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The Quest For Green & Beyond

An Organic Approach to Futuristic Design



United Technologies



Text & images: courtesy, the architect

With the

Strength of Steel

Volvo-Eicher Headquarter, Gurgaon, Haryana, India

Romi Khosla Design Studios



Romi Khosla is an internationally known architect and urban planner. He graduated in Economics from Cambridge University, also graduated in architecture from The Architectural Association in London. He established his independent consultants office in Delhi in 1972.

Martand Khosla graduated from the Architectural Association in London, in 2001 and worked with Allies and Morrison before returning to India to establish Romi Khosla Design Studios in 2002. Since setting up the design studio in Delhi, Khosla has been designing a wide range of projects that include housing projects for the poor and more affluent, corporate buildings, charitable hospices, school buildings as well as stage sets, interiors, and children's playgrounds. Martand's central concern revolves around intense research on functions and forms.

Romi Khosla Design Studios has won five world architecture awards and continues to be one of the leading design studios in India.



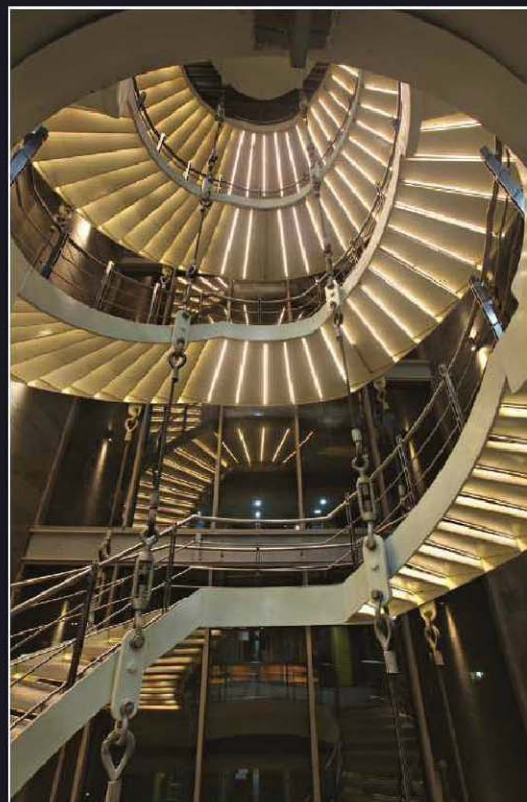


The Volvo-Eicher Headquarter of the newly formed joint venture at Gurgaon, Haryana by Romi Khosla Design Studios (RKDS) is designed to be a state-of-the-art steel building for the engineering group which uses the least amount of energy and resources possible in its day to day functioning. The clients approach towards the projects required RKDS in coordination with Spectral Design services to design LEED rated building.

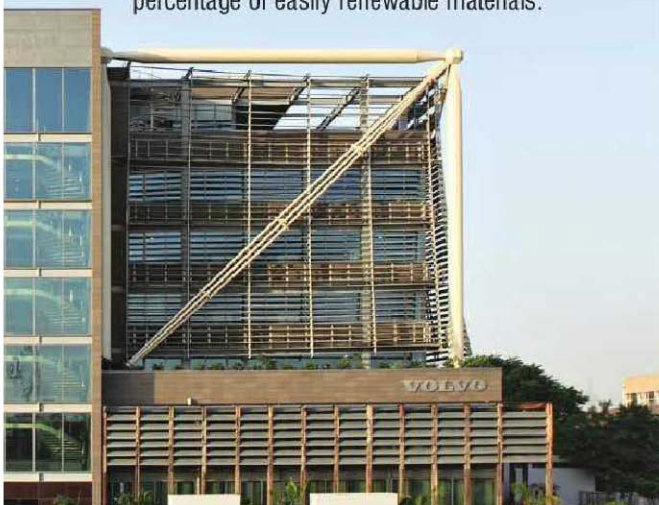
The basic objective for the design was to create the best working environment. The design had to ensure a healthy and productive atmosphere that is not only more comfortable but also enhance the fundamental quality of working life.

The air in this building is far cleaner and more oxygenated than the air in most other office spaces. The furniture has been ergonomically designed to ensure the comfort and health of all workers. Natural, glare-free light floods the und cluttered, open floors while all outside noise is blocked by double-glazed windows. Special care has been taken to eliminate all Volatile Organic Content (VOC) in the materials (such as paint, adhesives, sealants, carpets and furniture) used in the building.

The design of the building consists of two interlinked cubes, made almost entirely of glass and steel. As one walks into the main lobby, a 35-tonne spiral hanging staircase going all the way up to the sixth floor is prominent. The 30



The Volvo-Eicher Headquarter at Gurgaon, Haryana, designed by the renowned architects at Romi Khosla Design Studios, is a LEED platinum (provisional) rated building with innovative technologies. The building uses a large proportion of re-used materials and an extremely high percentage of easily renewable materials.





mm cables suspend the 'staircase' from the roof and then again at each floor by a total of six beams. They create quite a dramatic effect, when underlit with energy-saving LED strips. All the joints, bolts, cables and beams in building are exposed. The conventional raw materials - brick and concrete - are only about 10 per cent of the building and the rest is steel.

The building uses 1,250 metric tonnes of structural steel, another 35 tonnes in the central staircase, 215 tonnes supporting the external louvers and elsewhere, and 225 tonnes of reinforcement steel in its basement and floor slabs. The building also uses about 90,000 -sq ft of corrugated steel deck sheet, which weighs 135 tonnes.

The reasons for the use of steel are:

- Building with steel means building quicker and lighter. Both fabrication and erection are faster if a building's columns and beams - it's structural skeleton.
- Steel gave the freedom to keep the interior design flexible.
- Steel is 100 per cent recyclable (concrete and brick can only be used once) and was a critical factor in making the office a Green building.

The driveway is paved with porous, perforated blocks of concrete, each of which has been planted with grass. So, rainwater is soaked up by the grass within the gaps in the pavers, and the excess water percolates back into the captive drainage which is then used to re-charge the two rain harvestings wells under the driveway and the front lawn.

The exhaust pipes from the generators connect to a tower, so that exhaust fumes are blown out far above the office building. The most eye-catching feature is definitely the louvers. These 'blinds' which are strung outside the glass walls of the office and they have been painstakingly calibrated after a detailed solar ingress analysis. The architects and engineers have studied the building's orientation, latitude and longitude and the angles at which sunlight reaches it.

Each façade of the building was analysed to identify exactly how much sunlight would penetrate the glazing on the windows at different times of the day, and year. Then, these 'blinds' were configured and designed to eliminate the direct inflow of harsh sunlight. Finally, the louvers were made of a special quality alloy coated with a self-deansing finish and long lasting coating called Polyvinylidene fluoride (or PVDF coating). This perforated metal makes the louvers appear transparent and light.

Except for the sprinklers, all the other services have gone under the floor. The raised floor below is actually about half-a-metre higher than the 'structural' floor, and each of its tiles can be



the desks and cabins are fitted with LED desk lamps controlled by sensors.



the flexible interiors which are open, airy and flooded with sunlight . The ergonomically designed furniture ensure the comfort and health of all workers



the 30 mm cables suspend the 'staircase' from the roof

removed to access the network of wires below. All the air-conditioning ducts, which are normally fitted in the false ceilings above the heads in most buildings, are here fitted below the feet. The reason is very simple: hot air rises as a result only 6 foot high volume needs to be cooled from the ground reducing air conditioning loads by up to a third. In the building, the flow has been reversed so that the cold air reaches directly and cools efficiently.

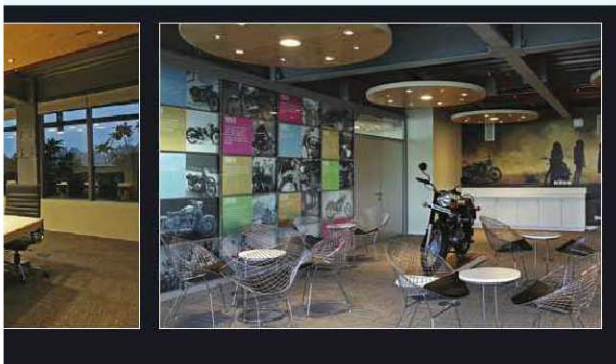
The wood used for false ceilings and furniture are made of pinewood that have been recycled from transportation crates. In the top compartment of all storage cabinets, a lamp has been fitted inside, facing upwards. The light from these lamps strikes the wooden discs suspended from the ceiling and is dispersed in such a way that, overall, the power consumption is significantly less.

The building has a very open, airy 'feel' because of the large glass windows on all sides of the office. This is a very special glass called SKN-165 which is insulated and double-glazed is used so that it lets in glare-free light but not heat and keeps the building sound-proofed. Inside the building, sound is absorbed by the carpets and wood to increase focus and comfort, without distraction. The louvers ensure that an impressive 75 per cent of the workspaces in the building are lit by natural light

which contributes towards a high LEED rating for an office interior. For more concentrated work, task light, on the desks and cabins are fitted with LED desk lamps controlled by sensors. The IBMS has been set up on the ground floor for automated controls for power, air-conditioning and water; it controls the elevators and makes sure that fire-detection systems and alarms work. The Heat Recovery Unit is a clever way of reducing air-conditioning energy which reduces air-conditioning load by up to 80 per cent.

Water is saved by installing auto sensors and water-closets having a 'dual-flush' option to in urinals. All the waste water from toilets is recycled by specially designed Sewage Treatment Plant (STP), housed outside the building and is used in the HVAC. To promote habitat and natural rain water percolation, project team has dedicated 14746.5 sq ft of green area within the site. All the plants used for the landscape according to climate and only require first 6-8 months of watering.

Besides the innovative technological features that have gone into this building, this building stands out as an aesthetic complex engineering feat. This building has achieved several firsts in the trajectory of Indian architecture setting now bench marks for the future. ▲



fact file:

project	: Volvo - Eicher Headquarter
location	: Gurgaon, Haryana
client name	: Eicher Goodearth Pvt. Ltd.
architects	: Romi Khosla Design Studios
chief architect	: Romi Khosla & Martand Khosla
design team	: Chandu V. Arsikere, Ram K. Nair, Sanjali Tuteja
area	: 9,972-sq m
commencement date	: 2010
completion date	: 2012
cost of project	: 60 crores
structural experts	: Frischmann Prabhu .
LEED facilitator	: Spectral Services Consultants Pvt. Ltd.
landscape consultant	: Sameer Chakravarty
photo credits:	Saurabh Pandey
awards:	World Architecture Award Winner