NEMETSCHEK Vectorworks

Case Study:

Using BIM to Breathe New Life into l'Ecole des Beaux Arts de Versailles

True-to-life visual of the protrusions.

With BIM, Beres was able to go directly from concept to manufacturing, and bring the distinctive, freeform elements of l'Ecole des Beaux Arts de Versailles to life.

A Modern Take on Old Versailles

In the town of Versailles, France, much of the architecture stands as it was hundreds of years ago, when Louis XVI surveyed the streets from the windows of his vast château. That all changed recently when Platane Beres and his team at Platane Architecture won a competition to transform a building in the heart of this quaint town. Called l'Ecole des Beaux Arts de Versailles or The Versailles School of Fine Arts, this space is located less than 500 meters from The Château of Versailles.

Beres and his team took on the challenge of updating the 300 square meter Sculpture and Painting Department's façade and opening it up to the town, while still retaining a historic feel to the building. Since many of the buildings are sheathed in stone, Beres included stone—but used it in an entirely different way, putting his indelible mark on the town. His vision was to suspend six 2 x ½ meter, two-ton rectangles of stone from a hidden steel structure to create the illusion that they were floating. And he envisioned these large blocks of stone to be splayed with bubble-like protrusions.

Here's where the BIM process became so important. Without it, Beres would not have been able to realize his vision to create such a unique and difficult structure. With it, he was able to go directly from concept to manufacturing, and bring the distinctive, freeform elements of the building to life.

Beres and his team rented a five-axis CNC milling machine; this was the first time in Europe that a computer-controlled mill was used to carve stones for a modern project. Beres tested exporting STL (stereo lithography) files from several BIM packages, and found the Vectorworks® functionality worked best. With the unique ability to transfer the data to the CNC driver and directly fabricate large, heavy stones, the team saved the town a significant amount of money, since hiring a stone carver would have cost three times more—and taken much longer. From start to finish, it was an 18-month project. The firm also cut its costs by creating the construction documentation directly from the model, integrating coordinated plans, sections, elevations, and 3D views. This reduced time and expenses by an additional 30 percent.

Project Collaboration

Beres praises workgroup referencing. Rather than wrestling with the hierarchy that can exist in some sharing environments, workgroup referencing options foster a more fluid exchange, allowing for collaboration on the file and the ability to model data both internally and externally. Beres explains, "It's important for the CAD program to have workgroup referencing. Then someone doesn't decide the rules for you. This is very good because it's open, it's free, and it's flexible."

3D Flexibility

The use and extraction of data from 3D models are important components of the BIM process. Beres relies on intelligent 3D models because 2D misses so much important information. "A 3D model has no 'holes;' it provides complete, unlimited numbers of sections and therefore complete control over every situation with practically no extra effort. It's the most like real life," Beres notes. In his offices, the team works in 3D, and then extracts the 2D documents, data, and plans to share with other teams.

"3D is the most like real life."

–Platane Beres, Founder of Platane Architecture, Paris, France

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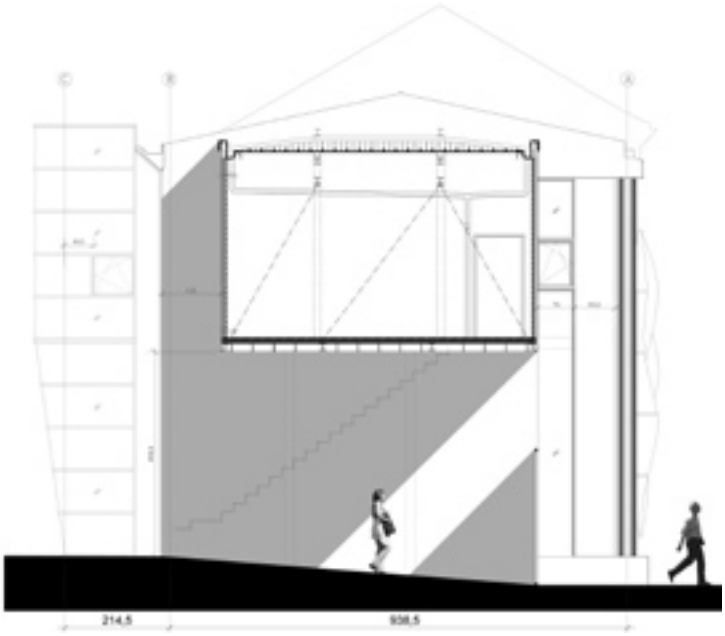
Complementing the historical buildings.

Modifications Made Simple

The ability to make changes easily has always been a hallmark of Vectorworks BIM functionality, says Beres, and the change process really sets it apart from the competition. "At the center of the program is the double-click to edit capability. This is really crazy in terms of the ease of modifications. It is very, very powerful. . .It's a way of thinking," he says. Since changes are inevitable and often frequent, this saves Beres and his team a good deal of time. In fact, after they won the Versailles competition, the town tasked them with scaling down the size of the bubbles. Once they made these changes, they presented many different perspectives with 3D models. Finally, Beres and his team were able to present the mayor with a 3D model made with STL plastic. This convinced the town to proceed with the new design.

The tools are easy to learn as well, "You can teach a person this in two minutes—all of the tools edit in the same way," he notes. Beres teaches BIM at an architectural school in France, and he's familiar with most CAD applications. He says, "When you draw in other programs if you want to modify you need to redraw. I prefer Vectorworks software because you enter or edit at the level that you want."



Section drawing from 3D model.

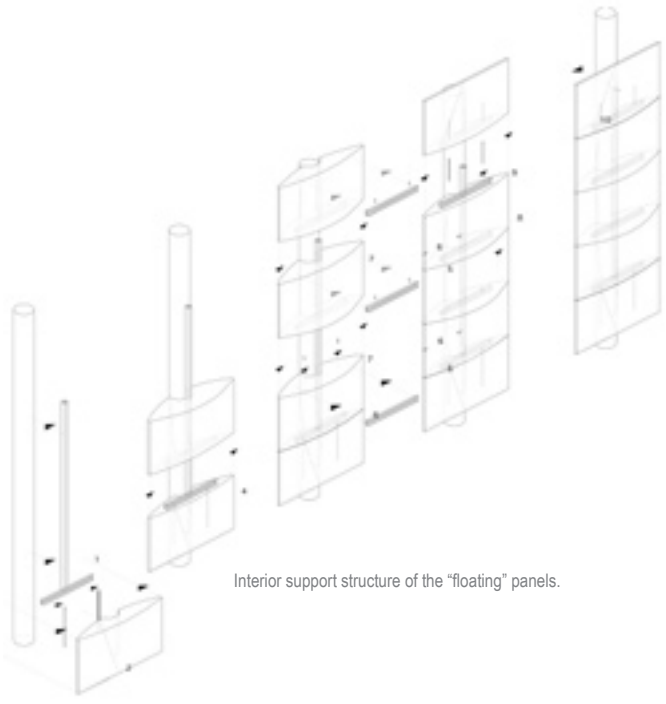
The soaring glass showcases the art.

"Thanks to the CNC milling machine, we could create the shapes of the large, heavy stones so precisely that they could sit on top of each other, just 5mm apart. What incredible precision! "

–Platane Beres, Founder of Platane Architecture, Paris, France

Tools for Every Job

For the Versailles project, Beres modeled everything in 3D, tapping into the program's specialized drawing and modeling tools to create the fanciful bubbles. Beres used the dynamic solids, surface, and NURBS tools to design the stones, and the Boolean operations to create the spaces between the steel and the stones. He and his team also used the Drape Surface command to create the freeform protrusions by dropping a sheet onto the bubbles. Their favorite thing about this project was its incredible precision. "Thanks to the CNC milling machine, we could create the shapes of the large, heavy stones so precisely that they could sit on top of each other, just 5mm apart. What incredible precision," remarks Beres.



Interior support structure of the "floating" panels.

> *"We always start with Vectorworks and end with it. It's very easy to separate or merge files from different people and at different phases."*
>
> *–Platane Beres, Founder of Platane Architecture, Paris, France*

"I've worked with the software since 1990, and I like it because I can do everything I want with it. I use it on all projects and in all phases. We always start with Vectorworks and end with it. It's very easy to separate or merge files from different people and at different phases. It's very, very flexible. That's the point," explains Beres.

Limitless Creativity

Platane Architecture recently took the coveted cover of *Architectural Digest*, and their work has also graced the pages of *Mark* and many other highly respected architectural publications. Founded by Beres in 1995, the architectural firm is based in Paris, but its designs reach across all of France, focusing on public projects such as schools, libraries, and homes for youths, as well as private homes.

A beautiful backdrop for works of art.

Beres received his DPLG degree (Diplômé Par Le Gouvernement) from the Paris-Belleville School of Architecture. He's a self-taught CAD programmer, and has taught CAD to individuals at both firms and universities. He studied with French architect Henri Ciriani and spent one year working with Swiss architect Mario Botta. Beres also counts Rem Koolhaas and Thom Mayne as two who have significantly influenced his thinking.

Beres sees the world of Architecture in two ways—first as an industrial process, and second as an artisanal process in which every building is a prototype. He believes that with the first you can structure, build repetition, find economy, and use all that the industry offers; with the second you can merge industry and artisanship. "You can use what the industry offers you for a part of the building and then discover a new way for another part."

He goes further, "With Vectorworks, I have the possibility to think of all buildings as prototypes so I can explore a new way to build. It gives me the freedom to explore other ideas as well. I really like the logic for drawing because it's very similar to the way I think; it offers the possibility to do all kinds of buildings." After bringing 21st century BIM design to a town steeped in history, there is no limit to what Beres and his team can explore.

Acknowledgements

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Founded in 1995 by Platane Beres, Platane Architecture has been featured on the cover of *Architectural Digest* and within the pages of *Mark*. Their unique approach to l'Ecole des Beaux Arts de Versailles reflects much of their work, which incorporates striking, gravity-defying approaches achieved with state-of-the-art technology.

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