

## SBCRI Update: Testing Approach Defined, Fine-Tuned

by SBC Staff

A mere six months after its opening, this facility is primed for a productive new year!

On June 28, 2007, SBC Research Institute (SBCRI) opened the doors of its state-of-the-art industry testing facility. Since that momentous (beautiful) day last summer, the SBC Research Institute has been buzzing with activity.

Official testing began with two small-scale proprietary testing clients. Each project has given the SBCRI Testing and Technical Support Teams the opportunity to assess and further refine their processes, procedures and standards in the areas of data collection, documentation, testing set-up and reporting. Concurrently, SBCRI staff has been building four testing stations and their related fixtures. These set-ups, which include single connector/connection system, single floor and roof truss, single wall and fully integrated building system stations, will provide a foundation



for detailed analysis of structural connections, wall, floor/roof and flow of loads through individual elements and through the entire building system. In addition, these stations will make test set-up and results processing as efficient and effective as possible, creating a "plug-and-play" working environment that can be quickly modified for any testing project as the research needs dictate.

### A Solid Approach to Testing

As a result of the initial testing, a critical decision has been made regarding the fundamental testing approach. Much of the industry testing focus will be on flow of loads through individual components and within a building system. With the goal of irrefutable accuracy, the groundwork for the standardized testing procedures has been put in place to assure this is the case, an approach unique to SBCRI. Additionally, sophisticated software is being used that allows staff to produce a testing report

### at a glance

- ❑ Several testing stations were built inside of SBCRI since it opened in June 2007.
- ❑ Measuring the flow of loads through individual components and within a building system has been defined as the approach to most SBCRI industry testing.
- ❑ Preliminary industry testing projects have been conducted on roof trusses and wall panels.

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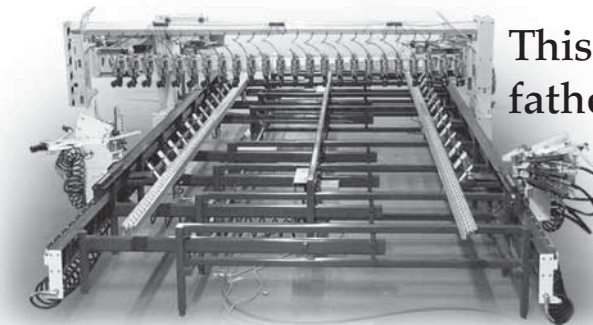
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within 60 minutes of test completion. The automation of this process allows for instant data review, analysis and next step evaluation so systematic progress can easily be made.

Here's a simplified look at the testing process. Each element, whether it's a roof truss, floor truss, I-joist, wall panel or any proprietary product, is easily tested singly using the standardized testing procedures to fully understand the flow of loads through the individual structural element. This simple, single component set-up outputs design values for the given element. Next, if additional performance data is desired, the individual element can be placed and tested within a full structural system. This structural system is constructed to replicate the exact field application the element would be placed in under real-life circumstances. Furthermore, all of the data acquisition devices used to measure the performance of the single element will be placed in identical locations when the element is tested in the single component set-up and once the element inserted into the real life system. This approach allows us to accurately view systems effects by seeing the changes in measurements taken at identical locations on the same element singularly and within real-life structural conditions. Unparalleled in the industry, SBCRI staff believe this feature will produce tremendous results.

The final step in the testing process is to perform the analysis needed to provide design values while being able to apply good engineering judgments. And, because the SBCRI facility is able to give a much better understanding of the mechanics of materials than testing previously available, these design



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value judgments will likely be considerably more straightforward and accurate as they relate to how a structure performs in the real world.

It is important to note that ASTM standards do not always exist for the tests performed due to the unique nature of the SBCRI facility capabilities. Therefore, the testing set-ups are relying on engineering principles and common sense to ensure that the applied loads replicate real life load conditions so that true building performance can be assessed. Already, this process has resulted in an unexpected awareness about current testing methods being used and why the results coming out of SBCRI will be even more valuable and relevant to in situ structure performance.

SBCRI staff has recently undertaken two preliminary industry-related testing projects including lateral load testing (simulating wind or seismic) for wall systems and roof truss testing to determine the amount of applied load at predefined bottom chord deformations. Watch for the results of this and other industry-related testing on the SBCRI website, [www.sbcinfo](http://www.sbcinfo) and in the April issue of SBC Magazine.

Structural engineer A.R. Dykes said: "Structural engineering is the art of molding materials we do not wholly understand into shapes we cannot truly assess in such a way that the community at large has no reason to suspect the extent of our ignorance." SBCRI has first hand knowledge of how profoundly well said this is and is poised to make a contribution to positive change.

*For more information and to stay up-to-date on current testing projects, visit the SBCRI website. In particular, take a moment to watch the SBCRI Talking Brochure™, which will provide you with an overview of the concepts being deployed in the testing facility. You can also use the SBCRI website to suggest industry testing projects or learn more about proprietary testing availability. SBC*

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