



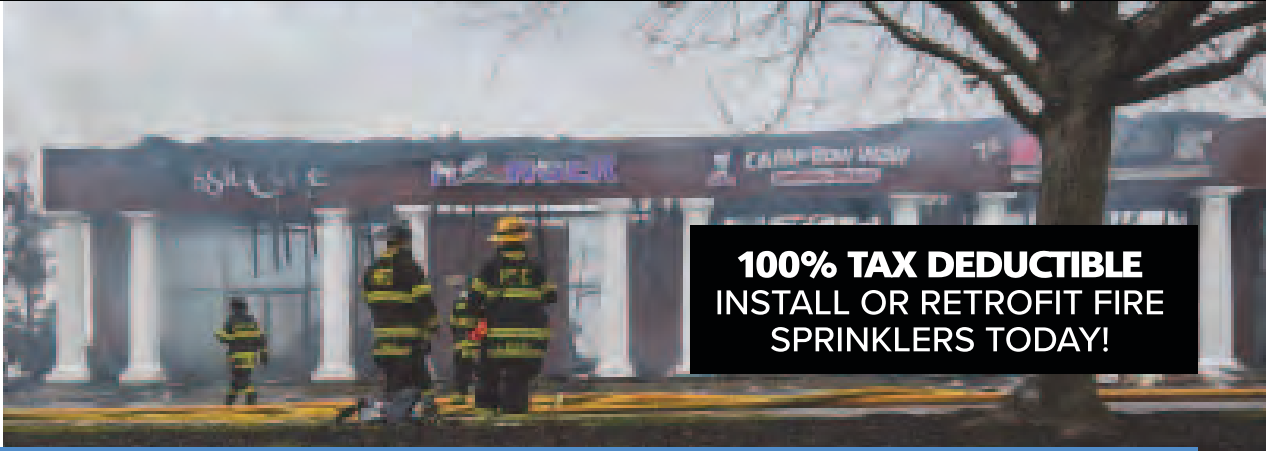
# CHIEF ENGINEER™

NOVEMBER 2023

## THIS MONTH'S ISSUE

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- Resurfacing the Rink at Morgan Park Sports Center • Pg 16
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# DON'T LET YOUR BUSINESS GO UP IN FLAMES!



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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.

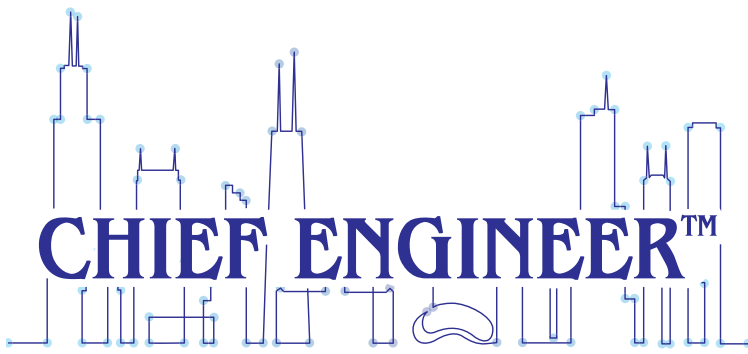
For more information on how these tax incentives might impact the business of your contractors, we would recommend that they contact their tax professionals, as situations differ based on the facts and circumstances for each business. As a general rule, we would not recommend that the Local provide tax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



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Mike Badame visits the Morgan Park Sports Center, where head Building Engineer Ralph White recently oversaw the resurfacing of its ice rink.

## 12 Troubleshooting: Ensuring Steam Trap Efficiency

Take a look into how to ensure that your steam traps are performing to the best of their ability.

## 22 2024 ASHRAE Winter Conference to Focus on Decarbonization, Climate Change, AI and More

The upcoming ASHRAE Winter Conference here in Chicago is going to be a big one for going green as well as for saving green.

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# PRESIDENT'S MESSAGE

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Dear Members,

While our Oktoberfest meeting never can compare with the popularity of our annual Golf Outing, there's just something about that particular event that's special. In part, it means that fall is finally here, and like so many of us, we're ready for it — not just at our properties, where we have our heating equipment in shape and ready to go. We may not like the cold that's yet to come, but while it lasts, fall is a golden time of year that many of us appreciate.



Likewise, we appreciate all of the sponsors who helped make our Oktoberfest event at Bridge 410 so memorable, including FE Moran, Air Comfort, Chicago Fire, Bear Construction and Hill Group. We should never take for granted our sponsoring organizations who have supported the Chief Engineer Association of Chicagoland over the years, and have helped create so many lasting memories as well as business relationships. Once again, I'll ask that you please keep them in mind when you have need for an outside contractor. Let's give them the support they deserve for their continued generosity on our behalf.

This month's meeting, our last prior to the holiday season, will take place Nov. 15 at Guaranteed Rate Field. Remember that at this meeting, we will be voting on the upcoming slate of officers. (See our Member News section on page 10 for the full list of nominees.) Registration is now open, so I hope I'll see as many of you as possible. Our thanks to Tom Phillips for making this event possible, as well as to our sponsors for their participation and support.

Our December meeting, as usual, will be scheduled in the second week of the month, on Wednesday, Dec. 13, at Maggiano's, 516 N. Clark St., downtown. Just a reminder that at the December meeting, we select a charity beneficiary to which we make a collective donation from the CEAC. Please be thoughtful and generous when giving.

While we're at it, let's be mindful of those men and women in uniform this Thanksgiving, both here and abroad, who may not be able to be with their loved ones while they're doing their duty to preserve us and our way of life.

See you at Sox Park on the 15th!

Sincerely,



Ken Botta



## Register Now for 2024 ASHRAE Winter Conference in Chicago

### ASHRAE Leads the Way in Public Health Standards with Groundbreaking Resource

ASHRAE is the leader in the development of guidance proven instrumental in safeguarding public health.

As the world continues to grapple with a resurgence of COVID-19, along with the flu and RSV, the importance of clean air flow in buildings has never been more critical. Now, the Society's pioneering resource, ASHRAE Standard 241, Control of Infectious Aerosols, is empowering building owners, operators and professionals to proactively protect indoor environments during this fall and winter virus season.

ASHRAE Standard 241 establishes minimum requirements to reduce the risk of airborne aerosol transmission, such as the SARS-COV-2 virus, which causes COVID-19, the flu virus and other pathogens in buildings, like single and multi-family homes, offices, schools and health care facilities. Published in June and praised by former White House COVID Response Coordinator Dr. Ashish Jha as "One of the most important public health interventions seen in years," Standard 241 is the first consensus-based, code-enforceable standard of its kind, having the potential for adoption at the federal level for all buildings.

"The world knows ASHRAE's leadership in sustainable, energy-efficient building technology, but we are also leaders in the development of public health standards that are making incredible impacts on building occupants

around the world," said 2023-24 ASHRAE President Ginger Scoggins, P.E., Fellow ASHRAE. "The importance of improved indoor air quality and ventilation became topics of mainstream concern during the pandemic, and ASHRAE remained committed to prioritizing the health and wellbeing of building occupants. Standard 241 is a blueprint for building designers, owners and operators with long-term benefits."

ASHRAE Standard 241 provides comprehensive guidance on the design, installation, commissioning and maintenance of HVAC systems to control the spread of infectious aerosols. The standard also includes recommendations for ventilation rates, filtration and air cleaning technologies, along with a building readiness plan that documents procedures for assessing existing or new HVAC systems to determine if they are working properly.

"With the fall and winter virus season approaching, mitigating the spread of airborne infections will be of even greater importance, and incorporating the guidance in Standard 241 can be a major step forward in addressing clean air flow goals," said Scoggins.

*For more information on ASHRAE Standard 241, including related resources, visit [ashrae.org/Standard241](https://ashrae.org/Standard241).*

# ASHRAE Wraps Up Successful 2023 Building Performance Analysis Conference

Embodied Carbon and Operational Energy were the focus of the 2023 ASHRAE Building Performance Analysis Conference held recently in Austin, Texas.

The theme of the conference, "Holistic Building Analysis: Linking Operational Energy, Embodied Carbon and Comfort," centered on a comprehensive approach of evaluating and designing buildings.

"This year's conference emphasized the importance of considering not only a building's energy consumption during operation, but also its carbon footprint throughout its lifecycle, while keeping occupant comfort and wellbeing in mind," said John Bynum, Conference Chair. "This theme challenged building professionals to rethink traditional building practices and adopt integrated strategies to create more sustainable and livable buildings."

The two-and-a-half-day conference, drawing 240 building industry professionals, included keynotes, paper sessions, seminars, vendor demonstrations, panel discussions and debates from more than 90 presenters.

Keynote sessions featured presentations from Jason DeGraw (*Extreme Events and the Role of Modeling in a Resilient Future*), Duncan Cox (*Whole Life Carbon, is This the Right Approach?*) and Alejandra Menchaca (*Early Design: The Greatest Opportunity to Influence Performance*).

Top-attended sessions were:

- *Modeling for Carbon and Embodied Energy I* – This session covered important aspects related to building and construction decarbonization.
- *Fishbowl Session* – This session allowed members of the audience to freely "join and exit" a panel discussion on a topic introduced by the panel moderator, 2023-24 ASHRAE President Elect Dennis Knight.
- *Occupant Health, Wellbeing and Comfort* – This session included three presentations on occupant comfort in indoor and outdoor settings and from thermal and visual perspectives

In conjunction with the conference, the 2023 LowDown Showdown modeling team competition was held where integrated teams of architects, engineers, designers and energy modelers worked together to create outstanding designs that solve real-world building efficiency challenges. This year's competition asked teams to envision a new creative reuse of the Houston Astrodome to provide needed urban amenities, and to do so within the constraints of reduced fossil fuel use and reduced carbon emissions.

First place was awarded to team "Carbon Lighters." See the team's complete project overview on the Modeling Challenge webpage, [ashrae.org/2023LDSd](http://ashrae.org/2023LDSd).

All sessions were recorded and posted for on-demand viewing. Presentations will remain available online for approximately 12 months after the conference has taken place.

Next year's conference will be rebranded as the 2024 ASHRAE Conference for Integrated Design, Construction & Operations, June 24-26, 2024, in Indianapolis, Ind. The conference will be hosted in conjunction with the 2024 ASHRAE Annual Conference. For more information, visit [ashrae.org/cidco24](http://ashrae.org/cidco24).



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## 2024 AHR Expo

Jan. 22-24, 2024  
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The AHR Expo brings together manufacturers and suppliers of all sizes and specialties to share ideas and showcase the future of HVACR technology. It's the industry's best place for OEMs, engineers, contractors, facility operators, architects, educators, and other professionals to experience everything new in HVACR and build the vital relationships that grow businesses and careers. 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, attendees can look forward to:

- 100+ free sessions on today's best practices, industry trends, tips for improved ROI, and ways to boost your professional growth.
- Sitting in on rapid-fire 20-minute presentations of new products and tech directly from manufacturers. Three theaters on the show floor will host 150+ presentations.
- The AHR Panel Series bringing together a wide variety of leaders to discuss trending topics and their impact across industry segments.

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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. Here are 5 ways this year's floor experience will blow you away:

1. **Meet the Big Players and the Small, and Everyone in Between.** The AHR Expo brings together the world's largest array of HVACR manufacturers, from established industry giants to innovative start-ups.
2. **See Products in Action.** Tired of browsing online and only reading about the latest HVACR products? Wish you could see, touch, and experience them for yourself? Access it all on the AHR Expo show floor.
3. **Get Real Answers.** Talk to top-level product experts in real time. Ask your questions and find out in 30 minutes what would otherwise take days of research and calls. There is simply no substitute for getting face-to-face with qualified professionals.
4. **Address HVACR's Hot Topics.** In addition to two special sections on the show floor focused on building automation and software, exhibitors will be showcasing solutions and ideas for the industry's most pressing challenges and opportunities. Stay current on a wide array of topics, from AI & Controls to Decarbonization, Plumbing & Hydronics to Heat Pumps, and more.
5. **Experience the Community.** Are you passionate about making a positive difference in the world and growing your business and career at the same time? Experience the once-a-year opportunity to interact with your colleagues, make new friends, and be a part of something bigger than yourself at AHR Expo 2024.


For more information or for event registration, visit [www.ahrexpo.com](http://www.ahrexpo.com). 



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[www.chiefengineer.org](http://www.chiefengineer.org)



## Up & Coming Engineer: Joe Lazzaro

### Dedicated to the Profession

by Kate Gawlik

Joe Lazzaro relies on his mentors, including Lore Roberto Ramos (left), to continue his learning.

The challenges of a job can be seen in two ways — as obstacles or part of the profession. The latter is true for Joe Lazzaro, a stationary engineer with Nature's Fynd, who says challenges are rare for him because of how he approaches his job.

Lazzaro, a Bridgeport native and De La Salle High Institute graduate, started training with the International Union of Operating Engineers Local 399 after high school. In 2016, he earned Online Cooling Tower and Online Local 399 chlorofluorocarbon (CFC) certifications. In 2017, he added on a certification for Service and Maintenance of Centrifugal Pumps, Motor Basics and Labor History. Lazzaro achieved his EPA Universal Card in 2018.

For those thinking about a similar path, Lazzaro says, "The classes and the training, it all is worth it in the end. You will see a huge difference in yourself when comparing what you knew at the beginning of your journey to your comfort level after."

Lazzaro worked under the leadership of Frankie Phillips and Stu Kemick. "Their mentorship has proved to be inspiring," Lazzaro explains. "Not only have they allowed me to work alongside them, but learn from them. Being able to learn from some of the best is mentorship enough. They have helped me reach new heights."

While going through the Local 399 courses and completing his education, Lazzaro worked as a stationary engineer at 2101 S. Michigan Ave., the Westin Chicago Northwest, and Lagunitas Brewery. He started at Nature's Fynd about two years ago, joining others who were intrigued by the operations that create a nutritional fungi protein called Fy. He describes the

opportunity as tremendous, with the added bonus of working with seven engineers from a past job, including mentors Lore Roberto Ramos and Hamza Abuosba.

"Joe's technical acumen has been solid, as he is quick to dive into issues and come up with solutions, Ramos says. "This is where having good mentors around him has helped him improve and match his technical talent."

Lazzaro is grateful to learn from his crew and is concerned about the lack of qualified workers joining the trades. Lazzaro makes it his focus to mentor new co-workers to ensure that the people who are coming into the engineering profession are getting trained and remain excited about the position.

He says, "The trend that I see lately in engineering is, we need more workers to enter the industrial workforce who truly want to be part of the labor force. We need to see people want to advance themselves within a trade."

For Lazzaro, his curiosity in the trades came from his father, an accident investigator for the city of Chicago who has a reputation for fixing anything.



Feeling part of a team with true friends is one of the benefits of the profession for Joe Lazzaro.

"My grandfather had his own construction business, and my father used to work for him when he was young. That's where my dad got his start working on houses; everyone still calls him to help fix things. He gutted the first house we lived in and did everything by himself. I always wanted to help him when I was a kid, so I learned a lot from my dad.

"I found my place in engineering when I realized the tasks that I could accomplish just from watching and learning from my dad."

At Nature's Fynd, Lazzaro is exposed to many different levels of mechanics, including NASA-level robotics. When it comes to the automation, Lazzaro focuses on the sensors and wires that keep everything functioning. Occasionally sensors break and wires become dirty. The team uses a human-machine interface (HMI) that connects an operator to the controller for an industrial system.

Lazzaro points out, "HMLs have important information, but if you don't understand what it shows, troubleshooting is really hard."

While every stationary engineer doesn't take on such tasks, Lazzaro is excited about the technology that is creeping into other areas of the industry.

"I think that the future of the industry will be exceptional with the new technologies that are springing up," Lazzaro explains. "I believe that the technological world will allow us to expand on not only our engineering techniques but the equipment that we will receive from it."

The future of the International Union of Operating Engineers Local 399 is in the hands of Lazzaro and others who have a drive and passion for this career.

"I want people to know that this is a great profession, there is always room for someone to join, and it is ever-expanding. The work and dedication you put into becoming an engineer is rewarding," Lazzaro notes. 📺

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

### **7 Questions With Joe Lazzaro**

#### **What is your favorite thing about Chicago?**

My favorite thing about Chicago is my friends and family being here.

#### **What is the latest show you binged and loved?**

It's Always Sunny in Philadelphia.

#### **What is your favorite meal?**

Cheeseburger.

#### **What is your most memorable concert or event?**

Jon Pardi at Red Rocks Amphitheater in Morrison, Colo.

#### **My favorite part about working in the industry is ...**

Expanding my knowledge and learning new techniques and new languages.

#### **When you were a child, what career did you want to have when you grew up?**

I wanted to be a fireman.

#### **What's the most exciting/adventurous thing you've done?**

I went to the All-Star Game with my parents in 2004 at the now Guaranteed Rate Field.



## **BEAR Construction Contributes to Old Chicago Post Office Award Win for Adaptive Reuse**

The renovation of the Old Chicago Post Office is a landmark project for BEAR. And this is being recognized quite literally as it the recipient of the 2023 Landmark Illinois Richard H. Driehaus Foundation Preservation Award for Adaptive Reuse.

"The grand reawakening of the Old Post Office in Chicago, built in 1921, is a testament to the indomitable spirit of architectural preservation and adaptive reuse," a recent press announcement asserted. "What became the largest adaptive reuse project in the nation was led by the partnership of 601W Companies, JLL, Telos Group, BEAR Construction and Gensler. They transformed the long-threatened and highly visible local and national landmarked building — included on Landmarks Illinois' 1997 Most Endangered Historic Places in Illinois — into a luxurious office complex that seamlessly blends its Art Deco roots with modern sensibilities. The massive project demanded meticulous attention to detail, seamlessly integrating contemporary amenities while honoring the building's rich heritage."

Congratulations, BEAR Construction and everyone involved! 📺

*Photo Credit: Liz Chilsen*

## Troubleshooting: Ensuring Steam Trap Efficiency

By Karl J. Paloucek

In your steam system, a steam trap is a necessity that filters out condensate as well as non-condensable gases. In selecting the right steam trap for your building's system, you need for it to successfully perform under whatever the conditions are in your area. To ensure its efficiency in every circumstance, put it through its paces with variable operating pressures, contrasting head loads or condensate pressure. Whatever the conditions, the steam trap you select should help to improve your system's overall efficiency.

But not everybody takes this kind of care with regard to selecting and maintaining the steam traps for their system. It's not uncommon for steam traps to go unattended, and when they begin to fail, this can result in the loss of hundreds to thousands of dollars in lost energy for their facilities. So let's look at how you can detect problems with your steam trap before they become too serious and avoid costly inefficiencies, repairs or avoidable replacement.

Among the most common causes of steam trap failure include oversizing, which can lead to overworking of your trap, and dirt accumulation, which can cause plugging or the prevention of valve sealing. But with a properly and regularly executed maintenance plan, you can avoid these and other problems, like strainer failure or blowdown valve failure. In looking out for these or like difficulties, keep an eye out for any of the following:

- Overheating in your boiler room
- Premature failure of the condensate pump's water seal
- Either overheating or underheating of conditioned space
- Your boiler struggles to maintain operating pressure
- Difficulty in maintaining vacuum in the return lines
- Water hammer in the steam and condensate lines
- Steam buildup in the condensate return lines
- Inlet and outlet lines the same temperature
- A higher-than-normal energy bill

Any of the above should trigger a response to at least check things out. If you suspect that your steam traps could be failing, consider testing them. Install a test valve downstream of the trap. Use sound detection equipment to listen to and diagnose the trap's action, or measure the temperature differential between the inlet and outlet of the trap. Any of these should give you a pretty good idea of what's going on within your steam system in the trap area. That said, if your system's conditions have markedly changed over the years, some of the above diagnostics might not be as accurate as they



More often than not, it will be easiest to simply replace your steam traps, but knowing how to properly maintain and care for them can help extend their lives, increase efficiency and lower costs.

as a testing device inside your steam trap, with a sensor that uses conductivity to detect the physical state within the trap. This can be done locally, remotely, manually or automatically, offering heightened flexibility for detection that can help you to minimize inefficiency and maximize return on the investment in your steam trap and your system as a whole.

Of course, your steam trap maintenance and testing routines will vary depending on what type of trap you have installed, as well as its application. If you have a balanced pressure steam trap, for example, its element is designed for easy replacement, and so long as you do so on the recommended schedule — about every three years or so — you'll reduce the need for trap checking overall, and will minimize the chance for defects and inefficiencies.

If you have a thermostatic trap installed, they generally can be changed by removing the screwed-in seat but it's a somewhat more complicated operation for thermodynamic traps. In this case, either two separate gasket joints or a single gasket will have to operate with two or more steam passages. If you've allowed the trap and body seat to blow steam, it should be easy to spot the weakest point between the joints.

A quick note regarding performing any replacement of parts on your steam traps — always check with the manufacturer about the proper technique for any parts replacement or other maintenance to them, and that site

conditions are a crucial factor in determining the nuance of that correct procedure. In fixing a small float trap, for example, the trap is designed so that the cover and internal parts can be removed and taken to a workshop for maintenance or replacement, allowing the main body of the trap to remain attached. This is much preferred to replacing the seats on an inaccessible trap, which typically melt into the pipework in dirty conditions. Any professional and respected manufacturer will supply you with the documents, direction and spare parts you need to get the job done to the highest standard.

More often than not, it will simply be easiest just to replace your traps than to repair them. To make it as easy as possible to do so during routine maintenance, you might consider installing flanged traps as opposed to the screwed variety — it might be more expensive, but it will make things easier and more efficient. And as always, if you have any difficulties or need an assist, call your manufacturer or one of our appropriate Associate Member organizations for that help that only they can provide. ■■■



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**1.6**

Saturday, January 6  
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LOCATION: THALIA HALL

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**2.17**

Saturday, February 17  
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LOCATION: MORGAN PARK SPORT CENTER

**3.20**

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

LOCATION: IRISH AMERICAN HERITAGE CENTER



# Resurfacing the Rink at Morgan Park Sports Center

By Michael A. Badame

You've been there for the February Skatefest — now see how it had its entire rink resurfaced.

The Morgan Park Sports Center is a 64,000-square-foot facility that sits in the Beverly/Morgan Park community on the Southwest Side of the city. This facility is the only combination gymnastics center and indoor skating rink in the City of Chicago. It boasts a state-of-the-art, NHL regulation-sized indoor ice rink, an 11,700-square-foot gymnastics center that can accommodate USGA competitions, two classrooms and also support program spaces.

Facility Manager Scott Brost was kind enough to take me on a tour of the facility and talk about the wide range of activities the property offers. “We have an umbrella of activities to offer the community that run from 6:00am to 12:00am 7 days per week. Skaters range from U8 to 18, activities are available from early morning to late at night, and this is a great place to keep teens in the community busy!” said Brost.

When I asked Brost how busy the facility gets, he replied, “We’ll have kids and adults from Brother Rice, Mt. Carmel, Marist, and St. Rita that take advantage of activities from our wellness program to open skate, we will also be hosting the 2024 Veterans World Event.”

After the overall facility tour with Brost, I was introduced to the head Building Engineer Ralph White to discuss details on the technical operations of the facility and a recently completed ice rink resurfacing project he supervised.



Ralph White oversees the resurfacing at the Morgan Park Sports Center.





The rink at Morgan Park Sports Center is an incredibly sophisticated piece of technology in action.

I didn't think that an ice rink could be that complicated until White took me for a technical tour of the equipment and operations.

An ice rink typically has the following layers from top to bottom:

1. Skating Surface
2. Chilled Concrete Slab
3. Insulation
4. Heated Concrete
5. Sand-and-Gravel Base
6. Groundwater Drain

The facility houses two 60-Ton Emerson Vilter VMC 450 XL Chillers, utilizing R717 refrigerant that provides cooling to a chilled concrete slab to make the ice as well as maintain it. There is a layer of insulation underneath the chilled concrete slab that reduces the energy required to make and maintain the ice.



Emerson Vilter VMC compressors.

The chilled concrete was designed to operate with a setpoint of 19°F. The system is monitored through a PLC-based control system which sends out notifications any time the system has critical alarms or is operating outside of design parameters. White mentioned, "The actual ice temperature will fluctuate between 19 °F and 26°F depending on the skating activity and building occupancy."



Domestic water heat reclamation exchangers.

A 50/50 water and glycol fluid mixture is circulated through 1" DR-11 HDPE tubing that is embedded in the concrete slab. The fluid has a supply temperature of 12°F and a return temperature of 15°F. The total volume of the water/glycol mixture in circulation for the chilled concrete slab is 400 gallons. After the heat has been absorbed into the system through the refrigeration process, the heat is not just rejected from the building. I asked White how they use this heat to increase the efficiency of their overall operations. "Some of the heat is repurposed through a heat reclamation system used to preheat the domestic hot water for the facility, melt snow in a collection pit and raise the temperature of the subsoil beneath the rink. Any heat that is not reclaimed is then rejected to the atmosphere through a cooling tower. Since the refrigeration process is energy-intensive, all heat that can be reclaimed and returned to the facility for other uses is both beneficial and sustainable," White explained.

The earth's subsoil temperature beneath the ice and concrete is monitored with temperature sensors. There is an additional coil under the chilled concrete slab that is operated at 55°F to keep the ground below from freezing, and from potentially expanding and cracking the concrete slab of the rink. To accomplish this, there is an additional coil, referenced as heated concrete,



Baltimore Aircoil Company (BAC) cooling tower

under the chilled concrete slab and insulation, to remove the snow that has been accumulated during the resurfacing process using the Zamboni.

"The Zamboni cuts the ice with a large razor on the front of the machine, where 1/16" of the ice is removed, fed through an auger and into a hopper. One-hundred-forty-degree water is then sprayed to smooth out any imperfections on the surface and we melt the ice shavings, utilizing reclaimed heat rejected from our main cooling system," says White.

The properties of the air within the ice rink play a critical role in maintaining the quality of ice at the facility. White began explaining the challenges associated with maintaining the proper dry bulb temperature and relative humidity conditions in order to avoid issues such as soft ice or even condensation at the ice surface. "We keep the dry bulb temperature at a constant 57°F and the relative humidity around 45 percent. Innovent Energy Recovery Ventilators (ERV) are used to maintain tight control of humidity in the ice rink so the quality of our ice stays top-notch."

Energy consumption from an ice plant such as this can account for 45 percent or more of the building's total energy use. This is where energy recovery wheels and heat reclaim equipment are utilized to maximize the utilization of energy and reduce the overall carbon footprint.

## KNOW THIS!

ANSI/ASHRAE Standards 62.1 and 62.2 are the recognized standards for ventilation system design and acceptable indoor air quality (IAQ).

Outdoor Air Requirements for Ventilation indicates that "Ice Arenas should be ventilated at the rate of 0.50 cfm/sqft." This is for occupants with a high activity level and does not account for ventilation requirements in spectator areas. Spectator areas would have to be calculated separately and added to the ventilation rate. Therefore, a cfm rate per square foot is more accurate to use when occupant loads vary significantly.

Make sure you are checking with your local code requirements and factoring in ventilation loads for multi-use areas of your facility.

After hearing about the intricacies of what it takes to operate the ice rink, White starting taking me through their recent ice rink resurfacing project. "The ice rink is resurfaced every 5 years, and it's always a cool thing to be a part of. We start off by shutting off the refrigeration system and leaving on the circulating pumps. Without the refrigeration system operating, the ice begins to slowly start separating from the concrete slab.

Bobcats are then used to break the ice up and haul it away in slabs. Once they have removed all of the ice, we are ready to start rebuilding a fresh ice rink layer by layer."



Bobcat removing ice from rink in slabs.



Bobcat hauling broken slabs of ice from rink.

"The refrigeration system is turned back on in order to bring the chilled concrete slab down to 14°F. Water is then sprayed out of a manifold with nozzles to form the first 1/16" layer of ice. This process is repeated over and over until an ice thickness of 1/4" is achieved.



Initial ice layers before painting lines & logos.

The ice is then painted white using specialty paint that is formulated just for this purpose. Water spraying continues until an additional 1/8" layer of ice has been achieved.



Lines and logos added to newly resurfaced ice rink.

At this point, lines and logos are painted onto the ice using the same specialty paint which has a sharp contrast on the white background. The ice is then allowed to cool down to 14°F and is flooded with water till the last 3/4" of thickness has been achieved.

The Zamboni comes out and does some finishing touches and the newly resurfaced ice rink is ready for action!"

*Ralph White has more than 35 years of experience as an Operating Engineer with Local 399. He is an Adjunct Professor teaching Energy Conservation and Sustainable Facilities for the last 10 years at Local 399 Technology Center. He is USGBC certified in Leadership in Energy and Environmental Design for Existing Buildings Operations & Maintenance (LEED-EBOM). He is also Recording Secretary with the Chief Engineers Association of Chicagoland.*

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# CHICAGO NEWS

## 2024 ASHRAE Winter Conference to Focus on Decarbonization, Climate Change, AI and More

ASHRAE has unveiled the preliminary technical program for its highly anticipated 2024 ASHRAE Winter Conference, taking place Jan. 20-24, 2024, in Chicago, Ill. The technical program can be found online at [ashrae.org/conferences/2024-winter-conference-chicago](https://www.ashrae.org/conferences/2024-winter-conference-chicago) and in the ASHRAE 365 app.

With a focus on addressing the pressing challenges of decarbonization and climate change, the conference will feature 11 technical tracks and more than 100 sessions, offering attendees a wealth of knowledge and insights. Participants will have the opportunity to earn Professional Development Hours (PDHs) while exploring tracks such as Decarbonization and Climate Change, Clean Spaces and Mission Critical Facilities, Tall Buildings Design, Artificial Intelligence, Refrigeration and Refrigerants and more.

"The conference gives attendees an unparalleled opportunity to discover practical and timely solutions to some of the greatest challenges facing the built environment," said Suzanne LeViseur, 2024 ASHRAE Winter Conference chair. "ASHRAE's decarbonization focus is included within all of the technical tracks, so that we can provide effective strategies on a variety of topics through the conference sessions."

Some examples of decarbonization related sessions include:

- Decarbonization in Cold Chain Process (Refrigeration and Refrigerants Track)
- The Logical Way to Tap Into Decarbonization: Hydronic District Energy Systems (Hydronic Systems Track)
- Beneficial Electrification (HVAC&R Systems and Equipment Track)
- Grid-Interactive Buildings for a Decarbonized World (Decarbonization and Climate Change Track)

Additional trending session include:

- Laboratory Superhero: The Critical Plan to Save
- Pulling Back the Curtain on DEI
- Standard 241: You Have Questions; We Have Answers
- Artificial Intelligence for Buildings Performance Simulation
- Harmony in Action: ASHRAE Standards Paving the Way for Building Decarbonization
- What's the Fuss About Zero Trust Cyber Security for BAS Control Systems
- Who's Afraid of the Net Zero Wolf?



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During the Plenary session, Canadian climate change solutions expert Chris Turner will give a keynote presentation on the global shift towards clean energy. ASHRAE Executive Vice President and Secretary Jeff Littleton will provide Society updates in his report and the accomplishments of ASHRAE's members will be recognized during the Honors and Awards ceremony.

At the President's Luncheon, 2023-24 ASHRAE President Ginger Scoggins will deliver her State of the Society address, marking progress toward initiatives outlined in the current Society theme, "Challenge Accepted: Tackling the Climate Crisis."

The ASHRAE Learning Institute will offer 18 courses during the conference. All courses are approved for continuing education credits toward maintaining P.E. licensure.

Four new courses are being offered:

- Starting the Path to Net-Zero Buildings Using ASHRAE 90.1-2022
- Understanding ASHRAE Standard 241 Control of Infectious Aerosols – Background, Overview, and Key Requirements
- V in HVAC – Health and Energy Improvements Using the Indoor Air Quality Procedures
- Is Your Building Ready? Applying ASHRAE Standard 241 Control of Infectious Aerosols – Facility Assessment, Planning, and Implementation

ASHRAE certification exams will also be administered during the week and business, committee and technical meetings will be conducted in the weeks leading up to, and during the conference.

The cost to attend the conference in-person is \$755 for ASHRAE members (\$1,010 for non-members, which includes an ASHRAE membership for one year). Company packages are available for virtual registrants. Conference registration includes free entry to the co-sponsored 2024 AHR Expo, Jan. 22-24, 2024. (See pg. 8 for more information.) Please check the conference webpage for additional pricing.

Tickets for tours, select social events, and ASHRAE Learning Institute Courses can be purchased during the registration process.

To learn more about the 2024 ASHRAE Winter Conference and to register, visit [ashrae.org/2024winter](http://ashrae.org/2024winter).



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Each year at the December meeting, the CEAC dedicates the event to a charity or family in need. This year, the event will benefit fellow Union brother, Paul Reynolds, who has been diagnosed with a Stage IV, incurable brain tumor. Paul is unable to work at this time as he receives treatment. Please bring a gift card (grocery/Target/Amazon) or monetary donation to help support the family.

**RSVP:** [HTTPS://CHIEFENGINEER.ORG/2023/DECEMBER/](https://chiefengineer.org/2023/december/)

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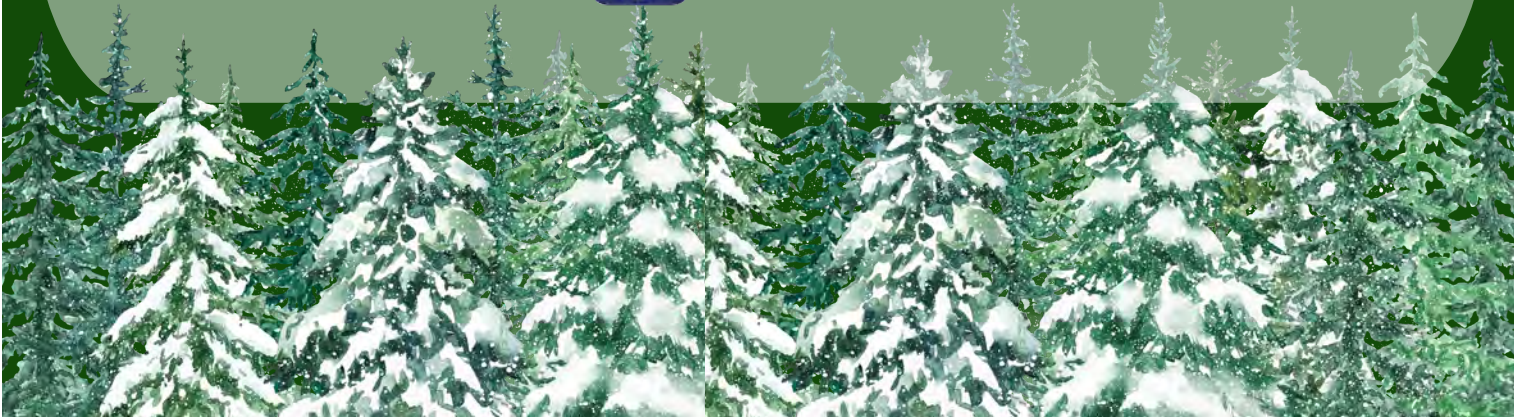


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### **CHIEF ENGINEER MEMBER INFO AND REMINDERS**

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](http://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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Watts' Series 800 pressure vacuum breaker backflow preventers offer freeze alerts to help prevent freeze damage.

# Watts Introduces Freeze-Sensing Technology on Series 800 Pressure Vacuum Breakers

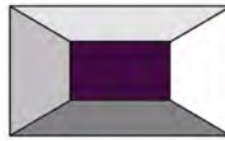
Preinstalled, connection-capable freeze sensors will now come standard on 1", 1 1/4", 1 1/2" and 2" Watts Series 800 pressure vacuum breaker backflow preventers. This new technology can be combined with Building Management Systems (BMS) and Irrigation Management Systems (IMS) to receive freeze alerts with a separately purchased add-on activation kit.

Key benefits include:

- Receive freeze alerts via sensor, enabling you to take action to prevent freeze damage
- Monitor your backflow preventer 24/7
- Reduce water waste as a result of freeze damage

Users can convert their existing Watts Series 800 pressure vacuum breaker orders to include this new freeze detection technology at no additional cost.

To learn more, visit [Watts.com/Freeze-Detection](http://Watts.com/Freeze-Detection). 



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## Next Generation Stud Finder Expedites HVACR Work

For HVACR contractors, maximizing efficiency involves knowing as well as possible what is behind a wall. This is necessary to install, maintain and repair climate control systems. To work safely, contractors typically rely on stud finders to locate studs and other objects in the wall and be alerted to the presence of live, unshielded AC electricity.

HVACR contractors have long utilized stud finders based on unrefined capacitive technology. While this original technology can indicate the location of wood stud framing, it may also discover metal, plastic, wiring and other objects in walls, and indicate them as studs. The potential for “false positive” indications is further increased by brands with constantly active, hypersensitive “deep scanning” models. The result is that traditional stud finders may chirp or flash LED lights to indicate something was sensed, but it is not clear what that is.

Today, the challenge of accurately assessing what is behind walls is only increasing. There is more behind the drywall than ever, including network cabling, plastic pipes, and tubing. Complicating matters, not all construction follows standard stud spacing practices of 16 inches or 24 inches on-center, and there are often additional support beams, fire blocks and other framing features that can further muddy the picture.

HVAC ductwork may change direction to avoid studs, wiring and other obstructions, and location also varies depending on the home’s style and layout.

Now, newer and more refined technology is being introduced to the popular stud finder category, and it promises to redefine the standards for stud finder performance.

## Increasing HVACR Contractors’ Productivity

HVACR contractors need to find wood studs. Finding the voids between studs is necessary to quickly assess how much room there is behind the wall to reroute ductwork or mount a new fixture. Whether retrofitting a residential or commercial building, it can be particularly important to understand if the studs are plumb, or if fire blocking is present.

HVACR contractors now can use advanced, second-generation stud finders from Zircon Corporation that utilize multiple sensors and sophisticated signal processing to help filter out false positives, minimizing the risk of misidentifying objects as studs.

Zircon, a wholly owned subsidiary of ZRCN Inc., has been in the stud finder game for more than 40 years. In 1980, the company manufactured the original StudSensor™ stud finder and invented the category. The Silicon Valley-based company produces more than just stud finders. It designs and manufactures an extended range of sensor technologies in electronic hand tools including wall scanners, metal detectors, circuit breaker finders, drill guides, water detectors and leveling tools.

The company’s latest innovation is the Wood Stud SuperScan® advanced stud finder with Target Control® technology and FILTERz™ cancellation. By analyzing the complex data streams from multiple sensors and controlling the result using sophisticated intelligence, the stud finder can find wood studs and filter out metallic objects such as plumbing, conduit, straps, brackets, screws, protector plates or ductwork behind the wall. The technology also alerts users to the presence of other low density, non-metallic targets like plastic pipe and PEX tubing.

DeepScan® mode locates the center of wood studs and metal up to 1½ inches deep behind walls. A MetallWarning® indicator will display when metal is detected.

To minimize the risk of cutting into dangerous electrical wires, the device also provides WireWarning® detection, which indicates the presence of live, unshielded AC electricity.

The stud finder has a new and improved user interface which provides an intuitive “go/no go” indication in response to what is being sensed. A new haptic vibration



and a patented SpotLite® pointer shines an arrow-shaped beam on the wall, to clearly indicate the target's location.

For HVACR contractors, the ability to determine quickly and more accurately what may be behind the wall before cutting into it will substantially increase productivity and safety. HVACR contractors would do well to upgrade their existing stud finder with this affordable, next-generation model that is sure to become the new standard in scanning.

For more information, call Zircon Corporation at (408) 963-4550, e-mail: info@zircon.com, or visit [www.zircon.com](http://www.zircon.com).



## Lennox Celebrates One Million Smart Thermostats Sold

Lennox® recently sold its one millionth Lennox Smart Thermostat since the company first introduced smart thermostat products. This milestone reflects the company's continued commitment to delivering healthier, cleaner air and increased efficiency through innovative technology.

Earlier this year, Lennox expanded its industry-leading suite of smart products with the launch of the Lennox S40 Smart Thermostat and accessories. The S40 Smart Thermostat goes beyond standard temperature regulation with the ability to detect air pollutants, customize comfort by room, provide maintenance reminders and service alerts and more.

With 82 percent of homeowners saying they prioritize good air quality in their homes more now compared to a year ago, indoor air quality continues to be an increasingly important consideration for homeowners.<sup>1</sup> To ensure homeowners have the healthiest air possible, the S40 Smart Thermostat paired with the Smart Air Quality Monitor can detect and track particulates, carbon dioxide and volatile organic compounds inside the home.

Recognized as one of the Green Builder's 2023 Sustainable Products of the Year, the increased efficiency from the S40 Smart Thermostat not only saves money for the homeowner but also translates to lower greenhouse gas emissions and ultimately a healthier planet. The S40 Smart Thermostat is part of the Ultimate Comfort System™ HVAC system which combines the best of the Dave Lennox Signature® Collection products to create an unprecedented whole-home HVAC comfort system.

*To learn more about Lennox and its pursuit of driving energy efficiency, sustainability and innovative technology in the industry, visit: [www.Lennox.com](http://www.Lennox.com).*

<sup>1</sup>Survey commissioned by 4Media Group on behalf of Lennox Industries, November 2022.

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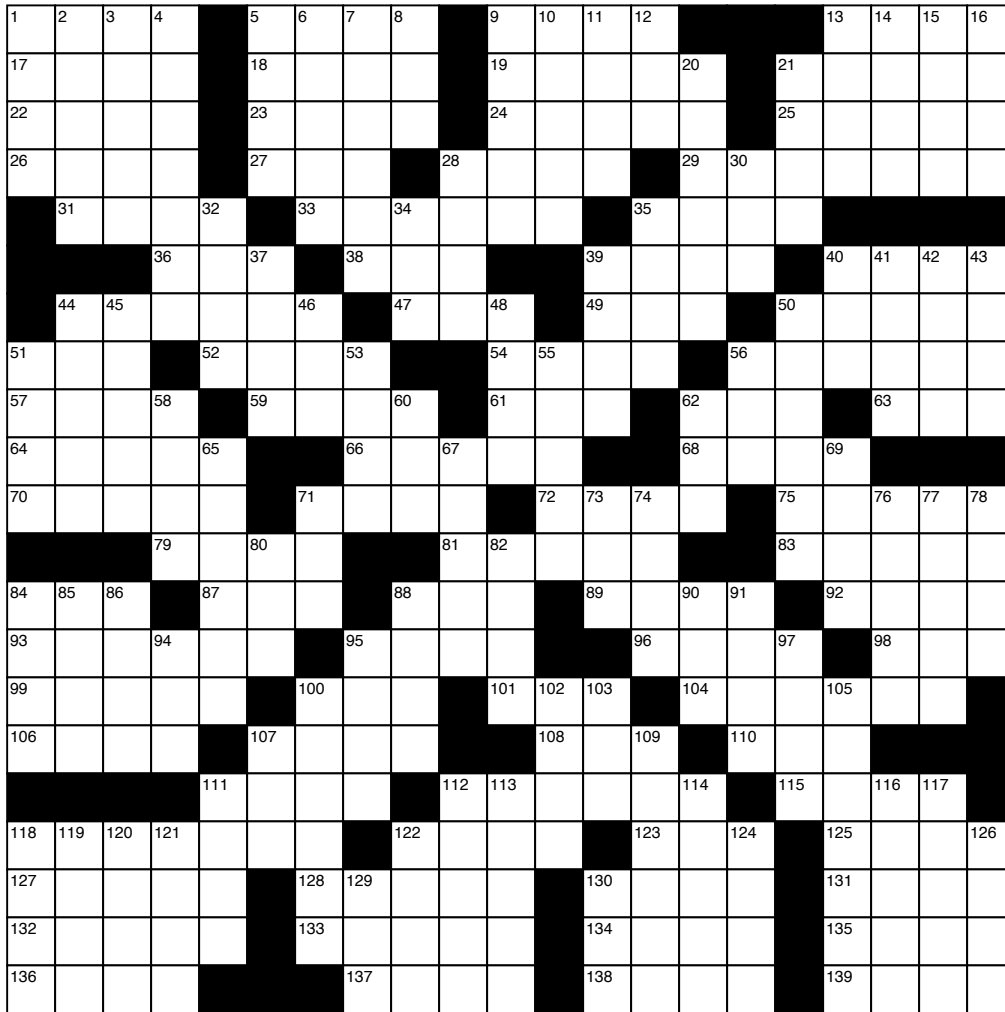
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# System Controls



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- 9 Help
- 10 Analyze syntactically
- 11 Narrow opening
- 12 First woman
- 13 Wild dog
- 14 Not out of
- 15 Scorch
- 16 Fresh
- 20 Convoy
- 21 Wet
- 28 \_\_\_\_\_ *switch*
- 30 **TAG-**
- 32 Light source
- 34 The other half of Jima
- 35 **Regulations**
- 37 Floating ice
- 39 Move quickly
- 40 Drunk
- 41 Mined metals
- 42 Pull
- 43 Opposed
- 44 Ermine
- 45 \_\_\_ cotta (clay)
- 46 Neither's partner
- 48 Take in
- 50 Popular Japanese drama
- 51 What children learn
- 53 Pop
- 55 Access (2 wds.)
- 56 Water closet
- 58 **Add more**
- 60 Physician
- 62 Bacon-lettuce-tomato sandwich
- 65 Delivery vehicles
- 67 Midwestern state denizen
- 69 Ripped up
- 71 Drink
- 73 Executive director
- 74 Rook
- 76 Musical composition
- 77 Present
- 78 Association (abbr.)
- 80 Killed in action
- 82 Attorney (abbr.)
- 84 Miss
- 85 Healing plant
- 86 Grain
- 88 Torah table
- 90 Type of Buddhism
- 91 Time period
- 94 Stood opposite
- 95 Soft cheese
- 97 Leaky faucet noise
- 100 **Technical Group**
- 102 Bunsen burner
- 103 **Mover of air**
- 105 Make jagged
- 107 Whiz
- 109 Lemon color
- 111 Ditto
- 112 Mimicker
- 113 Tusk
- 114 Card
- 116 Feather
- 117 Armor plate
- 118 Crazy
- 119 Person, place or thing
- 120 Write down quickly
- 121 Goad
- 122 Information
- 124 Tinted
- 126 Meshes
- 129 Dawdle
- 130 Affirmative

**ACROSS**

- 1 Totals
- 5 What a mosquito bite does
- 9 Niche
- 13 Bunch of hay
- 17 Glean
- 18 Scat!
- 19 **Flow device**
- 21 Receiver of a gift
- 22 S.A. Indian
- 23 Not taped
- 24 Constellation
- 25 Marriage site
- 26 Dictionary (abbr.)
- 27 Vane direction
- 28 Clenched hand
- 29 **Same surrounding conditions**
- 31 Disfigure
- 33 Grate
- 35 \_\_\_ d'etat
- 36 Workplace
- 38 Deuce
- 39 Arrange
- 40 Soybean
- 44 Pollen producer
- 47 IOU part
- 49 Central daylight time
- 50 Muslim "bible"
- 51 Dined
- 52 Support
- 54 Malaria

**56 Hidden**

- 57 Star Trek Automoton's
- 59 Graduate (abbr.)
- 61 Crimson
- 62 Float up and down
- 63 Slide on snow
- 64 Diamond weight unit
- 66 **Direction**
- 68 Klutz
- 70 Elevator alternative
- 71 Mexican sandwich
- 72 Account (abbr.)
- 75 Divided nation
- 79 Bomb
- 81 \_\_\_\_\_ **column**
- 83 Pressers
- 84 Food and Agriculture Organization (abbr.)
- 87 Central Intelligence Agency
- 88 Baseball stick
- 89 Slimly
- 92 Aborts
- 93 Mainland State
- 95 Arched
- 96 Unwanted plant
- 98 Wear
- 99 Tiny amounts
- 100 Fortify
- 101 Yes
- 104 Linear
- 106 For fear that
- 107 East

**108 Scriptural your**

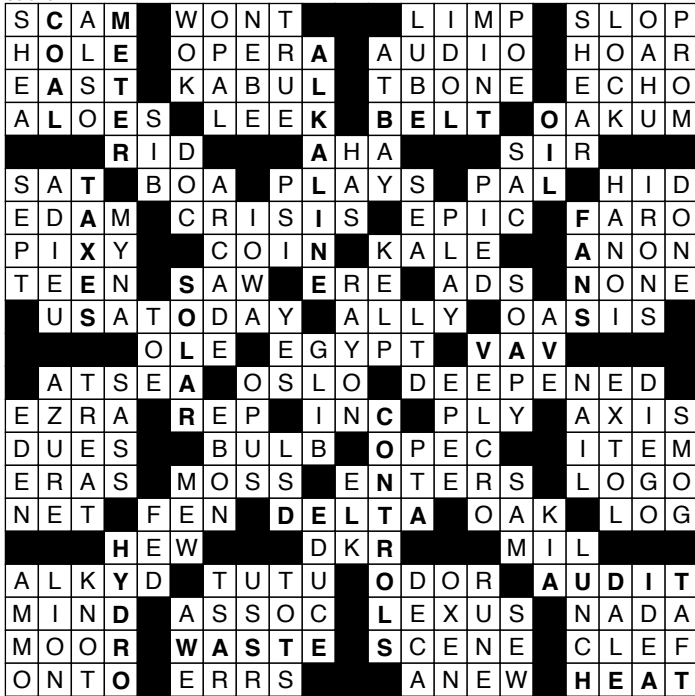
- 110 Rio de Janeiro
- 111 Suffer
- 112 Ballroom dance
- 115 Insect in a cocoon
- 118 Abater
- 122 Vocalist
- 123 Headed
- 125 Dale
- 127 Wastelands
- 128 "Remember the \_\_\_"
- 130 Drama
- 131 Great
- 132 Expenditure
- 133 Diner
- 134 Love flower
- 135 Discharge
- 136 Leg joint
- 137 Farside's Larson
- 138 Due
- 139 Loch \_\_\_ monster

**DOWN**

- 1 Dry
- 2 Material
- 3 Capital of Bangladesh
- 4 Omelet flipper
- 5 Island
- 6 Being
- 7 Stealthy
- 8 Garden tool

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