

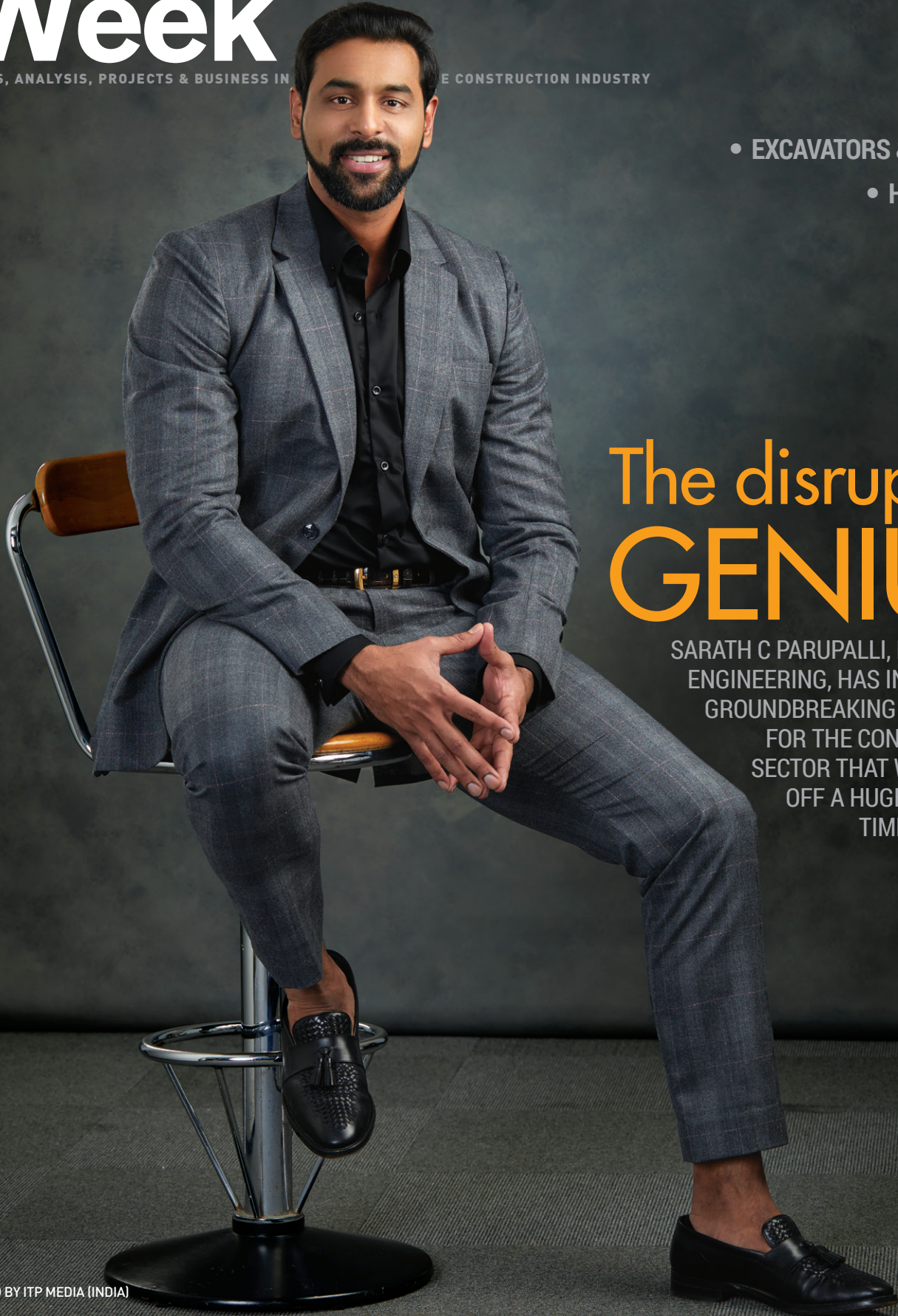
Construction Week

NEWS, ANALYSIS, PROJECTS & BUSINESS IN THE CONSTRUCTION INDUSTRY

- EXCAVATORS & LOADERS
- HIGH-RISES

The disruptive GENIUS

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Sarath C Parupalli, MD, Maiwir Engineering, has introduced groundbreaking solutions for the construction sector that will shave off a huge chunk of time and cost

BY JAYASHREE KINI MENDES

Think of it and you will realise that some of the greatest inventions and discoveries in history happened because its creator took up one idea, made that idea their whole life, gave it much thought, and dreamt and lived it. More often than not, these ideas were not accepted by authorities and the creator would have to scout for open and willing minds willing to accept and change the old way of doing a job. It's how entrepreneurs are born.

Sarath C Parupalli, MD, Maiwir Engineering, would understand this journey very well.

Way back in 2010, after completing his Masters in Mechanical Engineering from Canada, Parupalli did a brief stint with a start-up medical company in the US. But deep inside, he knew that he wanted to play a key role in India's infrastructure sector. Importantly, he wanted to add value and change the age-old ways of constructing. However, most exemplary is the way Parupalli has worked towards staying relevant to the customer and, in the process, better his dominance. And a large portion of the credit for that goes to the man many believe – and rightfully so – to be a revolutionist.

SLOW AND STEADY

For the young Parupalli, it was important that he bring in a technology that will drastically cut down construction time and cost. In his words, "By investing for many years in R&D and on-boarding a



▲ A section of the steel composite bridge under construction.

WHAT MAIWR BRINGS TO THE TABLE

- Composite steel tech will contribute to a great extent
- Construction of high-rise building structures in composite-steel has been rapidly increasing due to distinctive advantages such as:
 - ▶ Improved structural integrity
 - ▶ Faster construction - Construction time is reduced by 60% or more
 - ▶ Quick & easy erection
 - ▶ Less manpower & increased safety
 - ▶ Wind load & seismic load resistant
 - ▶ Significant reduction in cost and other resources
 - ▶ Concrete is monolithically poured that binds everything together and
 - ▶ Entails less maintenance
 - ▶ Concreting can be done up to a height of 650m
 - ▶ Architectural flexibility is pronounced.

global design team of experts who are abreast of advancements in engineering, we developed a hybrid composite-steel structure system that would bring in a massive reduction in construction time without compromising on quality."

How massive a reduction in time? He is quick to point out: "In India, the average time taken to construct a 1,000 sq-ft house takes around 8 to 12 months; our technology will build a 130,000 sq-ft complex engineering structure in 45 days."

He is convinced that his technology can completely alter the way India builds her infrastructure. For a long time, developers, concessionaires and government authorities have been searching far and wide for solutions that would reduce cost of construction and infrastructure projects through cheaper and stronger materials and also bring down project timelines. That solution has manifested itself as Hybrid Construction technology. Parupali makes it sound easier when he says, "This consists of conventional prefabricated and composite construction methods that utilises different materials and methodologies to form an effective structure. The highest optimisation of complex engineering structure is achieved in well-planned phases. First, the prefabricated steel members and partial precast members are manufactured off-site at a factory yard. In the second phase, ready-to-assemble members are transported from the factory and delivered to the site. The assembled ready-to-fix members are erected and fixed at the site using heavy machinery."

As a highly flexible building system, it is composed of horizontal (beams) and vertical structures (columns), which can



▲ The Gachibowli flyover from Shilpa Layout to outer Ring Road.



▲ The Aeronautical Development Establishment Campus at Bengaluru.

be used either separately or as part of a system depending upon the requirement. It is a global, effective and advanced solution for industrial, commercial, and residential buildings, as well as for large works, infrastructures, facilities, and conservative restoration. An offsite precast yard is set up for fabrication and assembling of the precast elements. Once all the members are installed to form a structural frame, a cast in-situ concrete pour is done monolithically to achieve structural integrity.

So why didn't someone think of this earlier? Shrugging, Parupalli says that this sector is content following traditional practices for ages and is unwilling to try something new. It could also be the reason why he found it tough to make inroads in the market earlier.

What makes it even more interesting is that the benefits of prefabricated hollow caged columns, composite truss beams & cast in-situ concrete will increase productivity, optimise resource utilisation, wind load & seismic load resistant to withstand impact of natural calamities, improved structural integrity, reduce losses caused by wastage, and massively bring down construction time.

At a time when 470 projects between April-June 2021 suffered cost overruns of 61.5%, i.e. Rs 4,46,169.37 crore, such



▲ Early procurement helps Maiwir gain economies of scale and keep costs standard.

novel ready solutions should be considered. Indian growth in GDP during 2021-22 is estimated at 8.9% as against a contraction of 6.6% in 2020-21. Considering the inputs from recent articles, he strongly feels that composite steel technology will improve, to a certain level, India's GDP rate.

MAKING INROADS

Parupalli's erudition and tenacity must have struck a chord in some officials when he was constantly doing the rounds. He struck gold when he completed the job to Design & Build the flight control system complex at the Aeronautical Development Establishment Campus at Bengaluru, for the indigenous development of fifth-generation Advanced Medium Combat Aircraft (AMCA) for India's premier defence agency, Defence Research and Development Organisation (DRDO), under the Ministry of Defence. The 7-storey building with a plinth area of 1.3 lakh sq-ft was completed in a record time of 45 days. "The main structural framework, which is the backbone of the entire building, was completed within 16 days and other services and finishes within 29 days," he adds.

Another ongoing project that thrills him and allows him to prove his claims is the Gachibowli flyover from Shilpa Layout to outer Ring Road. Bring a design & build for Greater Hyderabad Municipal Corporation (GHMC) as part of their road development plan at Hyderabad, Telangana, Maiwir Engineering installed the longest span of 64 meters, which is 18m above the ground, on one of the busiest junctions of Hyderabad. "We ensured completion of this curved construction of 1.5 km long, 16.60 meter wide flyover using heavy machinery like cranes, without causing any hurdles to heavy traffic movement. The peak hour traffic on this route in 2020 stood at 1,464 passenger

"WE OFFER DESIGN, FABRICATION AND ERECTION SERVICES. WE DESIGN HIGH-RISE COMMERCIAL & RESIDENTIAL BUILDINGS, AIRPORTS, SEAPORTS, BRIDGES, HOSPITALS, SCHOOLS, AND INDUSTRIAL STRUCTURES; STRUCTURAL FABRICATION & DRAWING SERVICES; STRUCTURAL STEEL DETAILING; PIER REVIEW SERVICES, STRUCTURAL BIM CONSULTING, AND STRUCTURAL ERECTION."



▲ State-of-the-art machinery helps the company to meet global standards.

car units (PCU) per hour and the projected peak hour traffic in 2040 will be 5,194 PCU per hour," he says with a smile.

He is not stopping here. Parupalli has invested time and efforts to bring in a solution for fast & affordable housing -- Monolithic Insulated Concrete System (MICS technology). "MICS is a well-proven system of formwork for reinforced concrete made with a rigid thermal insulation that stays in place as a permanent interior and exterior substrate for walls, floors and roofs. It results in cast-in-place concrete walls that are sandwiched between two layers of insulation material. The forms are interlocking modular units that are dry-stacked (without mortar) and filled with concrete, once laid out. Imagine the pace of construction to make real the government's Housing for All campaign," he avers. India's premier certification body, BMTPC (Building Materials Technology Promotion Council) under Ministry of Urban Development has certified this technology for fast & affordable house. He is also part of the stakeholder committee under CII-IGBC in drafting the Green-Affordable Housing Standards of India.

It is ironic that Europeans recognised the advantages of Mai-



▲ With most of the work done in-house, it's easier to meet quality standards.



▲ The company has a massive 50,000 MT pa manufacturing facility.

wir's solutions a few years earlier than Indian companies did.

Although the engineer bent of mind looks at bettering the products and solutions, Parupalli needs to be a sharp eye out to succeed in the business. His main material is steel – a highly volatile material – and whose procurement must be planned. He is unfazed. Says he, "As we scale up our business, our plan is to tie up with major producers for large scale supplies. Generally in conventional method of construction, steel is procured phase-wise because of the time period available, whereas in our model we can procure the steel in one go, thus

THE MANUFACTURING FACILITY

Maiwir's state-of-the-art manufacturing facility at Jadcherla, Telangana, has a capacity of 50,000 MT pa. The use of continuous CNC controlled automatic SAW machine, shearing machine, multi-torch machine, drilling machine and other sophisticated production equipment makes Maiwir Engineering a technology-driven company to the core. In order to cater to the rise in demand for more sustainable infrastructure, it's expanding its capacity by partnering with other manufacturing facilities across the country and also in the Middle-East to achieve tonnage of steel fabrication. Continuous improvement is a part of its work ethos. Towards this end, it regularly adopts new technologies and automated processes to sharpen its competitive edge and become a trailblazer.

reducing the risk of steel price escalations."

Sourcing from primary producers also compels the company to verify the material test certificate with NABL certified test agency and also on its in-house mechanical & chemical testing machines.

MAKE IT LAST

A pertinent question that arises here is the sustainability factor that has the world and every large company racing to set net zero targets. The construction industry is the largest contributor to greenhouse gas emissions. Experts say that the global construction & demolition waste market size is estimated to grow from \$26.6 billion in 2021 to \$34.4 billion by 2026.

This is where Maiwir contributes to reducing construction and demolition waste:

- **Concrete (1% to 5% in normal RCC buildings):** Pouring concrete in the shuttering area causes concrete wastage, but in the Maiwir Composite system, shuttering is a part of the structure and hence there will be minimal or no wastage.
- **Shuttering board:** (6% to 7% in normal RCC buildings): The shuttering boards are carved or cut for concrete works, whereas in our composite system there is no requirement for such shuttering boards.

He has got his wicket well-guarded. His resoluteness, attitude and motivation to become a person of value is what will enforce government authorities and construction companies to change their way of doing business, thus bringing about a change in the industry at large. **ew**