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## New Certification Course for Professionals Uses Holistic Approach

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By *Tom Sawyer*

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Virtual design and construction is the topic of a new professional certification program at Stanford University's Center for Integrated Facilities Engineering (CIFE). But it's not so much about 3-D modeling, software, hardware or magical visualizations as it is about an integrated approach to linking all the tools at your disposal, including data-driven design and organization and decision process modeling. The course teaches that VDC isn't a tool but a framework that leverages an array of technology to accomplish superior work.



Photo: Parsons Brinckerhoff

Mezher focused on VDC planning for the Alaskan Way Viaduct Deep-Bored Tunnel project.



+ Image

Image: PB / SFCTA / Caltrans

One project pushes a detailed 4-D constructibility and analysis model of the Presidio Parkway reconstruction in San Francisco to produce reports as time-sequenced animations.

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"It's about how you make that idea happen," explains recent graduate Sagar Gandhi, Southern California BIM leader for DPR Construction Inc., Newport Beach, Calif. He says the course is not about any specific software at all. "It's about the way we are thinking, and by the end of it [the students] understand you have to be collaborative...with all the stakeholders."

CIFE's VDC approach requires cross-discipline collaboration. Students are taught to integrate into the design process from the outset as many stakeholders from throughout the facility life cycle as possible. A broad range of stakeholders have been enrolling since the program started gathering steam a year ago.

The first 17 graduates were awarded certificates on Aug. 25. Several companies—like DPR, which took five seats—had multiple people enrolled. Their titles, and those of the new group of 16 now beginning a new session, cover many facets of construction.

"We have had building owners, architects, engineers, GCs, subs, suppliers and VDC service providers," says Martin Fischer, CIFE director. "We've had presidents, VPs, directors, project executives, project managers, superintendents, project engineers and IT specialists."

Fischer is one of the instructors. Others are John Kunz, CIFE executive director, and Roberto Arbulu, director of technical services at Strategic Project Solutions Inc., San Francisco, who helped plan and deliver the course. "To our knowledge, this is a first in the world," says Fischer.

Because the course is for professionals, its students "learn by doing," Fischer says. "We want the individuals, projects and companies to reap benefits ASAP."

The course starts with a week on campus to school participants on the material and get them thinking differently about project organization, design and management methods, as well as technology.

Participants return to their workplaces after the week to implement VDC on a project and capture performance

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metrics. Then, over the next six to 12 months, depending on their projects, they meet on monthly calls to discuss problems, share discoveries and describe progress. The course ends in a two-day session back at Stanford to present findings and help participants plan their next VDC deployments at their companies.

There are benefits for regular students in Stanford's graduate and undergraduate programs. Although they are not directly involved, Fischer says a lot of the material in the VDC program comes out of graduate-level courses, and feedback from the professionals flows the other way, improving the material on both sides. He adds that, ultimately, regular students also will benefit after graduation when they find managers who are in tune with the VDC methods championed by CIFE.

## Results Delivered

Brendan Robinson, who says he is the only owner to graduate from the course and be certified, is a project manager at the Duke University Health System Office of Facility Planning, Design and Construction in Durham, N.C. He says Duke FPDC previously had consultants


using models for visualization and clash detection, but it didn't have firm opinions or best practices about how models could be used on projects to add value. "One of my goals in attending was to understand how these methods could help us improve performance in delivering a capital project," he says. "The course gave me just what I was looking for."

Robinson cites several good results, including how VDC-style integrated concurrent engineering sessions around 3-D models with doctors and nurses—the stakeholders of hospital projects—paid off in faster design and...

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...reduced owner-directed changes in the field. Holding those meetings around 3-D models “helped us get rapid and high-quality feedback during the design process,” Robinson says. Creating and merging models of existing underground utilities into structural models for new buildings also paid off: In one case, a dozen conflicts were found, leading to redesign of the structure.



Another graduate is John Robison, director of information technology at integrated design firm LPA Inc., Irvine, Calif., and one of three LPA employees to take the course. He says although LPA has an inclusive design process, working with owners and builders in the VDC program helped him “realize more completely” where the big benefits are and has him looking to formalize processes for reducing waste and uncertainty and improving project performance.

Some examples derived from LPA's projects draw incident data from a building information model. One captures the way requests for information tend to spike around major project or trade deadlines. Robison says seeing this graphically helps LPA not only predict the internal effort that will be needed to respond at various stages of work, but also helps track and analyze RFI origins, which should help reduce them.

Another graphical output tracks the collisions found in the model and the impact across the project team. Robison says LPA is using that feature to generate standardized interference reports at defined project milestones. “This is new,” he says. It will help the team set expectations, identify the source of discrepancies and tag those responsible for resolution as quickly as possible, he says.

Parsons Brinckerhoff was another firm well represented by teams from its offices in Seattle and San Francisco.

“It was good to see all the 3-D, 4-D and n-D modeling, but I was more intrigued by the process and organizational modeling,” says Jay Mezher, PB manager of design visualization, virtual design and construction, in Seattle. “It’s something I haven’t worked with before. The course opens your eyes and makes you evaluate and question the design process.”

“I see this VDC certification as an opportunity for greater clarity across the entire industry,” adds Robison. He says he hopes a VDC standards-setting body will emerge to award accreditation for individuals and firms.

All the engineers ENR contacted reported good results with their projects, but graduate Josephine “Jo” V. Valente, director of virtual building technologies at Rosendin Electric Inc., San Jose, Calif., had one of the most directly gratifying stories of all. She went back to her specialty contracting firm and used the VDC approach to help develop a bid to fit out a large solar-cell manufacturing plant.

“We got all our team members together, so I educated them,” she says. “They were all in there, asking, ‘Why do we have to do it this way?’” Valente says they had meeting after meeting around the model to deeply analyze the project, organization and process.

“We collaborated, put together a presentation for the project, and we won it last week. We’ve moved our design team there, our construction team there, the detailing team—and this is new to our folks. I thought it was pretty exciting to

have received my CIFE certificate and then we—the entire team—accomplished this.”

