 20 mm and 30 mm in length with 0.5 %, 1.0 %, 1.5 % and 2.0 % of the weight of soil were used during the tests. Also the banana fibers were treated with epoxy and their performance was evaluated. The model plate load tests on banana fiber mats (bidirectional and one direction banana mat) were conducted to assess the load carrying capacity. The geotechnical engineering properties of banana fiber reinforced black cotton soil were improved in terms of strength, CBR and load bearing capacity.

Title of Thesis:**Experimental, Numerical and Probabilistic Analysis of Reinforced Anchors for Transmission Tower Foundations**

Name of Student: Dr. Sougata Mukherjee
Supervisor: Prof. G.L. Sivakumar Babu

Department & Institute: Department of Civil Engineering, IISc Bengaluru

SUMMARY: The thesis investigated the use of reinforced anchors to resist pullout and lateral forces exerted on foundations, through a combination of experimental, numerical and probabilistic approaches. Laboratory experiments were carried out on geogrid reinforced inclined anchors to study the influence of soil reinforcement and other design factors on the pullout capacity of the foundation. In addition, advanced three-dimensional numerical modelling was carried out to numerically analyse the influence of several design factors on the vertical and lateral load-carrying capacity of foundations. Finally, probabilistic analysis was done to investigate the influence of soil and load variability on the foundation's performance under static and seismic conditions considering the random variable and random field approaches. The application of reinforced anchors was demonstrated using practical design examples of transmission tower foundations. The use of geogrid reinforcement on top of the foundation was found to improve the foundation's uplift and lateral load carrying capacity significantly, which reduced the cost of foundation though the reduction in required width and/or depth of the footing. The soil and load variabilities negatively impacted the foundations performance by reducing the load carrying capacity and increasing the foundations displacements.

Title of Thesis:**Investigation on Cyclic Performance of Sand Treated With Microbially Induced Calcite Precipitation Technique**

Name of Student: Dr. Nilanjana Banik
Supervisor: Dr. Rajib Sarkar

Department & Institute: Department of Civil Engineering, IIT(ISM) Dhanbad

SUMMARY: Microbially induced calcite precipitation (MICP) technique of bio-cementation has been evolved as a sustainable methodology for improvement of the engineering behaviour of sandy soils. In this study, two bacterial strains (*Sporosarcina pasteurii*, *Bacillus subtilis*) were used for MICP treatment of poorly graded standard Ennore sand of India. Dominant failure mechanisms of the treated samples were identified through unconfined compression strength (UCS) tests. Further, low-strain shear modulus values were obtained from bender element testing. Effects of bacterial strains on the improvement of monotonic behaviour were reported. Cyclic characteristics of the treated sand were examined through strain-controlled unconsolidated undrained (UU) and consolidated undrained (CU) triaxial testing. Effects of wetting-drying cycles on the cyclic behaviour were also investigated for various treatment parameters.

Title of Thesis:**Experimental Study to Evaluate the Behaviour of Ordinary and Encased Stone Column – Treated Marginal Soil**

Name of Student: Dr. Sabreena Mohammad
Supervisor: Prof. B.A. Mir

Department & Institute: Department of Civil Engineering, (Geotechnical Engineering)
National Institute of Technology Srinagar

SUMMARY: The lateral shear resistance of soft soil reinforced by columnar inclusions was evaluated by performing large-scale direct shear tests in a laboratory. The impact of critical factors like column infill characteristics/morphology and the group action of columns on lateral shear response was investigated. Furthermore, the impact of encasing columns in geosynthetic sleeves on lateral shear response was one of the main objectives of this study. The study also provides insight into the types of failures seen in ordinary granular columns and encased granular columns.

The test results obtained from this experimental study are presented in terms of the increase in the overall shear resistance of the soil-column matrix and the increase in the shear strength parameters. To simplify the prediction of the shear strength of soil-column composites and to highlight the key variables affecting the same, multiple linear regression (MLR) was explored. The prediction model was developed based on the results of the experiments.

Title of Thesis:**Real Time Monitoring on Precipitation and Infiltration Triggered Landslide in Meghalaya****Name of Student:** Dr. J. Sharailin Gidon**Supervisor:** Dr. Smrutirekha Sahoo**Department & Institute:** Department of Civil Engineering, National Institute of Technology, Meghalaya

SUMMARY: A real-time landslide monitoring system is set up in Meghalaya, India, employing a variety of sensors (rain gauges, piezometers, irrometers, and inclinometers) to investigate slope behavior during rainfall. Future slope failure forecasts are aided by the identification of probable slip surfaces by finite element analysis, which also illustrates the effects of rainfall on slope displacement and matric suction. The application of deep learning models suggests that a bi-directional LSTM model outperforms conventional RNN and GRU models for predicting groundwater levels, matric suction, and slope displacement. The study highlights how important environmental elements like groundwater levels and matric suction are, as well as how crucial real-time data is for precise landslide forecasts.

Title of Thesis:**Influence of Presence of Defective Pile on Lateral Load Capacity of Pile and Pile Groups****Name of Student:** Dr. S. Hariswaran**Supervisor:** Dr. K. Premalatha**Department & Institute:** Department of Civil Engineering, College of Engineering (CEG Campus), Guindy, Anna University, Chennai, Tamil Nadu

SUMMARY: This research explores the behaviour of single and group piles with a necking defect subjected to lateral loading in sandy soil. Experiments were performed using a model pile with various configurations of the defect within a testing tank. The influence of the necking defect was evaluated by altering its characteristics, along with those of the pile and the surrounding soil. Additionally, the study was extended to examine structural forces in the piles through numerical analysis using PLAXIS 3D software. Findings indicate that the presence of a necking defect can reduce pile capacity by as much as 49%, depending on the defect's characteristics.

Title of Thesis:**Field Investigation of Earth Pressure Reduction on Retaining Wall Using Geofoam as an Inclusion Material****Name of Student:** Dr. Dinesh Bishnoi**Supervisor:** Prof. Satyanarayana M. Dasaka**Department & Institute:** Department of Civil Engineering, Indian Institute of Technology Bombay

SUMMARY: Field and numerical tests on a cantilever retaining wall are carried out to understand the performance of geofoam-wall system under static loading. The field tests are performed with EPS15_500 (geofoam of 15 kg/m³ density and 500 mm thickness), EPS15_1000, EPS20_500, and results are compared with control case without inclusion. Compared to control case, a maximum reduction of 30.82 % in lateral thrust and 34 % wall deflection reduction is observed using EPS15_1000 inclusion. Due to compaction, the maximum compressive strains measured are greater than the recommended design strain (i.e., 1 %) irrespective of geofoam density and thickness. The major reduction due to geofoam inclusion occurs at the bottom 1/3rd portion of the wall. The EPS thickness is the governing parameter for lateral earth pressure reduction.

Title of Thesis:**Modelling of Resilient Rubble Mound Breakwater against Tsunami****Name of Student:** Dr. Manu K Sajan**Supervisor:** Dr. Babloo Chaudhary**Department & Institute:** Department of Civil Engineering, National Institute of Technology Karnataka

SUMMARY: Rubble mound (RM) breakwaters often fail during tsunamis, as seen in the 2004 Indian Ocean and 2011 Japan tsunamis, causing coastal devastation. RM breakwaters are generally not designed for tsunami resilience. This study analyzed the failure mechanisms of conventional RM breakwaters and proposed novel reinforcement techniques using gabions, geogrids, sheet piles, and crown walls. Physical model tests, numerical simulations, and analytical studies showed that the reinforced breakwaters reduced settlement by over 90.2%, lateral displacement by over 94.6%, and increased stability by 2.2 times. These techniques offer a promising solution to enhance tsunami resilience, protecting coastal communities.

Title of Thesis:**Laboratory Study on The Effects of Solute Concentrations on Frost Susceptibility of Alccofine-Treated Soil****Name of Student:** Dr. Rufaidah Shah**Supervisor:** Dr. Bashir Ahmed Mir**Department & Institute:** Department of Civil Engineering, National Institute of Technology Srinagar

SUMMARY: In cold regions like Kashmir, frost heave and thaw-weakening cause significant damage to roads. This research examined the impact of solutes (salt) on frost-susceptible soils using a customized laboratory based freeze-thaw test setup. Results showed that higher solute concentrations reduced frost heave, frost penetration depth, and moisture movement, while also increasing the thaw-CBR value. Additionally, soil treated with Alccofine showed enhanced strength and reduced frost susceptibility. The presence of pore water salinity in Alccofine-treated samples further decreased frost heave and frost infiltration, resulting in higher thaw resistance and less microstructural degradation, as observed in scanning electron micrographs.

Title of Thesis:**Experimental Evaluation of Lightweight Expanded Polystyrene (EPS) Beads Based Geomaterials****Name of Student:** Dr. Anupam Yogendra Pande**Supervisor:** Dr. Amit Harihar Padade**Department & Institute:** Visvesvaraya National Institute of Technology Nagpur

SUMMARY: In the present work, the geomaterial is prepared by blending EPS beads with sand, coarser pond ash (CPA) and finer pond ash (FPA) materials. The first category represents the effort to assess the shear strength of geomaterial prepared at minimum water content by simultaneously varying the EPS bead content. The shear strength properties were determined by conducting triaxial tests on the samples prepared to determine cohesion and angle of internal friction. Second category evaluates the strength and density characteristics of geomaterial prepared with OMC. Third category the geomaterial prepared with CPA and FPA material in the form of slurry to evaluated density and strength characteristics with variation in EPS beads, cement and water content.

Title of Thesis:**Attenuation and Fate of Harmful Waste Contaminants using Clay Minerals and Bio-Polymerized Clays for Containment Applications****Name of Student:** Dr. Himanshu Yadav**Supervisor:** Prof. T.V. Bharat & Prof. Sachin Kumar**Department & Institute:** Department of Civil Engineering, IIT Guwahati, Assam

SUMMARY: The research focuses on the containment of various harmful waste including municipal solid waste, biomedical waste, and mining waste. The geosynthetic clay liners (GCLs) based on granular bentonite and polymerized bentonites were studied under the application of thermo-hydro-chemo-mechanical loadings. The kaolin was also accessed for application as a compacted liner system after amending with the biopolymers. Further, the fate and attenuation ability of coronavirus surrogate, Japanese encephalitis virus, and H1N1 influenza viruses with different clay minerals, their mechanisms, the role of granulation, interaction time, solid-to-liquid ratio, and salt environment were understood. Biomedical waste disposal protocols were proposed for the design of an exclusive BMW containment facility. This study is the first step toward the containment of pathogenic waste.

46th IGS ANNUAL LECTURE 2024



The prestigious

46th IGS Annual Lecture 2024

will be delivered by Prof. B.V.S. Viswanadham, Professor, Department of Civil Engineering,
Indian Institute of Technology Bombay, Powai, Mumbai.

The topic of his lecture is

**“Insights into Centrifuge-based Physical Modelling for Understanding the
Performance of Geostructures”**

CONFERENCE REPORTS AND CHAPTER NEWS

IGS Aurangabad Chapter

IGS Aurangabad Chapter in association with Civil Engineering Department organized the expert lectures on 16th August 2024. The following expert gave valuable guidance to the third and final year Students. Dr. N.G. Patil, Director, MIT, was present during the event.

Er. Tiru Kulkarni presented on “Applications of Geosynthetics”. Dr. Sachin Jain shared insights on “Applications of Artificial Intelligence and Machine Learning”. Er. Suman Jain discussed the “Construction of Caissons”, and finally, Er. Ramesh Kulkarni guided the students on “Career



Opportunities in Interdisciplinary Engineering”. The students appreciated the experts for their valuable guidance.

The Committee of three persons, Dr.

A.P. Singh, Er. Ramesh Kulkarni and Dr. Baadiga Ramu, visited the MIT Campus to take the overview of event preparation (IGC 2024) on 13/09/24.

Dr. N.G. Patil (Director, MIT), Dr. M.S. Dixit (Secretary, IGC 2024), Dr. U.B. Kalwane (Chairman, IGS Aurangabad Chapter), Dr. S.S. Jaiswal, Mr. S.N. Pawar and Mr. Y.D. Shermale, were present along with committee members. All members visited Manthan Hall, Rooms for Planery Sessions, Food Area, etc. The members also had a meeting with Hon. Director General Prof. Munish Sharma. The members suggested live streaming the keynote speaker’s session so that those seated at the exhibitor stalls can also listen.



IGS Jabalpur Chapter

A seminar was organized on 57th Engineer’s Day by IGS – TIET Jabalpur Students’ chapter to commemorate the 164th birth anniversary of the great Engineer Dr. Sir M. Visvesvaraya. Special guest of the seminar Er. S.S. Pawar, IGS life member and author of the book “Vigyashilipi Visvesvaraya” said young civil engineers will have to work hard and come forward for nation building. He presented important information on the personality of M. Visvesvaraya and mentioned the great works done by him in nation building. As the keynote speaker, Er Sanjeev Sharma technical zonal head Ultratech Cement Ltd. gave a presentation on the topic “New Building Materials in New Age Constructions” in which he



presented the latest information on modern technology and how modern materials are being used in construction. On this occasion, under the guidance of Prof. R.K. Vishwakarma and Akash Jain, students gave technical presentations. At the beginning of the program, the institution’s Principal and IGS Life

Member Dr. Sudhir Bhatt and Director Administration Dr. B.K. Sahu welcomed the guests with welcome address. Dr. Sanjay Verma, Vice Principal TIET and Honorary Secretary IGS Jabalpur Chapter coordinated the program. Institution Chairman Er. Vijay Gupta, Secretary Mr. Suresh Parchani, Co-

Secretary Er. Sharad Gupta encouraged the students chapter's activities. In the program, other department heads Dr. Shobhit Verma, Prof. Deepa Golani, and Prof. Dheeraj Dave, Dr. Nitin Gaur and faculties including Santosh Chauhan, Apoorva Srivastava, Satyam Tiwari, Deepesh Lodhi, Abhishek Patel, Shivam Tiwari, Er Rajesh Thakur and a large number of IGS TIET students Chapter were present.

A seminar was conducted by IGS-TIET Jabalpur Students' Chapter on the 141st birth anniversary of Dr. Karl Von Terzaghi (Father of Soil Mechanics). The Principal Takshshila and IGS life member Dr. Sudhir Bhatt briefed about the contribution of Terzaghi in the field of geotechnical engineering. He highlighted Terzaghi's recognition and formulation of the effective stress principle and its influence on settlement analysis, strength, permeability and erosion of soils. Dr. I.K. Khanna, Group Director TIET shared his experiences during his Ph.D. from IIT Delhi on pavement design long years ago. Dr Sanjay Verma, appreciated the TIET Student's Chapter works at this occasion.

In another event on republic day 2024 in the presence of IGS Jabalpur chapter's chairman Er. Sanjiv Verma, "Salil" student's planted trees under the "Ek Ped Maa Ke Naam" campaign. Dr. Sanjay



141st Birth Anniversary of Dr. Karl Von Terzaghi

Verma, Prof. Abhishek Patel, Prof. B K Agrawal, Prof. Satyam Tiwari and

students were present and planted trees to save the environment.



IGS Mysuru Chapter

IGS Mysuru Chapter in association with the Department of Civil Engineering at Vidyavardhaka College of Engineering organized a talk by Dr. Sunil Nataraj, a Structural Engineer from Arup, Auckland, New Zealand. The talk,

aimed at 2nd and 3rd year students, focused on career opportunities for civil engineers in New Zealand. Dr. Nataraj also interacted with faculty members, providing insights into opportunities for doctoral and post-doctoral research in New Zealand, fostering an environment for academic and professional growth.

The 5th IGS student chapter of IGS Mysuru Chapter at ATME College of Engineering was officially inaugurated by Dr. S.K. Prasad, Chairman of the IGS Mysuru Chapter. During the inauguration, Dr. Prasad delivered a lecture on "Case Studies in Geotechnical Engineering," offering valuable insights into real-world geotechnical challenges and solutions. The event marked the beginning new learning opportunities for students of ATMECE in the field of geotechnical engineering.

IGS Mysuru Chapter in association with National Accreditation Board for Testing and Calibration Laboratories (NABL) Bangalore and Department of Civil Engineering, VVCE Mysuru organized a one-day workshop on "Awareness on NABL Accreditation and IGS Foundation" on 10th August





2024. The workshop had more than 100 participants, that included faculty members from Civil and Mechanical Engineering, professionals from college managements, testing laboratories, manufacturers, and industries. The workshop featured a session on NABL accreditation led by NABL officials and a lecture on the "Importance of IGS Foundations" delivered by Dr. C.R. Parthasarathy. The event concluded with a panel discussion and a Q&A

session on prospects and objectives of IGS foundation, promoting active engagement and knowledge sharing



among participants. The event was generously funded by IGS main body.

IGS Mysuru Chapter in association with the Department of Civil Engineering at Vidyavardhaka College of Engineering organized a technical talk on "Geotechnical Challenges" which was delivered by Dr. M.R. Madhav, Former Professor at IIT Kanpur and Visiting Professor at IIT Hyderabad, on 13th September 2024. The event was attended by ACCE(I) Chairman, Honorary Secretary and members of ACCE(I) and IGS, students, and academicians from different colleges. Dr. Madhav shared his extensive experience, knowledge, and wisdom, making the session highly beneficial for all participants. The talk provided deep insights into the complexities and solutions in geotechnical engineering, enriching the academic and professional perspectives of the participants.

IGS Tadepalligudem Chapter

IGS Tadepalligudem Chapter organized One-day workshop on "Excel For Engineers" on 3rd August, 2024. Dr. M. Rama Rao, Convener of the workshop addressed the gathering and explained the importance of the workshop on Excel and its relevance in engineering. Civil Engineering department faculty and 80 students along with members of

IGS student chapter, Tadepalligudem participated in this event. Faculty of Department of Civil Engineering, Sasi Institute of Technology & Engineering, Tadepalligudem presented lectures on various topics under the theme "Excel for Engineers".

On August 31, 2024, the Department of Civil Engineering, in collaboration with the IGS Tadepalligudem Chapter,

conducted a one-day workshop titled "Recent Advances in Pavements for Infrastructure Development (RAPID-2024)." The lectures on the most recent developments in Pavements were delivered by three distinguished speakers invited from academia and Industry.

The workshop's Chairman, Dr. M. Rama Rao, spoke to the group and outlined



the workshop's significance. Mrs. R. Sudha Rani, Org. Secretary of the workshop delivered the importance of Pavements and types. Dr. R. Srinivasa Kumar, Professor, Osmania University, Hyderabad delivered the lecture on “Design of Flexible Pavement as per IRC: 37-2018”. He clarified the distinction between flexible and rigid pavements. and also described the load dispersion process. Er. Y. Narasimha Rao, Project Advisor, APRRP (PMC) delivered the lecture on “Design of Flexible and Rigid Pavements for Low Volume Roads including Applications (IRCSP-72 & IRC-SP-62)”. He gave an explanation of upgraded road ways and new pavements. in particular, blacktop and gravel roads. Er. K. Prabhakara Reddy, Project Advisor, APRRP, AIIB, PMC Vijayawada & Retd. Superintending Engineer delivered the lecture on “Full Depth Reclamation (FDR) with Cement and Commercial



Chemical Additive”. He discussed the use of cement stabilization to repair and upgrade damaged roads that already exist. In addition, the pavements failed.

The Department of Civil Engineering, Vishnu Institute of Technology, Bhimavaram (VITB), in collaboration with the Indian Geotechnical Society (IGS), Tadepalligudem Chapter, successfully inaugurated the IGS Student

Chapter with around 61 students on 13th September 2024.

On the occasion of the inauguration of student chapter at VITB, two expert talks were organized. The first talk was delivered by Dr. M. Rama Rao, wherein he delivered an insightful presentation on key case studies in geotechnical engineering practice, offering students real-world examples of geotechnical challenges and their innovative solutions, greatly enhancing their practical understanding. The second talk was delivered by Er. K. Balakrishna Murthy, wherein he gave a comprehensive overview of the Polavaram Dam's construction, emphasizing its critical role in regional water management and flood control. His in-depth discussion highlighted the technical intricacies of the project and its broader significance for infrastructure development.



ISSMGE BULLETIN

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TENTH INDIAN YOUNG GEOTECHNICAL ENGINEERS CONFERENCE (10 IYGECE, 2025)

11 – 12 MARCH 2025



VENUE:
**Indian Institute of Technology
Indore, India**

Invitation

Indian Institute of Technology Indore, in association with the Indian Geotechnical Society, Indore, Ujjain, Jabalpur, and Bhopal Chapter, extends a hearty invitation to Young Geotechnical Engineers under the age of 35 nationwide. We cordially invite you to participate in the 10th Indian Young Geotechnical Engineers' Conference (10IYGECE, 2025), scheduled to take place at the Indian Institute of Technology Indore from March 11th– 12th, 2025. This conference promises to be a significant platform for networking, knowledge exchange, and professional growth. We eagerly anticipate your valuable presence and contributions to this enriching event. Indore,

About IGS Local Chapters



The Indian Geotechnical Society (IGS) is a highly esteemed professional organization dedicated to advancing Geotechnical Engineering in India. The Local Chapters of the Society were introduced in 1968, and fifty-two (52) Local Chapters (Ujjain recently formed) are functional. The Indore Chapter, joined by the Ujjain, Jabalpur, and Bhopal Chapters, along with Andhra University, collaborates to make the 10th IYGECE 2025 a grand success.

About Civil Engineering, IIT Indore

Established in 2016, the Department of Civil Engineering excels in cutting-edge research and real-world problem-solving. It offers B.Tech, M.Tech, and PhD programs while undertaking sponsored projects funded by Indian and global industries. The faculty, with diverse expertise in Geotechnical, Structural, Transportation, Water Resources, and Environmental Engineering, drives innovation through national and international collaborations, aiming to become a global academic leader.

Call for paper themes

Young geotechnical professionals, both from industry and academia, as well as students below the age of 35 as of October 10th, 2024 (age proof required), are invited to submit abstracts not exceeding 250 words for the Tenth Indian Young Geotechnical Engineers Conference (10IYGECE 2025). Abstracts can be submitted for the following themes.

- Ground Improvement Techniques
- Geosynthetics and Applications
- Transportation Geotechnics
- Foundations
- Field Monitoring in Geotechnical Engineering
- Earthquake Geotechnical Engineering and Tunnelling
- Geotechnical Site Investigations
- Case Studies in Geotechnical Engineering
- Instrumentation in Geotechnical Engineering
- Environmental Geotechnics
- Offshore Geotechnics
- AI/ML in Geotechnical Engineering
- Rock Mechanics
- Stability of Embankments, Slopes, Landslides, and Other Mass Movements

Abstracts should be submitted via email to 10iygece2025@gmail.com as per the dates mentioned at <https://10iygece2025.iti.ac.in>. Papers may have joint authorship with senior professionals; however, the first and presenting author must be a young engineer who is one of the authors.

Important Dates

Abstract submission starts	10 th October 2024
Abstract submission deadline	25 th November 2024
Intimation of accepted abstract & registration deadline	30 th November 2024

Full-length paper submission deadline	10 th January 2025
Intimation of paper acceptance	25 th January 2025
Conference dates	11 th and 12 th March 2025

Registration Fee (in INR):

10IYGECE Particulars	IGS Members	Non-IGS Members	Industry
Delegates below 35 Years (Author/Co-Author/Student)	₹ 1500	₹ 2000	₹ 3000
Delegates above 35 years	₹ 2000	₹ 2500	₹ 4000

Sponsorship & Benefits

Each sponsorship tier for the 10th IYGECE 2025 guarantees an exhibition stall, inclusion in mementos advertising, a predefined number of complimentary delegate passes, and a food coupon for one stall attendant. The highest sponsorship level enjoys extra perks like a corporate presentation, prominent logo placement on the main banner, and personalized banners.

Sponsorship

Category	Sponsorship Amount	Free Delegates
Title Sponsor	Contact Conference Chairman	
Platinum	₹ 4,00,000	06
Diamond	₹ 3,00,000	05
Gold	₹ 2,00,000	04
Silver	₹ 80,000	02
Bronze	₹ 60,000	01
IGS Local Chapters	₹ 50,000	01

Exhibition Fees (In INR):

Exhibition Zone (Available area – 8000 sq.ft.)
10 ft × 10 ft size – ₹ 40,000
10 ft × 7 ft size – ₹ 30,000

Conference Organizing Conveners

Dr. Ramu Baadiga, IIT Indore
Prof. Neelima Satyam, IIT Indore
Dr. Raghavendra Singh, UEC Ujjain

Address for communication

GENERAL QUERIES

Dr. Baadiga Ramu, IIT Indore
Chairman, 10th IYGECE 2025
Assistant Professor, Department of Civil Engineering,
Indian Institute of Technology, Indore
Khandwa Road, Simrol, Indore - 453552, India.
Mobile: + 91- 9083688190 (Ph.D. Scholar)
Mobile: + 91- 7675015763 (Dr Ramu Baadiga)
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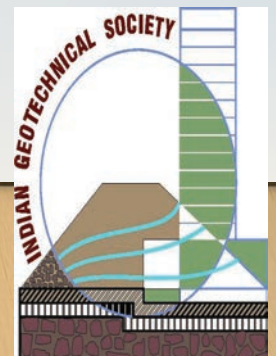


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Note: The licenses are exclusively for Academic Research, and cannot be used for any Consultancy/Commercial Projects as well as Sponsored Research

**For queries, Email: igsheadquarter@gmail.com
Phone Number: +91 9873070020**

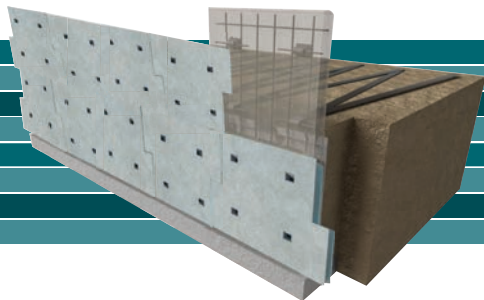




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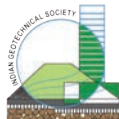
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Organized by
INDIAN GEOTECHNICAL SOCIETY



7th – 10th October, 2025

Venue

Taj Cidade de Goa Horizon, Goa

Website: www.geotechasia.org

Email : info@geotechasia.org

Invitation

It is with great pleasure that we extend a warm invitation to the **1st Geotech Asia International Conference (Geotech Asia)** that will take place in **Goa, from October 7th to 10th, 2025.**

About 1st Geotech Asia 2025 & Asian Regional Conferences

Every four years, the Asian Regional Conferences are held following a bidding and voting process among member nations. The 17th Asian Regional Conference, hosted by the Kazakhstan Geotechnical Society, took place from August 14th to 18th, 2023, at the Hilton Astana Hotel in Nur-Sultan, Kazakhstan. Under the theme "Smart Geotechnics for Smart Societies," the conference drew over 600 attendees, including scientists and experts from 90 countries, notably influential figures from leading construction hubs in Asia such as Japan, South Korea, China, Singapore, Turkey, and India. With 26 countries in the Asian Region and the ARC happening only once every four years, many countries miss out on the chance to host the conference. In light of this, a new series called Geotech Asia, to be held once every four years between the Asian Regional Conferences, was proposed. During the 17th ARC, the idea for Geotech Asia was introduced, and India was chosen to host the inaugural event in 2025 and 18th Asian Regional Conference (18ARC) is scheduled to be held at Thailand in 2027. The Indian Geotechnical Society, which hosted the first Asian Regional Conference in 1960, will also organize the first Geotech Asia Conference. Scheduled for October 7th to 10th, 2025, in Goa, the conference's organizing committee is inviting researchers, academics, and practising engineers to submit papers for presentation. As the first event in the series, India anticipates a significant turnout from member nations and their representatives.

Conference Sub-Themes

- Computational Geotechnics
- Data and Software for Geotechnical Engineering
- Deep Foundations
- Earth Retaining Structures
- Education - Embankments, Dams, and Slopes
- Earthquake Engineering and Soil Dynamics
- Engineering Geology and Site Characterization
- Geoenvironmental Engineering
- Geophysical Engineering

- Geosynthetics
- Geotechnics of Soil Erosion
- Pavements
- Risk Assessment and Management
- Rock Mechanics
- Shallow Foundations

Key Dates

Last date for AsRTC/TC meeting Proposal	30.10.2024
Abstract submission open	01.06.2024
Abstract submission deadline	30.08.2024
Abstract acceptance notification	30.09.2024
Full paper submission deadline	20.02.2025
Full paper acceptance notification	20.04.2025
Final full paper submission	30.06.2025
Geotech Asia Conference	07th - 10th October 2025

Registration Fees For Various Categories

Category	Early Bird (Upto 07.05.2025)	Regular (Upto 23.08.2025)	Onsite
	INR	INR	INR
IGS/ ISSMGE (Members)	40,000	45,000	49,000
Non IGS/ISSMGE Members	42,500	47,500	51,500
Student Participant	21,000	23,000	25,500
Accompanying guests	17,000	20,000	21,000

Address for Correspondence :-

Department of Civil Engineering,
Indian Institute of Technology Bombay,
Powai, Mumbai - 400 076, Maharashtra, India
Website : geotechasia.org
Email : info@geotechasia.org

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IGC - 2024

INDIAN GEOTECHNICAL CONFERENCE



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'GEOTECHNICAL ENGINEERING FOR A SUSTAINABLE TOMORROW' (GEST 2024)



19th - 21st December, 2024 | Website: www.igc2024mit.com

Venue:

MIT Campus, Chhatrapati Sambhajnagar (Aurangabad),
Maharashtra, India

Jointly Organized by :

Indian Geotechnical Society, Aurangabad Chapter

Civil Engineering Department, MIT, Chhatrapati Sambhajnagar,
Aurangabad, Maharashtra

Invitation

Indian Geotechnical Society, Aurangabad Chapter and Civil
Engineering Department, MIT, Chhatrapati Sambhajnagar,
Aurangabad extends you a warm invitation to the IGC-2024 to
be held at MIT Aurangabad.

Conference Themes

The main theme of the conference is 'Geotechnical Engineering
for a Sustainable Tomorrow' (GEST 2024).

Conference Sub-Themes

- Geotechnical and Geophysical Investigation
- Foundations — Shallow & Deep
- Earth Retaining Structures
- Geosynthetics and Reinforced Soil Structures
- Forensic Geotechnical Engineering
- Soil Dynamics and Geotechnical Earthquake Engineering
- Ground Improvement Techniques
- Physical and Numerical Modelling
- Rock Mechanics, Tunnelling and Underground Structures
- Geo-Environmental Engineering
- Slope Stability and Landslides
- Transportation Geotechnics
- Uncertainties, Risk and Reliability in Geotechnical Engineering
- Soil Structure Interaction
- AI/ML Application in Geotechnical Engineering
- Geomaterial Characterization, Site Investigation and Exploration.

Key Dates

Date of Abstract Submission	30.04.2024
Intimation of Abstract Acceptance	15.06.2024
Last date for Full Paper Submission	20.08.2024
Intimation of Paper Acceptance	20.09.2024
Submission of Camera Ready Paper	05.10.2024
Last date for Registration of Accepted Papers	05.10.2024

Sponsorship Details

Category	Sponsorship Amount	Free Delegates	Stall Size	Presenta-tion
Title Sponsor	Contact Conference Secretary		3x3m	15 min
Platinum	Rs. 10,00,000/-	06	3x3m	10 min
Diamond	Rs. 7,00,000/-	05	3x3m	7 min
Gold	Rs. 4,00,000/-	04	3x3m	5 min
Silver	Rs. 2,00,000/-	03	3x3m	3 min
Bronze	Rs. 1,00,000/-	02	3x3m	Nil
Well Wisher	Rs. 25,000/-	1	-	-

Registration Fees For Various Categories

Delegate Category		Up to 31st Oct 2024	After 31st Oct 2024
IGS Member		INR 6500	INR 7000
Non-IGS Member		INR 7000	INR 8000
Foreign Delegates	IGS Member	USD 400	USD 450
	Non IGS Member	USD 450	USD 500
SAARC Country delegates		INR 7500	INR 8500
Senior		INR 2500	INR 3000
Accompanying person		INR 2000	INR 2500
PG Students/ Research Scholars		INR 3000	INR 3500

Address for Correspondence :-

Dr. Manish S. Dixit
Organizing Secretary
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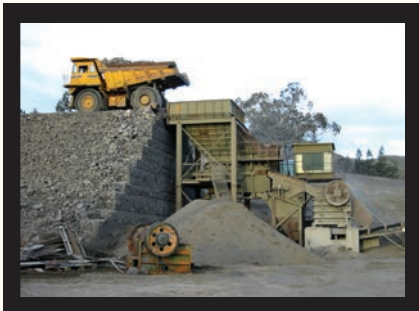
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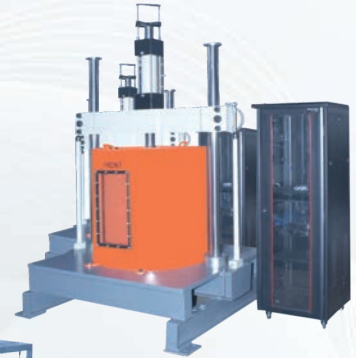
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Dr. K. S. Rao's research spanning over 42 years has been on engineering behavior of rock and rock- masses. stability of slopes, underground structures. foundations, site characterization, numerical modeling and seismic micro zonation of mega cities and its applications to infrastructure development.

Dr. Rao a teacher, researcher and supervised 30 Ph.D and 200 M.Tech theses. He designed and developed polyaxial, largescale direct shear, 3D profilometer, creep equipment, and impact testing equipments and published more than 350 technical papers in national and international journals and conferences.

Dr. Rao provided professional consultancy services for DMRC, NR, KRCL, USBR, IRCON, NTPC, NHPC, GMR, GVK, L&T, Power Grid, Mott Mec, JP, Gati, Energy Infratech, NWDA, Reliance, DLF, Feedback Infra, Repcon, KEC Int, SNC-Lavania, ISGEC, MES, ORA, BRO, DDA, SCCL, WAPCOS, RITES, DKF, NWDA, Stup, Vedanta, CUBE,

NBCC, NKG, Afcons, MES, Pavai, TTD, NHAI, NHIDCL Bharat Vandana, MCD, NMDC, BMRL NCC etc.

His recent geotechnical modelling work for assessing the stability of Chenab bridge abutments has cleared the way for the construction of Jammu-Baramulla Rail Link of National importance. Dr. Rao served as President of both Indian Geotechnical Society and Indian Society for Engineering Geology.

Prof. Rao delivered the 41 IGS Annual Lecture, 8 IGS Terzaghi Oration, 6th Victor De Mello Oration and received prestigious Kueckelman award and "Life time achievement award".

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- **KRCL:** Tunnel Slope Stabilization and Grouting works at USBR Project in Jammu -Kashmir
- **Gawar Construction Limited:** Reinforced Earth Wall at Bhiwani to Hansi
- **M/s. Adani Road Transport Limited (ARTL):** Stability of Six Lining of Azhiyur to Vongalam section of NH-T7 (New NH-66) in Kerala.
- **Girdhari Lal Constructions Pvt Ltd. :** Seepage Underground Water issue at Ayur Vignan Nagar Campus of AIIMS at New Delhi.



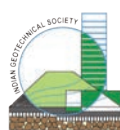
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12TH INTERNATIONAL SYMPOSIUM ON FIELD MONITORING IN GEOMECHANICS (ISFMG 2026)

6th – 10th August, 2026

Supported by

INDIAN GEOTECHNICAL SOCIETY



Venue

Indian Institute of Technology Indore,
Madhya Pradesh

Website: www.isfm2026.com

Email : convener@isfm2026.com
neelima.satyam@iiti.ac.in
neelima.satyam@gmail.com

Invitation

It is with great pleasure that we extend a warm invitation to the 12th International Symposium on Field Monitoring in Geomechanics (ISFMG 2026) that will take place in **Indore**, from **August 6th to 10th, 2026**.

Symposium Theme

The main theme of the symposium is "Advances in Field Monitoring for Geomechanics".

Symposium Sub-Themes

- Tunnels and Underground Spaces
- Bridges and Transport Infrastructure
- Dams and Embankments
- Slopes and Earthworks
- Buildings and Foundations
- Mining and Landfill
- Environmental Monitoring
- The Observational Methods
- Specifications and Standards
- Excavation and Retaining Structure
- Inverse Modelling
- Advanced Design Technology

Key Dates

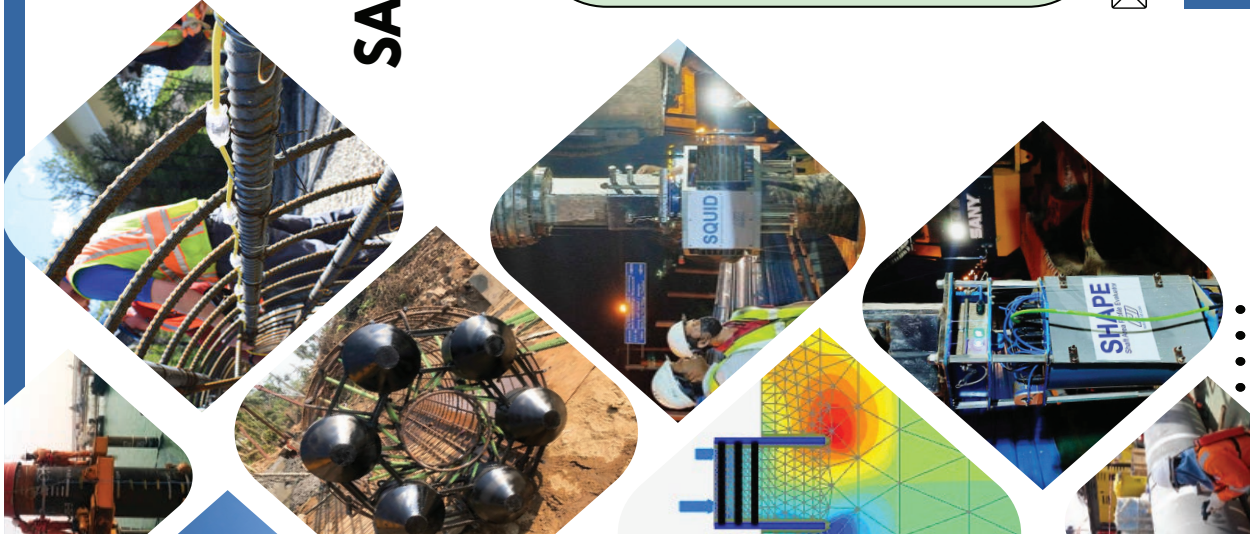
Tentative dates of the Symposium	06 -10 Aug 2026
Paper Submission start	To be Announced later
Abstract submission deadline	To be Announced later
Full paper submission Deadline	To be Announced later
Review Notification	To be Announced later
Camera Ready submission	To be Announced later

Registration Fees

Registration Type	By 24.11.2025	After 24.11.2025	Onsite 24.02.2026
	\$	\$	\$
Standard Registration	600	700	900
Student Registration	300	350	500
SAARC Country Delegates	500	600	800
SAARC Country Students	250	300	400

Address for Correspondence :-

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+91-9440488034 (Mobile)
convener@isfm2026.com
neelima.satyam@iiti.ac.in
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GEOTECHNICAL EVENTS CALENDAR

ABROAD

2024

November 18-20
Sydney, Australia

5th International Conference on Transportation Geotechnics, Ground Improvement and Evolving Technologies for Sustainable Transport Infrastructure.

For Details:

Website : <https://ictg2024-c10000.eorganiser.com.au/>

December 21-23
Bern, Switzerland

3rd International Conference on Civil, Industrial and Mechanical Engineering and Materials.

For Details: Website : <http://cimeme.iapub.org/>

2026

September
Athens, Greece

4th International Symposium on Geotechnical Engineering for the Preservation of Monuments and Historic Sites organized by the Technical Committee 301 of the ISSMGE.

For Details:

Email: secretary@tc301-athens.com

INDIA

2024

December 19-21
MIT, Aurangabad

Indian Geotechnical Conference (IGC-2024) on 'Geotechnical Engineering for a Sustainable Tomorrow (GEST 2024)' organized by Indian Geotechnical Society, Aurangabad Chapter & Civil Engineering Department, MIT, Aurangabad.

For More Details Visit:

Website : www.igc2024mit.com

Address for Correspondence:

Organizing Secretary,

Indian Geotechnical Conference, IGC-2024

Department of Civil Engineering, MIT

Chh. Sambhajinagar (Aurangabad) - 431010

Maharashtra

Email: igc2024aurangabad@gmail.com

2025

March 11-12
IIT Indore, India

10th Indian Young Geotechnical Engineers Conference (10th IYGEC, 2025).

Address for Correspondence:

Dr. Baadiga Ramu, IIT Indore

Chairman, 10th IYGEC 2025

Assistant Professor, Department of Civil Engineering,

Indian Institute of Technology, Indore

Khandwa Road, Simrol, Indore - 453552, India.

Mobile: + 91- 9083688190 (B S Praveen, Doctoral Scholar)

Mobile: +91- 7675015763 (Dr. Ramu)

Email: 10iygrec2025@gmail.com

October 7-10

Taj Cidade de Goa Horizon, Goa

1st Geotech Asia International Conference (Geotech Asia).

Address for Correspondence:

Department of Civil Engineering,

Indian Institute of Technology Bombay,

Powai, Mumbai - 400 076

Maharashtra, India

Website : geotechasia.org

Email : info@geotechasia.org

Organising Chairmen

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Prof. Dasaka S Murthy +91 9869607604

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Er. Sridhar Valluri +91 9967063113

Dr. Sunil S. Basarkar +91 9819799292

Dr. A. P. Singh +91 9899787317

2026

August 6-10

Indore, Madhya Pradesh

12th International Symposium on Field Monitoring in Geomechanics (ISFMG 2026).

Address for Correspondence:

Prof. Neelima Satyam

Symposium Convener

Department of Civil Engineering,

Indian Institute of Technology Indore

+91-9440488034 (Mobile)

convener@isfmng2026.com

neelima.satyam@iiti.ac.in

neelima.satyam@gmail.com

Visit us : www.isfmng2026.com

IGC - 2025

IGC-2025
would be hosted by

IGS-Jalandhar Chapter

The venue, theme, scheduled dates etc.
are being worked out and shall be
announced soon.

Now Online Membership Available

The homepage of the Society has been updated and a
new online membership platform has been
created to facilitate joining of new members.

Just log on to:
www.igs.org.in



IMPORTANT NEWS

The 17th meeting of CED-43 of BIS, 17 codes revised version is in print and a new code on "Combined Piled-Raft Foundation" are in press for printing. Also in 18th meeting of CED-43, IS-2131 revised version gone for final printing. So in recent past, BIS finalized 19 codes under CED-43 Soil and Foundation Engineering Committee.

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MEMBERS' NEWS



**Prof. S.P. Gopal Madabhushi
(LF-0496)**

Prof. S.P. Gopal Madabhushi of Civil Engineering and Head of the Geotechnical and Geo-Environmental Group, University of Cambridge; Director, Schofield Centre for Geotechnical and Construction Modelling. He was elected to the Royal Academy of Engineering Fellowship, the highest honour for an engineer/academic in the U.K.

IGC - 2026

IGC-2026
would be hosted by

IGS-Chennai Chapter

The venue, theme, scheduled dates etc.
are being worked out and shall be
announced soon.

Welcome to New Members

The Executive Committee of IGS extends hearty welcome to the following members who have been admitted to the Society recently/ elevated to Fellowship.

LIFE FELLOWS

RAKESH KUMAR	LF-0670
SAJU S	LF-0671
PRIYANKA GHOSH	LF-0672
VENKATA BHASKAR DAMERA	LF-0673

LIFE MEMBERS

ANUNIL PAUL	LM-5790
SWAPNA THOMAS	LM-5791
RAVISHANKAR SAHU	LM-5792
RIZWAN KHAN	LM-5793
SUNDAR THILLAI VILLALAN	LM-5794
SACHCHIDANAND KUSHWAHA	LM-5795
PRERANA KRISHNARAJ	LM-5796
ROMANA MARIYAM RASHEED	LM-5797
SAKSHI	LM-5798
ARUNSIWA R	LM-5799
ANUPAMA S	LM-5800
MAHESH M S	LM-5801
ANJALI MOHAN	LM-5802
SUDEEPTA PRAN BARUAH	LM-5803
RAGHVENDRA SHRIVASTAVA	LM-5804
AHAMED NOORANI S	LM-5805
SUNDARAM S	LM-5806
PRITAM DHAR	LM-5807
SANDEEP AGGARWAL	LM-5808
VIJILA BALAKRISHNAN	LM-5809
NADIA MUBARAK	LM-5810
SHAIK SUBHAN ALISHA	LM-5811
SUFYAN GHANI	LM-5812
ABHISEKH SAHA	LM-5813
MANOJ KUMAR	LM-5814
AVIJIT SANTRA	LM-5815
LALIT PATIL	LM-5816
MIHIR VORA PRAVINCHANDRA	LM-5817
NEHA RANI	LM-5818
SANTOSH PRABHAKAR PAWAR	LM-5819
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ALEX THOMAS	LM-5823
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DINESH KUMAR JAIN	LM-5828
RAM BABU GUPTA	LM-5829
SIDDHANT DWIVEDI	LM-5830
SUKHCHAIN PRASAD PATEL	LM-5831
MATESHWARI PRASAD	LM-5832
BIDYUT ROY	LM-5833
ANGIRA PINAKIN SHETH	LM-5834
VIKASH SINGH	LM-5835
JUMRIK TAIPODIA	LM-5836
ANIRUDDHA ROY	LM-5837
KANNAN THAKUR	LM-5838

STUDENT MEMBERS

VIKAS MISHRA	SM-0370
SAKSHI ROHILLA	SM-0371
NEKIBUDDIN AHMED	SM-0372
RAJAT THAKUR	SM-0373
ESHWARA PRASAD M	SM-0374
DEEPANKAR DEKA	SM-0375
ATHIRA ANIL	SM-0376
S BALAGOPAL	SM-0377
ABHAY	SM-0378
SAKET KUMAR NIRALA	SM-0379
MD TASNEEM JAWAID	SM-0380
SHAIKESH KUMAR YADAV	SM-0381
NATASHA KAKATI	SM-0382
KARTHIK VINOD	SM-0383
PRAMADHANATHA REDDY POCHA	SM-0384
ABHISHEK KUMAR	SM-0385
SAKSHI ROHILLA	SM-0386

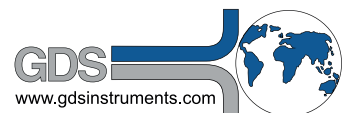
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