VERTICAL SHAFTS MADE SIMPLE:
The Power of Mechanized Sinking

The Vertical Shaft Sinking Machine (VSM) revolutionizes urban underground construction by enabling safe, precise and efficient shaft excavation even below groundwater level. Operating fully mechanized and remotely, the VSM eliminates the need for dewatering and on-site personnel inside the shaft. Its modular design, environmental benefits and proven global applications make it a sustainable solution for urban infrastructure, tunnelling and deep foundation projects. Read more on **page 3.**

Volume 11 Book 4, October 2025

DFI of INDIA News

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

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Mr. Aswin V Hari, Technical Coordinator

The executive committee members of DFI of India represent the key stakeholders across 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.

DFI of INDIA News
Volume 11 Book 4, October 2025
3

Cover Story

Vertical Shafts Made Simple: The Power of Mechanized Sinking

Stefan Frey, Julian Binder and Ben Hayes, Herrenknecht, Germany

Introduction

As cities continue to grow vertically, space on the surface becomes scarce and expensive. To meet the demands of expanding infrastructure, engineers are turning underground not just for tunnels, but also for utilities, storage and mobility systems. Constructing these structures, often at significant depths, requires safe, accurate and economical access solutions that can work efficiently even below groundwater level. The Vertical Shaft Sinking Machine (VSM), developed by Herrenknecht, represents a significant innovation in this area. Designed for the mechanized construction of shafts in challenging mixed-ground conditions, it offers a safer, faster and environmentally sustainable alternative to traditional methods.

Fig. 1: Overview of VSM application fields in urban environments

The latest application was the construction of two shafts for the first U-Park® system in Nanjing, China, with an Outside Diameter of 12.8 m and a depth of 65 m each. U-Park® is an underground car parking system. A VSM shaft might even be used as an underground parking space as well as a permanent foundation simultaneously, not only for buildings above surface, but also for bridges and other near-shore construction foundations. By excavating the shaft into more stable layers, the structure's weight is evenly distributed, ensuring a stable foundation. Also, the friction between the shaft walls and surrounding soil provides resistance, further reducing stress on the ground and enhancing stability.

The Concept Behind VSM

The VSM was first tested in 2004 and successfully deployed in Kuwait and Saudi Arabia in 2006. It was created to improve safety, reliability and precision in the construction of deep shafts, particularly in areas where lowering the groundwater table is not possible or could cause settlement and structural damage to nearby buildings.

Unlike conventional systems, the VSM operates entirely underwater, using a slurry circulation process that balances external groundwater pressure. This makes it highly effective in dense urban areas with complex geology. The system is fully remote-controlled from the surface, requiring no personnel inside the shaft during excavation, thus minimizing risk.

How the VSM Works

The machine consists of two main components:

Excavation Unit – equipped with a cutting drum on a telescopic boom, allowing controlled excavation and an adjustable working diameter.

Lowering Unit – a surface-mounted structure that holds the shaft using steel strands and hydraulic jacks, ensuring controlled sinking.
During operation, the VSM excavates the soil and transfers it through a slurry discharge system to a separation plant above ground. The entire process of excavation, lining and lowering occurs simultaneously, which shortens the overall construction time and improves accuracy.

This modular setup can be arranged flexibly on site, making it particularly suited to

Continued

confined city centres where space for equipment and material storage is limited.

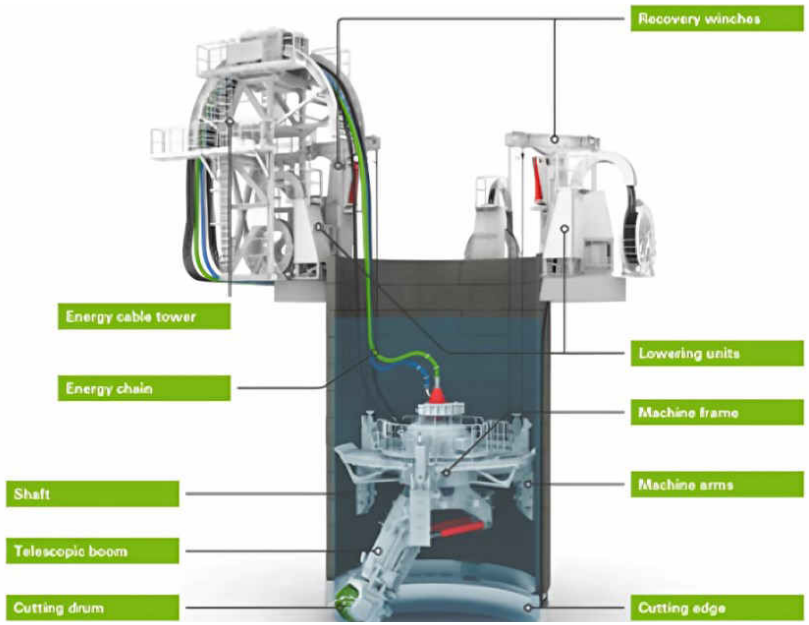


Fig. 2: Components of the VSM system

Advantages of Mechanized Shaft Sinking

Safety and Precision

Since excavation is done below groundwater level with the shaft filled with water, ground movement is mitigated and the risk of settlement is reduced. The remote-controlled nature of the system improves safety for personnel.

Efficiency and Cost Benefits

VSM technology allows for simultaneous excavation and lining, which ensures faster progress. The lining is typically installed using precast concrete segments, offering high precision and reducing the need for additional secondary lining. Each machine can cover a range of shaft diameters, making it a versatile and cost-efficient investment for multiple projects.

Environmental Impact

By operating without groundwater lowering, the VSM avoids ecological disturbance. It can be powered by the local electricity grid, reducing CO_2 emissions and noise pollution. In addition, the use of prefabricated concrete segments reduces overall material consumption by up to 40%.

Construction and Operation Process

The equipment arrives in modules for easy assembly on-site. Once installed, excavation begins with the cutting drum removing soil as the shaft structure is progressively lowered. The ring-building process occurs at the surface, where segments are connected and gradually lowered as excavation continues.

The VSM can operate under a wide range of soil conditions from soft clays to hard rock with compressive strengths up to 140 MPa. After the final depth is reached, a bottom plug is cast, the machine is retrieved and the shaft is dewatered and completed.

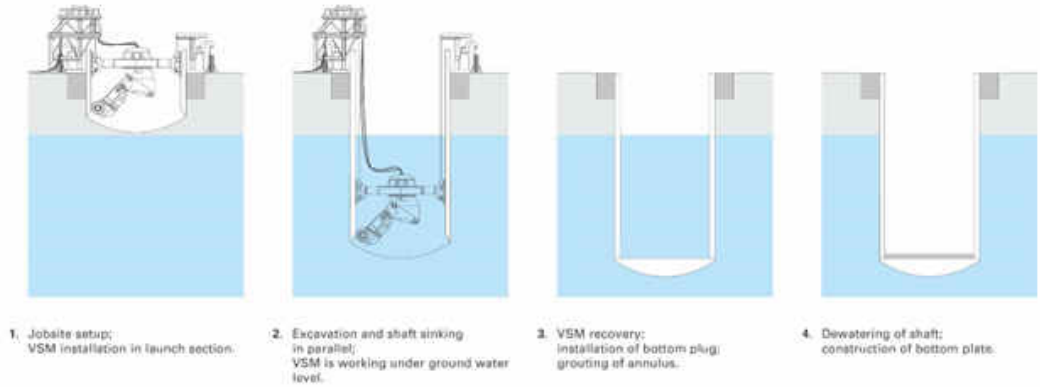


Fig.3: Installation steps of mechanized shaft sinking with VSM

Applications in Global Urban Projects

1. Grand Paris Express, France

Europe's largest metro expansion, the Grand Paris Express, used the VSM to construct

continued on page 19

Two insightful articles contributed by the DFI of India Sustainability Committee are featured in this section from Page 5-8.

Sustainability Corner

Advancing Sustainable Construction with Recycled Steel Sheet Piles

- ***Dr. Shilton RICA,*** *Arcelor Mittal, Shilton.Rica@arcelormittal.com;* ***Leila Novalic,*** *Arcelor Mittal*

When talking about steel sheet piles, long structural interlocking sections creating a continuous wall are understood. They enable to separate two distinct regions from each other and are commonly used as retaining structure in various applications, such as in the mobility infrastructure, the maritime and waterway infrastructure and can serve as barriers for flood and coastal protection. As depicted in Figure 1, steel sheet piles can be seamlessly integrated into various environments, enabling urban development while preserving surrounding ecosystems.

Fig. 1: Steel sheet piles employed in the Charlottenburg Canal – Germany© WNA-Berlin

As material, steel has been used for over 200 years, due to its distinctive properties, such as high strength, ductility and hardness. It is applicable from every day uses in the kitchen to medical devices and to structural components, such as steel beams or sheet piles. The versatility of steel has no limits to such an extent that the material is, in specific areas, irreplaceable. However, its traditional production method – using coke to reduce iron ore in a blast furnace followed by processing in a basic oxygen furnace – is highly carbon-intensive and results in significant CO_2 emissions. Extensive research and innovative technologies have validated the change of reducing agent from carbon-rich sources to hydrogen to be as effective as the traditional route. The hydrogen-based process, known as Direct Reduced Iron (DRI), significantly reduces CO_2 emissions by producing water as byproduct instead of carbon dioxide. In Europe, an example of such a facility can be found in Hamburg, Germany. Apart from the DRI production route, steel can also be produced by melting scrap in an Electric Arc Furnace (EAF). This process does not only allow to valorise scrap by recycling and

Fig.2: Steel sheet piles employed in Vadencourt – France© Patoux Travaux Spéciaux

Continued

transforming it into quality steel products but also plays a crucial role in advancing circular steelmaking. Since the EAF process involves a physical transformation of existing steel scrap, it is more environmentally friendly and resource-efficient, relying on secondary raw materials rather than primary extraction. Currently, the EAF share within steel manufacturing in Europe is in the range of 44%.

Together, DRI and EAF represent a shift toward low-carbon and resource-efficient steelmaking, aligning with global sustainability goals and enabling steel manufacturing industries to reduce their environmental footprint.

Beyond their sustainable production, steel sheet piles themselves, on top, perfectly integrate in the concept of circular economy. For temporary applications, such as during the creation of a cofferdam, sheet piles can be reused several times, reducing the need for new material production and thereby lowering the carbon footprint of individual sheet piles used. All upstream activities, such as mining, smelting and steel forming can be bypassed, as the final product is readily available. The reuse thus not only extends the material's lifecycle but also minimizes emissions associated with both production and transportation. The ability of sheet piles to be reused is grounded on their material durability and modular design through the interlocking system, allowing access to flexible configurations while employing repeatedly equal foundation units. Once a project is completed, the high strength and resilience of steel sheet piles allow for easy extraction and redeployment in future projects. Moreover, steel sheet piles can last for decades with minimal maintenance over a long lifespan, contributing to long-term sustainability. At the end-of-life, once the sheet piles are not required anymore, they are 100% recyclable through the EAF technology, which enables to close the circular economy loop, reducing waste and environmental impacts. Accordingly, from old unused steel, new required steel products are made available.

Thus, combining environmentally responsible production with high reusability makes steel sheet piles a compelling solution for sustainable construction. When produced using innovative methods such as the DRI/EAF route, recycled steel sheet piles emit only minimal CO_2 during the production phase. Furthermore, by designing construction works to enable the reuse of sheet piles, emissions are further reduced, even for a product that already has a low environmental impact from the outset!

Springer Volumes of DFI of India Annual Conferences

(Click on the volume to access)

Sustainability in India's Construction Sector: Current Initiatives, Situations and Challenges

- ***Sandip Bhutale,*** *MENARD Middle East & Central Asia, sandip.bhutale@menard-vibro.ae*

Technology breakthroughs, growing environmental consciousness, ambitious government policies, academic institutions/bodies/committee's efforts are all contributing to the paradigm shift towards sustainability in India's construction sector. The industry still has to overcome significant obstacles, such as high startup costs and a shortage of skilled workers, in order to create more resilient and greener surroundings.

Fig.1: Pictorial Representation of Sustainable Construction Practice

Growth drives sustainable construction

1. Government initiatives and incentives

India's government is actively promoting green building through a mix of policies and financial incentives.

- **Green Building Policy (2006):** This policy set a target for all new construction to adhere to green standards by 2030, with guidelines for waste management, energy efficiency and renewable resource use.
- **Tax incentives:** Provisions in the Income Tax Act offer tax benefits and up to 100% depreciation on expenses for sustainable features like solar panels and rainwater harvesting systems.
- **Low-interest loans:** The Indian Renewable Energy Development Agency (IREDA) provides loans for certified green building projects.
- **State-level incentives:** Several states offer non-fiscal incentives, such as rebates on development charges and additional Floor Area Ratio (FAR), for certified green buildings.
- **Fast-track approvals:** Green-certified projects often receive expedited inspections and approvals, streamlining the construction process.

2. Technological advancements

Innovations are streamlining and enhancing sustainable practices across the construction lifecycle.

- **Use of alternate solutions/methods:** The traditional approach for construction requires more resources and contributing more carbon when compared with new methods. For example,
  - Use of ground improvement techniques in place of traditional pile foundations, pile raft foundations.
  - Prefabrication and modular construction: Off-site fabrication reduces on-site construction waste and minimizes disruptions.
  - Use of geosynthetic material in place of steel in retention system.
- **Building Information Modeling (BIM):** This technology enables the creation of intelligent 3D models that provide dynamic insights into material selection and energy and water efficiency, helping reduce waste.

Continued

- **Augmented and virtual reality (AR/VR):** These technologies are used for immersive design, training and maintenance processes.
- **On-site renewable energy:** Incorporating solar panels and wind turbines into building designs reduces dependence on the grid.

3. The shift toward eco-friendly materials

Stakeholders are moving away from energy-intensive conventional materials like cement and steel toward low-impact alternatives.

- **Recycled materials:** Processed aggregates from construction and demolition (C&D) waste are reused, significantly reducing landfill burden.
  - Can be used as backfill material for reinforced earth wall/approaches etc.
  - Can be used as stones for stone columns/sand columns (ground improvement techniques)
- **Locally sourced, low-energy materials:** The use of materials with low "embodied energy," such as compressed stabilized earth blocks (CSEB), bamboo and other bio-based materials, reduces carbon footprint.

4. Corporate and consumer demand

Public awareness is driving a shift in preferences towards greener options, making sustainability a strategic advantage.

- **Enhanced brand image:** Building sustainably can enhance a company's reputation and attract environmentally conscious customers and investors.
- **Long-term cost savings:** Green buildings offer significant operational cost savings through reduced energy and water bills, offsetting higher initial costs.
- **Improved occupant well-being:** Sustainable designs that maximize natural light, use non-toxic materials and offer better air quality create healthier indoor environments.

Challenges hindering sustainable growth

- **High initial costs**

  Sustainable materials and advanced technologies often have higher upfront costs, which can deter developers and homeowners, especially those with limited budgets. While green buildings offer long-term savings, the perception of expense remains a significant barrier.

- **Lack of skilled labor and awareness**

  The construction workforce, from project managers to on-site laborers, often lacks the knowledge and skills for sustainable practices. Educating stakeholders and raising public awareness about the benefits of sustainable buildings are crucial for driving wider adoption.

- **Regulatory fragmentation and monitoring**

  The Indian construction industry lacks a systematic and streamlined regulatory framework for sustainability. Building codes and standards vary between states and effective monitoring and enforcement are often lacking, enabling inconsistent implementation.

- **Supply chain constraints**

  While demand for sustainable materials is growing, their availability and robust supply chains are not as developed as those for conventional materials. Long lead times for specialized green products can also cause project delays.

The path forward

For sustainable construction to become the norm in India, the industry must move beyond a focus on symbolic green certifications to a more holistic, performance-based approach.

- **Spreading awareness and educating the key stakeholders:** With the help of academic and institutional bodies, awareness can be increased to use more sustainable construction materials, techniques etc.
- **Skill development:** Investing in training and education programs for the workforce will bridge the knowledge gap and increase implementation capacity.
- **Supportive policy framework:** Government bodies must develop uniform and mandatory green building codes with strong monitoring mechanisms and continued incentives.
- **Market transformation:** Continued education and outreach can increase market demand and make sustainable construction practices more mainstream and economically viable.

Recap - DFI-India 2025: 14th Annual Conference

DFI-India 2025: 14th Annual Conference was successfully conducted from September 8 -10, 2025, in the diamond city of India, Surat. This year's event was a pivotal and successful platform for the industry, mirroring the success of the 2024 Goa conference. It effectively gathered professionals, engineers and researchers to share knowledge regarding the newest advancements in deep foundation technologies for infrastructure development. IGS Surat chapter and SVNIT Surat were the conference co -organizers and Prof. Chandresh Solanki chaired the conference. The event was co-led by the Technical Chairs, Dr. Jaykumar Shukla and Dr. Jitesh Chavda, whose leadership ensured that the technical content was of the highest caliber.

The Conference garnered exceptional support from the industry through sponsorships and exhibitions, with over 330 delegates from various organizations in attendance.

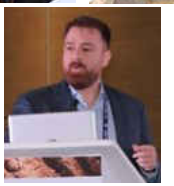
The proceedings commenced with a grand inaugural ceremony, attended and graced by the esteemed Chief Guest, Dr. Anupam Shukla, Director of SVNIT Surat. His presence reinforced the importance of deep foundation engineering in shaping the region's modern infrastructure.

Dr. K. S. Rama Krishna was honored with the Lifetime Contribution Award 2025. The proceedings also included the inauguration of the exhibition by Dr. Anil Joseph, President of IGS.

Keynote Presentations

The keynote sessions at the DFI of India 2025 Conference set an inspiring tone for the event, featuring thought-provoking talks from eminent leaders in the field. offered a perfect blend of technical depth and practical experience, reflecting the evolving trends and innovative approaches shaping the future of deep foundation engineering in India and globally.

Keynote 1: Dr. Eric Chong - *Pushing the Boundaries with Deep CFA Piling – Design and Construction Perspectives*
Keynote 2: Dr. Stuart Hardy - *Reinvigorating the Observation Method: The role of Real Time Back Analysis (Part 1)*
Keynote 3: Mr. Abhishek Basu - *A Case Study of Geotechnical Challenges in Treating Soft Soil through Vacuum Consolidation in Dhamra Port Expansion*
Keynote 4: Mr. Satyajit Vaidya - *Deep Foundation Challenges for a High-rise Building on Manhattan's Lower East Side*
Keynote 5: Mr. Andrzej Wolski - *Enhanced Liquefaction Resistance Using Rammed Aggregate Piers: The Role of Increased Earth Pressure and Density*
Keynote 6: Mr. Bedros Avakian - *Controlled Modulus Columns in Practice: A Review of Case Studies*
Keynote 7: Dr. Makarand Khare - *Geotechnical Instrumentation in Civil Infrastructure Projects – Case Studies from India*



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Special Session on 'Innovations in Deep Foundation and Testing Equipment'

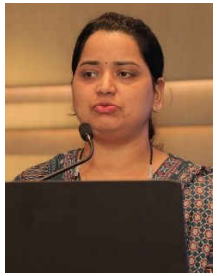
A key highlight of the conference was the special technical session dedicated to 'Innovations in Deep Foundation and Testing Equipment,' an area witnessing rapid technological advancements that are transforming the construction and geotechnical industry. The session featured Dr. Shilton Rica, who presented on *Construction of Cochin Dry Dock Using HZM Combi-Wall Sheet Pile System*, Mr. Ryo Kamioka, who discussed *Advanced Technologies for Vibration-Free and Noise-Free Installation of Steel Sheet Piles and Pipe Piles*, Mr. Dimitrov Krishnan, who shared insights on *New Technology Trends in Equipment: Sustainability, Electromobility and Automation*, Mr. Ben Hayes, who spoke about *The Role of Mechanized Shaft Sinking with VSM in Inner-City Applications* and Dr. Stuart Hardy, who presented on *Reinvigorating the Observation Method: The Role of Real-Time Back Analysis (Part 2)*.

The session provided attendees with an in-depth understanding of the latest innovations in deep foundation technologies and equipment, emphasizing sustainable, efficient and mechanized solutions for complex projects. It was particularly well-received by both practitioners and researchers, given the growing demand for advanced construction techniques and real-time monitoring solutions in challenging urban and industrial environments.



Technical Sessions and Paper Presentations

Over the course of the three-day conference, a series of technical sessions were held, covering a wide range of topics. These sessions featured over 55 paper presentations including poster and paper presentations, showcasing original research, innovative practices and case studies.

Women in Deep Foundations India (WiDFI) Session

The WiDF India committee conducted an empowering session in the recent DFI-India 2025 Conference featuring Ms. Vidya Basarkod, Managing Director of COWI India. By evaluating accomplishments and impediments, Ms. Vidya Basarkod inspired attendees to champion a more inclusive and dynamic future for the industry, striking a strong chord with participants and reinforcing WiDF's mission in India. The session was moderated by Ms. Lucky Nagarajan and Dola Roychowdhury.


DFII Student Awards 2025

Every year DFI of India conducts Student Awards Competition to encourage young talent to continue pursuing excellence in their research and professional development. The winners of the competition are Rima Das, Research Scholar at NIT Tiruchirappalli and Gaurav Tripathi, Master's Student at IIT Tirupati.

Continued

The winners were awarded with certificate, cash prize of INR 15,000 including travel expenses, e-book vouchers by Springer and free conference registration.

DFII 2025 Best Paper Awards

From a total of 62 contributory papers, the Conference Technical Chairs have honored two papers for their exemplary research and contribution. They are: ***1) A Case Study on Soft Soil Improvement Using PVD With Surcharge: Field Monitoring and Numerical Validation*** by Durgam Mahesh, Sanjoy Bhowmik, VK Panwar and ***2) Sustainable and Cost-Effective Foundation Solution for Crude Oil Import Terminal*** by Vimala C, Prasad P.V.S.R, Madan Kumar Annam. The winners received a certificate and cash prize of INR 5,000.

The DFI-India 2025 Conference concluded with a renewed vision for the deep foundations industry, emphasizing innovation, sustainability and inclusivity. The event provided a dynamic platform for knowledge exchange, inspiring attendees to implement new insights and foster meaningful collaborations across the geotechnical community in India and beyond. We sincerely thank all our supporters, whose unwavering commitment and generosity made this landmark event a resounding success, setting the stage for continued growth and advancement in the field. With a total of 328 registered delegates, the conference concluded as a resounding success, garnering extremely positive feedback. We extend our sincere gratitude to everyone for their attendance and participation.

Access the Conference Photos, kwikpic-in.app.link/e/7ICSsOZZuWb?uCode=SH*CK2

HAVE YOU RENEWED YOUR DFI MEMBERSHIP YET?

Renew it now if you have not already. DFI offers multiple benefits to its members for their technical as well as professional development. Learn, Network and Grow with DFI.

Check DFI membership categories, benefits, fees and renew here: dfi.org/members/

Hurry up!!! Join DFI of India today and connect with a network of geotechnical professionals driving innovation in deep foundations

Experiences at DFI-India 2025 Conference, Surat

Dr. Stuart Hardy: I have presented at many DFI/EFFC events across Europe, but when the opportunity arose to deliver a keynote lecture at the DFI-India 2025: 14th Annual Conference in Surat, I leapt at the chance. I had never visited India before and was unfamiliar with the local geotechnical industry, so I was unsure what to expect. However, from the moment I arrived at the venue, I knew I had made the right decision.

Dr. Stuart Hardy
Associate Director, Arup
DFI-India 2025 keynote speaker

The number and quality of the trade stands were up to the usual high DFI standards, featuring leading geotechnical contractors and consultants active in India, as well as a good mix of major international names and local companies.

Once the conference began, I was honoured to deliver one of the first keynote lectures on a topic I am deeply passionate about: the use of the Observational Method (OM) in geotechnical engineering. At Arup, we are striving to reinvigorate the use of OM through surrogate models, real-time back analysis and machine learning. These technological developments have made OM a practical reality, rather than the preserve of a select few. The audience was highly engaged and the ensuing discussion was both lively and informative.

After giving my talks on the first day, I was able to relax and enjoy the remaining presentations, as well as the exceptional food and hospitality provided by DFI India. I found the candour of the presenters—particularly in sharing experiences when things did not go as planned—especially refreshing. As geotechnical engineers, we truly learn when we share our "lessons learned" with the wider industry. The insights gained from some of the larger metro projects in India are something I will definitely take away with me.

Continued

Mr. Abhishek Basu: It was a distinct honour to participate as a keynote speaker at the DFI-India 2025: 14th Annual Conference in Surat, held from September 8–10 at Avadh Utopia, an event that stands as a testament to the remarkable progress of India's deep foundations community. Organized by DFI of India in collaboration with the Indian Geotechnical Society Surat Chapter and SVNIT Surat, brought together a vibrant cross-section of deep foundation professionals, researchers and industry leaders from across India and abroad.

Abhishek Basu
Head of Civil Engineering for Port Project, Adani Infra India
DFI-India 2025 keynote speaker

I have witnessed firsthand the transformative impact of collaborative platforms like DFI of India in advancing geotechnical engineering and infrastructure development across the nation. On one hand the conference was a showcase of the rapid evolution and growing sophistication of India's foundation engineering sector at the same time the special sessions of DFI of India Sustainability Committee and the Women in Deep Foundations (WiDF) India highlighted the sector's commitment towards social inclusivity.

The conference was impeccably organized, bringing together a vibrant assembly of industry leaders, researchers, practitioners and young engineers. What stood out was the spirit of collaboration, knowledge-sharing and mentorship. The exhibition area, with over 30 booths, was abuzz with the latest equipment and solutions, while

parallel technical sessions enabled in-depth discussions on best practices, lessons learned from failures and the adoption of sustainable, cost-effective approaches. The conference also provided a platform for young engineers and students to engage with industry stalwarts, reinforcing DFI-India's role in nurturing the next generation of geotechnical leaders. The meticulous attention to detail in every aspect - from session management to hospitality - created an environment conducive to meaningful dialogue and professional growth.

The conference also highlighted the critical role of organizations like DFI-India in facilitating the transfer of modern technology and best practices. The collaborative efforts of the organizing committee, volunteers and sponsors were evident in every facet of the event, reflecting a shared vision for elevating India's infrastructure standards.

In closing, I extend my heartfelt appreciation to the DFI-India leadership, organizing team, sponsors and all participants for making the 2025 Surat Conference a resounding success. I am confident that the insights and connections forged here will continue to drive innovation and excellence in our field.

DFI of India Lifetime Contribution Award 2025

Each year, DFI of India takes pride in honoring a distinguished senior professional in the field of deep foundations for their exceptional contributions and lifelong dedication to advancing the profession. This recognition celebrates the recipient's unwavering commitment, visionary leadership and lasting impact on the industry. This year, we are privileged to present the DFI of India Lifetime Contribution Award 2025 to Dr. K. S. Rama Krishna, in recognition of his pioneering work, outstanding leadership and remarkable contributions that have significantly shaped the growth of geotechnical and deep foundation engineering in India.

Dr. K. S. Rama Krishna

Dr. K. S. Rama Krishna is a renowned Geotechnical Engineer with over 45 years of experience in geotechnical and foundation engineering, covering design and construction of land, coastal and offshore projects. He is the Founder and former Chairman of the Deep Foundations Institute of India (DFI of India), established in 2013 and affiliated with DFI, USA, where he also served as a Trustee from 2014 to 2020.

As Head of Foundation Engineering at Larsen & Toubro (2005–2013), Dr. Rama Krishna was instrumental in introducing modern foundation technologies, specialized equipment and technical competency development, which led to the creation of L&T GeoStructure, a specialist foundation company. Prior to this, he held senior leadership roles in Singapore-based companies Soilcrete and Econ International and later served as Director of Econ India. He began his career at Engineers India, contributing to major industrial and offshore projects.

An alumnus of Government College of Engineering, Kakinada, Dr. Rama Krishna earned his M.Tech and Ph.D. from IIT Kanpur. Widely respected for his professional excellence, he received the DFI President's Award (2017) and the Distinguished Service Award (2020) from DFI, USA. He currently offers consultancy in foundation and offshore engineering.

DEEP FOUNDATIONS INSTITUTE DFI

DFI of India
Lifetime Contribution Award 2025

Awarded to

Dr. K S Rama Krishna

Formerly with Engineers India Limited, Soilcrete Pvt Ltd.,
Econ International Limited, Larsen & Toubro Limited.
On the board of DFI of India

08th September 2025

Several individuals leave an enduring legacy through their contributions to the society. The Deep Foundations Institute of India takes great pride in recognising you as one such individual, owing to your invaluable service to the foundation industry in India and your distinguished achievements in the design and execution of major industrial projects across the globe. Your expertise as a foundation engineer is evident in your commitment to adopting advanced technologies and upholding quality standards without compromising project timelines.

Your profound knowledge in foundation engineering for projects within the hydrocarbon and non-ferrous metallurgy sectors, offshore oil and gas platforms, and your proficiency in assessing the feasibility of underground hydrocarbon storage in rock caverns, has been instrumental to industry progress. Furthermore, your initiative in establishing the Indian chapter of the Deep Foundations Institute and your dedicated efforts have played a pivotal role in elevating DFI of India's standing.

In recognition of your decades-long professional dedication to the Indian deep foundation industry, the Deep Foundations Institute of India is honoured to present you with the **"DFI of India Lifetime Contribution Award 2025"** at the DFI-India 2025 Conference on 8-10 September 2025 being held in Surat, Gujarat.

The delegates attending the DFI-India 2025 conference will undoubtedly be inspired by your notable contributions to foundation engineering and to the broader field of civil engineering.

We extend our best wishes for your continued good health, strength, and ongoing professional achievements.

With sincere regards,

Mohan Ramanathan
Chairman, DFI of India

Sunil Basarkar
Vice-Chairman, DFI of India

Theresa Engler
Executive Director, DFI USA

The DFI of India Sustainability Committee successfully organized its first Carbon Calculator Training Session on November 6, 2025, marking a significant step towards promoting sustainable practices in the geotechnical and deep foundation industry.


Dr. Venu Raju


Sai Kumar

The training was delivered by Dr. Venu Raju, Professor of Practice at IIT Madras and Senior Advisor – Sustainability at Keller, along with Mr. Sai Kumar, Senior Engineer – Sustainability at Keller Ground Engineering. The session provided attendees with a clear understanding of how to integrate carbon assessment into project planning and offered hands-on guidance on using the carbon calculator effectively.

Participants appreciated the practical insights shared, which will help the industry take informed steps towards reducing the environmental impact of deep foundation projects.

Watch the webinar recording here:
youtu.be/N37kCwe51yg?si=0rNX47iPKl8U5WdC

DFII & DFI Upcoming Events

Event	Date	Venue
Conference on Foundation Decarbonization and Re-use	Mar 24-26, 2026	Amsterdam, the Netherlands
DFI-PFSF Piling & Ground Improvement Conference	May 18-20, 2026	Sydney, Australia
SuperPile '26	June 24-26, 2026	New Orleans, Louisiana
S3 2026	Aug 11-13, 2026	Charlotte, North Carolina
DFI-India 2026	Sept 17-19, 2026	Guwahati, India
DFI51	Nov 2-5, 2026	Orlando, Florida

DFI-India 2025: Photo Competition Winners

As part of the DFI-India 2025 Conference, a **Photo Competition** was organized to celebrate the visual aspects of deep foundations. Delegates enthusiastically submitted original photographs from their project sites, depicting various elements of deep foundations, ground improvement works and laboratory experiments. The entries were evaluated based on **technical relevance and content**, rather than photographic skill, ensuring focus on the engineering perspective. From the submissions, the **top three photographs** were selected for their clarity, insight and creativity. These winners were **recognized and awarded during the valedictory of the conference**, highlighting their contribution in capturing and sharing the essence of geotechnical engineering through compelling visuals.

The winners include (from left to right) : **Mr. Ekhlaq A Khan**, *L&T Heavy Civil;* **Mr. Prathmesh Wani,** *Soilmechanics GmbH*; **Mr. Rajendra Lavantra**, *Shrikhande Consultants*

Mumbai Trans Harbour Link
Captured by: **Ekhlaq Khan**

Continued

Vibrocompaction with tandem vibrating probes and water jetting for Deep Ground Improvement
Captured by: **Prathmesh Wani**

Excavation for Raft Foundation (3000mm), excavation depth 18300mm & Supporting system (Waler beams/Struts & Rock Anchoring) – Girgaon (Mumbai)
Captured by: **Rajendra Lavantra**

DFI members can post their professional or corporate achievements, awards and other news related to the geotechnical profession in DFII Newsletter. Send the details 15 days before every quarter, January, April, July and October to technical@dfi-india.org.

DFII Technical Committee News & Reports

DFII Sustainability Committee

DFII Sustainability Committee, formed earlier this year, made a 20-minute presentation on the importance of sustainability in construction and the goals of the committee during the DFI-India 2025 conference in Surat. The committee was expanded to add a few more members after the conference. Read more about the committee and committee members at *dfi.org/communities/sustainability-in/*.

The committee also conducted its first Carbon Calculator online training session on November 6, 2025. Please refer to more details on page 15.

DFII BCIS QC Working Committee

This is one of the newest initiatives of DFI of India. Formed in 2025, the committee aims to identify the major sources of quality control issues in the construction and testing of bored cast-in-situ piles and to prepare a comprehensive guideline document outlining common mistakes and best practices for the benefit of field engineers. Initially a working group of 25 members is formed to share their experiences related to quality control of BCIS piles. These contributions will later be developed into chapters of the guideline by the drafting committee. The guideline document is to be released in the second half of 2026.

DFII Student Outreach Committee-Groundwork

Under this committee one online Groundwork webinar was conducted in 2025. The committee also conducted the DFI of India Student Awards 2025 where two students (one PhD and one masters) were awarded during the DFI-India 2025 Conference, Surat, on September 10, 2025.

The committee plans to continue the Groundwork lecture series in 2026 with a mix of online and in-person lectures. Additionally, the committee is working on developing student chapters in selected academic institutes across the country.

DFII Training Committee on Foundation Technologies

The Committee has conducted six training programs to date with four online programs and the last two being hybrid events in 2024 and 2025. These events have seen increasing interest from the industry with participants from different parts of the country.

The committee has initiated developing the next training program for 2026, details will be shared soon.

CFA Pile Technology Implementation Committee

Panel 20 under CED 43 is drafting the BIS code for CFA Guidelines. DFII CFA Committee is playing a major role in this development. Dr. Sunil Basarkar, DFII CFA Committee Chair, is the convener of Panel 20. Along with him Anirudhan IV represents DFII in the Panel 20. The guidelines document is currently under review and is expected to be out in 2026.

The DFII CFA committee is also planning a knowledge dissemination program on CFA technology in early 2026. More details will be out soon.

Continued from page 4

four deep shafts for Line 15 South each up to 48 meters deep and 11.9 meters in diameter.

Operating electrically with minimal noise and emissions, the VSM proved ideal for the densely populated French capital. The machine was efficiently relocated between sites, reducing project downtime to only three weeks.

2. Metro Naples, Italy

In Naples' historic city centre, ten 4.5 meter diameter shafts were excavated up to 45-meters deep beneath UNESCO listed zones. The compact and quiet VSM setup allowed work in narrow streets with minimal disturbance to residents, achieving daily progress rates of nearly five meters.

Fig. 4: VSM construction in Naples

3. High-Speed Rail Project, Barcelona

For Spain's AVE high-speed rail line, six shafts up to 56-meters deep were excavated through complex strata ranging from soft sand to hard quartz slate. The VSM enabled settlement free construction, ensuring the safety of nearby structures and residents.

Fig. 5: VSM ventilation shaft in Barcelona

Conclusion: Building the Underground Future

As cities expand, underground infrastructure is becoming an essential component of sustainable development. The VSM demonstrates how technology can address the challenges of safety, space and environmental responsibility simultaneously. With more than 111 successful projects worldwide, the VSM has proven its reliability in constructing deep shafts efficiently and safely especially where conventional methods fail. Looking ahead, its applications may extend beyond tunnelling to underground storage systems, geothermal energy hubs and urban logistics networks, paving the way for a smarter, greener and more resilient underground future.

This article is based on an invited lecture presented during special session from the DFI-India 2025: 14th Annual Conference, Surat.

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 50 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
- Collaborate with colleagues by joining one of 25 plus active Technical Committees, Regional Chapters or a DFI group
- Gain visibility with a corporate member listing on the DFI website, which has more than 20,000 views each month
- Connect and communicate with industry peers through social media such as DFI's LinkedIn Groups or follow DFI on LinkedIn, Facebook, Instagram or YouTube
- Access OneMine.org and download up to 145,000 articles, technical papers & books from DFI & organizations all over the world - at no cost

51st Annual Conference on Deep Foundations

November 2-5, 2026

DFI's 51st Annual Conference on Deep Foundations is November 2-5, 2026, in Orlando, Florida. The theme of this international conference is "Sea Level Impacts: Navigating Challenges Together," focusing on the multifaceted challenges and profound global implications that rising sea levels pose. We will explore advancements in industry practices, techniques and project delivery through perspectives, case histories and research-based papers and presentations. Abstracts are being accepted.

Abstract Submission Deadline: December 1, 2025

For more details : *dfi-events.org/dfi51/*

This eNewsletter of DFI of India is available at DFI of India website: dfi.org/india/

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