



WINDOW & FACADE

MAGAZINE

POST-PANDEMIC FAÇADE & FENESTRATION DESIGNS

Occupant wellness & adaptability

Face to Face

AR. Rahul Kadri
Partner & Principal Architect,
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Integrating
Technologies into
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Project Watch

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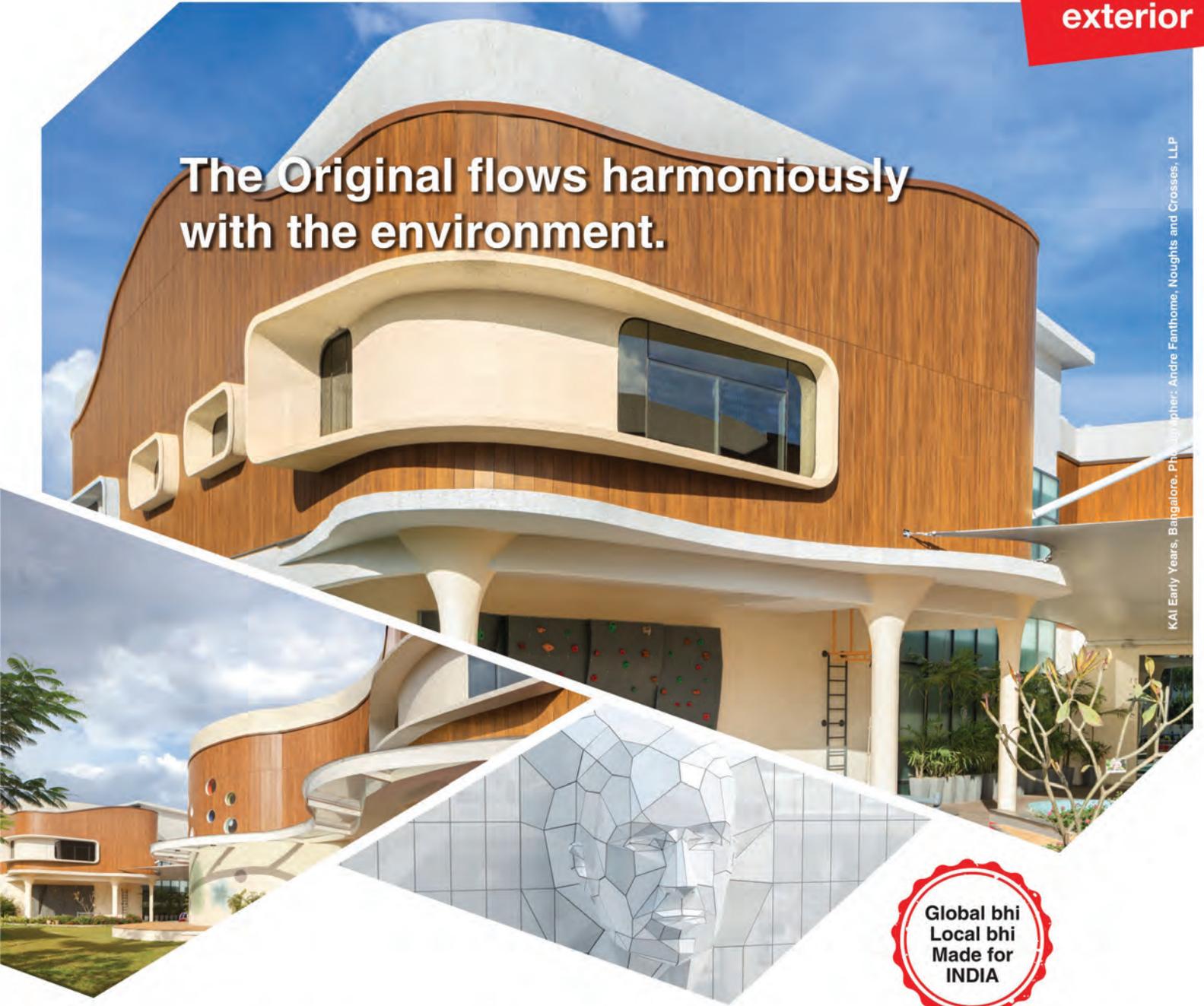
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/əˈliːəns/

noun

noun; alliance; plural noun; alliances

- a union or association formed for mutual benefit, especially between countries or organizations.

"a defensive alliance between Australia and New Zealand"

synonyms : association, union, league, treaty, pact, compact, entente, concordat; More bloc, confederation, federation, confederacy, coalition, consortium, combine, syndicate, affiliation, partnership; fraternity, brotherhood, sorority, team, ring, society, club, guild, group, organization

"a defensive alliance between Australia and New Zealand"

- a relationship based on similarity of interests, nature, or qualities.

"an alliance between medicine and morality"

synonyms : relationship, affinity, association, connection, closeness, kinship, propinquity

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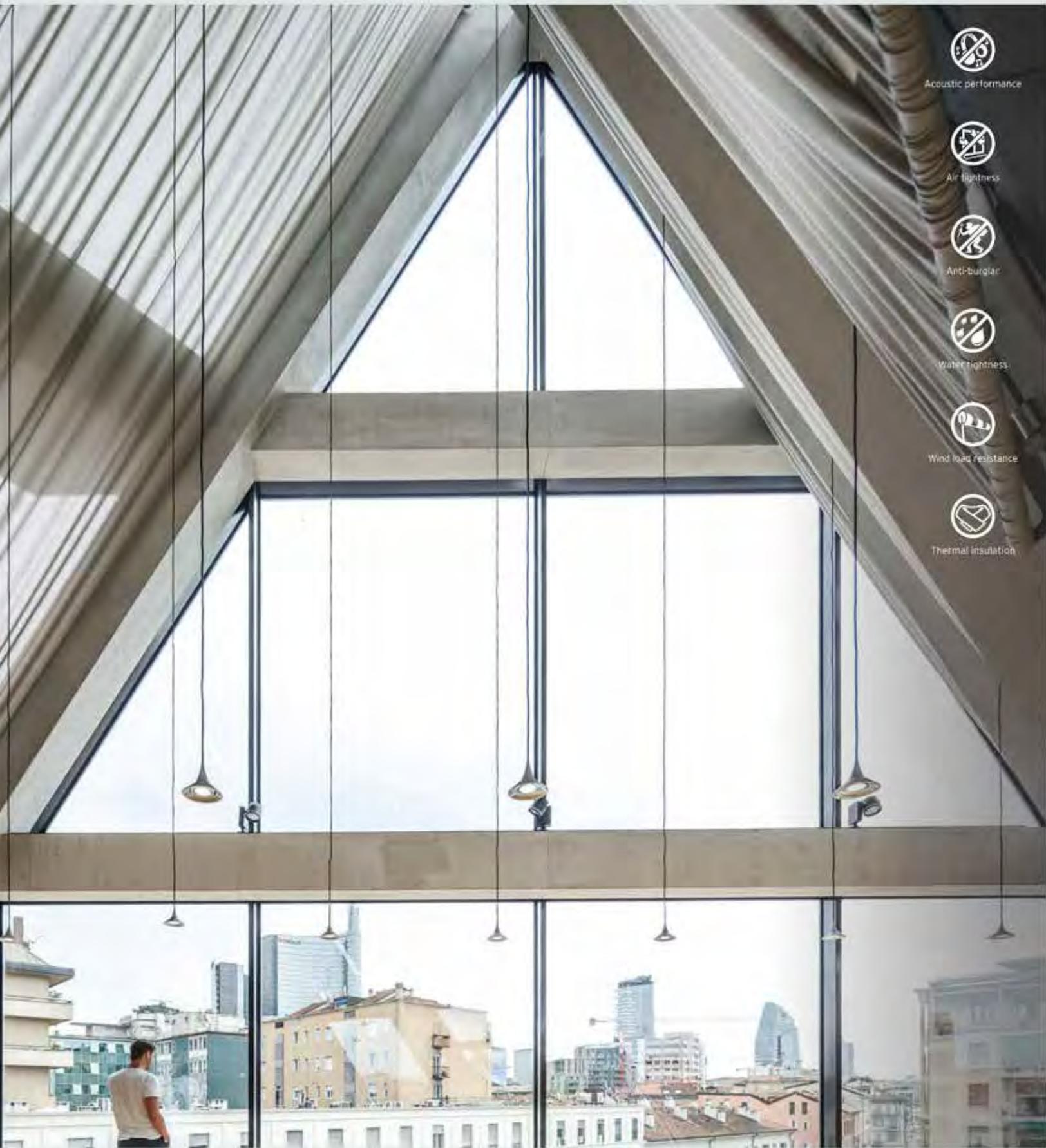
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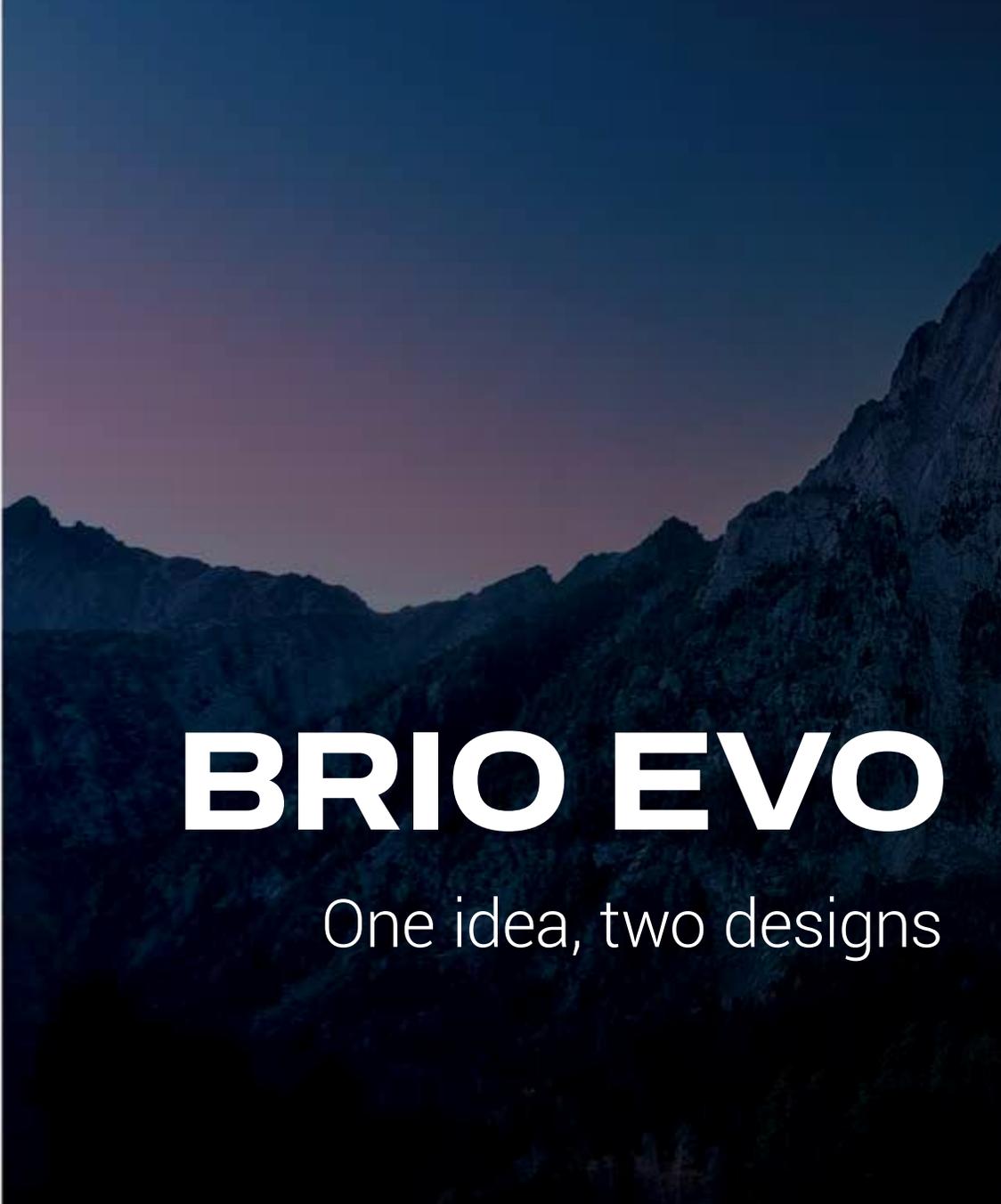
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EDITOR'S NOTE

The coronavirus pandemic is emerging as an existential threat to the nation's small and medium businesses. According to a study by researchers at the Harvard University, Economists project that more than 100,000 small businesses have shut permanently since the pandemic escalated in March. Their latest data suggests at least 2 percent of small businesses are gone, according to a survey conducted in May. Business owners are still debating whether to take PPP money, or is it better opting to reinvent their business model instead, often by doing more online and reducing staff costs. A desire to succeed in business by getting out of the box and learning and doing something new is the need of the day.

Across the globe, people have replaced in-person visits to sports and entertainment venues, retail centres, convention facilities, and other mixed-use environments in favour of virtual gatherings and Zoom meetings. In fact, we believe that the current crisis is only reinforcing the vital role that virtual spaces play in bringing people together and promoting business. With this perspective in mind, WFM Media is also in the path of 'Going Digital', and soon we will be announcing our new endeavour which would help to connect façade and Fenestration industry with architects, builders and other members of the construction sector.

Architecture is constantly changing, so is the façade and fenestration design. One outcome of the COVID-19 crisis has been a surge in the need for rapid-response, temporary, prefabricated, and/or highly adaptable venues – facilities that are tailor-made for modular construction and mixed-use with the amplification of pop-up, flexible, and adaptable spaces. Architects are also thinking out of the box to produce idealistic designs for occupant wellbeing. This edition is themed on Post-Pandemic Façade & Fenestration Designs – i.e., how to achieve Occupant wellness & adaptability ensured by a modular & agile approach. We are presenting many interesting articles on relevant topics, and a few comments/ interviews with very well-known experts, including those from Architect Hafeez Contractor, Lodha Group, Renson, Knight Frank, AECOM Consultants, View Inc., Space Matrix, PM Group, KGD Architecture, and many more.

This pandemic has taught us that it's critical to not just create great spaces and places, but also to create dynamic, integrated opportunities for human interaction that provide purpose to our lives. Whether it's new buildings that are about to be designed or existing architecture that now needs to be re-imagined, in many ways, this is a time for an architecture of optimism.

In this phase of uncertainty, stay safe and do your part in 'flattening the curve'.

Renu Rajaram
renu@wfm.co.in

Rainscreen Ventilated Façade

In the world of façades, an extensively discussed topic is 'Façade and Fire', it is worth understanding some basic principles that make it necessary to have fire protection in façades in the first place including the cavity and chimney effect!

Typically, there are two methods of handling façade waterproofing, face sealed and rainscreen. In the case of a face sealed façade, it depends on 100% of the rainwater has to be shed, however, due to weathering effects after a few years, seals get cracked creating leakages. These leaks demand periodic maintenance. A rainscreen façade is a kind of two-stage construction; the inner wall is a load-bearing insulated wall that is protected by an outer skin. The outer skin protects against rain and

moisture and maintaining a space between the cladding and building wall prevents water from infiltrating the building structure. A rainscreen is one of the most effective options in the market today if it is designed and installed in an authentic approach.

WHY RAINSCREEN?

There are several benefits of using a rainscreen façade over face seal systems:

1. **Superior waterproofing** - It protects the structure of the building from moisture, rain and condensation through a multilayer barrier system, and it is less dependent on site workmanship and sealant durability for waterproofing performance.
2. **Thermal efficiency** - The rainscreen cladding helps shade the structure and dissipate the heat. The cavity between the inner and outer screen doesn't allow heat to transfer into the structure (particularly the heat from direct sunlight), the heat is radiated into the cavity. The warm air moves up and out of the cavity by convection, drawing in cooler air at the base and insulating the primary wall structure.



Project : Intercontinental IT Park

Location : Hyderabad

System : HPL Rainscreen Cladding

Intercontinental IT Park

3. **Condensation control** – When rainscreen façades are properly designed and installed, condensation will form in the cladding cavity (as opposed to within the wall structure!) A rainscreen provides for this to be drained or evaporated, thereby preventing damage and mould growth.
4. **Long-term durability** – Rainscreen façades are less

dependent on sealants, and hence are less subject to deterioration over time, and the maintenance cost of dealing with this.

AND WHY A CAVITY?

The key features of a rainscreen façade are:

1. Outer cladding
2. Cavity
3. Air/water barrier

The outer cladding is designed to shed the most, if not all of water, and bears the primary impact of exterior weather forces and UV, hence cladding must be durable and of non-porous material. The air/water barrier is the final layer of protection, preventing any moisture from penetrating the building walls. It may be permeable or non-permeable depending on requirements. All penetrations should be sealed.

The cavity is essential for the effectiveness of the rainscreen system. It provides a secondary line of defence against the elements. It serves two purposes:

1. Allows drainage of any moisture to penetrate the outer cladding

2. Allows air circulation, evaporating moisture from the surface of the air barrier and drying the cavity

This plays a significant part in preventing water ingress into the building.

As a thumb rule, a minimum cavity of 25mm should be maintained to allow sufficient air movement. Walls greater than 25m high should have a cavity depth of 1mm per meter in height. For example, a 50m wall with a continuous cavity should have a minimum depth of 50mm. The cavity may be broken and drained at individual floor levels.

RAINSCREEN DESIGNS

As classified by the AAMA (American Architectural Manufacturers Association), there are two basic types of rainscreen systems:

1. Drained, Back-Ventilated (AAMA 509-09)
2. Pressure Equalised (AAMA 508-07)

DRAINED, BACK-VENTILATED

This system is increasing in popularity as a move forward from the traditional face-sealed model. A drained and back-ventilated rainscreen has continuous airspace, with openings at the top and bottom of a wall section



Project : Rajapushpa Paradigm
Location : Hyderabad
System : Terracotta Rainscreen Cladding

Rajapushpa Paradigm, Hyderabad, Terracotta Rainscreen cladding



Project : Meenakshi IT Park
Location : Hyderabad
System : ACP Rainscreen Cladding

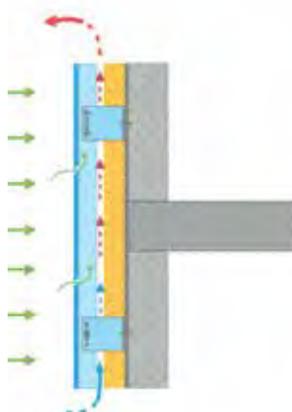


Fig 1 Typical horizontal detail

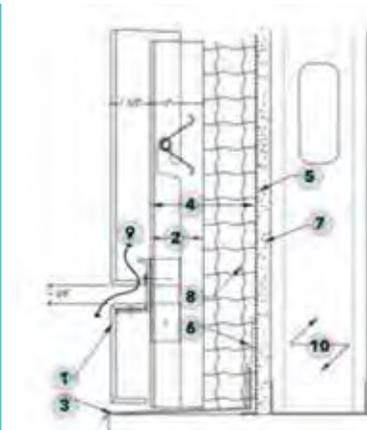


Fig 2 Typical horizontal detail

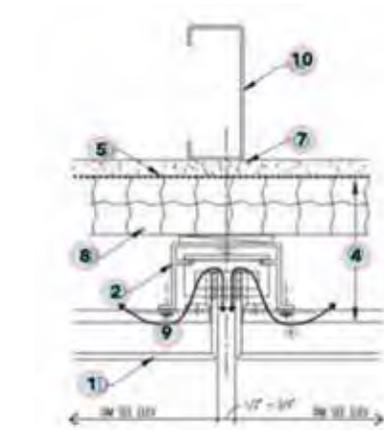


Fig 3 Typical vertical detail

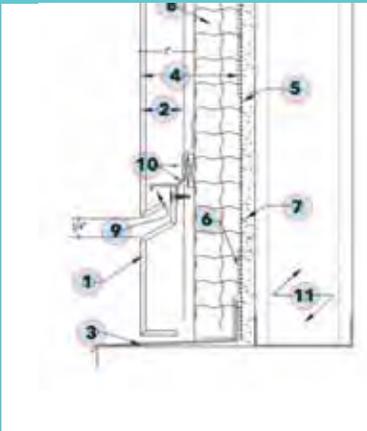


Fig 5 Typical horizontal detail

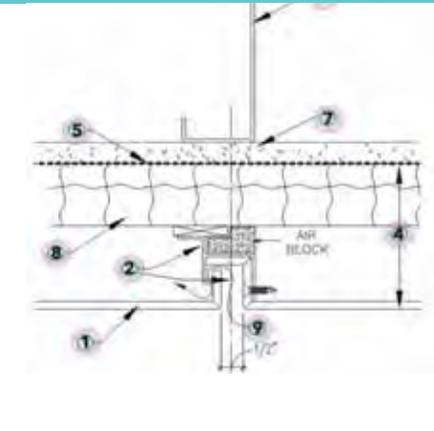


Fig 6 Typical horizontal details

(1) The 'Outer leaf' cladding system (or the 'rainscreen') (2) Vertical drainage channel (3) Penetration flashing (4) Ventilation cavity (5) Air/water barrier (6) Approved 'Air/water Barrier' compatible flashing membrane tape at all penetrations (7) The 'Inner leaf' or face of building structural wall (8) Moisture resistant insulation (Optional, as required by thermal design requirements) (9) Ventilation path (10) The building structural wall

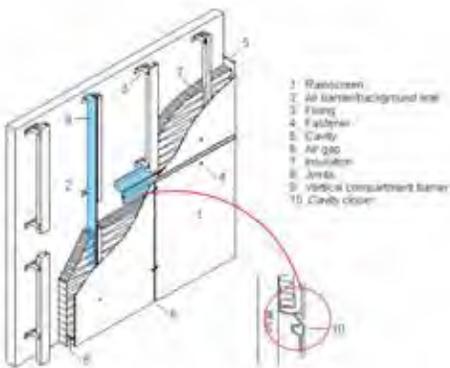


Fig 4 Typical horizontal detail

to encourage air movement. These systems stop well over 90% of the water that could potentially reach the air and vapour barrier of the building. The remaining small quantity of water is then dissipated through the combined action of gravity (drainage) and air circulation (evaporation). Refer below typical details form CWCT document. (Ref. fig. 2 & 3)

PRESSURE EQUALISED

Pressure equalised (Ref. fig. 4, 5 & 6) rainscreen are gaining prevalence

in Europe & USA as the optimum waterproofing solution. The system relies on a cavity pressure that matches the external air pressures. This is achieved through open joints (ironically!) and compartmentalising the cavity. The benefit of this system is that as air pressures are equal between the cavity and the external, there is no air movement to force rainwater into the cavity. This does mean, however, the air and vapour barrier must be able to absorb the wind loads. As such this system is mainly suitable for masonry construction or quality sheathing.

WHAT IS THE DIFFERENCE?

Dfcd, Back-Ventilated (AAMA 509-09)

- Water entering the air & water barrier is unlimited.
- No pressure equalised principal
- No need of compartmentalisation

Pressure Equalised (AAMA 508-07)

- Water entering the air and water barrier strictly limited.
- Works on pressure equalisation principal
- Compartmentalisation is must to control pressure equalisation.

RAINSCREEN, CAVITIES AND FIRE

Of course, the cavity present in the system also acts as a pathway to propagate fire in a fire event which is called a 'chimney' effect.

This is where intumescent cavity barriers become indispensable (refer fig. 7). Typically, unused in Indian construction, they have the ability to close the cavity when exposed to significant heat, preventing this airflow and helping to prevent the spread

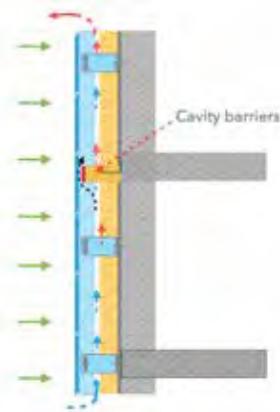


Fig 7

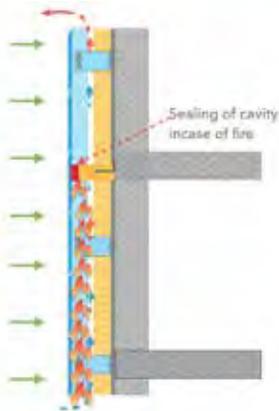


Fig 8

of fire (refer fig. 8). It is always good practice to include a cavity barrier at floor levels – regardless of the cladding.

For an exterior wall to function for waterproofing, condensation, fire, structural, insulation, etc. a holistic design process is required, with decisions not being made based on one single aspect.

TYPES OF CLADDING MATERIALS AND SELECTION

There are a variety of cladding options as natural stone, GFRC, GFRP, Aluminium metal cladding, zinc cladding, copper cladding terracotta clay tiles, high-pressure laminates (HPL), ceramic tiles, ACP, etc.

While selecting cladding

material we must give attention to the following points:

1. **Fire class of material** - As per international codes, there are many fire classes out of which fire class relevant for façades are A, A2 & B class. Where class A means non-combustible material, class A2 means limited combustive & class B means fire-retardant material.
2. **Tested system** - Tested system is needed for every project and due consideration shall be given to fire testing requirements as per relevant codes and project requirements.

CONCLUSION:

While designing and implementing rainscreen/ventilated façade, we must adopt a holistic approach. Poorly designed and poorly installed rainscreen façade without any cavity barriers become a disaster in case of a fire event, there are many examples where the rainscreen façade becomes the source of fire propagation due to the use of ACP with polyethylene (PE) and the fire spreads rapidly due to the chimney effect in the absence of cavity barriers.

Unlike other countries, India does not have specific norms or regulations pertaining to the use of cladding materials (especially ACP cladding with PE core). As professionals, we need to consider all the precautions to be taken in the selection of the cladding materials as well as to curb the propagation of fire. While designing a rainscreen cladding system the above points should be given importance and engineering judgment to be applied to arrive at an appropriate rainscreen system and also which will be fire-rated.



UPENDRA WALINJKAR
 Founder and CEO,
 Aluvision Façade Solutions Pvt. Ltd.

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Upendra Walinjkar, Founder & CEO of Aluvision Façade Solutions (AFS), is working in the curtain wall industry for more than 22 years. He has worked in engineering and designing of prestigious projects all over the world, covering the UK, Canada, Singapore, Kenya, Philippines, UAE & Qatar. Most notable projects are tall structure in FORTE D1 D2 (280 m tall, second tallest within downtown Dubai), Boulevard towers (220 m), engineering marvel entrance canopy of TELUS garden Canada, etc. He has also provided consultancy solutions for Nagpur cancer Institute, Science technology park Navi Mumbai, Dr. Babasaheb Ambedkar memorial Dadar to name a few.

AFS is an independent Façade Engineering Consultancy, offering a wide range of professional services predominantly dealing in design, engineering & consulting for the specialised field of façades.

Giving Buildings a New Lease of Life

"We" shape our buildings thereafter they shape us", Winston Churchill

Restoration of façade of an ageing building that is still strong enough to last a few more decades, will give it a new identity and breathe fresh life into it. A building can get old, or its design may become obsolete, as architecture is evolving constantly with new ideas and new technologies. Over the years, there can be leaks due to damaged silicone joints and glazing gaskets, worn out cladding system or rusted support systems, and building maintenance can become more expensive due to rising replacement and operating costs and decreased energy efficiency of outdated façade systems. The same can be said for older glazing that may have glass without high performance low-e coatings. This may be sufficient for building owners to consider options for façade replacement. There is also the pressure to attract new tenants or to increase rent through modernisation of an antiquated looking exterior.

Few significant buildings become a representation of their

time. Such heritage architecture is about conservation of the traditional architectural style, which has to be maintained the way the building was originally built, and may involve restoration of the elements that have been destroyed or damaged by time.

RETROSPECTIVE FAÇADE - MULTIFUNCTIONAL ENERGY EFFICIENT FAÇADE SYSTEM FOR BUILDING RETROFITTING

Sometimes, relatively new structures that no longer appeal to the occupants, or buildings that have to undergo a functional change, may need uplift. In both such cases, we have to design a new façade for the building and retrofit it over the old structure, giving it a brand-new look, and improving its energy efficiency. With the current spate of fire in buildings, it becomes all the more important to diligently review systems, using fire-proof and fire-retardant technology.

Improving energy consumption in the existing building will require the retrofitting of many, if not most, of these façades. While many buildings are currently undergoing energy retrofits, the scope of the renovation often stops short of the façade because

of the relatively high cost and the potential disruption to ongoing building operations. Even when the façade is included in an energy retrofit program, the options for approaching the façade element are often not prioritised.

HIGH PERFORMANCE FAÇADE: NEED OF EVERY BUILDING ASPIRING TO BE ENERGY EFFICIENT

Energy performance review as an approach helps, both in terms of helping the environment and being able to save on energy costs. By having a proper façade system, we can benefit from their natural thermal properties, which will create a layer of insulation. This insulation layer prevents the hot air from infiltrating into the building and helps in maintaining an optimal indoor climate.

By intertwining all of the different variables and factors, we will be able to have an end product that will be aesthetically pleasing which will yield results that is efficient in terms of energy, comfort & acoustics and is coordinated with one another. These unique solutions from suppliers, manufacturers and installers must be tailor made for office spaces that cannot afford losing working hours for a retrofitting solution.

adapted to fit a climatic conditions and any type of building façade, making it highly flexible in terms of use and deployment. This has the potential to improve the energy efficiency of buildings all over the world.

This provides a golden opportunity for research teams to work collaboratively on the development (architectural, energetic, installation, material), evaluation (of energy efficiency, material fire resistance) and demonstration (in real life building) of the façade system. Such project can bring together a multidisciplinary consortium with a well-balanced distribution between industry and research organisations. The team can be composed of large companies, technologically specialised SMEs, research as well as open innovation organisations.

DEMONSTRATION PLANS

The multifunctional energy efficient façade system solution can be demonstrated in a real building located in a region with diurnal variation and/or high seasonal temperature variations are common. The range in climatic conditions ensures that the system is tested in different conditions. The building will be monitored before and after the installation of the new retrofitting system to evaluate the performance of the solutions.

The objectives shall be:

- To demonstrate the system, including the structural panel and (some of) the technological modules in a real building retrofitting scenario
- To identify the limitations and problems of the whole system and the technological units installed in the pilot building and to optimise their performance



Tri-Tessellate Office Building in India by AKDA features a Tessellated façade of Aluminium and Glass¹

THE RETROFIT OPPORTUNITY

Today, the problem of poor performing, aging glass curtainwall is now an opportunity to combine need with solutions in a façade retrofit. Sustainable building practice values reuse of these aging buildings as superior strategy than demolition, recycling and rebuilding. Retrofitting is also a well-known sustainable model of reuse. There is no question that many buildings of this type could benefit significantly from a façade retrofit, and there is equally no doubt that recent material developments and technology can significantly improve their performance and likely their appearance.

EMERGING IDEAS: A MULTIFUNCTIONAL ENERGY EFFICIENT FAÇADE SYSTEM FOR BUILDING RETROFITTING

The concept idea is based on efficiency and on a multifunctional

integrated system. It can develop an innovative concept for retrofitting which applies multifunctional energy efficient panel modules, as well as innovative composite façade structure materials, all easily integrated in the façade for building envelope retrofitting. This new façade system can be easily



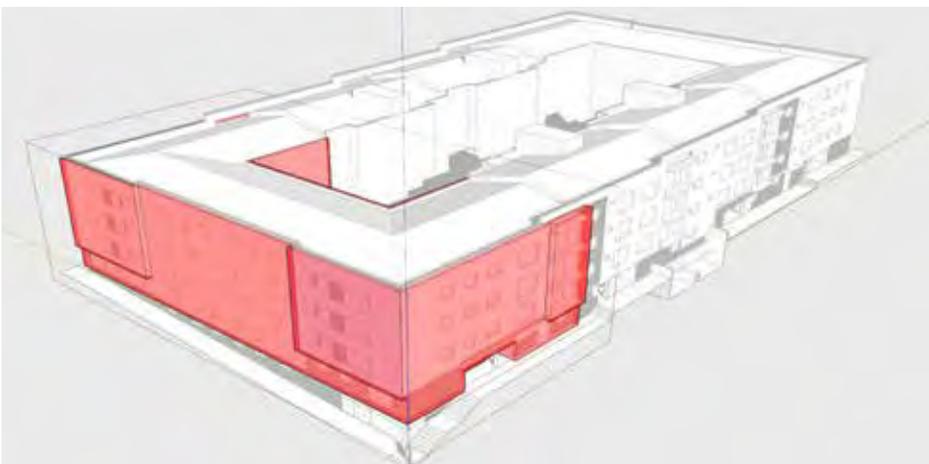
Al Bahr Towers, emirate of Abu Dhabi²

Façade Retrofit



Pixel Building, Melbourne³

- To assess the performance of the integrated system
- To certify the retrofitted building according to current national standards
- To validate on-site cost advantages of the new system
- To validate the façade



Demonstration model⁴

configuration and general conditions to be suitable for at least two other European climates

MARKET FOR BUILDING RETROFITTING

The market for retrofitting has been growing steadily over the past couple of years, although this has not been happening at the same rate and speed globally. According to a report from Pike Research, this global market will expand to \$151.8 billion by 2020.

Retrofitting is identified as one of the most cost-effective ways to reduce operational costs. Variety of financial instruments are required to support the process of energy efficiency retrofitting which will enable the market to grow. Western Europe is identified as the biggest market of retrofits for energy efficiency. Asia and the US will increase to \$54.6 billion and \$35.3 billion respectively by 2020.

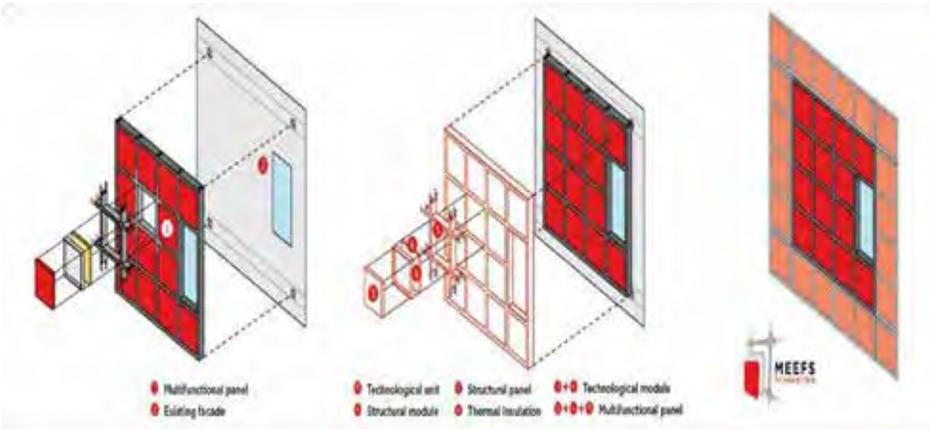
MARKET BARRIERS FOR BUILDING RETROFITTING

Market barriers must also be taken into account when addressing the deployment and uptake of retrofitting practices. Uncertainty in the market is a key barrier for building retrofitting. As is the case, consistency in the support offered as well as guarantees that the support will not be abruptly interrupted would enable stakeholder to have confidence in their investments and support received over time, thus continuously supporting the successful emergence of the market.

A report identifies market barriers that can give rise to "latent risks". These are the type of risks that can emerge in case the demand for building retrofitting increases and these risks are not accounted for.

Overall, the ability of markets to respond to these changes and mitigate risks is once again related

Façade Retrofit



Façade Elements focused for retrofit⁵



72 Screens, Jaipur⁶

to confidence in the markets and appropriate signals that are given in consistent ways and with a long-term vision. Not all building owners will find it economically viable to renovate their properties. To deliver the renovation targets, the Government should not frame regulatory policies to provide standards and encourage energy performance certification, but also to coerce some actions from stakeholders

The main stakeholders in retrofitting projects are building owners, the occupants, energy utility companies and other financing bodies, retrofit providers and also Governments. For a business model to work, each of these stakeholders' interests must be considered, and address all the barriers listed in the previous sections.

It has also been reported that overall the market for energy efficient building retrofitting is shifting away from one-time retrofits to models where upgrades are continuous and the use of ICT and real-time monitoring enables these projects to be implemented in a smarter way, thus successfully reaching the expected (simulated) cost savings and emission reductions.

THE BEGINNING

Façade retrofit thus represents a unique process, significantly different from that of new construction. Façade retrofit has a tremendous looming need of some importance. It is critical that this retrofit work be carried out efficiently and effectively. Yet this remains largely undefined territory. Everything from contracting strategies to system designs and means-and-methods considerations involves considerable ambiguity, and sustainability issues are problematic in the extreme. Following are the primary

Façade Retrofit

conclusions derived from this exercise.

- There is urgent need for defining appropriate retrofit strategies, evaluation criteria for their application, and the definition of means and methods for the implementation of the various strategies, possibly taking the form of best-practice guidelines for the various stakeholders.
- Design practices for new façades that anticipate and accommodate the eventual need for retrofit could facilitate future retrofit requirements. Façade systems should be designed to facilitate the retrofitting of new materials and technology as developments occur.
- Sustainable façade retrofit practices must be developed; a focus on material reuse is imperative to avoid filling landfills with discarded façade materials, particularly glass.
- New architectural glass recycling (not down-cycling) technologies are needed.
- Advanced façade solutions using raw float glass should be pursued because of the uncompromised material life and the potential for easy recycling. Double-skin strategies may

accommodate this in certain applications.

- Costing models that factor in the environmental cost of damaging construction practices and the true cost of energy are urgently needed to correct inaccurate perceptions of long payback periods for energy efficient technology.
- Additional mandatory measures regarding building energy and carbon performance will be required in the private commercial sector to achieve appropriate goals for energy use in existing buildings within this sector.

The impact of building façades on urban spaces is inevitable. It should be noted that being in a beautiful space, not only will have a favourable impact on improving the quality of life, but also prevent the emergence of adverse social interactions and develop optimal interactions. The best outcome of retrofits depends on intricate skills and procedures. Complexity in façade and variation in façade system requires a team displaying high quality experience and defined approach. Most importantly, the owner/developer needs to share all relevant building information and necessary support from site staff and contractor, thus formulating a Synergy.

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Jatin Shah, National Director, who also heads the Technical Due Diligence division for Colliers India, is a seasoned real estate professional with over 18 years of experience in India. Shah has managed entire aspect of project lifecycle development in multiple projects executed across India and also for International project.

Rahul Arangannal is a Senior Manager with over 12 years of experience in construction project management. Arangannal has managed all aspects of project management in various projects across Bengaluru and India.

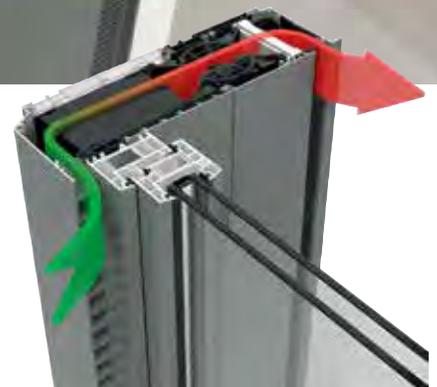


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Creating healthy spaces

Integrating Technologies into Constructive Façade Management

The façade is one of the most important contributors to any building's energy use and comfort parameters. In order to provide occupants with a

comfortable environment, a façade must fulfil many functions, such as providing views to the outside, resisting wind loads, supporting its own deadload weight, allowing daylight to interior spaces,

blocking unwanted solar heat gain, protecting occupants from outside noise and temperature extremes, and resisting air and water penetration.

The highly glazed façade has



become an important component today. The common use of glass in building envelopes has greatly fascinated the 'green building' and construction designers and owners. However, most of those buildings have intense reflection or use overly reflected glass and face severe internal comfort challenges. Only robust HVAC systems can solve this, resulting in substantial capacity, costs and environmental penalties.

The future façades will be much more interactive, environmentally friendly and design innovative. Integrating technologies into constructive façade management approaches helps to aspire for a greener and more sustainable future and to ensure that collaborative initiatives play a role in sustainability objectives. Skins will incorporate dynamic or film components in future, creating a unique architecture with multiple materials and systems.

MATERIAL SELECTION

Material selection is an important factor in designing sustainable façades. Improving thermal

performance of building envelopes and minimising thermal bridging are extremely important design strategies for sustainable façades. Thermal bridging occurs inside a wall where a highly conductive substance such as a metal support penetrates the isolating layer of the façade. It can influence the thermal efficiency of the wall dramatically and reduce its effective thermal resistance.

Material selection often influences the environment. Hence, choosing products that have the least harmful impact on the environment is becoming increasingly necessary. The life-cycle evaluation methodology can be used to calculate the environmental impacts of material selection, where material quality, manufacturing processes, energy requirements and waste are measured to evaluate the overall cost of an item, representing the total amount of its environmental impact.

Self-Cleaning Envelopes: With high-rise buildings becoming more frequent, self-cleaning envelopes

and finishes may help improve its notoriously difficult maintenance, dirt and smog safety. Cleaning glass façades can become an obsolete task with the help of these materials. Self-cleaning technology is not only beneficial for the care of large structures, small buildings or residences. The design gains sustainability when it comes to saving water and removing cleaning substances that can adversely affect the environment by reducing the need of cleaning.

Self-Healing Materials: Due to the environment, repeated use or unforeseen incidents, all products can be degraded over time. Sometimes an invasive solution is necessary to repair a small crack in a structure so that it can cause unwanted structural deficiencies. This question does not arise with self-healing materials anymore. Self-healing metal, concrete, and façades could increase the life expectancy of a building and dramatically reduce maintenance costs in the long run.

Controlling Solar Heat and Gain: Design strategies need to consider the conditions of the climate zone to minimise their impacts and reduce energy consumption. In cooling-dominated climates, protection from sun and direct solar radiation becomes more important. In mixed climates, combined strategies that balance solar exposure and access to daylight must be implemented. The orientation of a building determines its exposure to sunlight. Since the angle of the earth relative to the sun varies throughout the year and the sun moves across the sky during the day, solar exposure on a façade is continually changing. Strategies for controlling solar heat gain depend on the building's orientation. The optimal



Kanakia WallStreet - Along with Laminam tiles dry cladded on the façade, materials such as aluminium fins and DGU, and SGU glass have also been used

Future Façades

orientation of the building, from the perspective of solar heat gain, balances desirable solar heat gain during winter months with solar shading during summer months. In very hot climates, solar heat gain must be kept as low as possible during the entire year, but especially during summer months. In cool climates, more balance is needed across the seasons. In winter months, solar exposure should be used to passively heat the building.

Fenestration Elements:

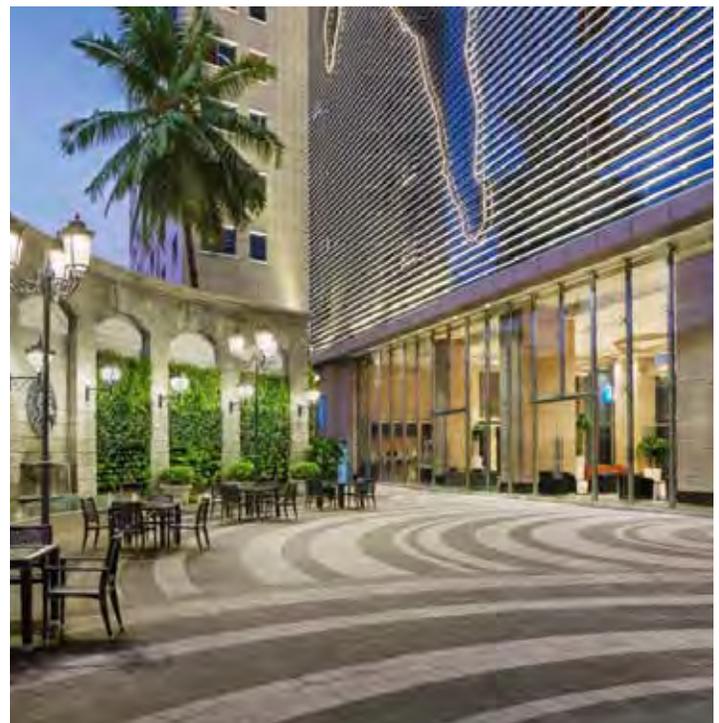
Components of fenestration (windows, curtain walls, clerestories) are essential elements of façade design from an aesthetic and performance perspective. They allow natural light to enter interior space, but also allow heat transfer between the outside and inside. Fenestration elements affect a building's overall energy consumption, as well as its occupants' well-being, health,

comfort, and productivity. When choosing fenestration materials, specific properties of glass should be considered, such as U-values, SHGC and visual transmittance. The design of the fenestration framing system is also important. Recent developments in fenestration products use new advances in building technology to allow transparent, yet energy-efficient façades. Glazing units can be insulated using two, three or more layers of glass. The spaces between the glass layers can be filled with inert gases or aerogel insulation to lower the U-value of the unit. Low-e, reflective, or ceramic frit coatings can be applied to the glass to reduce transmission of solar heat gain. Interlayer films within laminated glass can also provide shading.

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All façades create barriers between the exterior and interior environment, providing building occupants with thermally, visually, and acoustically comfortable spaces. Sustainable and high-performance façades must do more; specifically they must allow optimal levels of comfort using the least amount of energy. To achieve this high performance, designers need to consider many variables—climate and climate-based design approaches, thermal performance, daylighting, solar shading, glare, moisture transport, materials and their environmental impact, etc.



The design concept of the project Kanakia WallStreet is based on functionality, and is a mixture of the classical architectural style of the original Wall Street at New York

Factoring Natural Light & Ventilation

Kanakia WallStreet, Mumbai

Situated in Andheri, Kanakia WallStreet boasts of a prime location in the commercial-district of Mumbai. Andheri is the second biggest commercial micro-market in India and accounts for 34% of the commercial building market share in the city. Situated on the arterial Andheri-Kurla Road, the project is easily accessible to the highway, metro station, and railways station. The connectivity further extends to the domestic and international airport terminals, both in a radius of less than 5 km.

The architecture of Kanakia WallStreet reflects the heavy

stonework buildings that lace the kilometre-long Wall Street (New York). The design concept, based on functionality, is a mixture of the classical architectural style of the original Wall Street with a modern twist of our own. The classical gothic style fades away with the introduction of double-glazed glass and aluminium fins on the façade. Horizontal fins between the cladding run end-to-end in varying widths which resemble human figure silhouettes. The unique façade creates character and dynamism. Beyond the design element, the façade blinds cut off

the direct heat onto the structure. The double-glazed glass further reduces the heat into the structure as well as reduces the impact of noise from the arterial road and metro across.

The building symbolises the busy life and the effort it takes to achieve success. Along with Laminam tiles dry cladded on the façade, materials such as aluminium fins and DGU and SGU glass have also been used. The dry cladding system that has been used is a much safer option than wet cladding as it does not rely on any adhesive.



The double-glazed glass and aluminium horizontal fins on the façade run end-to-end in varying widths which resemble human figure silhouettes

Case Study



Factoring natural light and ventilation, windows and glazing have been provided of sufficient size to cater to the needs of every space

Factoring natural light and ventilation, windows and glazing have been provided of sufficient size to cater to the needs of every space. The design ensures that there is an economical use of glass, keeping in mind the weather of Mumbai. The design also ensures that there is no excess load on the air-conditioning and assists with energy conservation. The glass itself has been ceramic fritted in shape of the human figures to reduce excessive glare in the office spaces.

Kanakia WallStreet offers 10,00,000 Sq ft of office space, ranging from 800 Sq ft to 50,000 Sq ft. Along with the large floorplates, the 11'6" (approx.) floor to floor height helps create dynamic offices. The project features amenities that include The WallStreet news room and 24x7 news display, an executive lounge, as well as valet and concierge services. One of the key design considerations is the emphasis on personal health and well-being of the modern age entrepreneurs and employees. The landscaped

terrace gardens and cafes, indoor gaming zone, and library make for ideal breakout spaces. Sleeping pods have been designed owing to those who pull the late nights and all-nighters in the competitive environment. The multi-level carpark offers a solace to the lack of parking facilities on the busy arterial road, with advanced security and surveillance features.

QUICK FACTS:

Project: Kanakia Wallstreet, Mumbai

Location: Andheri, Mumbai

Client: Kanakia Spaces Realty Pvt. Ltd.

Type: Commercial

Architect: Ar. Reza Kabul

Commencement Date & Completion Date:
2011 - 2018



AR. REZA KABUL
President,
ARK Reza Kabul Architects

ABOUT THE AUTHOR:

Ar. Reza Kabul is the president of the design firm ARK Reza Kabul Architects. Established in 1988, it reflects the common vision to inspire quality living through innovation, sustainable design and holistic design approach. ARK began its practice in a time of exciting change and urban growth in India. Today, with strength of over 100 full time employees, the studio has grown drastically along with the country. Keeping in mind our clientele's unique background and need profile, they develop innovative approaches to design, access cutting edge technologies, and implement advanced management practices to provide optimal solutions with a focus on quality, timeline, and cost economy. ARK Reza Kabul Architects is headquartered in Mumbai (India) with offices at Pune and San Francisco Bay Area, USA.

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Use of Copper on Façades to Reduce COVID Spread

Defining Façade and Fenestration

D Façade - In architecture, the façade of a building is often the most important aspect from a design standpoint, as it sets the tone for the rest of the building. From the engineering perspective of a building, the façade is also of great importance due to its impact on energy efficiency.

Fenestration - The term is still used to describe the arrangement of windows within a façade, as well as defenestration, meaning to throw something out of a window.

Here are some notable facts and study regarding COVID on its spread in reference to façade materials, climate and us.

HOW DOES COVID SPREAD?

COVID-19 spreads mainly by droplets produced as a result of coughing or sneezing of a COVID-19 infected person. This can happen in two ways:

Direct close contact: One can get the infection by being in close contact with COVID-19 patients (within one metre of the infected person), especially if they do not

cover their face when coughing or sneezing.

Indirect contact: The droplets survive on surfaces and clothes for many hours. Therefore, touching any such infected surface or cloth and then touching one's mouth, nose or eyes can transmit the disease. This also means that virus is not an airborne transmitted.

CAN THE CORONAVIRUS SURVIVE ON SURFACES?

It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems likely to behave like other coronaviruses. A recent review of the survival of human coronaviruses on surfaces found large variability, ranging from 2 hours to 9 days. The survival time depends on a number of factors, including the type of surface, temperature, relative humidity and specific strain of the virus.

However, the two viruses differed in staying power on copper and cardboard. No viable SARS-CoV-2 was detectable on copper after 4 hours or on cardboard after 24 hours. In contrast, SARS-CoV-1 was not viable beyond 8 hours for either copper or cardboard.

Surface	SARS-CoV-2 (hr)	SARS-CoV-1 (hr)
Copper	3.4	3.76
Cardboard	8.45	1.74
Steel	13.1	9.77
Plastic	15.9	17.7

Table: Median Half-Life on Surfaces

COULD YOU BECOME INFECTED FROM JUST A SINGLE PARTICLE OF CORONAVIRUS?

There is a certain amount of viral particle that you need to be exposed to become infected. If you just had one viral particle on your finger, it is unlikely that you are going to be infected. Some viruses are very potent, you only need like 10 particles to get infected, while others you [may] need millions. The fewer viral particles you are exposed to, the less likely you're going to get infected. That is why the amount of virus on a surface is important.

CAN THE CORONAVIRUS DISEASE BE TRANSMITTED IN HOT OR HUMID CLIMATES?

From the evidence so far, the COVID-19 virus can be transmitted in ALL AREAS, including areas with hot and humid weather. Regardless of climate, adopt protective measures if you live in, or travel to an area reporting COVID-19. The best way to protect yourself against COVID-19 is by frequently cleaning your hands. By doing this you eliminate viruses that may be on your hands and avoid infection that could occur by then touching your eyes, mouth, and nose.

FAÇADE & FENESTRATION MATERIAL THAT CAN BE USED HIGHLY IS COPPER

- Evidence also suggests that the virus does not survive long on copper, as copper ions kill the microbes landing on the surface. The ions prevent cell respiration, disrupt the viral coat and destroy the genetic material inside. This latter property is important as it means that no mutation can prevent the microbe from developing resistance to copper.



A copper cladding on exterior surface (www.axolotl.com.au/)



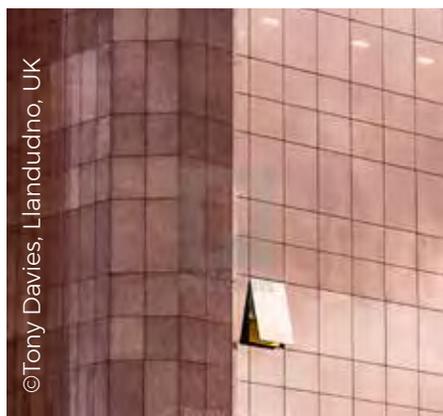
Copper door



A spiral staircase with copper cladding, copper can be used for cladding in the interiors too (Science Center, Hellerup, Denmark; Architects: CEBRA)



Itaca wooden cladding with copper finish on the exterior which transforms into *jali* on the terrace levels



An openable window of glass with the copper cladding tile on left of the façade to match the exterior glass glazing tile grid forms a unique combination of copper and glass



An exterior with copper cladding, copper used here is on the exterior and form an exterior skin of the building envelope

©Tony Davies, Llandudno, UK

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product/parklex-parklex-
façade-copper/1116776)

Façade Materials

- Zinc oxide is a well explored antiviral material, known to inhibit viral activity, including that of H1N1 influenza. “However, little has been explored in coating these materials on existing packaging systems,” To use this low-cost material, the researchers should explore the possibility of making robust thin film coatings on various packaging materials,

In the image below, we see the exterior skin is of copper and supported by the inside curtain wall, which forms a double layer of façade and arrest the virus on the first skin for 3 hours only, while the interior environment quality is unaffected, until and unless any person carries its systems and enters into the building. A *Jali* - which resembles like a fabric wrapped around the exterior envelope, façade and fenestration merging with each other.

SOME OF THE HIGHLIGHTS ON THE COPPER TO USE FOR FENESTRATIONS AND FAÇADES

- **Durability/long-life:** Copper roofs are extremely durable in most environments. They have performed well for over 700 years, primarily because of the protective patina that forms on copper surfaces.
- **Low maintenance and cleaning:** Easy to clean and low in maintenance cost
- **Grease:** By using some kind of grease, such as a layer of Vaseline, over the copper you can prevent copper corrosion
- **Sealer:** Employing a paint sealer to keep air off the copper is another good way to stop copper corrosion
- **Lightweight:** When used as a fully supported roof covering, copper is half the weight (including substrate) of lead and only a quarter of tiled roof
- **Ventilation:** Copper does not

require complex ventilation measures. It is suitable for both unventilated ‘warm’ and ventilated ‘cold’ roof constructions

- **Availability:** Copper is a reddish metal that occurs naturally in rock, soil, water, sediment, and air. Its average concentration in the earth's crust is about 50 parts copper per million parts soil (ppm). Copper also occurs naturally in plants and animals. It is an essential element for all known living organisms including humans and other animals.
- **Workmanship:** Copper can be easily moulded or shaped in any desired shape

EXPOSURE PATHWAYS

Copper is common in the environment. You may be exposed to copper by breathing air, drinking water, eating food, and by skin contact with soil, water, and other copper-containing substances. Most copper compounds found in



Tiled Perforated copper panels used for light to enter the interiors (Royal Holloway, University of London - Copper Recess Fixed Cassettes on BENCHMARK Karrier system during installation)



© Reineke Sash and Door

Copper window with glass panels

Façade Materials



The air passing through the copper fenestrations - Union Station, Toronto, architect : +VG Architect

air, water, sediment, soil, and rock are so strongly attached to dust and dirt or imbedded in minerals that they cannot easily affect your health.

In the light of law of reciprocation, which is a universal principal of brahmand from the authors point of view, I think as the corona virus has affected directly the immunity of the human kingdom so vastly, it can be counteracted by increasing our immunity which is directly proportional to taking utmost care of our health.

In the light of this fact - if we introduce copper as an important constituent for manufacturing of

precast façades and fenestrations, it will be a balancing factor to the health of the entire humankind.

Copper has many miraculous inherent properties which can enhance the human and façade relationship and the entire aura of the building, as we can't treat human and building differently.

The air passing through these fenestrations into the interiors space is also beneficial for respiration with reference to the below article published in an UK magazine and also, we should take into account the wisdom of ancient Indians who always used copper in their building material and water storage.



NIKET SUNIL UPASE
Founder Architect,
Ahamasmi Architect

ABOUT THE AUTHOR:

Niket Sunil Upase is the Founder Architect of the design firm Ahamasmi Architect, and is affiliated to Council of Architecture, Indian BIM Forum and Association of Designers of India. Upase believes that architectural designing should be always people centric. The firm designs residential, institutional and commercial spaces ranging from 500 - 1,00,000+ Sq ft building footprint area with economical and innovative thoughtful architectural solution in adherence to Vaastu principles, offering urban planning, architectural and interior design solutions. Ar. Upase is open to work for oversea projects for architectural design and BIM related services and also provides architectural design and execution of works. The firm, Ahamasmi Architect, has expertise in BIM (architectural and MEP revit) outsourcing services too.

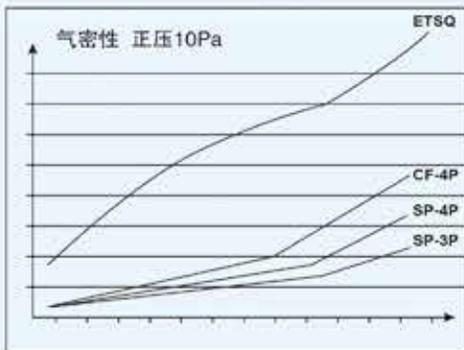


Form follows function - Bjarke Ingels Group designs domino-like copper façade for business school in Massachusetts (image by max touhey)

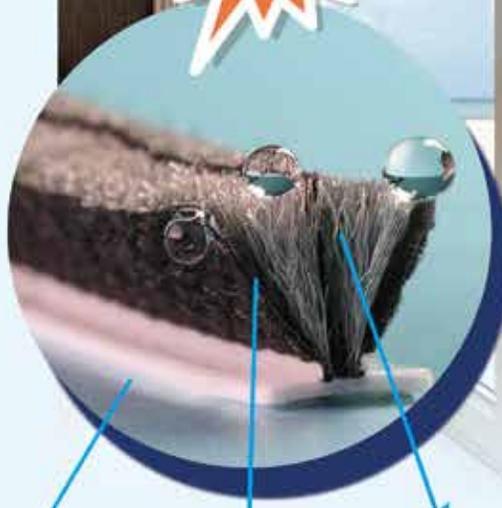


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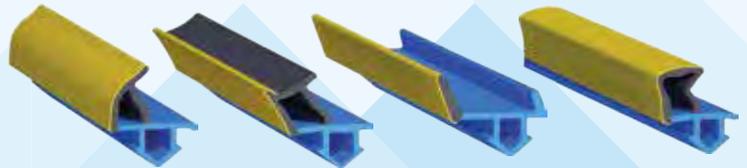


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Max Lato heading to the market demand, and launched a rivet less soffit system called FS01.

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Liberating fins - NITTE Meenakshi School of Architecture, Bangalore



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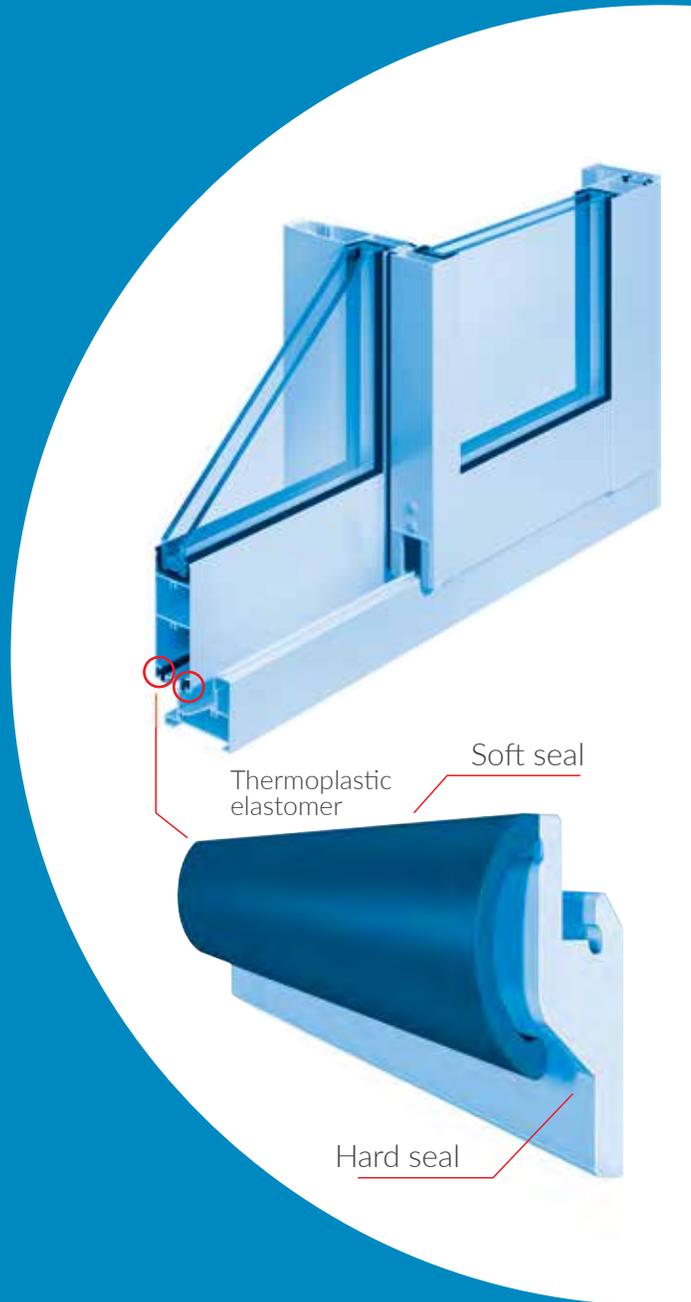
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The prospect of new room comfort is the theme of the future. We need the past to be able to design both sensibly and responsibly. Because tradition is the ideal basis for sustainable innovation. Even if we didn't call it "room comfort" before, we have

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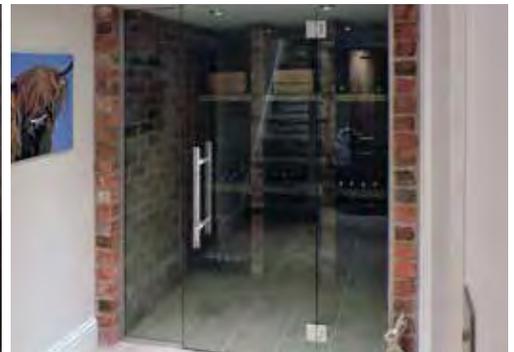
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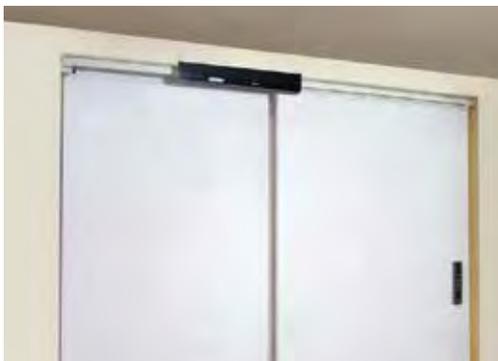
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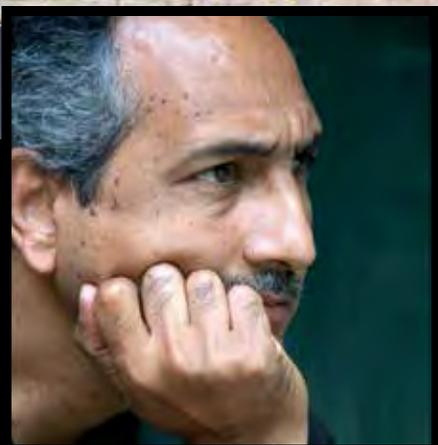
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“The Future of Façade Design Lies in Materials that are Highly Efficient and Energy Conservant”



AR. RAHUL KADRI

Partner & Principal Architect,
IMK Architects

Rahul Kadri is the Partner & Principal Architect at IMK Architects, an architecture and urban design practice founded in 1957 with offices in Mumbai and Bengaluru. Kadri took over the reins of the practice from his father I. M. Kadri in the 1990s after completing a graduate diploma in architecture from

the Academy of Architecture, Mumbai, and a Masters in Urban and Regional Planning from the University of Michigan, USA. The period was marked by significant shifts in India's socio-cultural landscape — in a newly liberalised economy, models of patronage and typologies of projects evolved. In response



and with Kadri at its helm, IMK Architects transformed to focus its practice on social consciousness and urban ecological sensitivity. Today, the firm ensures an effective and efficient delivery of holistic design solutions from buildings to city master-plans — vibrant, dynamic, healthy and robust spaces. Kadri's

work is widely acclaimed with multiple felicitations from the IIA and most recently, an 'Architect of the Year' award from the Times Network.

Architect Rahul Kadri Spoke to WFM Media on his practice, some of his recently completed and ongoing projects, the changes in façade

and fenestration designs over the years, latest trends in façade & cladding material and technologies available in the Indian market, the key factors to consider while designing and installing façades & fenestration, and on future façades & fenestration designs and technologies. Here are the excerpts from the interview.

Please tell us about your practice?

PIMK Architects was founded in 1957 by my father, I. M. Kadri. His body of work over the next few decades is a reflection of changing times and imaginations as our young nation navigated questions of tradition, modernity, business and politics on its way to a self-sufficient and economically-secure future. I took over the reins of the practice in the 1990s, a period that was marked by significant shifts in India's socio-cultural landscape — in a newly liberalised economy, models of patronage and typologies of projects evolved while modern technology made inroads into the architecture and construction industry; concerns of climate change emerged in mainstream discourse as well. In response, we transformed to focus our practice on social consciousness and urban ecological sensitivity. What has remained constant through the years, however, is our exploration of the potential of architecture within the paradigms of culture and civilisation to serve the needs and aspirations of the communities it serves.

Today, we are a 35-strong multidisciplinary team of architects, designers, planners, engineers and



Nehru Centre, Mumbai - Embellished with window and *Jalis* that symbolise rose petals associated with Nehru in the popular mind

visualisation artists, who draw from this rich legacy and cutting-edge engineering and construction technologies to create architecture that responds to place, time, and most importantly, people. We have offices in Mumbai and Bengaluru and our unique, collaborative SCRUM design process, which involves intense workshops with all project stakeholders, ensures the effective and efficient delivery of holistic design solutions, from buildings to city master-plans across the breadth of India — vibrant, dynamic, healthy and robust spaces where people thrive.

What inspired you to become an architect?

Since my father is an architect, I was exposed to architecture from a very young age. I believe that's what sparked my interest in the field. I went to school at the Sherwood College, Nainital, and hence spent most of my formative years in the Kumaon Himalayas amidst lush landscapes and exploring forests. This early relationship with nature infused within me a deep passion to create buildings and spaces in harmony with their natural context. I then went on to complete a graduate diploma in architecture from the Academy of Architecture, Mumbai, and a Masters in Urban and Regional Planning from the University of Michigan, USA, where I was influenced by the work and writings of Christopher Alexander and Charles Moore.

Façades and cladding industry in India has gone through a sea change in the past decade. Tell us about the latest in façade & cladding material and technologies available in Indian market and those used in your projects?

Yes, façades are no more treated as mere derivations of functions inside the building. They have now



A robust building with shades to match the natural surrounding of the hill, Lake Pawna, Lonavala





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Haveli House, Mumbai - The façade showcases the double height terraces formed by the duplex apartment

become an instrumental aspect to help accentuate buildings, enhance iconicity and make them memorable, while keeping the functionality intact; they can also develop a connection between the inside and outside nature, aiding general wellbeing. Today, various innovative materials are available to help design a façade that can protect a building from natural forces.

At the AURIC Hall, which has been designed incorporating climate-responsive and sustainable design practices, embodying low energy costs, and use of high-performance



Hotel Oberoi, Mumbai

materials to achieve IGBC Gold Performance, we designed large glazing on the North-facing façade and shading screens on the south side. The large, central, north-facing atrium with a ceramic frit glass surface allows maximum glare-free light into the building's office spaces to create a conducive work environment, while simultaneously minimising heat gain.

The atrium is also provided with lightweight, multiwall polycarbonate sheet roofing, which requires a lighter truss design, but also effectively blocks the glare and minimises the heat gain within the atrium. This helps in reducing the air conditioning cost for the large atrium volume.

What are the key factors to consider while designing and installing façades & fenestration? There are many cladding materials available in the market. How do you choose the apt one for your project? What are the criteria?

For us, the climate of the area and the sunpath with respect to the building's orientation are the initial guiding factors in the design of the building and the façade. To ensure we get optimal daylight into the building while reducing solar heat gain, massing studies become important too. In most of the northern hemisphere, north façades can easily solve this problem — they provide access to ample indirect and glare-free daylight without the risk of excessive heat gain. On the other hand, south and west faces require careful consideration of Window to Wall (WWR) ratio, daylighting and glare studies, and some form of shading device: blinds, vertical or horizontal fins, overhangs or *chajjas*, boxed or recessed windows, double façades, or screens like the traditional *jaali*.

Other factors that influence such decisions are the following: maintenance costs (low maintenance natural/textured materials such as brick and



Taj Coromandel - Traditional Indian architecture and local styles has been brought into full play in this project

concrete work best), the green properties or embodied energy of the material, the budget of the project, and the function of the building — especially for public or civic projects where the vision that the building's architecture needs to convey is important, façade design and materials used have a direct impact on the perceived humility or grandeur of the building.

Please brief on the technical benefits of a well-managed façade and how it helps the building to be energy efficient at the same time provide better interior environment? What about sustainability and environmental considerations when choosing the façade/cladding material?

A well-designed façade/skin system can significantly reduce the life-cycle cost of a building. For example, in the recent past, especially in tropical climates like ours, glass has received a lot of flak from building professionals as an inherently unsustainable material — a material that leads to excessive heat gain, which in turn increases the need for mechanical cooling and eventually results in increased energy consumption. This couldn't be further from the truth. Glass is as good a material as the designer

using it. It is, in fact, certified as a green building material according to the Indian Green Building Council (IGBC). If a glass surface is chosen with the correct insulating value, it can allow maximum glare-free light into the interiors, while simultaneously appropriating the solar heat gain coefficient and reducing the mechanical cooling loads. Similarly, highly reflective materials, when used on the roof or on direct sunlight areas, can also reduce the heat island effect.

To add to the longevity of the façade, one must choose cladding materials that are low maintenance and can provide protection from external natural elements.

There is also an urgent need to broaden our understanding of green or sustainable buildings beyond their traditional mandate of environmental response or energy efficiency to how they interact with their eventual inhabitants. A 'green' building should aid user wellbeing, and as several studies of biophilia have pointed out, natural light and connections to nature have a significant positive impact on the health and productivity of humans. This is where the façade design comes into play since it regulates the penetration of natural light and air into the building.



Shivsagar Estate, Mumbai - A strong modernist façade marking the new era of commercial buildings in late 60's

What are your views on future façades & fenestration technologies, and materials?

The future of façade design lies in materials that are highly efficient and energy conservant since it is the need of the hour to reduce the carbon footprint your building leaves behind. Such materials are currently being developed and will make a breakthrough in innovation in the very near future.

According to you, what is an intelligent façade? How can intelligent façades bring in the greenhouse effect and also restrict intensive use of air conditioners?

A façade that can adapt to changes in its immediate environment and natural surroundings is an intelligent façade. Such façade s should be planned keeping in mind solar radiation level, orientation and shading devices use, opaque wall to window proportion, wind speed, colour of shading devices, depth and openings of the double-wall, glazing type and metal façades

that adjust and adapt. This helps make buildings energy-efficient and reduces their life cycle cost.

What is your advice to young, aspiring architects?

My advice to young architects would be to have a radical focus on the needs and highest aspirations of your clients and all users or inhabitants of the building or spaces you are designing. Your training really allows you to do things that can make a profound difference in people's lives and to the planet at large through the choices you make in terms of sustainability. So you must use your skills to make the world a better place, one project at a time.



Shivsagar Estate, Mumbai - A strong abstract mural marks the wall to create an architectural language



Jivan Maneck, Mumbai - Rhythmic flow and symmetry of chajjas or sun shades brings a calm sense to the residential building



Symbiosis International University - Mild Steel metal trellis pre-coated with corrosive resistant paints was used to shade windows

AURIC Hall

District Administration Building, Aurangabad

Aurangabad Industrial City (AURIC) is one of the Greenfield and smart industrial cities, being developed as part of the Delhi Mumbai Industrial Corridor (DMIC). AURIC Hall is the landmark District Administrative Building within the Central Business District of the industrial city. The building is both the monitoring and the administrative nerve center for the smart city, housing the main command control room to manage all the civic utilities on a real-time platform centrally.

IMK was involved in the design process right from the concept and through detail design towards tender with the clients, and as part of the design and build team towards execution. The focus, in addition to design functionality and aesthetics, is also on the optimisation of designs both in terms of performance as well as costs.

AURIC Hall is designed as a transcendent, inspirational, timeless office building. It has been conceptualised as a building that creates spaces that strive to achieve innovation and transcend expectations. It is a socially responsive building, enhancing engagement with spaces where people and activities thrive. Although the building is advanced in technology and function, it was important that the building is planned with a character that was sensitive to Aurangabad's climate, context, and rich history.



AURIC Hall is designed as a transcendent, inspirational and timeless office building



The public spaces are enclosed with screens that maintain the soft and natural quality of light



The use of *jaalis* allows for the control of airflow and helps in lowering down the temperature of internal spaces while letting in diffused natural light

Historical Context

In imbibing the architectural and historical values from Aurangabad's legacy, ceremonial gateways mark the entrances along the compound wall at the approach to the building, which acts as definite pause points.

The first layer of spaces as you enter are lush green open spaces, nestled between a screen and the main building. The subsequent layer of public spaces are enclosures that create an approach to the beautiful refuge within, with screens that maintain the soft and natural quality of light. Additionally, the use of *jaalis* allows for the control of airflow and helps in lowering down the temperature of internal spaces while letting in diffused natural light. Taking its inspiration from the historic structures like Bibika-Maqbara, patterns have been used in the screens that envelope the building and repeated on the glazed panels as well, echoing the

theme of the building. A network of two aluminum screen modules of the same motif but varying scales forms the *jaali*. This breaks the monotony of the façade while helping control the light and shadow for open terraces and office spaces accordingly.

The porch leads onto a large linear and full height atrium space. The atrium was added as a modern interpretation of the garden. Every floor has access to multiple terraces; either outdoor green terraces on the southern edge or indoor-cantilevered terraces that overlook the atrium, encouraging interaction and allowing the users of the building to thrive. Entry-level spaces have been designed to be free-flowing and transparent, to allow visual as well as physical connectivity throughout the ground floor, which houses all the public facilities.

Materials: Commercial and office spaces call for large structural grids to allow for flexibility. As such, post-tension beams were used to enable the large spans and the services height clearances required within a proportionate floor to floor height.

Steel has been used on the façade and roof truss, which are crucial elements of the building. For the larger truss span, steel was a choice due to its durability, structural flexibility, and higher load-carrying capacity. Due to the advantage of steel construction in being rapid, it was a chosen technique to fit within the constrained building completion deadline. Another strength of steel is that it can be constructed off-site and assembled on-site, which saves a lot of time, and multiple works can happen simultaneously. The external *jaali* façade of the building needed to be selected considering various factors- it needed to be

lightweight, at the same time robust, incurring low maintenance costs and long-lasting. Laser-cut aluminium panels were finalised in comparison with alternative materials such as concrete, MS, Corten steel, or zinc. The atrium has been provided with multiwall polycarbonate sheet roofing. This is not only light in weight and hence requires a lighter truss design, but also effectively blocks the glare and minimises the heat gain within the atrium. This, in turn, also helps in reducing the air conditioning cost for the large atrium volume.

The large north-facing atrium façade has large glass panels with ceramic fritting. All the offices facing the atrium also have glass walls in line with the open office concept. The glass was carefully chosen again with the required technical specifications making it effective against glare, heat gain, and toughened at the same time against wind pressures and other loads.



Taking its inspiration from the historic structures like Bibika-Maqbara, patterns have been used in the screens that envelope the building and repeated on the glazed panels as well

Case Study

AURIC Hall has been designed incorporating climate-responsive and sustainable design practices, embodying low energy costs, and use of high-performance materials to achieve IGBC Gold Performance.

The building is oriented to allow maximum glare-free light into the office spaces, while simultaneously minimising heat gain. The layout consists of the large central north-facing atrium, maximised with a glass surface to optimise the daylight from the north, with office blocks abutting it on the other three sides, wrapped with an intricate modular *jaali*. The atrium width, as well as the width of the offices surrounding it, was controlled to ensure maximum daylighting. The *jaali* screen controls the airflow and lowers the temperature of internal spaces, while also providing natural diffused sunlight into the building.

The use of solar panels and energy metering and management systems facilitates energy efficiency while CO₂ monitoring enables indoor environmental quality control.

Inaugurated by the Prime Minister of India, Narendra Modi in September 2019, AURIC Hall is not only meaningful in its objective, but

also manifests itself as indigenous, leading edge of people's highest aspirations, whilst allowing people to thrive in its environs.

QUICK FACTS:

Project: AURIC Hall

Location: MIDC, AURIC City, Shendra, Aurangabad

Client: AITL – Aurangabad Industrial Township Limited

Architect: IMK Architects

Principal architect: Ar. Rahul Kadri

Design team: Anuprita Dixit, Bhumika Ganjawala, Heena Shaikh, Suvidha Mhatre, Tejashree Rajeshirke

Façade consultant: FCD

Façade contractor: Chiniwala Façades/Glazium Façades/
New Look Interiors

Engineering: SPCPL

Site area: 154172 Sq ft

Built-up area: 179334 Sq ft

Start date: October 2017

Completion date: April 2019

Photographer: Rajesh Vora



Steel has been used on the façade and roof truss, which are crucial elements of the building

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Symbiosis University Hospital and Research Center (SUHRC)

Lavale, Pune



Symbiosis Hospital and Research Center (SUHRC), Pune

Symbiosis University Hospital and Research Center (SUHRC) is established on the lower slopes of a hill, amidst the sprawling 40 acres land of Pune's educational institute Symbiosis. It is envisaged as a multi-specialty hospital to provide health care facilities and to enhance Skill development in the Field of Medicine. Amidst today's context,

currently, the hospital is being used for Government welfare as COVID 19 hospital.

Planned as a robust curve along the contours of the land, the building forms the façade of the project. Imbibing the client brief of 'grandeur' being a key element, two significant and symbolic entrances have been designed, distinct in approach to cater to the client brief

of unique identities for the hospital and the academic block. A large open-to-sky courtyard separates the centre from the hospital. The entrances for both these blocks lie on either side of the building, making them seem like two completely different entities,

The entrance for the Skill Centre draws inspiration from the stainless steel surgical instruments

used in hospitals. A mammoth silver steel bird, with wings wide open, welcomes the visitor into the building. Supported by steel pipes, a futuristic roof under the sun beaming brightly, is symbolic of a contemporary architectural response. The roof sits above the large semi-circular staircase that leads the visitor to the entrance. In contrast, the response to the other block is humbler. Split into two entries, where one is for casualties and the other for regular populous, the base of the entrance is lifted to be in line with the interiors. Above this large entrance, a slightly curved roof is designed, shading the entrance and making it possible for people to wait outside too. The tip of the entrance is stretched upwards, thus letting in more light to create a deeper canopy so that at least two lanes of vehicles could be parked along the length of the building under it. The canopy was stretched to the complete width of the building and gave it a smooth curvilinear shape in the front, which mellows down the impact of the sheer size of this structure. A balance between light and shade has been achieved with smaller skylights within the roof, and a larger opening towards the upward bending tip. The upper surface of this canopy was

converted to a terrace garden, which would promote healing.

Two large courtyards in the building create buffer zones that help in healing patients, bring in ample light, and are overlooked by wardrooms and the Out-Patient Department. The OPD has no air-conditioning but allows for fresh, natural air while ensuring sufficient ventilation. All departments and spaces of the hospital are designed such to bring in daylight and natural ventilation. Similarly, at all levels, there is a 3m wide corridor that abuts the central courtyard, which lets in natural light and ventilation, thereby reducing the AC load and power consumption for these areas. The courtyards act as spaces for healing, for the congregation while reducing cross-infections.

Attention has been paid to construction details, where post-tensioned slabs are used to achieve flexibility, minimum beams, and larger spans that facilitate different size room arrangements and to allow for easy routing of ducts.

Naturally compressed, sundried earthen bricks produced on-site, have been used for façade and masonry work and methods such as brick-boxing were incorporated to achieve efficiency, while reducing pollution. Together



The bricks enable a natural, original, and permanent finish on the building

with exposed concrete, the skin and the façade flatter the green hills beyond. The bricks enable a natural, original, and permanent finish on the building, which would be maintenance-free. Brick was adopted as the material of choice for the double skin on the façade with deeper shading projections that would reduce heat gain. The resultant boxing forms were skewed, twisted, or tapered to achieve variations in shape to form



Naturally compressed, sundried earthen bricks produced on-site, have been used for façade

Case Study

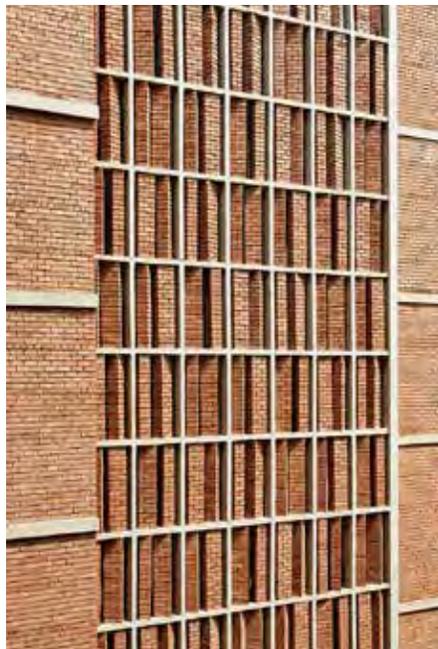
a multi-faceted façade that reflects light in different tones in any part of the day. The large retaining wall of exposed concrete also gets covered with climbers and plants, converting a blank mass of concrete to an aesthetically pleasing feature that adorns the approach to the hospital. Creating dynamism through its texture, capturing the play of light and shadow each day, the façade looks different, complimenting every mood of the day.

Energy Efficiency: To ensure efficiencies in terms of cost, time, and impact, all details such as glass façade, percentage of glass vs. brick (not more than 30% glass on the entire façade), shading factor, temperature, and humidity requirement, etc. were finalised at early design stages. This ensured energy efficiency as per functionality and not based on other projects or standard values.

In a centrally air-conditioned hospital, 55-60% power gets consumed by the air-conditioning system and 15-20% power by the

medical equipment. The balance 20% is shared by all the other systems such as lighting, water circulation, treatment, convenient power outlets, the vertical transportation system (Elevators), etc. Since there is a limited option to reduce energy consumption by Medical equipment, it is crucial to arrive at an appropriate air conditioning system. Water cooled chillers with variable speed drive premium efficiency pumps, and cooling towers with CTI certification for the assured thermal performance has been selected. The chilled water system is designed for low flow high delta T (temperature difference), making the chilled water flow requirement 17% lesser as compared to the regular conventional system. Vertical Transportation Elevators are selected with gearless drive motors and VFD controls to save the energy consumed by elevators by 35%. Transformers are selected to meet the loss values permitted by the Energy Conservation Building Code published by the Bureau of Energy Efficiency of India. Light

fixtures are selected with LED bulbs, and the domestic water is wholly recycled, treated, and used for secondary applications such as Air Conditioning, gardening, etc. – all resulting in zero liquid discharge from the building. Water Cooled Heat Pumps integrated with the air conditioning chillers are used for hot water production, thereby consuming only 35% of the energy as compared to conventional electric heaters. Additionally, the by-product of chilled water produced is taken back into the chilled water system to reduce the load on the chillers. A thorough mode of System Testing, Adjusting and Balancing was enabled to ensure that the design intent is achieved in the actual functioning of the project by a third-party testing and commissioning agency.



Brick was adopted as the material of choice for the double skin on the façade with deeper shading projections that would reduce heat gain

QUICK FACTS:

Project: Symbiosis University Hospital and Research Centre

Location: Symbiosis Lavale, Mulshi, Maharashtra

Client: Symbiosis Society

Architect: IMK Architects

Principal architect: Rahul Kadri

Design team: Nithin Hosabettu, Sahil Bipin Deshpande, Viraj Naralkar, Aakash Shrivastav

Site area: 96100.00 Sq m

Completion date: 2019

Photographer: Rajesh Vora

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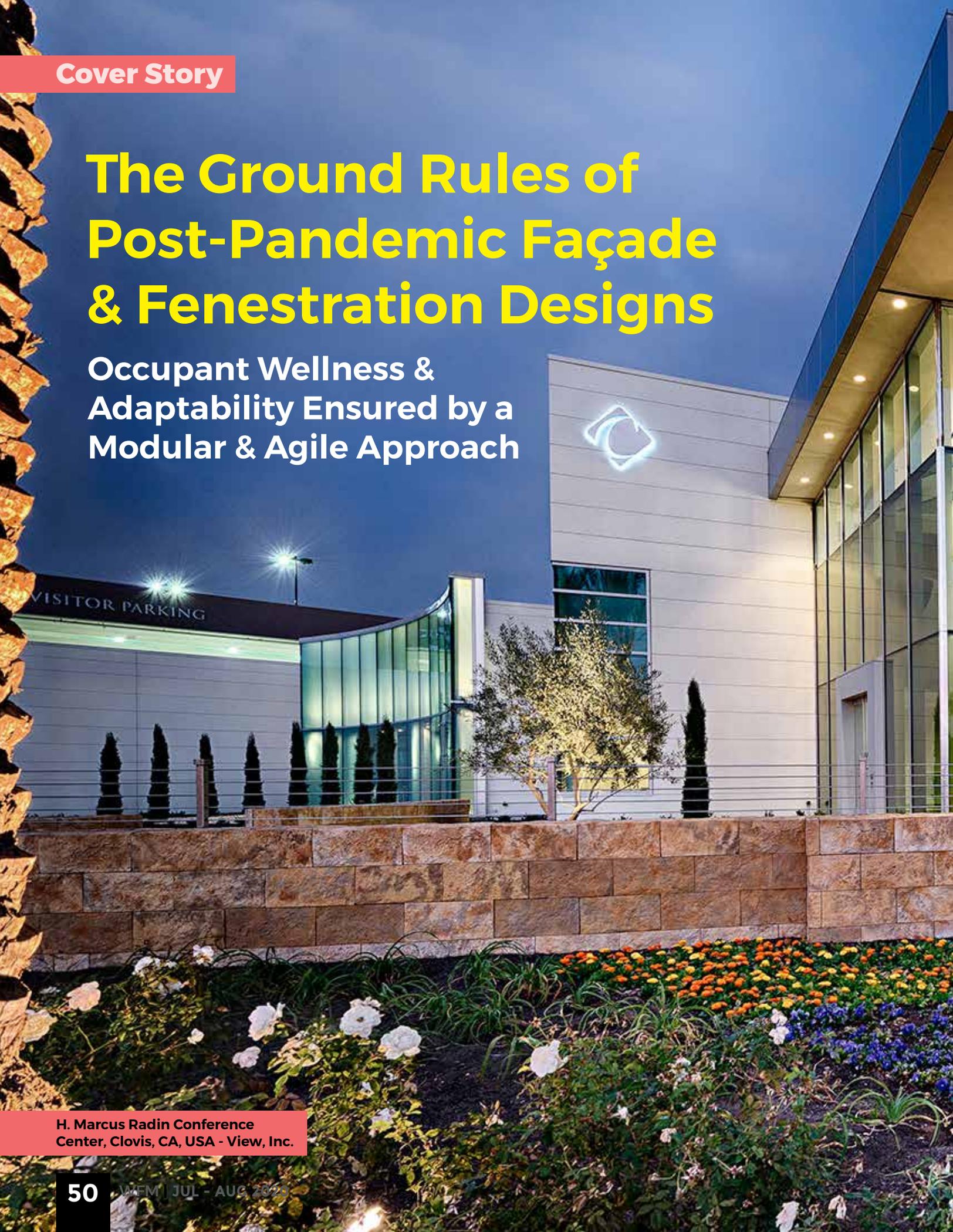
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The Ground Rules of Post-Pandemic Façade & Fenestration Designs

Occupant Wellness & Adaptability Ensured by a Modular & Agile Approach



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With the rapid spread of COVID-19, designs for a world will never be quite the same, especially for large public spaces, like airports, hotels, hospitals, gyms, and offices. This is an opportunity to rethink everything, including how we design and build façades and fenestration to be even more resilient, healthy, beautiful, green and creative. This is our time to come together and not just imagine but ideate and advocate for a future where the world is

in harmony with nature, and where innovation and imagination is valued for solutions that enhance the quality of life.

Can we shift from trying to save the bottom line to designing buildings that are carbon neutral because they reduce energy consumption, and participate in regenerating resources while offering ample space in which to live? Here are some fresh ideas by a few experts for the design of resilient façades and fenestration and brief on the same:



ANOOP DEVASIA
Lead Architect,
PM Group



ASHISH K JAIN
Partner, AEON Integrated
Building Design
Consultant LLP



DEBEN MOZA
Executive Director - Head of
Project Management Services,
Knight Frank India (Pvt.) Ltd.



PIERS MACNAUGHTON
Director of Health Strategy,
View Inc.

We are seeing that the entire world is getting affected by the spread of this pandemic. Despite the type and scale of spaces, the ground rules of designs will change. This will be felt in existing and proposed buildings, says **Anoop Devasia, Lead Architect, PM Group.**

COVID 19 has exposed the mankind on this planet to a completely new threat. It alarms that the buildings must be prepared for prevention of not only COVID-19 but any virus, in general, that may come up in the future, notes **Ashish K Jain, Partner - AEON Integrated Building Design Consultant LLP.**

When it comes to façades, it is already established that they are not just a part of the design or just for the show. Façade is as important as the internal spaces. Choosing façade materials depend on various factors - durability, ease of installation, maintenance, cost, resistant to external elements, etc. Health and wellness of the occupants are also added along with this, says Devasia.

According to **Deben Moza, Executive Director - Head of Project Management Services, Knight Frank India (Pvt.) Ltd.,** Covid-19 has certainly created a flurry in the design and construction industry. The conversation has shifted to focus on creating online experiences, deeper integration of technology, and

certainly, a change in the fundamental definition of office spaces. "However, what COVID has done is accelerate the pace of these changes which were already happening. We were already moving to a more tech-driven, flexible, touch-free, virtual space - we are now just going faster," says Moza.

One of the interesting learnings from COVID-19 is something that we already knew - enclosed may not always mean better, states Moza. Can you imagine an open façade, which serves not only to let air in, but also as an air filter? Asks Moza. Not only we would get the fresh air, but clean fresh air...

There will be changes in design because the way we use spaces is now changing, says Moza. The definition of work itself is changing, and thus the office space must change. Our common space interactions are changing, and thus spaces will respond. Understanding the exact change today, is quite impossible, as we are yet to see the complete unfolding of this pandemic. At this stage, we can only speculate, observes Moza.

OCCUPANT WELLNESS - THE PRIME CONCERN

Piers MacNaughton, Director of Health Strategy, View Inc. points out that in a post-COVID-19 world, there will be more emphasis on the health and wellness of building occupants. He observes that as



Independent Financial HQ in McKinney, Texas - View Inc.



AJAY GUPTA
Executive Director, KGD - A
Katerra Design Partner



TITIR DEY
Design Director,
Space Matrix



Lodha Trump Tower, Mumbai

a potential outcome of the COVID-19 pandemic, we will see an influx of tools that allow those working from home to interface with those working in the office more smoothly, such as window displays that turn virtually every surface of an office building into a screen.

Façades will increasingly be designed with smart glass that intelligently changes its tint based on cloud coverage and the angle of the sun, says MacNaughton. This high-performance technology-based on a cutting-edge electrochromic coating - blocks heat and glare without blinds and shades, while optimising comfort levels for people and giving them access to daylight and views of the outdoors.

Public buildings receiving and serving large population like airports, hospitals, hotels, workplaces, etc., have the largest risk as the people coming and moving out of these buildings become potential carriers for the travel of the virus. As per recent studies, it is found that particulate matter and other pollutants can also become a potential carrier for viruses. Façades, being the frontier of buildings, shall be an even more crucial element to design. Key factors in façade design to mitigate health issues will include prevention of dust, pollution and particulate matter entering the building, says Jain.

Architecture, especially large public spaces will see a paradigm shift or correction to the design approach we have taken for the last 3 to 4 decades, agrees **Ajay Gupta, Executive Director, KGD - A Katerra Design Partner**. The building design will become a reflection of nature, and environment outside rather than creating an artificial human comfort level environment inside which is alien to the actual surrounding of that space. The buildings will breathe in and out and manage human comfort with a passive approach. The façade and fenestration will also start to show a reflection of this, it will change from being a barrier to be a filtered

skin where light, heat and air can flow across with a purpose and complement the environment inside.

According to **Titir Dey, Design Director, Space Matrix**, from an indoor environment perspective, the wellness of a building's occupants depends upon factors like indoor air quality, space, thermal and physical comfort. There is thus a need for a sustainable design approach that focuses on the integration of natural light as much as possible. While designing the façade, materiality and style play a crucial role in determining how much natural light will enter the area. Glare control and balancing thermal factors through mechanical systems are essential to ensure a comfortable indoor environment. In the current scenario, there has been a lot of research around the surfaces and metals with superior antimicrobial properties. Designers must consciously focus on such options, especially for high touch-prone areas.

Devasia too agrees with Gupta and Dey, adding that the way façades impact internal temperature is one of the major criteria while evaluating the façades. Looking at the quality of air outside, façades which can improve the air quality will be a promising one.

IMPORTANCE OF FAÇADE DESIGN FOR OCCUPANT WELLNESS

Wellness is the word used when the environment around you compliments your physical and mental well-being, says Gupta. The façade design will play the key factor to integrate the internal to the external with the right mix of elements being transferred and filtered to the internal space. An average person spends 80 to 90% of the time within a building, be it an office, home or shopping area. This indicates the importance of designing façades as it can have a long term impact on the occupant, adds Devasia. Façade is part of the building interior as well as exterior, which makes a building façade much more than a simple protection layer from external elements. Façades should become the skin of the building, not a container.

According to Moza, the façade does more than set a tone for a building. It is an interface between the inside and the outside of a building, serving a protective and regulatory. More obviously, comfort factors like heat and noise transmission and visual privacy, and human performance factors like access to natural light and fresh air, are largely dependent on the façade. However, more intangible factors, like user control for instance – the ability to open a window near your desk – significantly impact user stress levels. We see an increasingly active role of kinetic, bioinspired, and technologically supported façades in controlling the interior microclimate and supporting building function.

MacNaughton too observes that as the skin of the building, the façade plays an important role in regulating occupant health and wellness. Scientists have known for decades that increased daylight and views of the outdoors can regulate circadian rhythm, lower blood pressure, and even positively impact our ability to learn.

The evidence regarding daylight's positive impact on sleep and health is encouraging, notes

MacNaughton. A recent study found that people who worked in an office with smart windows slept 37 minutes more each night. The participants were also 48 percent less likely to report eyestrain and 77 percent less likely to report feeling depressed in the room with better daylight and views of the outdoors. Also, the participants' cognitive function improved dramatically, resulting in a 42 percent average increase in test scores compared to when they worked in an office with the blinds.

These are groundbreaking findings, and quantitatively demonstrate that the quality of façade design with smart windows has a profound impact on occupant's health and business performance.

Light, air, and heat have a significant impact on human health and wellness, and façades have the potential of either enhancing or ruining these aspects for occupants, if not designed carefully, stresses Jain. Façade brings in daylight and allows people to have access to outdoor views – directly related to the visual comfort of occupants. Whereas, too much daylight, glare and heat

ingress through façade affects both visual as well as thermal comfort of the occupants. In naturally ventilated buildings, façade design is even more important as it serves as the means of bringing in the air and ventilate the building.

FAÇADE DESIGN - FORM, SPACE & MATERIALITY

Occupant wellness is vital not only inside but also outside the buildings, says Jain. While adequate wind flows around the building are important for outdoor comfort, airflow inside the building is important for indoor ventilation. An integrated design including space planning, building orientation, form and shape coupled with an efficient façade design with optimum glazed and operable areas can potentially help to achieve the goals of occupant wellness without compromising on building's operational efficiency.

Let's look at what are the elements a façade is trying to control - Mainly elements like light, air, water & noise. How daylight is treated by the façade will have an impact on the quality of space inside, thus help to improve the concentration, creativity, and productivity of the inmates, says Devasia. "Air is an integral part of us. We need breathing façades which can create well-ventilated spaces that will help positively for the people living within those façades. Water is an element that can improve the mood of occupants depends on space utility. Similarly, controlling environmental noise & sound transmission is very important, mainly in cities where people are not privileged to get a quiet environment. This can help to reduce the stress levels of the occupants. How a designer is transforming all these aspects into a façade design, and the materials the designer is choosing will define the occupant wellness.

Moza opines that the most basic



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answer to effective façade design lies in learning from vernacular architecture. The façade must not be looked at as a box that enclosed the building and creates a sterile, context-independent aesthetic. It must be climate-responsive at the least, and perhaps even a dynamic part of building systems that aid in energy generation or air purification. This requires us to move away from looking at only glass and steel and panels, and explore the plethora of innovations in the industry, from the pixel façade to smog neutralising façades, water-cooled façades, and even kinetic, technologically controlled façades, suggests Moza.

According to MacNaughton, building façades with traditional glass windows have no control on the amount of daylight that enters the building, leading to glare

when the sun is on the façade and relative darkness when it is not. We can only spend so much time near them before we start to feel uncomfortable (common symptoms are headaches, drowsiness and eyestrain).

So far, many solutions to this problem have been clumsy and low-tech, says MacNaughton: “We’ve covered windows with blinds and shades. The problem is, neither of these is very good at reducing heat and, perhaps more important, they block natural light and views of the outdoors - both of which are not only desirable amenities but critical determinants of our health and wellness. Smart glass solves these problems by maximising daylight into space while effectively eliminating glare and reducing thermal loads”.

AWARENESS OF FAÇADE & FENESTRATION DESIGN & CONSTRUCTION STRATEGIES

In the latest version, LEED v4.1 and other building codes the aim is to ensure that a building is resilient from natural and unnatural disturbances with a comprehensive set of design and construction strategies. Are you aware of this? How can these amendments raise the bar on building standards to address the present situation like the pandemic?

In the past, we thought of our workplaces as just that: places to work. We didn’t consider how they were affecting our health. We (in America) spend, on average, more than 90 percent of their time indoors, says MacNaughton. “Over the last 50 years, we’ve replaced the sun’s light with artificial



Almaden Tower, San Jose, California – Outdoor meeting spaces and vegetation contribute to a dramatic effect and healthier air. - Knight Frank India

bulbs, fresh air with HVAC, and the sound of the natural world with humming screens. We've created a new human environment, and it's making us sick," he adds.

Certification organisations and local building codes are slowly factoring occupant wellness into their standards. In addition to helping building owners meet more stringent energy requirements and obtain additional credits through LEED by reducing building energy consumption, products like View Smart Windows position organisations to benefit from new iterations of the standards that factor in health and wellness, says MacNaughton. More and more developers refurbishing old buildings are choosing to install smart glass. Such smart products also help developers achieve their LEED certification goals by earning points in different LEED categories, observes MacNaughton.

Moza explains, Green ratings, such as LEED as very widely known, and primarily aim to help to build be more environmentally responsible. To understand building interaction with its users, there are certifications like the Wellness Certification, which integrate with LEED to provide a more holistic picture of the built environment. "This is great, but unfortunately, these are discretionary in the application. Our best bet at the moment is approaching the built environment with relevant and mindful use of the material and an eye towards occupant wellness, which can certainly help create safer common use spaces," adds Moza.

According to Devasia of PM Group, the latest version is intended to raise the bar on building standards to address energy efficiency, water conservation, site selection, material selection, daylighting and waste reduction. This keeps the human being on the priority and focuses on material selection, human comfort, air quality and health features of a building. "I think while

Available Guidelines & Rating Systems

With the success of the Green building movement witnessed in the country during the last two decades, there is absolutely no doubt that introduction of wellness and resiliency aspects in rating systems will direct the thoughts and raise the bar of building aspirations. While Green Building Rating systems are now covering wellness and resiliency aspects, there are special rating systems also being formulated and available covering these aspects. Some of the available Guidelines and Rating Systems available include,

- "Measuring Resilience Guide"** for LEED v4.1 Cities and Communities
- "Design for Enhanced Resilience"** Pilot Credit under LEED v4.1 BD+C
- "RELI 2.0"** Rating Guidelines for Resilient Design + Construction by United States Green Building Council
- "The WELL Health-Safety Rating"** by International WELL Building Institute
- "IGBC Guidelines Combating COVID-19"** in Green Buildings by Indian Green Building Council

Subsequent to Green building, wellness concepts and rating has already sparked the industry and generated tremendous interest amongst the building community. Going forward, it is the 'resilience' that is likely to gain attention from the industry to address and implement these concepts in a built environment.

(Ashish K Jain, Partner - AEON Integrated Building Design Consultant LLP)

designing a campus (residential/commercial), one needs to ensure that the health and wellness of the occupants shall be one of the criteria. We need to start thinking and implementing ideas like urban farming, urban gardening, etc., in addition to promoting fitness, community inclusion in our projects," says Devasia.

THE 'NEW NORMALS' CONCERNING SUSTAINABLE DESIGNS FOR HOMES & OFFICES

As we move forward in the different phases of the pandemic, new configurations and new plans are starting to emerge. The quality and comfort of our homes will become at the top of the list. What would be the 'new normal' concerning sustainable designs for homes

and offices, putting wellness at the heart of building design?

Gupta says, the new normal will be common sense based ideology, nothing too complicated, nothing too complex, simple design ideas will prevail. Elements like fresh and



Riverwalk Place – Tampa, Florida - More than 50 stories tall, the mixed-use tower - Knight Frank India



Lodha Trump Tower, Mumbai

clean air, good and bright sunlight, natural greenery to filter light and air will become the norm. Artificial means of creating comfort will take a back seat.

According to Titir Dey, as people transit to the 'new normal' and start stepping out of their homes, they need to feel secure, valued and trusted. The focus must be on instilling a feeling of safety by making changes in culture, behaviour and materiality. There must be a sustainable approach that considers wellness of the occupants, and technology to usher in this change as well as management of the indoor environment. Whether it is a home or an office, the success of the design will be determined by the extent of physical and functional comfort provided to the occupants.

Agreeing with Dey, MacNaughton says, it is time to talk about the building as a whole; not to just talk about the different components like windows. In his opinion, the "new normal" concerning sustainable designs for offices would be to consider a 360-degree wellness profile of the building. Not only will occupants desire daylight and views, they will also look to their companies

and building operators to monitor environmental conditions and ensure a healthy environment. He adds that the coronavirus may end up kick-starting an architectural revolution - where buildings are designed from the ground up, with the health, wellness, and productivity of the people who live and work in them in mind.

Moza points out, "for the first time since the emergence of the open office, we are seeing a shift from user density and aesthetics to occupant wellness and psychological safety. As the new normal in workspaces, we may start seeing a deeper integration of technology - starting from the simple ones, like virtual collaboration spaces and thermal scanners to more robust building occupancy mapping and scheduling systems". The key here may be design resilience - the ability to adopt these changes, adds Moza. Regarding home spaces, which are now blending with workspaces, we are already seeing a return to our roots in terms of cleanliness and sanitisation. It would not be surprising if newly built homes were to feature a "sanitisation station" before the main entry - or simply a washroom,

an element seen back in the days of the *haveli* or traditional residences!

The new normal of the immediate future will be social distancing, more-frequent cleaning, limiting exposure to high-touch surfaces and switching to antimicrobial surfaces where possible, says Devasia. On the drawing board, many of the "Nice to have" will become "Must have". Over time there will be a different pattern of work. There will be a shift in how to manage resources. Corporate giants are seriously thinking to increase the percentage of Work-from-Home arrangement for the employees. This means the footfalls inside an office will reduce, which will eventually reduce the number of workstations, sizes of meeting rooms, etc.

During the pandemic, work from home swiftly got converted from "New Norm" to a "New Normal", observes Jain. While WFH has changed the lifestyle of many people and their families; quality, comfort and efficiency in homes have taken the front seat. With increased time spent in homes during the pandemic, people's perspective of how to use their homes is certainly altered.



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Achieving comfort and a conducive environment for living as well as working is a new balance to be achieved in the homes. Home is no more just a home, it is serving an additional usage of the workplace for adults, learning space for children and recreational space for all. Because of the multifunctional approach and comparatively a safer environment at home, Jain believes that wellness at home will relate more to:

- a) better space utilisation
- b) ergonomics
- c) acoustic & sound management
- d) thermal comfort
- e) visual comfort

Post-pandemic, our homes are serving as a space for full-time work, gym, schooling, etc., in addition to sleeping, eating and other leisure activities. We not only want them to be beautiful, but also healthy. The demand for biophilic design will continue to flourish in the future. More green areas and gardens, exploitable rooftops, natural light and ventilation, balconies, and terraces, minimal and wholesome indoor environments, transitional and filtered entrances, etc. could become potential changes.

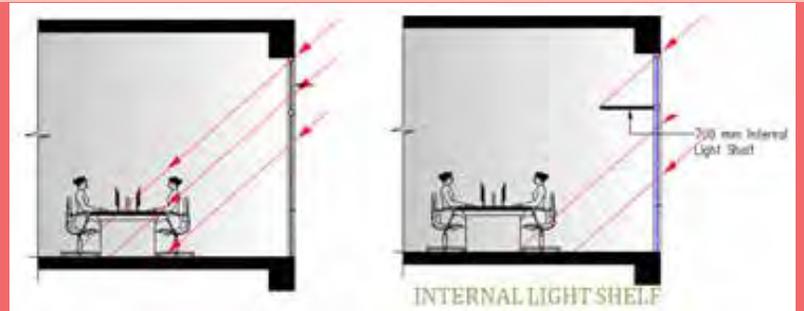
DESIGNING CARBON-NEUTRAL BUILDINGS TO SAVE THE BOTTOM LINE

The adverse impact of not designing the buildings sustainably has been faced for decades throughout the world, denotes Jain. Much of the natural disturbances and calamities are somewhere linked to the environmental disbalance created by not having an environment-friendly built environment. We have even witnessed the impact of CFC emissions leading to depletion of the ozone layer. Deforestation is causing another set of problems of seasonal imbalances. Recent news on the trail of earthquakes moving around different parts of the world is also a sign of such imbalance.

Performance Enhancement

Performance enhancement is more likely to come from a different set of building features and attributes that affect performance, says Jain. Lighting that produces glare

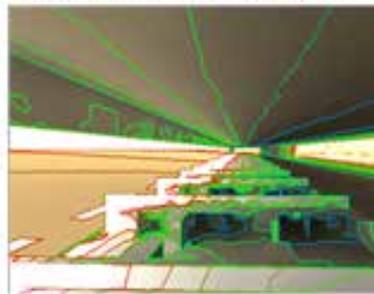
or visual discomfort is more likely to be associated with headaches and eye problems. Glare due to direct solar penetration and due to the lack of luminous uniformity across space distorts the



Before

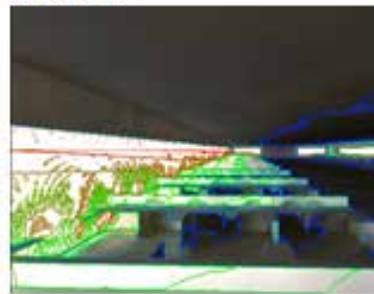
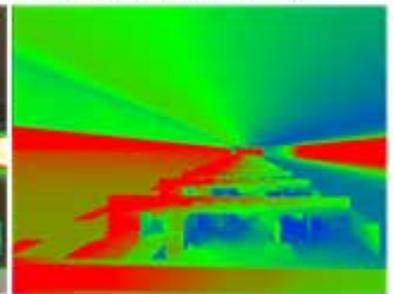
After

HUMAN SENSITIVITY ANALYSIS

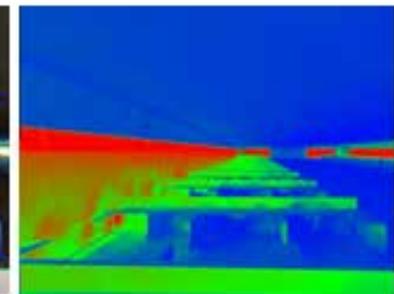


BEFORE

FALSE COLOR RENDERING



AFTER



The images which demonstrate the pattern of direct sun ingress into space and subsequent placement of workstation to achieve glare-free daylight in indoor spaces

Earth is composed of a certain proportion of water and land which is disturbed due to rising sea levels on account of CO₂ emissions

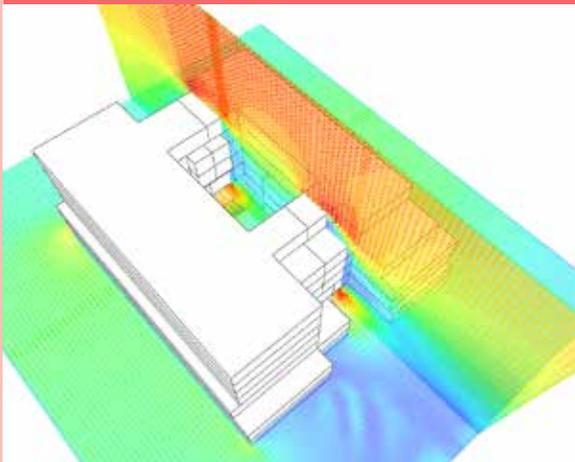
and global warming. With an increase in the water on the earth's surface, plate tectonics of earth are disturbed, causing a trail of

perception of good indoor daylighting. As per a field study of office workers, it is found that workers who had window views of nature felt less frustrated and more patient, and reported more overall life satisfaction and better health than workers who did not have visual access to the outdoors or whose view consisted of built elements only. The positive effects of nature may also extend to the immune system, thereby directly affecting human physical health. Thereby, one of the perennial challenges in designing façades is to achieve an even distribution of diffused daylight across the building section.

Use of Computer Simulations for Façade Optimisation

To achieve optimised façade

design for energy efficiency, cost efficiency and occupant comfort perspective, there are specialised computer simulations conducted viz. Wind CFD Analysis, Solar & Daylight Analysis, Glare & Visual Comfort Analysis, Natural Ventilation Analysis, etc. These computer simulations conducted at different stages of the projects help optimise the building designs to enhance performance and achieve comfort at the same time. The simulations are aimed to evaluate building designs for identifying potential concerns and providing solutions to ensure appropriate façade design by identifying the most feasible and cost-effective options for the project. The quantified results help owners, architects and engineers to make informed design decisions.



Wind CFD analysis conducted to optimise the window openings within the courtyard of this office building

(Ashish K Jain, Partner - AEON Integrated Building Design Consultant LLP.)

earthquakes around different parts of the world. While the concepts of Carbon neutral, energy use reduction, water

use reduction, green buildings are linked to the businesses' bottom line; these have a much greater role and impact on human life.

Thereby, says Jain, we don't have a choice but to find solutions to address both environmental and occupant health issues in our built environment in an integrated way. The shift to Carbon-neutral building begins with making conscious choices during the design process, observes Dey. From the perspective of interior architecture, factors such as conscious zoning and space planning, using the right materials, integrating the best-fit tools and technologies, etc., will help us achieve the energy efficiency and sustainability goals. Small, but effective changes can make a sizeable impact on the carbon footprint and power consumption. In times like the ongoing pandemic, the use of locally available materials and products can bring down the carbon footprint and also help in avoiding delays caused by a disruption in transportation.

According to MacNaughton, innovation can drive the type of human progress, transforming buildings to improve occupant health and wellbeing, reduce energy consumption, and increase revenue, where we don't have to pick between people, planet, and profit.

Shifting from saving bottom lines need not necessarily exclude the creation of sustainable buildings, says Moza. It is a matter of where the CapEx is being spent. What is more important, is a shift in the design mindset - for instance, rather than aiming to create a glass box that just looks good and which would take several hundred tons of air conditioning to cool on each floor, we should aim at creating a building that works in the climate context. Climate responsive architecture is not new. Add a layer of technology to it, and we can easily see intelligent, self-sustaining, energy independent, off the grid buildings that add

value to the environment around them.

With increasing numbers of countries, states, cities and organisations committing to carbon neutrality, zero-carbon buildings are finally getting the attention they deserve as a critical climate solution. Let's hope that the building industry will be more focussed on achieving this, remarks Devasia.

ROLE OF FAÇADES & FENESTRATION IN ACHIEVING CARBON-NEUTRAL BUILDINGS

The façade of a building is the largest surface area available which can well be put to use for a variety of purposes aside from creating a visual landmark, notes Moza. It can help in energy generation, by having solar panels built into it, or ambient cooling and air purification by having vertical greens. It can help control the microclimate outside the building as much as the inside. There is a myriad of solutions available even today, and these must be incorporated as the norm rather than exceptions in building design and construction.

Designing a high-performance building envelope is a must to achieve a carbon-neutral building. Smart façades (building envelope

that adapts to the environmental condition) which are energy-producing, light-responsive, operable skin can be used to achieve this goal, observes Devasia.

CHANGES IN THE DESIGN OF PUBLIC BUILDINGS POST COVID

Right from the outset of the pandemic, there is a need for a cultural and behavioural shift. In the initial stage, this change will require a lot of communication and high impact messaging serving as constant reminders of the 'new normal', Dey points out. For instance, public places will see a lot of signage and floor markings, etc., being put up to guide people on social distancing protocols, movement directions and usage patterns, etc. Over the longer-term, people would start inculcating new norms as habits and the change would become integral to common behaviour in public places. Future building designs will be governed by the principles of zoning and much higher focus on controlling circulation as well as the management of human density at all critical points. Flexibility will be the other major element enabling organisations to change their patterns and layouts on the go, adds Dey.

MacNaughton expects our

buildings and public spaces to get better and better during and post-pandemic. As painful as recessions may be for individuals, they often lead to the brilliant works of architecture. The theory goes like this: When the economy is good and businesses are hiring, developers erect buildings as quickly as they can to meet the demand. There is a virtual guarantee that developers will be able to lease these buildings - and fast. In an economic downturn - like the one brought on by the pandemic - that guarantee is gone. For buildings to lease quickly, they need to stand out against the competition. They need to be built with exceptional quality.

Confidence in public spaces has eroded during the pandemic. For people to return, they need to feel comfortable that they will be safe in the proximity of strangers, points out MacNaughton. In a recent survey conducted by Gensler and View, just 20% of travellers said they were currently comfortable travelling. With increased confidence in the airport, that number increases to 50% in October of 2020, but without confidence, passengers won't reach the 50% milestone until April of 2021. Drivers of confidence, such as continuous environmental monitoring, real-time display of environmental conditions, and touchless technology, can help bring people back to public spaces 6-8 months earlier.

Moza too insists to rely on the user behaviour, as we all will be learning the new way to interact in social spaces. In terms of design, public spaces will likely show an increase in passive environmental interventions - for instance using flora or screens to separate circulation. Transit spaces, like bus stops and railway stations, may as well start looking like airports, which were designed to be more



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open and flexible and thus can accommodate physical distancing. Community spaces and restaurants will probably require much more control of the occupants. We are already seeing pods and screens pop up. However, we must all be aware that the information flowing in about this pandemic changes every day, and as such, these are merely speculations, and only time and trial and errors will show us which interventions work, observes Moza.

All public places will have a high density of people, but better people flow management, and segregation of different zones concerning people and services like HVAC, etc., will become the norm. Technology will play a big role for decentralised non-critical activities in these areas, agrees Gupta.

Devasia too agrees that post-pandemic, social distancing will

potentially become one of the design considerations. "In my view, the first to change is the "Sq. Ft per person" calculation. A bus stop that previously designed for 10 people can now accommodate only half of them. This will have a cascading effect on entire space designs. Entry/waiting areas, corridors, passenger concourse, restrooms, etc. This will also mean either the capacity to be reduced or the Built-up Area has to increase," adds Devasia.

According to Jain, public buildings being the highest potential of risk are going to be employing several measures to fight and prevent issues like Coronavirus. Key factors will include the following:

- a) Architectural design such that space planning facilitates social distancing when desired
- b) Interior design such that touch surfaces are minimised and are

employed with sensor-based technologies like self-closing doors, wherever feasible

- c) Main entrances are designed to accommodate vestibules for creating buffer zones and preventing the dust and pollutants to enter the building
- d) Façade design such that it has no leaks and adequate openings for natural ventilation
- e) HVAC systems design such that it provides treated fresh air and controls pollutants like 'particulate matter'
- f) Toilets to be designed to have touchless faucets, soap dispensers, hand dryers, etc.
- g) Provision of sanitisation facilities
- h) Public buildings like airports and railway stations shall employ more digital technologies for ticketing and boarding passes



SLK Green Park at Bengaluru, KGD A Kattera Design Partner

THE NEED FOR MODULAR CONSTRUCTIONS & ADAPTIVE REUSE

Modular construction systems and adaptive reuse of buildings/spaces (the process of using existing structures to serve new purposes) have become popular in the recent past. According to Dey, this is a rapidly changing scenario, and people are looking for multiple options in every area. One of the main approaches towards modular constructions will be the focus on adaptability and user flexibility. Focus on adopting a modular approach while planning as well as during construction in sync with the adaptive usage trends is highly beneficial and offers flexibility, scalability, faster construction and a greater ability to change the usage pattern as per the need, says Dey. The pandemic has underscored the need for dynamic adaptability in accordance with the prevalent situation. This adaptability is ensured by a modular and agile approach.

Moza advice on investing in adaptive reuse. On a city-wide scale, adaptive reuse is a great idea to protect our cultural heritage and

avoid land wastage. On a smaller, organisational level, this may just be the solution to creating a flexible real estate strategy that can meet the changing organisational strategies.

According to Gupta, flexibility in design will be the key to success, no building is 'future-ready' but all buildings should be ready to change in the future, this mantra will take us ahead to a glorious future.

The number of corporate clients who are asking for a flexible building plan, which can remodel, rearrange depends on the business needs are increasing, agrees Devasia. "I feel post-pandemic requirement for a flexible workspace will further increase. Using modular construction can help this. When it comes to interiors we have demountable partitions, workstations all available in the market and the client can be choosier," he adds.

INNOVATIONS IN LIGHTWEIGHT ARCHITECTURE & FLEXIBLE DESIGNS - NEED OF THE HOUR

From an interior space design perspective, there is a humongous

opportunity for light-weight and flexible designs, says Dey. People prefer these concepts as they offer multiple choices. Today, the preference is to have options in everything, including the way people want to work or use the space for other purposes. When we provide people with the option to customise their space and boundaries as per their preferences and tastes, there is a lot of user satisfaction. Designs should be future-focused, integrating emerging concepts into office and home-office designs wherever possible, adds Dey.

Devasia too agrees that lightweight architecture or lightweight enclosures are the need of the hour. This is an area that is not much explored by the designers. This can have mass usages in public places. The lightweight character will help this to be installed in literally anywhere.

MacNaughton adds that the emerging technologies like the machine-learning software required to control natural light and heat also makes the entire skin of a building digital and intelligent, allowing it to be easily updated to gain new capabilities, effectively future-proofing the building. Besides, with such smart products, one can seat occupants right up to the window without having glare or temperature issues. This extra floor space enables you to be more flexible with space usage, both in the core and perimeter of the building.

If Covid-19 has taught our industry anything, it is that architects alone cannot save the world. Technology is our best friend, agrees Moza. He advocates complete wellness at work, and this concept includes comprehensive building information systems, responsible material choices, reconfigurable furniture, and tailored workspace designs. "Today, we have ramped



CenturyLink Technology Center, Monroe, LA, USA, View Inc.

up our efforts to educating our clients about wellness in design and creating spaces that support employee engagement and productivity. With our global network, we are keeping abreast of several innovations that can be incorporated into our daily lives. We are also advising our clients on their real estate portfolios, including re-occupancy of spaces, the changing meaning of work, and strategies to approach it in the future," concludes Moza.

CONCLUSION

In recent months, we have arrived at a new juncture of disease and architecture, where fear of contamination again controls what kinds of spaces we want to be in. The Coronavirus pandemic has brought a lot of amendments to building designs. Its impact on

global wellness has forced to flex and evolve, both in real-time and in the long-term. Confronting the limits of their own home has made architects rethink how they approach designing spaces for clients.

As the world is slowly reopening, easing lockdown measures, everyone is adapting to new realities. Imposing drastic adjustments to our lives, the coronavirus has introduced a new "normal", changing our perceptions and altering our priorities. Driven towards questioning and evaluating our environment, we are constantly reacting and anticipating a relatively unknown future. While we cannot foresee the future, we can create logical analogies that are based on the current situation and our first responses. Architects

around the world have put their knowledge to use in the fight against the Coronavirus and have created innovative solutions that might stick around for a while.

Emergency architecture and crisis architecture are topics that will start taking centre stage as the world changes. Responsive and adaptive reuse approaches are becoming vital in our emergency responses, allowing for rapid action in the age of the pandemic.

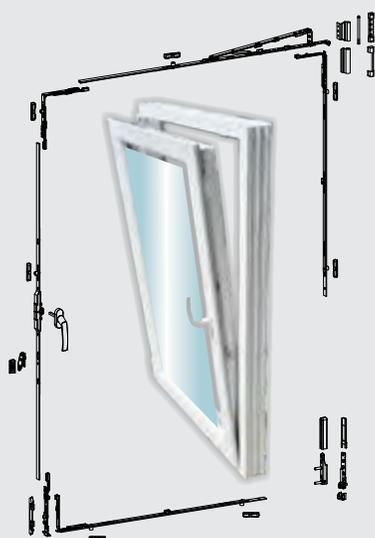
As Ar. Joel Sanders, professor at the Yale School of Architecture and Principal Architect at Joel Sanders Architect says, "Architecture has to mediate between the perceived needs of the moment versus the unknowable needs of the future; between the immediate needs of our bodies and the desire to create something that will outlast generations".



Another view - MFAR Manyata Tech Park, Bengaluru, by KGD A Katerra Design Partner



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McCoy Silicones Limited (Facade & Fenestration Division)

“Post-Pandemic World Needs Greater Degree of Flexibility & Adaptability in Designing”



AMRIT RAJ THAKUR
Dy. Manager - Central
Procurement, Lodha Group



The Clubhouse in Lodha Palava City, Mumbai - Weathered steel façades and stonecrete exteriors

One thing that the pandemic has taught us is that architecture cannot save the world, at least not on its own. Focusing on health-oriented approaches, new standards are going to be set. Design and material are rethought according to the current situation, generating new forms of living. While notions of modular design, prefabricated elements, flexible partitions, and lightweight structures will keep

on growing, architects will start planning new configurations with social distancing measures in mind.

IMPORTANCE OF FAÇADE DESIGN FOR OCCUPANT WELLNESS

Façade designs that are facilitated with green features provide a cleaner and more comfortable environment for their occupants which includes the selection of performance glass, Green wall concepts, etc. Consequently, high indoor environmental quality will lead to less indoor pollution and improve occupants' health and productivity compared with conventional buildings' residents.

Americans spend an average of nearly 90 percent of their time indoors, according to the Environmental Protection Agency. Yet what we breathe indoors is on average two to five times more toxic than what is typically outside, the agency warns, because of poor ventilation and off-gassing of toxic chemicals from a host of products. The wide-ranging efforts include improving indoor air quality and even increasing activity levels of building occupants. Allen and colleagues at the Harvard T.H. Chan School of Public Health have defined nine foundations for healthier buildings, such as better



Lodha Seamont - Walkeswar, Mumbai

water quality, reducing noise, regulating temperature, and maximising light.

THE LATEST VERSIONS OF LEED V4.1 & OTHER BUILDING CODES - RAISING THE BAR FOR WELLNESS

LEED guidance outlines sustainable best practices for cleaning, workplace re-occupancy, HVAC and plumbing, like:

- Cleaning and disinfecting - your space credit requires facilities to create a policy and implement procedures that follow green cleaning

best practices that support a healthy indoor environment and worker safety.

- Managing indoor air quality
- Building water system recommissioning

THE 'NEW NORMAL' CONCERNING SUSTAINABLE DESIGNS FOR HOMES & OFFICES

As the world is slowly reopening, easing lockdown measures, everyone is adapting to new realities. Imposing drastic adjustments to our lives, the coronavirus has introduced a new "normal", changing our perceptions and altering our priorities. As we move forward in the different phases of the pandemic, we will focus again on our intimate spaces. In fact, new configurations and new plans are starting to emerge. The quality and comfort of our homes will become at the top of the list. While we are confined in our houses, we are rethinking our requirements and needs, along with the "new normal": from green areas and gardens, exploitable rooftops, natural light, and ventilation, balconies, and terraces, minimal and wholesome indoor environments, transitional and filtered entrances, etc.

REDUCING THE CARBON FOOTPRINT

A new focus on reducing the carbon footprint of building materials enables structural engineers to make a substantial contribution to mitigating climate



MLCP - Palava by Lodha

change since the most commonly used structural materials - concrete steel, and aluminium - contributes more than 22% to global carbon dioxide emissions. In a typical building, 55% of embodied carbon is in the structure and substructure. Greenprint is a worldwide alliance of leading real estate owners, investors, and strategic partners committed to improving the environmental performance of the global real estate industry. Through measurement, benchmarking, knowledge sharing and implementation of best practices, Greenprint and its members are striving to reduce greenhouse gas emissions by 50% by 2030.

ACHIEVING THE GREEN GOAL WITH BETTER DESIGNS OF FAÇADES & FENESTRATION

Building façades are the most publicly visible design aspects of a building and at the same time, they are most vulnerable to performance issues. They need to enclose the building and control the flow of heat, light, air, and water, but they also need to look good doing it—typically for a long time. When they are well-designed and constructed properly, they can meet these needs by providing stunning exteriors that allow light and ventilation into interior

spaces, creating delightful places to live, work, or play. At the same time, well-designed façades can perform with a long-lasting durability that meets or exceeds a variety of code requirements related to structural integrity, weather resistance, seismic forces, energy efficiency, and fire ratings. Analysing the building performance, it can be found that façades are an important component of building envelope contributing to enormous heat ingress due to solar gain. In fact, a well-designed façade system can actually improve energy efficiency and comfort level of occupants, thus ultimately boosting the overall building performance. Various design principles for façades can be incorporated through climate analysis, building orientation and sun path analysis, day-lighting analysis, materials selection process, etc. During the design development, if the glazing and shading aspects of a façade are leveraged upon, overall energy efficiency would automatically reach a new level leading to exemplary performance.

DESIGNS FOR THE PUBLIC SPACES IN A POST-PANDEMIC WORLD

The pandemic has forced planners, designers and architects to create



Lodha Luxuria Club House at Majiwada, Thane, Maharashtra



One of the tallest buildings in India - Lodha World Tower

a new vocabulary or typology to describe places in terms of social density, distances, crowding, or public health risks. The pandemic will create a new lens through which to think about public space, and this new conversation will need a new vocabulary to help organise our ideas and analyse spaces.

THE NEED FOR MODULAR CONSTRUCTIONS AND ADAPTIVE REUSE

Nowadays developers and architects are moving towards modular construction and



Lodha World Towers, Lower Parel, Mumbai

are looking at adaptive reuse techniques for developing new buildings. In modular construction, the components of a building are prefabricated off-site in a controlled setting and then shipped to the project site and assembled. Modular construction involves less time.

Conducting the bulk of the construction process off-site in a controlled setting, it can contribute to improved quality, less waste, increased control of cost, and reduced risk. This pandemic situation has highlighted the need to design and build fast in emergencies. As the healthcare industry continues to be overwhelmed, the demand for more facilities such as hospitals, quarantine centers, testing sites and temporary lodgings has never been so high. Given this demand and an urgent need for these spaces, modular construction is the best technique. And to understand the importance of adaptive reuse, thinking to focus on what currently exists and how it can be incorporated thoughtfully into the goals and ideas of the future is essential. Adaptive reuse can be implemented in any building, although it is most commonly used while working on old buildings.

NEED FOR INNOVATIONS IN LIGHTWEIGHT ARCHITECTURE & FLEXIBLE DESIGNS

Any structure designed intelligently and responsibly aspires to be “as light as possible”. Its function is to support “live loads”. The dead loads of the structure itself are necessary critical. The smaller the ratio between a structure’s dead load and the supported live loads, the “lighter” the structure. Many companies have developed various architecture and design solutions that address the need for emergency facilities. Many have been tent structures, built to serve as field hospitals and test centers. Post pandemic situation, architects reconsider the way we live and build the future. Our connections to our homes (both physical and mental) have never been greater, and this may persist and even intensify after this pandemic subsides. If this happens, homes will need to accommodate a greater amount of services and functions. Designated spaces for a greater number of specific activities, such as reading, napping, physical activity and entertainment, will be desired. Hosting a greater array of activity spaces will require a greater degree of flexibility and adaptability in designing.



Lodha World Tower -1, Lower Parel, Mumbai

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The Elements of Post-COVID Façade Designs



MAKARAND KENDRE
Area Sales Manager India,
Renson Ventilation

With the rapid spread of COVID-19, designs for a world will never be quite the same, especially for large public spaces, like airports, hotels, hospitals, gyms, and offices. Makarand Kendre, Area Sales Manager India at Renson Ventilation comes up with a few fresh ideas on the design of facades and fenestration.

A critical aspect of designing façades is to incorporate elements

that still allow natural elements like the sun and fresh air to interact with the inside environment smartly. We have learned from COVID that closing a building off from the outside world can be dangerous. In the case of a pandemic or other viruses, the inside environment is not necessarily healthy. So we need to take up the challenge to design façades that can interact with the inside and the outside of a building, and that can adapt itself intelligently to changes conditions.

New concepts like natural ventilation via curtain walls and fixed windows with inbuilt PM 10 filters, and external dynamic shading to reduce heat gain up to 10 to 12°C will gain importance in post COVID façade designs.

Façade Design for Occupant Wellness

The façade is one of the key determinant factors when it comes to occupant wellness. It is literally the window to the outside world. By incorporating external sun shading,



Effective fenestration is essential to incorporate elements like the sun and fresh air within the inside environment smartly

for example, you can control the inside temperature of a building and/or avoid glare. By allowing occupants to open up a window or a night cooling elements, you can still flush the building with fresh air. These are just a few examples that show that the façade has a massive impact on the comfort level of an occupant.

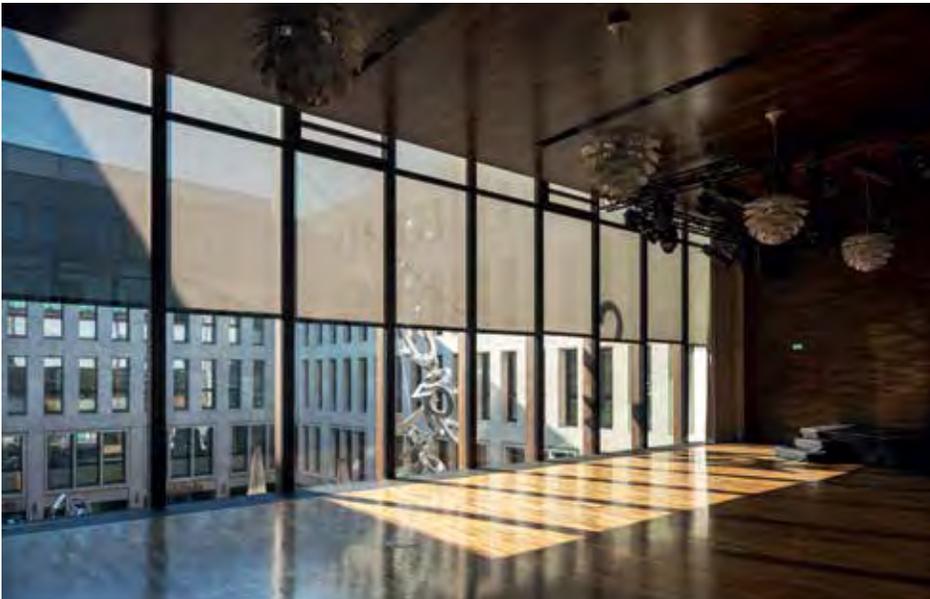
Some quick wins are: incorporating external sun screens to prevent overheating of the building and incorporating elements of the façade that we can open to allow fresh air to flow in. If you link this to a building management system, you can increase the occupant wellness immensely.

The 'New Normal' Concerning Sustainable Designs

The new normal should be that everybody has a 100% reassurance that he/she is working/living in a healthy indoor environment. Everybody should have a right to good indoor air quality. Nowadays a lot of offices are designed to fit as many people as possible, without really thinking about living or working conditions. By planning and building from the perspective of the occupant, we can impact the wellbeing of an occupant. It will result in better performance, fewer health issues and higher motivation.



Incorporating external sun screens to prevent overheating of the building



By incorporating sun shading, we can control the inside temperature and avoid glare

Carbon Neutral Buildings - Can We Save the Bottom Line by Regenerating Resources?

In my opinion, a total shift is not possible at the moment. The impact today of building this way is still too significant from a short term economic perspective. Meaning, as a building promotor, it is still more profitable to construct buildings that just comply with the building regulations. However, I see a shift in mentality on all levels in the building industry: from designers and architects to building promoters. More and more people are convinced that we need to start building a circular building economy. So I'm convinced that in the next years, a lot of people in the building industry will begin to look at their contribution to the current waste pile and reinvent themselves to make the circular building more attractive.

The Need for Modular Constructions & Adaptive Reuse

Repurposing of buildings is okay as long as the cost and impact on making that building comply with current regulations do not exceed

the cost of demolishing it and constructing something new. On a product level, it is essential that we design our products to make repurposing or service afterward as simple as possible. In fact, it should be mandatory that each

product is up to 80% serviceable. It is crazy that it is cheaper to buy a new product in many cases rather than fixing the old one. Our whole economy and design process are focussed on the 'new'. This is a mentality that needs to change.

Rudiments for Energy Performance of a Building

One of the elements is, of course, the performance of the products. The better is the insulation, the better is the energy performance of a building. When it comes to circular building and regenerating recourses, you can see that a lot of the window manufacturers are setting up recycling programs and are thinking about how much impact their product has on the waste pile. We can develop smarter façades so that we can increase its performance but also limit its effect on the environment. Why not incorporate solar cells in each façade so that the building skin can act as an energy supplier? The façade has enormous opportunities for creating a positive impact.



With better insulation, we can control heat and light ingress, and the energy performance of a building will also improve

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Architecture After COVID-19



KARL WADIA
Senior Associate,
Architect Hafeez Contractor

Architect Karl Wadia joined the design firm of Architect Hafeez Contractor as an intern in the year 1999 and

today, he leads a team of nearly 100 exciting designers, visualizers, and experienced technicians in his role of Senior Associate at the firm.

Having earned his graduation at Academy of Architecture, Mumbai & his Master's Degree at Columbia University's famous Graduate School of Architecture Planning & Preservation in New York City, his journey took him to London where he gained 3 years of valuable experience with Kohn Pedersen Fox; designing and working on some of their most expansive Middle East Projects between 2006-09.

Since his return to India,

over the past decade Karl's studio at Architect Hafeez Contractor (AHC) has been responsible for designing India's largest - 100% Net Zero Energy Building and the Griha 5-Star rated Manipal University Jaipur Campus, which also happens to be the third largest Net Zero Energy Building in the world.

Ar. Karl Wadia explains how the pandemic COVID-19 is going to impact the practice of architecture, the need for 'Informed Designs', his thoughts on Biophilia and occupant wellness, and the true concepts of Net Zero & Carbon Neutral buildings.





Pedestrian portal, Lodha Sterling, Thane

Is COVID going to change the way we design buildings, and how is it going to impact the practice of architecture?

It was a matter of time we began changing the way we design buildings and therefore I believe your question is more an inevitability than an “if”. Change has been in the offing for quite some time now and this pandemic is a catalyst for the entire fraternity that supports and participates in the design and construction of the built environment to embrace a new way of thinking and approaching design. In a sense it is a wake-up call. Architecture can no longer be about designing buildings that tick all the boxes on an excel sheet... be it cost, efficiency, glass to wall ratio, modularity, etc. Architecture needs to be more responsible.



W54, Mumbai

In repositioning our practices, our buildings too must be re-imagined to conform to their surroundings and connect us closer to nature, making the basics like fresh air and natural light as our guiding principles.

At the U.S.GBC 2020 Greenbuild India International Conference in Bangalore in February this year, your talk session was named - “Informed Design”. Can you opine on the relevance of this topic in the pre & post-pandemic era?

“Informed Design” is an approach to delivering design that thrives in a collaborative environment. I spoke at that conference with my friend and colleague Swati Puchalapalli, and our studios have been collaborating for some time now on projects where clients and promoters are willing to adopt an integrated approach do planning.

Sustainability is often an afterthought to the design process, however with the integrated approach; performance-based design takes centre stage from day 01. “Informed Design” is the umbrella under which performance-based simulations, documenting comfort, resource utilisation, airflow analysis, irradiation, sensitivity mapping, etc. form the genesis of early decision

making. This combined with the architect’s ability to make passive design decisions can substantially reduce the energy demands of the building while increasing the comfort factor from a heat, light, noise, and perception point of view.

Deriving the architectural form and orientation in the master plan to improve the micro-climate of the site and pedestrian comfort while achieving maximum daylight access, thermal and visual comfort is possible through this process and ultimately manifests itself into an architectural design which is “informed” rather than impulsive.

What are your thoughts on Biophilia and occupant wellness, and its relationship to façade design?

Biophilia is a broad subject which is difficult to measure. Simply put, the immediate surroundings that we create for occupants in a building must be comfortable with the highest level of visual, light, thermal, air and sound quality. Good Biophilia is created by increasing occupant connectivity to nature, maintaining a visual and physical connection to the outdoors with ample access to daylight and natural ventilation. One can say that wellness is measured through Biophilia. There are enough studies to prove that people who work and live in environments that are intrinsically connected to nature



Hanging Gardens, Rustomjee Crown, Mumbai



Democracy in Design, School of Architecture, Mumbai

shirt even though it may look good. A façade that is appropriate to its place and time will provide occupant comfort for decades to come, and that is the relationship between Biophilia and façades.

Please tell us about a few of your notable projects?

We most recently won the bid for the Indian Institute of Management at Calcutta and besides this we are fortunate to be designing several institutions of National importance such as the National Rail & Transportation Institute at Baroda; the Indian Institute of Petroleum Energy at Vizag; Bits Pilani - Pilani Campus; Goa Campus & Hyderabad Campus; Two Campuses for Symbiosis; Hinduja College and notably our Griha 5 Star Rated Manipal University & Hostels Jaipur Campus.

We are also designing India's largest upcoming hospitality project at Aerocity, New Delhi with conferencing, and a workplace offering. We won the bid for the Catalytic Development for Amravati Development Partners (A Singapore Consortium) which is another mixed use project. In the workspace segment, we have many ongoing projects in Mumbai's BKC district, Bangalore, Pune as well as the World Trade Centre IT Park in Navi Mumbai, and DLF Chennai IT Park.

Residential projects form a big part of our portfolio and some of our notable works include Lodha Venezia, Amara, Sterling, Upper Thane and Bel Air. We are also the designers for W54 Residences, 25-South, Rustomjee Crown,



Adaptive reuse, Lodha Amara Sales Pavilion, Thane



Roof Garden at 225m height, Lodha Venezia, Mumbai

get better sleep, have better concentration levels, and are more productive and attentive at their workplace or school. Something as simple as access to natural views,



Façade palette (Granite + Terracotta + Aluminium), Lodha Venezia, Mumbai

natural daylight and natural air can have a profound effect on people and buildings. Designing a façade for a building is like choosing the right fabric for the shirt you wish to wear. There is only so much time you can spend in an uncomfortable



Roof activation, ADP South India mixed use



**Public Breezeway Asset 13
Aerocity, New Delhi**

Piramal Mahalaxmi, Lokhandwala Minerva, Wadhwa's 465-acre township in Panvel - Wise City, 100-acre township for Prestige in Bangalore and several flagship projects for Godrej Properties including those at Altamount Road, Bandra, Vikhroli, Kharghar, Thane, and Bangalore.

Net Zero & Carbon Neutral are the latest buzz words. Is there more to this? Could you elaborate?

Buzz words to some, are core design principles to others. Over the past decade we have been working to achieve our first 100% Net Zero Energy Building. At our Griha 5 Star Rated Manipal University Jaipur Campus, we designed and help build India's largest Net Zero Energy Building, which also happens to be the third largest in the world.

We were fortunate to have clients that set such high standards and allowed us to work with sustainability partner Terravidis without whom this dream would not have come to fruition. The

passive shading elements make sure that the building boasts of a staggering 600 Sq ft per ton of air conditioning as opposed to the India's average of 150 Sq ft per ton, while ensuring complete occupant comfort, access to natural light and proximity to outside views.

Our next quest is to design for Carbon Neutrality in a return period of 20 years. This journey has taken us to West Bengal. IIM Calcutta's 135-acre campus which is being re-planned considering active on-site off-setting and sequestration of existing buildings through lighting, HVAC, refrigeration, etc. Step 01 of the journey is making sure all new buildings are designed as Net Zero Energy with materials that be 100% recycled like Steel for instance. By calculating the embodied Carbon of existing buildings, new constructions, transport, material manufacture, operations, cooking, material extraction, etc., we are preparing the Carbon Neutrality Road Map for the institute. This is something we take very seriously and is the sole focus for the studio in the coming decade.

How is everything we have just talked about related to the windows & fenestrations industry?

Façade and windows are the first and last screen between human

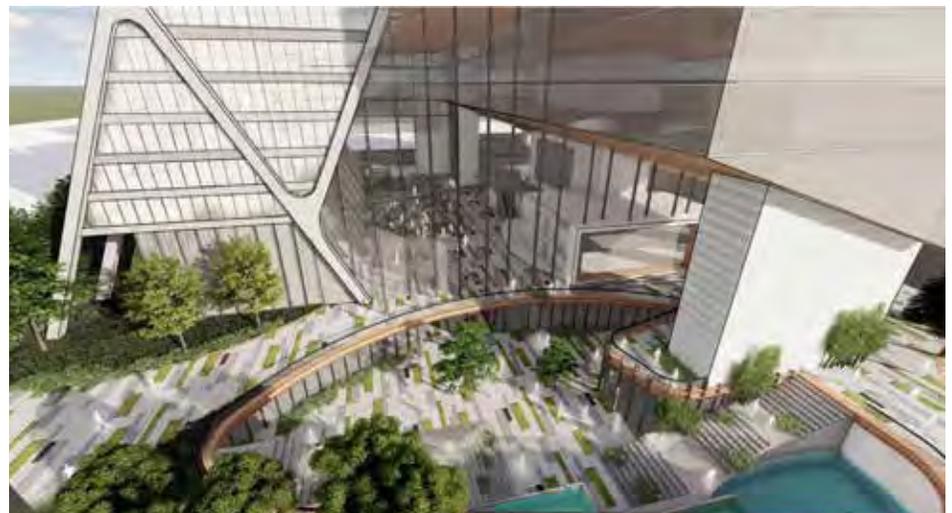
beings and the environment outside. In the European winters, we wear wool, leather and other such fabrics as they keep us thermally insulated; whereas in India, we prefer khadi and linen as they keep us well ventilated. Think of designing a building like choosing a comfortable shirt. Often Architects describe glass as an evil material however I disagree. Remember; insulated glass is a better thermal insulator than reinforced concrete. Don't believe it? Go check it out. To that end glass as a material has a lot of potential if prescribed well.

For too long, the industry looked upon shading as something that spoils the elevation of a building, but I think that as time progresses, you will see that architects doing buildings with façades which are more appropriate and give more thermal comfort, and more access to natural air and breeze.

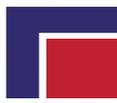
While this pandemic may have taught us to keep our social distance, human beings have realised more than ever before the importance of being connected to nature. This more so will manifest itself in the architecture we propose moving ahead with better and more responsible façade and fenestrations for a happier and healthier existence.



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SAURABH MITTAL
Managing Director and CEO,
Greenlam Industries Ltd.

Saurabh Mittal is the Managing Director & CEO of Greenlam Industries Ltd. Over the past two decades, he has been the prime mover of the exponential growth of Greenlam Industries, and for carving a niche for Greenlam Laminates and allied decorative products. Given his hands-on engagement across the entire value chain, he has always been deeply involved with the manufacturing process while progressively adding production capacity that is simply the best in the industry.

With an affinity to successfully execute marketing initiatives, Mittal built the brand Greenlam, which undisputedly commands the market. His sales experience is especially strong in the B2B segment as he built a distribution network that has provided incomparable market reach. An alumnus of Mayo College Ajmer and a Commerce graduate from the University of Madras - his charismatic leadership, personal drive and strategic thinking has rallied the company to attain leadership, in both domestic and international markets, in a very short period of time.

In an interview with Window and Façade Magazine, Saurabh Mittal elaborates on the evolution of cladding industry in India, the latest trends in materials and technologies in cladding, his company's role in bringing about the current revolution in the façade cladding sector, the effect of the pandemic on business and project execution, the environment-friendly cladding options, Greenlam's capacity expansion plans, and much more.

How do you see the exterior cladding industry evolving in India?

Over the years, the exterior cladding industry has experienced a paradigm shift giving birth to innovation, design and functionality. I believe, exterior cladding has been primarily used to enhance the building aesthetics which will not be the case in the future, looking at the rising temperature levels on a yearly basis. In this climatic condition of India, High Pressure Laminate (HPL) cladding is going to see an upsurge in demand due to its unmatched durability. Greenlam Clads offers exterior HPL cladding which is manufactured with advanced and revolutionary GLE Technology that protects your exteriors from all kinds of weather conditions. It is tested to withstand extreme temperature ranging from (-) 50 to (+) 80 degree centigrade. These clads are also fade-resistant, protect from microbial threats,

weather-proof and fire retardant, hence ideal for exteriors. Today, people have also become environment conscious and therefore practicing sustainability. This is where Greenlam Exterior Cladding comes in because the product is sustainable and green as well as has a Greenguard Certificate.

What are some of the latest trends and styles in façade cladding of the building?

Façades are no more considered like any part of a building but play a major role in forming a 'skin' that protects your space from wear and tear. Over the years, cladding has become a preferred solution for giving a protective layer and identity to both residential and commercial buildings. Speaking of the latest trends in this space, customers have shifted their preference from wood grain texture to natural and abstract patterns. For instance, cementitious pattern type along with few special wood



Cladding has become a preferred solution for giving a protective layer and identity

designs with knots are likely to be topping the trend chart. They also beautify the space because of their simple and clean appearance. Additionally, shades like light blue or pearly white are also suitable for every season.

What has been your or your organization's contribution in bringing about the current revolution in the façade cladding sector?

Façade industry is seeing a shift from wood to aluminium cladding to HPL all over the world. Looking at the recent mishaps in UK and UAE with regards to the aluminium cladding, a debate has risen around certain serious risks involved with this material which has resulted in severe casualties. Greenlam Clads are fire retardant and conform to a high fire rating – BS1DO – are best in the category, which makes it safe against fire, and are well designed. Moreover, these are ventilated façades and are eco-friendly, which makes them ideal for different weather conditions.

We are constantly increasing the awareness of customers on this front. This is our endeavour to prevent mishaps due to lack of knowledge, product quality, awareness, or incorrect use to ensure a safer world for our customers.



Greenlam Clads offers exterior HPL cladding which is manufactured with advanced and revolutionary GLE Technology

Industry Speaks



Balikesir Airport, Turkey - Greenlam products used for cladding



How is the present situation (due to the Pandemic) affecting your business and project execution?

The nationwide lockdown has impacted our operations and sales, which has slightly brought down our growth curve. However, this is a temporary phenomenon that the world is facing, and we all are in positive hopes to get back on track soon. The economy is opening up and we too have resumed operations across our manufacturing units and offices with highest standards of safety and hygiene.

Greenlam recently announced capacity expansion for its manufacturing unit in Nalagarh,

Himachal Pradesh. Please tell us about this and your future plans.

Over the years, there has been a revolution in DIY concepts, which has given birth to cost-effective alternatives and conventional surfacing materials such as stone, cultured marble or polymeric/synthetic slabs, especially in the UK, Poland and various parts of Europe. This trend has given rise to increasing demand for special purpose HPL compacts that stand as alternatives for work-tops, kitchen tops and breakfast bars apart from casing solutions. To catch-up with this demand soon, this additional high capacity production plant was set-up in Nalagarh, Himachal Pradesh. This



A commercial project by Greenlam - GROCERA at Jamshedpur, Jharkhand (Design Nos. & Name: 9201 - Premio & 9205 Citron Stone)

line assures meeting the demand for clads since more and more specifiers and retail customers have started to understand advantages of HPL cladding.

This step has enabled us to produce up to 15.62 million sheets in the facility annually which has further strengthened our position in the market. We will continue to add new dimensions within our company to better service our customers.

Please brief on the latest technologies being incorporated by Greenlam in exterior laminate manufacturing?

For Greenlam Industries Ltd., innovation has been the secret of success for years now. Greenlam Clads is a complete in-house developed technology which we named it as GLE technology with the help of our R&D facility. The product overcomes different challenges faced by the industry by building various attributes like fire retardant property without halogenated ingredients, weathering and climatic



Greenlam Manufacturing facilities

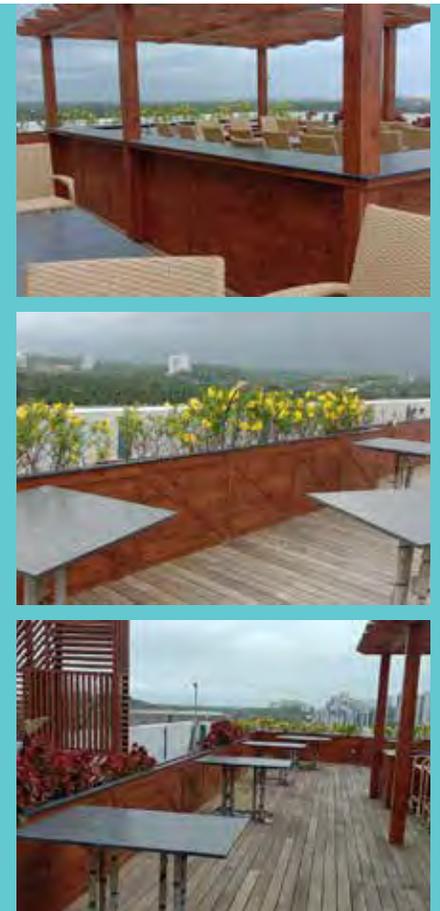
shockproof, and bring out a single product to suit geographical conditions from -50°C to 80°C.

Claddings from Greenlam come with special fasteners, which are made using non-corrosive materials that offer better colour fastening properties. The exterior clads allow you to decorate your home, office or entire building structures. Properties such as hard bonding strength, an excellent fire retardancy, high dimensional stability, impact resistance, and top-notch UV performance make Greenlam exterior cladding perfect for commercial and residential applications. They can easily last for decades, given the correct installation and maintenance.

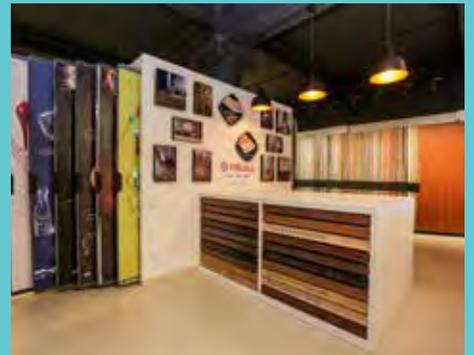
What are the emerging technologies in recent times which have impacted the façade design and the façade Material selection so to speak?

Technology in façades has reached new heights over the past decade which has made it

possible to produce a revolutionary combination of façade design and materials. Based on the market requirement and demand for new products, there are different materials like Neolith, Metal cladding (bronze and copper) and solid surface amongst others.



A hospitality project- Tamara Hotel, Thiruvananthapuram, Kerala



Greenlam Experience Center at Kolkata

Industry Speaks

Apart from these, there are other commonly used materials like clay tile, granite, HPL and ACP.

Are there enough choices in the Indian market for fire-proof cladding? What about environment-friendly cladding options?

Clads have been in use for a little while now and fireproofing has always been one of the many factors taken into consideration. There are no cladding materials available which are fire-proof, even inorganic materials like clay tile, bricks also get affected by fire. However, the product we manufacture are organic in nature and does not catch fire easily. It is fire retardant in nature and burns only when a continuous fire source is put on the surface and can be stopped if the source stops emitting fire. Our clads are fire retardant which is designated with BS1DO – Best in the category as per EN code. Also, we do not use any carcinogenic chemicals in producing clads to protect the environment.

There are performance requirements for façade materials – energy efficiency, aesthetics, etc. How much does that impact the selection of façade material and façade design?

Both façade material and system largely impact as far as the building energy efficiency is concerned. Therefore, Greenlam Clads are made with paper which is a bad conductor of heat. Moreover, our clads are used as breathable façade which indirectly helps in the conservation of energy and protect a building from all sort of weathering break downs.

As we are into decorative business since the inception of the organization and understand our customer requirements, we endeavour to deliver an

aesthetically beautiful and quality product. Therefore, while working with architects and interior designers, we make them understand our product's application through photographs of all our projects. Greenlam Clads are equipped with modular system, and they can be easily installed and are low maintenance which makes them an ideal refurbishment option.

Please tell us about a few of your recently completed iconic and innovative projects?

Some of our recently completed prestigious projects:

- Dimapur Airport, Dimapur
- Assam GST Bhawan, Guwahati
- Kochi Airport, Kochi
- Red Fort, Delhi
- Qutub Minar, Delhi
- Patanjali, Haridwar
- APIIC Building, Vijayawada
- Rajahmundry Municipal Office, Rajahmundry

How do you convince your clients when they speak about budget

constraints?

Our extensive experience in this industry has made us observe that our customers have evolved in terms of knowledge and understanding of an appropriate cladding solution. Therefore, our team explains to the client about the features of our products and samples of past installations done worldwide. We take our customers through the journey of our products and services which makes it easier for them to make decisions.

When it comes to new construction versus retrofitting, going forward what do you think the trends favour?

Retrofitting projects have lower budgets as compared to new construction projects. The condition of the building is considered by building owners or architects while making a choice between these two concepts. It is important to note that people prefer newly constructed and designed buildings basis the ongoing trends.



A project for the brand 'Patanjali'

Aspect Clay Façade

for Bangalore Electricity Supply Company

Bangalore Electricity Supply Company Ltd. (BESCOM) is a part of Karnataka Power Transmission Corporation Limited and is responsible for power distribution in eight districts of Karnataka. BESCOM covers an area of 41,092 Sq kms with a population of over 207 lakhs.

LENDING A PROTECTIVE YET AESTHETIC TOUCH TO THE BUILDING EXTERIOR

The BESCOM Head Quarters in K.R Circle Bengaluru has an employee strength of over 14000 people. The company required a façade that was environment-friendly and sustainable, and that also offered extensive longevity.

In addition to the wide range of aesthetic possibilities, sustainability along the value-added elements played a major role in the choice of façade material.

Aspect Clay Tiles fit the bill perfectly, considering its sustainable and long-lasting nature. The head-office used 1,400 Sq m of Aspect clay façade, which was designed by RC Architecture.

The installation was done with Aspect 600 x 300mm tiles size of and 50 x 50mm square Aspect louvers which was used as a creative element with shading functionality before the glass.

The clay façade is natural, sustainable and offers major technical and architectural advantages as façade cladding. Clay as a building material lasts for

generations. Cladding, with clay tiles, is an excellent heat insulator. Thanks to its mass, ceramic has a high heat buffering capacity.

Many proponents of high-performance, green design certainly believe that it is high time to move away from the conventional façade formats mostly visible in high-rise, high-design buildings for the past half-century. Some of the world's most

prominent "green" skyscrapers are looking at greener options to envelope their buildings.

The effect is as good as a building sheathed in continuous as a second skin - rain screen and sun-screen for the building, which minimises heat loss in winter and prevents over-heating during summer. The robust dry installation method avoids usage of adhesives and sealants. Specially designed



Wienerberger's Aspect Clay Tiles for façades is pocket friendly, sustainable and long-lasting

Project Watch

vertical joints prevent rattling of the tiles in windy conditions and act as rain drain during heavy rains.

Firing clay at exceptionally high temperatures ensures the tiles' resistance to fire as well as aggressive substances like acid rain and prevents fungus or algae formation. It has a distinctive property of 'no maintenance façade'.

HIGHLIGHTS OF THE PROJECT:

Wienerberger's Aspect Louvers were used in this project and this is a key highlight in terms of design and functionality. Louvers are long ceramic rods which act as passive shading devices. They are used to achieve additional design freedom and to stylishly adopt the passive shading functions in building architecture.

Louvers as shading or sun protection elements, provide the building's architecture with a unique character. Creatively used louvers can loosen up large



Wienerberger's Aspect Louvers as shading or sun protection elements, provide the building's architecture with a unique character

surfaces and can breed volume in conjunction with their shadows. Louvers can be manufactured in various shades, dimensions and thickness. Individual special forms such as square, rectangle and elliptical shapes are possible. Louvers can also be made available in engobes and glazes.

Monnanda Appaiah, Managing Director, Wienerberger India Pvt Ltd, adds, "In this project, Aspect was chosen specially for its louvers that highlighted the aesthetics of the building. Using clay façades provided the architects with greater creative expression. We aim to provide our clients with products for the whole building envelope that meet the requirements of the contemporary architects' style quotient. We understand and appreciate the architect's unique design aspirations and attempt to fulfill them through our natural, aesthetically appealing clay building products that can tastefully match the design requirements of the building."

For more details on Aspect by Wienerberger Clay Façade Tiles and project range and references, contact: marketing@wienerberger.in



MUTHU KUMARAN

Deputy General Manager, Head - Façade & Roof Division, New Market Development, Wienerberger India

ABOUT THE AUTHOR:

Muthu Kumaran is the head of the façade & roof division at Wienerberger India. He is also in charge of the new market development for the company. Muthu has been with the company for over 12 years and has also worked in the building materials space with various leading brands in the past before joining Wienerberger India. He has a keen eye for design and architecture special, the contemporary and renaissance style.

QUICK FACTS:

Project: BESCO, Bangalore

Location: KR Circle, Bengaluru

Client: BESCO

Architect: RC Architecture

Other consultants: Glaze Tech

Material used for façade and fenestration: Aspect rear ventilated clay tiles and Aspect louvers

Commencement date: February 2017

Completion date: July 2017

Interesting Visual Elements

ABIL Commercial Spaces, Pune

Located in Pune, ABIL Commercial Spaces is an on-going boutique commercial office project, which is a part of residential development. The building boasts of a host of features which are incorporated to improve the energy efficiency,

functionality and aesthetic quality of the building.

This ground + four-storey building, having a built-up area of 100,000 Sq ft is located in the suburb of Pune to the west, in a place called Baner, a residential and commercial hub of Pune and occupied by various IT companies.

It has a number of office accommodations, in addition to training and conferencing facilities, a café, a line of commercial shopping on the ground floor and a swimming pool on the terrace.

The building has a complete glass façade using performance glass from Saint Gobain - ST150,



Project Watch



Front elevation

which has got an external reflection factor of 19 percent and a solar factor of .56.

The glass façade is enveloped

with a frame clad in steel grey colour aluminium composite panels. The shape of the building being linear, vertical glass fins were

introduced to soften the visual impact of the glass façade. These fins also act as sun breakers and are in different shades of grey colour.



The building has a complete glass façade using performance glass from Saint Gobain - ST150

The glass fins are actually two glass panels sandwiched with a PVB coloured film. They are of varying levels of opacity and are in varied shades of grey PVB films installed in a random manner.

In total, there are about 300 fin sections. Each fin measures 300mm wide by 13.52mm thick and are 2875mm and 3475mm height. To complement the scheme, the fins have been given different levels of opacity and are in different shades of grey. The 300mm wide glass fins are formed from 6mm toughened glass with the PVB film sandwiched between 2 glass panels.

The building being linear, it is not visible completely from the front in elevation but is always viewed at an angle, therefore when travelling on the road, the coloured glass fins create an interesting visual and non-static element to the façade of

QUICK FACTS:
Project: ABIL Commercial Spaces
Client: Avinash Bhosale Infrastructures Ltd (ABIL)
Location: Baner, Pune
Architect: GA design
Area: Built-up area of 100,000 Sq ft

the building. The terrace of the building has a swimming pool and has a metal screen which provides privacy as well as forms an interesting feature on the upper periphery of the building. It also forms the backdrop of the branding of the commercial building. These metal fins are clad in ACP with staggered horizontal lines.



RAJAN GOREGAOKER
Principal Architect & Director (Partner), GA design

ABOUT THE ARCHITECT:

Rajan Goregaoker graduated from Sir JJ College of Architecture in 1990. With extensive experience in residential, commercial buildings and township projects as well as interiors of luxury homes and offices in and around Mumbai, Goregaoker is recognised as one of Mumbai’s leading architects. Associated with some of the regions most prominent builders and industrialists in the field of architecture and design, he brings together the design expertise of both architecture and interior design in projects successfully. Responsible for steering the firm’s overall strategic objectives, he has collaborated with multi-disciplinary design teams on projects across varied scales for over 20 years. With a profound attention to detail and a focus on simplistic, yet elegant and artistic solutions to complex briefs, his technical expertise and pragmatic design approach, is the reason behind the success of the some of the landmark buildings in Mumbai.



The 300mm wide glass fins are formed from 6mm toughened glass with the PVB film sandwiched between 2 glass panels

Tips to Extract the Best Performance from

FunderMax HPL

FunderMax High Pressure Laminates (HPL) serve several important functional and aesthetic purposes simultaneously. Apart from the attractive impact, it has on the appearance (in nature, stone, material, plain or customised digital patterns) of a building, the panels serve a much more critical role of providing thermal insulation, water protection and reduced noise pollution. FunderMax exterior panels offer a great deal of creative freedom for architects to try a variety of designs for exterior claddings.

FunderMax panels comprise natural fibres (65%) and synthetic resins. The panels can be used for applications like façade claddings,

balcony claddings, partitions, fences, attic claddings, outdoor furniture, tabletops, public facilities, playground facilities, sports facilities, sun protection, awnings, business entry portals, recording studios, children play areas and interior specialised applications like toilet cubicles, etc.

Other properties of FunderMax panels include optimal light fastness, and resistance to scratches, solvents, impact, bends, frost and heat. These features make the panels highly robust and long-lasting and help cut down energy bills.

FunderMax India is also a member of the Indian Green Building Council (IGBC) and



Tips to extract best performance from FunderMax High Pressure Laminates

its products can be used in constructing green buildings.

For More details, contact:

FunderMax India Private Ltd.

#13, 1st Floor, 13th Cross, Wilson Garden, Bangalore - 560027

ashwani.khanna@fundermax.biz



The primary differentiator of the FunderMax Rear Ventilated Façade system is the ventilation gap that separates the façade from the building structure. This decorative cladding acts as a screen that keeps off rain, heat, wind and noise away from the wall. The installation, along with insulation materials, adds to the energy efficiency of a building.

To ensure that FunderMax installation performs well for a long time, here are a few tips that one needs to follow:

Do's

- All HPLs must be installed using Rear Ventilated Façade system
- Spacing of rivets and sections should follow the structural design
- Clearance gap between panels must be maintained
- Only exterior grade laminate should be used for any area which is exposed to external environment (even if the area is under shade)
- Minimum 6mm panel thickness is required for exterior applications
- Ensure that you get the Max Exterior panels from authorised business partners to be sure about the original stamp of quality.

Don'ts

- The panels should not be cleaned with any acid or alkaline solution. Light soap solution or plain/warm water is good enough for the purpose. Avoid scouring substances
- Do not paint on the panel surface or apply protective cover on the panels
- Do not use silicones to cover the gaps
- Store the panels by stacking horizontally on flat and stable supports at the site. The panels can be stored in normal climatic conditions
- Use recommended tools for installation and preferably by authorised, expert hands.



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Telangana CM Approves OCI Architect's Proposed Design for New Secretariat Complex



Telangana Chief Minister K Chandrashekhar Rao has approved the designs submitted by Oscar & Ponni of OCI Architects for the new Secretariat Complex.

10 designs from different architectural firms were submitted to the government. Out of these designs, three designs made it to the table of the Chief Minister, who took the final decision.

The official sources have said that

the new complex will be fully Vaastu compliant, meeting the latest norms of fire safety, green building, disaster management, and other mandated regulations. The new complex will be an amalgamation of historic architecture and modern technology, reflecting the rich culture and tradition of the state.

The estimated construction cost for the project is Rs 500 crore. Built with the charming Deccani

and Kakatiya architectures, it will have concrete structures in only 20 percent of the vast 25-acre campus and the rest will be dedicated to landscaping and greenery. Facing the Hussain Sagar lake in the east, the new building will be rectangular with six floors (G+5) having about 7 lakh Sq ft of built-up area. The entire structure will be equipped with smart lighting controls, motion sensors, automatic switches, and other features to reduce energy consumption.

The elevation styles comprise the Deccan Kakatiya and South Indian architecture, with the dome and allied features inspired by the temples dedicated to Lord Shiva. Two large courtyards of the building will be designed to boost ventilation and reduce carbon emission.

Being constructed with the green building concept, the terrace, along with the parking area, has been designed to accommodate solar rooftop panels which will provide power to the entire complex. Huge corridors and other spacious areas will be constructed to keep the structure cool and allow the air to circulate naturally, making it energy efficient.

Ar. S Gopakumar Awarded Baburao Mhatre Gold Medal

Ar. S. Gopakumar, founder and architect at Kochi-based Kumar Group Total Designers, became the first architect from Kerala to be awarded the Baburao Mhatre Gold Medal for the year 2020. The award is from Indian Institute of Architects (IIA), the national body of Indian architects. The award acknowledges his contributions to Indian architecture. "It is a privilege to receive this award from IIA and to be in the same list as some of

the most elite names in the field. This motivates me to further work towards putting India on the global map of modern architecture," he said. The award was conferred upon Ar. S Gopakumar for his outstanding contribution to the profession and Indian Architecture. The award was given to Architect S Gopakumar on July 12 at the IIA national convention transcended by IIA national president Ar. Divya Kush. This is the most coveted award given to an architect in India by the apex body IIA.



Kumar Group Total Designers is a well-known architecture firm in Kerala. The firm has designed major landmarks like Kerala History Museum Kochi, KSRTC bus station Trivandrum, Taj Residency Calicut, Gandhi Park Trivandrum, Shanthy Kavadam crematorium Trivandrum, DH ground Kochi, etc.



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IIA's First virtual National Convention Held Successfully on 11th and 12th July

The Indian Institute of Architects' (IIA) first virtual National Convention (IIA NATCON 2020 - TRANSCEND) held successfully from 11-12 July.

The virtual inaugural ceremony was addressed by the Vice President of India, M Venkaiah Naidu. He urged the architects of the country to adopt and promote green architecture and use renewable energy in upcoming projects.

Industry experts spoke on six sessions over the two days, and was attended by people from across the country. The speakers included Rahul Mehrotra (Founder, RMA Architects), Marion Weiss & Michael Manfredi (Weiss/Manfredi), Sonam Wangchuk (Engineer & Founder, SECMOL, Ladakh) and Moshe Safdie (Safdie Architects).

The first day's programme had three sessions - Transcend, Resilience and Innovation. The topics were presented by industry

leaders such as Jelle Thery Ramboll (Ramboll Studio), Sanjay Mohe (MindSpace Architects), Rita Soh (president of ARCASIA), Debatosh Sahu (Espace), Naresh Narasimhan (Venkataramanan Associates), Parul Zaveri (Abhikram), Vivek Bhole (Neo Modern Arch), Mitesh Dixit (Domain), Jit Kumar Gupta (architect & town planner), Krishna Rao Jaisim (Fountainhead), Monolita Chatterjee (Design Combine), Vaissnavi Shukl (GSD), Sheila Sriprakash (Shilpa Architects), and Azmi Wadia (Azmi & Sarosh Wadia).

The theme for the second day was - Inclusiveness, Self-Reliance and Inclusiveness & Innovation. These sessions were joined by industry leaders such as Biju Kuriakose (ArchitectureRED), Sameep Padora (sP+a), Abin Chaudhuri (Abin Design Studio), Vinayak Bharné (Moule & Polyzoides Architects), Leena Kumar (Kumar Consultant), Divya Kush (president of IIA), Habeeb



Khan (president of COA), Jabeen Zacharias (president of IIID), V Suresh (chairman of IGBC), Satish Magar (president of CREDAI), Tushar Sogani (TSDPL), Amarja Nimbalkar (Amarja Nimbalkar Associates), Michael Samuelian (Samuelian Consulting LLC), Ameet Babbar (Babbar & Babbar Architects) and Fahed Majeed (Amarja Nimbalkar Associates).

USGBC Introduces New LEED Guidance to Address COVID-19 Concerns

The U.S. Green Building Council (USGBC) has introduced new guidance in response to COVID-19. The new four new Safety First Pilot credits outline sustainable best practices that align with public health and industry guidelines related to cleaning and disinfecting, workplace re-occupancy, HVAC, and plumbing operations.

These can be used by LEED projects that are certified or are undergoing certification.

The Safety First credits are part of the USGBC's economic recovery strategy released last month, which focuses on sustainable solutions

to rebuild a stronger and healthier economy by prioritising healthy people in healthy places.

The credits were created in response to COVID-19 and focus on the safety of those working in a building. These are available to all LEED 2009, LEED v4 and LEED v4.1 project.

Mahesh Ramanujam, president and CEO of USGBC said that these new credits are a first step in helping the building and construction industry demonstrate its commitment to sustainable strategies as part of building a healthier, more resilient future.



He added, "Supporting environmental and occupant health is a critical part of supporting community health and, as we look ahead, we know LEED and the USGBC community will play a role in delivering solutions that lay a better foundation for our economic and environmental well-being".



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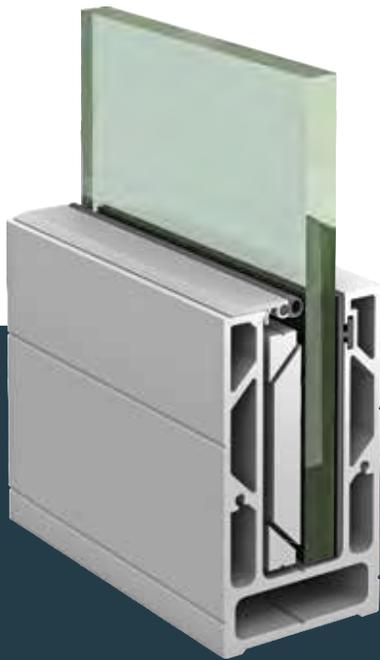


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