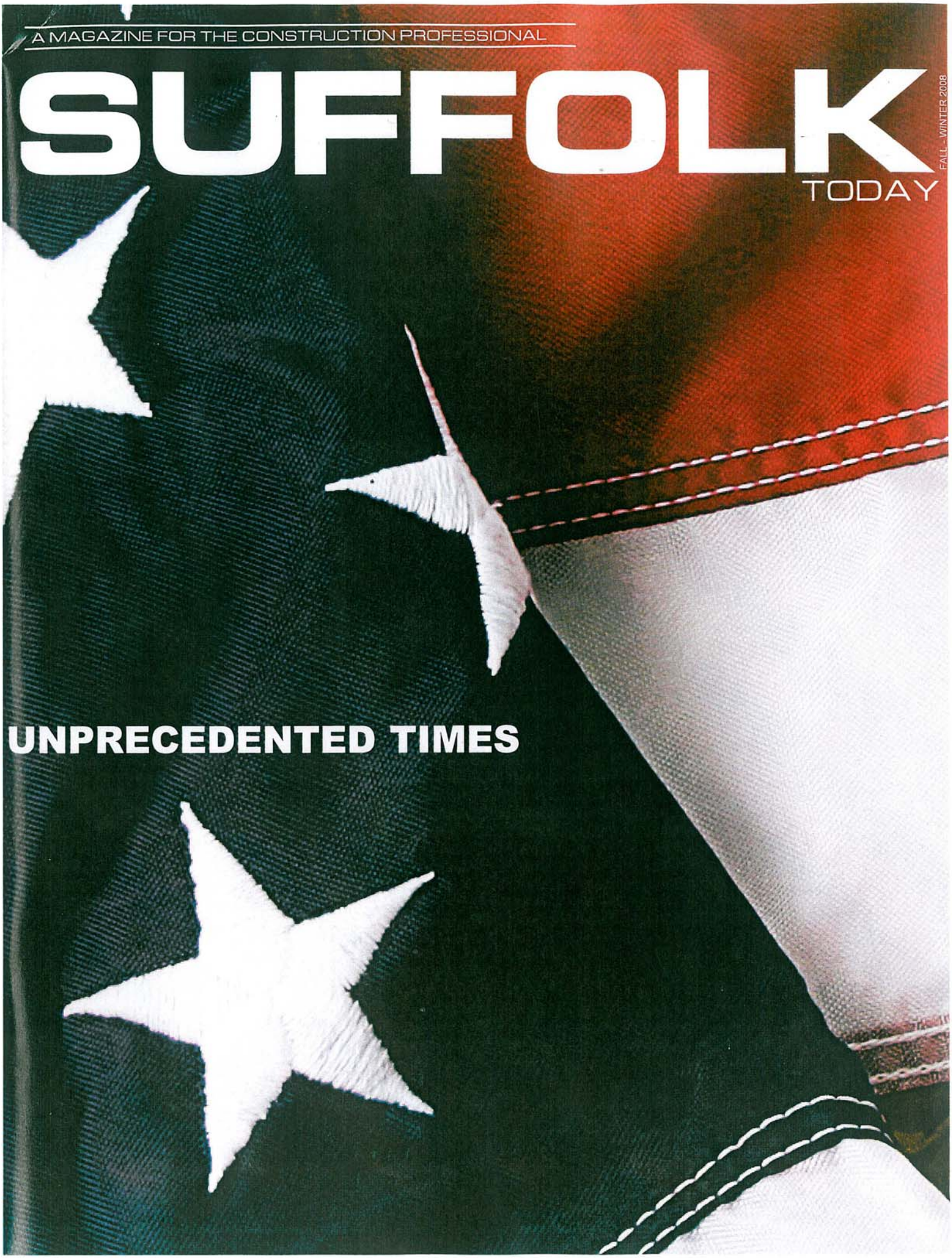
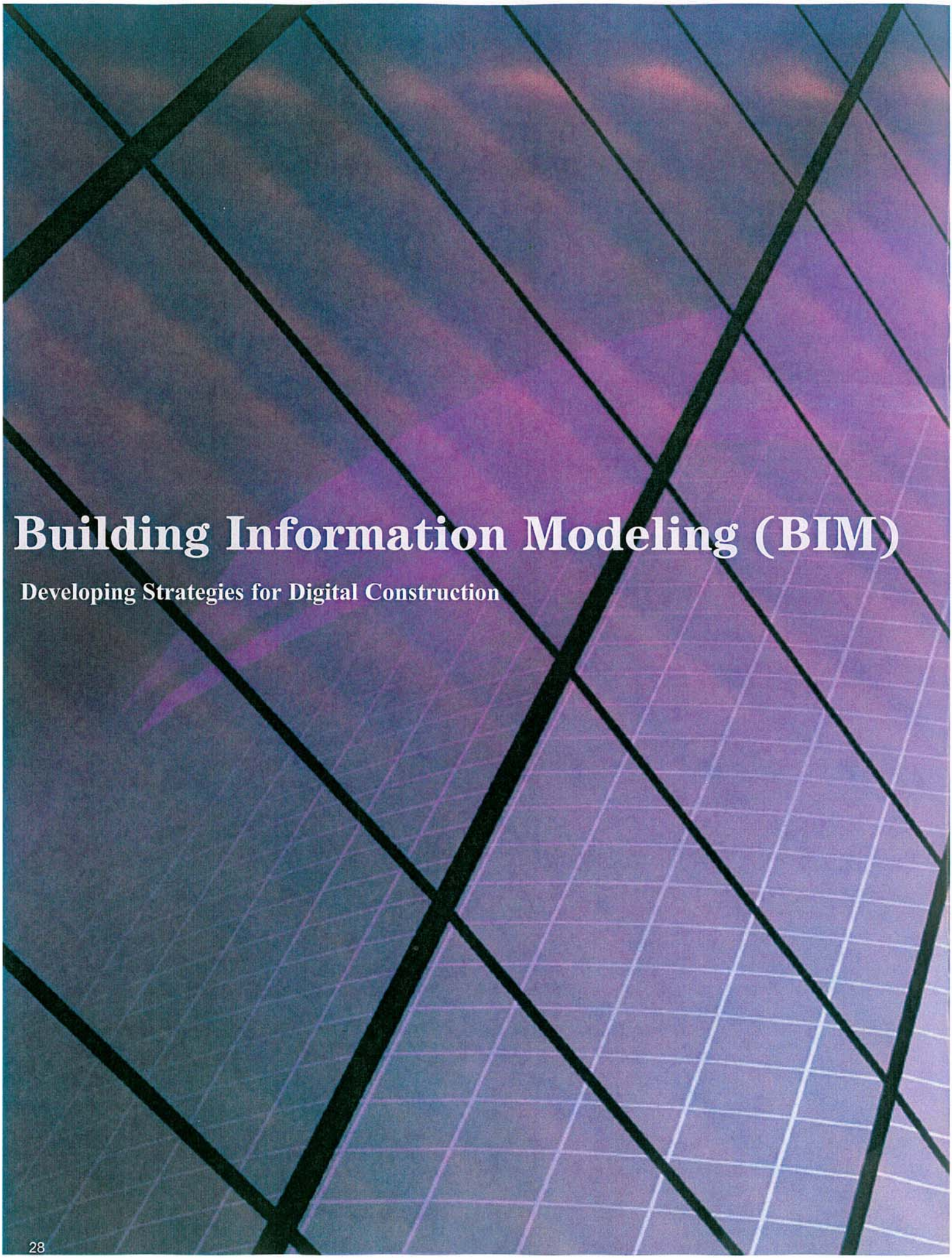
A MAGAZINE FOR THE CONSTRUCTION PROFESSIONAL

SUFFOLK TODAY

FALL - WINTER 2008



UNPRECEDENTED TIMES



Building Information Modeling (BIM)

Developing Strategies for Digital Construction

There is a revolutionary movement occurring in the building industry. Excitement (and some skepticism) keeps growing around the use of Building Information Modeling (BIM) on construction projects across the nation and around the world. Although the future benefits and rewards of BIM are still difficult to determine, Suffolk Construction is already realizing the potential of this next-generation tool on several projects around the country and actively researching more effective ways to utilize it on future projects. Suffolk recently formed a BIM Strategy Committee to research ways in which the company, as a general contractor, can continue to use BIM to facilitate the construction process while saving clients time and money on their projects. The committee currently is collaborating with architects, owners and subcontractors to gain insight on whether they are using BIM, how they are using it and which software platforms they prefer.

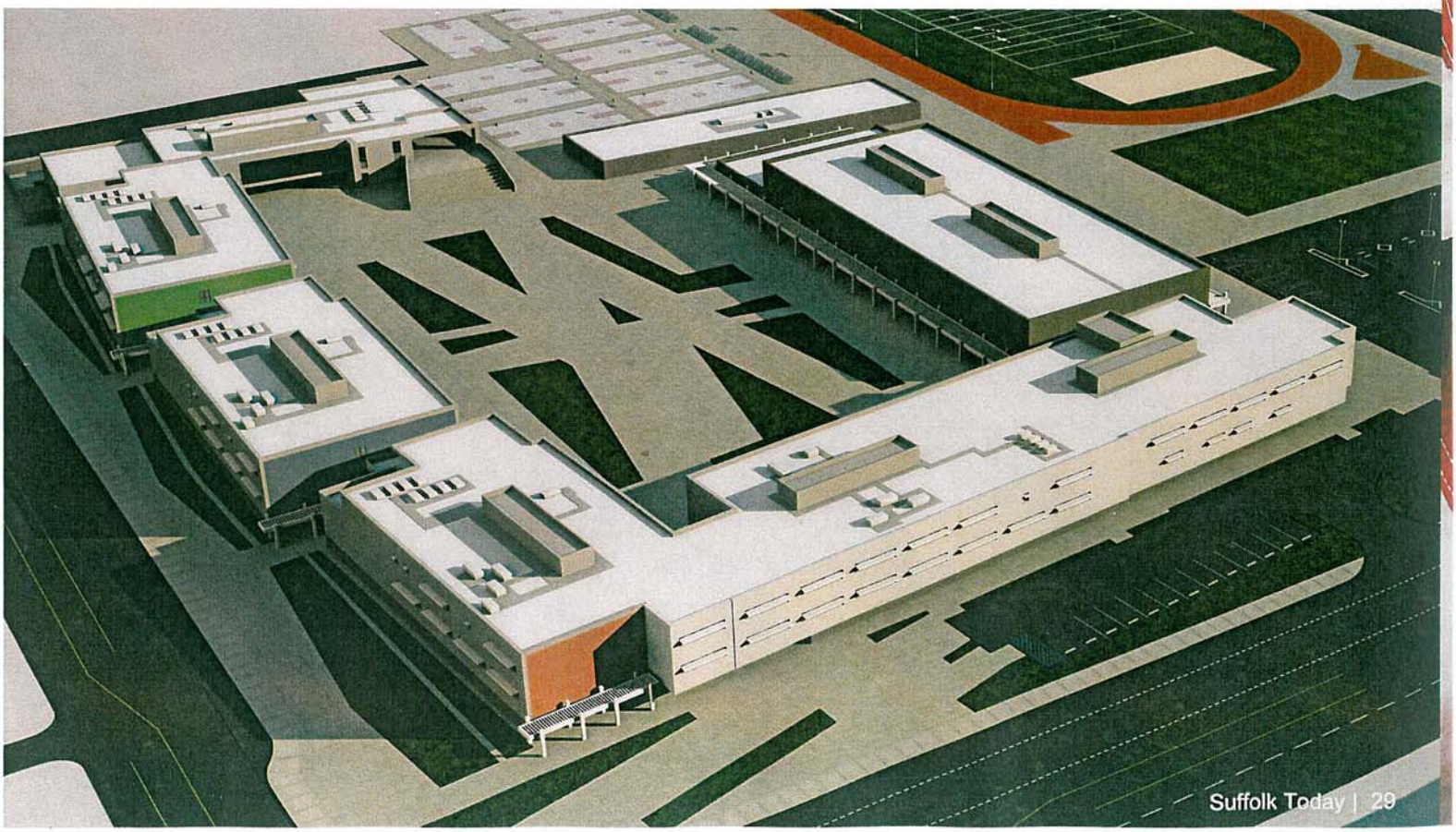
In the field, BIM allows for seamless design communication between architects, engineers and construction professionals, enabling them to work collaboratively by using a single model created from design infrastructure. The project is "built virtually" per design specs and plans, allowing all team members to "see" the final building, including all of its components. The completed BIM model is extremely useful in detecting any design conflicts well before construction begins, which saves clients time, materials and money.

Suffolk has worked with BIM on several projects across the country and is realizing the significant benefits BIM provides. Suffolk's California Division currently is using BIM on the Los Angeles Unified School District (LAUSD) High School #4 project. On the $106 million high school project, Western Air Limbach, the project's HVAC contractor, is taking the lead by using BIM to model mechanical, electrical and plumbing systems. With this model, the project team will be able to identify and resolve any conflicts in design early in the process by entering conflicting information into the model.

The California Division is also using BIM on the Jewish Homes for the Aging's Fountainview at Eisenberg Village project. FrameMax, a leader in light-gauge steel panelization, is using BIM to ensure that the steel frame, load-bearing structure is aligned properly. As a result of this model, all trades can coordinate to ensure that no design elements conflict with their work. FrameMax is using the software Autodesk REVIT Structure.

Barry Kuiak, a FrameMax CAD Developer, commented on how REVIT Structure allows for easy integration of several software platforms. "It can easily import/export in many formats allowing other trades to use the model as 'tracing paper' for their designs. This leaves no room for interpretation of the design. 'What you see is what you get' is a phrase commonly used. What you see in

LAUSD (Los Angeles Unified School District) Construction Model





LAUSD (Los Angeles Unified School District) #4 Model

our virtual model is what will arrive on the jobsite. BIM requires the full cooperation of the general contractor in enforcing this discipline on all of the trades to get their designs finalized, so a full 3-D model of the project can be completed to ensure all conflicts are resolved prior to construction. Working with the Suffolk team on their Jewish Homes for the Aging project has been 'pain-free.'"

Rob Latch, Suffolk's Senior Project Manager on the Fountainview project, takes it one step further, "I have managed a dozen projects without BIM…after what I have seen on Fountainview, I would rather not manage another one without its utilization. On podium projects, where thousands of connections must be spot-on, BIM adds a level certainty that cannot be replicated with standard CAD applications."

In Boston, BIM was used for both the steel and MEP systems during the construction of the Mandarin Oriental, Boston. This was one of the first projects in which the company used 3-D modeling, and it was extremely successful. Since owners of the Mandarin Oriental's condominiums were able to modify the layout of their units to fit their needs, no two units in the building follow a similar floor plan. This required intense collaboration on the part of Suffolk's project team, MEP specialists and framing contractors to plan the layout of plumbing systems and framing structures carefully, since bathrooms and kitchens were not stacked. The use of 3-D modeling was essential to mapping out the specific routing of plumbing and HVAC systems in the building while maintaining the high ceiling heights and column-free spaces required for the condominiums.

Due to the complexity of the mechanical, electrical, plumbing, and fire protection (MEP/FP) systems at Torrey Pines Institute for Molecular Studies, and the fast-track design and construction schedule, Suffolk's Florida division used BIM to coordinate all MEP/FP systems with each other and with the structure. After the MEP/FP systems and the structure were modeled, clash detection software was run to find all conflicts prior to fabricating any item. The value added through this process was twofold. First, the stakeholders were comfortable fabricating every single pipe, duct and other component based on the modeling data. No part or piece needed to be field measured, fabricated, then installed, which saved time. Second, any conflicts were found during the design phase, prior to fabrication and prior to construction. No time was lost due to field issues, and time actually was gained through early fabrication of all components.

Our experience using BIM on these projects has minimized delays in construction by allowing the use of conflict detection. The virtual model displays any parts of the building that are in conflict through detailed computer visualization of the conflicting piece in relation to the total building. As computers and software become more capable of handling more building information, these conflicts will become even more pronounced than in the current design and construction projects. Error reduction is a tremendous benefit of using BIM, which leads to cost savings for all members of a project. Reduction in time required to complete construction directly contributes to the cost savings numbers as well. It is important to realize, however, that this decrease can be accomplished only if the models are developed sufficiently in the design and development phase.

The jury is still out on the future of BIM, but the technology is certainly taking hold. Client/owners, such as General Services Administration, the Department of Defense and the U.S. Coast Guard, are all defining their deliverable requirements in BIM. If this trend continues, BIM certainly has the potential to change the way buildings are designed and built, and Suffolk will be at the forefront in implementing its use on projects nationwide.

