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DECEMBER 2023

The Art Institute
of Chicago,
Operating Systems
SENSIBLY

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A Ballad of
Jim Conway,
Engineer
Musician

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Maximizing Your
Equipment Lifecycle
With a Proper Water
Treatment Plan

22

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DEDUCT THE FULL COST OF QUALIFIED PROPERTY IMPROVEMENT!

CARES ACT

The Coronavirus Aid, Relief, and Economic Security (CARES) Act closed a loophole that was included in the TCJA by making QIP 15-year property. This change made businesses of all sizes, regardless of the amounts spent on equipment, eligible to deduct the full cost of commercial fire sprinkler systems using bonus depreciation.

The time is now to upgrade your building's fire safety with a fire sprinkler system or a sprinkler retrofit. Under the new Section 179 guidelines, the one year deduction period phases out after 2022. Any new sprinkler system or retrofit completed between September 27, 2017 and December 31, 2022 will be able to be fully expensed in one year. After 2022, the allowed deduction percentage is as follows:

2021: 100%	2023: 80%	2025: 40%
2022: 100%	2024: 60%	2026: 20%

2027 and after: The depreciation schedule becomes permanently set at 15 years.

WHAT IS QIP?

The Tax Cuts and Jobs Act (TCJA), passed in December, 2017, gave small businesses the ability to deduct the full cost of Qualified Improvement Property (QIP) up to \$1.04 million in the year of installation using Section 179.

QIP is defined as improvements to the interior of an existing building that is not residential property. Commercial fire sprinkler systems, including upgrades of existing systems or retrofitting in existing structures, are considered QIP.

The Section 179 deduction is not phased out over time. However, there is a phase out of the amount allowed as a deduction based on a maximum spending amount of \$2.59 million on equipment in a year. Businesses that spend over that amount will see a dollar for dollar reduction of their eligible deduction. So a business that spends \$3.63 million or more on equipment in a given year would not be allowed any Section 179 Deduction.

WHAT HAS CHANGED?

Prior to the TCJA allowing Section 179 on qualified improvement property, including sprinkler systems, property of this type was only allowed a deduction on a straight line basis over a period of 39 years. In other words, a company spending \$390,000 on a commercial sprinkler system prior to the TCJA would only deduct \$10,000 per year for 39 years.

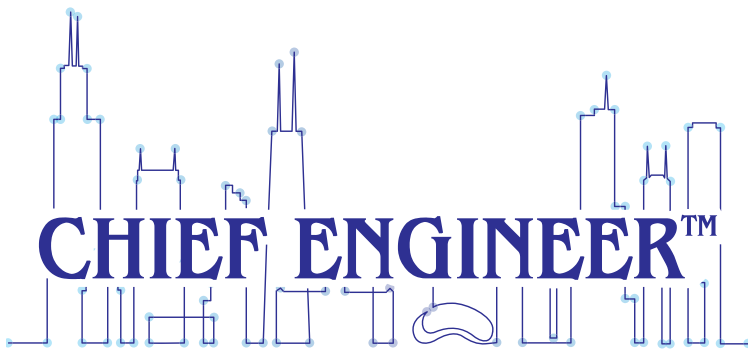
While many believe that the intention of Congress was to make Qualified Improvement Property 15-year property, which would have made this property eligible for bonus depreciation, the TCJA left the life of this property at 39 years. So, a taxpayer who did not elect to use the Section 179 Deduction or who has that deduction phased out would have been left to depreciate the remaining balance of the assets over a 39-year period.

Neither of these deductions is currently available for fire sprinkler systems installed in residential high rises. The National Fire Sprinkler Association (NFSA) continues to fight to obtain incentives for residential structures.

For more information on how these tax incentives might impact the business of your contractors, we would recommend that they contact their tax professionals, as situations differ based on the facts and circumstances for each business. As a general rule, we would not recommend that the Local provide tax advice to the contractors.



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16 The Art Institute of Chicago, Operating Systems SENSIBLY

The Art Institute of Chicago opens its doors to *Chief Engineer's* Patty Murray to discuss the cost-saving operation of its building systems that complements the stewardship of its art treasures.

20 A Ballad of Jim Conway, Engineer Musician

Kate Gawlik interviews Jim Conway about his life balancing twin passions of engineering and music.

24 Maximizing Your Equipment Lifecycle With a Proper Water Treatment Plan

Michael Badame talks to HOH Water Technology experts Joe Kowal and Matt Cota to explore the importance of an actual water treatment plan in extending the life of your building's various systems.

President's Message	5
ASHRAE Update	6
Events	8
Member News	10
Best Practices	12
New Products	31
Tech Edge	33
Boiler Room Annex	36
Dependable Sources	38



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Dear Members,

My time as president of the Chief Engineers Association of Chicagoland is just about up. It's been an honor and a privilege serving this fine organization these past two years, and before I go, I thought I'd close out my time in these pages by expressing my thanks to the Board and to everyone in the organization who helps make the CEAC such a meaningful experience. It's a pinnacle experience of my professional life to have been asked to lead this group, and I'm humbled at having had the opportunity to do so. I thank all of you for your help and for your inspiration.



But we still have business to attend to, which includes the upcoming December meeting, which will take place Wednesday, Dec. 13, 4:00-7:00pm at Maggiano's (516 N. Clark St., Chicago). This year, as every year, we'll be taking donations for a worthy charity. For 2023, we're taking donations for Paul Reynolds & Family. Any donations you can offer, be they monetary or in the form of grocery store/Target/Amazon gift cards are gratefully received.

As the colder weather moves in, let's also remember to keep our boilers in tip-top shape, and remember to call on our Associate Member organizations whenever we need outside assistance. They really are the best in the business, and we are as proud to support them as they are to support us.

Before I close and leave the CEAC to the very capable hands of President-Elect Doug Kruczek, I would just like to once more thank everyone for all of their support. These are often-trying times for many of us, and it's made a world of difference steering this organization knowing that I had such great people to work with. It's been great to be able to depend on you all of this time.

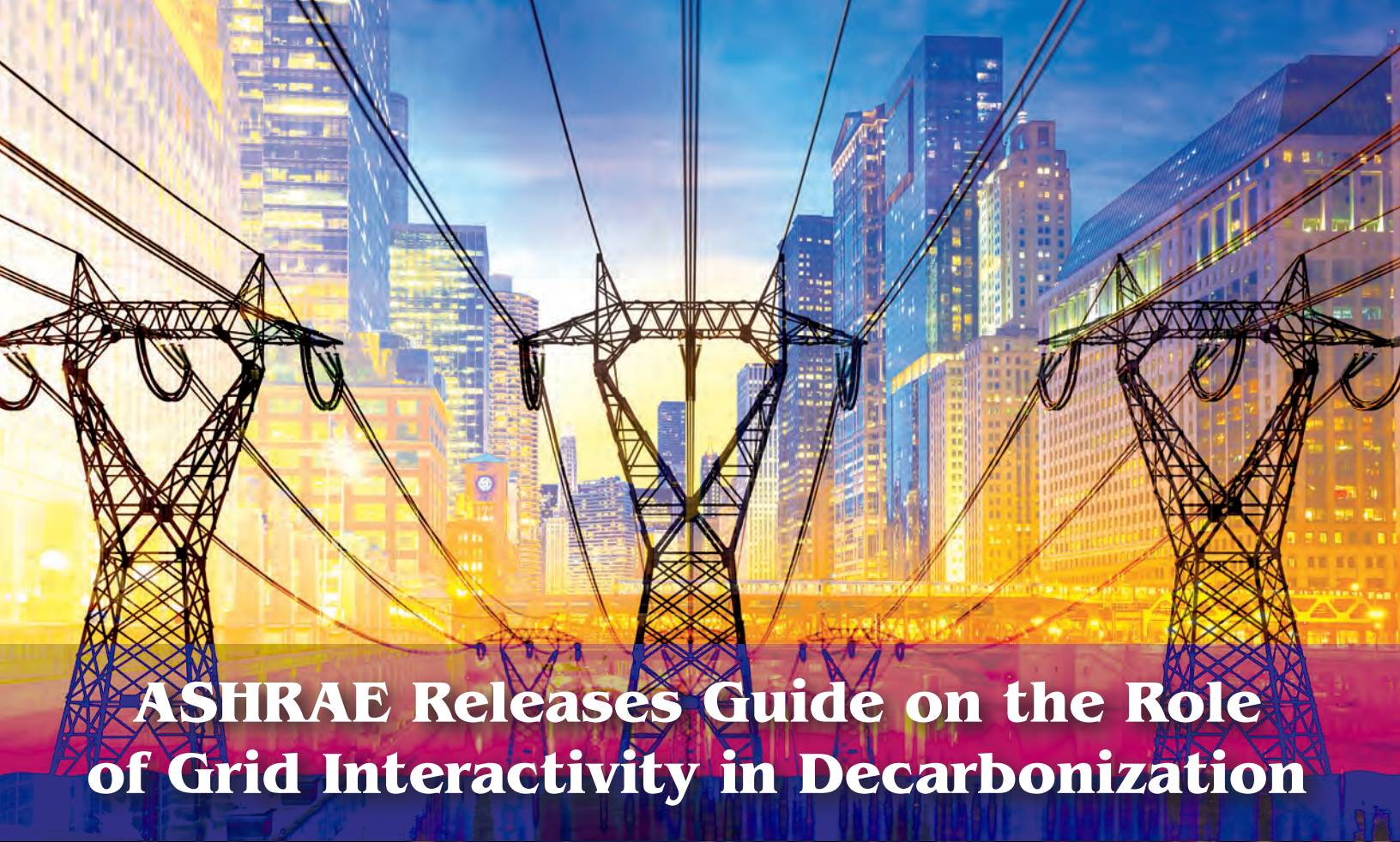
Lastly, let's not forget those men and women in uniform who keep us safe here in our communities and around the world.

Merry Christmas and a happy New Year to everyone!

Sincerely,



Ken Botta



ASHRAE Releases Guide on the Role of Grid Interactivity in Decarbonization

ASHRAE has released a new guide focusing on the critical role of grid interactivity in the decarbonization process.

The Grid-Interactive Buildings for Decarbonization: Design and Operation Resource Guide is the second in a series of guides developed by the ASHRAE Task Force For Building Decarbonization (TFBD) and provides information on maximizing carbon reduction through buildings' interaction with the electric power grid.

"Grid-interactive buildings actively engage with the energy grid," said ASHRAE TFBD chair Kent Peterson P.E., Presidential Fellow. "They utilize smart technologies, renewable energy sources, and energy storage systems to optimize energy consumption and generation. This allows them to respond in real-time to grid signals, thereby reducing overall demand and GHG emissions. Integrating buildings with the electrical grid is a critical component in the decarbonization process. It's an emerging focus for building professionals, and ASHRAE is thrilled to provide new guidance as we collectively work towards a more sustainable, resilient, and energy-efficient built environment."

Decarbonizing the electric grid necessitates a fundamental shift towards a dynamic, two-way relationship between buildings and the grid. This approach enables buildings to respond flexibly to grid conditions, including time-

varying carbon emissions rates. In recent years, the significance of this two-way communication has grown, driven by the integration of renewable energy sources, grid reliability concerns and the impact of extreme weather conditions. These factors have prompted utilities, grid operators and the building community to reassess the role buildings can play in supporting grid reliability and decarbonization by reshaping their energy consumption patterns.

The guide offers best practices, design considerations and operational guidelines to target the three primary value streams of grid integration:

- 1. Reduced Carbon Emissions:** Learn how to make significant contributions to reducing carbon emissions through smart building-grid interaction.
- 2. Cost Savings:** Discover strategies to optimize energy usage and save on operational costs.
- 3. Resiliency:** Enhance your building's ability to withstand and adapt to changing grid conditions, ensuring uninterrupted operations.

While the guide primarily focuses on commercial and multifamily buildings, it also includes relevant aspects for the residential and industrial sectors. In addition to design guidance, the resource guide provides operational recommendations for both new and existing

buildings, empowering them to optimize their available demand flexibility.

The Grid-Interactive Buildings for Decarbonization: Design and Operation Resource Guide can be purchased from the ASHRAE Bookstore or by contacting ASHRAE Customer Service by phone at 1-800-527-4723 (United States and Canada), 404-636-8400 (worldwide) or fax 678-539-2129.

The ASHRAE Task Force For Building Decarbonization (TFBD) webpage includes technical resources, information, videos and publications to expedite the adoption of climate change mitigation policies and reaffirms the Society's goals stated in the *ASHRAE Vision 2020* report, approved by ASHRAE's board of directors, as well as the *ASHRAE Position Document on Building Decarbonization*, to achieve net zero GHG emissions in operation for all new buildings by 2030.

ASHRAE will host the seminar "Grid-Interactive Buildings for a Decarbonized World," at which the guide, as well as project case studies that helped in the guide's development, will be presented. The seminar will take place at the 2024 ASHRAE Winter Conference, Jan. 20-24, 2024, in Chicago. Conference registration is open now.

Call for Winter Conference Volunteers

The Illinois Chapter of ASHRAE is the host committee for the winter conference this year. The conference will be hosted at Marriott Marquis McCormick Place on Jan. 20-24th, 2024. If you are interested in being a session volunteer and getting a registration discount, signups are available at tinyurl.com/3thmz29m

First time monitors receive free registration to the full event. Returning monitors receive the reduced registration fee of \$195 which includes all technical sessions and recording for one year post-conference.

Signing up does not guarantee a spot. The host committee will email to confirm your volunteer spot. For more information, check out the Chicago Conference website at ashraechicago.com. For any questions, please contact us at meetings@ashrae.org.

Calling Young Engineers in ASHRAE!

And speaking of subgroups within the Illinois ASHRAE, if you are an ASHRAE member 35 years old or younger (except student members), why not get involved with

the Young Engineers in ASHRAE (YEA). Members host several opportunities to get together with other young professionals to socialize, network, learn, and tour interesting project sites. For several years, YEA members have planned and conducted the chapter's excellent Spring Conference, held usually in March. The YEA committee is chaired by Paul Borchert and Kevin Schlotman. Reach them at YEA@illinoisashrae.org.

Find out more about YEA at illinoisashrae.org/YEA_Membership.

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 WWETT 24


Photo courtesy of the Indiana Convention Center

WWETT 2024

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Indiana Convention Center
Indianapolis, Ind.

The WWETT Show — Water & Wastewater Equipment, Treatment & Transport Show — is the world's largest annual trade show for wastewater and environmental service professionals. The event offers an unmatched educational program, a full slate of live demos, an array of networking opportunities, and an extensive expo floor where buyers and sellers come together to see and experience the latest product innovations and technology.

At WWETT, you can connect directly with 500+ suppliers and manufacturers from over 20 industries and make informed purchasing decisions as they display new products, equipment, and services. You'll be able to discover the latest products, services, and technologies that are driving the industry. See, touch and feel the products, equipment and services, and make purchases right on the show floor. You'll even

witness live demonstrations on the expo hall floor that will leave you in awe as powerful machines tackle the toughest wastewater challenges with ease, pushing the boundaries of what's possible.

Networking opportunities abound at WWETT. Connect with like-minded professionals, forge new alliances, and tap into a global community of wastewater and environmental service professionals at our networking events. Build relationships, share stories and challenges, and enjoy yourself at lively special events.

The WWETT Show Education Program offers a comprehensive and insightful lineup of sessions designed to imbue wastewater professionals with the knowledge and skills necessary to excel in their industry, all while earning CEU credits. From expert-led seminars to in-depth training courses, this program provides a wealth of learning opportunities that cover a wide range of topics.

*Registration for WWETT 2024 is now open.
For more information or to register,
visit www.wwettshow.com.*



2024 AHR Expo

Jan. 22-24
McCormick Place
Chicago, Ill.


The AHR Expo brings together manufacturers and suppliers of all sizes and specialties to share ideas and showcase the future of HVACR technology. The AHR Expo is co-sponsored by ASHRAE and AHRI and is held concurrently with ASHRAE's Winter Conference.

The biggest HVAC expo each year, the AHR Expo is not to be missed, featuring the best and latest in HVAC technology, products and ideas. Robust with panel discussions, product presentations and hands-on demonstrations, it's arguably the premier industry event to attend.

This year's AHR Expo features 100+ free sessions on best practices, industry trends, tips for improved ROI and more, as well as rapid-fire new product presentations and the AHR Panel Series that features industry thought leaders speaking on trending topics and their impacts across industry segments.

The heart of the AHR Expo is its massive show floor featuring 1,600+ exhibits from the world's top HVACR manufacturers. If you're looking to explore and discover the very latest HVACR products and technology, you'll find it all on display at the AHR Expo.

For more information or for event registration, visit www.ahrexpo.com.



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BEAR Construction's Scott Kurinsky will speak on the State of the Market panel at the upcoming Chicago Forecast event for 2024.

BEAR Construction's Scott Kurinsky Added to State of the Market Panel

BEAR Construction's Scott Kurinsky is a speaker on the State of the Market panel at the Chicago Forecast, the largest and longest running Commercial Real Estate Event in Chicago. They will discuss industry challenges, emerging trends and the market's future outlook as they take an in-depth look at the Chicago metro area.

The commercial real estate industry in Chicago, and across the country, is facing more headwinds than tailwinds, as virtually every sector continues to be shaped by inflation, upward pressure on interest rates, the development of hybrid return-to-work strategies and a myriad of other forces. A panel of experts — from brokers, developers, investors and lending sources, among others — take an in-depth look at the State of the Market in the Chicago metro area, including:

- What fundamentals contribute to sustained strength or weakness in asset class
- Overall assessment of up-to-date industry segments
- Reshaping lessons learned from the past, what to expect today and beyond
- How can investors maximize their returns in today's climate?
- Industry challenges, emerging trends and future outlook
- Today's market

Register or learn more about this event at pheedloop.com/2024chicagocreforecast/site/home/

Temperature Service Company Supports Charities at Dodgeball Tournament

Temperature Service Company recently brought the heat (and cooling!) to NAI Hiffman's 2023 Annual Dodgeball Tournament at The Dome at Parkway Bank Sports Complex in Rosemont. The event was set up by NAI Hiffman for the benefit of charities including Special Olympics, Misericordia Heart of Mercy, Alzheimer's Association and PAXA/Kids Too. You can check out how they did by watching a highlight reel at tinyurl.com/up92zfc6. Thanks to everyone involved in the planning and execution of this fine event on behalf of those in greatest need. You can all be proud of your contributions.



Employees of Temperature Service Company recently participated in a dodgeball tournament for charity at The Dome at Parkway Bank Sports Complex in Rosemont.



Robert Iwema, vice president of the Chicago office of BluSky Restoration Contractors, LLC.

BluSky Adds New Vice President to Leadership Team in Chicago

BluSky Restoration Contractors, LLC, has announced the hiring of Robert Iwema as vice president of its Chicago, Ill., office. In his new role, Iwema will be responsible for managing BluSky's Chicago office operations including business development, customer relationships, project management and administration.

As vice president, Iwema's primary objectives are to aid in the cultivation of growth for the office by leveraging the BluSky brand to develop relationships with industry professionals resulting in new business opportunities. Iwema also will ensure that his local office continues to provide unparalleled, customer-centric service through empathy, professionalism, communication and innovation.

Born and raised in Chicagoland, Iwema has 20 years of experience in the restoration industry, serving customers and developing management professionals. He is end-user focused and has established himself as a leader for his staff, to ultimately provide excellent customer care through the difficult situations of property damage.

Iwema resides with his family in the Western suburbs of Chicago and enjoys cooking, building projects and volunteering. "We are very excited to have Robert join the BluSky team to lead this office in Chicago," commented Jeff Neihouser, senior vice president of operational growth for BluSky. "He has the extensive experience in this unique restoration industry, which is useful to lead this high-quality Chicago team." ■■■

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Readying Your Rooftop for Chicago Snows

If there's one season that's dangerously unpredictable in Chicago, it's winter. We've seen it unseasonably warm, endured the Arctic blasts of the Polar Vortex, and we've certainly had our share of snow over the years. If you have a flat-roofed building for which you're responsible, here are a few things you should keep in mind with regard to the snow loads on your rooftop during the cold-weather months:

Know What to Expect

Chicagoans can expect roughly 37 inches of snowfall each year — and a lot more in extreme cases. But like snowflakes themselves, not all snow is alike, either. There's a big difference between three inches of powder and three inches of wet snow. An accumulation of ice is heavier still, and it's not unlikely that all three will be on top of your roof at once at some point during a cold winter.

With sunlight coming and going as well, snow and ice will melt, refreeze and can put extra burden on your roof. That layer of ice sitting under fresh snow can, before you know it, become as much as a foot thick, resulting in roughly 57 pounds per square foot of weight on your roof.

What Type of Roof Does Your Building Have?

Damaged, weakened roofs are liable to collapse under loads like the one described above, but whether it's structurally metal-, wood- or steel-based, it should exhibit signs of weakening integrity before total disaster occurs. Signs that your roof is in trouble can include:

- Bowing or falling ceiling tiles or boards
- Sagging sprinklers and sprinkler heads
- Difficult-to-open doors and windows
- Cracks in masonry and sheetrock
- Bowing trusses or braces
- Roof leaks
- Pooled water on flat roofs

It's important that unless you're a professional roofer and have the tools and skills to do a correct fix, that you don't try to correct the problem yourself. Professionals will be able to get their hands on the right materials needed to put things right, and can do it without risking greater damage to your entire structure. As far as the materials that compose your roof, it's important to note that wood-framed and timber-framed roofs are more susceptible to collapse under the weight of severe



Is your building's rooftop ready for the rigors of winter? (Photo: David Berkowitz)

snow and ice. Any metal roofs constructed prior to the establishment of snow-load-related building codes are also at increased risk under snow.

Roofs made of properly braced steel, cold-formed steel and roofs with concrete framing will be less susceptible to snow-load damage or collapse. But always be aware that when correcting a problem with your roof, if additional materials are installed over your old roof, whatever tolerance your framing materials have is necessarily reduced because of the increased weight of the materials added.

Preventative Measures

Before your roof even gets to the stage at which it needs repair, it should be receiving routine inspections every year prior to the winter snowfall season. Your roofing inspector will know what to look for with regard to damage, deterioration, any modifications suitable or otherwise, and any signals of potential trouble for the season ahead. Protrusions, low points in the roof, and areas next to sawtooth risers, where snow is given to accumulation, will receive the once-over twice from any decent inspector, as they must be particularly reinforced against drifting and packed-down snow.

Before the first snowfall, you'll want to have the following areas looked at by an inspector:

- Gutters and downspouts
- Exhaust-vent openings
- Rooftop flashing
- Ridge and soffit vents
- Cold-eave heaters
- Attic (look for dryness and insulation)

BEST PRACTICES

They'll be looking for cracks or perforations of any sort in the roofing surface, as well as corrosion or any signs of notable wear or stress, including inspecting any trusses and bracing to make sure everything is as it should be, and not unduly stressed.

When to Remove Snow — and How

There's likely to come a time when you'll need to remove snow from your roof, and that's going to be when you estimate that your roof's snow load is approaching 20-25 pounds per square foot, and in danger of possible collapse should accumulation continue. You'll want to have a solid plan in place prior to any major snowfall, and to consult with your roofing contractor and a structural engineer to make sure your plans are sound. If you don't have designated trained personnel for the task, make sure you hire professionals to do the job. With the right planning and execution, you can avoid major damage to your roof and keep everyone safe both inside your building and atop its roof. ☒☒

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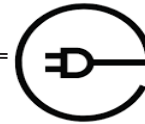
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Saturday, January 6
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LOCATION: THALIA HALL

Inauguration Event

2.17

Saturday, February 17
11:00 AM - 2:00 PM

LOCATION: MORGAN PARK SPORT CENTER

3.20

Wednesday, March 20
4:00 PM - 7:00 PM

LOCATION: IRISH AMERICAN HERITAGE CENTER



The Art Institute of Chicago, Operating Systems SENSIBLY

By Patty Murray

There are many aspects of Chicago that make the city unique and noteworthy. The city's distinctive architecture, food, music scene and many museums are just a few. One establishment that brings pride to Chicago and adds to the city's distinguished history is the Art Institute of Chicago. Noted as one of the oldest and largest art museums in the world, The Art Institute of Chicago houses work from some of history's greats like Van Gogh, Picasso and Warhol. According to its website, The Art Institute of Chicago originally was founded in 1879, with the current facility having been built in 1893 as part of the World's Columbian Exposition. The city of Chicago viewed this as a brilliant way to showcase the city's rebirth from the Great Chicago Fire of 1871.

Not only are the collections noteworthy but the building itself is quite impressive. The Art Institute of Chicago resides in the Loop neighborhood of Chicago, and was designed in the Beaux Art style, with the masonry load-bearing walls clad in limestone. Eight additional buildings have been added to accommodate the ever-growing collection of art pieces and ambitious exhibitions. Present day, the Art Institute is 750,000 square feet and houses more than 300,000 works of art and attracts in excess of 1 million visitors per year.

In knowing the value and importance of The Art Institute and its contents, you can imagine it is no easy task to

upkeep this property as well as sustain a safe place for the artwork and collections to be housed and displayed. To do so, they must maintain 70° F, 50 percent RH (relative humidity) year round in exhibition spaces. Within gallery areas they must maintain 68° F with 45 percent RH in winter and 72° F with 50 percent RH in summer. To adequately meet these conditions, the property operates and maintains:

- 57 air handlers
- A 4,750-ton central cooling plant, with 5 chillers
- A 2,300-HP steam plant that operates year round
- And all of the ancillary equipment

Protecting the artwork, exhibitions and collections is of utmost importance to the Art Institute of Chicago and its team. Tom Ryan, Vice President of Facilities and Logistics, and T.J. Kennedy, Chief Engineer, along with their crew of engineers, have the extremely important role of safely and efficiently maintaining the property to ensure that the art collections keep their integrity. With their constant re-evaluation of the operations, they came to the conclusion that it was time to tackle a more effective way of controlling the humidity, also known as latent heat levels, in the museum. Dehumidification optimization serves a dual purpose, one being better preserving priceless artworks, and secondly being cost-saving in operations.

History of Having a Reliable System

The Art Institute of Chicago has always had a reliable system to ensure ideal conditions for the galleries and the artwork they so proudly display. The temperature and humidity in the gallery and vault spaces is monitored and controlled through the building's automation system. Prior to recent upgrades, the common way to control the air efficiently of critical spaces was cooling air to dry it out, then reheating and/or humidifying it to maintain the desired space set-point. The reasoning behind this concept is that it locked in a starting point for the controls and made it easier to maintain the desired setpoints. However, this method was not the most effective. There was a significant amount of time the air did not need to be dried, and therefore the air was cooled and reheated unnecessarily — ultimately costing money and energy. Anticipating when these periods occur and being able to precisely control the system was the challenge. Tom Ryan, T.J. Kennedy and his team of engineers set out with a goal to reduce the amount of energy used to control temperature and humidity in the art gallery spaces while also maintaining a safe and reliable environment to house the artwork. The desired system would have machine learning algorithms with inputs such as outside air temperature, time of year, weather forecasts and museum population to predict the required discharged air temperature.

A System in Need of an Energy Upgrade

The standard mode of operation within the building automation system for most of the Art Institute's air handlers was to cool the air at the fan to an acceptable humidity level of 52° F to 58° F, then reheat the air to a comfortable level of 68° F to 72° F. Cooling the air was done by controlling a chilled water coil at each fan with the water being supplied from their central chilled water plant. Air was then reheated at a zone level by heating coils located on branch distribution ducts. The reheat valves were controlled by temperature sensors in the space that are independent from fan controls. Most of the air handlers had multiple zones to which they supplied air. These areas had zone humidifiers to add humidity to when needed. These systems all worked in combination to provide the optimal setting of 70° F/50 percent RH effectively. Although this system worked in doing so, it failed in saving energy. Moisture was often removed at the fan level unnecessarily, only to be added shortly after through these zone humidifiers. Zone reheats also added heat to the space that was often removed on the next cycle through the air handler.

Specifically, there are 34 air handlers with more than 700,000 CFM of air that serve critical art gallery spaces. Prior to 2019, a study was done on two of the air handlers, revealing that more than 3,000 hours a year the air was cooled and reheated unnecessarily,



The Art Institute of Chicago. *The Woman's Board Grand Staircase.*
Courtesy of the Art Institute of Chicago.

and the projected gas and electric savings could be several tens of thousands of dollars per year across their critical gallery air handlers.

Using Data Analytics to Optimize System Performance

Beginning in 2019, a collaboration began between Tom Ryan, T.J. Kennedy and the rest of the Art Institute of Chicago team, McGuire Engineering, Franklin Energy and People’s Gas as part of an energy efficiency project. The goal was to have “optimized” algorithms that took into account current conditions in each zone to produce the optimal discharge air setpoint at fan level. One 10,000 CFM air handler was implemented in 2019 that resulted in about 35 percent annual reduction in gas and electric consumption for that unit. In 2020, they expanded to four air handlers, but unexpectedly ran into several setbacks, including scaling issues, data crashes, and trouble with the algorithm being not self-learning and not applicable across all platforms. After pulling back, reflecting and implementing new ideas,

the team partnered with Ameresco on forming new architecture for the algorithm. The revamped sequence included adaptable, self-learning algorithms and new processes for data flow. They did so by doing the following:

- Established data flow from BAS system to analytics platform
- Identified hardware or sensor issues that affected operations
- Created point mapping for naming consistency
- Created ticketing data flow from door scans as occupancy proxy
- Built individual ML models for each air handler with a reusable template


Modern Upgrade for a Timeless Institution

The upgraded system involves accurate and vigorous temperature and humidity sensors, exact chilled water,



The Art Institute of Chicago. *The Franke Reading Room at the Ryerson and Burnham Libraries.* Courtesy of the Art Institute of Chicago.

hot water and steam control, and predictive, reliable software to choose the proper setpoints. This new system has been integrated with the existing building automation system and provides cloud-based analytics. These real-time analytics provide alerts and data that can identify issues such as energy waste, which improves building performance. These new optimized algorithms take into account current conditions in each zone to produce the optimal discharge air setpoint at fan level. Analytics show the largest savings occur during the overnight hours when the galleries have no patrons. The algorithm produces a setpoint closer to 70° F during these hours, which is mostly recirculating the air in the space. Upon opening hours, the building temperature will begin to lower to 60s and 50s when necessary. Any discharge temperature above 58° F results in both gas and energy savings, which ultimately saves money.

Since the upgrade to the building's air handlers, Tom Ryan, T.J. Kennedy and their engineering team at the Art Institute of Chicago have found success in optimizing their energy use in controlling temperature and humidity in their gallery spaces. This has not only ensured the safety within the gallery space for displaying the exhibits and artwork, but also has saved several thousands of dollars a year in energy and gas. The dehumidification optimization is a modern operational approach for an institution that houses thousands of timeless pieces of artwork from around the world. 

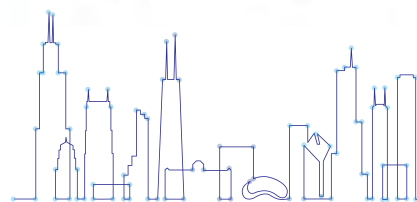


The Art Institute of Chicago. Griffin Court.
Courtesy of the Art Institute of Chicago.

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Here are a few things to keep in mind about your membership and Chief Engineer events.

- Members are invited to monthly meetings that take place once a month October – May
- Meeting topics, speakers, and times can be found online at www.chiefengineer.org
- Membership dues are good for one year. If not renewed, your membership becomes Inactive and you will need to renew before or upon entering events



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A Ballad of Jim Conway, Engineer Musician

By Kate Gawlik

John Conway regularly brings his Celtic music to the Milwaukee Irish Fest.

*"In the Chicago town, where I was born,
there was an engineer dwellin'.*

*Music by night and repairs by day,
his name was Jim Conway."*

If this ballad, based off "Barbara Allen," hasn't been sung yet, there is a man who could do it — Jim Conway. Currently a journeyman engineer at Presidents Plaza, 8700 W. Bryn Mawr in Chicago, Conway also can be seen in local venues performing and teaching music.

"Outside of my engineering life, I'm very busy performing and teaching music," Conway says. "I teach at the Old Town School of Folk Music. I perform regularly at local venues, such as the Irish American Heritage Center, Mrs. Murphy's Irish Bistro and Martyr's. I sing and play guitar, tin whistle, and harmonica. I have an endorsement with the Hohner Harmonica Company. I teach and play around the world at harmonica conventions and festivals. Most of my music consists of the traditional music of Ireland, however, I do occasionally like to take a Celtic break and go all Hillbilly."

Music and engineering give Conway a left-brain, right-brain balance that has existed since he was young. Both are his way of keeping traditions alive with an eye on the future.

Dualistic Approach

Conway's creative side was born when he started playing music at 6 years old. His Irish-born parents, Kevin and Marie, enrolled him in tin whistle, bodhran (Irish drum) and fiddle lessons.



John Conway gets the approval of the "Bronze Fonz" in Milwaukee.

"I dropped the fiddle playing because it was just too damn hard!" Jim says.

The logical and scientific side of Conway was fostered by his dad, a chief engineer. Kevin was a chief engineer at the Fine Arts Building and then at the Stevens Building, 17 N. State, both in Chicago.

Kevin loved to be an engineer and was trained under the Castleisland method, with Conway noting, "I remember my dad bringing me to the Fine Arts Building when I was a kid. I was fascinated by the manually operated elevators that would take you way down to the sub-basement where the engineer's shop was. I can still remember the smell of that boiler room. He told me to always be on time, don't argue with the chief, do a good job and make sure to clean up afterward."

"My dad was from Castleisland, Kerry, and he and other hardworking, adventurous Irishmen immigrated to America to become operating engineers. He didn't tell me much of the Castleisland method, but I know it involved a lot of coal shoveling."

The tradition for hard work has extended another generation, to Conway's kids. With his wife, Claire, Conway has a son, Alexander, and two daughters, Eleanore and Lila. Being a chief engineer may not be in the cards for any of them, but they have learned to pursue their own passions, which includes a finance and business degree for Alexander, a nursing degree for Eleanore and being an aerial dancer for Lila while



Conway sings and plays guitar, tin whistle, and harmonica with his band, The Boils.

finishing high school, among other talents for each of them.

Local 399 Calling

Conway, a Chicago native who went to Notre Dame High School in Niles and Triton College in River Grove, joined Local 399 in 1986. He served his apprenticeship at 30 N. LaSalle and stayed there as a journeyman and later assistant chief until 1997. He then took a 6-year engineering hiatus to work as a professional musician.



Conway (left) worked with apprentice Tom Phillips Jr. at 225 W. Washington, both always focused on safety.



Mike Kenzinger (right), the chief engineer at 225 W. Washington, and Conway show off the New York chillers with an automation system.

"I eventually went broke and returned to The Hall to get back into engineering," Conway says. "I did a series of off-hour, temporary jobs until I finally landed a sweet gig at 225 W. Washington. I worked there for 17 years as assistant chief."

At this location, Conway oversaw the preventative maintenance program and tenant service. The camaraderie he had with Tom Phillips, the first chief engineer he worked with at the site, and then Mike Kenzinger, the current chief engineer, were a bonus of the job.

"Both of these fellas are great, hardworking guys and are like brothers to me," he adds.

Conway's introduction to the Chief Engineers Association of Chicagoland (CEAC) came from Phillips, CEAC's past president. After a few years on the job, Phillips took Conway to a Chief Engineers meeting and presented him with the required paperwork to become a member. In addition to offering classroom and hands-on educational opportunities needed for his career, the CEAC allowed Conway to interact with highly skilled engineers and learn on another level.

A 17-year stretch at 225 W. Washington did not happen because Conway lacked an adventurous spirit. Conversely, he stayed because the job remained exciting and fresh, with little repetitive routine.

"I like the variety of jobs an operating engineer has — everything from computer programming to plumbing, to electrical to lock repinning. I could never work day after day imprisoned in a cubicle," Conway says.

Conway has focused on many different projects, like chiller replacement, elevator replacements, repinning locks for an entire building, cooling tower upgrades and more. Over time, the technology for the systems has become more advanced, in regards to the BAS (building automation system) and HVAC equipment.

"We encouraged tenants to ditch the old Carrier moduline units and move on to more advanced VAV boxes that give the engineer more precise control of zone temperatures," Conway says.

Conway hopes the profession starts to push for engineers to think green and work harder to preserve resources for the future. While he takes on this initiative and others in an ever-changing vocation, Conway will keep on strumming and playing the music of the past, balancing his two passions. 🎸🎵

Kate Gawlik writes about construction, design and business trends from Lockport, Ill.



Conway joined Local 399 in 1986 and worked at 225 W. Washington for 17 years.

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Maximizing Your Equipment Lifecycle With a Proper Water Treatment Plan

By Michael Badame

When it comes to maintenance of our buildings and mechanical systems, we spend countless hours performing routine tasks based on manufacturer recommendations and industry best practices. We change our filters to keep coils clean, lubricate bearings to preserve their performance, and insulate or apply protective coatings of paint to piping to prevent rust and corrosion. When these tasks are performed, we are confident in the return on investment our equipment will provide to the owners and operators for years to come. The objective of maintaining a building to this level of standard is to prolong its lifespan, avoid costly repairs, and ensure the safety of occupants. There is an important and often unsung hero in this equation that none of the aforementioned can be achieved without: a high-quality water treatment plan.

Joe Kowal and Matt Cota with HOH Water Technology were kind enough to take me on a tour of their facility, which gave an in-depth look at what it takes to help clients get the most out of their water-based heating and cooling systems. HOH Water Technology is an industrial water treatment provider based in Chicagoland, family-owned and operated for over 50 years. I also had the pleasure of meeting former CEO Tom Hutchison, who took over the helm from his father and who now serves as Chairman of the Board for

a company in its 6th decade and third generation of family leadership. Hutchison is also a proud member of the Chief Engineers Association of Chicagoland. "The Chief Engineers Association of Chicagoland has been an important part of our success!" Hutchison proudly exclaims.

The company services commercial, industrial, institutional and healthcare facilities throughout the Midwest. They specialize in helping to maintain the right water chemistry so building owners and operators can count on their equipment performing at peak efficiency. They went through a detailed list of the additional services they provide, including:

- Open Loop Systems
- Closed Loop Systems
- Wastewater
- Core Industrial Water Treatment Services
- Pretreatment Equipment and Service
- Water Safety Management
- Smart Control Technology
- Wastewater Management
- In-House Laboratory Analysis
- Chemical Blending/Manufacturing/Private Labeling
- Point-of-Use Bulk Delivery
- Equipment Delivery and Service
- New Construction Services

With the winter season now upon us, now is the time to start taking a more detailed look at the current state of the glycol used in your systems. I asked Kowal to describe what happens and what to look for when glycol starts to break down.

“Glycol contamination feeds rapid formation of organic acids such as acetic acid (vinegar) as well as glycolic, formic, oxalic, propionic, and other acids,” Kowal explains. “Glycols support microbial activity beginning at a concentration just under 25 percent by weight (250,000 ppm). Below 25 percent, the lower the concentration of glycol, the more hospitable the mixture becomes to microbial activity and the progressively greater both the rate and extent of breakdown. In highly dilute glycol solutions below 0.1 percent, or less than 1,000 ppm typical of contamination after coil reactivation, almost total conversion to organic acids takes place within a few days to a few weeks.

“Problems associated with springtime coil reactivation occur when the entire chilled water volume picks up only a few hundred ppm of glycol or roughly a few pounds per 1,000 gallons of system volume,” he continues. “Glycol breakdown lowers pH, destabilizes corrosion inhibitors, consumes pH & alkalinity buffers, initiates release of rust-like pipe debris, promotes rapid microbial growth, and creates smells and odors. Glycol breakdown is the single most problematic and costly influence associated with the operation of closed recirculating water systems.”

We also went through a few quick questions and answers with Kowal that could help trigger good talking points for your facility.

Chief Engineer: What goes wrong with glycol?

Joe Kowal: “Glycol should be chemically stable, even at the higher temperatures in a recirculating chilled or hot water loop. If your glycol is breaking down, it’s likely a bacteria-caused problem.”

CE: How much glycol do I need?

JK: “Adding glycol can involve a complex math problem. Most facility managers recognize that glycol should make up, say, 30 percent of their system ... but 30 percent of what? If they don’t understand the size of their system, they don’t really know how much glycol they need in gallons.”

CE: How frequently should you replace glycol?

JK: “There’s not a hard-and-fast rule about how frequently you should replace your glycol. Some of our customers have had the same glycol in their systems for 30 years; some have had to replace or add after only five years — it’s totally unique to the facility.”

HOH does recommend testing once a quarter to ensure that proper levels are being maintained and that you really are protected.

After speaking with the HOH Team, I went and visited with one of their clients who had some great feedback on chemical treatment and testing services. I had the pleasure of speaking with John Rochon, Chief Operating Engineer at 540 West Madison, where he and his team of 11 engineers operate a Class-A 1.1 million-square-foot, LEED-EB Platinum-certified office building in Chicago’s West Loop, with a technology center classification. The facility features a central HVAC plant that circulates 33,000 (GPM) of a 20/80 glycol water mixture at 40°F and 12” raised floor access for air and power distribution, and a 10MW emergency standby generator. I asked Rochon what their water treatment plan is like for a facility of this size. “We utilize HOH Water Technology for our water treatment solutions. They provide a multitude of services, which include consulting, chemical testing, training and, most recently, [upgrading] our system with Advantage MT Smart Controllers, which analyze our chemical concentrations and make adjustments based on the data collected,” he says. “They can even monitor the system remotely for issues and make changes if needed.”

The Engineering staff receives annual training on the proper handling of chemical systems, as well as what Personal Protective Equipment (PPE) to use, such as:

- Face Shields
- Chemical Resistant Goggles
- Chemical Resistant Gloves
- Chemical Resistant Protective Clothing



Chiller Plant Engineer Patrick Smith is responsible for oversight of the chemical treatment and daily readings.



Left to Right, Joseph Kowal, Dean Miller, Tammy Faber, Matt de La Bruere, Matthew Cota

Knowing when to test or add glycol to your system is critical to the safety and efficiency of your operations. There are always water losses on our systems whether from draining systems during routine maintenance or from repairs that need to be made from time to time. Here is a list of some of the issues that could arise if you have a glycol problem:

- Changing water-side filters on a more frequent basis
- Increased temperature or pressure differentials across heat exchangers and/or coils
- Turbidity or discolored water in your system
- Pipes freezing or bursting

Rochon went into some detail on an issue they had in the past during a data center project in 2021. "A new data center was being constructed in the building and the contractor had to tie into our chilled water risers for a plate-and-frame heat exchanger," he recalls. "After the tie-in was completed, we noticed the heat exchanger plates were getting clogged and causing issues with operations. We weren't sure if this was an issue with the heat exchanger or our water system.

"We called up HOH Water Technology to perform testing and they were able to determine it was from particles in stagnant points of our system," he continues. "We have three chilled water risers with multiple cross-connects on different levels. These cross connects were where loose metals released during the project tie-ins and clogged the plates on our heat exchangers. Having HOH provide the testing and immediate results gave the engineering department a resource to prove the value in their water treatment plan and avoid costly fees related to the construction project."

Having your systems running at peak efficiency means having a qualified team of professionals available to address issues that may surface. Rochon suggests having a thorough plan for your water systems just as we do for our equipment maintenance. "The comprehensive water treatment plan that HOH has implemented has proven to increase the lifecycle and effectiveness of our chilled water system," he says. "Through annual eddy current testing and internal inspections, the feedback received has proven HOH Water Technology provides quality results for our facility."



HOH Advantage MT Smart Controller and Chemical Feed System



Chief Operating Engineer John Rochon

John Rochon has been a member of I.U.O.E. Local 399 since 2013. Prior to joining Local 399, he was an 18-year member of the IBEW Local 134. He graduated from the Illinois Institute of Technology with a Master of Industrial Technology and Operations with a specialty in Facility Management. He completed his undergraduate work at Governor's State University and received a Bachelor of Arts in Mathematics where he graduated Summa Cum Laude.



Trane Chiller



Since 2017, HOH has taken part in the World Vision Global 6K for Water, helping to bring clean water to underdeveloped parts of the world.

Along with caring for the water quality in facilities like Rochon's, HOH Water Technology helps support Team World Vision, the largest non-governmental provider of clean water in the world. Since 2017, HOH has participated in the World Vision Global 6K for Water event, raising and donating funds every year and helping to involve other water treatment companies in the cause, which has provided clean water to more than 3.4 million people in areas where contaminated water threatens health, especially of children.



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The 0034e and 0034ePlus circulators are available with cast iron or NSF/ANSI 61 & 372 certified stainless-steel volutes, so they are ideal for closed-loop hydronic heating systems as well as domestic hot water recirculation systems. Both circulators also offer a convenient, rotatable control box cover for a professional look, no matter the orientation of the installed circulator.

The 0034e features an easy-to-use dial with five operating modes, including constant pressure, fixed speed, Taco's exclusive TacoADAPT[™] self-adjusting proportional pressure, and 0-10V capability. The 0034ePlus adds proportional pressure and more constant pressure settings as well as a digital display with real-time feedback, including watts, GPM, feet of head, and RPM. Both circulators are dual-voltage 115V/230V.

The new circulators come with exclusive features that make Taco's ECM high-efficiency circulators so easy to use, including SureStart[®] automatic unblocking and air purging, BIO Barrier[®] black iron oxide protection, dual electrical knockouts, and recessed flange nut-grabbers.

For more information, visit www.TacoComfort.com 



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Smarter Buildings Key to Decarbonization Goals, New Johnson Controls Study Finds


As the world races to meet critical climate targets, new research from Johnson Controls and Forrester Consulting reveals some of the biggest opportunities and immediate needs for business leaders looking to advance sustainability commitments. With buildings representing some 40 percent of global emissions¹, decarbonizing the built environment is one of the fastest paths to meeting net zero targets globally, and essential for many businesses with 2030 carbon reduction goals. The landmark survey shows widespread acceptance that sustainability is a business priority and a firm recognition that partners are essential to realizing 2030 sustainability commitments.

“For leaders looking to quickly advance their net zero journey and make a real impact on global carbon reduction, buildings are the key enabler,” said Johnson Controls Chairman and CEO George Oliver. “This new research shows decisionmakers around the world understand sustainable buildings are better for the balance sheet and external partners are invaluable in optimizing buildings and measuring environmental impact. Solutions exist today that can remove the need for upfront capital, digitalize a building’s systems to provide actionable data, electrify systems to accelerate the energy transition, and create positive cash flow. These are immediate solutions we can all adopt now as we respond to a changing climate and work to reduce carbon emissions.”

The survey of nearly 3,500 respondents representing 25 countries and 18 industries shows that sustainability is one of their three top business priorities. Among decisionmakers on sustainability initiatives specifically — a subset of 1,500 respondents — two thirds report they are fully on track to meet their carbon reduction

goals, while one third realize they need to accelerate their efforts to meet 2030 net zero goals. Respondents report that smart buildings are important in helping their organizations accelerate sustainability initiatives (69 percent) and that adding or upgrading building automation (56 percent) and digital technologies to optimize energy use (42 percent) are among the most impactful sustainability investment areas.

Technologies exist that can digitalize a building’s systems, multiply energy, emissions and cost savings, and can even create net-energy-positive solutions. Some 10 percent of respondents have already fully integrated their buildings systems and equipment to realize these benefits. Vast majorities of leaders seek partners who can provide a digital platform across sites and use cases (74 percent) that is easy to use for cross-departmental teams (67 percent) and is integrated into all building systems (70 percent). These partnerships solve two key problems for these leaders — 73 percent of sustainability leaders say their organizations lack the technical expertise to optimize building systems from insights collected while 40 percent lack the internal skills to measure their environmental impact.

“We cannot decarbonize the planet without decarbonizing buildings. This research shows that we’re at a tipping point where sustainability is a top business priority and companies are aggressively pursuing their net zero targets but are also actively seeking partners to help accelerate those efforts,” said Katie McGinty, vice president and chief sustainability and external relations officer at Johnson Controls. “Working with partners to rapidly deploy smart building technology not only cuts waste but strengthens the bottom line. It’s also increasingly becoming a regulatory imperative, an expectation of stakeholders, and a differentiator for attracting talent. Smarter, more sustainable building solutions are immediate steps leaders can implement to make a difference on climate change.” 

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President

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Cool Terms

ACROSS

- 1 American College of Physicians (abbr.)
- 4 Gave a lavish party
- 9 Test copy
- 14 Some
- 17 Stale
- 19 Hip
- 20 Radio detection and ranging
- 21 In addition
- 22 **Common air filter material**
- 23 **Duct material**
- 24 Musical production
- 25 Neck
- 26 **Device to reculate air pressure**
- 28 Tier
- 30 Meddling
- 32 **Automated control framework**
- 33 Cinder
- 36 **Airflow measurement**
- 37 Grown-up
- 40 Greenwich Mean Time
- 43 Breath mints
- 45 Jeweled headdress
- 49 Use a keyboard
- 50 Thistle
- 52 Three

1	2	3		4	5	6	7	8		9	10	11	12	13		14	15	16	
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133					134						135						136		

www.CrosswordWeaver.com

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> 54 Swiss-like cheese 55 Drink slowly 56 Wind (2 wds.) 58 Fruit 59 Pixy 60 East 61 Jogged 62 Wing 63 Hairstyle 64 Heat exchanger component 65 On the shore 67 Grommet | <ul style="list-style-type: none"> 69 Match 70 Unusual 71 She 73 Hearing part 74 Bolus 75 Clutch 78 Measures change 80 Width 84 Swirl 85 Savage 86 Hairpiece 88 Sign of the zodiac 89 Unrefined metal 90 Desert 91 Pounds 95 Far away 97 Popinjay 100 Tall tales 101 Ribald 102 Household cleaner brand 104 Spiked 106 Middle 107 Dales 108 Mommy 110 Respite 112 Women's partners (2 wds.) 113 Lather 116 Opp. of yeses 118 Not married 121 Northeast by | <ul style="list-style-type: none"> 122 Parasite 125 Pungent 127 Floor covering 129 Honey makers 130 Capital of Tunisia 131 Stair grips 132 _____ 133 Sarcastic 134 Wrinkle remover 135 Honker 136 Genetic code |
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| <ul style="list-style-type: none"> 137 _____ 138 _____ 139 _____ 140 _____ 141 _____ 142 _____ 143 _____ 144 _____ 145 _____ 146 _____ | <ul style="list-style-type: none"> 147 Synthetic fabric 148 Generous 149 Cattle marking 150 Monarchs 151 Self-esteem 152 Imperfect 153 Wooden sheet 154 Island 155 Slimly 156 Spookily 157 Cooling gas 158 Having helix form 159 Omega 160 Sandwich cookies |
|--|--|

- brand
- 75 Floral leaf
- 76 Teach
- 77 Thoughts
- 78 Strong rope fiber
- 79 IOU part
- 80 Dazzle
- 81 Peg
- 82 Large net
- 83 Groups of animals
- 85 Typing rate
- 87 Small island
- 93 _____
- 96 Ancient Italy dwellers
- 98 Whiz
- 99 Moisture
- 101 Measure of how long
- 103 Sever
- 105 Couple
- 107 Thief's hideout
- 109 Many
- 111 Whitish fruits
- 112 In the middle of
- 113 **HVAC efficiency rating**
- 114 Heed
- 115 Pelt
- 117 Rake
- 118 Grainery
- 119 Fibbed
- 120 Ardor
- 121 North by west
- 123 Card game
- 124 Transgression
- 126 Rio de Janeiro
- 128 Airport abbr.

WREACH

by Jim McGreal



WHEN WREACH WAS A BOY, HE WANTED TO KNOW...

...THE TRUTH ABOUT SANTA AND NOT JUST WHAT HE WAS TOLD.



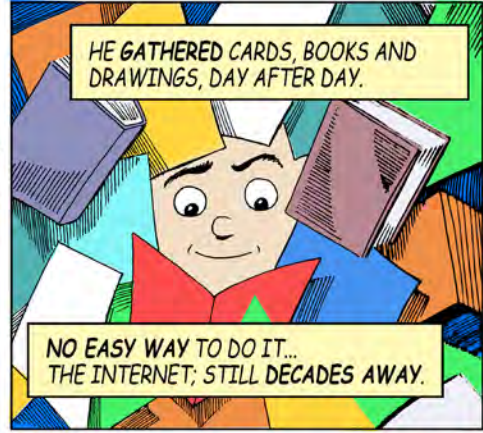
THE GROWN-UPS WOULDN'T TELL HIM WHAT HE NEEDED TO KNOW.

SO HE DECIDED RIGHT THERE, TO GO IT ALONE.

HE PLANNED OUT HIS STRATEGY, LIKE A YOUNG ENGINEER...



...TO FIND THE REALITY OF THE OLD ELF WITH A BEARD.



HE GATHERED CARDS, BOOKS AND DRAWINGS, DAY AFTER DAY.

NO EASY WAY TO DO IT... THE INTERNET; STILL DECADES AWAY.



EYE-WITNESSES CAME FORWARD AND HE TALKED TO THEM ALL.

HE LISTENED TO THEIR TALES... SOME VERY TALL.



AS THE CLUES CAME TOGETHER, HE STARTED TO NOTICE...

AND THAT'S WHEN HE SAW IT, THE TRUTH FINALLY REVEALED.

... A VISION OF SANTA THAT CAME INTO FOCUS.

THAT'S IT!

I KNOW NOW THAT SANTA IS REAL!

POOF!



YES, YOU'VE SUCCEEDED WHERE MANY HAVE FAILED.

YOU WORKED HARD, KEPT AT IT, AND FINALLY PREVAILED.



NOW THAT YOU KNOW, HERE ARE SOME FOLKS THAT KNOW TOO.

THERE WERE SCIENTISTS, WRITERS AND PLENTY OF SLEUTHS.



WE NOW GET TOGETHER AT THIS TIME EVERY YEAR...

... TO WELCOME NEW MEMBERS AND HAVE A FEW BEERS.



SO, IF THE TRUTH ABOUT SANTA, IS WHAT YOU ARE LOOKING FOR.

WE HOPE TO SEE YOU HERE SOON, THERE'S ALWAYS ROOM FOR ONE MORE.

Apologies to Hercule, Albert, Dick, Sherlock, Jane, Scooby and Bruce.

Happy Holidays from all of us at Chief Engineer!

(November puzzle solution can be found on page 38.)

Abron Industrial Supply.....	11	Hayes Mechanical	11
Addison Electric Motors & Drives	14	HOH Water Technology	30
Admiral Heating & Ventilating, Inc.	30	Hudson Boiler & Tank Co.	11
Advanced Boiler Control Services, Inc.	11	Industrial Door	34
Air Comfort Corporation	34	J & L Cooling Towers	33
Air Filter Engineers	Back Cover	Kroeschell, Inc.	28
Airways Systems	29	Midwest Energy	9
American Combustion Service	32	M&O Insulation Company.....	29
AMS Industries.....	32	MVB Services, Inc.	29
BEAR Construction.....	11	Olympia Maintenance	28
Bell Fuels	Inside Back Cover	Preservation Services.....	23
Beverly Companies	32	Rotating Equipment Specialists.....	35
Bornquist, Inc.	30	SERVPRO South Chicago	31
Bullock, Logan & Associates, Inc.	29	Sprinkler Fitters Local 281	Inside Front Cover, 4
Chicago Backflow, Inc.	7	Stanton Mechanical.....	35
Chicago Cooling Tower	28	United Radio Communications	28
Chicago Filter Supply	13	Waukegan Roofing Co.	35
Chicago Fire Protection	23		
Christopher Glass	23		
City Wide Pool & Spa	31		
Competitive Piping Systems	35		
Critical Environments Professionals, Inc.	9		
Door Service, Inc.	7		
Dreisilker Electric Motors	28		
Eastland Industries Inc.	30		
Energy Improvement Products, Inc.	14		
Evergreen Electric Supply	14		
F.E. Moran	14		
Global Water Technology	13		
Hard Rock Concrete Cutters	31		

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