



AT ISSUE

## Practical Science

In the face of new technical challenges, these firms have designed a smarter way to practice architecture.

by Nicholas Holt AIA, Yanel de Angel AIA, LEED AP, James H. Collins, Jr. FAIA, LEED AP, and J. Frano Violich FAIA; sidebar by Carol Burns FAIA / Fall 2011: Science (Volume 14 Number 3)

Increasingly complex building systems, interest in sustainable materials and technologies, and demand for improved energy efficiency — most architects would agree that the need for hard data and real innovation has never been greater. Some firms have embraced what would have been unimaginable a few decades ago: the integration of practice and science-based research. Their success suggests that they may have also found a path toward more artful design.

### SOM/CASE

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### PERKINS+WILL

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### PAYETTE

by James H. Collins, Jr. FAIA

Payette's practice has always been focused on challenging not only the status quo but also our own well-established thoughts and beliefs. We embraced the pursuit of innovation and invention within the context of a traditional design process but acknowledged the lack of appropriate tools beyond our instincts. Although we could often justify (or post-justify) the directions we took with calculations or measurements taken from the final design and construction, we were rarely able to pursue rapid iterations of design modifications in a controlled setting.

Over the past 10 years, however, the development of new software tools made specifically for design analysis, coupled with a surge of interest from academia, has enabled us to



*Detail, thermal buffer zone with automated blinds, developed for Brahan Science Center, Hudson Valley Community College, Troy, New York. By Payette.*

bring true rigor to this fundamental part of our work. With architecture schools throughout the country emphasizing technology, sustainability, and process, we have been able to bring new architects into the firm who leverage this technology and contribute to the design process at its earliest stages.

Of course, Payette is not unique in pursuing this agenda. Firms across the country have embraced science in myriad ways. Some have focused their practices on making each project an academic research endeavor. Others have formed elite “skunk works” teams within their organizations to pursue cutting-edge technologies, often with institutional partners. Payette has taken an approach that lives between these two extremes, incorporating tools as they come online but keeping specific client and project needs at the forefront. The focus is on the practical application of design research.

To turn this concept into reality, Payette recently established a “Research and Innovation Initiative.” This effort is led by representatives from each area of the firm, who make research tools — such as modeling software, prototyping equipment, and an in-house Wiki — available to all design teams, leaving the teams to determine how to implement

these resources. As part of this initiative, a building scientist joined the firm to provide expertise in the physics, engineering, and analysis of building performance.

Some examples of specific decisions that were a result of this approach may be useful. In Pakistan, we were able to develop a modern version of the traditional wind catcher, using earth ducts to provide natural ventilation and cooling throughout a new college campus. For a small community college in upstate New York, we were able to analyze multiple façade technologies to determine the cost benefit of double-wall construction under varying thermal conditions. For a small cheese production facility in suburban Boston, we were able to investigate multiple options for the development of a zero-net-energy installation specific to the needs of this farm.

The defining trait of these projects is that the results have relevance far beyond the immediate needs of the projects; this allows us to justify the additional overhead expense of the exploration. These investigations inform the entire practice and should streamline and influence future decisions. Ideally, significant research and results can be taken beyond our walls to the greater professional community through our online presence, conferences, and publications.

Ultimately, we see this as a question of leverage. We are not trying to live on the bleeding edge, inventing new technologies or materials, but we want to use all of the resources at our disposal to attack every problem we confront. Our approach to research is about strategic investigation that helps to rationalize our process, bring rigor to the work and, more than anything, develop the intuitive sense that drives all formative design work.

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**KVA**

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**SIDEBAR**