



# POETRY IN PARIS

Morphosis and IBE Bring  
Pragmatic Sustainability  
to the City of Lights

**BY SUSAN CHAITYN LEBOVITS**

**AS THE NARROW, GRACEFUL PHARE TOWER BEGINS TO RISE** in La Défense business district on the edge of Paris, it offers a glimpse of how the environment is bringing peace to the marriage of architects and engineers.

Architect Thom Mayne and IBE Consulting Engineers have found harmony in creating a more efficient, sustainable structure.



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From the farm of wind turbines on the building's crown to power harnessed from descending elevator cabs, engineers have sought to exploit natural and kinetic forces to build a more efficient tower.

“It's going to be seen as very sensuous in its visual qualities,” said Mayne. “All of the features that have to do with high performance, in terms of resources, are completely integrated.” Mayne said the challenges in creating the 300-meter, 68-story office building were enormous, beginning with complications on the ground at the site, where a freeway, a roadway and two rail lines converge. Slated for completion in 2012, the tower will overlook the Grande Arche and the Citit La Défense conference center.

Peter Simmonds, a mechanical engineer and associate at IBE, in Sherman Oaks, California, said one of the difficulties in creating a high-efficiency building of its magnitude was the scale of the south façade, which gets no shade from its surroundings. The team is experimenting with a number of exterior shading devices, including perforated metal screens, to balance how much daylight they allow into the space without contributing to the heat-load; the most likely candidate is a woven stainless-steel product produced in Germany on large looms.

The tower will also employ a secondary skin as a passive sunscreen layer, though not through a conventional double glazed façade. Tim Christ, the principal for Morphosis on the Phare Tower project, said that component is still in the research phase. “It's what we call a high performance exterior envelope.” The intention is to take as much of the solar gain off the glass and still preserve all of the views to the exterior. The metallic skin will act as a sunscreen on the south, east and west elevations.

In keeping with the overall mission of the building, Morphosis is developing solutions for office interiors that do not rely on artificial light during the working day, like glass walls.

“We've removed somewhere between 30 to 35 percent of the total energy load in the building, which goes toward lighting,” said Christ. “The heat gain on the interior of the space is reduced, which generally needs to be air-conditioned out. We're also reducing the consumption footprint because the reliance on daylight allows us to obviate the need for overhead lighting.”

When viewed from the center of Paris, the tower will appear to have a textured skin. Closer inspection will reveal a diagonal grid of steel beams, which will support the perforated metal surface and allow it to take on its sculptural shape. Escalators will extend 10 stories from street level to a public lobby filled with restaurants and cafés.

The commission came in November 2006, the culmination of an international competition. During the competition phase, the team designed the wind turbines to allocate electricity to the mechanical systems in the building to aid in driving HVAC fans on each floor, but that energy could be incorporated into any number of areas of the building, like lighting or operating the elevator system. Christ said it's not known at this time where it will be most optimally applied.

The team is also evaluating harvesting some of the latent energy in the elevator system, generated by the breaking of the cabs as they descend—much the way automobiles with electric engines generate energy—and recycling that into storage energy that would be used for some of the electrical loads in the building.

Mayne says the Phare Tower looks like a very poetic gesture, but that in fact it's an extremely pragmatic and functionally driven building. Since there were constraints where it came to the ground, the base of the building took the form of a tripod, below which pedestrian and train traffic will flow. The resulting conical shape has led some critics to remark on its resemblance to the Eiffel Tower, but Mayne feels with its smooth appearance, stainless steel mesh and single continuous sculptural form, the Phare is closer to the work of Constantin Brancusi than Gustave Eiffel.

“I look at the images of the Phare Tower models and it doesn't immediately scream classical serene beauty,” said Frank Sherman, an architect and vice president of Global Thinking, LLC a Hackettstown, New Jersey, green building consulting firm. “It has an odd, compelling nature that I find both dynamic and awkward. It will be very interesting to see how it evolves.”

Mayne said he's well aware of the softness, the femininity, of the Phare Tower, and because of it, critics are pondering a deeper metaphysical meaning behind the design. “Whether I agree with it or not is irrelevant,” said Mayne. “People see it as some sort of a change and read it as reexamining a different part of my personality.”

Sherman, who also sits on the board of the U.S. Green Building Council, was especially impressed with Mayne's tower since lighting, cooling and maintenance comprise as much as 85 percent of a building's 50-year life-cycle cost, so the economic benefits of green building are substantial.

“The technologies Mayne is proposing are not radical as much as they are adaptive,” said Sherman. “The building form and expression are shaped by strategies that will yield high levels of performance and comfort. The approach is more biological than formal.” In this respect, he said, the Phare Tower's “environmental adaptation and response is the most stunning aspect of the design.”

That adaptation, Mayne said, was one that he sort of “stepped into.”

“I've become the poster boy for green buildings, and it happened quite coincidentally,” Mayne said. “We just put our minds into solving this; I now feel some responsibility I haven't felt before.”

Mayne suggested that his reputation for incorporating environmental sensitivity into his designs began gaining momentum after the completion of the Wayne L. Morse United States Courthouse in Seattle, and the San Francisco Federal Building, which boasts operable windows and “living walls” eliminating the need for air conditioning for part of the year.

“As you mature in life, and become an authority in certain areas,” he said, “you realize that you now have different responsibilities.” ■