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# autumn

## The TJCAA Quarterly

# 2020

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Message from the President

Employment Opportunities

Why do I need an architect on my job?

### TJCAA's Business Certifications

- Alameda County Small, Local Emerging Business
- Bay Area Green Business Program
- California DGS SBE
- City of Colton SBE
- City of Los Angeles SBE
- City of Oakland LBE
- Eastern Municipal Water District SBE
- Inland Empire Utilities Agency SBE
- Metropolitan Water District of Southern California SBE
- Sacramento Municipal Utilities District (SMUD) SEED Vendor
- San Diego County Water Authority SBE
- Port of Long Beach SBE
- Port of Oakland LIABE/SBE/VSBE
- PWC Registration—Dept of Industrial Relations (DIR)
- West Basin Municipal Water District SBE

### Message from the President, Gianna Zappettini

Walking has been my go-to exercise during the pandemic due to the closure of gyms and discouragement of interactive sports. It provides social distancing and allows for interaction with neighbors on driveways, observation of the change of season, surveillance of vegetable gardens, and an opportunity to step away from electronic screens. But before or after exercise, my coworkers at TJCAA and I are hard at work providing excellent



services to our clients. We encourage you to exercise your right to reach out to us if we can help with your structural, electrical, or control systems engineering needs.

### Employment Opportunities



TJCAA is looking for qualified engineers to work on great projects with great people. To view and apply for open career positions, visit our website at [www.tjcaa.com](http://www.tjcaa.com).

### Why do I need an architect on my job?

We hear it frequently: *It's a pump station. Why does this job need an architect?* A general conception is that architects deal solely with how a building looks, and indeed, assuring that a building is attractive is one of the architect's responsibilities. TJCAA Structural engineer Terry Cavanagh, S.E. explains, "They also provide important contributions that help assure the best fit and function of the building—some of the details that keep a building watertight and corrosion-resistant, for example. Architects are key team members for all of our engineering projects involving buildings."

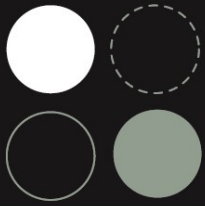
TJCAA's building projects, which include structures such as pump stations, reservoirs, operations buildings, equipment rooms, wellheads, material storage areas, chemical mixing facilities, and filter galleries, include plans and specifications for structural, HVAC, electrical, instrumentation, lighting, and *architectural* elements.

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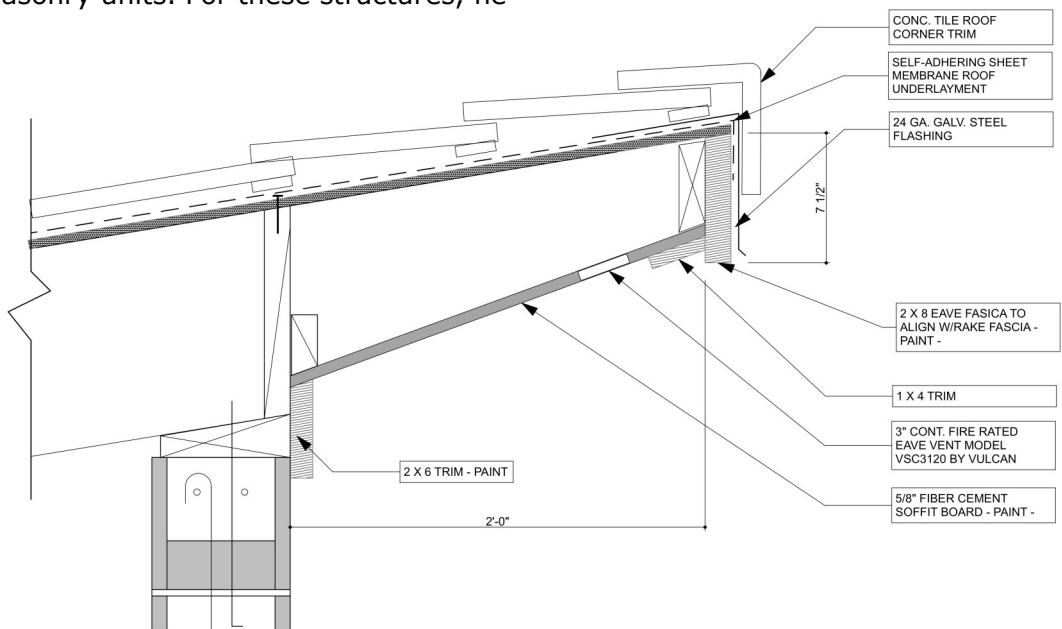
We talked with Saxon Sigerson, AIA of [Sigerson Architects](#) about the architect's responsibilities on typical environmental engineering projects. TJCAA often collaborates with Saxon for infrastructure-related building projects. Sigerson Architects' portfolio consists primarily of general commercial, medical/dental, and residential projects, along with industrial structures and infrastructure-related projects.

Saxon says, "Even though a pump station is not a conventional architectural project, like a residence, store, or office building, there are many technical challenges—details to get right from an architectural standpoint—and details matter."

Saxon's firm typically works with TJCAA on pump stations and well buildings, which we often design with highly functional and cost-effective concrete masonry units. For these structures, he

notes, the function-driven project objectives present some nice problem-solving opportunities. At the same time, he adds, "Pump stations are often sited in residential areas, offering a variety of aesthetic challenges." Sometimes, a few well-placed details can help a CMU pump station be a bit more harmonious with its neighborhood surroundings.

A recent pump station project on which we collaborated with Sigerson featured a shed-roof design (that is, the roof pitches in only one direction). "One of my responsibilities on this project," Saxon recounts, "was to evaluate the way the roof related to the wall. The engineers provided an eave overhang drawing, and I provided additional details that, among other things, addressed water tightness and the need for a fire-rated eave vent. To make the edge less bulky and more attractive, I created a chamfer on the rafter tails."



4 EAVE DETAIL @ HIGH WALL  
SCALE: 3" = 1'-0"

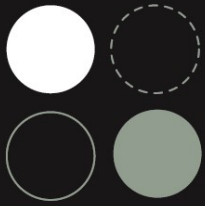
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Another structure that presented challenges in meeting both function and form goals was the Woodbury Well in Pasadena. The well building, with its 1920s–30s Art Deco style, was distinctive. The station rehabilitation project included the replacement of a removable panel in the building façade so that equipment could be moved in and out. The architectural design for modifying the façade features standing-seam roof metal paneling that is not only functional, but is also good-looking and respectful of the original architecture.



Typical architectural projects, such as houses, are architect-led endeavors, but our infrastructure-related projects generally are led by the engineers, who determine how the process, pumping, transmission, and/or distribution requirements can be best met. The architect will weigh in on details that affect watertightness, corrosion-resistance, wildland-urban interface concerns, egress, and Americans with Disability Act compliance. “I may have to adjust where Terry puts the door, for

example,” Saxon notes. Terry agrees: “For these types of projects, it’s a critical support role that not everyone is aware of, and Saxon has an excellent collaborative relationship with our TJCAA engineers.”

“Engineers typically don’t enjoy thinking about the details that are on my architectural drawings,” Saxon laughs. “I like working with Terry because he enjoys exchanging knowledge and thinking about the fine-grained details and how the structure is going together.”

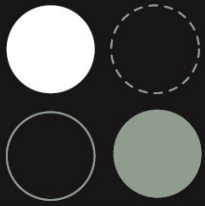
### Did you know?

During the 1st century BCE, Roman engineer and architect Marcus Vitruvius Pollio wrote *De Architectura*, a 10-volume treatise on city planning and architecture, in which he identified three elements necessary for a well-designed building: *firmitas*, *utilitas*, and *venustas*. Translated by Wotton in the 17th century as “firmness, commodity, and delight,” the Vitruvius elements are typically interpreted as follows:

- **Firmness** - structural integrity and durability
- **Commodity** - spatial functionality
- **Delight** - beauty, and stimulation for the senses and spirit

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Electrical Rooms  
May Be Larger  
Under the  
2020 NEC

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The fine-grained details, both aesthetic and purely functional, benefit from an architect's involvement. As an example, architects make sure that the selections for features such as roofing, doors, and handrails are appropriate. The Code is very strict regarding the configuration, materials, and performance of such elements for safety reasons, and ADA compliance also requires careful consideration.

The structural, HVAC, electrical, instrumentation, lighting, and architectural designs are parts of the whole project, and one of the strengths an architect brings to the team is a holistic view of how the building serves the client's needs regarding what's inside it and around it. Our teams often include an architect, and our clients' buildings are better because of it. If you have a project for a building that you would like to discuss, please give us a call.

### Industry News—Electrical Rooms May Be Larger Under the 2020 NEC

As engineers, we live by the Code. For most of our projects, that means the [California Building Standards Code \(Cal. Code Regs., Title 24\)](#), a 12-part document that includes the California Building Code (Part 2) and the California Electrical Code (Part 3), which references the National Electrical Code®. The CBSC covers everything from structural requirements and sprinkler systems to energy efficiency and electrical wiring and sets many requirements applicable to the facilities we design.

Recently, Massachusetts became the first state to officially update its state electrical code to the 2020 NEC. All states have their own codes and adopt the NEC at different times. The 2019 CEC became effective on January 1, 2020 and is based on the 2017 NEC.

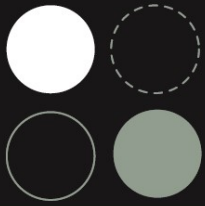
Jacqueline Arama, P.E., an Electrical Engineer in TJCAA's ICE group, explains that the CEC contains the full text of the NEC, annotated with California amendments. For example, Jacqui notes, the CEC amended the 2017 NEC definition of a "building." This change in turn affected other design elements, such as grounding and bonding requirements.

Even though California is typically one cycle behind the NEC, and the 2020 NEC won't be in effect in California until January 1, 2023, TJCAA monitors upcoming Code changes to implement those that may make a facility outdated if designed under the current Code. While there are many changes in the 2020 NEC, Section 110.26(C)(2) will have a major effect on some of our designs.

The new code adds to Section 110.26 (C)(2) this sentence: "Open equipment doors shall not impede entry to or egress from the working space" in rooms with equipment over 6 feet wide with a combined disconnecting means of 1,200 amperes. This change may require increases in the size of working spaces around the distribution equipment, compared to the size of the spaces typically designed today. The new requirement can, for example, apply to electrical rooms at water and wastewater treatment plants.

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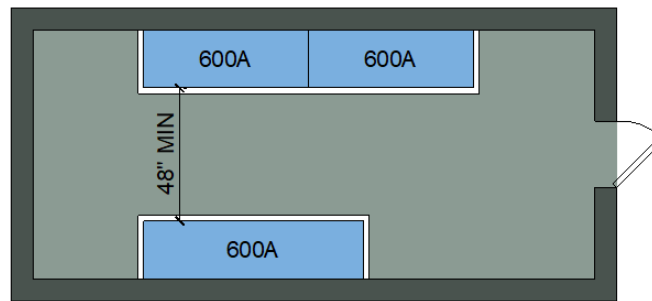
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### Electrical Rooms May Be Larger Under the 2020 NEC

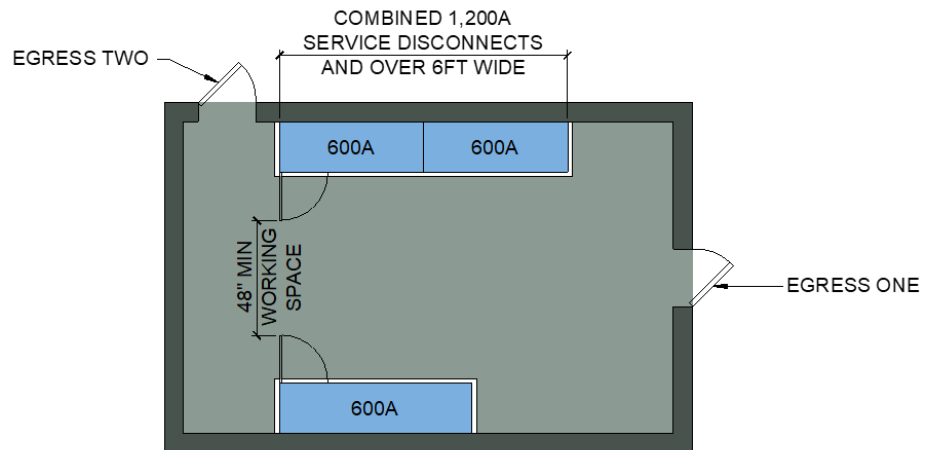
Depending on the interpretation of the authority having jurisdiction for a given project, this may also affect equipment facing each other under "Condition 3" of NEC Table 110.26(A)(1) or 110.34(A). Jacqui explains that under the current Code, if a room has multiple 1,200-ampere units that are under 6 feet wide, you only need one door. "Under the new Code, if you have a total disconnecting means of 1,200 amps in one or multiple units and the combined length is over 6 feet wide, the

equipment doors cannot swing into the working space and there must be two exit doors."

The figures here illustrate the difference in sizing that will result from the new Code. TJCAA engineers are excellent resources when it comes to making sense of the Code and designing for compliance. If you have questions about how this may affect your new electrical rooms, please contact us.



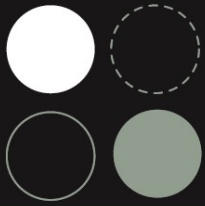
Electrical room under current Code



Electrical room under 2020 NEC

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Dates to Note

Trivia Night!

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### Dates to Note

- Sep 22 The Autumn Equinox
- Sep 19–30 Stanley Cup finals
- Sep 30 75th NBA Finals (tentative)
- Oct 1 Harvest Moon  
(Northern Hemisphere)
- Oct 10 [27th Annual Golden Spurtle  
World Porridge Making  
Championship](#)
- Oct 16 Dictionary Day
- Oct 16–17 [Empire State Maker Faire  
2020](#)
- Oct 20 116th MLB World Series  
begins
- Oct 26–29 [CA-NV Section AWWA  
Annual Fall Virtual  
Conference](#)
- Oct 28–30 [ASCE 2020 Virtual  
Convention](#)
- Oct 31 Hunter's Blue Moon
- Nov 1 Daylight Savings Time ends
- Nov 3 Election Day
- Nov 6 Saxophone Day
- Nov 12–15 The Masters at Augusta
- Nov 23 Fibonacci Day
- Nov 28 Red Planet Day
- Dec 10 Dewey Decimal System Day
- Dec 13–14 Geminid Meteor Shower

### Entertainment Review— Trivia Night!

Later this month we'll be holding our first TJCAA trivia night. If you have ever attended a public trivia night, you might recall some head-scratching, some smack talk, and even perhaps a bit of internal gloating associated with watching the competition sit there with blank looks on their faces. While we're waiting for bar trivia to once again be a thing, we have planned our virtual trivia competition, via Zoom with one of our TJCAA family members as host. Sharpen those pencils, TJCAA team members, and be ready to answer questions on topics including—wait, that's a secret! We'll let you know who won.

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