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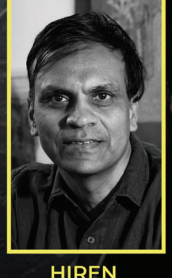

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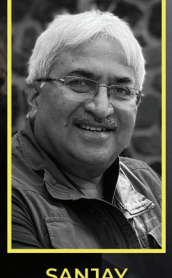

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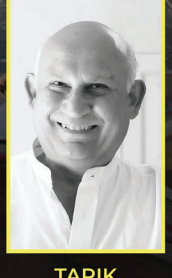

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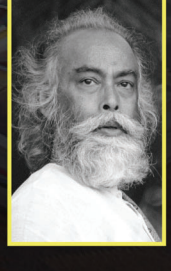

SUBRATA BHOWMICK

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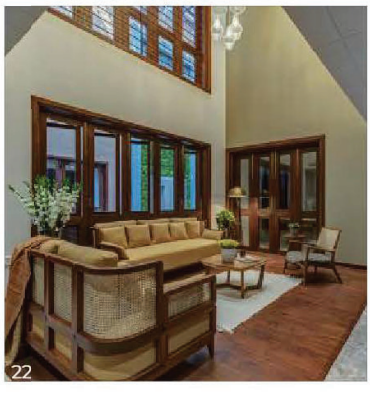

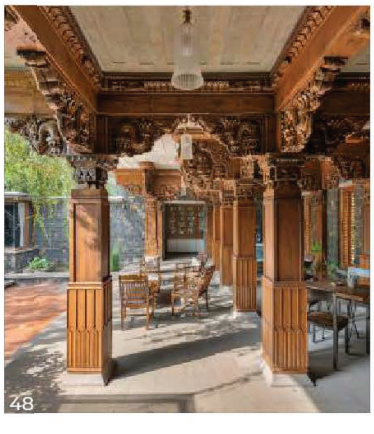

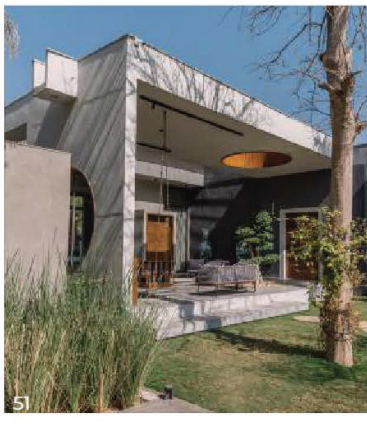

FISH TALK

A 5th generation aquarium at Ahmedabad Science City by INI Design Studio, Ahmedabad

AR. JAYESH HARIYANI

Ar. Jayesh Hariyani, Founder and Chairman of INI (formerly Burt Hill-Stantec Consulting) is instrumental in delivering research-driven, large multi-use developments, marked by good planning, architecture, technology and sustainable principles - having led regional planning & urban design projects totalling 75000+ acres in India.

For the design of 'Aquatic Gallery' – India's largest inland aquarium – INI Design Studio has crafted a 5th generation edutainment facility. A part of the Ahmedabad Science City complex, the aquarium reveals itself as a choreographed narrative of spaces giving visitors an engaging sensory experience, enhanced by well-integrated lighting, AV technology, projections, interactive features and environmental graphics.

Text: Ar. Mamta Dewan Jadwani, INI Design Studio
Photographs: Courtesy Vinay Panjwani

In this emerging environment of knowledge-driven economic growth, it is imperative to inculcate a scientific temper in the community. The Gujarat Council of Science City, established by the Government of Gujarat, has developed the Aquatic Gallery to realize this vision. This 5th generation facility, part of the sprawling 200 acres Ahmedabad Science city, is India's largest and first planned public inland aquarium, designed to bridge the gap between formal science education and the community at large.

The design of the Aquatic Gallery is derived from the intricate and harmonious forms seen in Nature; the spiralling, mysterious structures of galaxies and the exquisitely proportioned shells found abundantly along the Gujarat coast. The primary inspiration is drawn from the nautilus, a marine mollusc which is a captivating example of nature's exquisite design. The nautilus is a beautifully segmented and spiralled shell, that is not only a protective home for the mollusc but also a testament to the efficiency of natural engineering. This logarithmic spiral structure is formed by a series of interconnected chambers, each larger than the previous one, arranged in a precise and geometrically progressive manner.

The circular, segmented, spiral organization of galleries allows seamless movement through spaces of increasing size and continuity, allowing visitors to engage in a choreographed narrative, linked to the building's organic form. The exhibits unfold in synchrony with the circular movement, creating a captivating, living canvas, each section evoking environmental associations and a profound connection to water and life. A steel and glass canopy, resembling a cantilevered petal, enhances the entrance while the 27.5m diameter central atrium, crowned with a steel deck slab, provides a multipurpose space from where the galleries emerge. The form rises at the centre of the spiral, reaching upward for light through clerestory windows.

1

The exposed RCC exterior surfaces impart a dynamic visual quality, including shadow interplays on the façade, with openings resembling the gills of a fish. Visitors are treated to an engaging sensory experience, enhanced by well-integrated lighting, AV technology, projections, interactive features and environmental graphics. Both form and detailing prioritize structural stability and resilience against seismic activities and other natural calamities.

The Aquatic Gallery showcases 71% of Earth's surface at an average depth of 3.5 km, featuring an underwater viewing walkway, multi-level viewing gallery, interpretation centre, and a monumental water-world map floor mural. The 72 exhibit tanks house 12,000 fishes of 180 species, native to various regions and categorized into zones. The life support systems (LSS) provide precise water parameters, including salinity, pH, and TDS levels, chemical oxygen, etc. Laboratories and quarantine areas facilitate regular checkup and testing.

Use of cutting-edge technology facilitated flawless execution of this world-class aquarium. Sustainability is at the heart of the design, utilizing various strategies to reduce energy consumption; such as an insulated envelope and a high-performance glazing system with low emissivity. The structure is designed to be taller on the southern side, self-shading portions of the building


2


3

at all times, and service areas along the perimeter insulate the aquariums from direct heat exposure, enhancing operational efficiency. Solar panels on the rooftop further reduce operational costs.

The atrium benefits from diffused natural light, through fritted glass north clerestories. The lower level houses the exhibits, enabling the majority of water loads to remain at ground level within a controlled environment, promoting stable water temperatures and optimal life support systems. The centralized Chilled Water Energy Efficient System with chillers, pumping systems equipped with Variable Frequency Drives (VFDs), and evaporative cooling for fresh air, collectively save 90 tons of cooling by employing domestic water evaporative cooling for fresh air circulation. Integrated Building Management Systems (IBMS) compatibility is maintained through RS-485 equipped meters. Intelligent lighting systems also contribute significantly to reducing energy cost.

The two biggest resources for an aquarium facility are water and aquatic species. The initiatives taken for both include making use of the reservoir water provided on site and using a closed loop water filtration system to maximize the given water supply and minimize waste.

All Life Support Systems (LSS) for the tanks are supplied with fresh and salt water through the extensive water network. Specialized ZLD system is used for Saltwater Reject, which is then received into waste collection sump and transferred to an evaporator for treatment. This treated water is reused for landscaping; while rainwater harvested from the roof is directed to recharging wells, further minimizing the water footprint. Efficient plumbing fixtures contribute to a 44% reduction in water consumption.

The site being devoid of any vegetation, no trees needed to be cut during construction. Native species have been used for landscaping, thus reducing water consumption and maintenance cost. Both the ground landscaping and rooftop gardens purify, retain, and filter rainwater and also effectively lower indoor temperature.

In this project, design and engineering seamlessly unite to create an optimal environment for the live exhibits. A major challenge was the project execution during COVID-19 pandemic; however no compromise was made on timelines, construction quality, and procurement of fishes across international borders.

Offering a premier edutainment experience, whilst also integrating sustainable design practices, the Aquatic Gallery attracts more than 1 million people annually. Through subsidized visits for school children, and free entry for less privileged rural kids, the project fulfils a social responsibility to promote education and environmental consciousness. ▪

1. The Aquatic Gallery showcasing an immersive underwater walkway

2. A cutting-edge technology used to ensure fresh saltwater circulation

3. The exposed RCC façade creates a dynamic interplay of light and shadow

4. The design is inspired by spiraling galaxies and Gujarat's coastal shells

For more visuals, scan this QR