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Richmond Architecture-Engineering Firm Finds Unique Niche in Structural Engineering for Solar PV Arrays

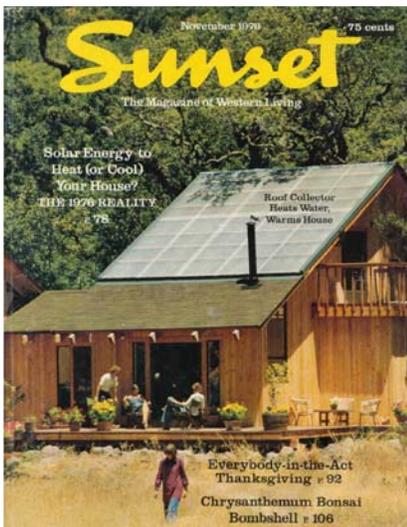
Solar Photovoltaic energy is big business, and Richmond, California-based architecture-engineering firm Interactive Resources has laid claim to a small part of it that may not be deep but is very wide.

Like where the proverbial rubber hits the road, all solar arrays have to be attached to something, almost always a rooftop or the ground. For large commercial solar arrays, an engineer must determine if the support of the array is adequate to withstand gravity, wind and seismic loads and design the attachment or foundation that carries those loads to a building or the ground.

That is what Interactive Resources has been doing for more than five years involving over a hundred very large solar installations altogether totaling over 15 megawatts of commercial solar PV power systems located in a dozen states. A megawatt is generally considered equivalent to the power used by 750 homes.

Interactive Resources has served virtually every large solar contractor, providing structural engineering services and developing relationships that result in return customers who rely on the firm's unique experience and quick turn-around. An example is BP Solar, which recently won a contract to install large solar arrays on up to 20 Wal-Mart stores and Sam's Clubs.

This recent re-entry into alternative energy consulting is somewhat déjà-vu for Interactive Resources, which was founded in 1973 during the Arab oil embargo, now acknowledged as the first U.S. energy crisis. The firm made a name for itself designing and building solar and wind energy installations and designing energy conserving buildings when these technologies were first emerging. One of the firm's solar homes appeared on the cover of *Sunset* magazine in 1976, and Tom Butt, FAIA, an Interactive Resources founder helped start Sun Light & Power, a solar contractor still in business today.



The market for solar expertise all but evaporated when cheap and abundant energy returned in the late 1970s for a nearly 25-year run, and Interactive Resources returned to a more conventional architecture-engineering practice.

In 2004, Mike Bowler, formerly with Sunlink, a solar mounting hardware manufacturer, walked into Interactive Resources looking for a structural engineer. As the mounting hardware provider, Sunlink was, by default, assuming responsibility for securing permits for the attachment to the building or ground.

John Clinton, AIA and SE, a structural engineer and also one of the founders of Interactive Resources, provided the necessary engineering, and a new service was born. Mike Bowler went on to help organize Perpetual Power, a solar PV developer.

The structural engineers at Interactive Resources have perfected what is as much an art as a science of anchoring solar arrays and dealing successfully with plan checkers and permitting authorities, including the challenging California Division of the State Architect that is the permitting authority for K-12 schools and community colleges.

Solar arrays with structural engineering by Interactive Resources range from less than 100 kW to a megawatt (1,000 kW) in locations that include [San Francisco International Airport](#), AT&T Park, many schools and colleges, Wal-Mart, Kohls, Safeway, Walgreen's, Google and Macy's. Just a few of the solar contractors who have used services from Interactive Resources are SunEdison, Borrego, Cupertino Electric, Chevron Energy Solutions, Bleyco Incorporated, SunTechnics, Solar Monkey, Bass Electric, Solar Craft, SunPower, SolSource, Perpetual Power and BP Solar.



Limoneira Solar 1 megawatt array on 5.5 acres installed by Perpetual Power (photo courtesy PV-tech.org)

Developer: Perpetual Power
Architect and Engineer: Interactive Resources.
Electrical Engineer: Blue Oak
Contractor: Bleyco



100 kW PV array at Washington Elementary School, Berkeley, CA.

Architect and Engineer: Interactive Resources.
Electrical Engineer: Blue Oak
Contractor: Eshone Electric
Construction Manager: Parsons

In a few cases, Interactive Resources has assumed the larger role as project architect, such as the Berkeley Unified School District 100 kW array at Washington School, which was a nearly \$1 million design-bid-build project that also included a new roof system. In another project with Perpetual Power at Limoneira in Santa Paula, CA, Interactive Resources included the design of a Visitor Center that overlooks a 1 megawatt array in a lemon orchard. The Visitor Center has

been submitted for LEED Silver certification. Structural engineering for solar arrays at Interactive Resources is currently managed by Paul Westermann, SE, who oversees a half dozen engineers and drafters working on current projects.



Viewing Plaza of the Limoneira Solar Visitor Center, which also features a vegetated roof designed by Suding Design Landscape Architects, Inc. of Santa Barbara, featuring native plants.

For more information about Interactive Resources, see www.intres.com.