

Telescopic Handler solution from VOLVO

Main Application

Deep digging of trenches, holes, foundations

Configuration of Telescopic Handler

Boom : Standard goose-neck boom

Arm : 3-stage straight extending telescopic arm

Attachment : Clamshell bucket

Cabin : Sliding cabin with bottom window for visibility of working area

Additional CWT : for stability X1 and X3 piping are needed.

Read more on Page 2.



Volume 1, Book 2, July 2015

DFI of INDIA

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Quarterly e-Newsletter from
Deep Foundations Institute of India
www.dfi-india.org

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The cover picture

VOLVO Teledipper

M/s Chennai Metro Railway Ltd (CMRL), has embarked a massive underground/ over-head railway project to service the ever growing population of Chennai. The project is estimated at approximately US\$ 4 bill. Its being executed by leading Indian contractors such M/s L & T Infrastructure Ltd, M/s Gammon (I) Ltd & M/s AFCONS Ltd. Their joint venture partners are M/s SUCG China, M/s Mosmetrostroy Russia & M/s Tunnelstroy of Poland. There are totally 21 underground stations in the network apart from 22 Kms of overhead lines. The project has been progressing at a steady pace overcoming various hurdles & shortly train services for a stretch of approx 12 Kms is to be started. One of the challenging areas is soil excavation at underground stations. Currently this job is carried out either by conventional excavators with extended booms up to a depth of 8 m or by power operated Gantry cranes. In either case the approximate output is about 50 m³ /hr.

M/s Advanced Construction Technologies Ltd (ACT), a leading trading house which has ushered in the latest construction/earth moving equipment, in India, through M/s Volvo, M/s Atlas Copco & M/s Terex embarked on suggesting a faster equipment to excavate the soil from deeper depth up to 33 m. Through M/s Volvo Construction Equipment (I) P. td, they worked closely to bring in Teledipper, which is mounted on a standard excavator with due modifications to the under chassis, boom & hydraulics. The boom carries set of telescopic hydraulic cylinders which stretches out upto a depth of 33 mtrs vertically, at the end of which a crab is fixed. Cameras are provided at the end of the boom to achieve visibility for the operator at the cabin screen. Such Teledippers are extensively used in many metro projects abroad, namely in Russia & Singapore. These teledippers have been a runaway success in these overseas project as it almost doubled the output of extended boom excavators or Gantry cranes.

Trials at M/s Gammon (I) Ltd

The conglomeration of M/s Gammon (I) Ltd & M/s Mosmetrostroy came forward to accept trials from M/s Volvo, for teledipper duly supported by M/s ACT. They also supported the trials guiding M/s Volvo & ACT in safeties & mandatory compliance laid out by CMRL. M/s Volvo deployed EC 290 B TELEDIPPER from end of July 2014. The trials were started on Anna Salai for L I C underground station. Here, pits of 7mtr x 7mts were excavated vertically to a depth of 7 m, namely to the concourse level (minus 8 m), at the bottom are two small excavators of 12 tonne class, were used to excavate soil from either side. Normally 5-6 such pits will be made along the length of the station at an interval of 60 m. The small excavators at the bottom of the pit removed the soil from either side along the length of the station & dumped them at the bottom of this pit. The teledipper was located on one convenient side of the pit at the ground level while the telescopic boom carrying the bucket was lowered vertically to bail out the soil excavated at the concourse level by small excavators. *Courtesy: Mr. Mohan Ramanathan, ACT India, Chennai*

DFI of India is affiliated to Deep Foundations Institue USA through an affiliaton agreement.
DFI of India is registered as non profitable organisation under Sec 25 of company registration act of India.

Towards excellence in Geotechnical Engineering Practice in the Country

Message

Geotechnical engineers have made and continue to make excellent contributions towards successful completion of several major construction projects in the country. This is certainly satisfying. However, based on my own experience, I am of the view that there is scope for substantial improvements in our practices to achieve economy and timely completion.

Globally, for major projects, the broad outline of the practices are as follows:

1. After site selection, before deciding on the detailed geotechnical investigation a desk study is carried out. This study takes into account the site topography, geological report of the site by an expert and information on geotechnical investigations in the vicinity. Also considered are the project layout, the location of important structures and preliminary structural details. This is followed by a preliminary geotechnical investigation by an accredited agency.
2. The Geotechnical Consultant, in consultation with Structural Consultant, decides the scope of detailed geotechnical investigation, which is carried out by an accredited and qualified agency under independent supervision.
3. Detailed investigation report is then submitted by the agency giving the results of field and laboratory tests only. No foundation recommendations form part of the investigation report.
4. The specialist Geotechnical Consultant interprets the results of the investigation and recommends the type of foundation and the foundation design parameters. The foundation design is finalised through interaction between the Geotechnical and the Structural Consultant.
5. The Geotechnical consultant is fully involved during execution, assessing all geotechnical issues including the results of further tests, such as pile load tests.
6. In cases of all important structures, settlements and other observations are made and the foundation performance assessment report is prepared by Geotechnical Consultant.

In contrast, in India, in most cases the scope of the detailed investigation is decided by the Structural Consultant and a bill of quantity for field and laboratory tests are given to the investigation agency. We do not have a process of accreditation both for the Geotechnical agency as well as the Geotechnical Consultant.

7. Most often, the Geotechnical agency does not have (a) Sufficiently trained manpower to carry out field and laboratory tests, (b) Experienced Geotechnical Consultant to interpret field and laboratory test results. Their report gives, in addition to the results of field and laboratory tests, recommendations regarding the type of foundations to be adopted and the foundation design parameters, quite often, without having full structural details.

8. The agency would not know what type of foundation has been finally adopted and how the foundation has performed.

Because of this unsatisfactory situation most of the foundation designs are very conservative and sometimes unsafe with cost and time implications. All of us need to work together to remedy this situation so as to reach global standards. I would like to compliment the India team of DFI for their efforts in this direction. A one day workshop titled "Geotechnical Investigation in India – a way forward" held at IIT Madras on 12th July, 2014 is a welcome step.

Best wishes

Prof. V.S. Raju, (Formerly Director, IIT Delhi; Prof. & Deen, IIT Madras)



Forthcoming events

DFI-India 2015, Deep Foundation Technologies for Infrastructure Development in India 2015, will be held on 28-30 September 2015 at IISc., Bangalore. The conference is being organised by DFI of India in association with, Indian Geotechnical Society Bangalore Chapter and ASCE India Section. The event starts with a one-day workshop on Piled Raft Systems on 28 September 2015 (separate registration required). Conference chair - Prof. G.L. Sivakumar Babu, IISc., Bangalore and Conference organising secretary - Mr. P Raghuvier Rao, IISc. Bangalore. Conference Email: 2015dfi@gmail.com. More details available at www.dfi-india2015.org (More details in page 11)

DFI of India in association with IGS Surathkal chapter and NITK Surathkal is organising a one day national workshop on RECENT DEVELOPMENTS IN GROUND IMPROVEMENT AND PILING. The workshop will be held at Mangalore at NIT SURATHKAL auditorium on 31st July 2015. The speakers are well experienced in the respective fields and workshop will be highly beneficial to the professionals and students.

CONTACT:

Organizing Secretary, Dr. Sunil B.M., Assistant Professor, Department of Civil Engineering, N.I.T.K. Surathkal, Srinivasnagar, Mangalore.
Mob:+919448523664; Email: bmsunil@gmail.com

From the Executive Body



The DFI India conference held at Hyderabad in the year 2011 was the real beginning of DFI activities in India even though a similar event was organized in Mumbai few years back. The Hyderabad conference provided some quality presentations, but the response was poor because of very high delegate fee due to an external event manager holding the event in a five star hotel. It was in this background, the Chennai conference of 2012 was modeled with the participation of an established organization like IGS and also utilizing the facilities available in IIT Madras. One of the major goals of the event was to amalgamate co-operation among the industry and academia and in this aspect the conference was a success. The pre-conference workshop was also well received by the participants. The model established two important aspects, viz, 1) association from an established body like IGS & its local chapters and the reputation of institutions like IITs could very much enhance the acceptance level of the conference and 2) the expenditure could significantly be brought down facilitating a reduced delegate fee & discounted fee for the students. The next two conferences, DFI-India 2013 in IIT Bombay and DFI-India 2014 in IIT Delhi were also successfully modeled in similar way.

Despite the fact that the delegate fee structure was brought down to be on par with similar events in India, comments from some friends in academia suggest that many of us are not really aware of this. I take this opportunity to inform all our friends that the DFI-India conferences and workshops are very much affordable now and more than 50% discount is offered to the students in geotechnical discipline.

Conducting workshops and conferences will be a continuing program by DFI of India so that all the beneficiaries are kept updated on the technological advancements in deep foundation construction. Workshops in the small cities can be conducted with Indian resources, while the workshops in mega cities will require resources from advanced countries. The funds available to DFI of India are not sufficient to support travel and course fees. Our efforts to bring in FHWA courses to such workshop could not so far be materialized because of large expenditure involved.

My appeal to all members of the Indian geotechnical community is to support DFI of India to realize its goal to bring in world standards in the design and construction of foundations in our infrastructure development and other projects. DFI of India is also keen to enroll students interested in deep foundation technologies so as to help DFI of India in formulating its activities. JAI HIND

I.V. Anirudhan, Vice Chair, Deep Foundations Institute of India

Company Profile

Credibility, Capability, Ingenuity and Skill

makes your organization stands out. This space is available for you to showcase the capabilities and skills of your company. This e-newsletter is circulated among more than 3000 readers and is a great opportunity to convey your message. Please contact dfiindiaoffice@gmail.com for more details.



Congratulations to the DFI-India 2014 organising team IIT Delhi and IGS Delhi Chapter

Deep Foundation Technologies for Infrastructure Development in India 2015

Tuesday, September 29, 2015 8:00 AM to
Wednesday, September 30, 2015 6:00 PM

Workshop on Piled Raft Foundation Systems

Monday, September 28, 2015 8:00 AM

Indian Institute of Science
National Science Seminar Complex
J.N. Tata Auditorium
Bengaluru, India 560012, India



Conference chair
Prof. G.L. Sivakumar Babu, IISc., Bangalore
Conference organising secretary
Mr. P Raghuveer Rao, IISc. Bangalore.
Conference Email: 2015dfi@gmail.com.

DFI-India 2015, Bangalore

Register by 21 September 2015 at
www.dfi-india2015.org

What You Can Expect

India is considered to have one of the fastest growing economy in the world, and the government of India is working towards a double digit growth rate. Infrastructure development will be the prime activity for growth over the next few decades, and foundation technologies will contribute immensely to the acceleration of construction. It's imperative for all stakeholders in the foundation industry to meet as often as possible to review these technologies and devise ways and means for their implementation in projects for the benefit of all. The DFI-India 2015 Conference, "Deep Foundation Technologies for Infrastructure Development in India," is a perfect opportunity for collaboration.

About the Event

The event starts with a one-day workshop on Piled Raft Systems followed by a two-day technical program with keynote lectures by invited experts and presentations by authors of accepted abstracts presenting case histories highlighting innovations and execution of the latest drilled piling systems, driven piling systems, ground improvement and deep excavation systems. Panel discussions will allow participants to interact with the experts and authors of presentations.

An Exhibition Area features the latest products and services of equipment, material, instrumentation and testing technology providers as well as contractors and other interested parties. The conference schedule includes dedicated time for attendees to visit the exhibit and network with manufacturers, technology providers and others.

The event will be of interest to contractors, developers, agencies, designers, consultants, educators and representatives from local, state and central government and public and private sector organizations involved in infrastructure projects.

Registration Options

2-day Conference Only

	INR*	USD
DFI, IGS, ASCE India Member	6,500	200
Non-Member	7,000	300
Students	2,500	50

2-day Conference plus Workshop

DFI, IGS, ASCE India Member	8,000	300
Non-Member	8,500	400
Students	3,000	75

Exhibitor/Sponsorship Rates (see Options online under Exhibits/Sponsors)

Registration fees include session attendance, exhibit attendance, poster attendance, refreshments, tea breaks, lunches, banquet dinner and conference bag containing registration materials and handouts.

*INR registration rates apply to individuals and companies residing in India only. USD for all others.

Visit www.dfi-india2015.org for registration and more details

DRIVEN CAST-IN-SITU PILES - A RENEWED AWARENESS

TECHNICAL ARTICLE

An achievement that speaks volumes

Maximum Piles Installed in one day	211 nos.
Maximum Piles installed by a single rig in one day	40 nos.
100 Piles installed in a day	44 times
Maximum piles in a week	1,042 nos.
Maximum piles installed in one month	3,301 nos.
Maximum meterage of installed piles in one month	48,360 m
Total number of piles installed in 179 days	8,821 nos
Place of Event - A crude oil storage facility in a remote port town in West Gujarat. 22 storage tanks supported on 1100 kN capacity driven cast-in-situ piles, 15m long.	



100% indigenous Pneumatic Hammer (5.4MT weight)

There was time when Driven Cast-In-Situ (DCIS) piles of 330mm to 450mm diameter were the very first choice of foundation wherever a good bearing stratum is available within 15.0m to 20.0m depth. DCIS piles have closed bottom seamless MS tube driven into the soil to a desired length and thereafter the reinforcement cage is lowered and concreting is done. After complete concreting, the casing is extracted. This pile offers advantages of speed, economy and quality. The reach of good bearing stratum kept increasing as the constructions moved to unfavorable geotechnical environment and for larger capacities, bored cast-in-situ piles were depended upon. The segmental precast driven piles did not become popular.

DCIS piles are again becoming preferred choice of foundations because of reasons which include rapid construction; absence of splicing, economy, better quality of piles and because they address the safety and housekeeping issues on the site. With the advent of heavier and more efficient hammers (pneumatic and hydraulic), their speed and drivability aspects have seen a quantum leap. These are best suited for a capacity range between 750 to 1400 kN, with lateral dimensions of pile varying from 400 to 600mm. Drivability aspects prevent higher capacities than these.

Most of these piles are top driven, and use Modified Hiley's formula to relate actual driving resistance to the ultimate pile capacity. The working pile Set is used as a most vital field control for such piles. Confirmation of the validity of Set are usually made with the results of Initial static load test on the pile before further proceeding with working piles.

Since all methods of driving improve most subsoils, driven systems produce a rough concrete surface area, they are able to develop higher shaft friction than any other type. Flat bottom steel shoe are used which are stronger, and are rarely damaged even under hard driving conditions and are known to keep the pile tube dry even under high water table.



DCIS Piling Rig

Article continued

Driving of such piles in cohesionless soils causes increasing compaction. With closely spaced piles, increasing compaction of sub-soil can result in refusal several meters above the toes of preceding piles, a matter which requires prior considerations.

Execution of Fast Track Project with Driven Cast-in-Situ Piles – A Case Study

A crude oil storage facility was planned in a remote port town along the coast of Gujarat. The facility comprised 22 tanks supported on DCIS piles of 560 mm diameter. Safe capacity of the pile was 110 tons and the expected length of the piles was 15 metres. A generalized subsoil profile encountered at site comprised soft to medium stiff clay up to 10.0m followed by medium dense sand of about 4.0m thickness immediately followed by highly weathered friable rock.

The scope of the piling included:

RCC driven, cast in situ piles	:	8,821 no.
Reinforcement for piles	:	4,800 T
Conducting initial and routine load tests :		
Vertical load tests	:	37 no.
Lateral load tests	:	36 no.
Pull out load tests	:	14 no.
Conducting low strain integrity tests	:	850 no.

Total time duration available was only 6 months including time for mobilization and initial pile load tests. The working piles could not be started unless a few initial tests were completed leaving just about 4-1/2 months to complete 8,809 piles along with testing. The challenge was indomitable and required a total rethink on all aspects on the part of all partners of the execution team to make it a success.

The owners, the designers and project management consultants and the piling contractor came together and decided that decision making in all respects had to be expedited and accorded top priority

with the target being zero production time loss in the field. As a piling contractor, first two rigs were mobilized immediately and a mobile batching plant within 2 weeks time. The earthwork commenced simultaneously and areas to accommodate rigs were readied sequentially. Daily, weekly and monthly monitoring of targets was resorted to.

A full fledged mechanical team along with full inventory of fast moving spares was maintained at site. Adequate lighting and workforce was made available for ensuring round the clock working. Appreciating the fact that even a decent workshop facility was at least 120 km away, it was decided to maintain even some of the plants on standby.

Just prior to the commencement of this project, R&D team had successfully completed the task of development of a 100% indigenous pneumatic hammer of 5.4 MT Ram weight which could be used with a crawler crane for ease of mobility. This hammer not only could yield 36 to 38 blows per minute as against 15 to 18 blows with the conventional Driven Piling Rigs but also had a big advantage in terms of reducing the transit time in between piles. While the conventional rigs used winch arrangement to pull and slide over wooden logs, the hammer mounted on Crawler cranes could move much faster. This technical advantage proved to be a key factor in achieving higher productivity rates on this project.

After satisfactorily completing the Initial test piles in 25 days, the working piles commenced on the 47th day with the help of 3 rigs. The cycle time for the initial piles ranged from 1.20 to 2.50 hours per pile. The project team studied this aspect and made certain improvements which streamlined the operations further.

Concluding Remarks

The streamlined operations resulted in unprecedented reduction in unit piling time and resulted completion of targeted pilings well ahead of schedule. The entire scope of 8,821 piles, along with associated initial and routing testing was successfully completed in 179 days. Such unprecedented achievement was possible primarily because of the following reasons:

- Total understanding and cooperation between all the parties involved in the execution of the project.
- Requisite permissions and preliminary site developmental activities completed prior to construction phase.
- Advanced technology developed and used successfully for pile driving, thereby cutting down drastically on the cycle time per pile.
- Excellent Project planning and monitoring ensuring minimum loss of productive time.

Article by ITD Cementation India Limited, Mumbai

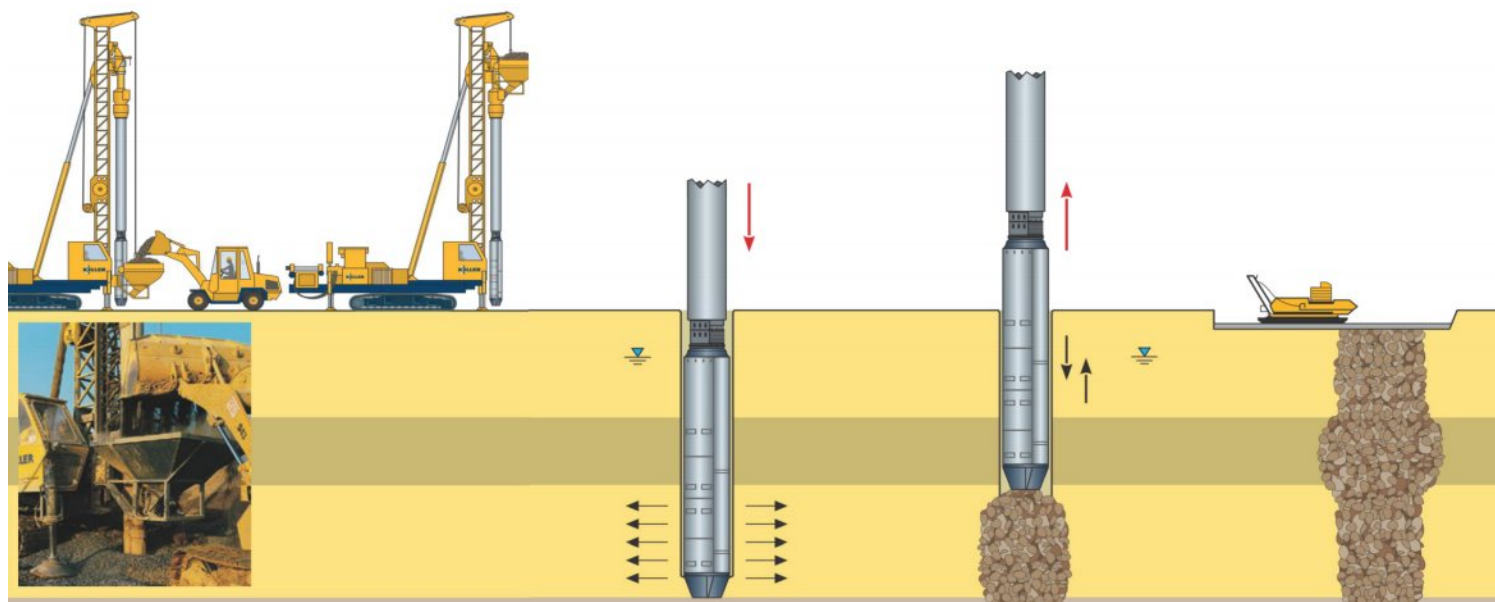
TECHNICAL ARTICLE

Stone columns - Vibro Stone Columns (dry bottom feed method)

Stone columns as reinforcing elements for improving soft clays and other soft clayey deposits is a well-accepted procedure now. New developments now allow us to install the columns without challenging the environmental balance. Dry bottom feed method is one of them.

Ground improvement using reinforcing elements has wide range of practical applications such as foundation for simple residential units to the foundations very large storage tanks. Several projects in India have utilised the capability of stone columns as cost effective alternative foundation solutions.

Here we provide a photo feature describing the step by step field procedure of installation of vibrostone columns using dry bottom feed method. *Courtesy- Keller India*



1 Preparation

The vibrocat positions the vibrator over the required location of the compaction point and stabilizes itself using hydraulic supports. A wheel loader fills the skip with aggregate.

2. Charging

The skip is lifted and empties its contents into the air chamber. Once the air lock is closed, the material flow towards the vibrator tip is assisted by pressurized air.

3 Penetration

The vibrator displaces the soil and is lowered to the design depth, aided by the compressed air and by the vibrocat's pull-down

4 Compaction

After the maximum depth the vibrator is pulled slightly, causing the aggregate to fill the cavity created. During re-penetration the aggregate is compacted and pressed into the surrounding soil

5 Finishing

The stone column is built up in alternating steps up to the design level. During the final leveling, the surface requires to be re-compacted or a blinding layer is required as an alternative

PHOTO FEATURE



Step 3: Penetration of depth vibrator to required level

Step 4: Stone feeding through the skip (parallel operation while penetration of vibrator)



PHOTO FEATURE



Step 5: Building of stone column from bottom to top



Step 6: Fag end of building of stone column (vibrator reached at surface)



Step 7: Installed stone columns

Report on DFI Worldwide Activities

Deep Mixing Conference Wrap-up

Deep Mixing 2015 was a resounding success with over 300 attendees from 23 countries enjoying 2.5 days of technical presentations and discussions on all aspects of deep mixing research technology and application. This conference, held in San Francisco, California, was the sixth in the series of international conferences and workshops on deep mixing and the first held in North America since the inaugural conference in 1996 in Tokyo, Japan. Presentations and sessions during the conference overviewed international practice for laboratory and field studies, analysis and design procedures, successful case histories, quality control and assurance practices, and interpretation and writing of effective specifications.

SEFE 8th Seminar Report

DFI co-sponsored and exhibited at SEFE 8: Seminar on Special Foundations Engineering and Geotechnics and the 2nd Foundations and Geotechnics Industry show with ABEF (Brazilian Contractor Association) and ABMS (Brazilian Chapter of the ISSMGE) on June 23-25, 2015 in Sao Paulo, Brazil.

Over 5,000 reported people visited the tradeshow and 700+ attended the technical sessions. Some of the topics covered in the sessions included the reliability of pile design and testing, the DFI-EFFC carbon calculator and how the tool can and should be used to facilitate choosing less impactful design and construction methods, as well as the current and future trends in deep foundations.

IFCEE 2015 ASCE Geotechnical Special Publication No. 256 - This Geotechnical Special publication CD contains selected papers from the International Foundations Congress and Equipment Expo (IFCEE15) held in San Antonio, Texas on March 17-21, 2015.

Design Guide for Pile Caps This design guide has been developed along with the Concrete Reinforcing Steel Institute (CRSI) to provide the practicing engineer with a detailed overview of pile cap design, detailing and analysis methodologies that represent the current state of practice in the industry.

Many publications are also available from OneMine.org, a web-based document library containing over 100,000 articles, technical papers and books from organizations all over the world. DFI Members can access OneMine at no additional cost, while non-members can purchase and download documents for \$25 per download.



Member News

Prof. S. R. Gandhi and Mr. Balu E. George, IIT Madras, India, attended Super Pile 2015 held at Kissimmee, Florida during May 6-8, 2015. About 250 members comprising of piling equipment manufacturers, designers, academicians and Government officials attended the program. Over 50 companies exhibited their products and services. The event started on 6th May 2015 evening with the committee meetings on Driven Pile, Marine Foundations, Micropiles (Task Force) & ACIP/DD Piles and on Drilled Shafts, Testing and Evaluation, Electric Power Working Group & Seismic and Lateral Loads. The main conference held during the next two days had 30 technical presentation made in several technical sessions in two parallel sessions. Prof. Gandhi and Mr. Balu George presented their paper 'Application of Helical Blade in Displacement Bored Pile'. Bored cast in-situ piles are widely used to support structures on weak deposits. One of the major difficulties faced in this type of pile is weakening of the natural strata by constant presence of bentonite slurry at the interface of the pile and the surrounding soil. Field performance of displacement piles have proved much better performance compared to non-displacement type bored cast-in-situ piles. Use of a helical blade for installation of a displacement casing for cast-in-situ pile construction was discussed in the paper. These piles may be termed as 'Displacement Bored pile', which does not require bentonite slurry as well as tremie pipe for concreting, and is expected to give much higher capacity.



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L&T ECC

Corporate Individual members

Susmit Vora, L&T Construction, Gujarat

Vandana Padmanabhan, L&T Construction, Gujarat

Jayachandran Srinivasan, L&T Constuction, Gujarat

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Affiliate Member

Geo-Ground Engg Operations India Pvt Ltd

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Akshay Kumar Sahoo, Odhisha Engineering Services

J C, Gogoi Geotechnical Consultant, Assam

A. Boominathan, IIT Madras, Chennai

Sundara Badam, Sundar Associates, Kakinada, Andhrapradesh

G. Srinivasa Rao, Saipem India Projects Private Limited

Maruthi Nandhitha Shinde, Saipem India Projects Private Limited

Individual Members (new)

Palash Hazarikha, Assam Engineering College

REPORT ON SIXTH INTERNATIONAL GEOTECHNICAL SYMPOSIUM (6IGS CHENNAI 2015) ON DISASTER MITIGATION IN SPECIAL GEOENVIRONMENTAL CONDITIONS -

By Prof. A. Boominathan, IIT Madras, Chennai, Chair of the symposium

The Sixth International Geotechnical Symposium (6IGS Chennai 2015) on Disaster Mitigation in Special Geoenvironmental Conditions was successfully held at Chennai, India, from January 21 to 23, 2015. The three day symposium was organized by Indian Institute of Technology (IIT) Madras, Indian Geotechnical Society (IGS), Chennai Chapter and [Deep Foundations Institute of India](#), with the support of Asian Technical Committee on Geotechnical Engineering for Natural Hazards (ATC-3) of ISSMGE. Kochi and Bangalore chapters of the Indian Geotechnical Society were the co-organizers of the symposium. A total of 55 International delegates, and 160 National delegates participated in this symposium.

The three-day symposium provided tremendous opportunity to the delegates from both academia and industry to exchange knowledge and experience on the recent advances and techniques in instrumentation, monitoring and various other researches focused on the geotechnical problems related to natural hazards.

Prof. A. Sridharan, Former Deputy Director, IISc Bangalore, with his scholarly inaugural address opened the symposium. Prof. Ikuo Towhata, Vice President ISSMGE (Asia), Prof. A. Sriramarao, President IGS New Delhi, Prof. Askar Zhussupbekov, Immediate past Vice-President ISSMGE (Asia), Prof. K. Ramamurthy, Dean, IIT Madras, Prof. A. Meher Prasad, Head, Department of Civil Engineering, IIT Madras, and Dr. K.S. Ramakrishna, Chairman, DFI India, Chennai, graced the inaugural function. Prof. A. Boominathan, Prof. R.G. Robinson, and Dr. Subhadeep Banerjee, from IIT Madras, highlighted various aspects of the symposium.

The symposium offered ten keynote lectures and six invited theme lectures apart from more than seventy contributory presentations from different countries. In addition to the regular sessions, three special sessions were also organized in the conference.



A cultural programme showcasing the classical, semi-classical and folk dance forms of India followed by a welcome dinner were organized during the evening of day one. A heritage tour on 24 January 2015 added flavor to the symposium that was otherwise rich by its technical presentations. The tour covered the heritage site Mahabalipuram, a temple town situated along the shores of the Bay of Bengal and a visual treat of south Indian culture at Dakshin Chitra.

The proceedings of 6IGS Chennai contain 106 technical papers from 14 countries namely, Australia, Germany, India, Japan, Kazakhstan, Korea, Malaysia, Poland, Portugal, Russia, Taiwan, Turkey, Ukraine, and United States.



REPORT ON ONE DAY NATIONAL WORKSHOP ON PILE FOUNDATIONS – ADVANCES IN DESIGN AND CONSTRUCTION PRACTICES HELD AT BHUBANESWAR, ODISHA, INDIA ON 25TH April 2015- Prepared by Dr. Sunil Basarkar, ITDC, Excom Member, DFI of India

DFI of India in association with the Indian Geotechnical Society (Bhubaneswar Chapter) organized One Day National Workshop on Pile Foundations – Advances in Design and Construction Practices at The Institution of Engineers (Odisha State Centre), Bhubaneswar on 25th April 2015 – an event intended to create awareness in the deep foundations and retaining techniques in the eastern part of India. This objective was realized by inviting experts in the field to deliver presentations.

Following topics were covered:

- Pile Foundations – Design and Analyses for Various Types (Presented by I.V. Anirudhan, Geotechnical Consultant, Chennai)
- Bored Piles – Execution and Construction Practices. Scope of New Technologies (Presented by J. Jeyson Samuel, L&T GeoStructure, Chennai)
- Driven Piles – Construction Practices in India and Potentials (Presented by Dr. Ramakrishna, Director, DFI of India)
- Sheet Piles – Novel Applications and Case Studies across the Globe (Presented by Boris Even, M/s Arcelor Mittal Distribution Solutions, Luxembourg)
- Deep Excavation Support Systems in Urban Areas - Theory, applications and case studies (Presented by A. Manickavel, M/s EMBYE Consortium Pvt. Ltd., Chennai)
- Quality Control and Assurance in Pile Foundations (Presented by Ravikiran Vaidya, M/s Geo Dynamics, Vadodara)

The Last session was devoted to a panel discussion wherein the participants had interactions with the experts and many of the technical issues and site concerns were discussed.

This workshop evoked an overwhelming response with 120 participants coming from Government departments of Odisha state; private consultants and service providers; Equipment suppliers; academicians and about 15 students. The participants hailed from Kolkata, Raipur, cities of Odisha, Vijayawada and Visakhapatnam covering a radius of about 600kms. This workshop had very inspiring standards and was curtain raiser for the existing and novel practices in piling and deep excavation support systems. Each of the speakers had in store various cases of Indian and global practices, untapped technologies with various case studies.

The workshop venue was intentionally selected in the eastern part of India, where there is a wide deficit in available piling equipment and their use. Awareness is low, in this part of India, on the potential use of deep foundation, available and modern technologies; and hence this workshop has been effective in initiating this objective. The participants were also exposed to the potential deep foundations and retaining systems applications, and hence they will very likely be part of such events if they are held anywhere within India. The enthusiasm was very vivid, and there were suggestions for variety of topics on deep foundations to fill the knowledge gap in the future.

Special thanks to IGS Bhubaneswar Chapter, for teaming up with DFI and conducting this event. Grateful acknowledgements for the support of Gold Sponsor (M/s Geo Ground Engineering Operations, Delhi), Silver Sponsor (M/s HBL Power Systems, Hyderabad) and Special Sponsor (M/s ArcelorMittal Distribution Solutions) and all Advertisers for this prestigious event. Thanks to The Institution of Engineers (Odisha State Centre) for the venue and various facilities conducive for such events. Sincere thanks to all our Participants, Supporters for taking the event to a high level of success.



WHAT CAN DFI DO FOR YOU?

Overview

DFI is an international association of contractors, engineers, suppliers, academics and owners in the deep foundations industry. For more than 30 years, we have brought together professionals for networking, education, communication and collaboration. As a member, you help create a consensus voice and a common vision for continual advancement in the planning, design and construction of deep foundations and excavations.

Find Common Ground. Become a Member of DFI

Network with thousands of members and industry professionals worldwide
Get involved locally through DFI's active presence in Europe, India and the Middle East

Strengthen your knowledge base and obtain practical information at seminars, short courses, workshops and conferences

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Stay informed through the flagship Deep Foundations magazine and the peer-reviewed DFI Journal

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DFI WORLDWIDE - UPCOMING EVENTS

Register for DFI's 40th Annual Conference on Deep Foundations

DFI's 40th Annual Conference on Deep Foundations, taking place in Oakland, California from October 12-15, is the landmark event for industry professionals from across the globe to gather and share experiences, exchange ideas and learn the current state-of-the-practice from various disciplines. This year, Professor Kenji Ishihara, a world-renowned expert on earthquake geotechnology, will deliver a featured presentation titled, "Destruction of Seawalls and Coastal Dikes by Tsunami During the 2011 East-Japan Earthquake and their Restoration." To find out more or to register, please visit www.deepfoundations2015.org.

Save-the-Date

DFI Europe is currently planning the next international conference in partnership with EFFC in Rome, Italy sometime in the spring/summer of 2018. This event follows the successful 2014 Stockholm, Sweden conference and others in Europe since 1987. Be sure to keep an eye out for additional details on www.dfi.org.

DFI Publications

Latest DFI Journal – Now Available

The most recent issue of the DFI Journal — Vol. 9, No. 1 — covers an interesting spectrum of geotechnical load tests, design recommendations, a state-of-the-practice survey and the evaluation of a bio-cement ground improvement technique. The following papers are included:

Load tests on drilled shaft foundations in moderately strong to strong limestone | M. L. Race, R.A. Coffman

Static tests on instrumented piles affected by residual load | B.H. Fellenius

Industry survey of state of practice for helical piles and tiebacks | S.P. Clemence, A.J. Lutengger

New device for measuring drilled shaft bottom sediment thickness | J.Z. Ding, K.A. McIntosh, R. M. Simon

Performance of biocemented Sydney sand using ex situ mixing technique | Y. Duraisamy, D. W. Airey

The DFI Journal is available online to all DFI members, at no cost, through your MyDFI account at www.dfi.org. Members and nonmembers can order printed copies of the 2007-2013 volumes of the Journal from the publications page of www.dfi.org members at preferential rates. Subscriptions are available at www.moneyonline.com/pricing/dfi.

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