Seizing the Space

As office space races towards unprecedented growth across all major cities of the country, suppliers of materials and solutions are making this market segment the focus of their growth strategies

By Mrinmoy Bhattacharjee

Photo Source: Amfis

THERE IS GROWING acceptance of the fact that workspaces are the primary incubators of ideas and nerve centres of business execution. Managements are recognising that their office spaces impact the productivity of their employees, and reflect on their brand as well as the bottom-line. Companies are therefore going back to the drawing board to overhaul the philosophy behind the design of their office space. Besides as realty prices sky-rocket, concerns about occupant safety and security are being heightened and environmental sustainability is becoming the new global norm.

Such thoughts are motivating organisations to redesign their existing workspaces and often take up new spaces across the country. The companies operating in the IT/ITeS, E-commerce, BFSI, Fintech and business consulting sectors particularly are taking the lead in absorbing new office space. Real estate consultants JLL India estimate that office space occupancy will expand to 100 million sft by 2020 in the cities of Mumbai, Delhi-NCR, Bengaluru, Chennai, Hyderabad, Pune, Ahmedabad, and Kolkata (see: *Riding on a Growth Momentum*).

This trend is presenting burgeoning business opportunities for the building products, furniture and interior sectors. And comments emanating from the people heading product and marketing portfolios of major players reveal that the office space is critical to their goals.

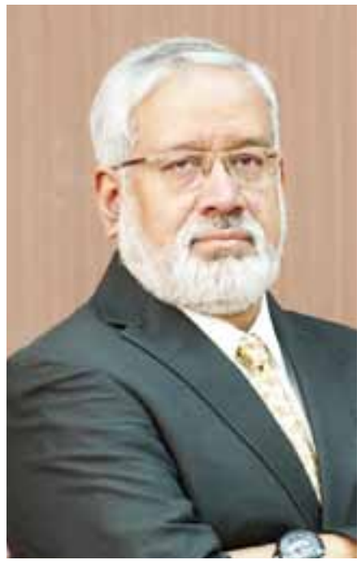
Shankho Chowdhury, executive business head for decoratives at plywood and laminates major Century Plyboards (India) Ltd says, "With an estimated contribution of 20% to the total demand from the real estate market, commercial office is an important demand centre for our laminates and decorative veneer products." He avers that Century will continue to focus on providing relevant products and designs and increasing its footprint in the promising segment to achieve business growth.

Echoes Hardeep Singh, managing director of Gurugram-based Forbo Flooring India Pvt Ltd, the Indian arm of Dutch commercial floor-covering specialist, "With efforts of the government to ease the process of doing business in India bearing fruit the office segment is expected to expand, which makes it one of the crucial verticals to focus on."

HIL Ltd, formerly known as Hyderabad Industries Ltd, recognises the institutional segment as a very important focus area for Birla Aerocon, its green buildings solutions brand. The company has set up a dedicated technical solutions team to promote usage of green building solutions. "This team also provides training on systems and processes to use the products in the best suited manner. The team facilitates our valued clients with processes and project audits," elaborates the company's managing director and CEO Dhirup Roy Choudhary.

"Office and commercial space furniture has a significant share in the overall furniture segment," states Gaurav Bajaj, VP-sales & marketing at Hettich India Pvt Ltd, subsidiary of German furniture fittings heavyweight Hettich Holding GmbH & Co oHG. "It is not a small market that can be disregarded. Secondly it gives us as an organisation a chance to reach out to the end customer much in advance, before he starts building or furnishing his home," he avers. With commercial space leasing being undertaken on a major scale in India, Bajaj foresees an equally big growth in demand for manpower. "Most IT companies hire young talent and this gives us a chance to help the employees experience Hettich fittings very early in their career. When they are at a stage of investing in their own house or furniture, we expect that the Hettich brand would be on top of their mind."

Anup Kumar Tripathi, country head, Sloan India Pvt Ltd, subsidiary of American commercial restroom solutions expert Sloan Valve Company, acknowledges that commercial space has assumed a major role in the company's growth strategy. The company, he asserts, is ready to furnish the growing number of offices across the country that would need to be equipped with premium, water-efficient and hygiene-promoting restrooms.



"OFFICE GENERATES 20% OF TOTAL REALTY DEMAND"

Shankho Chowdhury, Century Plyboards

"EASE OF DOING BUSINESS WILL BOOST OFFICE MARKET"

Hardeep Singh, Forbo Flooring

"CREATED TECHNICAL TEAM FOR GREEN BLDG SOLUTIONS"

Dhirup Roy Choudhary, HIL

"YOUNG TALENT IS OUR FUTURE MARKET"

Gaurav Bajaj, Hettich

"READY WITH WATER-EFFICIENT RESTROOMS FOR WORKSPACE"

Anup Kumar Tripathi, Sloan

"uPVC SET TO GROW PHENOMENALLY"

Satish Kumar, Deceuninck

"IoL WILL REDEFINE OFFICE LIGHTING "

Anuj Dhir, Wipro Lighting

Office buildings are being designed by considering not only thermal loss through windows, but also human comfort and wellbeing, observes Satish Kumar, country manager of Tamil Nadu-based Deceuninck India, subsidiary of the Belgium-based uPVC door and window systems specialist. The company, he says, is poised to grow its business significantly in this space.

Homegrown office lighting tech specialist Wipro Lighting, a part of Wipro Consumer Care and Lighting, foresees about 20% growth in office occupancy rates in leading metros, says its VP & business head Anuj Dhir. His estimates, he says, are based on interactions with the country's leading project management consultants. "We have strong relationship equities with leading

"BUSINESSES ARE EYING NEW ENERGY-EFFICIENCY METHODS"

Ripu Daman Sharma, Lutron Electronics

IT/ITeS, BFSI, corporate, and the specifier fraternity in the country," he asserts. No wonder he is confident of achieving a dominant position in the office segment of the lighting market.

Dhir's optimism also stems from Wipro's past ability to identify the niche in the market — commercial green buildings, and "successfully illuminating approximately 60% of the green buildings in the country" with green lighting technology solutions. In present, he is confident about Wipro Lighting's latest platform 'Internet of Lighting' (IoL) that marries lighting with technology. "IoL is the convergence of lighting and data transmission technology based on Power over Ethernet (PoE) technology, and is crafted for modern workspaces and smart buildings. We are aiming to use IoL to provide smart, connected and human-centric lighting solutions to our customers. We are launching and promoting IoL in all tier-I-cities of India by end of April." What's more, the company has brought the cutting-edge Li-Fi (Light Fidelity) technology to the country under IoL. The technology uses LED light bulbs to transmit the Internet data faster, more securely and safely, than Wi-Fi.

The drive for energy conservation by businesses is making the US-headquartered lighting controls leader Lutron Electronics Inc upbeat about the space. "As awareness shifts towards the increasing benefits of energy-efficiency, many businesses are exploring new methods of conservation," says its country manager for sales in India sub-continent Ripu Daman Sharma. The company's intelligent and highly flexible light control systems, he stresses, are easily integrated and capable of generating substantial savings while contributing towards productivity and the overall aesthetic of offices. "We have the most advanced technology of lighting control while maintaining the top market position in providing exceptional quality and design. Lutron products are designed keeping in mind the ever-increasing demand for energy and its conservation henceforth." ●

Riding on a Growth Momentum

JLL India says that net office space absorption is estimated to cross 100 msf by 2020

IN THE LATEST ESTIMATE by JLL, India's real estate services major, net absorption of office space is expected to cross 100 million sft (msf) by end of 2020 in the top eight cities of India. These cities are Mumbai, Delhi-NCR, Bengaluru, Chennai, Hyderabad, Pune, Ahmedabad, and Kolkata. Office space absorption is expected to grow approximately at a CAGR of 8% over 2017. The office space market has been experiencing robust demand trends which will be fructified in the next two-three years, keeping the office leasing activities buoyant and in an upward movement.

According to JLL estimates, the net absorption for 2018 is expected to be at 30.2 msf to record a positive growth over 2017. Though the percentage increase will be moderate at about 5%, it will be significant as net absorption had been witnessing year-on-year decline between the periods of 2015-2017, dropping below the psychological barriers. The next two years will see healthy increase in net absorption of Grade A office spaces at an average of 10% year-on-year, giving the office absorption market a stable momentum.

Ramesh Nair, CEO & country head, JLL India says, "The office space absorption growth is directly dependent and indicative of economic factors like the growth in GDP, access to institutional capital and stability in the market. India is on a steady rise on global charts as a business location. Demand is expected to come

both from domestic as well as global companies in India. Our estimates of growth sectors impacting the office absorption for the next three years are IT/ITeS, E-commerce and related businesses, BFSI and Fintech companies and business consulting and services firms."

The estimated net absorption for office space in the various cities for 2018 would be strong, with Bengaluru expected to witness approximately 7-9 msf of net absorption leading the volumes. Mumbai is expected to see between 6-7 msf of net leasing activities in 2018. Chennai, Hyderabad and Pune will remain in the range of 4-5 msf each in this year. Kolkata could see anywhere between 1-2 msf of office space absorption in 2018.

On the supply side, the estimate for the next three years is 116 msf, which would also grow at a CAGR of 15% from 2017-2020. This year is expected to see a total supply of 36 msf, adding over 33% msf over 2017. Post that, supply will see a moderate growth of 7% Y-o-Y. The surge in supply in 2018 will be the catalytic push to demand for Grade A office space. Year 2017 saw a significant decline in supply leading to pent up demand, which will get absorbed once new supply comes into the market, maintaining the vacancy rates between 12%-14% on an average.

Nair further says, "The supply and absorption trends have to be seen in overall context of the market where periodically one will outstrip another to maintain stability. The expected growth of the economy in a stable manner will allow the realty market to follow a sustainable trend. A stable trend, which is supported by internal factors of the economy, will help in strengthening the construction sector as well, which in turn feeds back to the economy."

A stability of vacancy indicates a stability of rentals in most locations. Rentals are expected to grow in between 5-8% year-on-year, albeit only in high demand micro–markets of SBD and IT corridors of key markets. The rest of the markets are expected to hold on to current values. ●

Solutions for Wholesome Workplaces

Here are ideas and solutions that specialists propose, to help achieve environmental sustainability, productivity, health & hygiene, cost efficiency, and safety & security

By Mrinmoy Bhattacharjee

Laminates

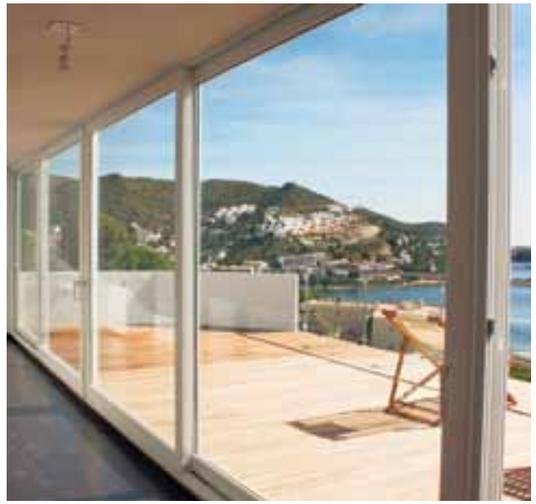
Century Plyboards has developed 'first-in-the-industry' Design Library for its laminates range, to enable architects and designers visualise their design ideas and import them into their technical drawing software such as AutoCAD and 3Ds Max, explains the company's executive business head for decorative Shankho Chowdhury. "We went a step ahead and created CenturyPly Studio app where all the designs can be seen with a click of a button on a smart phone. Just take the picture of the application area/furniture and see the imposed desired laminate design to make the right choice."

Window Systems

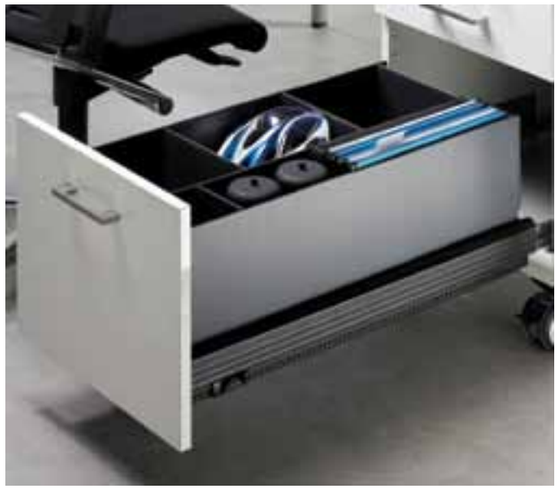
According to uPVC window systems specialist Deceuninck's country manager Satish Kumar, interior designers and architect should evaluate the Visual Light Transmission (VLT) required inside the office space and select the opening sizes and types of glass accordingly. Next to be considered is heat gain, and glass with the appropriate Solar Heat Gain Coefficient (SHGC) chosen. Subsequently, U value and air-infiltration should be considered.

"We have systems from 2.4W/m2K to as low as 1.3W/m2K with conventional systems, and lower than 1W/m2K for passive housing systems. Depending on the air change per hour needed for the office space, the specifier can then choose the system with appropriate air leakage to ensure that the air quality is maintained," Kumar says, adding that noise is also an important factor for overall wellbeing. "Based on the external environment we can recommend the glass thickness, insulated glass, and triple glazing to bring down the noise levels to a necessary comfort level."

He informs that Deceuninckis building awareness about performing windows which can cut off heat, reduce noise, restrict dust infiltration, be water tight during monsoons, and still look aesthetically pleasing. "This is the need of the hour," he states. He adds, "Many people prefer light ventilation during evenings after being in an air-conditioned room the whole day. Our tilt-and-turn systems offer the best solution to ventilate the room. We also have systems with peripheral ventilation to get fresh air into the room."



Furniture

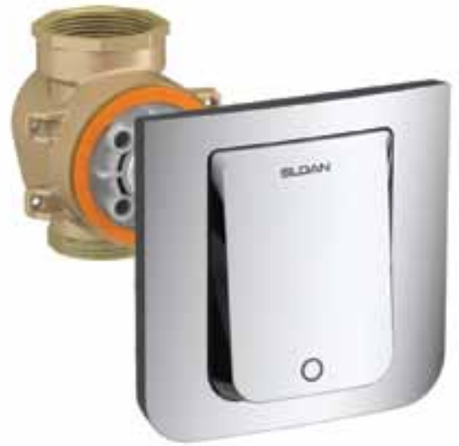


Hettich's VP-sales & marketing Gaurav Bajaj avers that furniture designers can maximise space utilisation, enhance productivity and boost ergonomics for their clients by using Hettich's highly evolved solutions spectrum in fittings. "Systema 2000 and SysTech are ideal for space optimisation," he advises. Both are prefabricated drawer systems with a top pencil tray that has neat bifurcations for storing stationary. The second level is a normal drawer where anything can be stored. The third level is a large storage for hanging file frames. "The system helps in creating neat and organised spaces which maximise storage as well as increase productivity of the users, as everything is easily available to the user of the pedestal."

Informing about other products, Bajaj says that Hettich's Big Org@Tower is a "smart" example of utilising the space between two workstations, which normally gets wasted. Organising the internals in different configurations ensures maximum space utilisation and enhances userproductivity. LegaDrive, with egaDrive Systems Desk support, enables adjustment of height of the work top to any level through use of an electric motor. This gives the user flexibility to work in standing or sitting position. "This fitting greatly improves the ergonomics of the furniture." OrgaWall Organiser System keeps the desk tidy and uncluttered. "It is space-saving in the sense that it utilises the area which would have otherwise got no utility; at the same time it increases the productivity of the user by making things accessible, and in view."

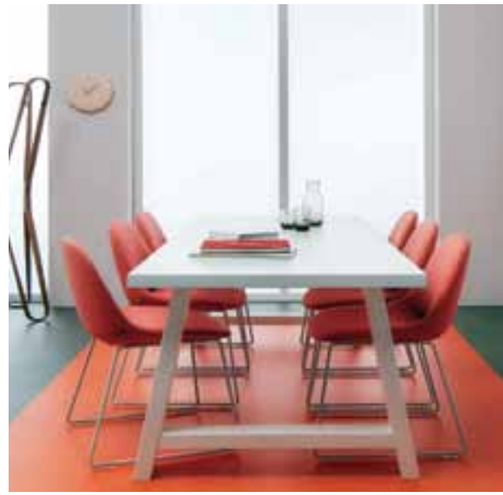
Plumbing

Plumbing specialist Sloan's country head Anup Kumar Tripathi states, "We take responsibility through every part of the product life cycle, from the sourcing of raw materials through usage, consumption, maintenance, and recycling." He informs that Sloan's plumbing solutions can be used to gain USGBC LEED v4 points and/or comply with CALGreen and other building codes. "Many of Sloan's products not only help the customer meet LEED's 20% baseline reductions, but can also help in achieving extra pointsas outlined in LEEDv4 WE credit 2."

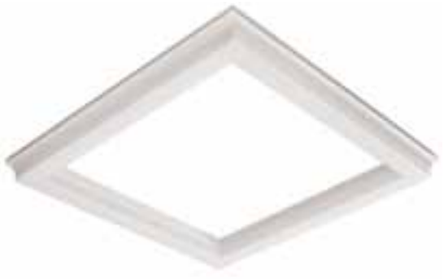


Flooring

Specifers should consider Forbo's vinyl and carpet solutions if they are looking for floor coverings that are environment-friendly and ensure better



indoor air quality, according to Forbo's managing director Hardeep Singh. He asserts that the company abides by its commitment to sustainability that centres on all aspects concerning health, wellbeing and comfort, with regard to its products and services for present and future generations. "All our products are manufactured using green or renewable energy, and the EPDs for each of them are available on the website. Products such as Marmoleum have Cradle-to-Grave and Tessera Carpet Tiles have Cradle-to-Cradle certifications."



Lighting

Wipro Lighting, under its IoL brand, offers intelligent lighting technology that enables users to control lighting through connected devices such as smartphones and tablets. "This helps to enhance employee comfort, productivity and safety through personalised control of work spaces, and trackperformance by tapping real-time updates on lighting system status," avers VP and business head Anuj Dhir. He explains that the company's solutions also provide historical data and analysis to continually improve operations and experiences, thus helping facility managers gain insights and in turn manage spaces effectively. "The operating cost of lighting in commercial buildings is estimated to be significantly high, and smart and connected lighting provides an efficient and cost effective solution."

Dhir says that specifiers can be spoilt for choice since Wipro brings them a variety of products. VergeLED is a reddot 2017 product design winner backlit luminaire. OpusLED features a unique floating spherical diffuser and surrounding light chamber that subtly introduces circular geometry into the ceiling plane. PieLED conforms to 'Right Light' philosophy for creating cheerful, vibrant and high performance workspaces. AslimlineLED is "one of the slimmest" products for better light efficacy and offers a blend of aesthetics and functionality. AxeonLED is an up-down suspended linear lighting product for offices. Dhir asserts that Wipro is the pioneer in bringing Li-Fi technology to India and is capable of delivering high speed and secure data transmission through its LED luminaires.

Lighting Control

In most office buildings lighting accounts for 39% of annual electricity consumption. Lutron's country manager-sales for India sub-continent Ripu Daman Sharma advises how organisations can adopt light control strategies to save energy.

Light Control Strategies

Potential savings in each category can collectively save up to 60% lighting energy and 20% HVAC energy.

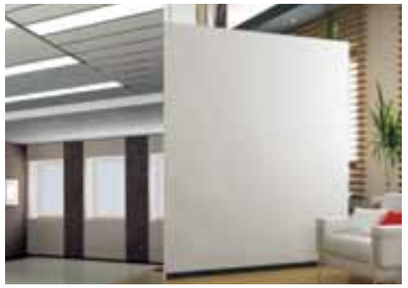
Potential Savings

- High-end trimming 10-30% lighting
- Occupancy sensing 20-60% lighting
- Personal light control 10-20% lighting
- Daylight harvesting 10-30% lighting
- Plug load control 15-50% controlled loads
- HVAC integration 5-15% HVAC
- Controllable window shades 10-20% HVAC
- Time scheduling Variable
- Demand response Variable
- Preset scene control Variable

"Lutron's solutions provide flexible, scalable systems that can fully integrate lighting, shading, and sensors for maximum energy savings. These solutions can be easily designed, installed and reconfigured to meet the changing needs of buildings," says Sharma.

Dry Wall

Birla Aerocon's products are "ideal" if architects are keen to build superior green construction, avers Dhirup Roy Choudhary, managing director and CEO of HIL. The company offers



cement sandwich panels, fibre cement boards, and designer boards for dry walling and fast track applications. It has AAC blocks, block jointing mortar, and readymix plaster and wall putty for wet walling. Stressing on the green quotient of the products, Choudhary says that the brand's unique five-way green philosophy ensures that its products and processes are environment-friendly from end to end. "We begin by choosing green raw materials with a low carbon footprint; and process them using a green manufacturing process that produces zero effluents, by-products and emissions. We also have a green energy profile with 30% of our energy needs being met from renewable sources. Finally, our end products are also green, and can be reused and recycled for minimal environmental impact." ●

Coworking is Win-Win...

NCUBE Planning & Design (formerly NELSON India), a coworking design specialist, has designed 40 such spaces in Dehi-NCR, Mumbai, Bengaluru, Hyderabad, Kolkata, Pune and Chennai over last two years. The company's COO Sandeep Roy shares his thoughts on what is driving preference for this new office genre.

By Mrinmoy Bhattacharjee

Economic Proposition

It is a win-win situation for all the parties. A coworking company like Awfis does not own the space; they lease it from developers and add value to it. The values are of two kinds: design and service. So companies like NCUBE design a space or create an ambience to acceptable norms, expectations and brief, and Awfis provides the service and manages it. Most of our coworking office properties are situated in lucrative real estate places. But, sometimes these spaces may not get the value despite their prime locations. For example, a property located at the corner of the two prime streets of Kolkata - Park Street and Camac Street - did not have a frontage but had an alleyway to the plot. Despite its address being 1 Camac Street, it could not generate the value it deserved. We moved into the plot, changed the façade, put up signages, painted the whole building, and redid the interiors. Now, people feel good when they go into the place. Added to the value of design was service that Awfis provides. This enabled the landlord to raise the value of the property to a par with others on the street. The landlord is happy! This space has 80% occupancy; it has attracted clients such as Zomato and CNBC to set up their operations. These companies do not have to lock in their monies for setting up maintenance and service infrastructure that is involved in any office. Besides, companies can simply book additional space within the cooworking space as they grow.

Sandeep Roy, COO, NCUBE

Demand by HR

Traditional offices have fixed numbers of cubicles, cabins, large and small desks for non-managerial employees, general managers, vice presidents, senior vice presidents, and others. These spaces can accommodate a fixed number of each of these staffs and senior executives. I often hear from human resource heads that if they want to promote a GM to VP, they cannot find a VP cabin. We are designing our new corporate space and I am taking myself out of the cabin into an open office space. Because I do not know how many senior executives I would require in the future, and what kind of growth will we record. A person sitting in the open space can easily get into two, three, or four-chaired meeting pods located 10 seconds away for spaces meant for in-person or telephonic meetings.

Big Shift

Coworking space does not only attract funding-starved young entrepreneurs or startup guys, but also the corporates. These days many corporates are on the quest to discover how to utilise their workforce better, and want to reinvent and transform their offices. They recognise that workspaces are enablers for enhanced productivity of their employees, and coworking space often fits the bill. So, they are moving their back offices as well as their front offices into these spaces. This situation also busts a myth that coworking is ideal for millenials alone, as corporates bring millenials and older generations together. ●

Suzlon One Earth

Akkisetti Ramprasad, managing director of one of the country's revered architectural design firms Christopher Charles Benninger Architects (CCBA), advocates the need for emulating Indian architectural ethos while building modern offices, to be able to bring human beings close to nature for increased productivity of employees. "Offices should be able to provide free, fluid and interactive space. They should cater to silent and intellectual thinking which something does not happen in Indian offices that only focus on a lot of production, whereas it should be reflective in nature," he tells SH. Ramprasad shares one of CCBA's profound projects for inspiration – the Suzlon One Earth Global Corporate HQ.

WIND ENERGY major Suzlon Energy Ltd is based in Pune, Maharashtra. With sustainability as their product, they have pledged to create the greenest office campus in the country. Living the motto of the company - powering a greener tomorrow - the design exclusively employed non-toxic and recycled materials. Water, energy, air, sewerage and trash are


Akkisetti Ramprasad, MD, CCBA

all sustainably managed on site. No sewerage, wastewater or trash is removed from the site and all are recycled within it.

Covering about 1,00,000sqm of built-up area on ground plus two levels, on a 10.4 acre urban site, the project achieved international LEED Platinum and Indian TERI GRIHA top certifications, with 8% of its annual energy generated on-site through photovoltaic panels and windmills, at an incremental cost of about 11%. At the time of completion there were no other campuses in India with this level of certification, on-site renewable energy, at this level of cost efficiency. With an off-site wind energy farm supplying 92% of the potential 4MW energy consumption, the campus is a net zero energy project.

The only instructions to the architect were to create a high technology, global campus, in which the visitors would feel they were in India. The strategy derives its inspiration from historical campuses like Fatehpur Sikri and the Meenakshi Temple complex in Madurai. The concept took the shape of a land scraper, opposing the idea of a sky-scraper. It is a counter blast to 'the glass box'.

A series of served and server spaces were conceptualised, allowing adaptability, suitable to the transformational nature of evolving business patterns. The served spaces cover a major share of the campus, where people work accommodating flexible modular walls and furniture systems. These are served by more static cores housing wet areas, vertical utility ducts, fire stairs, elevators, entry and reception areas, which will not change over time. 'Modules' were employed, like the silo fire stairs; the benchmark glass cylinder ventilation chimneys, and the 8.4 x 8.4 meter structural modules that could be used like a Lego set, and moved about in one's mind to create internal and external spaces. Aluminum louvers act as a protective skin allowing daylight and cross ventilation. A generic strategy was to provide 75% of the workstations with daylight and external views, making the inhabitants sensitive to seasons, weather conditions and the time of day. All work areas have operable fenestration allowing cross ventilation when desired.

Photovoltaic panels form the ceiling of the learning center atrium, sheltering a traditional reflective pool, tempering the microenvironment of the center in addition to soothing aesthetic sensibilities. Throughout the landscape, traditional channels carry water to the Crescent Reflecting Pool resting at the lower basement level, around which the curved dining area opens visually onto the cascade of waterfalls feeding the pool. A traditional stepped wall gives rhythm to the water movement. This large water body gifts evaporative cooling to the central lower court. All the external landscaped areas are visually integrated into the indoor spaces along the perimeter of the building bringing fresh air, greenery and natural light into the work areas.

The design process started with a premise of creating a central gathering space, or Brahmasthan, with the sky as its ceiling, offering visual access to extensive gardens from everywhere. The fabric of the green spaces and water elements is interwoven into the built fabric so one's sight lines continually meet the out of doors. The anchoring visual element is the stone Deepstambh, a traditional Indian pillar of oil lamps, set in the center of the Crescent Reflecting Pool. Sight lines from all directions converge at the Deepstambh, making it the focal element of this organic composition. The central garden plaza, on a podium over parking and utilities, encourages interaction and discussion amongst the 2,300 colleagues, providing an iconic memory point for all who visit the campus.

The building employs a complex building management system that monitors energy, lighting, temperatures, and occupancies of various areas and the efficient running of systems. The project strategy included a mandate for standard sizing to reduce construction wastes, achieving a ceiling of three percent wastage. Incorporating green principles in the planning and design stage of the campus, strategic investments in high-tech energy-efficient technologies, and overall optimisation of materials and resources has confirmed that it is possible to create green buildings in a cost effective manner without compromising on features, finishes, or utility. ●

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Steps to Sustainability

Every stakeholder derives benefits from GRIHA's green building strategies

AR NAMRATA AMARJEET MAHAL

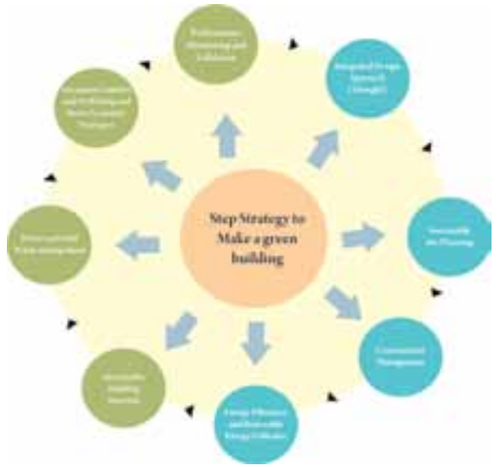
CONSTRUCTION ACTIVITIES inevitably bring disruption in the immediate environment, at a speed that is likely to surge exponentially in the coming years. Research studies have long established this insurmountable challenge, with data. One such study says, around half of all non-renewable resources consumed by mankind are used in construction, making it one of the least sustainable industries in the world . Nonetheless, it also offers enormous opportunities to harness the potential of technology advancement to minimise the detrimental impact on the environment. Having said that, GRIHA (Green Rating for Integrated Habitat Assessment) has positioned itself to recognise and seize these opportunities, such that it lays a proportionate blend of best global practices and rational approaches.

While revolutionising the concept of green buildings in India, GRIHA was adopted and endorsed by the Ministry of New and Renewable Energy in 2007 as the National Rating System for green buildings. Since then, urban local bodies and state governments have incentivised GRIHA in their respective jurisdiction by offering free of cost additional FSI (Floor Space Index), discount in the premium amount and property tax paid and so on. The latest being the Government of India highlighting GRIHA as one of the national strategies for attaining the emission reduction targets set in its 'INDC (Intended Nationally Determined Contribution): Working Towards Climate Justice' document submitted to the UNFCCC (United Nations Framework Convention on Climate Change).

Green Building Strategies

GRIHA is a (point based star rating) tool to evaluate the environmental performance of a building in a holistic manner, over its entire life cycle, thereby providing a definitive standard for what creates a 'green building'. Nationally accepted codes and standards like ECBC (Energy Conservation Building Code) and NBC (National Building Code) create the foundation of GRIHA; still, green building is yet not a common practice.

What really does it take to make a building green? It's just the 'thought' to make a difference and the onus to deliver in an integrated manner until the end. GRIHA framework aligns the thought process towards sustainability, and may be simplified as an eight-step strategy to make a green building



Point	GRIHA Rating
25-40	1 star
41-55	2 star
56-70	3 star
71-85	4 star
86 or more	5 star

(*see graph*). These strategies work splendidly well because every stakeholder sees a benefit in it. Few of them are enlisted:

- 30-50% reduction in energy consumption from the GRIHA

Description	Best Practice Advocated in GRIHA
Low-impact Environmental Materials Use of BIS recommended industrial waste* in the building	
Structural Minimum 15% replacement of OPC (Ordinary Portland cement) with fly-ash*, by weight of cement used in structural concrete, is advocated in GRIHA	■ Use of fly-ash based PPC (Portland Pozzolana Cement) ■ Use of GGBS (Ground-Granulated Blast-furnace Slag) in concrete design mix
Non-structural Minimum 40% composition of building blocks/bricks by fly-ash* by volume, for 100% load bearing and non-load bearing walls	■ Use of fly-ash bricks, AAC (Autoclaved aerated concrete) blocks, Adobe bricks and so on
Interiors Minimum 25% of all materials (calculated by surface area) used for building interiors (false ceilings/ internal partitions/paneling/in-built furniture/flooring/internal door & window panels & frames) meet the low-impact material requirements	■ *Use of low-impact materials like:* ● Stones from India like rough local granite for flooring ● Composite wood based products ● Manufactured products with at least 5% recycled content ● FSC Chain of Custody certified products ● Products with EPD (Environmental Product Declaration) analysed and published as per ISO 14025 / ISO 21930 ● Products with water footprint analysed and published as per ISO 14046
Finishes	■ Use of fly-ash based PPC in plaster and masonry mortar ■ Use of zero/low-VOC paints, adhesives and sealants in building interiors
Efficient Systems & Products	
Water	■ Use of water-efficient fixtures like dual flushing systems, sensor based faucets, low flow shower heads, waterless urinals, etc ■ Use of water-efficient irrigation systems like drip irrigation and sprinkler system ■ Use of additives to reduce curing water requirements ■ Installation of waste water treatment system like reed bed treatment system
Energy Meeting the mandatory requirements of ECBC	■ Fenestrations meeting the SHGC (Solar Heat Gain Coefficient) requirement of ECBC ■ Equipment efficiency (HVAC) as mentioned in ECBC ■ Fans are BEE star-rated ■ Lamps must demonstrate luminous efficacy of at least 75 lumens/watt ■ Automatic lighting controls ■ Occupancy and daylight sensors ■ Transformers installed as per ECBC ■ Renewable energy systems like solar water system

energy benchmark (encourages energy demand optimisation and installation of renewable energy systems to offset the optimised demand)

- 40-60% reduction in building water consumption as compared to GRIHA benchmark (encourages water demand optimisation and installation of water efficient fixtures)
- 40-50% reduction in landscape water consumption (encourages recycling and reuse of treated waste water)
- More than 50% of the living areas are day-lighted (reduces the requirement of artificial lighting)
- More than 40% fly-ash or any other BIS approved waste used in the block work (low embodied energy material)

Best Advocated Practices

GRIHA is structured on a very simple philosophy, i.e. first optimise the demand of the resource; secondly use efficient systems/products to meet the optimised demand; and lastly offset the demand through renewable resources. Optimising demand of the resources is majorly a design and planning intervention. So, let's take a quick look at few of the low environmental impact materials, efficient systems and products available in the market.

Way Forward

Forethought and well planned actions in a unified manner, with the entire project team, by responding correctly to the context while using modern materials and technologies can be less detrimental to the environment around us. Undoubtedly, GRIHA can act as a guiding tool to achieve the desired degree of sustainability in the built environment. ●

The author is a manager at GRIHA Council, India. The opinions expressed in this column are those of the author.