

# Economic Upturn for Building Industry

*Software Companies Address Construction Rise with Innovations, Interoperability, Better Graphics and Mobile Apps*

*By Larry Kabaner*

As the economy improves and more construction projects get underway, software developers are meeting the increasing number of projects with new products and services, as well as updating current offerings. Software companies are also responding to the needs and interests of their customers: a need to continue to run lean and interests in interoperability, more sophisticated graphics, flexibility and mobile apps.

“There’s a lot more work out there,” says Amber Freund, Director of Marketing for RISA Technologies, LLC ([www.risatech.com](http://www.risatech.com)) in Foothill Ranch, California. “People are still working pretty lean. Even companies that had been slow are now getting more work; they haven’t really increased their staff – a lot of them – or at least not proportionately to the work. Some of our customers are expanding, so we are getting people calling us for new licenses because they have new projects. People who have been out of maintenance because they couldn’t afford to pay for their software are now renewing because they have projects to justify it.” (See ad on page 75.)

Notes Randall Corson, Structural Engineer at Computers & Structures, Inc. (CSI) ([www.csiberkeley.com](http://www.csiberkeley.com)) headquartered in Berkeley, California: “For us, the transportation sector continues to be a significant source of business domestically, and we are seeing an increase in the use of building design software in certain regions of the country. Internationally, portions of the Far East are still very active.” (See ad on page 76.)

“From my conversations with people in the industry, things are turning in the right direction,” says Michele Arnett, Marketing Manager of Lincoln, Nebraska-based Design Data ([www.sds2.com](http://www.sds2.com)). “There are areas that are doing better than others, but the worst of the economic downturn appears to be behind us.”

At RISA, Freund says that they just released their first version of RISA-Tekla Link which links RISACONNECTION with Tekla Structures. “Tekla Structures does all of the scale detailing, but they have never been able to do any of the connection design. This link allows users to design connections in their Tekla Structures model using RISACONNECTION. We’ve had really positive feedback on it. The Tekla users are thrilled, because they now have a complete package. And it’s been good for us because it gets RISACONNECTION to a market that we typically wouldn’t touch.” She adds: “We do structural engineers. They [TEKLA] do detailers and navigators. So it’s been nice to get

into that market. All of a sudden, they [TEKLA users] don’t have to learn a new software. They’re doing everything within Tekla Structures, since they’re basically using RISACONNECTION to design it.”

As for trends, Freund notes: “Definitely, I think it’s interoperability. Everybody’s talking about BIM – and has been for a while. I think you’re going to see more implementation of that. I think the trend over the next five years is going to be that people are going to start using it more. With that, it’s going to require the software to change a bit, too.”

To meet its customer needs, CSI recently released the latest in their ETABS product line, ETABS 2013. “It’s an innovative and revolutionary integrated software package for the structural analysis and design of buildings,” says Corson. “From design conception through the production of schematic drawings, ETABS 2013 assimilates every aspect of the engineering design process. A 64-bit solver allows for extremely large and complex models to be rapidly analyzed, and supports nonlinear modeling. Design of steel and concrete frames, composite beams and columns, joists, shear walls, connections and base plates is seamlessly integrated with the analysis.”

He adds that the latest offering from CSI for bridge engineers is CSIBridge V15. “This software allows for quick and easy design and retrofitting of steel and concrete bridges. The parametric modeler allows for rapid generation of complex bridge models using terms familiar to bridge engineers such as layout lines, spans, bearing, abutments and bents.” Corson is proud of the company’s quality management system. “Computers and Structures, Inc. is one of the few structural engineering software companies that has implemented a verifiable quality management system to ensure that customer expectations and industry requirements are not only met, but exceeded. CSI is ISO 9001 compliant as certified by Det Norske Veritas, an independent agency accredited by the International Organization for Standardization. CSI’s quality management system covers processes and procedures for all of our software.”

Design Data’s Arnett would like SEs to know about two newer products that will benefit them. “SDS/2 Approval is an in-model review tool that allows engineers to improve their shop drawing review process by taking advantage of today’s technology. With SDS/2 Approval, engineers can view the shop drawings alongside the 3D model, streamlining the process by eliminating time consuming searches through 2D information,” she says. “Using the detailer’s 3D

model, SEs gain the ability to see the steel they are reviewing in the context of its actual location in the structure, reducing ambiguity as they review the detailer's submittals. In addition, electronic approval is a 'green' process, eliminating the need to store stacks and stacks of paper drawings as well as reducing printing and paper costs. Instead, the model is archived and storage space becomes digital rather than physical. Learning to implement the electronic approval process is straightforward and free."

"We have seen a trend in the software industry as a whole in the demand for mobile apps. In response, we've released our SDS/2 Mobile Status app for Android and iOS, including interfaces for both phones and tablets. It shares the same status update technology that is in SDS/2 Approval, allowing updates to be sent via email to the detailer's model from any location," Arnett says.

Another product from Design Data is a connection design add-in for Revit Structure called SDS/2 Connect. "This tool allows engineers to access the connection design that has long been associated with SDS/2 products inside their native Revit model. With SDS/2 Connect, SEs can design and apply connections to the model, allowing them to see the materials, bolts and connection design calculations without ever leaving Revit Structure. As an added benefit, SDS/2 Connect includes model round-tripping tools to send the Revit Structure design model downstream to the fabricator and receive model updates back into Revit Structure, getting users closer to the as-fabricated product," Arnett says. A free 30-day trial of SDS/2 Connect is available at [www.sds2connect.com](http://www.sds2connect.com).

SEs and others can also get a free trial for Tedds, a structural calculations software ([www.cscworld.com/Try/Tedds](http://www.cscworld.com/Try/Tedds)), from Chicago-based CSC, Inc ([www.cscworld.com](http://www.cscworld.com)). "We have just launched our latest version: Tedds 2013," says Vice President Stuart Broome. "It's up to twice as fast as its predecessor and includes a new, fully integrated 2D frame analysis application as well as many new and enhanced calculations to both U.S. and Canadian design codes. Tedds 2013 is also compatible with Microsoft Word 2013." Broome says that the new release enables engineers to access a range of analysis options within Tedds, avoiding the need to use separate analysis software. "Engineers can analyze frames such as trusses, cranked beams and portal frames, then create a single-project document including calculations, notes and sketches. The primary benefit of Tedds is increased productivity, but many of our clients value the detailed and transparent output which Tedds produces."

CSC also offers Fastrak, a steel building design software, alongside CSC's Integrator (a free tool for synchronizing Fastrak and Revit Structure models back and forth). Broome notes, "It is a physical object-based modelling solution which automates the requirements of AISC360 and ASCE7." He says the main reasons clients use Fastrak are: the ability to model and automate the design of composite floors and complex roof structures/trusses in one model and in one interface; the ability to model and automatically design gravity and lateral systems in one model and in one interface; and, the ability to synchronize a design model with a Revit model and pass information in both directions as many times as required in a manageable way.

The company also offers CSC's Integrator which is available as part of Fastrak. This free software enables structural engineers to synchronize models between Autodesk Revit Structure and Fastrak. Adds Broome:

"It is an industry-leading solution making two-way integration with Revit Structure easy, highlighting any amendment made during the synchronization process, thus enabling engineers to react to changes quickly and reduce the risk of errors."

Michael Brooks, President of ENERCALC, Inc. ([www.enercalc.com](http://www.enercalc.com)) of Corona del Mar, California, would like SEs to know that their Structural Engineering Library is not just a collection of over 50 design modules. "It is a calculation preparation program where the engineer builds calculation packages that include Excel, Word, PDF, and Scanned materials in addition to the calculation modules we provide. ENERCALC has been in business for a very long time and we've had a number of products released. From the original Lotus 1-2-3 templates to the current sophisticated Windows program. We want SEs to be sure to check out our latest software packages, as things are continually being improved."

Brooks is seeing a strong recovery for his company. "Last year was a 20 percent jump over 2011, and 2013 shows a 25 percent to-date increase. Because we see the early trends in design office activity, it's obvious that the construction industry is in a recovery stage." As for seeing other trends, he says: "Software is becoming more transparent across devices, so we are seeing more cloud-based data storage and software delivery. ENERCALC offered our first web based 'thin client' software over 10 years ago. We were too early...but we're developing a full web platform to cater to the swelling demands of our clients for work-anywhere and data-anywhere." (See ad on page 3.)

According to Marinos Stylianou, CEO of S-Frame Software ([www.s-frame.com](http://www.s-frame.com)) in Guilford, Connecticut there are four key trends that he sees in software: interoperability, ease of use, integration and the ability to easily automate repetitive tasks. "Ideally, clients want a 'single-glass' model for their software/tools. They can't afford to move back and forth between dissimilar products and technologies. Integration is key not only at the designer or engineering level, but at the entire business level of the company and its partners. With each new release of our product suite, we strive to offer our clients tangible improvements in all four key areas."

S-Frame recently released R11 of their Structural Office Suite. "All our existing products saw feature additions, enhancements and bug fixes," says Stylianou. "In addition, we released a collaboration and validation tool called S-VIEW, which is included within S-FRAME Analysis. Our Interoperability with BIM and CAD systems was expanded via brand new bi-directional links with Tekla and Revit. The DXF translator was also completely rewritten and modified to handle increased customer needs. S-FRAME Software will release an entirely new product called S-FOUNDATION this summer to expand our leading presence in the concrete analysis and design arena."

Stylianou sums up his company's goal by saying: "Industry trends and demands motivate our team to provide the best state of the art technology, while providing an enjoyable and simple user experience. The ability to communicate between our products and with 3<sup>rd</sup> party and in-house products is another driver being requested by our clients. Clients are seeing a refresh in their business that requires faster concepts, better designs, all at a reasonable cost. Our solutions aim to address all three of these points." (See ad on page 4.)

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At IES, Inc. ([www.iesweb.com](http://www.iesweb.com)) in Bozeman, Montana, Engineer and Developer Terry Kubat says that the company provides everyday tools for analysis and design projects. To his customers he says: "Your success is based on working efficiently to get your job done, so our programs stay out of your way to let you do what you need to do. We stand behind our tools with free technical support, free web-based training, and reasonable pricing."

IES continues to upgrade their products, says Kubat. "VisualAnalysis 10.0 is the newest release of our flagship product. Our long-term customers are praising the continued improvements that help them save time and solve tougher problems. Coming this fall are design specification updates to stay current with IBC changes."

Kubat adds: "Customers are starting to move to new machines and upgrade Windows and so we are working hard to 'retool' our software to leverage all of the capabilities that were not available in Windows XP, or as easy to leverage on that platform. Things like parallel processing, multiple-threading and the like are going on behind the scenes to make our products significantly faster... IES has always been a democracy, with customers leading the evolution of our tools: our job is simply to listen and respond."

The company offers free trials. "You may test our products, fully-functional and fully-supported without ever having to deal with a

sales-person, because we don't have any. Nearly 30 percent of those who try an IES product buy it within a few months," says Kubat.

Reaching a specific market niche is the aim of Leroy Emkin, Founder and Co-Director of the Computer Aided Structural Engineering Center (GT STRUDL) at CASE Center ([www.gtstrudl.gatech.edu](http://www.gtstrudl.gatech.edu)) in Atlanta. "[Our customers are] companies involved in the analysis and design of nuclear, fossil fuel power and nuclear defense industry safety-critical structures, general process and plant design industry structures, offshore oil & gas exploration structures, offshore wind farm structures, cable supported structures, sport stadiums, complex long-span bridge structures, hi-rise commercial buildings, etc.," he says. Emkin would like SEs to know about a product developed by one of the GT STRUDL Distributors located in Athens, Greece. "3DR Engineering has developed a new and powerful GUI interface to GT STRUDL called ATLAS, which takes full advantage of AutoCAD's powerful 3D graphical modeling features. ATLAS is a highly powerful GUI to GT STRUDL that is easy to learn and easy to use by any structural engineer familiar with AutoCAD. ATLAS performs automatic modeling of structural frameworks and finite element meshes."

Also going for a niche approach to software is the Canadian Wood Council (CWC) ([www.cwc.ca](http://www.cwc.ca)), a national, non-profit association,

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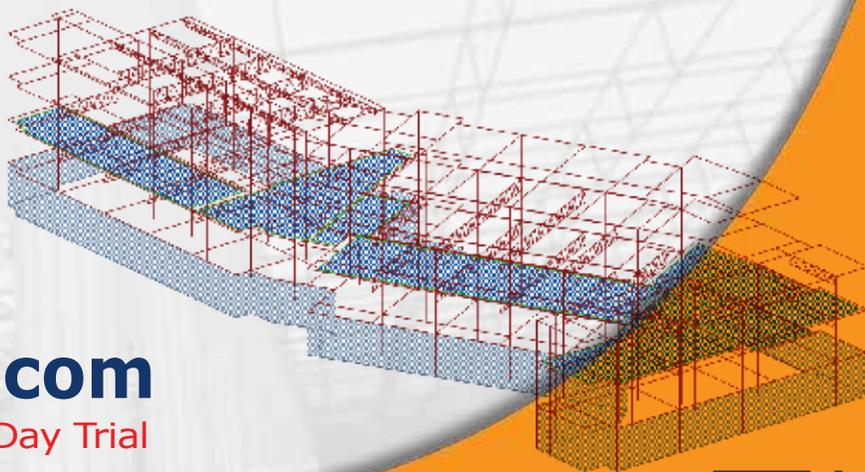
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located in Ottawa, Ontario, representing manufacturers of Canadian wood products used in construction. Robert J. Jonkman, Manager, Structural Engineering for WoodWorks, their software product, says CWC's main priority is to ensure that "building professionals such as engineers, architects, and other design professionals have the needed information in hand to specify and use wood products in a safe, secure, and code-compliant manner. One way we do this is through our wood engineering software, WoodWorks." Separate Canadian and US versions of WoodWorks software are available. For the U.S. version, compatible with the IBC, NDS, SDPWS, and ASCE7, CWC works closely with the American Wood Council (AWC) to ensure consistency in technical interpretations, according to Jonkman.

"The US version of WoodWorks has been updated to conform to the 2012 IBC, the 2012 NDS, and the 2010 ASCE-7. New features have been added as well," he says. These include:

Shearwalls:

- shear walls with inadequate capacity to resist the lateral loads are now automatically highlighted, making them easy to identify
- .PDF files can now be imported as a template to lay out the structure

Sizer:

- the fire design procedure from NDS Chapter 16 is now included
- revised southern pine values are included in the database
- steel beams are now included as a design option in the latest Canadian version of the software

Connections:

- the connections software has been upgraded to a fresh format that is significantly more efficient to use

WoodWorks software can be purchased as a full suite called Design Office, which includes Sizer, Shearwalls, Connections, editable database, a PDF version of the NDS and SDPWS (US) or CSA O86 (Canada), and free technical support for the current version. Sizer can also be purchased separately. A free download is available to test the software.

StructurePoint, LLC ([www.structurepoint.org](http://www.structurepoint.org)) in Chicago, Illinois was formerly the Engineering Software Group of the Portland Cement Association, and is a dedicated team of engineering professionals committed to excellence, continuous improvement, and service, according to Marketing Director Heather Johnson. "We provide civil and structural engineers with the software and technical resources they need for designing concrete buildings and structures. StructurePoint is a convenient single point of access to the vast resources and knowledge base of the entire cement and concrete industry including library services, training, R&D, publications, building codes, specialty engineering services, concrete material and testing, concrete repair, codes and standards consulting."

StructurePoint's primary focus and passion is concrete structures. "We are watching closely every code change and amendment relevant to concrete design. We are also behind the scenes looking for important upcoming changes to make concrete design simpler, faster, and more accurate. This way we do it once and well, so that every engineer can benefit and sleep better at night knowing that at least his concrete design is optimal, economical, safe and code compliant," Johnson says. "In spColumn v4.81, StructurePoint has further refined slender column design provisions to meet stringent new requirements of ACI-318."

Business has been improving, says Johnson. "Companies of all sizes and geographies have been increasingly more upbeat about business opportunities, and cement shipments have been growing steadily indicating more construction spending. Amongst our users, geotechnical engineers have been exceptionally active responding to exploding opportunities in oil, gas and petrochemical projects. These opportunities continue to drive additional demand of our spMats and spBeam program for foundations in industrial facilities and infrastructure construction." (See ad on page 65.)

Better graphics are always of interest at Simpson Strong-Tie ([www.simpsonanchors.com](http://www.simpsonanchors.com)) which, in 2009, purchased a state-of-the-art 3D visualization company so they could provide competitive sales and design programs for their customers. "We continue to invest in this technology and see further integration of 3D visualization applications in our industry in the coming years," says Paul McEntee, Engineering R&D Manager. The Pleasanton, California company recently released its new Anchor Designer professional design software to comply with ACI 318, ETAG and CSA code requirements. The software features a fully interactive 3D graphical user interface with intuitive navigation and real-time design. "Anchor Designer enables structural engineers to satisfy the strength design provisions of ACI 318 Appendix D, CAN/CSA A23.3 Annex D, ETAG 001 Annex C or EOTA TR029 design methodologies. The software quickly and accurately analyzes an existing design or suggests anchorage solutions based upon user-defined design elements in cracked and uncracked concrete conditions. The software replaces Anchor Selector for ACI 318 and Anchor Selector for ETAG software, and is compatible with design files created with those programs," says McEntee. To download the new Anchor Designer software, go to [www.simpson.com/anchordesigner](http://www.simpson.com/anchordesigner). (See ad on page 25.)

At Nemetschek Scia ([www.scia-online.com](http://www.scia-online.com)), Dan Monaghan, North American Managing Director, based in Columbia, Maryland notes that they just released a new version of its flagship structural design software, Scia Engineer 2013. "Scia Engineer 2013 is part of a new breed of integrated structural design software that is helping engineers plug analysis and design into today's 3D workflows. Scia Engineer is the only analysis and design program that integrates Structural BIM Modeling with advanced FEA analysis, design, drawings, and calculation reports, in one design environment," Monaghan says. "It handles any combination of materials, free-form geometry, multiple design codes, and all types of analysis, from simple beam check (1D), to single plate (2D), to whole structure (3D), to detailed analysis of how structures will perform over time (4D). And, with bi-directional links with Revit Structure, Tekla Structures, and certified support for IFC 2.X3, Scia Engineer makes it easy for structural engineers to participate with others in today's BIM process."

Monaghan sees a trend among BIM users. "We're seeing a recognition from experienced BIM firms that there isn't one software product or even software vendor that can cover the various needs of all the stakeholders involved in the design, construction and management process. Firms are recognizing that the, 'ONE BIG BIM model' concept is not possible or even practical. Today, 'working collaboratively in a model based workflow' means creating and coordinating many

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# SPECIAL SECTION

## Engineering Software

smaller federated BIM models created by different stake holders using different software, i.e. software that works best for their part of the BIM process. From this, new BIM model servers, or cloud BIM services, are becoming more important as a way to assemble, manage, view and report on the various models being created for a BIM project. “

He adds: “A big problem for engineers is how to efficiently plug analysis and design into today’s BIM workflows. While direct links to Structural BIM programs are great, the links can be fragile, difficult to work with, and do not support every material or geometry. Scia Engineer 2013 compliments our direct link workflows with certified support for the IFC BIM exchange format. IFC is a vendor neutral BIM exchange format developed by the AEC software industry under buildingSMART International ([www.buildingsmart.org/organization](http://www.buildingsmart.org/organization)). The IFC file format provides the AEC industry a robust way to exchange models amongst the various BIM software programs used in today’s design, engineering, construction and facilities management process. By providing certified support for IFC, Scia Engineer 2013 makes it easy for engineers to leverage models from designers into engineering analysis, and pass back to optimized structural designs for model coordination or documentation.” (See ad on page 63.)

“In the past twenty-four months, Hilti has launched almost sixty new products which have contributed to us seeing growth in all parts of our business,” says Carla Biggs, head of Public Relations for Hilti Corporation ([www.hilti.com](http://www.hilti.com)) headquartered in Liechtenstein. “Hilti

expertise covers the areas of adhesive and mechanical anchoring, measuring, powder actuated fastening, drilling and demolition, diamond coring and cutting, firestopping, screw fastening, strut and hanger systems. We offer software for anchor design (PROFIS Anchor) and steel diaphragm deck design (PROFIS DF).” She adds: “PROFIS Anchor software now includes the innovative new Hilti product known as HIT-HY 200 Adhesive Anchoring System. The HIT-HY 200 System eliminates the traditional blow-brush-blow method of cleaning anchor holes. Therefore, when the complete HIT-HY 200 System is used, no manual hole cleaning is required to obtain optimum anchor performance. Calculations with the provisions of ACI 318 Appendix D can be performed for this product.”

Biggs says that the PROFIS Anchor portfolio now includes the provisions of ACI 318-11 Appendix D. “This is the latest addition to the portfolio, which also includes provisions for ACI 318-08 Appendix D, ACI 349-01 Appendix B, CSA A23.3-04 Annex D, ETAG design and Allowable Stress Design.”

Biggs concludes: “Many of our customers are using Building Information Modeling during both the design and construction phases of the project. To support this strong trend of BIM usage, Hilti has developed a comprehensive library of BIM/ CAD objects for our products including anchors, fasteners, firestop and strut. In the long term, Hilti expects further integration of design analysis software into BIM.”



A software guide for Structural Engineers

# SOFTWARE GUIDE

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COMPANY NAME	SOFTWARE	BIM	BRIDGES	BUILDING COMPONENTS	BUSINESS/PRODUCTIVITY	CAD	CONCRETE	FOUNDATIONS/ RETAINING WALLS	GENERAL/ PACKAGES/SUITES	LIGHT GAUGE STEEL	MASONRY	STEEL	WOOD
<b>ADAPT Corporation</b> Phone: 650-306-2400 Email: <a href="mailto:info@adaptsoft.com">info@adaptsoft.com</a> Web: <a href="http://www.adaptsoft.com">www.adaptsoft.com</a>	ADAPT-PT_RC Strip Design			X			X						
	ADAPT-Builder Edge Floor Pro MAT SOG	X		X			X	X					
	ADAPT-ABI 4D Construction Phase Analysis		X	X			X	X	X				
<b>American Wood Council</b> Phone: 202-463-2766 Email: <a href="mailto:info@awc.org">info@awc.org</a> Web: <a href="http://www.awc.org">www.awc.org</a>	AWC Online Connection Calculator												X
<b>Bentley Systems</b> Phone: 610-529-6629 Email: <a href="mailto:Dave.eckrote@bentley.com">Dave.eckrote@bentley.com</a> Web: <a href="http://www.bentley.com">www.bentley.com</a>	STAAD		X	X			X	X	X	X		X	
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