ASCE INDIA SECTION

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ASCE's *Civil Engineering* magazine reaches out to more than 144,000 civil engineers across the world

Members are encouraged to contribute features/ articles/ brief technical notes on Indian civil engineering projects to share the experience of challenges, uniqueness, and importance to promote the profession of civil engineering

If you wish to showcase a civil engineering project that you are involved in or know about, you may like to get in touch with Ms. Laurie Shuster, Managing Editor, CE Magazine, at lshuster@asce.org with your feature proposal

1.0 One Day Indo-US Workshop (IDEaS-2012) June 27, 2012, ASCE-IS SR

This workshop, entitled "Strides in Infra-Development on Expansive and Soft Soils", was aimed at addressing the important issues related to infrastructure development on expansive and soft soils.

The proceedings started with a prayer followed by the address of the president of the event Prof. KVL Subramaniam, Head, Department of Civil Engineering, IIT Hyderabad, who introduced the past and future infrastructure developments at IIT Hyderabad and explained how important this workshop was for both academia and practitioners. Later, the Guest of Honor, Shri. C V S Rama Murty, Engineer-in-Chief, Panchayat Raj Engineering Department of Andhra Pradesh, addressed the delegates.

The Chief Guest of the event, Prof. V.Eswaran, Dean-Faculty Affairs and Head, Mechanical Engineering department, IIT Hyderabad, pointed out the importance of the workshop which was attended by both academia and practitioners. He recognized that the subject of the workshop brought many dimensions to the workshop. The inaugural proceedings ended with a vote of thanks by Dr. Sireesh, Organizing Secretary, who thanked all for their accepting the invitation and attending the event.

The Indo-US workshop was well attended by the practitioners, academia, feld engineers, students and young geotechies from different parts of India, USA and Australia who shared their research/field experiences on a single platform.

The first technical session started with Prof. M.R.Madhav, Professor Emeritus/Visiting Professor of IITH and JNT University, Hyderabad chairing the morning session.

Prof. Anand J. Puppala presenting his Lecture

The first speaker Prof. Anand J. Puppala, Distinguished Professor, University of Texas at Arlington, Texas, USA made his presentation on "***Novel Ground Improvement Techniques for Expansive soils***". Prof. Puppala emphasized the importance of using combined Lime-Cement stabilization for promising results in highly expansive soils, with a critical reference to the City of Arlington, Texas roads. The lecture was followed by a small discussion on the questions asked by the participants.

After the tea break, the technical session was reconvened by Prof. Dr. M R Madhav who invited Prof. Krishna R. Reddy, Professor, University of Illinois, Chicago, USA for a lecture titled "***New Approach to Assess Piping Potential in Earth Dams and Levees***".

Prof. Reddy enlightened the topic with his recent work on piping potential in earth dams and levees and suggested a new promising technique to calculate the piping potential for dam safety. This was followed by discussion on a few issues.

Prof. T. G. Sitharam, Professor, Indian Institute of Science, Bangalore presented a lecture titled "***Engineering preparedness for Earthquake Disaster Mitigation – Seismic Microzonation of Urban Centres***". Prof. Sitharam highlighted the growth of India in terms of Infrastructure and he compared the progress of infrastructure development in India with that of China and other fast growing countries. He emphasized the preparedness for earthquake disaster and similar hazards. Later he discussed the effects of local site conditions and the need for seismic microzonation for urban infrastructure development. This lecture was followed by a lunch break.

Prof. Krishna R. Reddy presenting his Lecture

Speaker Prof. A. SriramaRao presenting his Lecture

The proceedings started after lunch with Prof. G. V. Rao, Professor Emeritus and former Head, Department of Civil Engineering, IIT Delhi chairing the session. Prof. Rao invited Prof. A. Srirama Rao, Former Principal, JNTU, Kakinada for his talk on "***Expansive Soils – A veritable challenge***". Prof. Srirama Rao accented the use of granular bed for mitigating the swell-shrink behavior and recommended the use of granular pile anchors for foundation support in expansive soils.

Prof. G V Rao invited Prof. G L Sivakumar Babu of Indian Institute of Science, Bangalore for his presentation. Prof. Babu gave two lectures titled " ***Lime Stabilization in expansive soils*** and ***Use of Soil Nailing For Excavation Stability and Slope Stability Improvement***". Prof. Babu emphasized that the shrinkage of expansive soils was as important as swelling of those soils. He presented field studies and methods that could be adopted for design of soil nailing systems in difficult soil conditions.

After the tea break, Mr. K P Pradeep, Secretary, ASCE-IS-Southern Region chaired the interaction/discussion session and corporate presentations. The sponsors of the event M/s HKR Roadways, M/s Louis Berger India Ltd., M/s Egis India Ltd presented their wide reach in recent infrastructure projects and achievements. Regional President of ASCE-IS-Southern Region, Prof. Babu addressed the gathering especially young students who had come from different parts of India and Prof. Babu advised them to become student members so that they could stay in touch with ASCE-IS.

In the discussion session, all the keynote speakers and chairs of the two technical sessions acted as panel members.

Volunteers and some participants at the Event

The discussion was open to the delegates and members. Many critical issues were deliberated upon. The discussion on 'the gaps in Indian Code Provisions' took a big seat. Field engineers and practitioners, especially Mr. Madhusudhana Rao from M/S Meil expressed his views on lack of promising guidelines in the codes. The session concluded with a recognition amongst field engineers, practitioners and academia that there was a need to form a group on 'Expansive Soils' with Prof. A Sri Rama Rao as the Chairman to develop a design guide based on the academic research and field experience to be followed by practitioners and academia for general engineering and design of infrastructure purposes. The committee will consist of enthusiastic academia and practitioners who are doing active research or dealing with the design of infrastructure on expansive soils. It was also concluded that the committee would put forward the outcome of the group discussions and design guide to the Standard code committees for further action.

Dr R Dayakar Babu, Organizing Secretary of the event, made significant contribution to the workshop in sponsorship, mobilization of the delegates and in organization of the technical program. Dr. Sireesh, Organizing Secretary, concluded the workshop with final words of thanks and he encouraged the students and practitioners to participate in such future events for exchanging ideas and promoting such ideas and interactions.

2.0 Technical Events in July, ASCE-IS SR

2.1 Technical Presentation

Prof. Krishna R. Reddy, F.ASCE, of the University of Illinois in Chicago, USA, gave a presentation on 'Electrochemical Remediation of Polluted Soils and Groundwater' in the Department of Civil Engineering at the Indian Institute of Science, Bangalore.

Prof. Reddy started off stating that it was quite challenging and highly expensive to clean up sites with low permeability and heterogeneous subsurface conditions and/or with recalcitrant contaminants such as heavy metals and hydrophobic organic compounds, using traditional remediation technologies.

In-situ electrochemical remediation held a great promise in such situations; however, a large number of complex dynamic physico-electro-chemical reactions occurring simultaneously required an in-depth understanding of electro-geo-chemistry and then engineering the systems to favor the desired contaminant removal.

The use of electrode conditioning solutions was shown to yield high contaminant removal efficiencies; however, the exorbitant cost and environmental concerns with the fate of injected electrode condition solutions into the subsurface was an impediment to a widespread field implementation of this technology.

In recent years, integration of this technology with other technologies, such as chemical oxidation-reduction, bioremediation, and phytoremediation, was found to result in economic and sustainable remedial option. Organics would be degraded completely in-situ, while metals are recovered and reused for beneficial use. In addition, renewable energy such as solar power can be used for the operation of the system.

It was concluded the electrochemical remediation technology was the most suited option for smaller and deeper source zones with complex subsurface and contaminant conditions, where all other technologies were ineffective and impractical to implement. The need for well-documented field studies was emphasized for wider acceptance and use of this technology.

The presentation was well received by the audience as evidenced from the intriguing question and answer session that followed.

2.2 Invited Lecture on Reliability & Risk Analysis

Dr. Chandra Putcha, professor at California State University, Fullerton (CSUF) in the Department

of Civil and Environmental Engineering with more than 30 years of experience, in his lecture noted that there were a lot of scope of application of the principles of Reliability and Risk Analysis in the field of Civil Engineering.

His talk concentrated on the basic principles of Reliability and Risk Analysis, which he considered inherently that there was certain amount of uncertainty in the design variables. Dr. Putcha discussed these variables could be in the arena of strength or load parameters. This was because there were two types of basic analyses: Deterministic Analysis and Probabilistic Analysis. In deterministic analysis, all the quantities were treated as fixed quantities whereas in Probabilistic Analysis, all quantities were treated as random quantities which were supposed to have certain kind of distributions. Reliability Analysis could be considered as an extension of Probabilistic Analysis. In the reliability Analysis, mathematical limit states were defined for various performance functions which varied from structure to structure. Using these limit state functions, safety indices, followed by Reliability values could be calculated for various limit states. These in turn gave the component reliabilities.

Using the concept of Reliability Block Diagram (RBD), the system Reliability could then be calculated for the structure under consideration. The field of Reliability and Risk analysis was interdisciplinary in nature. After illustrating the basic principles of Reliability and Risk Analysis, Dr. Putcha emphasized that these were applied to simple beams followed by bridges (continuous structures). The principles being general in nature, could be applied to other structures as well - columns, frames, plates. Similarly these principles could also be applied to buildings as well to determine the safety levels against natural and manmade hazards which came under the general area of catastrophic Risk Management. The presentation was well attended and a technical discussion took place. There, graduate students and faculty of Department of Civil Engineering interacted with the speaker and discussed on the topic.