Gamechangers of design

Manit and Sonali Rastogi of Morphogenesis share how they conceptualise and realise green structures of all shapes and sizes

INTERVIEWED BY RASHMI NAICHER

Every architecture and design firm — particularly those that are committed to sustainability — has a particular design language through which it communicates its philosophy. At Morphogenesis, one of the leading practices in India and a pioneer of sustainable design, the design language is forged on the foundation of climate-responsive design, harmonising architecture with the environment.

Four aspects are central to the firm’s philosophy: the design is conceived through first principles and through the lens of SOUL — Sustainability, Ökonomie (Economics), Ubiquitous (Universality) and Liveability. The firm’s belief in sustainability shapes all its projects, and forms the very basis of design. “Our approach is to design in a manner that reduces consumption of resources and energy, resulting in up to 50% less energy consumption than certified green building benchmarks,” explains Rastogi. “Our projects are designed to perform at an efficiency level that is in line with the principles of energy conservation and sustainability.”

In a country like India, the climate plays a crucial role in determining the cost of building and the performance of the building. “The key is to understand the local climate, to design and build for the climate, and to use materials that are locally available and sustainable,” Rastogi adds. “Our approach is to design buildings that are not only energy-efficient but also resilient to the changing climatic conditions.”

The firm’s projects are designed to be adaptable and flexible, allowing them to respond to changes in temperature, humidity, and other environmental factors. “We believe in designing for the future, in creating buildings that can adapt to changing needs and conditions,” Rastogi says. “Our approach is to design buildings that are not only energy-efficient but also resilient to the changing climatic conditions.”

Morphogenesis recognises the importance of sustainable design, and its projects are designed to meet the highest standards of sustainability. “We believe that sustainable design is not just about reducing energy consumption, but also about creating healthy and comfortable environments for people,” Rastogi says. “Our approach is to design buildings that are not only energy-efficient but also resilient to the changing climatic conditions.”
that processes ultimately are as the service of the reducer. Hence, inflexibility is the core of the design process to build genuinely smart environments.

The founders elaborate: “We consider mobility, security, outdoor comfort, technology, health and well-being, ease of facility management and disaster readiness to create spaces that work well for all users. Architecture, design and urbanism must be in sync with the forces of urbanisation, globalization and technology.”

It is this bridge between tradition and modernity where the work of the practice is perceived, and why the couple place emphasis on the Indian perspective in the global narrative.

Establishing and running a successful practice is credited to Mani’s education in sustainability as well as work with John Frazier (“with whom I studied evolutionary design”) as his major influences till date. “Frazier introduced me to sustainable and the interconnected universe, to evolutionary space and time, and that gave me our vision and purpose. Simon’s help led me to understand the science of passive design, that forms the basis of the work we do today,” he adds.

For Sonali, being Indian and living in an evolving, diverse country with varied craft and style of working and materials—simply being surrounded by the environment and history has been key in shaping her thought process. “Our education at the Architectural Association (London) exposed us to cutting-edge architecture and discourse on design, furthering our ability to see and absorb. It is an institution, not a person that helped me on to a path of almost constant development of sustainability and not a one-time influence,” she explains.

Influenced by these influences, the duo co-founded Morphogenesis 23 years ago to expand the boundaries of architecture and urban design. Their goal is to achieve design as well as built excellence.

“Our working strengths are complementary, which makes us a solid team,” Sonali states. “On a project level, we brainstorm concepts. Frazier works towards defining the passive design strategy setting out goals and metrics that need to be achieved. I am the details person, carrying that through into the actual design, ensuring efficiency in delivering projects on time and to quality.” In this synergy that keeps the wheels moving at Morphogenesis.

One of their significant achievements is a belief that processes in nature are a continuum, evolving for different parameters, and so do people and architecture. “To place Indian architecture on a global platform means that we will always be wearing the wisdom of 5,000 years of India’s construction history with current day aspirations, aesthetics and technologies,” explain the architects.

The practice was set up as a time when India was at the cusp of globalization and in the midst of a paradigm shift in design thinking. Their desire was to bring Indian design to the forefront of global discourse since “architecture, design and urbanism as processes needed to be in step with this radical shift.” So, they chose architecture to bridge boundaries and through discourse, set the ground for evolution and innovation, and engage with society to make architecture more relevant to the common man.

“We have become architectural activists in an attempt to affect change in our cities,” says Mani. “Recently, they exhibited “The Fractal Metropolitan Layer”, Morphogenesis’ ongoing mission to revive Delhi’s historic nullah network. The endeavor embodies the practice’s urbane, environmental, architectural, socio-cultural and artistic dimension. The aim is to create a new metropolis, a sustainable network in the capital. Besides public interventions, their overall work employs passive strategies by responding to the local climate and ecology. We have successfully created prototypes that achieve a 30% reduction in freshwater demand, use 50% less energy than established green rating benchmarks, without incurring additional costs.”

Morphogenesis is proud to state that over the last ten years, they have optimised an area of 3,200 square metres of built environment, benefiting over 2,000,000 inhabitants. They have also pioneered the use of terracotta tiles for building facades in India.

Grunnsaus extensive experience, they are well versed with the challenges faced while designing sustainable commercial and institutional spaces. “These are driven by two completely different sets of parameters. Their scale has gone up in the last two decades. In many ways, it is a new construction technology; they say it is nonetheless an exciting technology for us to be involved in; to experiment with materials, help design, and develop globally appraised, viable and robust commercial architecture. As for institutional, the process has to be bankable for projects. However, the notion and perception of an institutional space by the modern Indian academic has changed, they point out. “Space is no longer a physical entity. Learning is no longer limited to a particular space. In a world geared by the internet, learning is digitised and our structures must embrace that.”

In a world geared by the Internet, learning is digitised and our structures must embrace that. This is evident in the commercial segment, which has made them aware of how external factors influence design. From concept to execution, an area of expertise for the duo, is a perfect example of the importance of sustainability. “The central idea is to make efficient use of the financial ability of small and medium enterprises to form a large part of and contribute greatly to the construction industry. We see the growth towards high-end software that enables visualization, modelling, virtual environments, etc. These too keep evolving with time. Our adoption to newer forms of technology is not the barrier. It is the ability of every professional not everyone, can afford it.”

Morphogenesis’ focus on sustainability and innovation has earned them several awards and recognitions, both national and international, including the prestigious National Award for Sustainable Architecture and Design, and the UN-Habitat Award for Sustainable Cities and Human Settlements.

For the future, the practice plans to continue its focus on sustainability and innovation, with a particular emphasis on digital design and sustainability. “We are looking at ways to integrate digital technology with sustainability, for example, using digital simulations to explore building performance before construction begins.”

In an interview with the practice, they expressed their optimism about the future of architecture in India. “We believe that architecture in India is entering a new phase of innovation and creativity. With the increase in the middle-class population, there is a growing demand for sustainable and affordable housing. We are working on developing sustainable housing solutions that are affordable and accessible to the masses.”

The practice has also been involved in several social initiatives, such as the design of affordable housing solutions for low-income families. “We are committed to making architecture accessible to everyone, regardless of their economic status,” they said.

With their focus on sustainability, innovation, and accessibility, Morphogenesis is a practice that is truly ahead of its time. They are a testament to the fact that architecture can be both beautiful and sustainable, and that it is possible to create a world that is not only aesthetically pleasing but also environmentally friendly.
**Case Study: City Centre, Siliguri**

Located at the foothills of the Himalaya in Siliguri, West Bengal, City Centre is one of the largest commercial developments in eastern India, spread across 115,000 sqft. Positioned at the interface between the city and the township, it is a much needed, organized commercial district for the city. The City Centre is a sustainable and commercially successful development with an embedded agenda for enhancing the socio-cultural engagement of the inhabitants.

A good example of how built form can work with local climate, the retail complex is designed to keep common corridors and areas naturally ventilated along the line of the prevailing wind direction. Perforated rain screens are used for large parts of the facade to keep rain out, while allowing ventilation for a pleasant microclimate inside, despite high humidity. In keeping with the traditional Indian scheme of high streets and porous spaces, it breaks down into a complex web of well-scaled structures and offers maximum interaction to users. The finishes of the building are simple, creating a back-up for the local art school students to exhibit their work, energizing the space by participation, enriching the space with urban art and culturally rooting the development in the artistically rich heritage of this region.

Commonwealth contribution has led to mutually beneficial opportunity for the space at no cost.

The Siliguri Township's success is due to being sustainable in terms of social equity and economic viability. The project set Morphogenesis' direction of creating settlements to be ecologically viable, culturally sympathetic, and visibly capable of sustaining the dynamic processes of life and growth.

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**Case Study: ITC Campus, Kolkata**

Located in Rajarhat, an upcoming suburb of Kolkata, the ITC Campus has a mixed land-use brief with IT and commercial offices, hotel, convention centre and residential towers. Being conscious of the region's philosophical bent and cultural pride, Morphogenesis created an identity for the project wherein buildings become the physical manifestations of the local's rich arts and artisanal culture. The thread that weaves the mixed-use commercial development together is the culture of Bengal, reflected in its literary heritage, music, fine arts, drama and cinema.

The tension of buildings is planned along a central spine, while stitching of the form led to a 15% reduction in usage of steel. The urban footprint of the tall, soaring stone facades on the east and west have been manifested as vertical canvases in the form of intricately carved metal, showcasing local art and craft. Eschewing Bengal's craft and Tagore's writings on the environment are the inspiration for the crafted stone facades of the lower scale convention centre in the foreground.

The urban space is used as a plazamaking tool to host and celebrate the Bengal socio-cultural ethos, which is one of discourse, deliberation and communal harmony. Taking inspiration from the pandal (temporary pavilions), public spaces have been segmented along the entire central spine as open-air museums with sculpture and art installations adding to the sense of place.

For this project, Morphogenesis involved the crafts community and emerging artists from Bengal to bring craft back to the public realm.

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**Project Information**

**Client:** Ambuja Neotia

**Built-up Area:** 96,000 sqft

**Site area:** 10 acres

**Consultants:**

- **Structural:** SPA Consultants - Sanjiv Parekh
- **HVAC:** Chandrachandran Consulting Engineer
- **Plumbing:** RK Solutions - Raza Sarkar
- **Electrical:** DB Indoor - Dipankar Banerjee
- **Landscape:** Design: Integral Design
- **Fire Fighting:** CRS - Prateek Bapu
- **Façade:** Morphogenesis
- **Photography:** Andre | Panchhane, Edmund Sumner

**Contractors:**

- **Civil:** Simplex Projects
- **Structural:** carrier
- **HVAC:** ANM
- **Plumbing:** Sreeam Builders
- **BMS:** Elmark Engineers
- **Roofting Systems:** Kirti Building System India Ltd
- **Facade:** Niton And Amares Private Limited

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**Project Information**

**Client:** ITC Pvt. Ltd.

**Built-up Area:** 30,000 sqft

**Site area:** 17 acres

**Climate:** Warm-Humid

**Consultants:**

- **Structural:** Sterling Engineering Consultant Services
- **M&E:** AECOM
- **Plumbing:** AECOM
- **Electrical:** AECOM
- **Fire Fighting:** AECOM
- **Green Consultant:** AECOM
- **Lighting:** Design Matrix
- **Hospitality:** HPC Consulting
- **Traffic:** Traffic & Transportation Engineering Consultants
- **Quantity Surveyor:** IM Cost Management
- **Security:** Mahindra SSG
- **PM:** ITC (Client)

**Façade:** Modern Facade Technology

**Sustainability:** Morphogenesis

**Landscape Design:** Morphogenesis

**Interior Design:** Morphogenesis

**Master Planning:** Morphogenesis

**Contractors:**

- **Piling:** Geo Piling Solutions
Cover story

**Case study: Maker Maxity, Mumbai**

Described almost two decades ago, Maker Maxity is a sprawling 20-acre property at the mouth of Bandra Kurla Complex in Mumbai. It is a mixed-use commercial development comprising five commercial towers. The site was a drive-in theatre that had been deserted since the late 1990s. As the first project to come up in the area, Morphogenesis considered it important to make the placemaking exercise almost take precedence over the building exercise. It was envisioned as a large integrated complex to revive public space and create a microcosm of a city within a city. The campus was divided into three phases with the institutional and office hub coming up first. Morphogenesis used these blocks to define the front to establish public presence. Over the last few years, after tremendous success and the validation of its placemaking exercises, phase 2 and phase 3 are now under construction. This commercial success validated the early design decision of not treating each building as a self-contained plot with its own set of terraces but actually treating the entire project as an urban placemaking exercise with no boundaries. The landscape played a tremendous role—carefully designed water curtains and pergolas have almost made a new city a non-entity, creating a sense of an entirely pedestrian campus. A large network of public amenities such as cafes, gyms, and art galleries on the ground level have also enhanced the environment. This has resulted in increased public engagement and presence throughout the day. Well-embellished and landscaped outdoor and indoor public art collection across the campus and the lobby has further augmented the placemaking exercise, making Maker Maxity a robust, thriving, and learning environment.

Morphogenesis considers the rain during monsoon season, which hampers local municipal services and severely affects the way of life. So, a strong disaster and flood mitigation strategy was incorporated into the architectural design by Morphogenesis. Combining data from high tide levels, data on the maximum rainfall received, and the displacement water from the catch basins of BKC were studied. The result was that the entire datum of the site was designed to be one metre above the flood. Additionally, heavy rainwater from the campus runs along the site with sluice gates (like in a dam) where they exit the site. In case of a flood, these are shut to allow the water to exit the site. The validity of the design innovation was proven soon after completion, when Maker Maxity was the only site in the region that stayed dry during flooding.

**PROJECT INFORMATION**

**Typology:** Commercial

**Location:** Bandra Kurla Complex, Mumbai

**Client:** Maker Developments

**Built-up Area:** 10,766,000 sqft

**Site area:** 20 acres

**Climate:** Warm & Humid

**Consultants:**

- **Structure:** Stirling Engineering Consultancy Services
- **HVAC:** Spectrum Consultants Pvt. Ltd.
- **Electrical:** Spectrum Consultants Pvt. Ltd.
- **Landscape:** Integral Design and One Degree North

**Photographer:** Maker Maxity

**Case study: Surat Diamond Bourse**

Morphogenesis is proud to have won the competition and to be executing the world's largest building. India's gloss shines at 15% of the world's annual diamond trade and Surat being the capital of this trade. With a built-up area of 65.5 lakh square feet, the Surat Diamond Bourse is set to be the world's largest commercial office building. It will accommodate over 4,500 offices of diamond traders. Exploiting to be the centrepiece of the international diamond trade.

The design brief called for the provision of a single function office to accommodate the local industry. More than 95% of the world's diamond pieces are cut in Surat, contributing to about 80% of India's annual diamond export. Amounts to about Rs. 70,000 crores. Currently, there is a huge population that travels daily between Surat and Mumbai to trade. The upcoming bourse aims to centralize all activities of cutting, polishing, and trading in Surat. For a single building of this scale, movement patterns, nature of the trade, and human interaction became key design parameters. The challenge was to enable easy navigation for large volumes of people within trading time.

Multiple vertical circulation nodes such as stairs and elevators across each floor have been placed within one-minute walking distances of each other. This would enable over 65,000 people daily to reach their respective offices in under seven minutes from the point of entry into the complex, including high-level security checks. Traffic studies, ingress and egress points, and juxtaposition of various functions with different types of people — of all an extensive role in the plan.

The building is planned along a central axis that's aligned with the prevalent wind direction. The North-South oriented towers provide glass-façade, office, and accommodating functions of trading and selling of diamonds, customs, etc. The central spine is used for interconnection between towers on every level. The building forms aim at maximizing the potential of self-shading, thereby reducing dependency on other forms of cooling. Forty percent of the total area is controlled by radiant cooling, making it the largest installation of its kind across the globe.

The central axis connecting all the offices is designed as an interactive hub comprising of breakout spaces and green areas. These not only act as the lungs of the building but also address the chance, interaction and transitional nature of business. Outdoor spaces have been designed in the form of nine courtyards to foster social cohesion and community engagement. The use of dense vegetations within these courtyards have psychological advantages, improve air quality and provide thermal comfort as well as sociocultural event spaces.

The campus aims to integrate the demands of high-density commercial architecture and an efficient climate-responsive design. It will be equipped with state-of-the-art amenities — walk-in display units, exclusive clearance house, world-standard convention centre, exhibition centre, training centres, entertainment areas, restaurants, and a club. The bourse is located at the large central business district and is to be the destination of attracting regional developments with allied civic amenities. Currently, the diamond industry in Gujarat employs more than seven lakh people, most of whom are based in Surat. Once completed, this bourse is estimated to provide employment opportunities to lakhs of people and generate economies in the area, boosting the regional economy and putting Surat to become the world's largest diamond trading hub.

**PROJECT INFORMATION**

**Project Name:** Surat Diamond Bourse

**Typology:** Office

**Location:** Surat, Gujarat

**Status:** In progress

**Client:** Surat Diamond Bourse

**Built-up Area:** 65.50,000 Sq Ft

**Site area:** 35.5 Acres

**Consultants:**

- **M.E.P.** AECOM
- **Civil & Structural** IV Consultants LLP
- **PM & EPC** Masters
- **Vertical Transport** TAK Consulting Pvt. Ltd.
- **Traffic** TTC

**Cost:** Godrej Hootboom Consulting (India) Pvt. Ltd.