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Quarterly e-Newsletter from  
Deep Foundations Institute of India  
[www.dfi-india.org](http://www.dfi-india.org)

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## IMPLEMENTATION OF CFA PILE TECHNOLOGY INITIATIVE BY DFII - PROGRESS UPDATE

### The Cover Picture

Consequent to the article we published in DFII newsletter issue for the April – June'19 quarter highlighting the developments of CFA pile project since the commencement of this initiative during Oct'18, we are pleased to share with the readers that

1. Necessary arrangements to move piling rig, concrete pump, other required materials have been made commencing from May First week.
2. Commencing from 22nd May onwards, around 30 representatives from more than 10 organizations started reaching the NPCIL site to assemble the piling rig, concrete pump, and to make required arrangements including concreting supply and pumping arrangements, reinforcement cage fabrication ready and to complete test pile installation..
3. We are happy to share that; we could complete 2 pre-trial and 6 test pile installation commencing from 28th May to complete by 30th May'19.
4. We could complete 11 m length pile installation in less than 15 minutes including auguring, concreting and reinforcement cage installation.
5. Expanding this technology to major infrastructure projects in a couple of years down the line will provide phenomenal value addition to the construction industry in terms of achieving enhanced performance corresponding to safety/quality/cost/time parameters in handling foundation scope of major projects.
6. Dr. K S Ramakrishna, Mr. B S Sarma, Dr. Sunil Basarkar, Mr Ravikiran Vaidya were some of the senior professionals from industry were available for about 5 days fully to supervise the program.



**Mr. G Venkata Prasad**  
- Director of Operations  
DFI of India

**Contd.**

As engineers, we are going to be in a position to change the world - not just study it.  
*Henry Petroski*

We also had more representation from NPCIL, PGCIL, DFII, L&T, ITDECem, Soilmec, AECOM, Bauer, Radise(US), Ultratech Cement, Schwing Stetter, Keller, IIT Delhi to participate and witness the program . 2 experts of Soilmec, Italy has been flown from there exclusively for this project and one expert from the US for handling instrumentation scope was available during installation.

7. We are grateful to the following organizations and their leadership for this timely financial support for CFA test pile project.

CFA Test Pile Project - Support from the Industry	
In-Kind Contribution	Details
ITD Cementation India, Mumbai	Resources, Supervision, Site Infrastructure for Concrete, Reinforcement, and Pile Testing Works
Soilmec India, Mumabi	Providing CFA Kit, Assembling CFA Kit including operators form Italy and India and Test Pile Installation
Ultratech Cement	Supply of Cement
Schwing Stetter	Supply and Operation of Concrete Pump
Smart Structure (Radise Group) US	Instrumentation for two piles
PDI, US / Geo Dynamics Vadodara	Thermal Integrity Profiling of two piles
BASF Chemicals, Mumbai	Supply of Admixture
Asahi Ropes, Delhi	Supply of Wire ropes
Balaji Enterprises, Chennai	Supply of Cover blocks

Table Contd.

DFI of India initiated various technical committees for the development of Indian Geotechnical Industry.  
Be a volunteer and help to make Indian Foundation Industry Strong.

Financial Donations	Amount in Rs. L
DFI Grant (30000 USD)	20
LnT Chennai	10
Tata Projects, Saritha Infra & Geo-Structures	10
Keller India, Chennai	5
IRB Infra, Mumbai	4
Afcons, Mumbai	2.5
Manjeera Constructions, Hyderabad	1
SKCL Developers, Chennai	1
Advance Construction Technologies, Chennai	1
Dr. K S Ramakrishna, DFI of India	1
Smart Structures (Radise Group) US	0.6
Mr. G Venkata Prasad, DFI of India	0.3
<b>Financial Donation Total</b>	<b>56.4</b>

The success of this trial project goes to the whole Indian construction industry including DFI and DFII teams who coordinated this whole project.

### ***Way Forward***

DFII team will put required efforts to complete the testing of this trial piles and this will be followed up by preparation of design manual/guidelines for CFA pile implementation for the deployment of this technology across India in all infrastructure projects.

### ***More Initiatives from DFII***

We feel pride that we had many review meetings among DFII CFA committee members and also with DFI US team on CFA pile initiative

beyond what is mentioned in this note in the last one and half year and we are sure these efforts will bear desirable results in short and long terms.

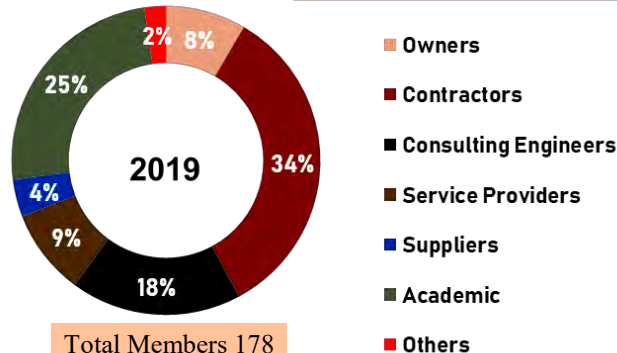
We are happy to share that DFII presently working on few more interesting initiatives that will benefit the Indian construction industry in the long run and we will provide coverage on the same from time to time.

**DFI Mission**

Through above initiatives, DFI team is endeavouring to achieve the mission of “bringing together multi- disciplined individuals and organizations to find common ground and create a shared vision and a consensus voice for continual advancement in the deep foundations industry”.

Be part of DFI I's Mission for developing Indian Foundation Industry together. Join DFI Membership at

<http://www.dfi.org/membership.asp>

**DFI of INDIA Members**

Total Members 178

Deep Foundations Institute of India is regularly conducting workshops, symposiums and conferences in association with other organizations with similar interests





CFA trial Pile installation photos at NPCIL Site, Hisar, Haryana during various stages of installation

DFI members have access to 110,000 technical documents pertaining to deep foundations, mining and minerals at [www.onemine.org](http://www.onemine.org).  
DFI has contributed almost 2000 documents to this online library. Non-members can download documents at a cost of \$25 per document.

## ABOUT DFI &amp; DFII - FROM THE EXECUTIVE DIRECTOR, DFI

Ms. THERESA ENGLER, EXECUTIVE Director, DFI



As I reflect on DFI's 40 plus years and how the organization came into being, the parallels between DFI's beginnings and the beginnings of the DFI of India chapter are quite similar. DFI was born from conversations between a few people in the deep foundations industry in the United States who felt strongly that the industry should have a forum for exchange of information pertinent to their field. People who cared about their country and their industry. They imagined an Institute that would bring all disciplines together to communicate about the challenges they face on a project and to find a way to use that information to collaborate so that all benefit – owner, constructor, designer and supplier – through open communication. The idea for the establishment of a membership association was discussed at a piling seminar by the founders and DFI's early mission of disseminating information to affect the most economical design and construction for support of structures on deep strata and for protection of deep excavations was carried out through seminars and annual conferences.

Similarly, in 2012, following a successful DFI conference in Chennai, a regional chapter of DFI was discussed by Dr. K.S. Ramakrishna and other like-minded people who care about India and the foundation industry in the country with the goal to provide a platform for all stakeholders to embrace new technologies for faster development of India via conferences, seminars, workshops and training courses. Another parallel between the two groups is the formation of technical committees. In the early years of DFI, committees on technologies and applications were established so members could collaborate with each other to build consensus and influence the profession. The committees produced valuable publications such as white papers, model specifications, inspector manuals and guidance documents. Now, the committees' number 26 due to the increased number of deep foundation techniques and various applications for which they can be used. DFI of India has also established committees to implement new technologies and to create awareness of best practices in design and construction of deep foundation elements.

A dedicated page is allotted for a nominal fee of Rs 10,000/- per issue for the profile of a reputed company involved in the deep foundation industry to showcase its capability in the field. Please contact DFI of India at [dfiindiaoffice@gmail.com](mailto:dfiindiaoffice@gmail.com). This is more than an advertisement since it carries your mission statement.



Both groups have also formed alliances with other industry organizations and governmental agencies. DFI overall collaborates with the US Army Corps of Engineers, the Federal Highway Association, State Departments of Transportation, the American Society of Civil Engineers and its Geo-Institute, the Pile Driving Contractors Association and the International Association for Foundation Drilling. DFI of India works closely with the Chennai Metro Rail Limited, National Academy of Construction, Nuclear Power Corporation of India Limited, many Indian Geotechnical Society chapters and many Indian Institutes of Technology. Early on DFI learned the importance of working with sister organizations and related governmental agency departments. The affiliations ensure wider spreading of information, so more persons are aware and educated. Now DFI of India is looking to further the practices in the Indian market by aligning with the above-mentioned agencies so members keep apprised of the latest challenges its member companies will need to solve and upcoming projects for which they will need to provide services.

The most important commonality between DFI and DFI of India is the dedication and support of their members. To provide utmost benefit to the industry, we recognize there's strength in numbers. The more people from the industry world-wide and locally in India that join, get involved and share their knowledge or ask the right questions means a safer, stronger, better educated industry that produces high quality foundations that are critical to a nation's infrastructure and future.

In 40 years, we have learned what makes DFI successful and what's important to our membership, thus we stick with our core principles – networking, education, communication and collaboration. DFI of India also incorporates these principles into their activities.

### ***Education***

Both groups provide practical technical guidance, experience and know-how to professionals locally and across the globe. In-person conferences and seminars are held where presenters from all over the world come to share their latest success or what they learned from a recent failure – both are valuable to those who attend. Remote presentations via webinar/online methods allows those who cannot travel or attend in person to also learn. Similarly, online publications such as our magazine and journal provide a wealth of information, as does the DFI YouTube Channel where video presentations are posted.

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Cover story in each issue of the newsletter showcases a technology that is not very popular in India, but has tremendous potential for India's infrastructure development. Readers may contribute to the cover story.

### ***Networking***

DFI and DFI of India members network with each other as well as with companies and individuals from related industries so our members can expand their client base and think out of the box on ways their products and services can be utilized. These networking opportunities, whether at our conferences/seminars or via social media outlets like Facebook, LinkedIn or Twitter or via email through DFI's website, results in opportunities to disseminate their ideas and knowledge to other members who will benefit from that knowledge and technological expertise.

### ***Communication***

DFI's creation was borne out of the need for clear communication between everyone involved in a project – the engineer, the contractor, the owner and the suppliers – and that communication continues now and will continue in the years to come.

### ***Collaboration***

As mentioned previously, DFI recognizes the importance of working with others. Teaming up with other associations and agencies provides more value to our members and means together we can address global challenges such as sustainability, the need for more site investigation, better ways to measure quality assurance and monitor performance, and the need for building new and maintaining current infrastructure. I urge companies and individuals in India who are involved in the design and construction of deep foundations to join DFI of India so that you, your company and your nation can benefit from the strength of working together, communicating with your colleagues and learning from each other. DFI of India has much planned to enhance the knowledge of the local industry through new technology implementation, support of metro rail projects, skills training, engagement of female practitioners and outreach to students who are the future leaders of this industry.

## UNIQUE CONTRUCTION METHODOLOGY FOR JETTY CONSTRUCTION IN INDIA

**K**eller India team adapted first of its kind construction technology in the execution of jetty for a port project in Chennai in southern part of India and the details are presented below.

Katupalli Port, near the southern Indian city of Chennai, is undergoing an extensive transformation to become one of the largest cargo ports in southern Asia. The facility already handles 1.2 million shipping containers a year, but new owners Adani Group want to diversify the cargo and increase capacity by another 40 million tonnes over the next three years. A critical part of the development is the construction of a new 300m-long jetty for 150,000 deadweight tonnage vessels.

### **Ambitious schedule**

With these ambitious plans comes an ambitious schedule – just 14 and a half months to get the jetty up and running. Keller India who bagged the contract took the support of its sister company Waterway Constructions, based in Australia which is lead by Mr. Deepak Raj and equipped with necessary experience and expertise in such kind of jobs. They worked with India's Head of Engineering Madan Kumar Annam and Project Director Ajay Kawlekar, who both have marine engineering experience before tender stage and to develop a solution that met the demands of the project. "The Project team developed a construction methodology using three temporary gantries – two independent piling gantries and a civil construction gantry – an approach that's unusual in India," explains Madan.

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Technical photo feature of relevance are invited from the readers. The feature shall preferably illustrate a modern technology or testing procedure. Please prepare the feature with six to eight good quality pictures with brief and crisp description.

“The piling gantries facilitate the installation of the large diameter marine bored piles, while the civil construction gantry follows them to install the precast elements over the bored piles. Through this method the project team was able to precisely calculate cycle times [the time taken to complete one row of piles] and reassure the client which enabled them to complete the project on time.”

### A methodical approach

The total scope of works is for 164 piles, along with precast elements including pile muffs, cross beams and long beams, and a cast-in-situ concrete deck, 300m long and 40m wide. The piles are around 60m long and require around 200m<sup>3</sup> of pre-hydrated bentonite mix per pile. Because of the size of the piles, the permanent steel liners and reinforcement cages needed to support them are too big for the gantries, so have to be transported on high-capacity barges.

Large capacity initial static pile load tests have been carried out in simulated off-shore conditions to prove the quality of the bored piles, as well as a routine high-strain dynamic pile load test. And to ensure the project is carried out to the highest quality and safety standards, the site crew has undergone rigorous training from APAC’s HSEQ team. Half way through the programme, the team is making good progress, despite a couple of on-site challenges, including clearing large boulders and drilling through deep-seated rock, neither of which were anticipated. To put it in the words of Mr. Madan Kumar “It’s been a steep learning curve, but this is a fantastic project win for us that could open up many new opportunities in what is a fast-growing sector in India,” he says. “And thanks to this project we are now building local capabilities, both engineering and operational skills, thanks to the effective transfer of technology from Keller’s global marine experts.”

The executive committee members of DFI of India represent all the stakeholders in the foundation research, design and construction. The members will express their views about the role of DFI and other similar organizations in the development and transfer of modern technology for infrastructure development of India

## Jetty Construction at Katupally Port, Chennai



**2019**



Join us for DFI's 44<sup>th</sup> Annual Conference on Deep Foundations (#DFI44) at the Chicago Hilton! This conference will be a call to action to develop forward-thinking plans in geotechnical engineering through technical presentations and panel discussions.

## DFI's WOMEN IN DEEP FOUNDATIONS INITIATIVE - FROM NEWYORK TO INDIA

- Ms. Lucky Nagarajan, Geotechnical Engineer - Business Development, Nucor Skyline, US



New York City is home to a huge deep foundation industry and is one of the major cities where innovative foundation and methodologies are put into work for the very first time. In this vast and diverse industry, many female construction/infrastructure groups evolved in the last few years. Despite so many women working in the deep foundation industry, there were no local deep foundation groups to bring them all together. Karen Armfield of AKRF, Sayantani Ghosh of Langan, and Lucky Nagarajan from Nucor Skyline met at the Women in Deep Foundations (WiDF) reception at the June SuperPile '18 Conference and the Metro New York City (NYC) Group was born. Metro NYC WiDF Group is part of the international Deep Foundation Institute Women in Deep Foundations (WiDF) committee. This committee comprises of women and men who are advocates for retaining and advancing women in the deep foundations industry. The goal is to foster greater success and interest of professional women in the industry by promoting networking events, endorsing outreach and building mentoring relationships.

The Metro NYC WiDF held its inaugural get together on July 30<sup>th</sup> 2018 at the AECOM headquarters in lower Manhattan. Because of the size of the room, the reception was open to the first 50 women and men who advocate for women in the industry to register.

With only four days' time to organize and plan the event, Lucky and Gisele Passalacqua from AECOM were very busy, but they pulled it off, with almost full attendance.

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Many publications of DFI are available from OneMine.org, a web-based document library containing over 1,00,000 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.



Attendees came from the design, construction, and foundation engineering industries for the first time and discussed the general reasons for having such a gathering. An icebreaker helped everyone open up and get more comfortable with each other. We learned of many talents, some hidden, some not, within the group. One of the members sings in the United Nations Choir, one trained to be an Air Force pilot, and one has visited 46 out of the 50 United States, to name a few. Theresa Engler, Executive Director of DFI and DFI Educational Trust joined the meeting to show support for the group and interact with all the participants. The meeting was a complete success, and it was decided that meetings would be held twice a year. Since there are a few technical associations and organizations in the Big Apple area to cater to technical topics, Metro NYC WiDF group decided to provide support on non-technical topics on soft skills, such as mentoring, leadership, communication, presentation, negotiation, etc to assist women and men to succeed in the industry.

Our second event was held on October 17<sup>th</sup> 2018 and hosted by New York City office of WSP. For this event, Dr. Liesl Folks, MBA, Dean of University at Buffalo's (UB) School of Engineering and Applied Sciences (SEAS) was invited to "Discuss Navigating Gender Bias, Inequity & Discrimination in STEM". She championed STEM education initiatives such as PreK-12 program, IEEE Summer program on magnetics, and she currently, is Principal Investigator of the NSF-Supported NAVIGATE project that aims to increase women STEM graduates who persist in their chosen disciplines and achieve leadership roles.





At Metro NYC WiDF Event, 2019

Contd.

DFI-India 2019: 9th Conference on Deep Foundation Technologies for Infrastructure Development in India, November 14-16, 2018, NAC Hyderabad, Telangana, India Visit [http://www.dfi.org/India2018\\_for more details](http://www.dfi.org/India2018_for more details)



At the Metro NYC WiDF networking event, Dean Folks presented strategies for problem solving when you are faced with workplace bias, inequity, or discrimination and examples of case studies used in her research. Dr. Sissy Nikolaou (WSP) and Guillermo Diaz-Fanas (WSP) worked with Lucky with a few volunteers from WSP and other leading engineering firms to execute a successful event.

Our third event was held on April 30<sup>th</sup> 2019 and hosted at Langan's New York City Office. Jamie Lee, leadership coach discussed "Strategic Conversations: How to Lead, Influence and Thrive in your industry". Jamie has worked with thousands of professionals as a workshop leader on mutual-win negotiation strategies, self-advocacy, and transformative leadership. Jamie's presentation provided strategies to communicate, advocate, engage, negotiate, lead and influence to thrive in the industry. The speaker was followed by a short panel discussion featuring leaders of the industry, Anjana Kadakia with Thornton Tomasetti, Michele Cooper with Skanska USA, and Domenica Stasiak with Langan. These female leaders came from diverse deep foundation industry to provide valuable advice for junior to senior engineer's questions. Metro NYC Group is already planning their second event of 2019 and discussion topics are currently under consideration.

**We look forward to DFII beginning similar activities in India. Come to the DFI of India November conference to learn more.**

One page is allotted for the Corporate Members of DFI of India to showcase its capability in the field. Please contact DFI of India at [dfiindiaoffice@gmail.com](mailto:dfiindiaoffice@gmail.com) for including your company profile. This is more than an advertisement since it carries your mission statement.

## UPCOMING DFI EVENTS

### DFI-India 2019: 9th International Conference on Deep Foundation Technologies for Infrastructure Development in India

**November 14, 2019 - November 16, 2019**  
**National Academy of Construction (NAC)**  
**Hyderabad, Telangana, India**

DFI of India, in collaboration with the National Academy of Construction (NAC), and the Indian Geotechnical Society Hyderabad Chapter, is hosting DFI-India 2019: 9<sup>th</sup> Conference on Deep Foundations Technologies for Infrastructure Development in India, November 15-16 at NAC, Hyderabad, Telangana, India. Presentations will highlight the latest and appropriate geo-technologies, contract and project management procedures, work methods, latest equipment and tools, and the skill development programs needed in India. This conference will be preceded by a technical workshop on a relevant foundation theme on November 14, 2019.

Event	Date	Venue
<b>Challenges in Foundation Construction - Way Forward</b>	July 20, 2019	NAC, Hyderabad, Telangana
<b>S3; Slope-Support-Stabilization</b>	August 6-8, 2019	Minneapolis, Minnesota
<b>Shotcrete Short Course</b>	September 9-11, 2019	Idaho Springs, Colorado
<b>Pile Integrity Testing Seminar</b>	September 12, 2019	Brussels, Belgium





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Innovation forms the core of Keller's geotechnical expertise. Since its inception, Keller India has introduced many path breaking solutions coupled with new technologies that are suitable for Indian environment. Site conditions can vary greatly within a single project site and are challenging. Therefore, developing optimal solutions with single or combination of techniques requires comprehensive knowledge, vast experience, and sound skills which is crucial and is the forte of Keller India.

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- Bored Piles
- Driven Piles
- Barrettes
- Plugge Columns
- Baker Piles



### EARTH RETENTION & SHORING

- Diaphragm Walls
- Contiguous Piles
- Secant Piles
- Sheet Piles
- Soldier Piles



### GROUND IMPROVEMENT

- Vibro Stone Columns
- Vibro Compaction
- Vibro Sand Columns
- Deep Soil Mixing
- Rapid Impact Compaction



### SMALL DIAMETER DRILLING

- Anchors
- Micropiles



### GROUTING

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- Permeation Grouting
- Compaction Grouting



### FOUNDATION CIVIL WORKS

- Raft/Pile caps
- Tank/Sand pads
- Earth Works
- Basement excavation works



## 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 net- working, 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
- Collaborate with colleagues by joining one of 15 active Technical Committees, Regional Chapters or a DFI group
- Gain visibility with a corporate member listing on the DFI website, which has 20,000 views each month
- Connect and communicate with industry peers through social media such as DFI's LinkedIn Groups
- Access OneMine.org and download up to 100,000 articles, technical papers & books from DFI & organizations all over the world - at no cost

This e-newsletter of DFI of India is available at <http://dfi.org/enews.asp?india>

**Editorial team: Mr. Mohamed Athif & Mr. Chandra Sekhar J.**

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