

**TJC**  
and ASSOCIATES, Inc.

# Summer The TJCAA Quarterly

2013  
www.tjcaa.com

## Message from the President

TJCAA  
"Supports"  
Green Power

### TJCAA's Business Certifications

- Alameda County Small, Local Emerging Business
- City of Oakland Local Business Enterprise
- California DGS Micro Business (SB (micro))
- Port of Long Beach SBE
- San Diego County Water Authority SBE
- SoCal Network SBE
- CA PUC WBE
- City of Sacramento SBE
- Sacramento Municipal Utilities District (SMUD) SEED Vendor

## Message from the President Gianna Zappettini



We recently had a company event that involved board games including "Apples to Apples." Under the rules we followed, one person drew and read a green card on which was printed an adjective, for example, "ordinary." Then the other staff members each chose a red person-place-or-thing card from their hands—a card they thought was the "best match" for the green card. The "best match" was based on what the person with the green card would think. The game was fun and enlightening, and reinforced the common saying that "you learn something new every day." I would encourage all of you to learn something new about TJCAA by giving us a call and seeing what we have to offer regarding your engineering needs.

## TJCAA "Supports" Green Power

TJCAA designed the structural support system for Occidental College's landmark solar array, a 3,486-panel installation with a generating capacity of 858 kilowatts. The eye-catching array features a field of photovoltaic panels that exemplifies the college's creativity and its forward thinking—Occidental estimates that the new facility will save about \$250,000 per year in power costs.

Completed in April of this year, Occidental's solar project also features a parking lot cover and has a total generating capacity of 1.142 megawatts.

The photovoltaic panels and structural support system were installed by Martifer Solar USA, a multinational solar developer and installation company.

The ground-mount portion of the project follows the contours of a hillside, with the panels just 2 or 3 feet above grade. Combining function with art, the highly visible array forms a unique pattern that was designed to resemble a hysteresis loop, a mathematical expression describing the magnetic properties of a material. Kara Bartelt of the Los Angeles architecture firm Lettuce conceptualized the array pattern.

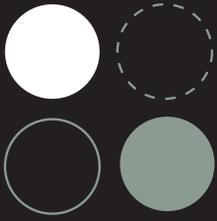
Martifer's press release for the project notes that physics professor Dr. Daniel Snowden-Ifft was the "driving force" of the project, and shares his description of it: "It is sustainable from economic, environmental and aesthetic perspectives and as such, it exemplifies one of our main messages to students—that big problems often require multi-disciplinary solutions. I hope it will inspire our students, our community and others to think outside the box."

Terry Cavanagh explains that the support system design needed to have special capabilities to accommodate the aesthetic and functional goals of the project. Because the 163 tables in the array needed to hug the uneven terrain on the hillside, the support system had to allow for tilting in both the north-south and eastwest directions. TJCAA provided the structural design for the custom racks. The racks, which are mounted on a drilled-pier foundation, were fabricated from light gauge steel specifically for this project.

After quality testing, the photovoltaic panels were installed by crane. A brief timelapse film of the installation is available on YouTube [here](#). (see pictures below)

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Industry News

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Occidental College's Landmark Solar Array – Support System Designed by TJCAA

### Industry News

The Structural Engineers Association of California has published documents covering design of roof-mounted solar voltaic arrays. The International Building Code, which provides guidance for designing buildings, did not historically cover solar arrays. While the 2012 Code improved the information available, the guidance was still limited and it did not provide loads to be used for design.

SEAOC has filled that gap with its documents on seismic and wind design for rooftop photovoltaic arrays:

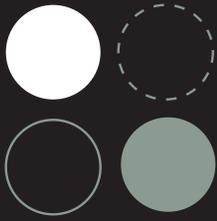
– Seismic Structural Requirements and Commentary for Rooftop Solar Photovoltaic Arrays - SEAOC Report PV1-2012

– Wind Design for Low-Profile Solar Photovoltaic Arrays on Flat Roofs - SEAOC Report PV2-2012

The Solar Photovoltaic Systems Committee, a subcommittee of the SEAOC Wind Committee, developed these recommendations “to address the lack of clarity and specific requirements in applying structural building code provisions to solar photovoltaic systems.” Having good criteria, Terry Cavanagh explains, can improve the reliability of designs and thus, the life-safety associated with solar installations.

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### Entertainment Review

### Did you know?

### Dates to Note

The 12-page seismic requirements document (Report PV1-2012) provides requirements for three types of arrays: unattached (ballast-only) arrays, attached roof-bearing arrays, and fully framed arrays.

The 38-page wind design document (Report PV2-2012) focuses on low-profile arrays on flat or nearly flat roofs on low-rise buildings. The report provides a method intended to be used with either ASCE 7-05 or ASCE 7-10, and presents proposed changes in ASCE 7-10.

The seismic and wind design documents are available in pdf format at the SEAOC website ([seaoc.org](http://seaoc.org)).

### Entertainment Review

One of our TJCAA family members has screened "Star Trek Into Darkness" and recommends it for all adult audiences who like action thrillers. "It's not just for sci fi fans," she says. "There's plenty of excitement, compelling characters, spectacular visuals, surprises, and a bit of humor, as well." Benedict Cumberbatch's charismatic villain is a bonus, she adds. Long-time fans of the franchise can enjoy this outing with their favorite characters in new storylines, all with the advantage of rich sound and stunning effects. It sounds like a good ride, so to quote Scotty, "Welcome aboard." (PG, 132 minutes)

### Did you know?

Queen bees, which can live for 3 or 4 years, can lay up to 1,500 eggs per day during peak times, and up to 1 million eggs during their lifetimes.

The other female bees in a bee colony are worker bees, and when they are out foraging, they may visit up to 2,000 flowers in a day!

### Dates to Note

- June 20 The Summer Solstice (see [this link](#))
- June 9-13 [ACE13 - The American Water Works Association Annual Conference & Exposition, Denver](#)
- June 24-July 7 [The Championships at Wimbledon](#)
- June 29-July 21 [100th Tour de France](#)
- July 9-11 [Intersolar North America, San Francisco](#)
- July 12-28 [California State Fair](#)
- July 14-21 [The Open Championship at Muirfield](#)
- July 20-July 27 2013 U.S. Junior Amateur Championship, Truckee, Featuring Rick Cavanagh as a Volunteer Caddie
- August 11-12 [Perseid Meteor Shower](#)
- August 18 Junius Courtney Big Band at the Friends of the Golden Gate Library event, Temescal Creek Park - "Pocket Park" on 47th Street between Adeline and San Pablo Ave, Emeryville/ Oakland line (see [juniuscourtneybigband.com/calendar](http://juniuscourtneybigband.com/calendar))
- September 5 NFL Season Opener - Baltimore at Denver
- September 14 NCAA Football - Nebraska vs. UCLA, Memorial Stadium, Lincoln, Nebraska

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