SPECIAL REPORT:

MAPPING OUT THE CULTIVATION SUCCESS STORY

PLANNING FACILITIES, OVERCOMING MISTAKES, AND PREPARING FOR COMPETITION.

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SPECIAL REPORT

HERE TO HELP

Cannabis cultivation is made especially difficult by the speed at which this industry seems to advance. New technologies and services bombard cultivators with promises of greater yields and smoother operations. With all the noise in the industry, it can be difficult for cultivators to make sense of what's right for them.

This is why we're thrilled to present this "Mapping Out the Cultivation Success Story" report, the fourth such educational guide we've published to help growers with their facility design needs.

With 15 years of experience in the cannabis industry, Surna is proud to support cultivators not only through our equipment and services, but as a total solutions provider. Whether you're looking to improve your yields, decrease pest pressures, or have a more consistent growing environment, Surna can help cultivators navigate the ever-murky waters of facility design, maintenance and upgrade.

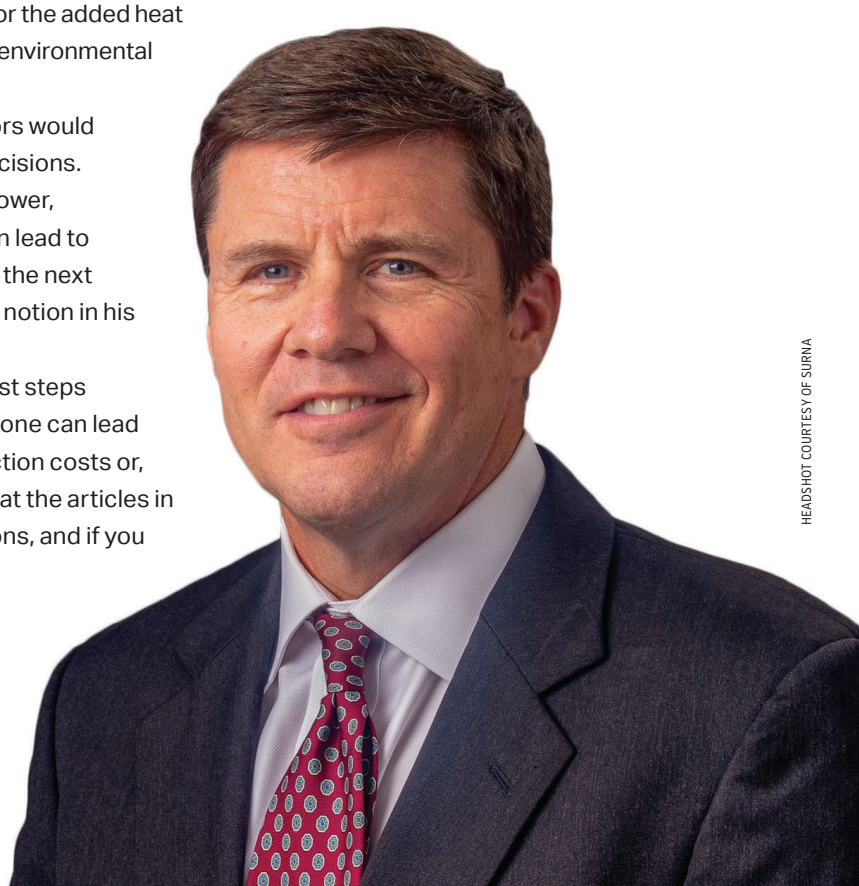
Don't just take our word for it: Osage Creek Cultivation, a new operation in the freshly minted Arkansas market, saw their environmental controls related issues nearly vanish after working with Surna, as detailed on p. S6. Osage Creek worked with us to upgrade its HVAC system after the company realized it could more than double the plant count in every flowering room but couldn't compensate for the added heat and moisture load. After increasing its capacity and fine-tuning its environmental conditions, the cultivator is set up for success for years to come.

Given the fast-paced nature of the cannabis industry, cultivators would be wise to consider future growth when making facility design decisions. Planning for future expansion without accounting for access to power, water, and sewage, or even manufacturing and storage space, can lead to massively expensive corrections when growers are ready to take the next step. Andrew Lange from Agrios Global Holdings expands on this notion in his article on p. S3.

Planning and designing a cultivation facility is one of the biggest steps growers take early on in their cannabis journey. Taking the wrong one can lead to production issues, product quality letdowns, increased production costs or, in the worst-case scenario, crop and business failure. We hope that the articles in this educational guide can help you make better informed decisions, and if you have any questions, we're here to help.

TONY MCDONALD
PRESIDENT AND CEO, SURNA

CULTIVATORS WOULD BE WISE TO CONSIDER FUTURE GROWTH WHEN MAKING FACILITY DESIGN DECISIONS.



HEADSHOT COURTESY OF SURNA

BY ANDREW LANGE

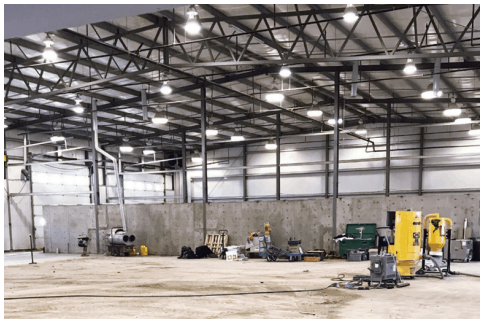
FACILITY DESIGN FOR LONG-TERM SUCCESS

The cannabis market evolves quickly. Include how you want to grow your facility in the early design stages to ensure your business can adapt.

Before starting the design process for a new facility, you likely completed an in-depth market review and business plan so that you have some operational targets in mind. Once you're comfortable with your business plan, the next step is drafting a project brief that outlines the primary goals of the facility. This brief should include what products you will make/grow, how you will make those products, the quantity of products per year, and more production details.

BUILD FOR TODAY

Many people start their facility designing process with a certain size building in mind. Instead, it's best to start the design process by working backward from your production goals. This is especially important in emerging markets in states with smaller populations, as sometimes bigger isn't always better. Decide what your annual target production is, then work backward from that to calculate the number of harvests per year and production per square foot to determine how many square feet of flowering canopy you need to achieve your goals.



A warehouse being constructed for cannabis production. When planning your facility size, it's best to start with production goals and work backward.

Example: If your target is to hit 1,000 pounds (453,592 grams) of production per year, you think you can hit 100 grams/square foot (for easy math), and you're only having one harvest per year, you need to have 4,325.92 sq. ft. of canopy (453,592 g/100 g per sq. ft.) If you have four harvests per year, you would need 113,250 g per harvest (453,592 g/4 harvests per year), which brings your canopy requirement down to 1,133.98 sq. ft. of canopy (113,398 g/100 g per sq. ft.)

DRAW A SPECIFIC FLOOR PLAN

Remember to size veg, cloning, mother rooms and post-harvest processing spaces appropriately for your level of cultivation. If you don't know how to determine these figures, reach out to a qualified cannabis consultant who can help you, as mistakes in these initial calculations could lead to expensive corrections later in the build process or, worse, downtime during production to correct mistakes. Designing your facility in this manner will save precious time, not to mention the money spent on architecture and engineering.

If you haven't already, it would be beneficial to hire an experienced cannabis design consultant to start working out the initial details and some cultivation specific equipment selections such as lighting, irrigation, rolling benches or vertical racks.

PHOTOS COURTESY OF SURNA

SPECIAL REPORT

Engineering is not only the most time intensive portion of the design, but it also has the largest economic impact on the project cost.

CREATE BUILDING PLANS AND CONDUCT FEASIBILITY STUDY

After you have a workable floor plan that will support your project goals, it's time to engage with an architect. The architect will be able to review the plan you have and adapt it to local and national codes (if need be), as well as turn it into a building set of plans, which include the final plans on how the building will be built (framing schedules, wall schedules, door schedules, etc.) They will also be able to help get your feasibility study started. This feasibility study is extremely important. Ideally this is completed before purchasing land, but it should be conducted even if the property is already purchased. The study should include verification of the site utilities to ensure your building site has adequate power, water, sewer (in both capacity and availability), and space for parking, fire access, as well as a grid stability study to determine the need for emergency power generation, etc. Discuss the findings with your local municipality and work out any hookup requirements ahead of the design process so that you know what the infrastructure costs will be prior to moving forward. Being unable to hook into a city sewer or having to pay for a power upgrade are quick ways to blow a budget before the project even starts, so it is extremely important to understand those costs associated with your desired location.

HIRE A MECHANICAL AND ELECTRICAL ENGINEER

Shortly after engaging with an architect, I suggest working with a mechanical and electrical engineer, preferably one with cannabis experience. This is likely going to be your most critical decision for success, as the mechanical and electrical engineering portion of the project is by far the most involved in the design phase for cultivation and manufacturing facilities. This includes reviewing and evaluating every component that requires electricity and all the mechanical equipment to maintain environment—all of it needs to be included in engineering prior to installation. Your architect may be able to help find the right engineers for the project if need be, but there are firms such as Surna that have hundreds of facilities worth of experience that is invaluable in this part of the design process.

Engineering is not only the most time intensive portion of the design, but it also has the largest economic impact on the project cost. Do not rush through this process. Often, clients wish to cut corners at this juncture to get to the finish line quickly, but it is imperative that you take some time to review how the HVAC system will work, its energy efficiency and its maintenance costs to determine if the system is a good fit for you. By this portion of the design process, you should already know your target production and have worked backward on how much canopy and, therefore, how many plants you will have. That will determine your HVAC needs.

On the electrical side, make sure you have accounted for all the major equipment you plan to have. Major pieces of equipment that sometimes get forgotten include: irrigation pumps, water heating systems, control boards, nutrient distribution pumps, trimmers and other post-harvest processing equipment.

Additionally, many pieces of equipment common in the cannabis industry run on non-standard voltage. In North America, these systems require special transformers and other equipment to run. It is also important to ensure you have thought through outlet positioning, as to avoid utilizing extension cords, splitters and other (generally not allowed) devices once you're operational. Finally, make sure you have battery backups on key systems such as cameras, computers, and networking, to ensure your facility remains online during grid power outages.

PLAN FOR THE FUTURE

Keeping future growth in mind during the planning and design process is important, as a well thought out expansion plan will save you a lot of money, time, and headaches further down the road. But if there is one very important thing to keep in mind, it's to stay flexible. Having worked with dozens of operators over the years, I have seen first-hand that business plans change a lot in this industry.

For that reason, I suggest that if your future expansion plans aren't in the very near future (around 18 months or sooner), then don't go too far down the design path. Very

often, needs change as markets develop. You might find the extra square footage you're planning for cultivation is more useful or profitable to your company as manufacturing space in two years.

On the other hand, make sure you're accounting for additional processes that may be required in the future. Oftentimes in burgeoning markets, demand for flower can be so high cultivators may not cure product or have to store it in bulk, but, as the market matures, need to account for adding those steps to the process, which require space and specialized conditions. Planning for this from the start will save you from growing pains later on.

Mechanical and electrical foresight is especially important. If you need more power for expansion, it's important to plan that from the start to ensure its availability to the site. Sometimes, it can be more economical to install the equipment upfront for your eventual needs rather than adding on or reinstalling equipment in the future.

If possible, have the infrastructure in place for your future expansion. At minimum, this means having walls, ceilings, doors and basic power and lighting completed, as the last thing you want is construction dust and debris while you're growing. Ideally, have those, as well as your final power and HVAC, in place so all that remains to utilize the space is acquiring the cultivation equipment. Planning your buildout this way will allow you to expand into those spaces much quicker than if you needed to permit, install, and inspect all the infrastructure for the additional space, and it will allow your company to be nimble with your expansion plans.

SCALE FOR SUCCESS

Scalability is another important aspect to keep in mind when developing facility plans. Very few operators can launch a fully operational, large-scale facility at the opening of a new market. This is generally due to either market demand or capital limitations, forcing the operator to adopt a phased-out build or grow approach.

Make sure you always maintain egress for larger pieces of equipment and an easy way to move things into your expansion areas. Plan around being able to move pallet-sized loads of equipment at a minimum. If you have larger things that need to be moved into a space (such as extraction equipment or large-scale dryers), make sure you account for it. I've seen operators excitedly order new equipment just to be left in frustration when they cannot fit it through the doors or around a tight hallway bend, requiring them to remove walls, cut holes or even remove roof sections to get the equipment where it needs to go.

Once your team approves the final floor plan, electrical and mechanical engineering can complete their placement drawings for final approval. At this point, your design team should have a 98% complete picture of the finished product, which marks the end of the design process and the start of the building process. The next steps involve reaching out to and vetting general contractors. I suggest interviewing at least four that specialize in commercial construction. Review their portfolio of past projects to make sure they have worked on comparable projects and reach out to past clients (if possible) to get comments on their experience with the builder. Once you have made your decision, you're ready to submit for permitting and move into the construction phase of your project.

To plan for future expansion, make sure to maintain egress in the aisles for larger pieces of equipment and the ability to move pallet-sized loads of equipment.

SPECIAL REPORT

BY BROOKE BILYJ

ROOM TO GROW

How Surna supported Osage Creek Cultivation to **efficiently increase growing capacity.**

With 15 years' experience in the construction industry, Jay Trulove knew quite a bit about the building process before drawing up plans for his family-owned operation, Osage Creek Cultivation. He also knew how to manage a farm, with more than 30 years' experience raising chickens, cattle, and crops. Plus, as a pilot who has been flying for a major airline for 37 years, Trulove understood the importance of starting with a solid plan and being prepared to navigate change along the way.

When his family received one of Arkansas' first four cultivation licenses in July 2018, Trulove didn't fathom just how vital climate control would be to his operation. When he realized that his 92,000-square-foot indoor facility offered enough space to double his intended plant capacity, his original HVAC plans quickly fell short. That's when he turned to the experts at Surna to refine his facility design to maximize his efficiency.

"When you double the number of plants per room, you have to make adjustments, and Surna's been pretty good at that," says Trulove, COO, who owns Osage Creek Cultivation with his wife and CEO, Mary, and their sons. "Even though we've thrown them a few curve balls, Surna has been instrumental to helping us accommodate the additional load."

Eleven Roses cultivar grown at Osage Creek Cultivation. Growing at a commercial scale taught the company's COO how important precise temperature and humidity control is.

INCREASED CAPACITY

While designing Osage Creek, Trulove spent time touring other facilities, particularly around Denver. "I learned quite a bit, but mostly what not to do," Trulove says. "A lot of these were existing buildings that had been modified, so they were cramped, and space was a big issue."

After squeezing through these crowded grow rooms, Trulove wanted to make sure he had plenty of room to grow. "We built with expansion in mind, because I saw so many facilities that needed more space and had nowhere to go," he says.

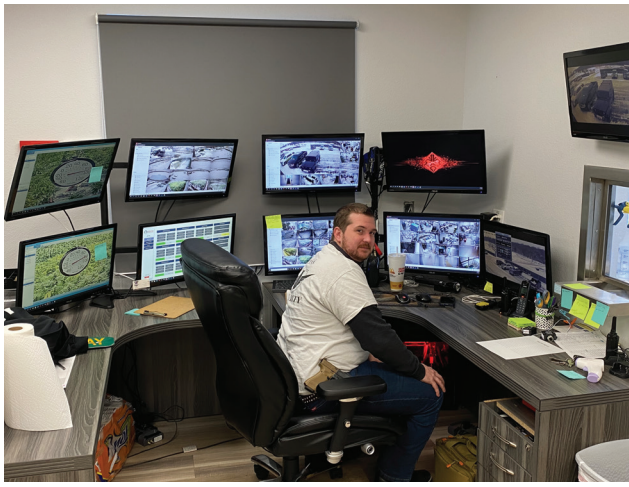
Trulove started with several key pieces of growing equipment—like 6-foot rolling benches and HPS lighting systems—and designed the facility around those. He ended up with six grow rooms measuring 40 feet by 110 feet. Following the recommendations of an industry consultant, Trulove calculated that this space could accommodate 600 plants.

But once cultivation began, Trulove realized that they'd significantly underestimated their growing capacity—which meant that their HVAC design needed to be ramped up, as well.

"When you double your plants from 600 to 1,300 and increase your feeding, which is increasing water, it changes the humidity," Trulove says. "As we upped our plant count, Surna helped us make modifications to keep up with the temperature and humidity changes."

To accommodate the increased plant capacity, Surna installed two additional boilers and converted several fan systems from cooling only to

PHOTOS COURTESY OF OSAGE CREEK



Left: As Osage Creek Cultivation grew its plant count, Surna was there to ensure the environmental controls could keep up with the added heat and humidity.
Above: Osage Creek Cultivation's security station. In addition to monitoring security risks, security team members can keep an eye on room temperatures thanks to strategically placed cameras in the cultivation areas.

ABOUT OSAGE CREEK CULTIVATION

Year launched: March 2018

Location: Berryville, Ark.

Flowering canopy size: 38,700 sq. ft.

Number of employees: 80

Products offered: flower, vegan gummies, chocolate bars, vape carts, capsules, wax, shatter, suppositories

Water bill: <$400/month

dual-purpose heating/cooling units. They also helped Trulove's growers adjust the climate control settings to account for the extra crops. Later, when Osage Creek switched from HPS to LED lighting, which made the grow rooms noticeably cooler, Surna helped Trulove navigate the changing conditions again.

"The most valuable lesson we learned was not to underestimate the importance of maintaining the most precise temperature and humidity control," Trulove says.

EQUIPPED FOR EXPANSION

To control the environment in Osage Creek's grow rooms, Trulove relies on a four-pipe chilled water system from Surna that uses hot and cold water coils to adjust the air temperature. Each grow room contains 24 fan coil units that control the distribution of airflow to manage temperature and humidity levels.

"I like this system because the airflow is very even, so we have a consistent temperature," Trulove says. "It hardly varies a degree from the front to the back."

So, whether the temperatures outside are below 0 or above 100—which, depending on the season, are both likely in Arkansas—Trulove's growers can control the growing conditions with precision.

When Osage Creek recently expanded, adding five more 40-foot-by-110-foot grow rooms and a 40-foot-by-50-foot R&D room, Trulove "didn't hesitate to call Surna first," he says.

With limited electrical ampacity (the maximum current in amps) available in rural Berryville, Trulove didn't have the bandwidth to power any more chillers. Instead, Surna helped him compare several other options to find energy-conserving units to efficiently control humidity in the new rooms.

Through these solutions and support, Surna helps Osage Creek maximize growing efficiency while maintaining cost control, keeping Trulove's monthly water bills under $400 for the entire facility.

"We're very happy with the results," Trulove says. "We've reached (yield) goals we were shooting for, and now we're just raising the bar. We're always looking to produce the highest quality cannabis we can by focusing on efficiency and maintaining cost control, and Surna has done a good job helping us."

"As we upped our plant count, Surna helped us make modifications to keep up with the temperature and humidity changes."

-JAY TRULOVE, COO, OSAGE CREEK CULTIVATION

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Q&A WITH → KENNETH LOSHELDER

BY BRANDY KEEN

Surna's director of engineering and field services, who has supported hundreds of building projects throughout his career spanning indoor cultivation, sports arenas, government facilities and laboratories, says there is room for innovation in the cannabis industry.

Chatting with industry peers often is a great way to get different perspectives on ongoing challenges and ideas about how to move forward. In this fast-paced Q&A, Brandy Keen, co-founder and senior technical adviser with Surna, speaks with the company's lead engineer, Kenneth Loshelder, about what he sees as the cannabis industry's greatest design and construction challenges. Loshelder, a licensed engineer who has been working in the HVACD industry since 2005 and is experienced in mechanical design and commissioning, energy efficiency, building controls optimization and LEED/sustainability consulting, also shares what continues to surprise him, and what excites him about the future.

Brandy Keen: What do you think is the biggest challenge during design and construction of cultivation facilities?

Kenneth Loshelder: The amount of self-inflicted pain on project teams due to poor planning. Although it's improving as the industry matures, it really felt like the Wild West of construction when I started. There are thousands of decisions that are interconnected through several trades in any major construction project, and this is especially true in a cannabis facility with specialized systems and equipment. These decisions need to be made in the proper order with consideration of the entire timeline to achieve the desired outcomes with the least pain and money. Careful project planning and execution will pay itself back tenfold when it leads to desired outcomes on the first try.

BK: You've been doing this for a long time now. Do you still get surprised?

KL: I am still surprised by how little consideration is given to the HVAC system and its integration with the facility during early design decisions. Other than the building itself, the HVAC system is one of the most expensive components of the facility, and it has a direct impact on the heart of the operation. The value of the facility is generated in the cultivation rooms, yet, oftentimes, the racking and the climate control environment are the last items to be figured out. Cultivators are better served by starting with the needs of the plant, and then working from there to determine the best way to integrate critical systems into the facility design.

BK: What would you say is the most challenging aspect of mechanical design for cultivation facilities?

KL: The lack of industry standards and empirical data is a major challenge, especially for less experienced engineers. There are not many reliable sources to go to when you are working through a problem or considering a new approach. We continue to apply our experience to develop our own internal resources, and to give cultivators access to real data through our controls systems.

BK: What excites you the most about the industry and the work you're doing at Surna?

KL: There is so much room for innovation! At Surna, we have our own opportunity to be a part of this evolution to push the envelope in terms of environmental consistency and energy efficiency. I am excited about our work to expand our offerings and educate our clients in several possible approaches for environmental control in cultivation facilities. We've put in a lot of time and energy to evaluate the various HVACD system approaches that work well, and to ensure we can offer a wide range of system types to meet the specific needs of each cultivator. In addition to that, the industry is increasingly seeing the value of energy efficiency, and we continue to focus on energy efficiency, energy models, and data collection to further our understanding of the operational costs of each alternative. The quality and value of our offerings continue to improve each year.

"The lack of industry standards and empirical data is a major challenge, especially for less experienced engineers."

HEADSHOT COURTESY OF SURNA

BY BRANDY KEEN

EFFICIENCY MAXIMIZED

How cannabis cultivators can **get the most out of their environmental control systems.**

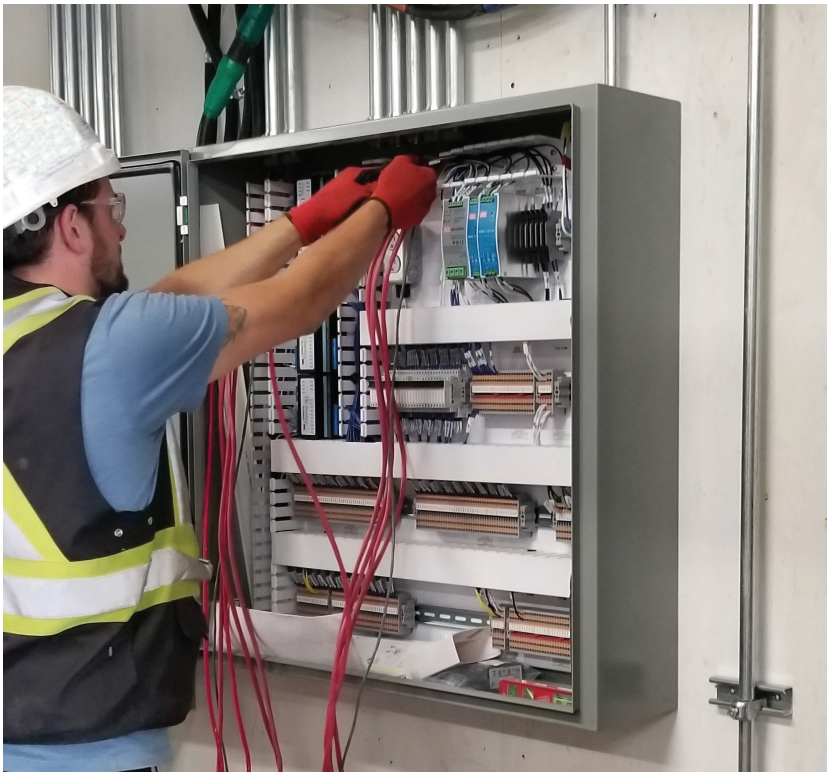
At Surna, we speak often about how decisions around heating, ventilation, air conditioning, dehumidification (HVACD) and humidification touch every component of a cultivation operation, at all phases of development. Budgets, architectural floorplans, construction, facility operation, operating costs and revenues are affected directly by the design and implementation of the mechanical system.

Good design starts with a clear understanding of the goals of ownership, cultivators, and the operations team. Each part of the team should have the opportunity to chime in before a specific direction is decided upon. Ideally, your HVACD mechanical designer should have the expertise to understand the team's goals and articulate the various technology options available to afford the ownership team the opportunity to compare options. It's important they understand how each option best meets the team's goals around budgets, operating costs, operating complexity and maintenance, precision and capacity, biosecurity, odor control, and more.

Unfortunately, not every owner has had that opportunity, and in many cases, operators are working with what they've got. So, how can cultivators go about getting the absolute most out of their HVACD systems?

MAINTENANCE

First and foremost is the absolute need to maintain systems in the facility to ensure optimal performance. HVACD systems in cultivation facilities are increasingly sophisticated, requiring maintenance far more complex than simple filter changes. In addition to the proper cleaning of all components, management of refrigerant charges and pressures, controls systems and sequence programming, chemical treatment, lubrication, and more are



A controls system being installed. A solid controls system can be an early warning system for any maintenance requirements.

PHOTOS COURTESY OF SURNA

Good design starts with a clear understanding of the goals of ownership, cultivators, and the operations team.

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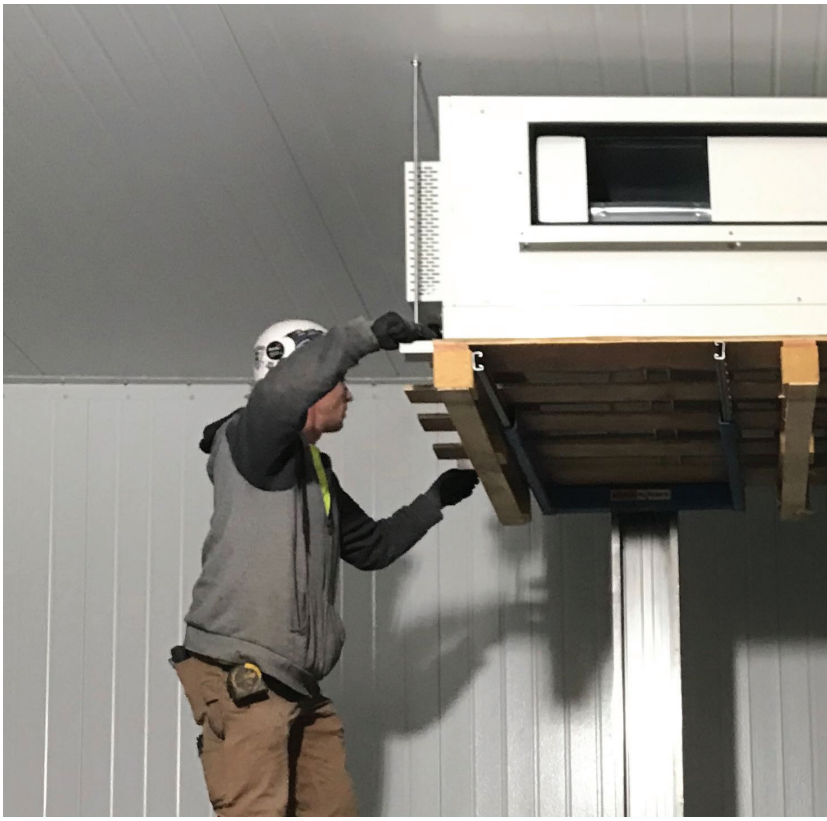
all part of a correctly executed HVACD maintenance plan. Improperly maintained systems will begin to underperform in ways that aren't easy to detect at first. While outright failure is certainly a possibility, it's more common for the early indications of improper maintenance to be more insidious. Diminished capacities caused by improper maintenance first impact energy use—the systems begin using more energy than they need to do the job. This cuts straight into the cultivator's bottom line in the form of increased operating costs. Like most of the suggestions on this list, improvements in performance and energy use will go hand in hand.

As these maintenance issues progress, systems may begin to fail to maintain climate parameters consistently. Brief departures from setpoints may not be noticeable or particularly concerning at first, but parameter inconsistency can lead to inconsistent yields, as well as create biosecurity risks, as fluctuations in humidity and temperature can leave plants particularly vulnerable to fungus and other pathogens and pests. If filters, ducting and air sterilization equipment associated with the HVACD system haven't been properly maintained, this increased vulnerability is exacerbated by increased infiltration of those same pests.

As these maintenance-related issues persist, performance will usually continue to degrade, ultimately leading to an expensive emergency service that could have been avoided with far less expense (and stress) had the maintenance been properly managed in the beginning. Sometimes the emergency service is limited to performing long overdue maintenance, and sometimes it results in premature failure of equipment, such as compressor or fan motor failure. In any facility, this is disruptive and expensive. In some, it's catastrophic. Ensuring that your systems are properly maintained to manufacturer's specifications will ensure that you can get the most out of what you have, regardless of system type.



Conducting regular maintenance on systems, including HVAC units, is critical to ensuring your operation is running at peak efficiency.

SETPOINTS (VPD)

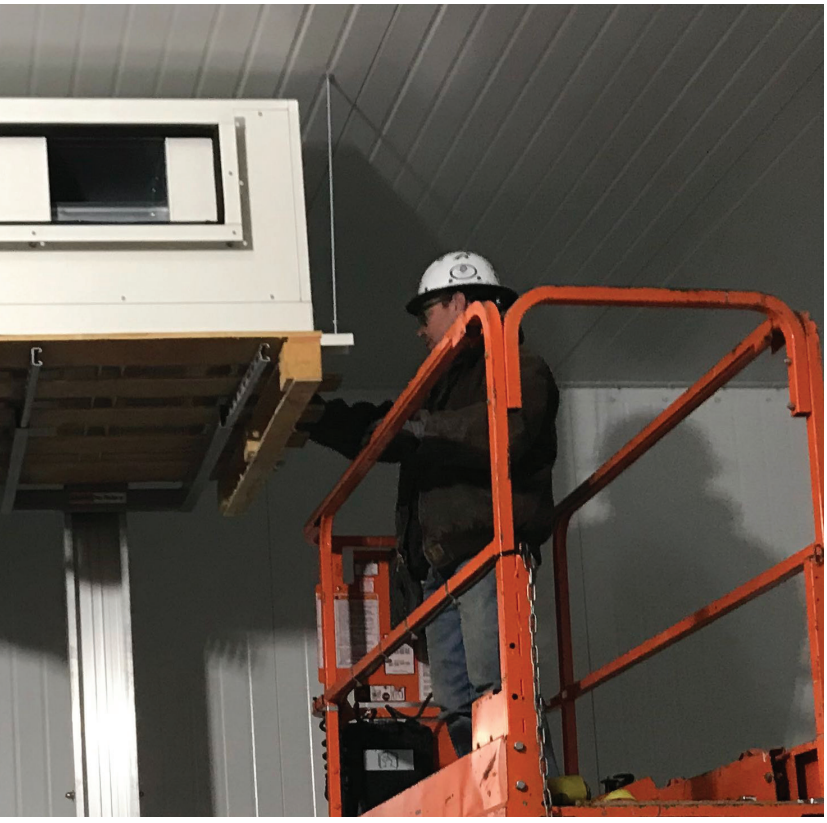
Vapor Pressure Deficit (VPD) is the difference between the amount of moisture in the air, and the amount of moisture the air can hold, and is the driving force behind plant transpiration. If your climate control system is struggling to maintain setpoints, consider adjusting the setpoints wherever possible to raise the effectiveness of the HVACD system without negatively impacting VPD. Obviously, plant health is always going to be priority one, but the same VPD can be maintained with various combinations of temperature and humidity setpoints. In general, the higher the temperature and humidity setpoint, the more effective the climate control system is going to be at maintaining those setpoints.

For instance, a setpoint of 75 degrees F and 55% relative humidity (RH) is roughly the same VPD as a setpoint of 78 degrees F and 58% RH, at approximately 1.33 kPa (kilopascals). However, the 78 degree/58% setpoint can reduce the HVACD capacity required to maintain those parameters by more than 10%, and in some cases even higher. Ideally, your systems should be designed correctly when you launch to meet your desired setpoints. However, that's not always the case. If your system is struggling to maintain target conditions, or if your energy bills are excessive, minor system setpoint adjustments can have a major impact.

Obviously, plant health is always going to be priority one, but the same VPD can be maintained with various combinations of temperature and humidity setpoints.

STAGING LIGHTING

Staging lighting systems can assist with the peaks and valleys of the load on the HVACD system, both at the facility level (operating rooms on a "flip," or



opposing 12/12 lighting schedules) and at the room level, by turning lights on and off in stages as opposed to turning everything on and off at once. If your dehumidification system is becoming overwhelmed when lights initially come on or off, powering lights on and off in 5 to 10 minute stages can give the dehumidification systems time to adjust to the changing conditions instead of forcing them to operate in catch-up mode after the fact. This is especially useful if there is no sophisticated controls system in use.

This strategy also serves to minimize peak electrical usage, for which there is an upcharge from most electric utilities, where the cost per kilowatt hour is calculated based on the highest amount of electrical usage at any given time, even if the peak is just for a few minutes. Operating the facility on a flip minimizes peak usage associated with both lighting and HVACD and can have a substantial impact on utility bills.

CONTROLS SYSTEMS

While a good controls system can be a bit of an investment, most operators will tell you it's money well spent. For starters, a good controls system can be a great early warning sign for maintenance requirements. SentryIQ®, a sensor, controllers and automation product suite from Surna, for instance, tells cultivators at what capacity the major components of Surna systems are operating. Anomalies in power use, run times, or other changes in equipment behaviors are displayed and can be a canary in the coal mine for maintenance needs. Similarly, the data collection around room conditions provided with most controls systems can also be helpful as it relates to system maintenance—reviewing climate conditions and identifying anomalies or unusual drifting can be a trigger to check the components of your systems to ensure they don't need maintenance.

And that's just one of the many benefits of utilizing controls systems to maximize HVACD performance. The most effective HVACD systems are operated based on a controls sequence—essentially programming that dictates "when this happens, do this." Simple thermostatic control only allows for enabling and disabling functions of each piece of equipment being controlled by that thermostat (or humidistat, etc.). In some cases, that means slamming an air conditioner on and off at full capacity when conditions aren't satisfied, regardless of whether the full capacity of that unit is really needed at any given time. With a real controls system, sequences of operation can be adjusted to maximize output when the full power of the equipment is needed, and minimize it when the systems only need to run at partial load, or to stage units when all pieces of equipment in the space aren't needed.

Some controls systems also provide significant data collection options, inclusive of how the equipment itself is operating, which allow the users to run all manner of reports and trend data to inform decision making. This information can be used to identify areas where energy use spikes and can be mitigated, or where equipment loading may be disproportionate. SentryIQ® products also use predictive algorithms to begin responding to a change in conditions before room conditions are impacted. For instance, the climate control system will respond to the inevitable humidity changes of lighting being turned off, before there is a spike. When a climate control system operates in catch up mode, responding to conditions after they've drifted out of spec, it uses additional energy and will take longer to bring the system back down to setpoint than if it is able to respond proactively.

While it's extremely difficult to retrofit an HVACD system in a fully operational facility, installing a good controls system in a launched cultivation operation is not nearly as disruptive. This should be considered if it's in the budget to help maximize the systems that are in place.

GET HELP IF YOU NEED IT

If you are struggling with your existing system and don't know where to turn, companies like Surna are happy to help evaluate what you're working with and help you get the most out of what you have. For folks who are planning a cultivation facility, partnering with experienced professionals for design, equipment integration, installation, controls and facilities maintenance will always result in the best outcome for your facility. HVACD systems are one of the most vital components of the cultivation operation. Starting off on the right foot, and staying on it, will ensure the best performance at the lowest cost, and that your facility will generate the maximum returns for decades to come.

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COMPREHENSIVE CANNABIS ENVIRONMENT SOLUTIONS

An efficient and precise environment is critical to maintaining a healthy, consistent crop and a successful business. Don't hope for the best when it comes to your HVACD design and equipment; choose Surna's experienced team to provide a climate solution specific to your facility's unique needs and budget.

CLIMATE (HVACD) SYSTEMS

Environmental systems and equipment designed for energy efficiency and plant health.

LICENSED MEP ENGINEERING

Cannabis-focused MEP engineering & design with fully stamped construction documents.

CONTROL SYSTEMS

Intelligent data mangement with schedules, trends, and system alarms at your fingertips.

MAINTENANCE SERVICES

Proactivley address problems with your HVACD system before they impact your bottom line.

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