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Passive design shapes form, orientation, materiality, and openings in anticipation of heat, wind, and sunlight from the outset.

PASSIVE DESIGNS MAKE AN ACTIVE IMPACT

Passive design strategies allow architecture to enter a quiet partnership with climate, drawing comfort, light, and ventilation from nature.

By Bindu Gopal Rao



Passive design is about harnessing nature and creating comfortable environments using natural design strategies.



Saumya Khanna, Founder, Sudhir Saumya Design Associates (SSDA), New Delhi

Passive design is a philosophy that treats climate not as a constraint, but as a generative framework – one that enriches spatial experience and amplifies natural comfort, creating a deeper sense of harmony between the structure and its surroundings. Experts weigh in.

THE CONCEPT

Passive design shapes form, orientation, materiality, and openings in anticipation of heat, wind, and sunlight from the outset. “At the core, passive design is the process of regulating a building’s temperature, ventilation, and lighting with natural elements like sunlight, wind, shading, thermal mass, and landscape, instead of by mechanical systems. It shifts the emphasis from ‘controlling’ the environment to ‘responding’ to it. For us at SSDA, passive design is simply intelligent architecture: when the building is planned sensitively, comfort becomes a natural outcome, not a forced intervention,” says Ar. Saumya Khanna, Founder, Sudhir Saumya Design Associates (SSDA), New Delhi. Passive design is about harnessing nature

and creating comfortable environments using natural design strategies. It is also the foundation of sustainability because a building that uses less energy from the start is inherently more efficient and environmentally responsible. In other words, it is about designing a building to work with the sun, wind, and rain instead of fighting against them.

THE ADVANTAGES

The main benefits of passive design lie in its ability to create buildings that feel inherently attuned to their environment, where comfort emerges naturally from the way light, heat, and air are orchestrated through form and material. “By reducing the building’s reliance on mechanical systems, passive strategies act to enhance energy efficiency, stabilise interior temperatures, and introduce gentler and more nuanced qualities of daylight and ventilation. This approach reduces operational costs over time and allows the architecture to age with more grace, since its performance is rooted in thoughtful environmental response rather than in constant technological intervention. Ultimately, passive design elevates both



Bhuvan Kapila, Co-founder & Principal Architect, Workshop for Metropolitan Architecture (WMA). & Gagandeep Kapila, Co-founder & Principal Architect, WMA.

PHOTO COURTESY: WMA



Passive design works by aligning a building's form and materials with the natural forces present on its site.

TIPS

- Correct building orientation to control heat gain and maximise natural daylight.
- An optimised window-wall ratio so that spaces receive good light without overheating.
- Deep recessed windows and effective shading devices such as overhangs, louvres, and screens.
- Courtyards and atriums that bring in daylight and support natural ventilation.
- Materials with strong thermal mass (stone, concrete, earth blocks) to stabilise indoor temperatures.
- Proper insulation and airtightness to reduce unwanted heat gain or heat loss.
- Cross-ventilation and stack ventilation to naturally move fresh air through the building.
- Roof insulation or green roofs to minimise heat entering from above, the hottest surface.
- Light shelves, skylights, and clerestory windows to bring in natural light without glare.
- Local materials like stone or fly-ash blocks that provide thermal comfort and reduce embodied energy.
- Landscape as a climate tool: trees for shading, water bodies for cooling, and vegetation to improve the microclimate.

PHOTO COURTESY: WMA



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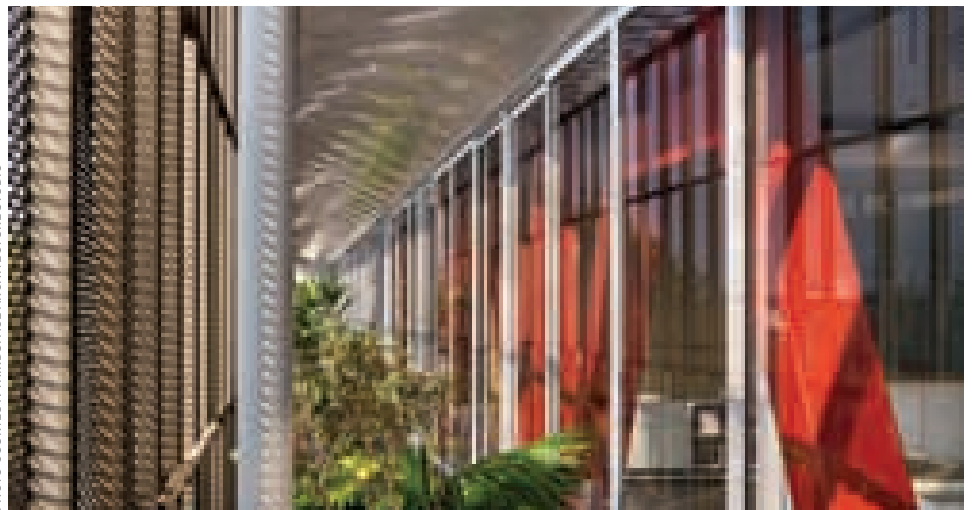
Praveen Bavadekar and Namrata Betigiri, Principals of Thirdspace Architecture Studio

sustainability and luxury, showing refined living can be achieved through intelligence, restraint, and a deeper sensitivity to place,” avers Ar. Bhuvan Kapila, Co-founder & Principal Architect, Workshop for Metropolitan Architecture (WMA).

THE SPECIFICS

Passive design works by aligning a building's form and materials with the natural forces present on its site, letting climate shape performance well before mechanical systems intervene. Praveen Bavadekar and Namrata Betigiri, principals of Thirdspace Architecture Studio, say, “These design strategies are a mix of architectural knowledge, traditional and contemporary building techniques and materials, and traditional knowledge systems,

PHOTO COURTESY: THIRDSPEACE ARCHITECTURE STUDIO



By positioning windows and openings correctly, the building can naturally ventilate itself, bringing in fresh air and creating comfort without mechanical systems.



Common passive strategies begin with placing the building to work in harmony with its climate, allowing orientation to determine how it receives or deflects heat, wind, and light.

as well as a comprehensive understanding of natural sciences. We can achieve better thermal comfort and ventilation just by aligning the built spaces with respect to the natural elements like prevailing winds or the sun's path, or by introducing buffer spaces like verandas, or even by a careful curation of materiality. That is where a deeper engagement with the environment in the design process manifests.”

THE STRATEGIES

Common passive strategies begin with placing the building to work in harmony with its climate, allowing orientation to determine how it receives or deflects heat, wind, and light. Vinod Singhi, Founder & Principal Architect, Basics Architects, says, “The first strategy is to align the building with the sun's direction based on the sun path. This helps the building receive sunlight where it is needed and avoid unwanted heat. A careful study of the sun path, heat gain, and heat loss also ensures that the building can optimise natural light throughout the day. Harnessing the wind is equally important. By positioning windows and openings correctly, the building can naturally ventilate itself, bringing in fresh air and creating comfort without mechanical systems. One of the most critical components is the performance



PHOTO COURTESY: BASICS ARCHITECTS

Passive design can be thoughtfully integrated into existing buildings by improving how the structure interacts with its climate.



Vinod Singh, Founder & Principal Architect, Basics Architects



PHOTO COURTESY: STUDIO 9

Passive design is not a style; it is a mindset that leads to better architecture and better living.



Apoorva Lekha and Sandesh Dhanaraj, Principal Architects at AD Studio 9

of the building envelope. Proper insulation and the right material selection help reduce heat gain in hot climates and prevent heat loss in cold climates. A well-designed envelope plays a major role in keeping the indoor environment naturally stable and comfortable."

THE DIFFERENTIATOR

The critical difference is in the intention. Traditional architecture usually relies on mechanical systems to correct conditions after the fact, but passive design anticipates climate from that very first sketch. Apoorva Lekha and Sandesh Dhanaraj, principal architects at AD Studio9, explain, "Passive design is ultimately about creating buildings that work in harmony with nature rather than resisting it. By thoughtfully using elements like light, air, greenery, and climate, we can design spaces that feel calmer, healthier, and more human. It not only reduces energy use but also enhances the emotional and sensory experience of a space. At AD Studio 9, we believe that every building, whether new or existing, has the potential to reconnect people with their environment through simple, intelligent, and climate-responsive design choices. Passive design is not a style; it is a mindset that leads to better architecture and better living."



Pooja Bihani, Founder, Spaces and Design

THE RETROFIT

Passive design can be thoughtfully integrated into existing buildings by improving how the structure interacts with its climate. Whereas adjusting orientation is not possible, refining the openings, improving insulation, and introducing landscaping elements can significantly improve environmental response. “Retrofitting demands strategic intervention, yet it is decidedly possible. Adding shading devices, improving glazing, enhancing insulation, redesigning ventilation paths, introducing light wells, or even using reflective

PHOTO COURTESY: SPACES AND DESIGN



Passive design does not necessarily increase the initial construction costs; it just reallocates them.



PHOTO COURTESY: SPACES AND DESIGN

Passive principles shape luxury architecture, rooting comfort and sophistication in an intelligent environmental response rather than surface embellishment.

roofing materials can dramatically improve thermal comfort. The changes in landscaping around the building, like dense planting on the west or adding evaporative cooling elements, are highly effective. The best news for most homeowners is that small upgrades can do much to make their old homes more efficient and comfortable,” adds Ar. Sudhir Ambawata, founder of SSDA.

The cost

Passive design does not necessarily increase the initial construction costs; it just reallocates them. Many strategies rely on orientation, proportion, and material intelligence rather than expensive add-ons. Pooja Bihani, Founder, Spaces and Design, explains, “Some elements like better glass or insulation can increase upfront cost. But many passive choices are design decisions, not costly add-ons, orientation, zoning, window placement, integrating greens and courts. At Urban Park, careful planning of layout, massing and landscape at the concept stage helped cut long-term energy use without a big cost jump. Over time, energy savings and better comfort pay back the initial investment. In fact, the urban park sales experience centre was built on a sustainable aspect too.”

THE DESIGN

Passive principles shape luxury architecture, rooting comfort and sophistication in an intelligent environmental response rather than surface embellishment. “When form, materiality, and proportion are informed by climate, the resultant spaces feel calm, controlled, and intrinsically refined. Light moves with intent, temperatures remain stable, and every room carries a quiet air of equilibrium. In such environments, even the quality of glazing speaks to a deeper expression of contemporary luxury: clear, precise, and effortlessly attuned to its surroundings,” says Ar. Gagandeep Kapila, Co-founder & Principal Architect, WMA. Traditional architecture, especially in urban contexts with sealed glass facades, often ignores climate and relies heavily on air-conditioning and artificial lighting. Passive design creates healthier, cooler, and more nature-connected spaces, while traditional designs tend to consume more energy and feel less responsive to their environment. Passive design ultimately helps buildings work with the environment, not against it, resulting in spaces that are sustainable, adaptive, and deeply comfortable. **A&I**

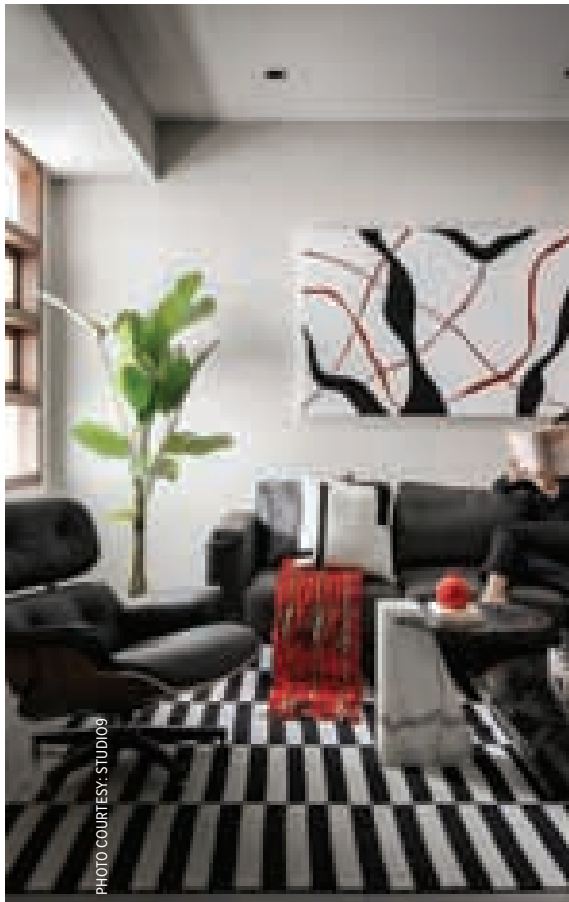


PHOTO COURTESY: STUDIOS

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