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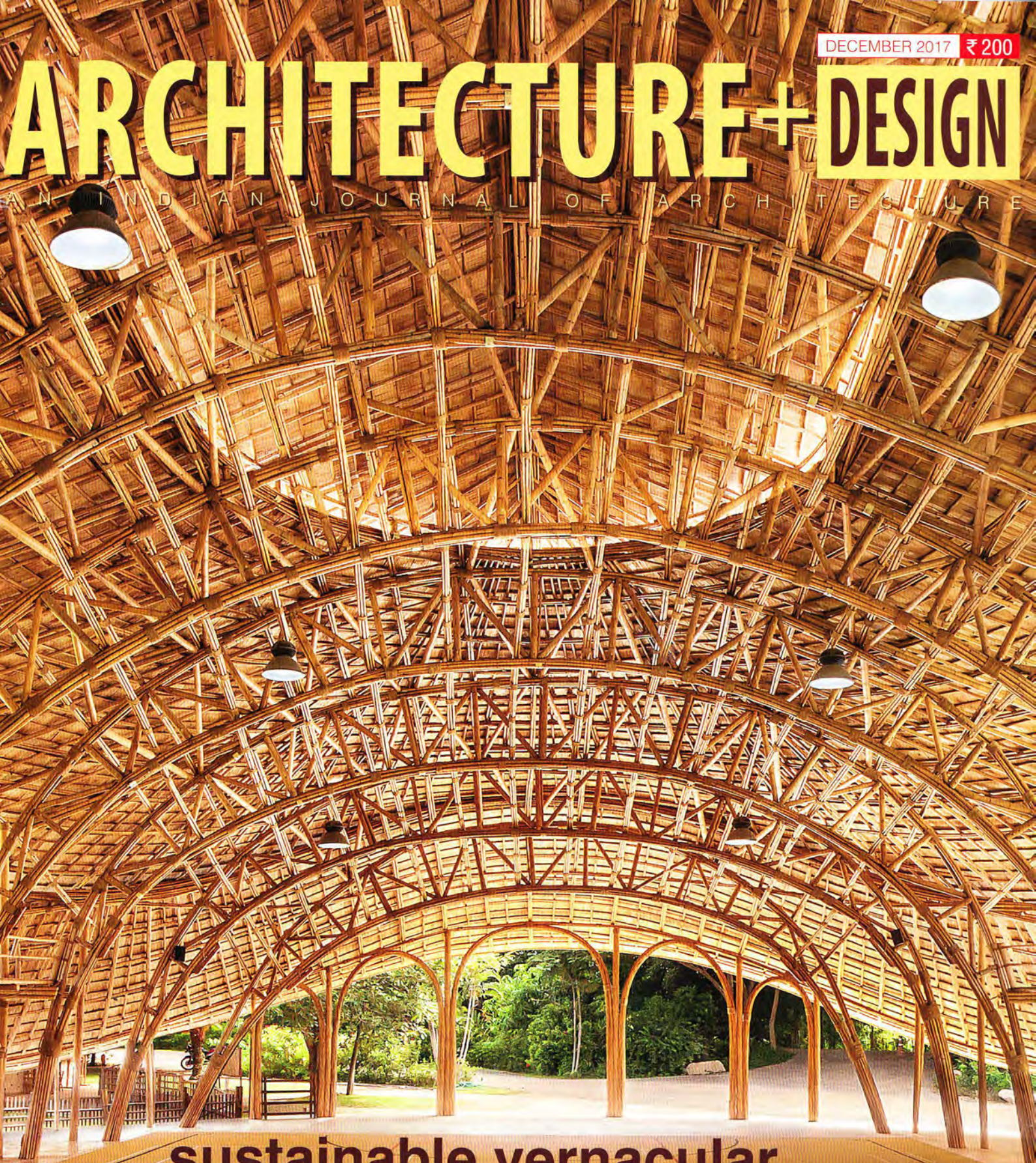

sustainable vernacular

"What will endure is what is uniquely human"
—Jennifer Leonard

"The good building is not one that hurts the landscape, but one which makes the landscape more beautiful than it was before the building was built"
—Frank Lloyd Wright

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Inspirations from Sustainable Vernacular in Contemporary Architecture

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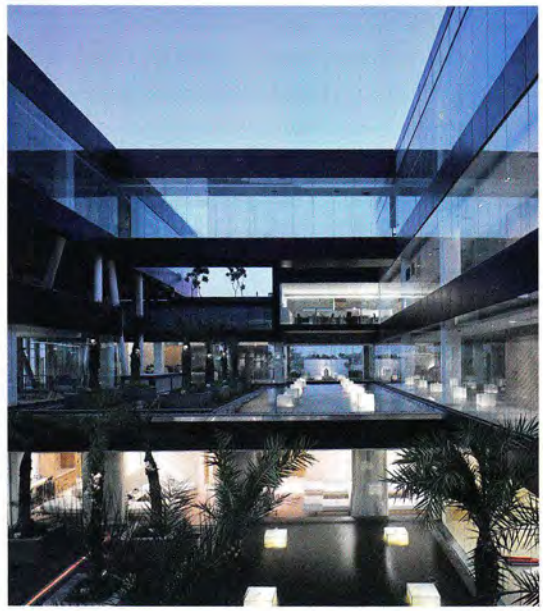
Amongst many issues plaguing Indian Architecture and Urbanism today, there is the larger issue of identity; what is Contemporary Indian Architecture? What is 'Brand India' when it comes to Architecture? Is there a need to develop a discourse – a global discourse – on Indian Architecture? What about Indian Architecture needs to be propagated? Indian Architecture of the past has successfully addressed architecture in a sustainable way whilst creating adaptive, affordable, liveable, socio-culturally responsive and visually-enriched architecture, usually in response to not having access to abundant resources of water and energy. In a world struggling with environmental degradation, this is a highly valuable skill. The real question is how can we take what we were really good at and create a model for the future based on the present, where finance, globalisation and pre-conceived imagery currently take centre stage?

We believe that though project briefs are getting increasingly 'global', the response needs to be deeply rooted in the 'local'. A critical position needs to be established that is or will be embedded intrinsically in contemporary Indian architecture. It must deal with all issues unique to our economics, sociology, history, diversity, all within the gamut of our Indian-ness. Our cities and architecture must necessitate an impetus to redefine the way we tend to live as modern Indians. Today, developments across India are being designed with a layer of sustainability or 'green' superimposed. There needs to be a conscious attempt to step away from this overlay system of green points and instead incorporate passive approaches to design, right from conceptual and planning stages. Unlike other nations, local resources, materials and methods of construction are still easily available to us. It is imperative that we, as Indian architects, take a few steps back into the past, to be able to find solutions for creating a sustainable future.

Sustainability beyond purely energy consciousness – to encompass environmental, social, cultural and financial, has elicited varied architectural responses from us, which sit within our investigation into architecture through three pillars – passive design, resource optimisation and contextual identity. The key to our approach is to take inspiration from sustainable vernacular techniques of the past and today's technologies, to create contemporary architecture that is not only highly sustainable but is also adaptive, affordable, imageable, liveable and socially and culturally responsive.

This is succinctly captured in an extract from the foreword by Michael Webb, architectural critic and co-founder of Archigram Group, "Around the world, architects are challenged to infuse new forms with the legacy of the past and the spirit of place.

India Glycols Headquarters, Greater Noida *(Photo Credit: Andre J Fanthome)*


In an age of globalisation this has become a critical issue, especially in emerging nations that have embraced generic modernism in their race to catch up, we are a notable exception that roots its work in the environment. It abstracts the vernacular with no resort to mimicry, and it achieves sustainability by an intelligent use of traditional materials and techniques. It would be hard to overstate the importance of this achievement.

One of the key projects that best reflects this ethos has been the Pearl Academy in Jaipur. Pearl Academy is an attempt to develop an 'architecture of somewhere' at a time when there is a paradigm shift in architecture towards a landscape sprinkled with identity-less models of 'generic modernism'. Looking at the project through the lens of sustainability, passive features lend themselves to the identity of Pearl. This project in Jaipur is geared towards creating an environmentally responsive, passive habitat. A radical fusion of traditional and contemporary architecture, the institute creates interactive spaces for a creative student body to work in multifunctional zones that blend the indoors with the outdoors seamlessly.

Pearl Academy, Jaipur *(Photo Credit: Andre J Fanthome)*

The introverted building design compensates for the unloved industrial nature of the site's surroundings. This building takes an optimised rectangular form derived from Jaipur's traditional building morphology, which is typically of a high density and opaque exteriors with more fluid interiors. Despite its compact, rectilinear external form, Pearl's internal courtyard shapes provide a sense of the perpetual, infinite – a continuous and fluid space with no end; like a Mobius strip.

The architecture is a confluence of modern adaptations of traditional Indo-Islamic architectural elements and passive-cooling strategies commonly used in Rajasthan's desert climate, such as self-shading courtyards, water bodies, baolis and jaalis to negotiate the large differential between internal and external temperatures.

The building is protected from the environment by a double skin, which is derived from a traditional building element, the *jaali,* which is prevalent in Rajasthani architecture. The double skin acts as a thermal buffer between the building and its surroundings. The density of the perforated outer skin has been derived using shadow analysis based on orientation of the façades. The outer skin sits 4 feet away from the building and reduces direct heat gain through articulated fenestrations, yet allows for diffused daylight. The *jaali* thus serves the function of three filters – air, light and privacy.

Traditionally inspired low-cost methods of roof insulation have been used to cut down heat absorption. Inverted matkas are laid across the surface, the space between filled with sand and bricks and then cast over with a thin, binding layer of concrete.

The underbelly, derived from a traditional *baoli,* employs earth sheltering, thermal banking and evaporative cooling to modulate surrounding temperatures. Temperature and climate analysis for this region shows that at a depth of 3 metres the ground temperature equals the average temperature of the region, which is about 25ºC. This, along with evaporative cooling, achieves stable temperatures of about 27ºC inside the structure without the use of air conditioning, even when outside temperatures are up to 20ºC higher. The space serves as a large student recreation and exhibition zone with a cafeteria and a performance area, a space for fashion shows, and forms the anchor for the entire project. Manipulation of the program enabled

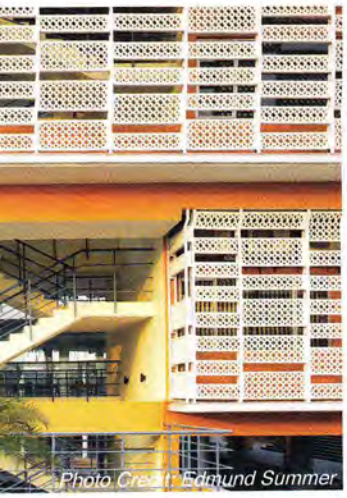
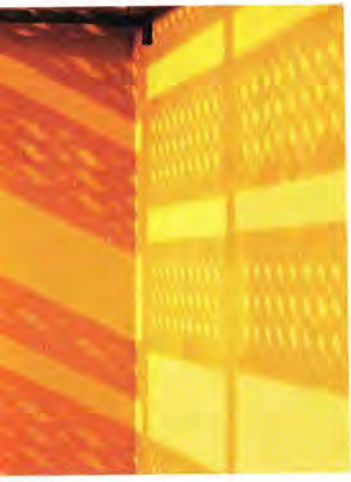


Photo Credit: Edmund Summer



the elimination of a complete built-up floor, as the same functions are now designed to be carried out in the underbelly.

The Pearl Academy is an exemplar of inclusive architecture that is socio-culturally relevant and is inspired by local heritage, while positioning itself within the contemporary cultural and architectural paradigm.

Another typology this philosophy has been applied to is the India Glycols Headquarters building which unlike the Pearl Academy, is fully air-conditioned, yet borrows from local courtyard traditions. Contextually responding to its location on an express highway and the harsh local microclimate – with temperatures that reach up to 50ºC – the project is conceived to fortify itself from the external environment and create a relevant oasis-like internal environment. The morphology is inspired from the ancient development of Fatehpur Sikri, near Agra. The serene interiors are designed as a series of courtyards enclosed within the fort-like external walls. The introverted scheme acts as a heat shield to protect from the harsh climate and bleak exterior views. This building addresses energy, heat and lighting from a sustainable perspective – economising on the first, defeating the second and optimising the third. The opaque exterior walls contain within them juxtaposed volumes that create shade for, and are seamlessly integrated with the central landscaped courts. These courtyards help in creating visual links and provide ocular relief. This inside-outside connect is strengthened by raising the outer landscape to the 'work-desk' level.

Inspired from the traditional *baoli* and kund concepts, microclimate tempering is effected by the multiple shallow water bodies and mist gardens. Evaporative cooling brings down the internal perceivable temperatures by up to 10ºC. 8 metre-wide floor plates ensure the internal landscape is within immediate proximity of every occupant, and the entire office is naturally lit and blinds-free. The self-shading arrangement of the building volumes creates a usable outdoor environment almost year-round and plays a vital role in temperature reduction. Construction techniques and features such as cavity walls, fenestration design, terrace gardening and water bodies aid in reducing solar ingress and absorption.

The rhythmic articulation of volumes and spaces generates a scheme that is a radical departure from the 'sealed glass box' workspace and extends the sense of personal space while achieving high standards of sustainability and livability, yet very 'global' in its visual aesthetic. The design enhances collaboration spaces to allow for socio-cultural intermingling and cross-pollination of ideas, and exemplifies the ideology of 'equity and transparency' in the workplace as an integral part of its architectural vocabulary.

Through all successive projects, we successfully implement this design ethos, also challenging the myth that green buildings are more expensive to build. As a result of incorporating vernacular techniques of the past, the built form responds to the environment and a harmony of interdependence is maintained amid the two. It is this very relationship that will not only create an architecture that is truly sustainable, but which will also build communities that are once again interconnected with nature.

Sonali Rastogi and Manit Rastogi are founders and principal architects of Morphogenesis.