

THE MAINTENANCE BEACON

The Monthly Newsletter of the North Carolina Public School Maintenance Association

Volume 60, Number 6

June 2023

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MEETING DATES

The districts of NCPSMA meet twice yearly.

District 1

January, July

District 2

January, July

Pres. Ronald Moore

Phone: 910.296.1875

District 3

February, August

Pres. Greg Woodard

Phone: 252.399.7822

District 4

February, October

Pres. Donna Fields

Phone: 910.678.2565

District 5

March, September

Pres. Justin Dyson

Phone: 336.909.2280

District 6

April, October

Pres. Chris Adkins

Phone: 980.343.4526

District 7

May, November

Pres. Jeff Adams

Phone: 336.551.1109

District 8

March, November

V. Pres. Jason Kelly

Phone: 828.456.2402

Meeting Dates & Locations

Should be sent to The Maintenance Beacon two months in advance for publication.

Deadlines

Publication deadline for articles and advertisements is first day of the month prior to month of publication.

NCPSMA Welcomes New Advertiser



The NCPSMA is proud to introduce one of our new vendors to the organization – John Q. Bullard Associates Inc. headquartered in Norcross, GA with a local office to serve North Carolina in Apex.

John Q. Bullard Associates Inc. is a long-established manufacturer representative to the Southeast. John Q. Bullard Associates opened the doors May 1965, in a one room space inside of a sheet metal shop in Georgia. Mr. Bullard attracted a team of individuals with grit and integrity that helped to grow the company into what it is today. John Q. Bullard Associates, Inc. offers hydronic heating and cooling equipment from pumps, boilers, heat exchangers, cooling towers and much more! In addition, they have a warehouse in Norcross, GA where we can repair/refurbish/build pumps.

Two of those individuals who make up this fantastic team are Crystal Twiss, Sales Representative of the Carolinas, and Lance Bradner, General Manager of the Carolinas. For more information about their company visit their website at www.jqbullard.com, or contact Crystal Twiss at 404-633-2507 x 227.

Extreme Heat

There is hot, and then there is hot! Extreme heat is a period of high heat and humidity with temperatures above 90 degrees for at least two to three days. In extreme heat your body works extra hard to maintain a normal temperature, which can lead to death. Extreme heat is responsible for the highest number of annual deaths among all weather-related hazards.

Older adults, children and sick or overweight individuals are at greater risk from extreme heat.

Humidity increases the feeling of heat.

Prepare for Extreme Heat

Learn to [recognize the signs of heat illness](#).

- Do not rely on a fan as your primary cooling device. Fans create air flow and a false sense of comfort, but do not reduce body temperature or prevent heat-related illnesses.
- Identify places in your community where you can go to get cool such as libraries and shopping malls or contact your local health department to find a cooling center in your area.
- Cover windows with drapes or shades.
- Weather-strip doors and windows.
- Use window reflectors specifically designed to reflect heat back outside.
- Add insulation to keep the heat out.

Meetings and Events

51ST ANNUAL NCPSMA EASTERN CONVENTION/WORKSHOP

September 26-29, 2023

DoubleTree by Hilton Atlantic Beach

For more info please contact Krisite Payne at

828.565.0115 or office@ncpsma.org

JAY PALMER MEMORIAL SCHOLARSHIP GOLF TOURNAMENT

September 27, 2023 at 1 pm

Brandywine Bay Golf Club, 177 Brandywine Blvd., Morehead City, NC

For more info please contact Tournament Director James Palmer III

at 336.746.5000 or 336.239.1315 *mobile*

DISTRICT THREE GOLF TOURNAMENT

October 27, 2023 (Rain Date; November 3, 2023)

Lunch at 12 pm - Shotgun start at 1 pm

Wedgewood Golf Course, 3201 Old Stantonsburg Rd., Wilson, NC

For more info please contact Sue Farmer at 252.399.7823 or

sue.farmer@wilsonschoools.net

DISTRICT EIGHT FALL MEETING

November 2, 2023 at 6:00 pm

Nesbitt Discovery Academy, 175 Bingham Rd. Unit 10, Asheville, NC

For more info please contact Krisite Payne at

828.565.0115 or office@ncpsma.org

DISTRICT THREE MEETING

August 3, 2023 at 4:00 pm

Hosted by Johnston County Schools

Facility Services Building, 601-A West Market St., Smithfield, NC

For more info please contact D3 Secretary/Treasurer Sue Farmer at

252.399.7823 or sue.farmer@wilsonschoools.net

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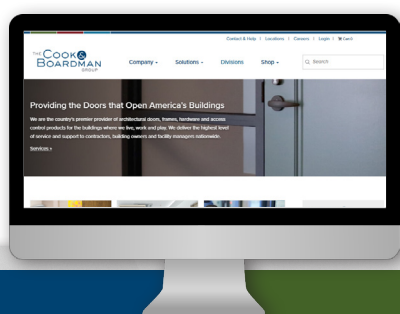
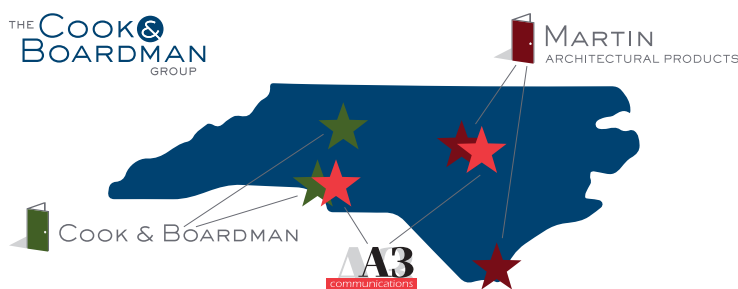
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Visit www.COOKANDBOARDMAN.com to learn more about our group, find helpful resources and to place product orders.

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Contact: Kevin Wren | (803) 984-7007



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Cook & Boardman

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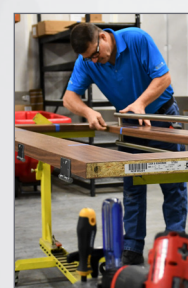
With offices in Charlotte and Winston-Salem, Cook & Boardman has provided architectural doors, frames and hardware across the state since 1955. Counter sales, pre-installation, fabrication, installation and service available!

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Winston-Salem Office: Vernon Spence | (336) 462-1829



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Construction Divisions: 8 & 10

With offices in Cary and Wilmington, Martin Architectural Products is the leading provider of architectural doors, frames and hardware in eastern North Carolina. Counter sales, installation and service available!

Cary Office: Ira Garner | (919) 868-6593

Wilmington Office: Kyle Praeuner | (402) 841-1345

Maintain Your Facility with a Green Cleaning Program

by Carlos Albir Jr. October 5, 2022

As the importance of green cleaning rises within the industry, so does the emergence of best practices for implementing a green cleaning program in facilities. Green cleaning refers to a system that utilizes both green chemicals and cleaning tools. While having the right tools is a great first step, there is more to green cleaning than the proper supplies.

Lay the foundation

First and foremost, implementing a green cleaning process requires the involvement of building owners, facility managers, and occupants. As stakeholders in the program, they need to agree on a system that defines their green cleaning values and how that program will be implemented in their facility. Once they have made an agreement, the stakeholders must put it into writing in succinct, easy-to-understand terms. Meanwhile, building leaders should organize a team that includes not only cleaning professionals, but also sustainability managers and supply chain professionals.

continued on page 4

Save the Date

NCPSMA invites you to participate in the Annual Jay Palmer Memorial Scholarship Golf Tournament

SCHOLARSHIP

GOLF

tournament

Sponsored by **Premier SUPPLY INC.**

Wednesday
September 27, 2023

Brandywine Bay Golf Club
177 Brandywine Boulevard, Morehead City, NC

Questions? Contact Kristie Payne at office@ncpsma.org or (828) 565-0115

Extreme Heat

continued from page 1

- Use a powered attic ventilator, or attic fan, to regulate the heat level of a building's attic by clearing out hot air.
- Install window air conditioners and insulate around them.

If you are unable to afford your cooling costs, weatherization or energy-related home repairs, contact the [Low Income Home Energy Assistance Program \(LIHEAP\)](#) for help.

Be Safe DURING

- Never leave people or pets in a closed car on a warm day.
- If air conditioning is not available in your home go to a cooling center.
- Take cool showers or baths.
- Wear loose, lightweight, light-colored clothing.
- Use your oven less to help reduce the temperature in your home.
- If you're outside, find shade. Wear a hat wide enough to protect your face.
- Drink plenty of fluids to stay hydrated.
- Avoid high-energy activities or work outdoors, during midday heat, if possible.
- Check on family members, seniors and neighbors.
- Watch for heat cramps, heat exhaustion and heat stroke.
- Consider pet safety. If they are outside, make sure they have plenty of cool water and access to comfortable shade. Asphalt and dark pavement can be very hot to your pet's feet.
- If using a mask, use one that is made of breathable fabric, such as cotton, instead of polyester. Don't wear a mask if you feel yourself overheating or have trouble breathing.

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Press Release

Governor Cooper Urges General Assembly to Make Major Investments in Public Education

April 25, 2023

Following Significant Student Learning Recovery, Governor Cooper Urges General Assembly to Make Major Investments in Public Education

Report Shows Over \$5 Billion in Federal Investments Empowered North Carolina Students to Experience Major Learning Recovery

Today, Governor Roy Cooper urged state legislators to make major investments in public education following a [report](#) from the North Carolina Department of Public Instruction that showed students across

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Press Release

Governor Cooper Urges General Assembly to Make Major Investments in Public Education

the state experienced significant learning recovery in *continued from page 3* nearly every subject during the 2021-22 school year. These results come following over \$5 billion in federal investments sent to North Carolina's public schools to address the pandemic's impact.

"North Carolina students saw major learning recovery and increased test scores because of unprecedented federal funds directed to public education," said Governor Roy Cooper. "The impact of these funds shows that when schools have more resources, students succeed, and our state legislature must follow through with major investments in public schools and teachers to continue the momentum and ensure every child has the sound, basic education our constitution requires."

The report highlights the significant strides in learning recovery made by North Carolina students during the 2021-22 school year, with the greatest gains in middle and high school math. North Carolina also widely saw gains in test scores during the 2021-22 school year while students across all races and ethnicities showed signs of academic recovery for every subject with few exceptions.

North Carolina's public schools saw an unprecedented amount of federal funding in response to the pandemic and have invested a significant amount of those funds – at least \$2.3 billion – in what matters most for improving student success, including teachers and tutors to help accelerate student learning. These federal funds, though, expire in 2024 and many school districts will be facing a "fiscal cliff" that will need to be addressed if we want to continue helping students recover from the pandemic.

Governor Cooper also allocated \$20 million in federal Governor's Emergency Education Relief (GEER) funds to support school districts in addressing student academic needs. Of those funds, more than \$14.8 million was used for hiring more teachers, teacher assistants and other education personnel or providing supplemental pay and bonuses to school personnel. This includes more than \$5.5 million that was used to hire tutors.

The Governor's [budget recommendations](#) invests substantially in public schools and a sound basic education required by the constitution for every student by raising teacher pay and including funding to help hire more educators, nurses, counselors, social workers, school psychologists, and turnaround coaches. It fully funds the remedial plan ordered by the Supreme Court.

The budget also increases teacher pay by an average of 10% in FY 2023 and 6% in FY 2024 and sets minimum starting teacher salaries at \$46,000 in addition to local supplements. This would make North Carolina first in the Southeast in teacher pay and 16th in the nation, up from 32nd. The budget also seeks to address bus driver shortages across the state by raising pay 9.5% for noncertified school personnel and expanding DMV capacity to train school bus drivers.

Press Release

Governor Roy Cooper declared that public education in North Carolina is facing a state of emergency

Monday, May 22, 2023

In a special address today, Governor Roy Cooper declared that public education in North Carolina is facing a [state of emergency](#). In his address, the Governor outlined extreme legislation in the NC General Assembly that would cripple the state's public education system and urged North Carolinians to contact their legislators.

"It's clear that the Republican legislature is aiming to choke the life out of public education. I'm declaring this a state of emergency because you need to know what's happening. If you care about public schools in North Carolina, it's time to take immediate action and tell them to stop the damage that will set back our schools for a generation," said Governor Cooper.

In recent weeks, Republicans have pushed a series of sweeping legislation that would choke the life out of public education. These extreme bills would cause public schools to lose hundreds of millions of dollars, exacerbate the state's teacher shortage and bring political culture wars into the classrooms.

A Devastating School Voucher Scheme

Legislative Republicans propose pouring billions of dollars in taxpayer money into private schools that are unaccountable to the public and can decide which students

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Maintain Your Facility with a Green Cleaning Program

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Have team members discuss the green cleaning system's goals and targets, to ensure that everyone is on the same page. Make sure all building occupants are aware of those goals and targets, so they will have buy-in to the success of the initiative.

Reap the health and financial benefits

Focusing on sustainability and the inclusion of a green cleaning program gives you the potential to improve your bottom line. A 2020 study found that corporations that have adapted sustainability strategies are more likely to perform better financially, in spite of the misconception that going green is an expensive endeavor.

Implementing a green system also gives you the potential to improve your brand's reputation among customers, employees, and recruits. Nearly 80% of Americans in a 2020 report viewed sustainability as an important aspect of operating a business. In fact, roughly 60% claimed they would change their purchasing habits to reduce negative environmental impacts.

In addition, green cleaning is a great way to support employee health and wellbeing. Cleaning with third-party certified products, such as Green Seal-certified products, can improve indoor air quality (IAQ), while minimizing allergy and asthma symptoms. Best practices for cleaning and disinfecting surfaces, in tandem with hand hygiene, can reduce virus concentrations by 85.4%.

Reduce plastic waste

In 2021, the U.S. Department of Energy (DOE) announced its plan to invest upwards of \$14.5 million for research and development on cutting waste and reducing the energy used to recycle single-use plastics, such as plastic bags, wraps, and films. The funding affecting plastic recycling technologies promotes the DOE's mission to address the challenges associated with plastic waste recycling and further supports the Biden Administration's efforts to create a clean energy economy, ensuring America reaches net-zero carbon emissions by 2050.

According to a report from The New Climate Economy, 95% of plastic packaging—the equivalent of \$120 billion annually—is wasted after the first use, and microplastics have been found in 114 aquatic species. Your workplace can make an impact on reducing plastic waste, beginning with encouraging sustainable habits among employees, such as bringing reusable water bottles to the office and saving food in reusable containers. Investing in water coolers for your workplace discourages staff from drinking water out of single-use plastics.

Demand the same commitment to sustainability from your suppliers by asking them if they use certified recyclable packaging. If they don't, consider alternative suppliers.

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Press Release

continued from page 4

Governor Roy Cooper declared that public education in North Carolina is facing a state of emergency

they want to admit. Their plan would expand private school vouchers so anyone – even a millionaire – can get taxpayer money for their children’s private school tuition.

By expanding voucher eligibility to any K-12 student, our public schools, especially schools in rural and poorer counties, will face steep funding cuts, leaving schools without the resources to maintain fixed costs and support students.

A Worsening Teacher Shortage

North Carolina schools currently have more than 5,000 teacher vacancies. Recruiting and retaining quality teachers to the classroom is harder than ever and low pay is a big reason why. Governor Cooper’s budget proposed an 18% pay raise over two years. But last week Senate Republicans proposed increasing veteran teachers’ salaries by just \$250 spread over two years. This will cause North Carolina to continue to fall behind, pushing teachers out of our classrooms and leaving public school students without instruction. In addition, legislators are proposing an acceleration of tax cuts that are projected to cut North Carolina’s state budget by almost 20 percent —hamstringing the ability to fund public education now and in the future.

Injecting Culture Wars into the Classroom

Republican leaders want to inject their political culture wars into classrooms across North Carolina with bills that would put politicians in charge of curriculum setting, micromanage what teachers can teach, and target LGBTQ+ students. Already, prominent Republicans have proposed eliminating core science classes and are pushing to rewrite history curriculums to fit a political agenda. Students need an education that prepares them for the workforce and success. North Carolina’s families, businesses and economy depend on it. Putting politicians in charge of the classroom is dangerous.

This week, Governor Cooper will travel across the state to meet with business leaders, educators and parents to raise awareness about the dangers of the bills in the NC General Assembly and ask them to demand better and join the fight to protect public education in North Carolina.



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National Lightning Safety Awareness

**National Lightning Safety Awareness Week
June 18 - 24, 2023**

National Lightning Safety Awareness week was started in 2001 to call attention to this underrated killer. Since then, US lightning fatalities have dropped from about 55% per year to less than 30. This reduction in fatalities is largely due to greater awareness of the lightning danger, and people seeking safety when thunderstorms threaten. During National Lightning Safety Awareness Week, we encourage you to learn more about lightning and lightning safety.

Lightning is fascinating to watch, but also extremely dangerous. It kills or injures hundreds of people every year in the United States. It's important to understand the dangers associated with this weather phenomena and what you need to do to stay safe when thunderstorms threaten.

Reprinted by permission from the Lightning Safety Council

Maintain Your Facility with a Green Cleaning Program

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Take an audit of your workplace's communal kitchen to assess the amount of recyclable plastic. Then find a local recycling facility and set up a volunteer schedule among building occupants willing to bring the plastics to be recycled. Get everyone in your workplace involved by placing recycling receptacles in the building and posting signage encouraging its use.

Set environmental goals

It's impossible to ignore the ways climate change is affecting our lives, from increasingly hot temperatures to more frequent weather events such as hurricanes. Sustainable business practices are no longer optional—they are imperative for business leaders.

Green businesses focus on the best interests of the local and global environment. Environmentally aware businesses measure success beyond profits. They consider their impact on society and the environment as well.

Sustainable businesses adhere to a term called the triple bottom line—three components that cover profits, people, and the planet. Such businesses can earn profits by being socially responsible and protecting the use of the planet's resources.

Carlos Albir Jr.

DIRECTOR OF OPERATIONS AT ABCO CLEANING PRODUCTS

Carlos Albir Jr. is director of operations at ABCO Cleaning Products, a leader in sustainable cleaning tools. ABCO is a family-owned, Certified Minority Business Enterprise with Green Seal certified products, headquartered in Miami, Florida. For more information, visit www.abcoproducts.com.

Reprinted from CMM – Cleaning & Maintenance Management (<https://cmmonline.com/articles/maintain-your-facility-with-a-green-cleaning-program>)

Submitted by Donna Fields, Cumberland County Schools



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Deadly Mistakes

Fatal Event on April 8, 2019

By Judyth Forte, State Plan Coordinator

Fatal Event: On April 8, 2019, a 66-year-old man died when he was struck by a vehicle while servicing a gas station pump at a convenience store.

Investigative Findings: The employee worked for an oil company that distributed wholesale fuel, operated convenience stores with gas pumps and employed staff to service and maintain these facilities. The employee was part of the maintenance crew and had been given a work order to change a filter on a diesel fuel dispenser at a convenience store that operated a gas station. The employee had changed out the filter and during the course of the repair, diesel fuel had leaked out of the pump and been captured in a 5-gallon bucket. The employee carried the bucket to the cover of the opening to the underground storage tanks, where diesel is filled from the tanker, and removed the cover. Under the cover is the end of the main drop tube (where the tanker hose connects) and the spill bucket. The spill bucket captures any diesel spillage during the filling and disconnecting process and an internal valve returns the diesel to the storage tank. The employee was kneeling on the ground to remove the tank cover when he was hit by a large pickup truck. The pickup truck was being driven by a patron leaving the convenience store parking lot. There were no visible safety devices or protections in place around the employee's work area to identify that he was present or alert the public to avoid that area.

Discussion: When speaking to the operator of the convenience store, he said he had placed the work order but was never routinely told when someone was on site to make the repair. He only got a notification when the repair had been completed. He had not seen the incident occur but had been informed by a customer. The customer who hit the employee said he had climbed into his truck, after visiting the convenience store, and sat idling for a while before scanning the parking lot and proceeding to make a U-turn out of the lot. He hit the employee soon after he started moving. He stated he did not see the employee kneeling on the ground. Interviews with other employees who do similar work for the company indicated they were provided work boots, high visibility vests, safety glasses and hard hats by the employer. They were also given a company credit card to buy other items needed to perform their jobs. They had been told to wear the vests and park their truck in front of the gas pump and to place cones and barricade tape around themselves when working by the gas pumps. At the incident site there were no cones or tape present, and none were available in the employee's work truck. It was the location of the employee that made him vulnerable considering the nature of the facility where he was working. Vehicles came in and out of the facility in rapid succession. It would not occur to an average patron to be looking at ground level to avoid someone. The best control measure in this situation would be a barrier to physically prevent a struck-by event. If that was not possible, installing a visual device, such as cones and caution tape, would make customers aware that something out of the ordinary was going on and to pay extra attention. The fact that the company did not provide the cones and caution tape may have been perceived by the employees that they were not necessary.

Recommendations:

One of the "root causes" of workplace injuries, illnesses and incidents is the failure to identify or recognize hazards that are present or could have been anticipated. Struck-by hazards are a leading cause of workplace fatalities, both in construction and general industry.

- A hazard assessment is the process used to identify, evaluate and control workplace hazards and the risks to worker health and safety. The assessment is an essential part of a safety management system.
- If hazards are present, or likely to be present, the employer is expected to use engineering and/or administrative controls to reduce or eliminate the risk.
- In this case, a physical barrier such as a parked vehicle with flashing lights would have been an appropriate engineering control to prevent other vehicles from reaching the employee's work location. Other controls, such as traffic cones and caution tape, could have helped control pedestrian and vehicle traffic around the work area.
- Prevention – take the time to set up a safe and visible work zone for all activities where there is a struck-by hazard no matter how long the task will take to complete.

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THE MAINTENANCE BEACON

Executive Director: Kristie Payne
Phone: 828.565.0115
E-Mail: office@ncpsma.org
Website: www.ncpsma.org

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Officers of the Association

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Variable Speed Pump Control in the Age of ASHRAE 90.1-2010/13 • Part Five

By JMP Equipment Company

Manual Versus Automatic Balancing

How much pump head do you need in a manually balanced system at part load?

Again, it depends. Consider the proportionally and manually balanced system with a design flow of 1000 GPM and 84 feet of head shown in Figure 14. We are using differential pressure area pump control with a control head of 20 ft.

Balancing is easy enough at full load with 200 GPM going to all 5 zones. But what happens if system demand drops from 1000 GPM to 200 GPM? The question is unanswerable without knowing where the load is. It could all be in Zone A, B, C, D or E. Or it could be split between any two or more zones. In a typical HVAC system where the zone loads are never the same, it's anybody's guess where the load is. That's the challenge since head loss varies depending on the location of the load and the pressure losses through the branch pipe.

To better illustrate this dilemma and keep it simple, let's pretend that the 200 GPM load is all in Zone

A. If that's the case our pressure drop adds up to approximately 69 feet. That's how much pump head we need to establish full flow through Zone

A. Depending on the type of pump control we have, we will most likely experience a flow miss in the system if we are using manual balance valves (Figure 15).

The black stars on the curve in Figure 16 represent the head requirements for the system at 200 GPM for the multiple zones. If we repeat this for other flow points, we can plot the pump control area for the system.

So, pressure drop varies quite a bit depending on where the flow happens to be. For example, at 200 GPM, the actual pressure drop could exist anywhere along the vertical line of black stars.

This represents a large pump control area which increases the potential for flow misses.

Now let's look at the same system utilizing automatic balance valves or pressure independent control valves. If this is the case, then our pressure drop

A Lesson in Curve Control

Many assume that curve control is always sensorless; this is not the case. In addition to sensorless control, there is also what can be thought of as "pump head curve control" and "full system flow curve control."

Any time curve control is used as a strategy to control variable speed pumps, the goal is to keep the pump operating on the building's control curve as established by the design engineer. For every point of flow on the control curve, there is a unique speed. So if you know one you can determine the other.

In sensorless curve control, the controller calculates the system flow based on the kW, RPM, and the impeller size of the pump. Using this estimation of flow, the pump controller adjusts the RPM of the pump so that it stays on the control curve. In essence, sensorless control uses the variable speed drive and the pump as a flow meter; but instead of physically measuring flow we are calculating a theoretical flow.

Not every pump is suited for sensorless control. Ideally, the pump curve will be shaped so that the horsepower

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Membership runs from July 1, 2023 through June 30, 2024.

Membership Dues are \$20.00 if paying by check. Complete this form and submit along with your check for \$20.00 to: **NCPSMA, 224 Mulberry Street, Clyde, NC 28721**

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ADDRESS			
CITY	STATE	ZIP	
TELEPHONE			
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Would you like a reminder sent to your e-mail each month when the latest edition of the Maintenance Beacon is available online?		YES	NO

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District Three Golf Tournament Save The Date



WEDGEWOOD PUBLIC GOLF COURSE WILSON, NC
FRIDAY, OCTOBER 27, 2023
RAIN DATE – FRIDAY, NOVEMBER 3, 2023
1 PM SHOTGUN START

NCPSMA Annual Golf Tournament District III Superball Tournament

DATE: October 27, 2023

RAIN DATE: November 3, 2023

PLACE: Wedgewood Golf Course 3201 Old Stantonsburg Road, Wilson, NC

Entry Fee: \$50.00 per person
\$200.00 per team

(THIS INCLUDES: GREEN FEE, RANGE BALLS, CART & LUNCH)

ALL CHECKS: PAYABLE TO: NCPSMA DISTRICT III

REGISTRATION FORM and PAYMENT FOR HOLE SPONSORSHIP AND TEAMS ARE DUE BY OCTOBER 21, 2022

!!!!!!!!ATTENTION!!!!!!!!

!!!!IF PAYMENT IS NOT RECEIVED BY THIS DATE YOU CANNOT PARTICIPATE!!!!

LUNCH AT NOON

Shotgun start at 1:00 PM

Hole Sponsorship: \$100 per hole

Prizes Include:Low Score, Closest To Pin, Longest Drive

Mulligan's: \$5.00 Each (MAX) 2

COMPLETE:

Team Name: _____

Team Players Names: _____

Address: _____

School Unit or Company: _____

RETURN TO:

Wilson County Schools – Maintenance Department
PO Box 3878, Wilson, NC 27895
Attention: Sue Farmer-Golf Tournament
Phone – 252-399-7823
Fax – 252-243-7197
Email: sue.farmer@wilsonschoolsnc.net



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Variable Speed Pump Control in the Age of ASHRAE 90.1-2010/13 • Part Five

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line intersects with the pump curve at one easily defined point like the one in Figure 19.

If, however, a pump has a curve that looks like the one below (Figure 20), it is not a good candidate for sensorless control. Notice that a pump with a 6.25 impeller at 3 horsepower follows approximately the same slope between

310 GPM and 450 GPM. Within this flow range, there is no way of knowing what the pump flow will be without a flow meter.

Sensorless control may also limit variable speed drive options. In sensorless applications the variable speed drive and its control are typically exclusive to the pump manufacturer, which can be a problem if there is a failure.

Curve Control with a Sensor
 Pump head curve control compares the pump head pressure differential to the motor RPM to see where the pump is operating on the pump curve and then adjusts the speed to keep it on the control curve. This method requires a pressure sensor across the inlet and outlet of the pump to measure the pressure differential as shown in the diagram below (Figure 21). Full system flow curve control works on the same principal as sensorless curve control except a flow meter is used to read real flow versus an estimated flow. The flow meter is typically located on the discharge of the pump. This, of course, provides more accurate pump control (Figure 22).

Once again if we know flow rate and speed we can slow down or speed up the pump as needed to keep it operating on the control curve.

The primary advantage of both full system flow and pump head curve control is that each is compatible with any drive manufacturer or any pump. Finally, it is important to note that whenever a curve control strategy is used (sensorless or otherwise) most pump manufacturers will default the control head of the pump to a value that is 40% of the design head. For example, if the full design flow requires 100 feet of head, the control head (the required head a zero flow) would be 40 feet.

This is because most systems will not meet the following ASHRAE requirement with a control head setpoint greater than 40% of design head:

6.5.4.1 Hydronic Variable Flow Systems. HVAC pumping systems having a total pump system power exceeding 10 HP that include control valves designed to modulate or step open and close at a 50% or less of the design flow rate. Individual chilled water pumps serving variable flow systems having motors exceeding HP shall have controls and/or devices (such as variable speed control) that will result in pump motor demand of no more than 30% of design wattage at 50% of design water flow.

To stay below 30% of design wattage at 50% of flow, the engineer will likely have to have the control head set at no greater than 40% of design head. Because manufacturers default to 40%, it is recommended that the control head needed for your system be programmed into the pump controller at the time of commissioning, otherwise the owner will be wasting energy indefinitely.

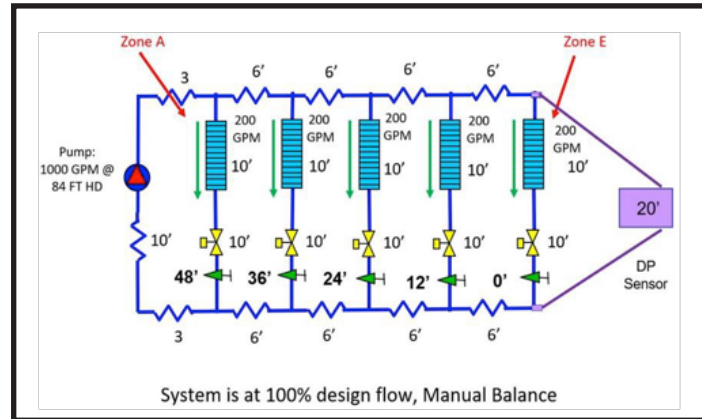


Figure 14

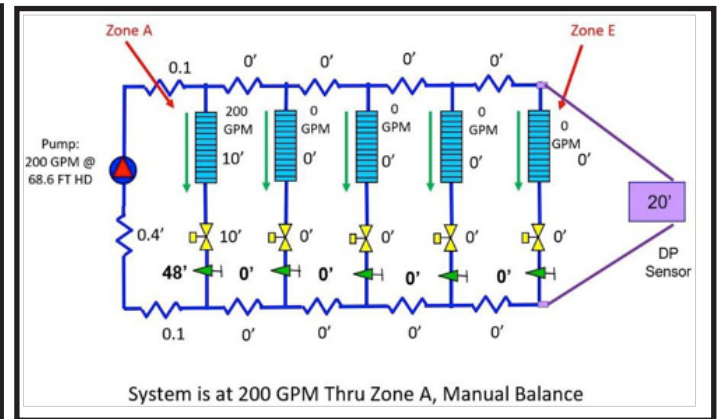


Figure 15

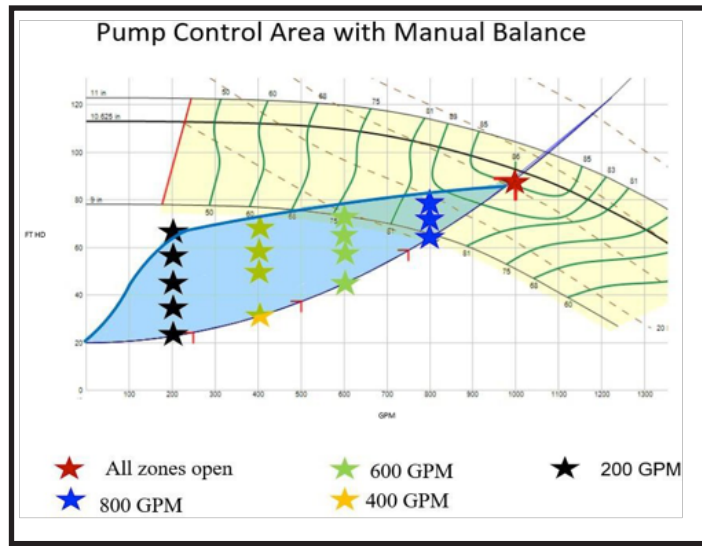


Figure 16

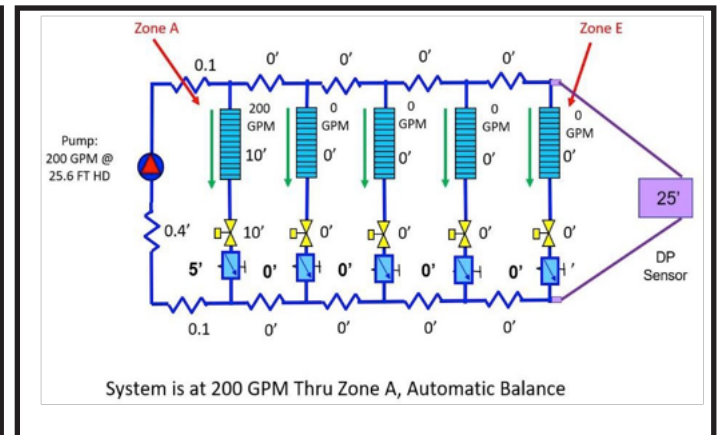


Figure 17

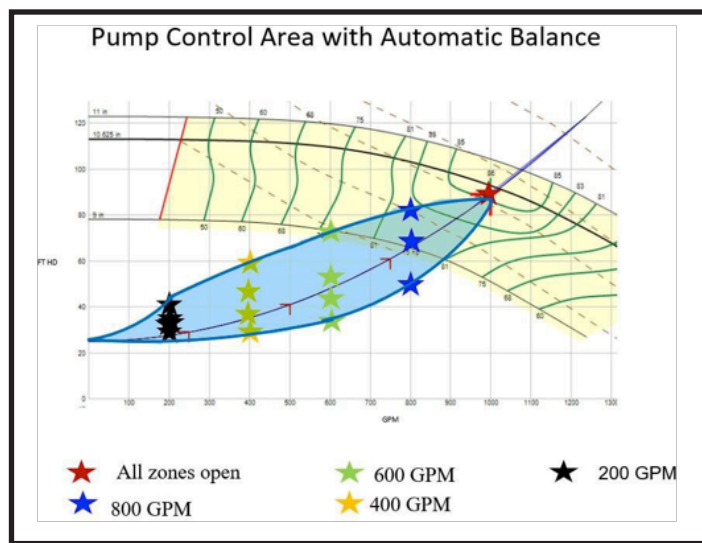


Figure 18

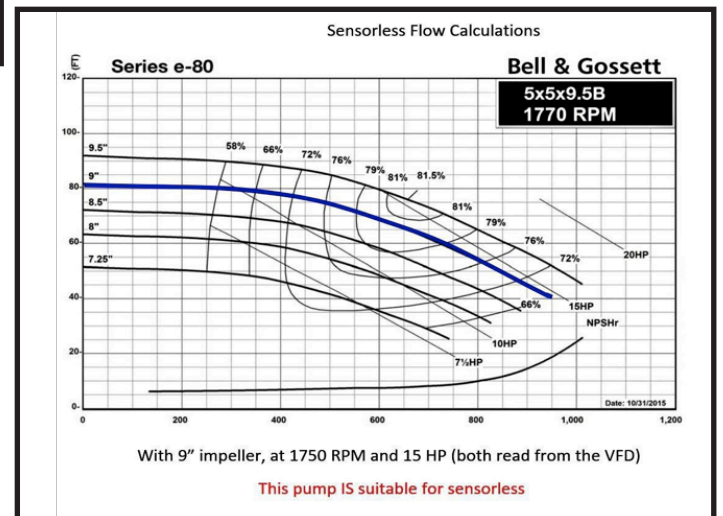


Figure 19

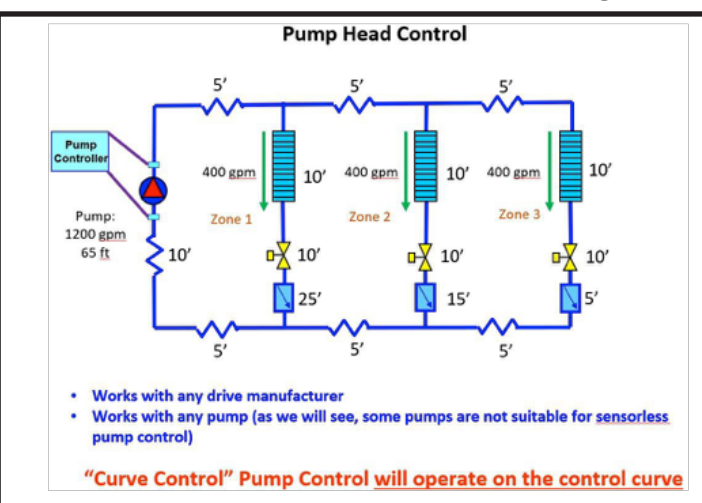


Figure 21

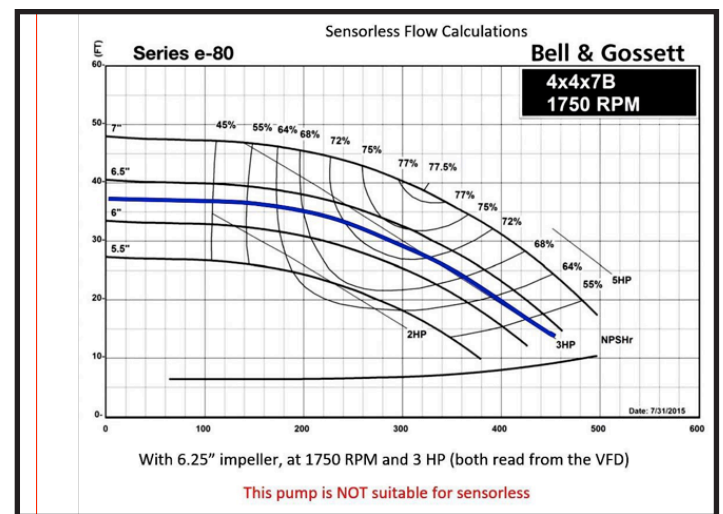


Figure 20

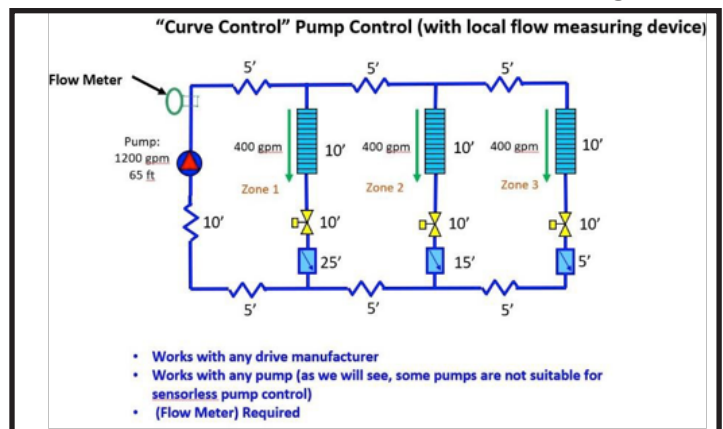


Figure 22

Jay Palmer Scholarship Winners for 2023

The Jay Palmer Scholarship Trust Fund is pleased to announce the 2023 winners. Each recipient will receive \$1,000.



Jessica Rochelle Hughes, daughter of Jimmy and Amy Hughes attending UNC Pembroke from District 5.



Kendall Nicola Proctor, daughter of Joshua and Darena Proctor attending NC State University from District 3.



Charity Faye Speaks, daughter of Bergie and Sharon Speaks attending UNC Greensboro from District 7.



Reagan Danielle Tullock, daughter of David and Dianne Tullock attending Appalachian State from District 7.

Not Pictured :Cameron Brooke Miller, daughter of Jason and Angie Miller attending UNC Charlotte from District 5.

Thank you to everyone who plays in the Jay Palmer Scholarship Golf Tournament which is sponsored by Premier Supply and to all those who make donations to this generous fund that helps sponsor those well deserving recipients!!

Anyone wishing to make a donation or participate in the upcoming golf tournament may contact James Palmer, III at (336) 746-5000 or james_marie@lexcominc.net.

Extreme Heat

continued from page 3

Heat-Related Illnesses

Know the signs of heat-related illnesses and ways to respond. If you are sick and need medical attention, contact your healthcare provider for advice and shelter in place if you can. If you are experiencing a medical emergency call 9-1-1.

Get more detailed information about heat-related illnesses from the [CDC](#) and [National Weather Service](#).

HEAT STROKE

Signs:

- Extremely high body temperature (above 103 degrees F) taken orally
- Red, hot and dry skin with no sweat
- Rapid, strong pulse
- Dizziness, confusion or unconsciousness

If you suspect heat stroke, call 9-1-1 or get the person to a hospital immediately. Cool down with whatever methods are available until medical help arrives. Do not give the person anything to drink.

HEAT CRAMPS

- **Signs:** Muscle pains or spasms in the stomach, arms or legs

HEAT EXHAUSTION

- **Signs:** Heavy sweating, paleness, muscle cramps, tiredness, weakness, fast or weak pulse, dizziness, headache, fainting, nausea, vomiting

If you have signs of heat cramps or heat exhaustion, go to a cooler location and cool down by removing excess clothing and taking sips of sports drinks or water. Call your healthcare provider if symptoms get worse or last more than an hour.

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What is a Dad?

A Dad is a person
 Who is loving and kind,
 And often he knows
 What you have on your mind.
 He's someone who listens,
 suggests, and defends
 A dad can be one
 of your very best friends;
 He's proud of your triumphs,
 but when things go wrong,
 A dad can be patient
 and helpful and strong.
 In all that you do,
 a dad's love plays a part
 There's always a place for him
 deep in your heart
 And each year that passes,
 you're even more glad,
 More grateful and proud
 just to call him your dad!
 Thank you Dad...
 for listening and caring,
 for giving and sharing,
 but, especially, for just being you.

Author Unknown