

Summer

The TJCAA Quarterly

2021
www.tjcaa.com

Message from the President

Introducing
Anne M.
Broughton, P.E.

Employment Opportunities

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/VSB
- PWC Registration—Dept of Industrial Relations (DIR)
- West Basin Municipal Water District SBE

Message from the President, Gianna Zappettini



Welcome Back!
We have been looking forward to our return.

The migration back to the office has begun and we are enjoying the in-person encounters. Virtual meetings were a great substitute while shelter-in-place guidelines were mandatory but working side-by-side on interesting projects has been a nice change. TJCAA will continue to embrace a hybrid work environment with some days in the office and some days remote. No matter where our talented staff are located, we are committed to continuing to provide excellent services to our valued clients.

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.

Introducing Anne M. Broughton, P.E.



We are pleased to welcome Anne Broughton, P.E. to TJCAA. Anne has been a licensed engineer since 1992 and has extensive expertise in high, medium, and low-voltage electrical systems, switching station/power plant engineering and

construction, and other major capital project engineering. She will be working as a Senior Electrical Engineer with our Instrumentation, Controls, and Electrical Group out of our Oakland office.

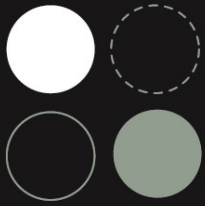
A native of New York state, Anne traveled extensively during her previous work with Chevron, leading engineering teams on projects in Indonesia, Nigeria, Kazakhstan, England, and the USA. Her thorough knowledge of project management processes, design, and construction practices is an asset to our ICE Group.

Table of Contents

Message from the President.....	1
Anne M. Broughton, P.E.	1
Employment Opportunities	1
Stonehenge and the Solstice	2
What's that on my drawing?	3
Quiz	5
Industry News	5
Equipment Obituaries	5
Entertainment Review.....	7
Quiz Answer	7
Dates to Note	7

Copyright 2021 TJC and Associates, Inc. All Rights Reserved

- Structural Engineering•SCADA•Electrical Engineering•
- Instrumentation and Controls•Control Systems Programming•



TJC

and ASSOCIATES, Inc.

Introducing
Anne M.
Broughton, P.E.

Stonehenge and
the Solstice



curalium
CONSULTING

Curalium Consulting provides technical writing and editing services for engineers and scientists.

curalium.com
(916) 863-0822

Summer

The TJCAA Quarterly

2021
www.tjcaa.com

After 17 years of world travel, she's enjoying living and working in the Bay Area. Commuting on BART is a "piece of cake," she says, and after many years in the electrical engineering field, she continues having fun at work. We asked how she got her start in engineering—turns out it was a family affair! Her father and all four of her siblings also chose engineering as their fields.

Many of TJCAA's engineering projects are complex, multimillion-dollar, multidiscipline public infrastructure

projects, and despite their scale, they represent a contrast to her previous major project responsibilities, which included execution and management for oil and gas projects with scopes ranging up to \$7 billion. How is she adjusting to this shift to "smaller" projects? "Well," Anne says, "If you think about it, when you break any project down into its parts, it's really just a set of smaller projects." We're glad to have Anne here working on TJCAA's projects, large and small.

Did you know? Stonehenge and the Solstice

This issue of the TJCAA Quarterly is our 2021 Summer Solstice edition, and we found out that, while living in the United Kingdom in 2005, Anne (see p. 1) happened to be at Stonehenge on the Summer Solstice. While she had visited the site many times before, the solstice marked the first time her party was allowed into the interior area, rather than being limited to the area outside of the stone circle.

Why was that a special time to be there? The ancient, iconic Stonehenge has its main axis laid out relative to the solstices. English Heritage, the organization that cares for Stonehenge and over 400 other historic buildings, monuments, and sites, explains the alignment of the prehistoric world heritage site.

The sarsen stones, put up in at the center of the site in about 2,500 BC, were carefully aligned to line up with the movements of the sun. If you were to stand in the middle of the stone circle on midsummer's day, the sun rises just to the left of the Heel Stone, an outlying stone to the northeast of the monument. Archaeological excavations have found a large stone hole to the left of the Heel Stone, and it may have held a partner stone, the two stones framing the sunrise.

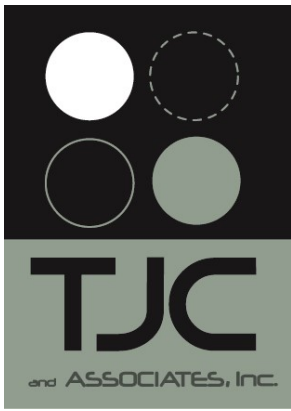


Photo: istock/Pipop_Boosarakumwadi

For additional information and a diagram, see [this link](#). English Heritage's 2021 Stonehenge Summer Solstice Festival began on Friday, June 18 and runs through Monday, June 21.

Copyright 2021 TJC and Associates, Inc. All Rights Reserved

•Structural Engineering•SCADA•Electrical Engineering•
•Instrumentation and Controls•Control Systems Programming•



Summer

The TJCAA Quarterly

2021
www.tjcaa.com

What's that on my drawing?

What's that on my drawing?

Our engineers prepare numerous drawings during the course of design. These drawings show a wide variety of information about a project, including structural, electrical, instrumentation, and controls schematics, plans, and details. To help our readers interpret these drawings, which may not be "old hat" for all of you, here is our next installment of "Reading Engineering Drawings 101."

In our [Winter 2020](#) and [Spring 2021](#) editions, we focused on P&IDs (piping and instrumentation diagrams). This time, we're taking a look at structural drawings. Structural drawings show how to build physical elements (foundations, walls, roofs, etc.) in facilities such as treatment plants or pump stations. Consisting of both plan and section views, the structural drawings are two-dimensional representations of what one would see in real life. The plans can be used together with the sections and details to visualize what the structure looks like in 3D.

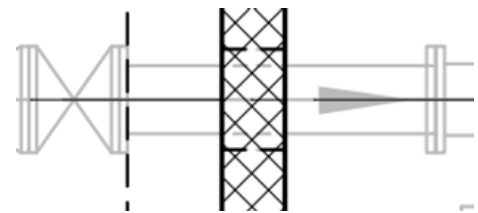
Structural plans use various line and fill types to depict different features and materials. We'll go over a few of the most common ones here. Lines show the edges of walls, foundations, and roofs, reinforcement, and other features shown on the drawings for informational purposes, such as equipment and piping. Various line types and line weights are used both to indicate placement and as symbols themselves.

Solid lines usually show the edges of visible features in the plan or section. In contrast, a dashed line is used to show "hidden" features, or features that are "behind" the plane represented by the

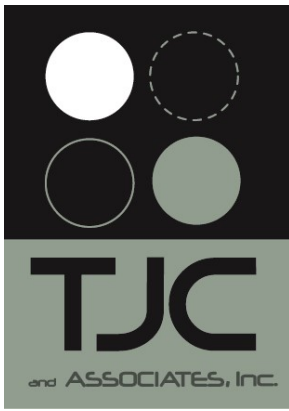
drawing. Special line types, such as a solid-dash-dash-solid, may be used to show guardrails or handrails. The center of a column is shown with a solid-dash-solid line. Special line type definitions are called out in the notes of a drawing package for reference.

- hidden line
- - - - - guardrail
- . - . - . column line

Screened lines (lines that appear grey in color, versus black) show existing features and non-structural features such as equipment and piping. The drawing excerpt below shows new features to be constructed in dark lines and a pipe and valve in screened (grey) lines. Dashed lines show that the pipe is beyond the section plane, or "hidden" as it passes through the wall.



Concrete reinforcement (such as rebar) is shown with solid lines when the reinforcement is parallel to the plane depicted by the drawing, and with dots when the reinforcement is perpendicular to the plane depicted by the drawing. Lines and dots showing reinforcement on structural drawings do not necessarily show the exact placement of rebar; rather, the location of the reinforced area is shown along with notes defining the size and spacing of the reinforcement.



Summer

The TJCAA Quarterly

2021
www.tjcaa.com

What's that on my drawing?

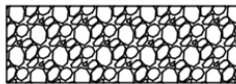
Lines are also used for dimensioning (we will cover dimensioning in detail in our next edition).

Fill patterns on structural drawings show material types. For water and wastewater treatment facilities, our designs often use concrete as a building material. TJCAA's structural drawings show concrete as a pattern containing small triangles. Other representations of concrete or concrete grout may show dots among the triangles.

CONCRETE



CLASS II
 AGGREGATE
 BASE



GRATING



Like the pattern for concrete, the patterns for aggregate and grating look like the materials they represent.

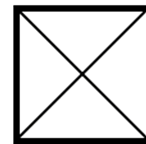
We do many designs with concrete masonry units, known to college students as "cinder blocks." The pattern below shows masonry.

MASONRY

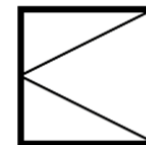


The General Notes included with each set of structural drawings contain a legend for the patterns used in that set, as well as definitions of abbreviations used in the drawings.

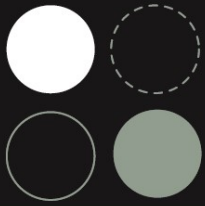
Two conventions that are often used in our drawings are depictions of holes and hatches. A hole is shown with an "X" in an area. The "X" shows an area that the reader can visualize "seeing through" because it means there is no material in the depicted plane of the drawing.



A hatch is represented with a "V" in its location. The "point" of the "V" represents which edge has the hinges for the hatch.



As noted above, next time we will cover dimensions, and we will explain how to interpret structural drawings of wood members and fasteners. In the meantime, here's a little quiz.



TJC

and ASSOCIATES, Inc.

What's that on my drawing?

Industry News

Equipment Obituaries

Summer

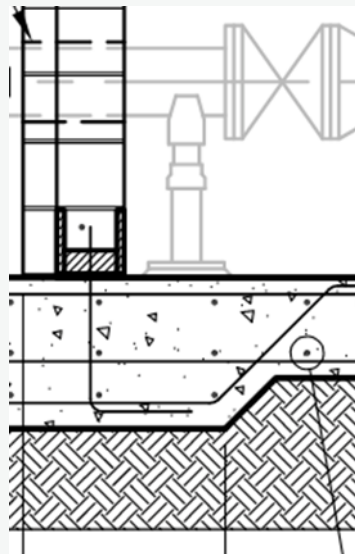
The TJCAA Quarterly

2021

www.tjcaa.com

Quiz

This shows which of the following?



- a) A wall and concrete slab on undisturbed earth, with reinforcement parallel to the plane of the section shown, and a pipe, valve, and support.
- b) A wall and concrete slab on structural backfill, with reinforcement parallel to the plane of the section shown, and a pipe, valve, and support.
- c) A wall and concrete slab on structural backfill, with reinforcement parallel and perpendicular to the plane of the section shown, and a pipe, valve, and support.
- d) A wall and concrete slab with no reinforcement, on sand, with a fire hydrant, guard rail, and gate.

Answer on page 7.

Industry News

We anticipate that an update to American Concrete Institute CODE-350-06 will come out this year. This document, *Code Requirements for Environmental Engineering Concrete Structures*, is central to our designs for water and wastewater treatment plant structures. As the "06" in its name indicates, ACI last updated this document in 2006. We anticipate that the updated code will contain requirements for increased reinforcing to address shrinkage cracks. As a result of these new requirements we will, for example, see more rebar (relative to earlier designs) at the base of basin walls and in locations where we are placing new concrete against old concrete.

Equipment Obituaries

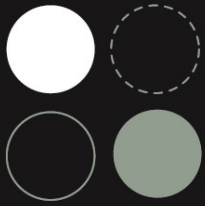


This GE PLC is an obsolete RX7i that was an upgrade to a long-obsolete 90-70.

If your control system was installed in the 1990s and early 2000s, it is most likely obsolete. Continuing to use such equipment—for which spare parts and support are no longer available—is risky. Call us if you have one of these ready-for-replacement units.

Copyright 2021 TJC and Associates, Inc. All Rights Reserved

•Structural Engineering•SCADA•Electrical Engineering•
•Instrumentation and Controls•Control Systems Programming•



TJC
and ASSOCIATES, Inc.

Equipment
Obituaries

Summer

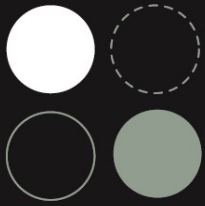
The TJCAA Quarterly

2021
www.tjcaa.com

Manufacturer	Model or Series	Obsolete Status	Replacement
Schneider Electric	SCADAPack 357	End of Commercialization 8/1/2020	New SCADAPack
Cisco	2960 Series switches	End of Sales 10/31/2014, End of Support 10/31/2019	Catalyst 9300 Series
Cisco	3750 Series switches	End of Sales 05/14/2016, End of Support, 05/14/2021	Catalyst 9300 Series
Cisco	Catalyst 3560 Series switches	End of Sales 05/14/2016, End of Support, 05/14/2021	Catalyst 9300 Series
Cisco	Catalyst 3000 Series industrial switches	End of Sales 05/14/2016, End of Support 05/14/2021	Catalyst IE3200-3400 Series
Cisco	3600 Series switches	July 2017	Cisco 3800
Cisco	3700 Series switches	July 2017	Cisco 9300
GE MDS	iNet Series Radio	March 30, 2020	MDS Orbit Series
GE MDS	iNetII Series Radio	March 30, 2020	MDS Orbit Series
Microsoft	SQL Server 2008 and 2008R2	July 9, 2019	SQL Server 2017
Microsoft	Windows Server 2008	January 14, 2020	Windows Server 2019
Microsoft	Windows 7	January 14, 2020	Windows 10
Rockwell	MicroLogix 1500 Series	May 18, 2017	CompactLogix 5370 Series
Rockwell	1768 CompactLogix Series	June 30, 2020	CompactLogix 5370 Series
Schneider Electric	Modicon Quantum PLCs	December 1, 2018	M580
Schneider Electric	Modicon Quantum I/O	December 1, 2021	X80 I/O Series
General Electric	90-30 Series PLCs	December 1, 2017	RX3i Series
General Electric	Genius Series I/O	June 1, 2017	RSTi Series or VersaMax Series
Hach	1720E Turbidimeter	July 27, 2018	TU5 Series

Copyright 2021 TJC and Associates, Inc. All Rights Reserved

•Structural Engineering•SCADA•Electrical Engineering•
•Instrumentation and Controls•Control Systems Programming•



TJC
and ASSOCIATES, Inc.

Entertainment
Review

Quiz Answer

Dates to Note

Summer

The TJCAA Quarterly

2021

www.tjcaa.com

Entertainment Review

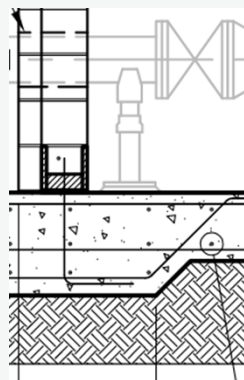
During two of our recent all-staff meetings, we had fun getting to know each other a bit better through some entertaining "matching" exercises. For our first try, TJCAA President Gianna Zappettini asked us to match our staff members with their "alternate dream profession," which she had queried previously. Two-time TJCAA Trivia Champion Jacqui Arama presented our next matching exercise, which had our staff guessing, "Whose favorite movie is whose?" As we look forward to staff meetings in person again, these exercises have been livening up our video get-togethers. We'll leave it up to you to figure out whose favorite movie is "Gigi" and whose is "Blade Runner."

Dates to Note (Subject to change— dates shown are as of publication day)

- Jun 20 The Summer Solstice
- Jun 22 NBA Draft Lottery
- Jun 26– Jul 18 107th Tour de France
- Jun 28 Tau Day – Pi is wrong – Robert Palais
- Jun 28– Jul 11 Wimbledon Championships
- Jun 29 NBA Draft
- Jul 8 Math 2.0 Day – Celebrate by eating a double helping of "pi"
- Jul 11 UEFA EURO 2020 Final
- Jul 11–18 149th Open Championship at Royal St. George's
- Jul 23– Aug 8 Summer Olympics, Tokyo, Japan
- Aug 11–12 Perseid Meteor Shower
- Aug 22 Full Moon (the Sturgeon Moon)
- Aug 24 Pluto Demoted Day
- Aug 30– Sep 12 US Open Tennis Championship
- Sep 9 102nd NFL Season Opener (Buccaneers vs. Cowboys)
- Sep 12–15 [AWWA Water Infrastructure Conference](#), Phoenix, AZ

Quiz Answer

This shows which of the following?



- c) A wall and concrete slab on structural backfill, with reinforcement parallel and perpendicular to the plane of the section shown, and a pipe, valve, and support.