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International Facility Management Association

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NOVEMBER/DECEMBER 2015



biomimicry

imitation as a science

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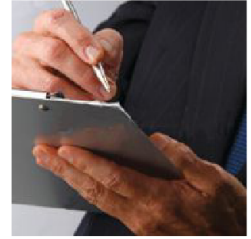
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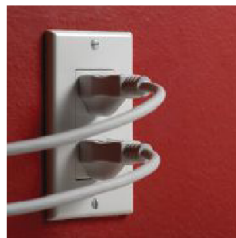
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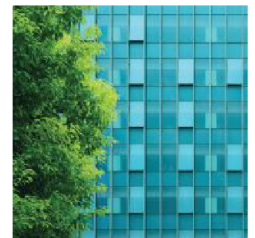
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BEHIND THE COVER: With a gecko crawling across the FMJ nameplate, one would rightfully wonder how a gecko relates to facility management. For our annual sustainability issue, the real question is how does a gecko make carpet more environmental? This issue's feature dives into the fascinating research of biomimicry and how mimicking various tried-and-true methods in nature can improve our lives, products and workflow.

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IFMATM
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Empowering Facility Professionals Worldwide

ABOUT IFMA

IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 24,000 members in 105 countries. The association's members, represented in 134 chapters and 17 councils worldwide, manage more than 37 billion square feet of property and annually purchase more than US\$100 billion in products and services. Formed in 1980, IFMA certifies professionals in facility management, conducts research, provides educational programs and produces World Workplace, the world's largest facility management conference and exposition. To join and follow IFMA's social media outlets online, visit the association's LinkedIn, Facebook, YouTube and Twitter pages. For more information, visit the IFMA press room or www.ifma.org.

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*Check out the interactive version of FMJ, featuring **videos, online extras and more!** FMJ can also be viewed on mobile devices.*

THIS ISSUE

The online version of the publication includes interactive resources.

- **VIDEO:** "What is Biomimicry?" to accompany "Biomimicry: Imitation as a Science" (p. 18)
- **PODCAST:** "Reducing Your Carbon Footprint Through FM Tech" to accompany "A Simplistic Sustainability Truth" (p. 33)
- **BLOG POST:** "What Shade of Green Are You?" to accompany "A Simplistic Sustainability Truth" (p. 33)
- **VIDEO:** "Integrated Pest Management and Health Inspections" to accompany "Reducing Pest Complaints and Costs in Your Facilities" (p. 40)
- **ARTICLE:** "Millennials More Attuned To Corporate Social Responsibility" to accompany "Building Relationships, One Good Deed at a Time" (p. 46)
- **VIDEO:** "Defining Indoor Air Quality" to accompany "Proactively Improving Indoor Air Quality" (p. 64)
- **FACT SHEET:** "Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions" to accompany "Lowering Utility Costs and Increasing Facility Performance" (p. 68)
- **VIDEO:** "Skyscraper Farms and Edible Walls: Living Architecture" to accompany "The Grass Isn't Always Greener on the Other Side" (p. 80)
- **ARTICLE:** "Top Five Packaging Trends for 2015" to accompany "Developing Trends in Sustainable Packaging" (p. 91)
- **PODCAST:** "2010 Interview with George Graves" to accompany "Celebrating the Life of George Graves" (p. 110)
- **PODCAST:** "Getting to Know IFMA's September 2015 Member of the Month" to accompany "Congratulations to IFMA's September and October Members of the Month" (p. 114)
- **VIDEO:** "Getting to Know IFMA's October 2015 Member of the Month" to accompany "Congratulations to IFMA's September and October Members of the Month" (p. 114)

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EDITOR'S COLUMN

ANDREA SANCHEZ
Editor-in-Chief
IFMA's FMJ magazine



THE PAST 12 MONTHS AT IFMA have been a turning point for me. From the emergence of pivotal milestones that have strengthened my skillset to experimenting with new strategies that embrace my thirst for creativity, I have made it a priority to keep myself growing. My perpetual quest for knowledge and exploring the “what ifs” is what keeps me moving forward.

Your personal fossil fuel

Sustainability, in its most traditional sense, is defined as the ability to sustain or capacity to endure. It is associated with environmental protection, whether that is an external or internal environment.

For people to be internally sustainable, it is important to understand what makes them commit and stick through things. Individual values and culture play a huge role in a group's capacity to endure and beat the odds.

What keeps you going? Is it the clean slate a new day brings? The ability to make a difference in someone's life? A paycheck? A good laugh? For some it's as simple as the chance to be themselves — it just feels right.

Something magical happens when you figure out where you're supposed to be. You no longer doubt where you are, you just know you'll find a way to keep going. That is endurance and commitment at its finest.

I believe this is a sweet spot for our IFMA members. An example is a recent conversation I had with one of our volunteers for the Knowledge Library. This person has given her life to the profession, receiving countless accolades for her work and the highest respect from her peers. She signed up to assist with the Knowledge Library until the time of her very well-earned retirement in fall 2015. As

SOMETHING MAGICAL HAPPENS WHEN YOU FIGURE OUT WHERE YOU'RE SUPPOSED TO BE. YOU NO LONGER DOUBT WHERE YOU ARE, YOU JUST KNOW YOU'LL FIND A WAY TO KEEP GOING. THAT IS ENDURANCE AND COMMITMENT AT ITS FINEST.

of yesterday she stated that she would not step down with her involvement. Her exact words were, “I did not just volunteer, I am now committed.” This member is Mary Gauer.

I have an abundance of other names I could list, all members who have been an inspiration to me — truly personifying what endurance is all about.

Setting the bar

As we bid adieu to 2015, how will you set the bar for the next 12 months? Remember that high is not necessarily always the answer. In the game of limbo, a low bar challenges you to be creative in how you pull through to get to the other side. Change your mindset. Set your own bar, mainly starting with your internal one.

Don't know where to start? Take time to reacquaint yourself with you. Discover your unique fossil fuel that will give you the means to move forward without giving up.

I look forward to hearing about the additional success you are capable of. Best wishes to all of you!

Until next issue,

Andrea

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CHAIR'S COLUMN

MICHAEL D. FELDMAN, FMP, CM
Chair, Board of Directors



HELLO IFMA MEMBERS AND FMS EVERYWHERE,

The one word that I have heard most often to describe our recent World Workplace in Denver, Colorado, USA, has been “fantastic.” Congratulations to the entire IFMA team, the program committee, the Denver Chapter of IFMA and all others who volunteered their time and energy. Denver hosted more than 4,600 total attendees, nearly 1,000 of whom were experiencing World Workplace for the first time, and a sold out expo floor. You rocked it!

It takes a great deal of detailed planning, preparation and follow through for an annual event like World Workplace to be successful. The success achieved also demonstrates a personal commitment by the event staff to assist every participant in having a positive and productive experience. Those factors combined with a very relevant theme — “Collaborate to Innovate” — generated a truly positive vibe in Denver.

World Workplace takeaways

I know we all have our own unique set of takeaways from the conference. My list is long, but highlights included opening keynote speaker Josh Linkner’s reference to best practices being historical and the importance of staying focused on evolving “next practices.”

The IFMA Foundation’s scholarship awards presentation is always a highlight. Those students are our future and seeing the commitment to education and the generosity of IFMA’s partners, chapters and councils is truly inspiring. In addition, the Awards of Excellence and Chair Citation recipients all help make IFMA stronger. It was also a privilege to participate in honoring the 2015 class of IFMA Fellows: Buck Fisher, Marc Liciardello and Steve Lockwood.

Finally, the standing-room-only response to the first TED talk-inspired FRED (facility, real estate and design) talks and the release of IFMA’s new Knowledge Library were important outcomes in Denver. While unplanned, the opportunity to help the Denver police and fire departments conduct a mass evacuation was an exciting way to close the conference. The emergency responders did a great job in front of very experienced observers. Look for an interview with the Hyatt Regency Denver on those events in an upcoming issue of FMJ.

The challenge is to build off the success of each event and continually improve. Please help us by taking a brief survey

about your World Workplace Denver experience at <http://bit.ly/1O3cBNW>. The planning for World Workplace 2016 in San Diego is already well underway. I have no doubt it will be a great event and hope to see you there!

Looking forward

With the successful launch of IFMA’s Knowledge Library accomplished, we now have the ongoing obligation to keep it fresh and vibrant. Check it out at www.community.ifma.org/knowledge_library. I want to encourage you to not just use the library, but let us know what you think. Find out how to comment, contribute or help curate the growing content by going to www.ifma.org/knowledgelibrary. The fundamental goal is to make this your go-to source of information and your engagement is welcome.

Another critical opportunity for FMs to influence the future of our profession is to actively engage in the Global Job Task Analysis (GJTA). The information being collected will be used to update and refine core FM competencies and related professional development curricula. In a rapidly changing world, what new skills will FMs require to be successful? The GJTA needs our active engagement to help answer that question. Please visit www.ifma.org/professional-development/global-job-task-analysis to join this effort.

The role of FM can only intensify across all sectors of the built environment in mature, maturing and emerging economies. The implications of urbanization, globalization and climate change will continue to influence the built environment and the quality of life experienced by tens of millions. Companies, communities, cities and countries that best assess risks, prepare accordingly and build resilience will have a competitive edge moving forward. FMs must be prepared to be active players in those efforts. This is a prime motivation behind IFMA’s strategic focus.

I am often asked, “How I can get involved? How can I make a difference?” I have listed several opportunities in this column that are available now. IFMA is strengthened through member engagement, so please join me in these efforts.

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PRESIDENT'S COLUMN

TONY KEANE, CAE
President and Chief Executive Officer



ANOTHER WORLD WORKPLACE HAS COME AND GONE.

Based upon much feedback from attendees, the event was a huge success! A big thank you goes out to our Denver Chapter hosts, sponsors, exhibitors and staff who all worked together to create another memorable event for IFMA.

The new Knowledge Library has already had more than 12,000 views and more than 1,000 downloads within the first 20 days after its World Workplace launch. This resource-rich new member benefit is just the beginning of the deliverables we will see from IFMA's Knowledge Strategy.

At the board meeting held just before World Workplace the following items were approved:

- New FM Innovation Award
- Memorandum of understanding (MOU) with City Energy Project submitted by the Environmental Stewardship and Sustainability Strategic Advisory Group
- IFMA FY 2015 audited financial statements
- Governance Committee updated charter

Other items that were discussed and reported on at the meeting:

- FY 16 financial performance
- Knowledge Library
- FM Asia Trends Report
- Chapter performance matrix
- Community and council alignment
- New marketing and public relations toolkit
- Foundation update on the Global Workforce Initiative

IFMA awarded fellowship to three individuals at the conference. It was a great honor to be involved in the presentation of their achievements. Our three new Fellows are:

- Howard K. "Buck" Fisher,
IFMA Fellow, CFM, Fisher & Associates
- Marc S. Liciardello,
IFMA Fellow, CFM, MBA, CM, Aramark
- Steve Lockwood, IFMA Fellow, CFM, IFMA Foundation

A question that was asked at World Workplace was, "How do all of the new initiatives fit together?" IFMA's mission is to globally advance and support the practice of facility management. In order to accomplish this, IFMA has to be a knowledge transformation-based association. This requires us to provide value and maintain relevancy by curating content and sharing it through usable, easily accessible and timely products and services. The current initiatives supporting this aim relate to IFMA's four strategic themes.

Global community

To serve a global community, IFMA has to have the support infrastructure in place to deliver consistent services to our members, who are currently located in 104 different countries. IFMA's new association management system (database software) and upcoming content management system (website platform) are major steps forward in supporting these worldwide connections.

Membership

IFMA has to have a strong value proposition to maintain a strong membership. Initiatives that support this are the new Knowledge Library, enhanced FMJ, chapter performance matrix and the new alignment of councils and communities.

Sustainability

This theme has become part of everyday life for most of us in the world of FM. The new City Energy Project MOU shows IFMA's continued support for environmental stewardship. Ongoing emphasis on the SFP® credential and sustainable operating practices maintain IFMA's strong position in this area. The new alignment of the sustainability area of IFMA's Online Community will also provide a stronger platform to highlight sustainability topics to all industry segments.

Knowledge/education

IFMA's Knowledge Strategy will accelerate our journey to becoming a true knowledge transformation association. FM knowledge is packaged throughout IFMA's service and product offerings, and the Knowledge Library is the latest release in this area. The ongoing efforts to maintain the high quality of IFMA courses are also critical. The Global Job Task Analysis now underway is the key to ensuring the future relevancy of these global credentials.

IFMA's strategic planning process is integrated from the board's vision through the strategy map to our annual operating budget. With the rate of business change accelerating, the board and staff are working together to make sure the course forward is properly mapped and reflected in IFMA's balanced scorecard objectives, measures and targets.

Have you invited your colleagues to join IFMA? If not, why don't you let them know about the great benefits of being part of the world's largest community of FM professionals?

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WORKPLACE STRATEGY SURVEY FINDS UNASSIGNED SPACE ON THE RISE

A new survey released by IFMA provides critical insights into the evolving state of workplace strategy. According to “Distributed Work Revisited,” released at IFMA’s World Workplace 2015 Conference and Expo, most surveyed organizations have increased the number of staff sitting in unassigned spaces when compared with the initial 2009 “Distributed Work” report. At the same time, survey respondents reported a decrease in the amount of space required to support unassigned staff.

The results further illustrate the increasingly important role facility management and real estate professionals are playing in high-level strategic workplace decisions. Specifically, when asked who was driving workplace strategy decisions related to the implementation of distributed work, FM and real estate managers were identified in 30 percent of responses, only slightly less than senior executives (38 percent).

“Our workplace research confirmed that distributed work strategies are here to stay,” says Gordon Wright, director of consulting at HOK, which co-authored and co-sponsored the report. “The key for organizations across the world is to understand how to modify these workplace strategies over time to keep pace with the changing needs of their people and operations.”

IFMA has researched and reported on distributed workplace strategies since the early 1990s. This latest contribution, Research Report #37, identifies trends across industry categories primarily in Canada and the United States. During its 35 years of service to the facility management industry, IFMA has observed and supported a shift in the perception of the workplace to become a tool to support organizational goals.



IFMA found that in order to help achieve these goals, more organizations are employing a “growth without growth” strategy when it comes to workspace allocation. With more people using less space, the sharing ratio has increased such that organizations are increasing their size while using the same amount of real estate.

The report also identifies social barriers — not technological ones — as the primary hurdle for implementation of distributed work strategies. For those organizations that do adopt distributed work strategies, technology and furniture are the top drivers of cost. One surprising result was the increased cost of parking, resulting from the fact that workplace density is increasing beyond the expected levels.

In addition to the complete survey data, the report includes case studies from

organizations that have found success with distributed work strategies, including eBay, Accenture, Microsoft, the U.S. General Services Administration and the City of Calgary. Finally, the report offers an invaluable “Lessons Learned” section in which real experiences in implementing these strategies are condensed into useful guidance to help FM professionals succeed in similar efforts.

The complete version of “Distributed Work Revisited: Research Report #37” is available for sale online at <http://bit.ly/1RTYKYU>. The report is US\$95 for IFMA members and US\$175 for nonmembers, and the funds raised help support ongoing and future research. This paper was made possible by generous contributions from supporting sponsors HOK (www.hok.com) and Allsteel (www.allsteeloffice.com).

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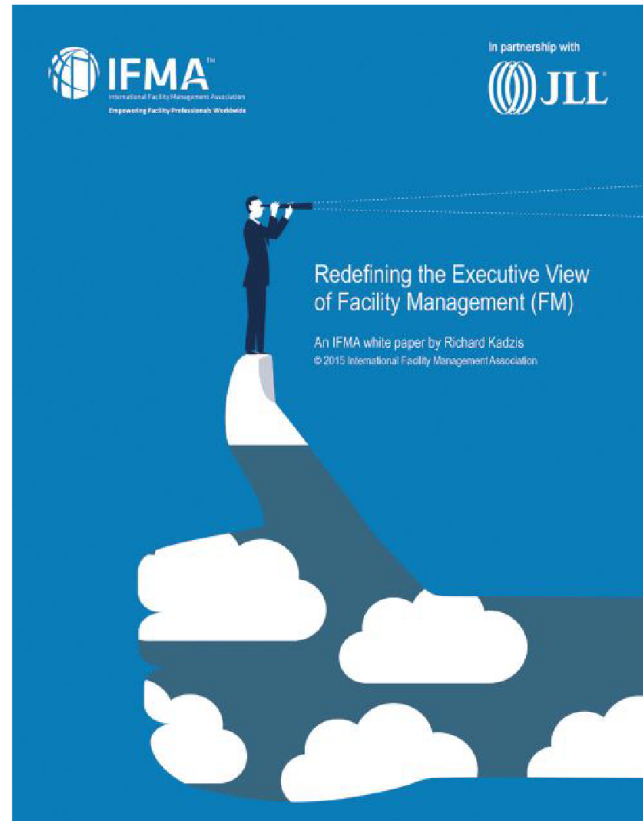
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WHITE PAPER EXPLORES C-SUITE PERCEPTION OF FACILITY MANAGEMENT AND HOW TO IMPROVE IT

Continuing its role of thought leadership in facility management, IFMA, in partnership with JLL, has published a thought-provoking white paper exploring the challenges and benefits of a shift in C-suite perception of facility management from a support-based cost center to a strategic partner. The paper, officially released at IFMA's World Workplace 2015 Conference and Expo in Denver, Colorado, USA, offers a compelling case for facility management professionals to take a more active role in informing and achieving organizational goals, while also providing specific suggestions to achieve this elevated status.

"As the FM industry advances and transforms with the workplace, it requires new business skills, innovation and new ways of thinking," writes IFMA first vice chair and international director of global integrated facilities management for JLL, Maureen Ehrenberg, FRICS, CRE. "New types of career opportunities hold much promise for the future of FM and its relationship to the business. The implications of the convergence of technology, workplace and facilities services will impact the business enterprise well beyond the traditional 'comfort zone' of FM as it has been defined in the past."



Over its 35 years of service to the FM industry, IFMA has supported a remarkable shift in perception of the built environment from simply a box that contains the tools of productivity to a tool in its own right. The built environment, in the hands of a qualified FM, can enable any number of goals – from workplace productivity to worker well-being and safety, as well as cost savings and sustainability. Yet many social and professional barriers continue to impede the necessary elevation of the FM professional to the critical role of strategic partner.

The IFMA paper, "Redefining the Executive View of Facility Management (FM)" by Richard Kadzis, first explores the current state of the relationship between FM and the C-suite, then proposes a model for improving that relationship. Part three provides practical advice for actionable next steps, supported by case study examples. The paper is available free of charge and can be downloaded from IFMA's new Knowledge Library at http://community.ifma.org/knowledge_library.

INDUSTRY NEWS

SURVEY SHOWS HAND WASHING AWARENESS AFFECTS U.S. PATIENT EXPERIENCE

SCA, the producer of the Tork® brand of away-from-home professional hygiene products and a Silver Corporate Sustaining Partner of IFMA, has announced findings from a U.S. patient survey conducted by Ipsos Public Affairs, revealing that 93 percent of health care facility patients and visitors agree that hand hygiene is more important in health care settings compared to other public places.

Of the respondents, all of whom had visited a health care facility over the past year, nearly three quarters (71 percent) were concerned about acquiring an infection from being at a health care facility. Likewise, 96 percent of respondents agreed that they would be concerned if health care professionals were not practicing good hand hygiene, while similar proportions further agreed that they would not want to be treated by a health care professional who does not practice good hand hygiene (96 percent).

The survey was conducted in conjunction with the launch of the Tork Healthy Hands website, a new resource for health care facilities, providing free materials to promote hand hygiene compliance as the number one way to reduce infections in health care facilities. The site features a variety of hand hygiene insights, statistics and reminders, as well as a selection of visual designs. Health care facilities can select a design style, choose the information to be featured and add their own logo to build out free, customized hand hygiene signage.

The site will be regularly refreshed with new designs and information, enabling hospitals, doctors' offices and long-term care facilities to frequently update hand hygiene signage. Changing up hand hygiene communications on a regular basis keeps messages from wearing out with employees, ultimately helping hand hygiene protocol to stay top of mind, increasing compliance and reducing health care associated infections.

The Tork Healthy Hands website is live at www.torkhealthyhands.com, and health care workers are invited to provide feedback at torkusa@sca.com in order to help make the site even more useful.

SOUTHERN CALIFORNIA FEDERAL BUILDINGS' ENERGY AND OPERATING COSTS TO BE REDUCED BY NEARLY US\$50 MILLION

ABM (NYSE:ABM), a leading provider of facility solutions and a Silver Corporate Sustaining Partner of IFMA, announced it has signed a contract with the U.S. General Services Administration (GSA) to begin a second phase of extensive energy and facility improvements to federal buildings throughout Southern California, including the Edward R. Roybal Federal Building in Los Angeles, the U.S. Social Security Building in Huntington Park, the 300 North Los Angeles (NLA) Building, the Glenn M. Anderson Federal Building in Long Beach and the Ronald Reagan Federal Building and U.S. Courthouse in Santa Ana.

In all, ABM's Bundled Energy Solutions (BES) program guarantees savings of at least US\$48.4 million in energy and operating costs over the next 20 years through its innovative long-term financing solution, reducing the buildings' energy use by 38 percent. ABM recently completed the first phase of the multi-million-dollar contract for GSA which centered on retrofitting the central plant's HVAC system and upgrading building automation controls to regulate energy usage. This upgrade is expected to reduce

energy consumption by 25 percent. The central plant is shared by the Edward R. Roybal Federal Building and the 300 NLA Building.

ABM's BES program is designed as a financial solution to meet clients' technical facility needs and sustainability goals. ABM's goal is to drive costs out of clients' operating budgets, allowing savings to be reallocated to fund mission-critical facility needs.

This customized solution for GSA includes 54 energy conservation measures across the buildings including: replacing and retro-commissioning heating and cooling equipment with state-of-the-art systems, including low-load chillers to provide more fresh air to building occupants; upgrading building automation controls to regulate energy usage; installing state-of-the-art LED lighting and occupancy control devices, reducing wasted lighting energy; transformer upgrades; solar window tinting; and phase change technology that helps save energy by actively absorbing and releasing heat, offsetting heating and cooling loads in the NLA building.

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biomimicry

imitation as
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What is
Biomimicry?

BY BILL CONLEY

“It’s not nice to fool Mother Nature!”

(Cue the thunder and lightning.) For those who remember, that was an old television ad for a brand of margarine. I mention this not to assess the pros and cons of butter substitutes, but to expand on the precept that nature is an unforgiving force. Abusing and misusing natural resources such as air, water and earth — the stuff that sustains life — has consequences far beyond human control.

On the flip side of the coin, however, it is said that imitation is the sincerest form of flattery. There is a relatively new burgeoning movement called biomimicry: the study of how nature treats and heals itself. The lessons that can be learned from natural processes are both edifying and eye-opening.

Nature as a mentor

Biomimicry is an avenue to innovation and creativity that derives sustainable solutions for human challenges. It does so by observing and replicating time-tested patterns and strategies presented by nature. The results delivered through biomimicry are clean, efficient technologies that bring supply chains — and, through them, society — closer to a sustainable future.

In facility management, an increasing emphasis is being placed on knowledge transfer, preparing new professionals for success in the field. Tools such as benchmarking and best practices are utilized to improve performance based on past successes. Case studies are pored over to derive practical applications in parallel situations. Mentoring is strongly encouraged to pass on tradition through the revelation of lessons learned by trial and error. The advantage of biomimicry lies in allowing nature to lead by example through any or all of these vehicles.

Nature can be a mentor. The idea that nature can serve in this role implies a shift in humankind’s relationship to it. Instead of acting as if people are separate from nature and can treat it indiscriminately, we need to understand and accept that the human race is part of nature. Humans should strive to treat nature as they would have themselves treated.

Instead of being part of the problem, people should attempt to be part of the solution. Modern industry, which drives a large percentage of professional motivation, has been around for less than 200 years. The facility management profession has only been recognized for less than 40 years. Nature has been experimenting and engineering for 3.8 billion years. Over that time, it has learned what works, what is appropriate and what lasts. Failures are fossils.

The results of these eons of experience offer an incredibly large testing sample and incalculable experiments from which FMs can draw conclusions.

Biomimicry is an approach to viewing and valuing nature in a new way. Its precepts are not based on what we can steal from nature to satisfy short-term wants, but on what we can learn from boundless examples of accumulated successes.

Case studies

Most people have heard, or heard about, the “birds and the bees” talk. For many, it is a major part of growing up and/or raising children. It is only logical to recognize that there are other lessons nature has to provide. Biomimicry studies nature’s models and then imitates or takes inspiration from these designs. Such modeling entails emulating nature’s forms and systems to solve human problems. Animals, plants, insects and even microbes are consummate engineers.

Some miracles of nature come compliments of the spider. Certain spiders protect their delicately crafted insect nets with a special silk rope that reflects ultraviolet rays. It is a technique to keep birds from flying through and destroying their webs. Birds can see the ultraviolet rays and recognize the webs as obstacles they should avoid. Based on that design, a similarly patterned UV reflective coating has been developed that is virtually transparent to the human eye, yet is visible to birds, thus reducing collisions of birds into windows.

Spider silk is known to be one of nature’s strongest materials. It measures five times stronger than steel by weight, yet at the same time it is also flexible and lightweight. Being able to replicate its properties in a cost-efficient manner would be a boon to the construction industry.

Another trait of spider silk is its multiple textures. The material needs to be sticky in order to catch prey, yet smooth on other surfaces so that the spider can move across it. Scientists have created a medical product that mimics this property: a flexible tape that can be peeled off a wound without damaging the tissue underneath. To make the silk-inspired tape, researchers apply a silicon-based film to the backing material and use a laser to etch a grid pattern onto the silicon. The grid allows some parts of the material to adhere to the skin while other areas are not sticky, just like a spider’s web.

From the chemistry of rock-clinging seashells comes formaldehyde-free adhesives. Mussels secrete certain proteins capable of great strength and flexibility. New plywood technology utilizes a non-toxic, soy-based adhesive that replaces urea-formaldehyde in panels used to build cabinets and furniture.

Geckos have long been studied by those interested in biomimicry, primarily because of their seemingly sticky feet. Gecko feet are marvels of evolution, able to keep traction even on glass. Inspired by the intermolecular force that allows animals like the gecko to adhere to surfaces, glue-free

carpet installation has become part of the industry. Benefits include no messy glue, and an environmental impact that is more than 90 percent lower than that of traditional glue carpet adhesives. It also eliminates damage to the slab and enables repair and replacement chores to be handled in-house, as needed.

Termites are best known for eating buildings, albeit one little bite at a time. However, they can also teach professionals how to build a facility. Termite mounds are constructed with the ability to self-cool. They can maintain the temperature inside their nest to within one degree, regardless of external conditions. Much of the energy in a building is consumed to provide climate control; establishing sustainable ways to regulate temperature is an ongoing challenge.

The Eastgate Building, an office complex in Harare, Zimbabwe, implemented a climate-control system modeled on these self-cooling mounds. The building has large chimneys that naturally draw in cool air at night to lower the temperature of the floor slabs, just like termite dens. During the day, these slabs retain the coolness, greatly reducing the need for supplemental air conditioning. Eastgate uses 90 percent less energy for ventilation than conventional buildings its size and it is estimated that more than US\$3.5 million dollars have been saved in energy since its construction.

Energy and flow

Natural powered energy, also known as renewable energy, utilizes the forces of nature to deliver power and generate electricity. Biomimicry is a tool that can be applied to these efforts; for instance, creating a solar cell inspired by a leaf.

Photosynthesis is the process by which green plants use chlorophyll to convert sunlight, water and carbon dioxide into carbohydrates and oxygen. The humble leaf is singled out because the entire solar industry is based upon replicating photosynthesis as closely as possible, and the leaf is one of the most perfect models.

Scientists are establishing major in-roads in mimicking the leaf. An “artificial leaf” could be used to generate power for off-grid homes in developing areas, and it is anticipated that one such “leaf” could provide enough energy for an entire household. This advanced solar cell is about the size of a poker card and mimics photosynthesis. It is different from current solar technology, which converts sunlight into energy directly.

Instead, this process utilizes water along with the sunlight, much as typical leaves do. The solar cell is placed in a container of water exposed to sunlight, where it splits water into hydrogen and oxygen and stores those gases in a fuel cell. The process would make hydrogen fuel cells an efficient, self-recharging and less expensive way to create and store energy for home and industrial systems.

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Naturally flowing liquids, gases and heat follow a common geometric pattern that differs from conventional man-made devices. Nature moves water and air using a logarithmic or exponentially growing spiral as commonly seen in seashells. This pattern is everywhere in nature, from the swirl of galaxies to the shape of the cochlea of inner ears.

Prompted by the way nature moves water and air, this fundamental geometry has been applied to the shape of man-made rotary devices. Depending on the application, the resulting designs have reduced energy usage by anywhere from 10 to 85 percent over standard rotors and the noise of their operation has been reduced by up to 75 percent.

The Shinkansen Bullet Train was so fast that it was violating Japan's noise ordinances. As it drove through tunnels, air pressure built up in waves and when the train emerged, it produced a shotgun-like thunderclap heard for a quarter mile. An engineer recognized that the kingfisher, a fish-eating fowl, barely creates a ripple when it dives into the water. The train's nose was redesigned to replicate a 50-foot-long steel kingfisher beak. Now the train just cuts through the air. Not only did this innovation solve the noise problem, it also reduced power use and enabled faster speeds.

Wind turbines are major edifices on the modern landscape. Their blades can scribe circles more than three hundred feet in diameter. Critics see them as blights on the environment: unsightly, view-dominant and hazardous to birds. Turbines have become more powerful, but their size requires that they be spaced far apart, decreasing efficiency and use of resources: a wind farm takes up a lot of land.

A solution to the spacing challenge was found underwater. An experimental wind farm was built in which the location of turbines relative to each other takes advantage of the airflow among them. The turbine placement was determined by studying the wake vortices produced by schools of swimming fish. The 30-foot-tall turbines have twirling vertical blades that gather energy generated as wind flows through the farm. In situating the blades in this fashion, they can take advantage of the wind's behavior for energy production the way that fish take advantage of the water's behavior for forward movement. The asynchronous pattern of the turbines minimizes their visual effect.

Inspired by the flippers humpback whales use to enable their surprising agility in the water, turbine blades have been developed with bumps called tubercles on the leading edge. This creates greater efficiency in applications for wind turbines, hydroelectric turbines, irrigation pumps and ventilation fans. Compared to sea life with smooth surface fins, the bumpy humpbacks realize 32 percent less drag and 8 percent increased lift in their movement through air or

water. Using such blades to catch the wind for renewable sources could provide a 20 percent increase in efficiency.

Other sea-inspired designs can be derived from the shark. For a beast that moves slowly through the ocean, sharks stay remarkably clear of algae and other fellow travelers. That's largely a function of their unique skin, covered with microscopic patterns called denticles that keep microorganisms from adhering to the body. Based on this are bacteria-repellant coatings that can be applied to high-touch areas such as rest room handles, light switches, shopping carts and handrails.

The balance of nature

Biomimicry uses an ecological standard to judge the "rightness" of our innovations. It can be seen as a benchmarking tool utilizing nature as a measure. This entails evaluating designs and solutions against those of nature and determining if current methods are as efficient, simple and sustainable as those found in nature. Challenges should be defined in functional terms and then investigated as to how that function is delivered and utilized in nature.

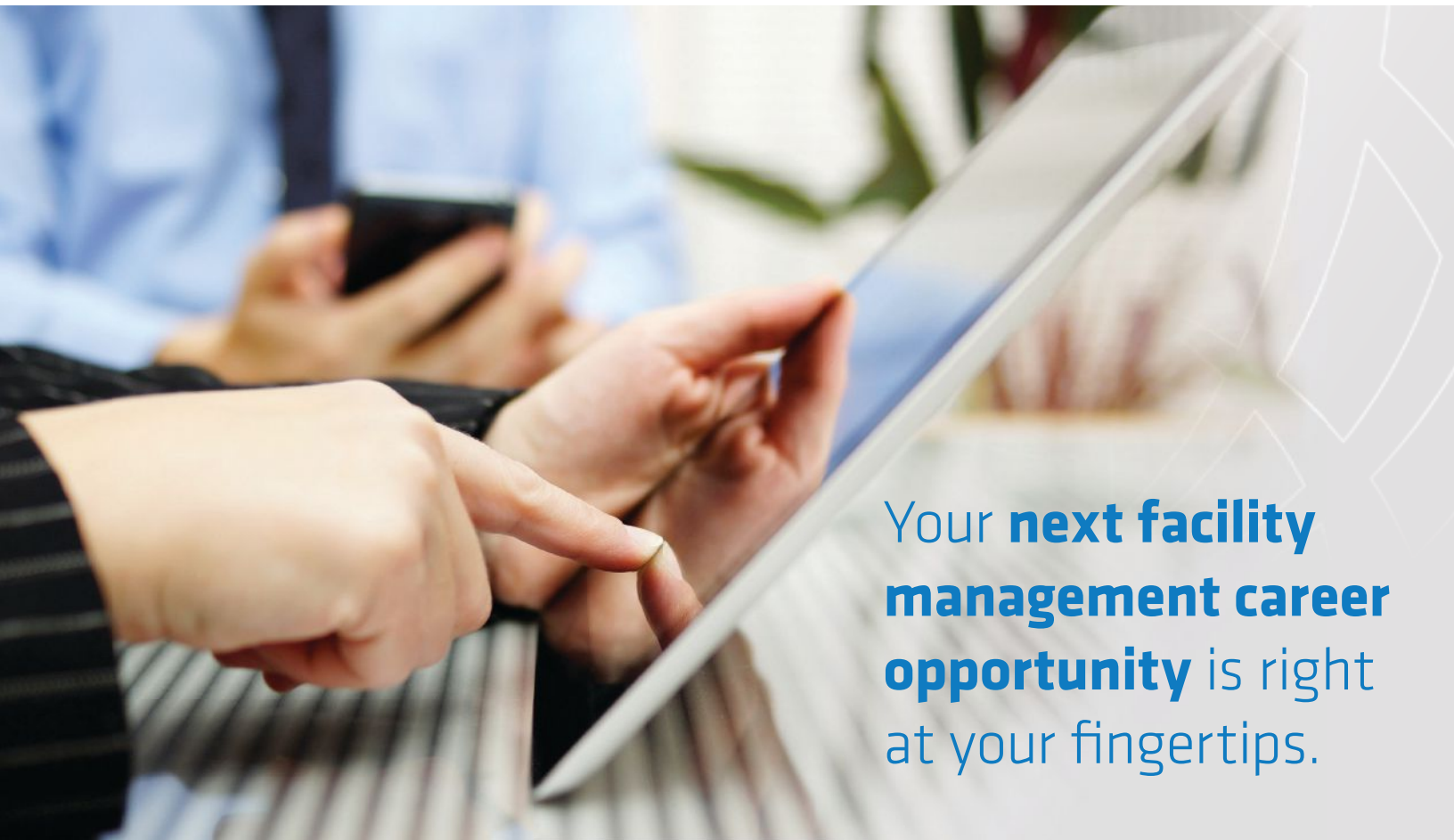
What goes around, comes around. Biomimicry is a logical conclusion to the shift in humankind's approaches to nature: from trying to conquer it, to trying to preserve it and most recently, striving for a reconciliation with it. Utilizing biometric principles, it is possible to retain many of civilization's achievements while rethinking what has been poorly exercised using nature as a guide for improvement and long-term success.

Nature's journey to its present state brings the phrase "been there, done that" to a whole new level. After billions of years of research and development, failures are extinct and what exists in nature today is the secret to survival. Biomimicry is an integral part of sustainable thinking: proof that following in nature's footprints is a path well taken. **FMJ**



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Conley has served on the IFMA board of directors, is a recipient of IFMA's distinguished member of the year award and has received the association's distinguished author award three times. He has been a regular contributor to FMJ for 20 years and has authored more than 50 FMJ articles.



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HOSPITAL FINDS ENERGY- SAVING BEHAVIORS CONTAGIOUS

BY KHIRY SUTTON

The journey to curb energy consumption continues to mature as the demand for controlling health care costs increases. Since 2007, large hospitals are reported to consume more energy per square foot than some commercial buildings, likely due to occupant volumes at all hours of the day and times of the year and robust heating, ventilation and air conditioning systems that control temperatures and air flow.¹

Health care facility managers are eager to find innovative solutions that will improve building energy performance without compromising occupant comfort or regulatory compliance. While various automation solutions, power-saving devices and sensors such as occupancy and sunlight offer standardized outcomes to optimize savings, the up-front capital and implementation costs may be prohibitive for many health care systems.

Conversely, a relatively low-cost approach that integrates occupant behavior modification as part of a hospital's energy-efficiency investments has the potential to improve energy performance and generate ongoing savings. Human behavior is less systematic than technology solutions which make it difficult to predict outcomes; however, setting clear expectations for staff to perform simple energy-saving actions while working can yield visible results.



Designing an effective program

Carolinas HealthCare System (CHS) adopted a goal to reduce energy-use intensity 20 percent by 2017 across its portfolio of owned, hospital-based acute care facilities over a 2012 baseline. While several investments to reduce energy consumption are being made at the participating facilities, the concept of generating ongoing savings from occupant behavior modification drove CHS' decision to develop a low-cost, behavior-based energy-efficiency (BBEE) program.

Emilie F. Greene, program manager for a healthy environment at Carolinas HealthCare System, encourages facility managers to select actions that are easily achievable and can be performed in less than two minutes in order to avoid interfering with staff's fulfillment of primary job duties. "The program selected simple behaviors that can be transferred from home to work," says Greene.

"Our teammates were asked to carry out five specific actions in unoccupied patient rooms: **Turn off lights, turn off televisions, power down computer monitors, reset thermostats and close window blinds.**" — EMILIE F. GREENE

This program was piloted at CHS Lincoln Hospital, a small hospital with a progressive culture undergoing a series of energy-efficiency investments. Preliminary results of the program demonstrated value for future programs, so a subsequent study was launched in May 2015 to assess the effectiveness of the behavior change and estimate the resulting savings opportunity.

A total of 90 single and double patient rooms were measured daily for individual behaviors and total room behavior compliance. Due to the ability to assess occupancy rates using current hospital management systems, only inpatient rooms from surgical services, telemetry, maternity and the critical care units were evaluated.

The rooms were randomly divided into two groups allowing for visual cues (stickers) to be applied in a subset of rooms. These small visual cues were placed around patient rooms as a reminder of the desired behaviors, driving staff's awareness and attention to unnecessary energy waste. The cues, and all corresponding educational materials, were intentionally designed using an image of a monarch butterfly to symbolize the connection between human and environmental health. The printed materials (including stickers) and invested time in education were all factored into the total cost to achieve this program.

Creating a culture of conservation

Staff education was important to the adoption of energy-efficiency behaviors. Emphasizing that energy production is one of the largest causes of air pollution and poor air quality, which has been demonstrated to exacerbate pulmonary and cardiac diseases,^{2,3} encouraged hospital staff to take action.

Education explaining how each behavior decreased energy use — such as resetting thermostats to weather-appropriate temperatures and closing window blinds to lessen solar gain and heat loss — was shared with occupants every three weeks. An unpublished survey of CHS Lincoln Hospital staff revealed that 67 percent of respondents personally knew someone whose health was impacted by pollutants in the air.



To date, CHS Lincoln Hospital has reduced its energy use intensity by 25 percent over 2012 baseline through focused energy-efficiency investments and behavioral modification, earning well-deserved recognition in the American Society for Healthcare Engineering's Energy to Care program.

CHS is a 101-bed community hospital located in Lincolnton, North Carolina, USA, supporting a wide range of services such as a 24-hour emergency department, a Level 2 nursery inside the maternity unit and a state-of-the-art imaging, rehabilitation and surgery center.

Another key measure for success was leadership communication. The desired behaviors, the purpose of the visual cues and possible impact of the corresponding behaviors were explained to leadership in each studied unit. They were asked to cascade the program materials, explain the expected behaviors, and encourage and support staff participation. Presentations at monthly leadership meetings reinforced the importance of behavioral compliance and recognized employees who embraced energy-saving behaviors.

An unanticipated achievement of the BBEE program came from observed data during the study which indicated that the frontline staff were most likely to perform the desired energy-saving actions.

The environmental services team (housekeeping) and nursing staff have direct access to unoccupied patient rooms in order to perform job responsibilities. Encouraging them to incorporate the five energy-saving actions into their current processes increased the behavior compliance. Additionally, the hospital's security officers would turn off lights and televisions in patient waiting areas during routine safety checks.

Ensuring the study's integrity

A simple logistic regression was performed to measure the overall impact of the visual cues on behavioral compliance. An explanatory variable was used in order to control for each unit's staff and cultural differences, while compliance was defined as the dependent variable.

The cue data did display a positive influence on individual behaviors compliance rates, however it showed no statistical

significance on the typical level in determining the compliance of a room. Overall, rooms with visual cues showed about a 42 percent higher chance of being in compliance than the non-cue rooms based on the estimated coefficients.

In order to test the long-term impact of the visual cues, a weighted linear regression was conducted with the dependent variable as the percentage of days in compliance. Again, the visual cues showed a positive relationship on influencing behavior response, but were not statistically significant in the proportion of days compliant.

To assess the continued stimulation of the behaviors during the study in comparison to the BBEE program's onset, a two-sample proportion test between compliance rates was performed. The ratio of each behavior response was compared between the time periods. This resulted in a significant increase in the rates of compliance and suggests that there was an improvement of behavior response during the study, which was most likely caused by the continued maturity of the BBEE program.

The high level of behavior compliance also suggests that the increased awareness from staff education, leadership communication and engaged frontline positively influenced compliance rates within the observed rooms. While statistical analysis of the visual cues suggest that long-term deployment may not prove necessary, leveraging them as a desired behavior reminders in only a subset of rooms may have helped encourage occupants to perform the behaviors in all rooms.

Realizing the energy savings opportunity

CHS Lincoln Hospital was able to estimate the amount of

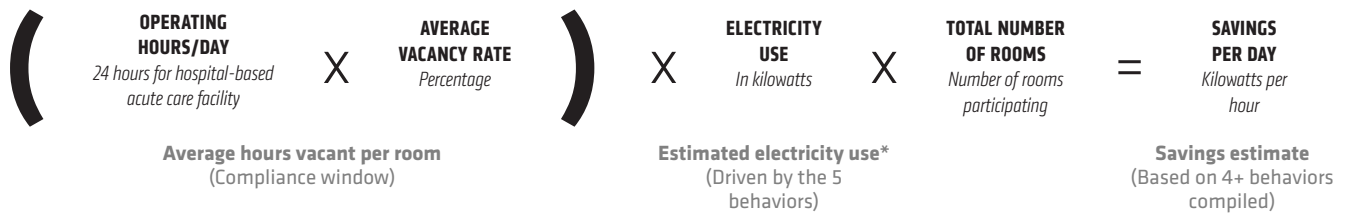


FIGURE 1 shows a calculation created to generate energy-saving opportunities at CHS Lincoln Hospital. Equipment and lighting consumption values were based on actual measurements conducted during the study,* while heating and cooling estimates were based on a study published by the National Institutes of Health.⁴

energy produced by each room and the amount of savings possible with compliance by using the following equation: Energy Use in Room = (# of TVs x wattage of TV) + (# of computers monitors x wattage of monitors) + (heat gains/lost⁴) + (lighting wattage).

The maternity unit proved to have the largest opportunity to conserve energy based on the estimated length of vacancy and the amount of energy required to supply the demand of their rooms. By applying the compliance rates and vacancy rates observed through the study, the electricity costs at CHS Lincoln Hospital could be reduced by as much as US\$50/day on peak, and US\$27/day off peak when four or more behaviors were performed.

The study also indicated that the hospital was able to reduce daily waste by 513 kilowatt hours, which can equate to an avoidance of 778 pounds of carbon. From an environmental impact lens, the 778 pounds of avoided carbon represents 379 pounds of coal burned or the amount of carbon sequestered by 9.1 tree seedlings grown for 10 years. If the hospital can sustain its current energy-efficiency behavior compliance rate, it can achieve an estimated monthly savings of approximately 15,896 kilowatt hours.

It's important to note that although the study attempted to control for as many variables as possible, there were still variables that influenced the results, such as the visual cues crossover effect and length of exposure. Additionally, the environmental services staff were given assigned rooms to clean and their individual adoption of energy-saving behaviors may have contributed to a higher concentration of rooms in compliance. Lastly, data was difficult to collect during times of regulatory and safety compliance assessments, as well as full patient occupancy.

In the end, the results of the study demonstrated that integrating occupant behavior modification as part of a hospital's energy-efficiency investments offers the potential to improve energy performance and generate ongoing savings at a relative low cost of implementation.

The success of this behavioral-based energy-efficiency program was achieved by deploying visual cues as

reminders to take energy-saving action, educating staff on the environmental and health impacts of energy production, communicating regularly with all levels of leadership and engaging the frontline staff in helping to create a culture of conservation. **FMJ**

REFERENCES

1. U.S. Energy Information Administration. "Large hospitals tend to be energy-intensive." www.eia.gov/todayinenergy/detail.cfm?id=7670. August 2012.
2. Duke Energy Corporation. "Connected 2014 Sustainability Report." <http://sustainabilityreport.duke-energy.com/pdfs/2014-duke-sustainability-report-complete.pdf>. January 2015.
3. Union of Concerned Scientists. "Environmental Impacts of Natural Gas." www.ucsusa.org/clean_energy/our-energy-choices/coal-and-other-fossil-fuels/environmental-impacts-of-natural-gas.html#.Vd8awX_D_IG.
4. Memarzadeh, Farhad, Ph.D., P.E. National Institutes of Health. "Thermal Comfort, Uniformity, and Ventilation Effectiveness in Patient Rooms: Performance Assessment Using Ventilation Indices." www.researchgate.net/profile/Farhad_Memarzadeh2/publication/234094679_Thermal_Comfort_Uniformity_andVentilation_Effectiveness_inPatient_Rooms_PerformanceAssessment_Using_Ventilation_Indices/links/09e4150f04edad0281000000.pdf. January 2000.



Khiry Sutton is an alumnus of Wake Forest University's sustainability graduate program and an advocate for the Center for Energy, Environment and Sustainability. In his role as sustainability research consultant for Carolinas HealthCare System, Sutton continues to advance

environmental awareness through improved workplace education and best practices.

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A Simplistic Sustainability Truth

FM TECHNOLOGY HELPS ORGANIZATIONS
REDUCE CARBON FOOTPRINT, REDUNDANCY
AND EXPENSES

BY FRED GUELEN

Sustainability has become a standard societal buzzword meaning many different things to many different people. It is used by social activists to inspire policy change. It is used as a product marketing slogan to help consumers feel better about their purchases. It is used by industry experts in nearly every field to make real or perceived business decisions.

But at the heart of its definition — the quality of not being harmful to the environment or depleting natural resources, thereby supporting long-term ecological balance — there is a simple truth. If we make less environmentally harmful choices, all of us benefit.

Sustainability efforts can take on many different forms: for example, performing an action or not performing an action; leaving certain ingredients out or adding others in; making positive choices in how we generate waste or diminishing initial intakes to generate less waste. There are hundreds of thousands of ways for companies to be more sustainable in their efforts.

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BLOG POST
What Shade of
Green Are You?

Commuting by the numbers

What about the sustainability of encouraging employees to think differently about their daily routines? There are the obvious benefits to decreasing greenhouse gases by reducing the number of people commuting or encouraging commuting outside of peak hours. Depending on the percentage of employees using cars to commute, flexible work options can help yield reduced overall use of fossil fuels, reduced emissions of harmful substances, less noise and lower traffic intensity.

In fact, the numbers are quite impressive:

- 81 percent of workers in the United States commute alone to work, driving an average of 18.8 miles to get there.¹
- Gasoline has an energy content of 125 thousand British thermal units per gallon, so the average commuter will consume 42,500 British thermal units per year.
- This is more than the total energy consumed by office buildings, which is approximately 40,300 British thermal units per year per employee, according to the U.S. Energy Information Administration's Commercial Buildings Energy Consumption Survey.²

Flexible work options may cause home energy consumption and waste generation to go up slightly by heating spaces that would otherwise be empty during the day, running the TV during lunch or lighting extra rooms. However, this ecological footprint is negligible compared with the fossil fuel consumption and subsequent emissions created by daily commuters, according to an article written in 2006.³

What about alternative transportation?

Because offices will continue to operate — with the heat on, coffee machine running and other facility services — the most sustainable solution would be to increase the number of commuters who use public transportation or bike



If we make less environmentally harmful choices, all of us benefit.

to work. However, with only 1 percent of workers in the U.S. commuting regularly by bike and Portland, Oregon as the top city for commuting by bike at 5.9 percent, this won't be a quick or easy change.⁴

With companies starting to consider the energy savings associated with specific geographic locations as well as efficiencies like being near public transportation and providing bike racks as well as shower facilities, employees can start a cultural shift by taking advantage of these amenities.

Working from home

Until the United States reaches a tipping point, like in the Netherlands where 30 percent commute by bike, it is far more sustainable to encourage employees to work from home or have flexible workplace desking options. These options reduce the amount of square footage needed and can contribute to significant cost savings.

Not surprisingly, a recent Forbes article revealed that 82 of the top 100 "Best companies to work for" allowed employees to work outside the office 20 percent of the time.⁵ When companies embrace alternative workplaces, they also need new ways to foster more efficient collaboration, knowledge sharing, flexibility, speed, innovation and productivity through technology.

The wide adoption of these concepts as a business model can significantly reduce the amount of square footage needed for business operations. Because space, in most organizations, is one of the most expensive company assets, knowledge of real estate assets, their functions, quality, areas, usage and occupancy is a key prerequisite to gain efficiency and cost reduction across the business portfolio.

This can be appealing not only to the facility managers, but to those who work in finance, operations, human resources, etc. as well. By measuring and monitoring all energy consumption, carbon emissions and costs of the buildings and departments in a structured and standardized way, such as using next-generation facility management software, organizations can determine new ways to optimize their business processes.

Looking at the costs

According to 2014 research that assigned a key role to end-users in a business, 40 percent of end-users can be categorized as "Rich Green Cost-cutters."⁶ These people invest in sustainability, but prefer it to deliver cost savings and work-flow efficiencies. The good news is that sustainability and cost savings often go hand-in-hand.

In the not too distant past, the financial crises affecting the global economy

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prompted companies to find ways to immediately lower operating costs. Sustainability for self-preservation became an extremely hot topic. Facility managers were brought to the forefront and had to become increasingly dynamic as they searched for more ways to trim costs in a sustainable way without cutting so much as to hurt revenue.

As buildings consume more than one third of the total energy in an industrialized economy, they became the natural place to look for cost-cutting measures. Simple steps, such as switching off unneeded lights at night or easing up a few degrees on air conditioning represented easy choices. However, decision makers had to start looking deeper into the data to determine more cost-saving efficiencies. Being able to measure the sustainability profile of their buildings and processes in a controlled manner, making improvements where possible and continually monitoring functions became critical to creating a continuous cycle of improvement and savings.

More than just dollars

However, for the “Persistent Green Frontrunners,” encouraging employees to work from home has other significant sustainability benefits. Another note would be that traffic congestion all but disappears with just a small reduction in vehicles on the road. This article suggests that those interested in sustainability issues should look at the total “price” of commuting including enhancing flow on the roads and not just at fuel usage and emissions.⁷

In short, next-generation facility management software can significantly contribute to solving one of today’s bigger societal and sustainability problems simply by creating flexible workplace options. By reducing the demand for commuting and allowing flexibility in working locations, forward-thinking companies are truly looking at the triple bottom line behind sustainability: economic, ecologic and social.

EIGHT SHADES OF GREEN



Research conducted by Facility Management Netherlands (FMN), Corporate Facility Partners (CFP) and the Dutch Green Building Council (DGBCC).

Measuring the efforts

Business information on impact areas such as energy, waste and commuting data can be combined in one central database and then be used to support decision making and compliance reporting. Sustainability assessments based on international standards including BREEAM and LEED can validate the green performance of a company’s real estate and organization.

While most data about organizations’ energy consumption is available already, it usually comes from fragmented sources including spreadsheets, supplier bills, smart meters or energy management systems.

Bringing all of this data together in a well-structured and centralized single database allows facility managers to track and analyze consumption patterns, identify excessive energy use and compare buildings over time. This ensures maximized re-use of existing

data and can help in compliance process registration and reporting.

Extensive data mining of this caliber can lead to:

- Determining peak energy consumption times, including identifying saving opportunities in relation to fixed charges
- Making optimum use of proactive functionalities that automatically warn of unusual meter readings
- Analyzing the results and comparing ROI with targeted reduction goals for energy consumption, CO₂ emissions, costs and other relevant target metrics
- Executing internal audits easily, while managing the processes, analyzing the results and identifying value improvements where possible
- Translating audit results into programs, projects and improvements on the basis of well-documented knowledge and experience
- Linking projects, measurements and actions to meters and installations in buildings to allow facility managers to analyze, report and continue to monitor the effects

Working with these technologies enables FMs to bring all relevant data (e.g., spaces, workplaces, floor areas, CAD drawings, departments and people) together in one central database — the first step in professional space management, workplace innovation and asset optimization.

Iron Mountain Europe

In 2010, Iron Mountain, the world leader in information management services, implemented a sustainability management software solution across its European locations. Iron Mountain Europe was not only looking at its manpower and space efficiency efforts; it wanted holistic visibility into all of its

sustainability impact areas: water, waste, natural gas and hazardous materials.

The team entered data into a central database and used it for multiple processes like space and maintenance management, compliance, energy monitoring and improvement measures. This led to the discovery of an interesting phenomenon across their geographically separated sites.

“We started delivering valuable measurement data across key impact areas such as energy, gas, water and waste and this was a great motivator,” said Wil Boemen, Iron Mountain Europe head of FM and sustainability. “After making consumption data visible to our staff, it became competitive between different sites, which was far more effective than pushing reduction orders from the head office.”

Strategic sustainability efforts, regardless of the motivation, can help

businesses reduce waste and ultimately help the bottom line. FM and building-related assessment results by building can help benchmark facilities against each other and identify the best investment opportunities.

Boemen defined the success of the Iron Mountain Europe project with three key recommendations: “First, sustainability is not about being an environmental activist or making your brand appear green; it’s about resource efficiency and making it relevant to the business. Second, some companies are running lots of sustainability initiatives but they’re not grouping them together, measuring the results or communicating them. Third, as well as measuring and monitoring, sustainability is about action and awareness that small steps can have big impacts.” **FMJ**

REFERENCES

1. www.census.gov/hhes/commuting/

files/2012/Paper-Poster_

Mega commuting%20in%20the%20US.pdf

2. www.eia.gov/consumption/commercial/data/archive/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003html/c3.html
3. <http://sspp.proquest.com/archives/vol2iss1/0511-020.moos.html>
4. www.census.gov/newsroom/press-releases/2014/cb14-86.html
5. www.forbes.com/sites/kathryndill/2014/07/29/the-best-companies-for-work-life-balance/
6. <http://shadesofgreen.eu/>
7. www.vtpi.org/tdm/tdm96.htm



As Planon’s CFO and president of North American operations, **Fred Guelen** has contributed to the success of this global real estate and facility

management software company. Before joining Planon, he was one of the founding partners at Buren van Velzen Guelen, an international law firm. Fred Guelen studied law at the University of Leiden and the University of Amsterdam.

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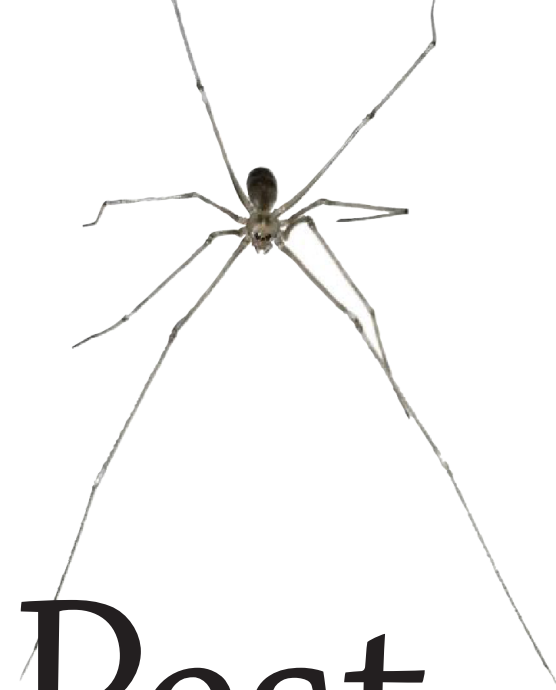
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Reducing Pest & COSTS IN

BY THOMAS A. GREEN AND
MATTHEW NEFF

By definition, a pest is a creature we want out of our lives, so it's no wonder pest management is a subject most prefer to avoid.

However, “thinking pest” during design, construction and operation of facilities can return big dividends. These include sharp reductions in pesticide use, pest complaints, costs and health and environmental impacts, and a new success story for sustainability efforts. Facility managers can achieve these benefits inside and outside of facilities by shifting from treating symptoms to addressing underlying conditions that lead to pest problems.



A large, detailed illustration of a brown cockroach is positioned on the left side of the page, partially overlapping the title. On the right side, a line of several black ants with red abdomens is shown marching diagonally from the top right towards the bottom right. The title 'Complaints YOUR FACILITIES' is centered on the page in a large, black, serif font. The word 'Complaints' is significantly larger than 'YOUR FACILITIES'.

Complaints YOUR FACILITIES

Benefits of IPM

Integrated pest management (IPM) has been shown to reduce pest complaints by 30-89 percent and pesticide applications by 93 percent in multiple studies including in office buildings¹ and schools.² This common-sense approach is the foundation of green pest control. IPM is effective because it focuses on resolving why the pest is present, rather than applying pesticides routinely as a Band-Aid over fixable problems.

Fewer pest complaints and pesticide applications translates into reduced staff absences and improved productivity.

Exposure to mice, cockroaches, dust mites and some aerosol pesticide products can aggravate asthma symptoms and trigger asthma attacks. Flies, ants, cockroaches and rodents can visit environments contaminated with pathogens, including listeria, before they arrive on food or food preparation surfaces, inviting foodborne illness. Some staff may also feel uncomfortable with pesticides and

ask for time off after an application has been made. No one wants to work in an environment where distracting pest sightings are a common occurrence.

Excluding pests by tightening up building envelopes is a key IPM strategy that also can reduce heating and cooling costs. Properly installed door sweeps on exterior doors seal the gap between the bottom of the door and the sill, keeping pests and dirt out and improving fire safety by restricting air flow. In one study, door sweeps on school buildings in Florida reduced pest complaints by 65 percent.

Each time a pest complaint is prevented, time and money are saved by avoiding the costs associated with the distraction, reporting and logging the complaint, arranging for pest control services, and accompanying the provider to investigate and resolve the complaint. Avoiding health department action due to unmanaged pest problems is priceless to an organization's brand image.

How?

The first step is a change in mindset. Pest control is not something that can simply be delegated to a pest control service provider. Everyone in the facility has a role to play in preventing pest problems. This doesn't mean more work; it means adjusting behaviors to deny pests food, water and shelter.

To integrate green pest control into existing infrastructure, think about green pest management as another element of the overall sustainability program. Incorporate the following into green program policies and training:

- Promptly report any pest or pest-friendly conditions
- Promptly resolve food and drink spills
- Store any food items in pest-proof containers
- Avoid clutter by not storing items on floors or in corners
- Keep exterior doors closed
- Maintain 6-inch cleaning and inspection aisles around equipment and furnishings
- Avoid bringing in/using any pesticides

Persuade staff to cooperate by explaining the risks and benefits, just as you would for water or energy conservation. To maximize efficiency, add these elements to existing staff training programs, and include pest reporting in the existing maintenance request system. However, several roles will need more specific policies and training.

Food service staff should be aware that accumulated organic matter in floor drains and food debris in hard-to-reach locations are two leading sources of pests in food service areas. Dirty drains provide excellent breeding grounds for pathogens and small flies, and food sources for ants, cockroaches and mice. Placing exterior waste containers as far as practical from entryways and keeping container lids closed can also make a huge difference. Removing food items from cardboard containers as they are shelved and immediately moving the cardboard to exterior

recycling containers can reduce cockroach introductions by eliminating any egg cases that might be hiding in the corrugations.

Cleaning professionals need to understand that mops and brooms can trap food particles and provide a buffet for ants and cockroaches, and so should be kept clean and hung up off the floor after use. They can also benefit from understanding that ants can leave a pheromone recruitment trail when they find a food source, and that simply cleaning up the trail as well as the food can stop additional ants from following. Many spider problems can be reduced simply by vacuuming up any webs. Emptying trash cans that may contain food items at the end of each day can greatly reduce fruit fly and ant problems. Ensuring trash can liners are strong enough to stay intact in the dumpster can reduce spills and pest attractants.

Maintenance staff will appreciate knowing that mice can squeeze through a quarter-inch gap (the diameter of a pencil). That's why proper installation of door sweeps, without gaps at the ends or in the middle with double doors, is essential. Sealing up any plumbing or electrical penetrations through walls is also critical for energy savings, fire safety and pest management.

Sealing even smaller gaps including around escutcheon plates, and wall-mounted equipment and fixtures, is especially important in food-service areas to eliminate harborage for cockroaches. American cockroaches typically enter facilities through drains with dry P-traps; maintenance staff can often completely eliminate this problem by ensuring that infrequently used drains are checked and filled regularly, or by installing one-way valve covers.

Architects and designers will benefit from Pest Prevention by Design.³ This invaluable resource was created by a collaboration led by Dr. Chris Geiger of the San Francisco Department of the Environment. The guide provides

comprehensive general principles and practical specifics for building out pests during design, construction and renovations, including setting up food-service and storage areas to minimize pest harborage and food sources.

Facility managers are the cornerstone of any green pest management effort. They need to be trained and supported as program coordinators to provide quality control over internal roles and responsibilities, and quality assurance for contractors. They must be able to interact effectively with peers and superiors to ensure cooperation up and down the chain. Working alongside a pest management professional, they need to be actively engaged in review of designs for new construction and renovation, annual preventive maintenance inspections, identifying the root cause of any pest problems that occur and implementing recommendations for resolution.

For a great training resource for the multiple roles in a facility, see the online learning modules at stopschoolpests.org. While these are specific to schools, they can be readily adapted for any facility and added to your existing training program.

Finding a competent pest management service provider

Most pest management professionals understand the importance of appearing green, so it's important to understand the difference. Hire a competent green pest management professional as a partner and train your facility team to provide oversight. Facility managers should periodically join service technicians on visits and review the technician's service record after every visit.

Dr. Albert Greene, entomologist with the U.S. General Service Agency, advises that if a facility can answer "no" to all of the following questions, it's a good sign:

- Are pests or evidence of pests frequently encountered?
- Are there obvious conducive conditions for pests?



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- Are insecticides routinely sprayed indoors?
- Are there obvious indoor rodenticide placements?
- Is pest control service limited to pesticide application, with little or no inspection of potential trouble spots?
- Are many occupants dissatisfied with the pest control service?

If yes is the answer to any of the above, an improvement in service or change in service provider may be in order.

Green pesticides?

“Going the green service route is a partnership; it is a commitment from both parties to be proactive in identifying potential pest issues and in addressing them before it is necessary to use pesticides,” says Dr. Angela Tucker, training director for Smithereen Pest Management Services based in Niles, Illinois. “However, there are times in nearly all facilities when pesticides must be used but in a targeted manner and not on a scheduled or routine basis.”

Pesticide risk is a product of exposure and toxicity. All pesticides should be used in a way that reduces potential for exposure, because there is always potential to learn more about toxicity than we know today. Thanks to manufacturers that have developed effective bait formulations for nearly all structural insect pests, there are options that can be used in minimal amounts, and in crevices, voids and other locations inaccessible to non-targets, including facility occupants.

FM teams can also take advantage of resources for identifying effective least-risk products, such as the Bio-Integral Resource Center’s IPM Practitioner’s Directory of Least Risk products⁴ and the Texas State Schools Green Category pesticide list.⁵ Work with the pest management service provider to create an approved list of least-risk products with usage guidelines on when and where these may be used.

Green landscapes

IPM for landscape care follows the same basic concepts from design through construction, maintenance and renovation by examining why pests become a problem and how this can be prevented. Here are some specific practices to incorporate in your green program:⁶

- Select native plants and place them in locations where they will experience conditions that allow them to thrive.
- Avoid placing plants that attract stinging insects adjacent to walkways and entryways.
- Use mulch or masonry mowing strips under fence lines and around paved areas and planting beds to allow mowing equipment access right up to the feature.
- Use underlayments and geotextiles under benches, tables and bike racks, and under gravel, brick and stone to reduce the need for herbicide applications.
- Mulch properly around tree trunks and plant bases.
- Water turf deeply and less frequently to encourage deep rooting.
- Promptly repair damage to existing turf and overseed in late summer to ensure thick turf that prevents weed establishment.
- Avoid soil compaction which slows turf root growth; aerate when and where needed.

If you are participating in the U.S. Green Building Council’s LEED program, LEED for Existing Buildings: Operations and Maintenance currently offers two points for indoor and outdoor IPM programs, another benefit to implementing a green approach. As an FM, your specification of green structural and landscape services helps drive greater adoption of IPM and access to its benefits. **FMJ**

REFERENCES

1. Greene, A. and N.L. Breisch. 2002. Measuring integrated pest management programs for public buildings. *J. Econ. Entomol.* 95(1): 1-13.
2. Chambers, K., T. Green, D. Gouge, J. Hurley, T. Stock, Z. Bruns, M. Shour, C. Foss, F. Graham, K. Murray, L. Braband, S. Glick and M. Anderson. 2011. The Business Case for Integrated Pest Management in Schools: Cutting Costs and Increasing Benefits. 8 pp. www.ipminstitute.org/school_ipm_2015/ipm_business_case_print_version.pdf.
3. www.sfenvironment.org/sites/default/files/fliers/files/final_ppbd_guidelines_12-5-12.pdf.
4. www.birc.org/Directory.htm.
5. <http://citybugs.tamu.edu/factsheets/ipm/ent-4003/>.
6. Helpful presentations from expert Chip Osborne and James Sotillo on sustainable turf and landscape care: www.ipminstitute.org/Public_Agency_Commercial_Facility_IPM/Natural_Lawn_Landscape_Workshop_0409.htm.



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BY LYNDA ELLIS



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ARTICLE

Millennials More Attuned To Corporate Social Responsibility

Business success is not simply measured by return on investment, but also by a company's ability to have a positive effect on society at large.

Today's workforce places great value on corporate social responsibility (CSR) and environmental stewardship. In fact, research shows that millennials are drawn to companies that demonstrate a positive social impact. That's why CSR plans are essential for companies that want to attract top employees, generate favorable reviews and give back to the communities they serve.

From implementing sustainability programs to organizing building-wide fundraisers, facility managers can organize a number of initiatives that enable occupants to make a positive impact on society. In doing so, they not only benefit numerous good causes, but they also help to strengthen relationships and increase productivity.

As part of a successful CSR program, facility managers can spearhead and organize community service initiatives at their commercial properties. From canned food drives to disaster relief support, the key to an effective CSR plan is getting participants excited to give back to the community. That's why it is important for facility managers to create a culture of giving in their buildings.

It is also important to learn what occupants are passionate about and infuse their interests into CSR activities. For example, do they want to support local, national or global relief, or a combination of all three? Do they value environmental stewardship? If so, what sustainability projects do they already participate in and what projects would they like to venture into?

By surveying building occupants, facility managers can determine the community service projects that resonate the most with them. After all, there is power in numbers. The more people who participate in an event, the more successful the event will be.

Reaching out to the local community

By organizing local outreach programs, facility managers can provide support to area communities while strengthening internal

relationships. From fundraising to mentoring programs, there are many opportunities to build relationships within the community.

The first step to a successful drive is to determine where support is most needed. Are local school children in need of supplies? If so, facility managers can arrange a back-to-school drive to collect items such as notebooks, pens, paper supplies, etc. Is there a local animal shelter? By encouraging donations of old blankets and towels, they can provide comfort to animals in need. Giving back to the local community not only helps build corporate morale, it also builds a collaborative team spirit.

Some additional ideas for local outreach include:

- Leading up to holidays, arrange for customers to participate in canned food or toy drives to help make the holidays much more enjoyable for local families in need.
- Ask customers if they are willing to serve as mentors for local high school students or unemployed workers who are seeking career direction.
- As winter weather approaches, place a box in building lobbies to collect warm blankets and coats that can be donated to local humanitarian organizations.
- Help local children set a path for their careers by arranging for customers to speak at a school career day.

For more information on volunteer opportunities, contact a local volunteer center. They can connect you to one-time projects, such as helping to landscape a park, or ongoing community service, such as delivering hot meals to home-bound senior citizens.

On the U.S. and global front

Organizations such as the Red Cross, Wounded Warriors Foundation and the American Cancer Society, to name a few, impact millions of lives every day. While individuals take pride in participating in such great causes, they may not have the time to

acquire the information and materials necessary to contribute — and that's where a facility manager can help.

By researching when fundraisers will take place and contacting the organization for registration material, facility managers can make it easy for building occupants to participate in a number of CSR activities.

Consider the following:

- **Organize a fundraiser and collect donations on behalf of a national organization.** For added engagement, give individuals or teams in each building their own donation jar and host a friendly competition to see who can raise the most funds. Then, congratulate winners with a lobby showcase, a planned celebration or an announcement.
- **Set up an area where building occupants can register to participate in walks, relays or golf outings.** By offering a registration table in a common area, colleagues are not limited to working with their teams and have the opportunity to connect with others in the building.
- **Get creative.** Organize and encourage occupants to participate in a building-wide competitive event such as a karaoke battle. Hold the contest after business hours and have donations benefit a national organization.
- **Reach out to occupants to see what organizations they are passionate about.** Showing support for a variety of organizations, especially those that are special to building users, can greatly increase participation.
- As with any CSR activity, **hold the event on a recurring basis** so coworkers can look forward to participating regularly.

Keeping it green

Environmental stewardship and sustainability are essential elements of CSR. Facility managers can help their buildings promote sustainability, not only through recycling programs, but also through efforts that raise awareness about the importance of healthy environments and conserving energy.

By encouraging occupants to be as green as possible, FM's can help decrease the amount of paper and energy consumed on a day-to-day basis, reduce pollution and waste, save energy and water, and reduce contributions to landfills as well as operating costs.

Some ideas that are easy to implement include:

- Once a month, hold an electronic recycling day where items such as old cell phones and computers are collected.
- In order to engage occupants, hold a "Save the Earth" contest where they submit ideas for how to preserve the planet, save energy, etc. Then, recognize the individual or team who submits the best idea.
- Every three months, do a building-wide collection of unwanted inventory and donate to community organizations.
- Encourage occupants to conserve energy by asking them to unplug kitchen appliances, laptops, etc. at the end of each day.
- Have motion sensors installed throughout the building so lights automatically turn on and off.
- Let occupants know that they are making a difference by providing them with fun facts. For example, "Did you know that recycling five plastic bottles provides enough fiber to create one square foot of carpet? Last year, our building recycled enough bottles to carpet our lobby."

- Or, eliminate water bottles altogether by using filtered drinking water machines.
- Invite occupants to participate in a building-wide CSR activity such as an environmental clean-up day or a seedling planting party.
- Place a seed packet on every desk in the building.
- In the summer, organize a local farmers' market in the lobby of building.

CSR activities are an important service in commercial buildings and can be implemented quickly, without costly investments in the facility. Today, more than ever, employees are looking for ways to be socially responsible. Through CSR activities, facility managers can not only help numerous good causes, they can also strengthen their relationships with occupants and make a big impact on the communities they serve. **FMJ**



Lynda Ellis is president, CEO and owner of Capitol Concierge, the U.S.' first and most uniquely tailored provider of services for commercial office

properties, upscale apartments and condominiums, shopping malls, private corporations and individuals. She joined Capitol Concierge in 1998 and purchased the company in 2007. Since then, she has been guiding the enterprise with her passion for service and trademark enthusiasm.

Ellis' and Capitol Concierge's accomplishments include being named an *Enterprising Women Magazine* 2013 "Enterprising Women of the Year;" *Smart CEO's* 2013 "Future 50 Award" and 2012 *Brava!* "Business Hall of Fame;" winning the prestigious 2012 "National Capital Business Ethics Award;" *Inc.* 5000 list for three years; and the Apartment and Office Building Association "Outstanding Leadership Award" for seven consecutive years.



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EFFICIENT USE OF SHADING:

IT'S IN THE DETAILS

BY BRENT PROTZMAN

Encouraged by updated building codes, new energy regulations and a renewed emphasis on sustainability, building owners and facility managers are once again embracing daylight as a practical, aesthetic and essential element of good building design. Achieving daylight autonomy involves designing a space that maximizes the amount of useful daylight, thereby minimizing or eliminating the need for supplemental electric light — saving energy and improving a building's bottom line.

Building and facility managers must understand that daylighting starts with shading. Shading is not a matter of completing the solution, but rather defining the lighting strategy. Automated shades detect daylight conditions and automatically modulate the shade position to provide as much daylight and view possible without sacrificing glare mitigation. They not only reduce daytime lighting energy use by up to 65 percent,¹ but shading also makes the space more comfortable, and comfortable employees are generally more productive employees.

By contrast, unfettered glare from windows has been shown to reduce productivity up to 25 percent² — potentially causing eyestrain, headaches and general discomfort. Blackout shades are not ideal, either, as access to views can increase mood and productivity up to 12 percent² as well as improve memory function and mental recall up to 25 percent.² The best daylighting solution preserves view, reduces glare and heat gain, and ultimately minimizes the need for supplemental electric light.

However, it's not as simple as just installing standard automated shades. The real benefits come when building owners and facility managers dive into the details — most importantly, the type of fabric used.

Unfortunately, there are no industry standards for the effective use of shade fabrics. This leaves facility managers without the guidance they need for fabric tolerances, visible light transmittances and glare control. It becomes a guessing game for most, and in the end, the building environment, occupants and energy bills suffer.

The following are a few helpful tips to help you find your way through the shading maze.

Know the fabrics

There are two key fabric properties that all FMs should understand. These properties have a strong impact on building glare, daylight and view clarity performance:

- **Openness factor (OF):** The percentage of light that transmits directly through a solar screen without being redirected or diffused.
- **Visible light transmittance (Tv):** The percentage of light that transmits through a solar screen, including both direct and diffused light.

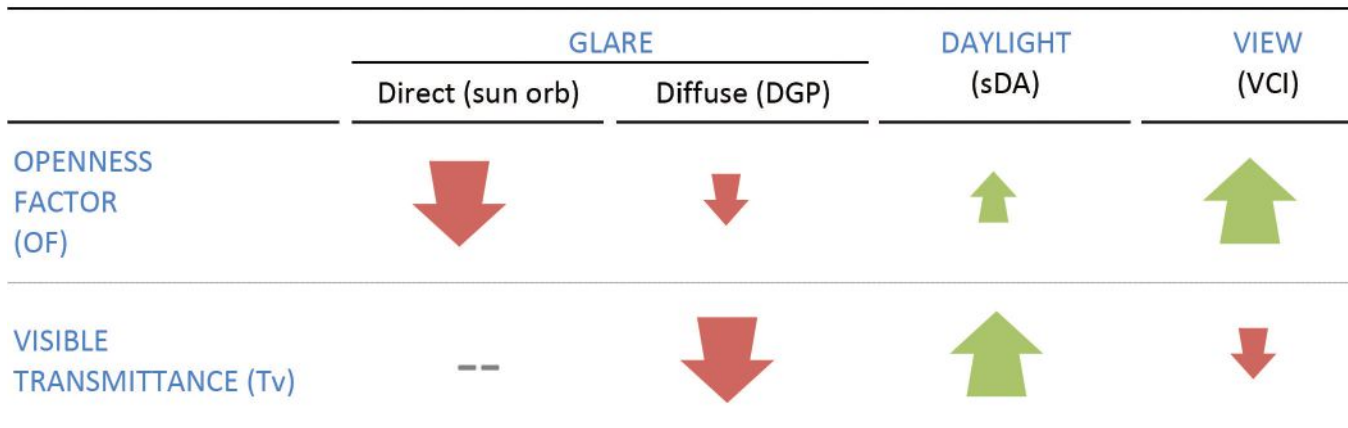
Manufacturers should list the OF and Tv on all available fabrics. As a general rule, fabrics with higher OF and Tv will transmit more daylight into the space, therefore improving space daylight autonomy and increasing energy savings.

The following are a few other key points to keep in mind:

- A low OF will provide good direct sun control, but will significantly reduce view.
- A low Tv will provide good diffused daylight control as well as better view preservation but will significantly reduce daylight availability.
- Fabrics with higher OF and/or Tv could result in glare problems, a significant issue for the effectiveness and efficiencies of daylighting strategies.
- The OF and Tv listed on fabric cards or marketing materials are generally approximations. This is a significant issue as appropriate fabric properties are essential to daylighting performance.

Watch the glare

It is clear that the fabric selection is critical to building performance. However, what happens after the fabric is specified is just as important. In the past, shading selection was primarily based on aesthetics and rules of thumb. Fabric manufacturers had little incentive to refine manufacturing processes to maintain tight performance tolerances.



Note: Arrow size indicates importance, with larger arrows indicating greater importance. An arrow pointing down means that a lower value is desired to optimize that performance metric.

FIGURE 1

The tolerances on fabric properties are important to all areas of daylighting performance, but the one to keep the closest eye on is glare. Regardless of how much energy is saved or how much view is preserved with higher OF and Tv fabrics, if the end result is too much glare, employee comfort and productivity will suffer. And, after all, the cost of employee salaries and benefits outweighs energy savings by a factor of 100 or more.

The plot in Figure 2 shows the potential impact of fabric tolerance on daylight glare probability (DGP). In general, a DGP value less than 35 percent is considered comfortable and a value greater than 45 percent is considered very uncomfortable.

In this example, an optimized fabric Tv was chosen to meet the glare requirements of a project, then the Tv was increased to simulate what would happen if the installed fabric were near the tolerance limit for tight (+20 percent x mean), fair (+60 percent x mean) and high (+100 percent x mean) tolerances.

As shown, when the installed fabric has a tight tolerance, the expected glare perception still does not quite reach the noticeable point. A fair tolerance can create an environment where occupants perceive the space as uncomfortable during critical glare periods. A high tolerance, which is not uncommon, can create an environment in which very uncomfortable glare is present.

From these findings, it is clear that a more stringent shading fabric performance can effectively address the glare tolerance of shading fabrics. Fabric tolerances can vary widely, +/-5 percent, from the written fabric rating. To ensure daylighting strategies are being met, facility managers will have to rely more heavily on actual data and fabric testing results to choose the best fabric for their space. This will allow FMs to realize the best balance of energy efficiency and productivity, ultimately lowering costs.

Finding the balance

It is important to find that perfect

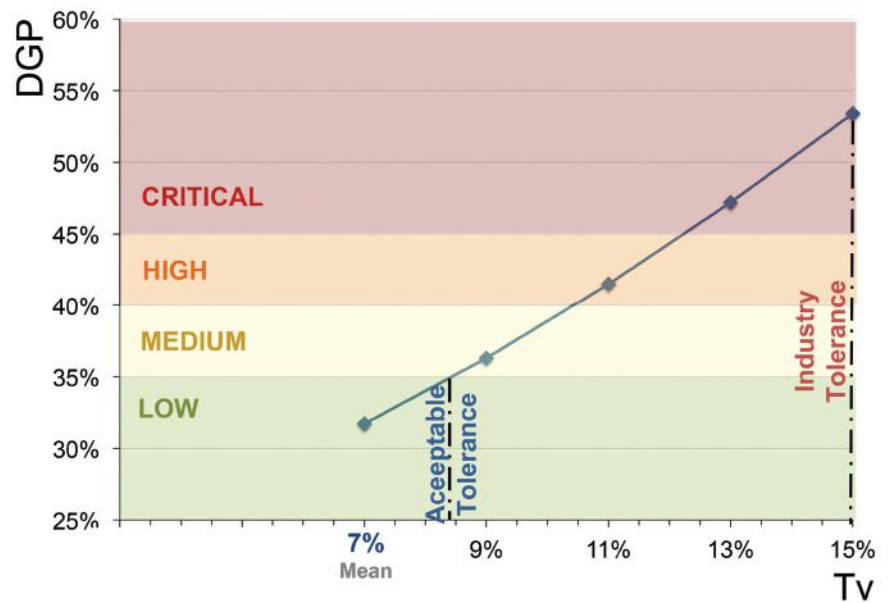


FIGURE 2

balance between daylight provision and visual comfort. Until now, this balance was unknown since the impact of fabric properties and control on view to the outdoors could not be accurately quantified.

Recent studies provide insight on shading properties with respect to glare and daylight provision, but one area was largely ignored: view clarity. For these reasons, a leading electronics company partnered with Purdue University's world-renowned Herrick Laboratories under the direction of Dr. Thanos Tzempelikos, assistant professor of civil and mechanical engineering, to conduct research to investigate and evaluate the clarity of view through windows with solar screen fabrics.

A key performance feature of solar screens is their ability to simultaneously provide glare control while allowing daylight into the space and preserving view to the outdoors.

The team conducted a full-scale field study with 18 human subjects to measure view clarity preferences in two offices equipped with 14 shading fabrics of different properties, including OF and Tv. The tests were conducted with different sky conditions and viewing positions. The testers compiled results based on a combination of quantitative visual tests and subjective questionnaires which they used to create a scoring system and fabric rankings.

The results showed that darker fabrics with higher OF generally achieved higher clarity scores, followed by light-colored fabrics with high OF and then dark or colored fabrics with small OF. Light-colored fabrics with low OF received the lowest view clarity scores. These findings resulted in a new metric: the view clarity index (VCI). Results from this new metric can be easily predicted for any shading fabric using only the two basic shade properties, OF and Tv.

Efficient fabric selection

Selecting a fabric to meet a single building performance requirement, such as glare, view or daylight, is fairly straightforward. Often, specifiers can use a simple online tool like www.performanceshadingadvisor.com to leverage metrics for fabric recommendations.

However, optimizing fabric selection for multiple priorities is difficult and requires the use of a tool such as VCI to achieve an optimal and efficient daylighting strategy. Each of the following industry performance metrics should be considered when selecting fabric to effectively quantify glare, daylight and view clarity performance in a space:

- **Daylight glare probability:** The likelihood that an occupant will begin to experience daylight glare in a space. Generally, 35 percent or less is a good upper limit for glare-critical spaces, as this is generally

considered the point at which glare starts to become noticeable.

- **Spatial daylight autonomy:** The percentage of the work area where daylight contributes at least 30 foot-candles for 50 percent of work hours or more. This is an area of a building where even daylight switching of the light fixtures will give significant energy savings.
- **View clarity index:** The quality of view when looking through a fabric to the outdoors. A value of 100 percent is perceived as clear as with no shade at all, and a value of 0 indicates that a typical occupant cannot see through the fabric. This metric is only used to quantify the view of the solar screen fabric.

Automated shades, when properly controlled, may protect from glare as well as — if not better than — manual shades. But they do so while allowing

more daylight into the space, which leads to greater energy savings and higher productivity. Facility managers should make shading a critical part of their building design strategy and be sure to educate themselves on the fabric specifications and performance tolerances provided by manufacturers.

Despite the lack of broad-based industry standards, there are resources available, including quantification tools and research studies, to help facility managers make the most efficient shading. It's just a matter of diving into the details. **FMJ**

REFERENCES

1. www.performanceshadingadvisor.com. Simulated savings compared to applications where shades are closed, as shades are not often moved. Both the closed and automated shade simulations assumed fabrics with a transmittance of 15 percent or less for glare control. Savings would be less for fabrics with higher transmittances.
2. Requires a daylight harvesting system. Heschong Mahone Group, Inc., 2003. *Windows and Offices: A study of office worker performance and the indoor environment*. Prepared for California Energy Commission.



Brent Protzman, Ph.D., IES, LC earned his Ph.D. in architectural engineering from the University of Nebraska and is the author of published articles on human

factors in lighting and lighting energy. He is a former professor and researcher in the building systems program at the University of Colorado.

Protzman is active in the lighting and building system professional community, serving on the Illuminating Engineering Society of North America daylighting and papers committees and on the board of directors for the Attachment Energy Ratings Council. As manager of energy information and analytics at Lutron Electronics, he drives energy research and analysis with a focus on engineering system integration and architectural applications.

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- **Project Management:** Facility managers make use of all aspects of project management beginning with planning, scoping and scheduling, and ending with evaluating. Project planning and management are core skills in facility management. The skills are particularly important because of the wide range of projects assigned to the facility organization. Projects vary in scope, complexity, duration and financial risk.
- **Finance and Business:** Facility managers manage/oversee high-value assets that represent significant financial investment in technology, buildings, structures, interiors, exteriors and grounds. Since facility managers are typically responsible for the oversight, operation and maintenance of the buildings and grounds, as well as oversight of various service contracts, understanding the basics of finance and business is critical.
- **Leadership and Strategy:** To be effective, facility managers must develop strategies to successfully carry out major initiatives by influencing the decisions and attitudes of others. Effective strategies require that facility managers are able to integrate people, places, processes and technology. They must be able to align the facility portfolio with the entire organization's missions and available resources, and to be innovative in order to move forward with their staff and processes to respond to ever-changing requirements.

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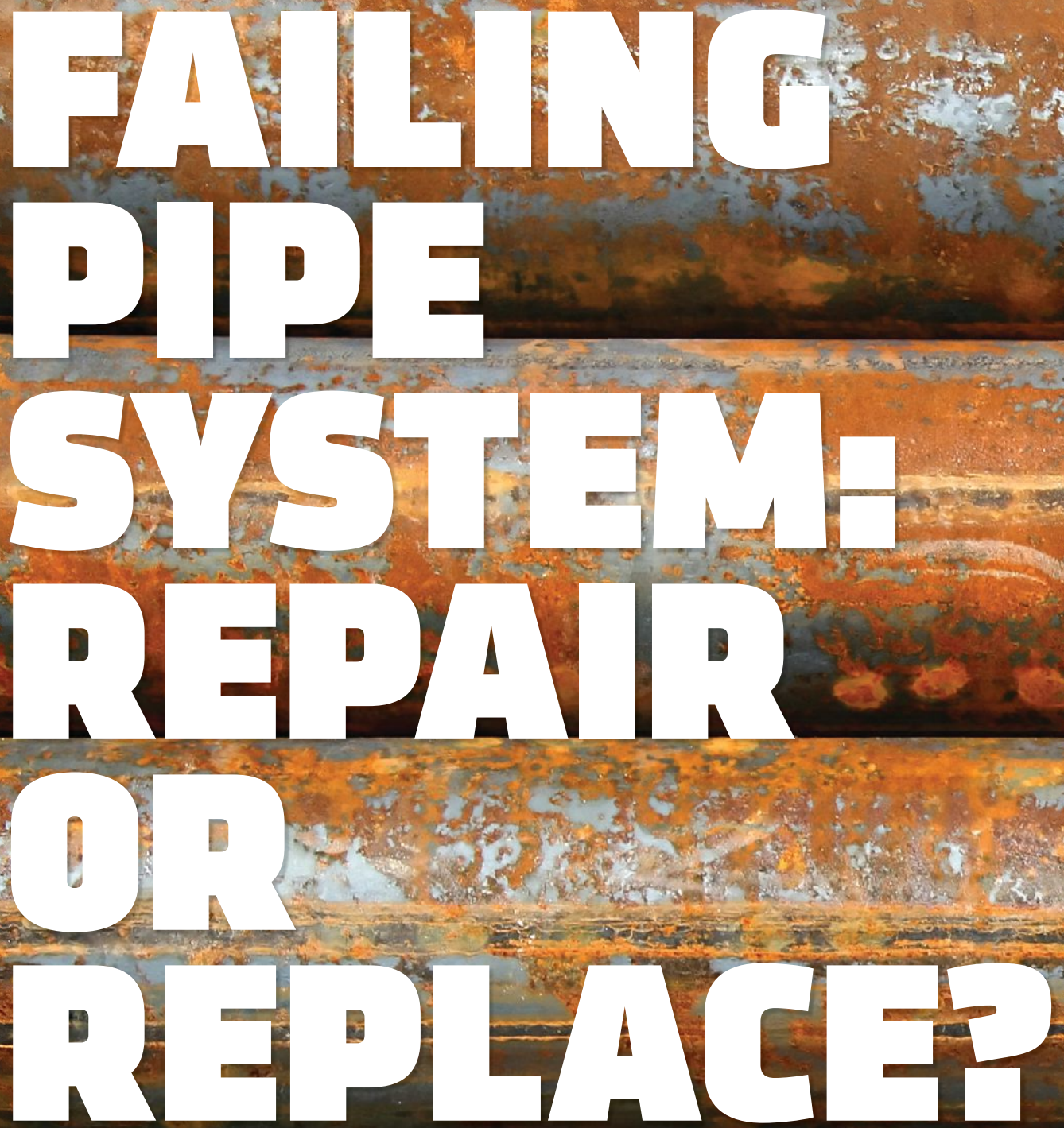
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- Brian Rush, CFM, FMP

The background of the entire image is a close-up, high-contrast photograph of heavily rusted metal. The rust is a mix of bright orange, brown, and dark grey, with some areas where the original metal surface is still visible. The texture is rough and uneven, with various pits and scales of corrosion.

FAILING PIPE SYSTEM: REPAIR OR REPLACE?

**SUSTAINABLE OPTIONS FOR
MAINTAINING CRITICAL FACILITY
INFRASTRUCTURE**



BY AMANDA STROUSE

When an asset breaks, facility managers are faced with the decision of whether to repair the asset or replace it. Factors such as the size of the asset, frequency of use, age and cost comparisons help shape that decision. But how easy is that decision in regard to an embedded infrastructure system within a facility? What is the most sustainable repair practice when a facility's infrastructure system fails to operate efficiently or entirely?



Although all infrastructure systems within a building are important, pipes are the blood vessels that keep every building habitable, pumping clean water in and carrying waste out. Pipe systems are also one of the most intricate and most commonly used components in a building. A hospital or a manufacturing facility could easily have miles of horizontal and vertical pipes throughout. Hidden behind walls, in ceilings and under slab, these pipes are used constantly, but can be overlooked — until they stop working.

Creating a maintenance plan for the property's pipe systems and strictly adhering to it is an essential responsibility for facility managers. Although pipes are often made of lead, copper, steel or iron, their robust metal does not mean that they will continue to function at optimum levels for decades to come.



AN APATHETIC STATE OF MIND HAS NO PLACE IN MAINTENANCE AND FACILITY CARETAKING.

Not only should facility managers know the different pipe systems, their materials and locations within their facilities, but they should also know the age of the pipes. Pressurized pipe systems are more likely to encounter failures than nonpressurized systems, and these failures can cause very serious damage or disruption to your facility if they are not fixed competently and quickly.

There are many components that help determine the longevity of pipe systems, including the external environment of the pipes, how often the pipes are cleaned, frequency of use and the velocity of internal fluids. There are also research-based lifespan estimates of certain types of pipes, which can range from 15 to 50 years. But even with this knowledge, it is important for facility managers to regularly assess the pipes' conditions and to be proactive, rather than reactive.

Traditional, yet unsustainable solutions for pipe failures

Part of optimizing a piping maintenance plan includes knowing the different solutions for piping problems. There are three general categories of solutions: temporary fixes, replacing the pipes and pipe lining. The first two categories are not ideal. Temporary fixes include patching holes in pipes or flushing (hydrojetting) the pipe system's interior. Replacing the pipes, also known as a repipe, is a traditional fix that creates waste.

For a repipe, the failing pipe system is turned off and is nonoperational, and then the entire system or part of the system is torn out. First, the surrounding walls, ceiling, floor, slab, landscape or hardscape must be destroyed and removed. Extra efforts must be utilized to ensure that surrounding soil and groundwater do not get contaminated during this process.

Next, the pipes (and soil, if applicable) are removed. These ripped out pipes, along with the removed surrounding environment, are sent to a landfill, and then new pipes are brought in and installed. Finally, another contractor completes the reconstruction of the area with new drywall, concrete, wall paper,

marble floors, grass or whatever material surrounded the pipes. This is clearly not an environmentally friendly or sustainable method. A lot of waste is created and it is also more expensive and time consuming compared to a sustainable repair.

Sustainable solution for pipe failures

An alternative, long-term solution to replacing pipes is a modern and innovative method called pipe lining (also called relining). In this method, a protective coating is applied to the interior of water pipes using non-destructive and eco-friendly technology. This strong liner restores the pipes to a better-than-new state.

Pipe lining is a very effective rehabilitation strategy that has been utilized throughout the world for decades, and it has been gaining popularity with facility managers, property managers, building engineers and water authorities. Compared to a traditional pipe replacement, pipe lining's many benefits include eliminated destruction and business disruption. It is also an effective preventive measure, proving to be more cost-effective than waiting to experience a pipe system failure.

One of the most popular forms of pipe lining is epoxy coatings, which provides many types of sustainable benefits. The application of epoxy coatings utilizes the pipe system's existing access points and clean, compressed air. This compressed air is blown into the pipe system at the access points to initially clean the pipes and prep them for the epoxy coating, then to coat the interior of the pipes with the epoxy.

The process to apply an epoxy coating for the restoration of water pipes is generally the same for all pipe lining companies, with different companies having their own benefits or drawbacks to their particular epoxy or installation method. They all follow a similar procedure:

- A full pipe system evaluation and diagnosis

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- Planning the pipe lining process, mapping the pipes and setting up the equipment
- Draining the water pipes and drying them using compressed air
- Applying an abrasive agent to the pipe system (a process called sanding)
- Applying the epoxy to the interior of the pipe system using compressed air and letting it cure
- An evaluation of the work performed, pipe system re-assembly and testing of the pipes

Reusing

Pipe lining is a sustainable procedure first and foremost because it reuses the current pipe system. This unique process renews the otherwise non-renewable pipes to a better-than-new state, allowing them to function at a higher efficiency and greatly extending the useful lifespan of the system.

A traditional pipe replacement method involves a large amount of destruction and digging to access the pipes, including the removal of surrounding soil, plants and building materials. Trucks, which add to air pollution, are used to haul the waste to already overcrowded landfills, and trucks are used to bring new supplies to the job site. Pipe lining technologies have an extremely minimal environmental footprint by making use of what is already in place.

Preventive

A disciplined, proactive approach is needed for effective facility management. An apathetic state of mind, where a person is reactive rather than proactive, has no place in maintenance and facility caretaking.

Research has found that it is more cost-effective to prevent catastrophes, rather than wait until they occur and clean up after them. Pipe system failures can cause damages that range from leaks destroying wallpaper to entire shutdowns of buildings, depending upon the pipe system and its particular issue.

Investing in pipe lining will greatly extend the pipe system's useful life, ultimately saving a facility money, maintaining its professional image and providing management with peace of mind.

Minimal disruption

Not only do pipe lining technologies preserve the buildings in which they are installed, but they also preserve the landscape and hardscape outside of the buildings, offering the least disruptive pipe system repair solution.

If a facility encounters a leaking underground pipe, such as a potable main or a sewer main, the pipe could run below the entrance to the building, below the parking lot, below adjacent streets and below landscaping and sidewalks. If a conventional repipe were considered to repair an underground pipe such as this, then normal transport around and access into the facility would be greatly impaired. It is very common for parking lots, streets, sidewalks, building entrances and landscaping to be dug up and removed during a pipe replacement project.

Non-invasive solutions, such as pipe lining, prevent the need to dig up landscape and hardscape, inside and outside buildings, so the flow of traffic, plant life and employee or customer parking lots are not disrupted.

Conserving resources

It goes without saying that water is a dwindling, precious resource. Every business throughout the globe should consciously take part in water conservation and other sustainable practices. Pipe lining technologies offer effective leak protection (thereby preventing wasted clean water), which has been time-proven from decade-old projects, as well as vigorous independent laboratory tests.

With facilities containing thousands of miles of pipes, finding every leak could be impossible without routine leak detection tests using expensive, non-invasive process. The most surefire way to prevent leaks is to apply a pipe lining

technology to pressurized pipe systems, which completely coats the interior of the pipes with a strong epoxy or other material, inhibiting corrosion or erosion that eventually creates breaches in pipes.

Healthier water

Choosing an epoxy pipe lining solution to restore and preserve a facility's pipe systems also will provide the facility with cleaner, healthier water. For example, lead leaching into clean water via lead pipes, can cause serious health side effects, especially to people who are very young or old. It is estimated that an eighth of the United States population drinks lead-contaminated water on a daily basis and up to 50 percent of the water supply pipes in Great Britain contain some lead.

Epoxy pipe lining applications have been proven as an efficient and desirable way to prevent the leaching of heavy metals (such as copper from copper pipes and lead from galvanized iron pipes) into the water supply.

Pipe lining technology can also prevent interior corrosion buildup and rusty water, therefore improving the water quality. In addition, epoxy pipe lining methods are believed to hinder the formation of legionella, which is a bacteria that grows in warm, stagnant water.

Utilizing relining technology, such as epoxy pipe lining applications, will reduce the need for facilities to add expensive chemicals, such as phosphates, to the water supply. Pipe lining is an eco-friendly process that keeps clean water safer for consumption than water brought into a building using brand new pipes. **FMJ**



Amanda Strouse is a marketing professional who has five years of experience promoting in-place pipe lining technologies to the international market. She

currently works for Pipe Restoration Inc. and ACE DuraFlo, which own and use the patented ePIPE process, which has the fastest return-to-service resins approved for small diameter drinking water pipes on the market.

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FMJ: CAN YOU SHARE SOME TIPS TO HELP FMS PROMOTE HYGIENE IN THE WORKPLACE?

TORK: Promoting hygiene is a key step for facility managers to ensure a clean and safe workplace, and one of the ways to do so is by, quite literally, encouraging employees to throw in the towel.

For instance, instead of rental towels, consider disposable wipers, which contribute to reducing workplace hazards such as cross-contamination. While many facilities rely on the use of rental towels, managers may not realize that those towels, when sent for laundering, are interchanged between various environments. When those towels are washed, the contaminants mix into the water and can be re-deposited into towels that are recirculated as clean.

Disposable wipers, however, remove that risk, as you get a clean, fresh towel every time for the task at hand. This also helps to ensure that surfaces are thoroughly sanitized and disinfected, eliminating the risk of rags accidentally being transferred from, for example, the bathroom to the workplace surfaces.

FMJ: HOW IS TORK UTILIZING SMART TECHNOLOGIES TO PROVIDE A BETTER RESTROOM EXPERIENCE?

TORK: Tork is bringing Buildings Internet of Things (BloT) connectivity to the washroom with its market-leading Tork EasyCube Intelligent Restroom System, which utilizes sensor-embedded equipment in toilet paper, towel and soap dispensers.

Each individual dispenser transmits real-time data, which can be checked instantly from a connected device. Usage trends help facility managers understand when guests are most likely to use the restroom, and when to schedule an extra cleaner. When managers can accurately track how much inventory is being used, purchasing decisions can be based on actual usage rates, not guesses. No checking on dispensers unnecessarily and no more running out before the next shipment.

By harnessing the power of big data, building managers can keep up in an increasingly tech-driven world — all while ensuring a pleasant restroom experience. Because no matter how many intelligent devices enter the BloT ecosystem, perfecting the guest experience is the smartest move you can make.

RSMeans

FROM THE GORDIAN GROUP®

COMPANY NAME RSMeans
EXPERTISE FM consultants/Services/Providers
CSP LEVEL Silver **CSP SINCE** 2013
WEBSITE www.rsmeans.com

FMJ: WHAT TYPE OF DATA SHOULD FMS TRACK IN ORDER TO CONTROL COSTS DURING CONSTRUCTION PROJECTS?

RSMEANS: Any type of data that can significantly impact productivity should be tracked. For example, if material has to be transported by special means, over great distances or to high floors, an additional allowance should be considered.

While horizontal movement is typically a sole function of distance, vertical transport introduces other variables that can significantly impact productivity. As an example, in an occupied building, the use of elevators (assuming access, size and required protective measures are acceptable) must be understood at the time of an estimate. For new construction, hoist wait and cycle times can easily be 15 minutes and may result in scheduled access extending beyond the normal work day. Finally, all vertical transport will impose strict weight limits likely to preclude the use of any motorized material handling.

FMJ: HOW DOES RSMEANS GO BEYOND SOFTWARE TO ASSIST FMS WITH DATA ANALYSIS?

RSMEANS:

Analytics and reporting

RSMeans conducts facilities life cycle and benchmark research studies and predictive cost modeling to help building owners and facility managers understand the lifetime maintenance costs of a building, the price to build a specific building model in different locations across the country and the globe, and if the estimate they are basing their major decisions on is accurate.

Estimating services

RSMeans' estimating services provide reliable guidelines and neutral analyses in cases of cost and estimate disputes. Leveraging years of estimating experience and RSMeans data, cost engineers review various types of cost and estimate disputes and report unbiased findings.

Facility management – life cycle costing

Life cycle costing enables building designers and owners to achieve higher quality design and construction projects at lower costs to avoid cost-cutting efforts that often sacrifice quality for the cheapest products. RSMeans consults with owners and facility managers interested in understanding the life cycle costs of their buildings and provides custom dashboards which include relevant data for owners overseeing multiple buildings and/or campus-type settings.



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PROACTIVELY IMPROVING

INDOOR AIR QUALITY

BY JEFF DRYFHOUT

FMJ EXTRA



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VIDEO
Defining Indoor
Air Quality

Without realizing it, many facility managers may be overlooking one of the most important aspects of a clean building: the air. The proliferation of dust, allergens and other airborne pollutants often seems unavoidable in buildings large and small. However, imagine if you could eliminate the vast majority of these contaminants, long before they've been inhaled by building occupants or settled across every surface in a room.

Improving indoor air quality, using a combination of source control, increased ventilation and air filtration makes this concept a reality. A few simple, proactive measures allow facility managers to get buildings cleaner by reducing allergens, airborne viruses and volatile organic compounds (VOCs).

Though we can't see most of these pollutants, they affect cleanliness and can significantly impact health. In fact, indoor air is often two to five times more polluted than outdoor air. Since the average person spends 90 percent of his or her time indoors, air quality in buildings is of the utmost importance, especially in high-occupancy places such as schools, offices, health care environments and senior living facilities.

By taking buildings to the next level of cleanliness, facility managers have the opportunity to deliver the benefits of clean air including increased productivity, patron loyalty and general well-being. Improving indoor air quality is a solution to some of a building's most common pain points and provides facility managers with an integrated solution.

Diagnosing poor indoor air quality

Poor indoor air quality (IAQ) is a much more common, and much more expensive, problem than many facility managers may realize.

Contaminated air impacts building occupants' health and may make poor impressions.

One reason IAQ suffers is because many buildings are designed to be airtight in order to cut down on energy costs and be more sustainable. The "tightness" often leads to inadequate ventilation, for which there's not always a quick fix.

A lack of ventilation can also cause other problems, such as moisture buildup and mold growth. This is sometimes exacerbated in older buildings because they may contain hazardous building materials such as formaldehyde, lead or asbestos, adding to the cocktail of unsafe contaminants that linger in limited airspace.

While architects and builders are constantly adapting to create greener, healthier buildings, facility managers need to develop an IAQ action plan. When buildings aren't maintained effectively, problems with IAQ only worsen over time. Even new buildings can experience poor indoor air from factors such as the intrusion of outdoor air pollution or the use of chemical cleaning products.

Short-term symptoms associated with unhealthy indoor air quality include fatigue, dizziness,



POOR INDOOR AIR QUALITY IS A MUCH MORE COMMON AND EXPENSIVE PROBLEM THAN MANY FACILITY MANAGERS MAY REALIZE.

drowsiness, nausea, coughing, increased asthma attacks and eye and throat irritation. Unhealthy IAQ is also associated with long-term health problems such as respiratory and cardiovascular disease.

If 20 percent or more of building occupants experience such issues, it constitutes sick building syndrome.¹ About one in four new or renovated buildings may meet this criterion.

Lastly, one universal risk facilities face is the spread of airborne viruses such as influenza. The flu is responsible for 17 million missed days of work and 38 million missed days of school each year.² While it comes as a surprise to most people, airborne exposure is the most common way to catch the flu. Since people are most contagious the moment their symptoms begin, they're often spreading germs in the air before even realizing they could be spreading their illness along to others.

Filtering the air in common spaces can be an effective way to reduce the exposure to airborne viruses.

Three ways to improve indoor air quality

The U.S. Environmental Protection Agency has three main recommendations when it comes to improving indoor air quality:³

1. Control sources of contaminants
2. Improve ventilation
3. Utilize air cleaners

The source control aspect of this three-pronged approach is often the most accessible and affordable. Facility managers can test for hazardous contaminants and effectively remove them from the building or seal them off if it is more cost effective.

Another form of source control is simply avoiding the use of certain cleaning products, which can create a problem by releasing VOCs into the air. These products can trigger headaches and dizziness, as well as asthma or allergy attacks.

Switching over to green, unscented cleaning products and only using as much as necessary is a simple change that can greatly improve indoor air quality and sustainability.

Improving ventilation is a more complex problem. If an HVAC system hasn't been properly maintained, or in cases where older spaces are repurposed for a different use than originally planned, ventilation systems may be insufficient for the current needs of building occupants.

Remediating an outdated or inefficient HVAC system can quickly become expensive. More importantly, these larger systems are not intended to address higher-contaminant areas effectively. While HVAC systems can be adjusted for temperature control, a more targeted solution, such as commercial-

grade air purifiers, is necessary for eliminating odors, germs and other contaminants in common areas.

The EPA's third recommendation is installing air cleaners. Facility managers can make a few easy changes to reduce airborne contaminants, but air cleaners are the simplest solution for removing them almost entirely. These devices are a targeted solution that take facilities to the next level of cleanliness and provide infection control against airborne pathogens.

Commercial-grade air purifiers with HEPA filters effectively reduce allergens, VOCs, odors and even viruses such as influenza. In the U.S., true HEPA filters must reach the standard efficiency of removing 99.97 percent of particles that are 0.3 microns in size.⁴

Air cleaners are particularly beneficial in problem areas that are prone to higher levels of contaminants. Bathrooms, locker rooms and conference rooms are common places in which germs, viruses and odor can quickly accumulate and create unhealthy air quality. By installing air purifiers, facility managers can minimize contaminants in the rooms that are the biggest perpetrators.

The rewards for facility managers

By tackling indoor air quality proactively, facility managers can save time and money and deliver a cleaner facility. Improving indoor air quality is universally beneficial, creating healthier outcomes for building occupants and facility managers alike. Occupants and workers can rest assured that they are working or living in a healthy environment, and facility managers

won't lose time dealing with complaints or trying to constantly spot-check problem areas.

What's more, with the cost of one employee sick day averaging US\$2,650, cleaning the air of airborne viruses can impact the bottom line. In addition, clean indoor air will naturally eliminate just about all odor complaints. A smelly bathroom or room that simply doesn't get enough ventilation can quickly become loaded with airborne germs and other contaminants. Masking it will only make the problem worse. That's when a commercial-grade air cleaner can make a huge difference.

Another valuable benefit is creating healthier environments for occupants and giving them a true sense of well-being.

Imagine a classroom full of kids who are able to focus better because the air doesn't make them drowsy or nauseated. Think about giving workers fewer days

where they dread the sound of a sneeze as flu rapidly spreads through the office. Consider the senior with asthma who no longer has to worry about constant attacks instigated by all the dust and allergens in the air. Improving indoor air quality can make these scenarios a reality.

Where we're heading

There will be higher occupant expectations for healthy indoor air quality in the coming years. Already, we're seeing companies and organizations installing air quality sensors to quickly and accurately identify problem areas.

Right now, facility managers have an opportunity to be proactive, and clean the air to greatly improve the health and cleanliness of their facilities.

In the long run, investing in indoor air quality has the potential to minimize related maintenance problems, decrease occupant complaints and contribute

to the long-term health of a building. It can also help contribute to facility cleanliness, thereby saving facility managers time and money. But most importantly, it gives facility managers a chance to dramatically improve public health and make positive change in the years to come. **FMJ**

REFERENCES

1. National Institute of Occupational Safety and Health
2. U.S. Centers for Disease Control and Prevention
3. U.S. Environmental Protection Agency
4. U.S. Department of Energy



Jeff Dryfhout is the global marketing director of AeraMax Professional. To learn more about AeraMax Professional, go to www.aeramaxpro.com. For

additional information on why clean, filtrated air is necessary to prevent airborne flu, visit <http://cleanair.aeramaxpro.com/flu>.

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LOWERING UTILITY COSTS AND INCREASING FACILITY PERFORMANCE

COMMISSIONING AND RETRO-COMMISSIONING

BY JOHN RIMER

Commissioning is one of the most cost-effective means of ensuring optimum building performance and efficiency, returning energy savings as high as 25 percent and payback periods measured in months. However, in spite of such successes, commissioning (Cx) and retro-commissioning (RCx) are still largely misunderstood and have not been fully adopted in the marketplace.

Before clearing up the confusion and defining what one might expect or require of the commissioning process, let's further discuss the benefits and associated costs savings.

In 2009, Dr. Evan Mills with Lawrence Berkeley National Laboratory released a report titled "Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions." In the report, Dr. Mills stated that "Commissioning is arguably the single most cost-effective strategy for reducing energy, costs and greenhouse gas emissions in buildings today."

In the study of more than 600 buildings, Dr. Mills found that the median energy savings of commissioning for new construction and existing buildings was 13 percent and 16 percent, respectively; the payback on energy savings alone was 4.2 years for new construction and 1.2 years for existing buildings. Additionally, the median non-energy benefits offset 49 percent of the commissioning costs, improving the payback period. Examples included improved overall functionality of building systems, reduced contractor call-backs and increased occupant comfort — all of which have a direct impact on the bottom line.

Commissioning fees on new construction were generally offset by cost avoidance and remediation of design miscues identified during design review and site walk-throughs. The resultant improved building performance and efficiency gains offered year-over-year benefits through increased productivity and lower operations cost. Retro-commissioning —

GIVEN THE INTERDEPENDENT NATURE OF TODAY'S TECHNO-CENTRIC SYSTEMS, THE BULK OF COMMISSIONING EFFORTS WILL BE SPENT DURING FUNCTIONAL PERFORMANCE TESTS.

commissioning of existing buildings and systems — generally returned energy savings of at least 15 percent to more than 20 percent with paybacks of a year and a half or less. These savings, coupled with potential utility incentives, meant that these projects could be funded directly out of a facility's operations and maintenance budget.

The cost of commissioning is driven less by the square footage of the facility and more by the quantity and complexity of its systems and equipment; thus it is difficult to define an expected price range. However, given that the aforementioned payback periods fall within most organizations' funding criteria, the costs should be easily justified.

Commissioning: New construction and systems

Commissioning is the evaluation and testing of new buildings and systems to ensure that their performance reflects the owner's requirements and the subsequent design intent. To clarify, Cx is not contractor start-up or TAB (test/adjust/balance), as these terms are quite often misinterpreted.

Commissioning is not limited to new, ground-up construction projects; rather, it should be performed on new equipment and system installations. The complexity and interdependency of today's automated systems make this all the more a must to ensure optimum operations. Commissioning is often limited to mechanical systems; however, it should be expanded to include review and testing of electrical systems, the building envelope and other facility systems that affect performance and energy use.

Design phase

A third-party commissioning agent (CxA) or in-house expert should be

brought on early in the process. Ideally the CxA should participate in programming and pre-design discussions in order to gain a clear understanding of the project's intent and required performance. The CxA conducts design reviews, typically at 30 percent, 60 percent and 90 percent completion, to verify that the design aligns with the owner's requirements.

It is also recommended that the TAB contractor participate in the design review to ensure adequate quantities of and access to balancing dampers and valves. The CxA should provide commissioning specifications as part of the construction documents so that the contractors are aware of the extra, yet minimal, efforts required for commissioning. The CxA may also prove valuable when evaluating and interviewing construction contractors.

Construction phase

Typically, the CxA hosts a commissioning kick-off meeting with the participating contractors to answer questions and establish clear expectations. It is important to note that the CxA should act and be seen as a team member who is there to help identify and solve problems, not create them.

The CxA should conduct periodic site visits and participate in construction meetings, both of which will likely increase in frequency as the project progresses. Identified deficiencies should be documented and communicated to the project management team, so that issues can be tracked, resolved and validated. The CxA should assist with submittal reviews and provide feedback as necessary.

Testing and acceptance phase

There are generally three types of tests conducted: pre-start, start-up and functional performance tests.

Pre-start tests are typically developed by the CxA but completed by the respective installing contractor. These tests confirm that the equipment is installed correctly and safe to start. The CxA will review the completed pre-start documents and conduct field spot checks. Once the equipment has successfully passed this phase, the contractor(s) will perform the start-up tests as supplied by the CxA. The CxA will witness the start-up tests; however, he or she may only witness a sampling of high-quantity equipment, such as terminal units, air-control valves and variable air volume boxes. The CxA will typically spot check TAB readings at this juncture as well; 10 percent is a reasonable sample.

These initial tests lead up to functional performance testing, during which equipment is individually tested to its design limits. Afterward, the cross-functional interactions of the various systems are collectively evaluated to ensure that the building, as a whole, functions per the owner's performance requirements. Given the interdependent nature of today's techno-centric systems, the bulk of commissioning efforts will be spent during this stage. A large, complex facility could take months to complete, so plan accordingly in the construction schedule.

Prior to performing functional performance tests, the controls contractor should complete and submit a point-to-point verification report to the CxA for review. Once the controls system is ready for the functional testing stage, the CxA will work closely with the contractor to confirm that the systems and their interdependencies operate according to the sequence of operations and design intent. This is accomplished by running the systems through various failure scenarios and

operating conditions. The end product should be a new building or system that adheres to the owner's expectations and performs as the facility management team deserves to inherit.

Note that the facilities team should maintain a measure of representation throughout the design and construction phases, participating in meetings and providing value-added feedback. This participation should grow during the testing and acceptance phase, as this is the perfect time to train building staff and to familiarize them with the building and its systems.

Transition to operations: The hand-off

The transition to the operations phase is one of the most critical to successful operations and maintenance of the new facility/system, and yet it is often one of most fumbled or altogether forgotten. At this juncture, there is often increasing pressure to close out the project, with quickly approaching,

if not already lapsed, deadlines, and numerous contractors frantically trying to address punch-list items, which hastily overshadows the hand-off to facilities. Success in this phase requires appropriate planning, budgeting and defined expectations from the onset of the project.

Prior to acceptance of the space, adequate budget, support and time should be allocated to upload building and equipment information, establish job plans and schedule preventive maintenance in the building management system. Failure to maintain equipment according to manufacturer's recommendations can void the warranty, thus there is an urgency to schedule and perform the required maintenance.

Standard, maintenance and emergency operating procedures should be developed and tested prior to occupying the building. The testing and acceptance phase allows a great opportunity to develop and test such procedures,

as they are often quite similar to the functional performance tests. Service contracts should be put in place or amended to support the new equipment.

Most facility organizations are too busy to absorb an effort of this magnitude once the building is occupied, as they will be handling day-to-day issues and helping occupants to get settled into their new space; thus it is imperative that such tasks are accounted for during project development and executed prior to assuming ownership. The CxA may be able to provide these services or at minimum assist with compiling the data.

The CxA will also typically review O&M manuals and related documents to ensure that they are complete and accurate.

First year of operations

Given that the CxA is intimate with building operations, it is recommended that the CxA stay engaged as a resource to facility staff through at least the first year. The CxA can answer questions,



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THE FACILITIES TEAM SHOULD MAINTAIN REPRESENTATION THROUGHOUT THE DESIGN AND CONSTRUCTION PHASES AND PROVIDE VALUE-ADDED FEEDBACK.

troubleshoot issues and assist in fine-tuning systems, especially during the shoulder seasons (spring and fall). Additionally, the CxA should participate in the 10-month warranty review.

Retro-commissioning of existing buildings

Retro-commissioning is the commissioning of an existing building or system that has never been commissioned. Re-commissioning is the commissioning of facilities/systems that have been previously commissioned. In their report, Lawrence Berkley National Laboratory recommends that buildings be re-commissioned every three to five years, due to the inherent “creep” of equipment and systems from optimum performance over time.

Ideally, the original commissioning test procedures should be used to re-commission the building, adjusting for operational changes. For retro-commissioning, test procedures should be developed using original design documents, if available, as well as current stakeholder and performance requirements and operator feedback.

As is similar to commissioning, RCx generally focuses upon mechanical systems; however, RCx teams should consider expanding to evaluate other systems. Additionally, spot check TAB should be performed, especially in areas that may have heating/cooling or airflow issues.

As part of testing the building systems, the CxA should take the opportunity to interview facility staff and solicit feedback from occupants. The CxA should review the building management system’s alarm history and trend data. Additionally, utility data may be able to shed more light on

building performance, especially when benchmarked against like facilities.

The output of the RCx effort should include a report that identifies field adjustments made (as permission allows), recommended maintenance actions and proposed capital improvements. The CxA does not typically make in-field repairs, unless otherwise directed and funded. It is highly recommended that building trends and energy usage data be collected prior to making any adjustments or repairs, so that the resulting energy savings and performance improvements can be measured, documented and marketed.

Common deficiencies found through RCx include malfunctioning or out-of-calibration sensors, equipment that is overridden or operating “in-hand,” incorrect schedules and setbacks, broken damper linkages, improper control sequences and excessive simultaneous heating and cooling. Often, with retro-commissioning, there are a few significant finds that account for the lion’s share of the performance and efficiency improvements. Some examples, in addition to those previously listed, include heat pumps plumbed backward, sensors controlling the wrong zones or equipment, disconnected ductwork, closed dampers and economizers that were never wired or installed.

Selecting a commissioning agent

The quality of commissioning and the value returned hinges heavily, if not solely, on the CxA selected; thus FM’s should take special care when evaluating CxA candidates. Ideally, the CxA should have a team that provides depth of expertise with local representation, including a firm understanding of building operations and a working knowledge of building management systems.

Commissioning should be one of the company’s primary service offerings, as reflected by the number of full-time commissioning engineers employed and their involvement in the commissioning industry. The company should demonstrate a history of training and continued improvement, including related credentials and certifications, such as those that can be obtained through industry associations.

Ongoing commissioning

Ongoing commissioning leverages a building’s existing technology, such as the building management system and energy metering, to continually assess system performance and trends. Custom algorithms and alarm thresholds can be established that will alert facility staff of sub-optimal system performance or impending failure. Data such as this can also be utilized to migrate the maintenance program from reactive firefighting to proactive, condition-based maintenance.

Overall, commissioning is a quality and performance assurance service that improves facility operations, reduces O&M costs and lowers utility consumption with a payback that is easily palatable for most organizations. **FMJ**



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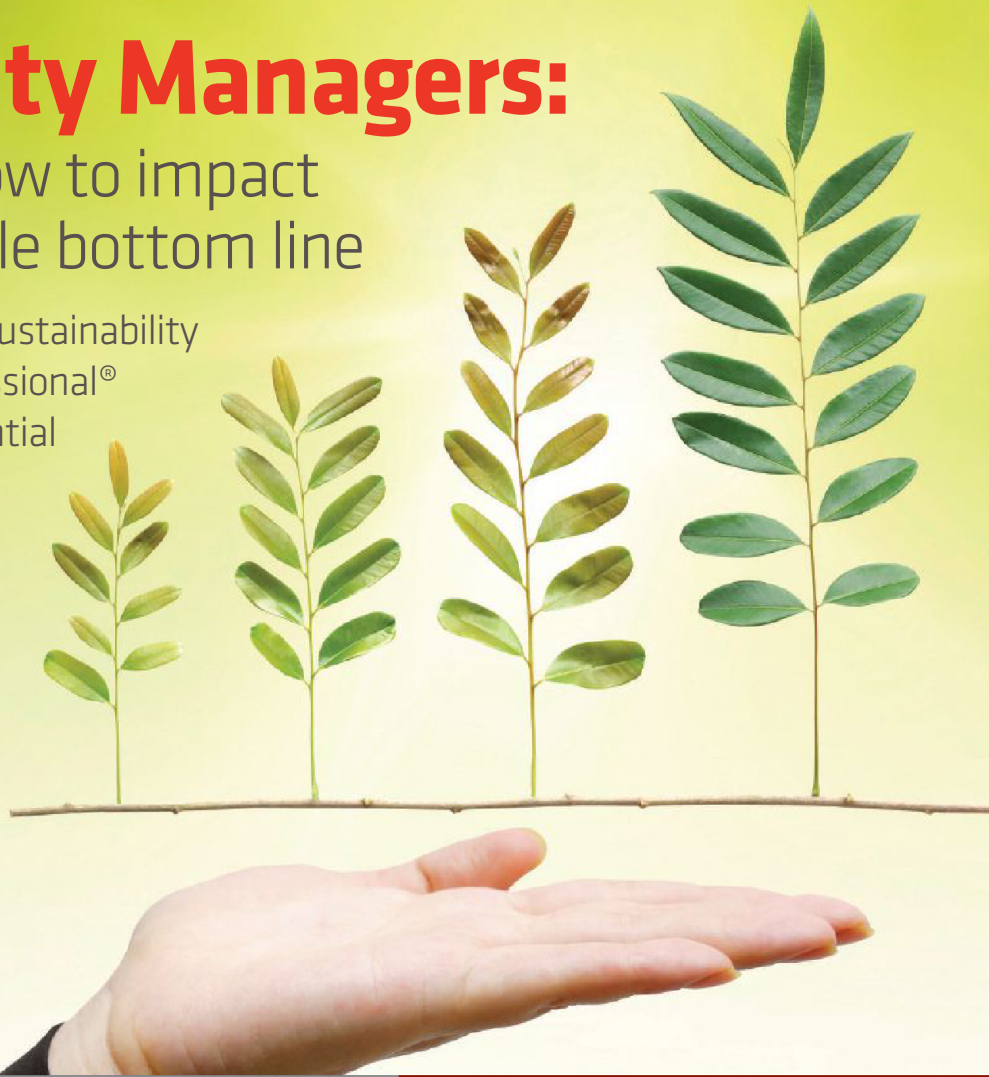
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UTILIZING INNOVATION TO MAXIMIZE RECYCLING COST SAVINGS

BY RICK COREA



In 2013, the United States Environmental Protection Agency reported that “Americans generated about 254 million tons of trash and recycled and composted about 87 million tons of this material, equivalent to a 34.3 percent recycling rate. On average, we recycled and composted 1.51 pounds of our individual waste generation of 4.40 pounds per person per day.”¹

The facility management role is continually evolving due to technology, economy, social responsibilities and environmental changes. Facility managers are not only expected to maintain and operate facilities to their optimum quality but also to emerge as innovators. FMs constantly have to add value, reduce costs and provide a safe and friendly environment while focusing on their organization’s vision.

Being good stewards to the Earth, FMs have to be aware of their carbon footprint, and do so on a much larger scale due to the magnitude of their facilities. Outsourcing the reduce/recycle plan is also a major consideration. Which is the most cost-effective option? Will my internal clients understand our goal? Can we help others while recycling?

Existing recycling program

To answer these questions, ON Semiconductor, a company headquartered in Phoenix, Arizona, USA, wanted to identify a waste management company that would take ownership of ON’s waste streams by managing, educating, removing, recycling, sustaining and reducing costs. If demonstrated viable, the plan was to roll this process and methodology out to semiconductor factories globally.



The existing waste removal service provider was a legacy vendor that was started by another semiconductor company and was used by all of their sites in the Phoenix metropolitan area. It was a standard pull-and-dump process, with minimal success in recycling. The recyclable proceeds from this process went to a charitable organization and 10 percent of the revenue (US\$172,500) was donated over 15 years.

To change the mindset on how to manage waste removal, the Phoenix facilities group explored different methods to simplify their process. They sought the best value contractor that would be responsible for implementing their own process. To refine the vendor selection, the company's facilities group partnered with the Performance Based Studies Research Group (PBSRG) at Arizona State University.

Arizona State University research

Since 1994, PBSRG has been researching and testing best value and leadership-based concepts to develop organization and service models that increase efficiency and performance while minimizing risk. The methodology has been tested more than 1,804 times on US\$6.4 billion in project value (US\$4.2 billion in construction projects and US\$2.2 billion in non-construction professional service projects), in six countries and 31 U.S. states with a 98 percent success rate. This research uniquely optimizes effective practices by the client and the expert vendor.

Traditionally, FMs tend to manage vendors, but if a system is in place that enables the vendor to know what to measure in cost and time deviations, this allows contractors to do their own quality control. This leaves the FM to take care of quality assurance, eliminating confusion and guesswork in knowing if the vendor is meeting the client's goals. This is documented by the vendor with the FM's signoff. It builds an accountability factor throughout the life of the contract and is implemented in three simple steps:

1. Selection of the waste management vendor
2. Pre-planning and risk minimizing by the selected vendor
3. Performance metrics for the life of the contract

Selection of the vendor

The selection stage focuses on the waste management vendor's ability to differentiate itself from other vendors based on its expertise to identify, prioritize and minimize potential risks. In this case, the semiconductor manufacturer realized that hiring the vendor based on low price (hard bid) is a reactive model.

Instead of focusing on minimum requirements, the semiconductor manufacturer wanted to allow vendors to compete based on value and ability to maximize the company's satisfaction through pre-planning and risk

minimization. An expert vendor has no risk within the technical scope of work and realizes that the only risk is in a potential lack of control of that which is outside the scope of work or where there is insufficient information regarding the scope of work.

The following evaluation criteria were assigned for selecting the best value waste management vendor:

EVALUATION CRITERIA	POINTS
Past performance information	10 points
Technical scope plan	5 points
Risk assessment and value added	20 points
Cost	25 points
Measurement plan	5 points
Interview	35 points

Three waste management vendors provided proposals. Based on the total points for each criterion, three vendors were scored out of 100 points, with Vendor C attaining the highest ranking.

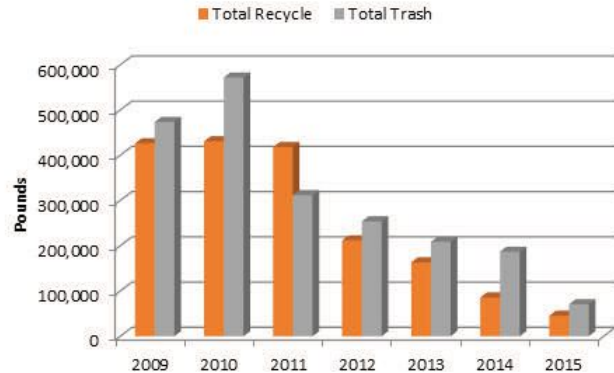
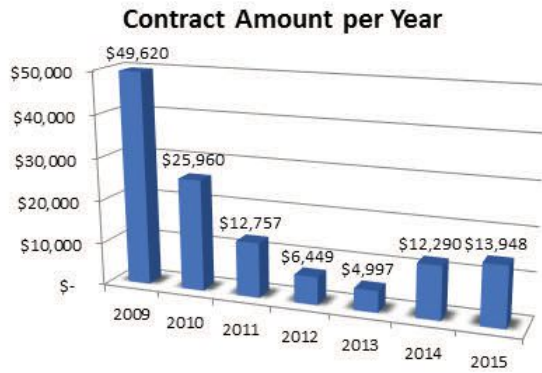
Pre-planning and risk minimization

ASU research identifies owners as non-experts who nevertheless have expectations. It is the expert vendor's responsibility to simplify and create transparency based on the vendor's level of expertise. The expert vendor should have a plan to deliver the project and minimize deviations by performing risk management. Through risk management, the vendor can create an environment that assists all stakeholders by minimizing risk.

In this case, the waste management vendor implemented a weekly report, which it provided to the FM. It described all risks related to the project, as well as tracking cost and time deviations and measuring their impact based on the detailed schedule and original project price. There were no vendor-generated risks; however, the vendor did identify four unforeseen risks. The vendor proposed an action plan to handle those risks, which ultimately benefited the bottom line and proved to be cost-saving factors.

The risks and proposed actions included:

- **Risk:** Compactors were being picked up when not full.
Action: The contractor installed sensors on compactors and monitored compactors. The sensors were designed to notify the contractor when the unit was full.
- **Risk:** Employees not recycling at their desks.
Action: The contractor installed desk-side co-mingle



This graph depicts the total contract amount, total recycled and total waste from 2009 to 2015. The average contract amount was US\$18,003 per year. The average total recycled and trash amounts were 254,634 pounds and 296,926 pounds respectively.

FACILITY MANAGERS ARE NOT ONLY EXPECTED TO MAINTAIN AND OPERATE FACILITIES TO THEIR OPTIMUM QUALITY BUT ALSO TO EMERGE AS INNOVATORS.

containers. This allowed individuals to put all recyclables material into one container.

- **Risk:** Exposure of secure documents.
Action: The waste management vendor provided secure containers and vehicles for use in transportation of confidential documents.
- **Risk:** Trash containers were used incorrectly.
Action: Employees and contractors were trained on what was recyclable versus what constituted trash and proper locations for disposal of each.

Performance metrics for the life of the contract

Using the ASU research model, the awarded vendor was expected to report weekly on the performance and risk level of the service. The best-value waste management vendor was successfully able to establish a simple metric system that would track and document the trash and recycling performance numbers for the FM.

The ASU research team came back at the five-year contract mark to conduct a customer satisfaction survey with the facilities group to see how the process and the awarded vendor endured. The overall satisfaction rating for the ASU research process was 10 out of 10. The overall customer satisfaction for the awarded vendor was 9.5 out of 10. Moreover, the awarded vendor successfully met the quality expectations of the company. Prior to the new contract the vendor was rated at 4 out of 10, which increased 137 percent using the new process.

The facility manager was successfully able to utilize innovation through the ASU research process to hire an expert waste management vendor, rather than managing, directing and controlling the waste management vendor in the traditional model. In turn, the vendor was able to solve issues, maintain accountability, show cost savings and give back to charity.

Global efforts

As environmentally conscious FMs, we need to share our successes and pitfalls so that the next generation of FMs is more successful. Although this study was done on a local scale for a recycling program, it can be applied to any function, such as construction or non-construction services, and in virtually any industry.

Our goal as FMs is to help educate those within our profession and sustain our value in the current and future business market. This can be accomplished when we share innovative ideas and education among fellow FMs throughout the U.S. and globally. **FMJ**

REFERENCES

1. www3.epa.gov



Rick Corea is the senior global facility manager at ON Semiconductor for 21 sites worldwide (9.5 million square feet and 430 acres). He manages a US\$170 million budget and leads a team of 450 facility professionals. He served two terms as president of the Greater Phoenix Chapter of IFMA.



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THE GRASS ISN'T ALWAYS GREENER ON THE OTHER SIDE

How subsurface drip irrigation can work for your facility



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Skyscraper Farms and
Edible Walls: Living
Architecture



BY MAURICIO TROCHE

Whether you oversee a hospital or a hotel, a park or a retail center, maintaining an attractive exterior landscape with lush green grass and brightly colored flowers is always a priority. The practical and aesthetic benefits of maintaining green spaces, particularly in urban environments, has been well documented: Studies have shown that people who live near parks and gardens tend to live longer and healthier lives; retail customers will gravitate toward shopping in locations that are well maintained and convey a sense of luxury; occupants of office space in a gorgeous commercial building are proud to invite clients over.

But in the face of unprecedented drought conditions, particularly in California and the Southwest United States, aggressive water restrictions have changed the landscape industry. “Drought shaming,” the act of singling out blatant water wasters by blasting them in public forums, has brought unwanted attention not only to homeowners who overwater their front lawns, but also to facility managers charged with maintaining their property’s green areas with an irrigation system that may not be the best fit for the landscape.

After all, unless a facility’s irrigation hardware was designed to match the topography from the very beginning, it stands to reason that there will be some far-reaching corners or odd-shaped slopes of land that won’t get enough water.

For decades, commercial properties have primarily relied upon sprinkler irrigation to maintain their landscapes year-round. As technology advanced over the years, the rise of smart, weather-based controllers greatly improved the water efficiency of landscapes through

automated systems that respond to a landscapes needs based on weather and soil monitoring systems.

But, as controllers continue to become more advanced, the water-efficient limitations of traditional sprinklers have become more exposed.

You don’t have to look very far to see the inefficiencies of traditional sprinkler irrigation. Wet sidewalks, driveways and streets are perhaps the most evident signs of the erratic water delivery offered by sprinklers. As increasing pressure is placed on today’s green industry professionals to focus on elevating the water efficiency of the areas they maintain, many are coming to realizing that sprinkler irrigation may not be capable of meeting today’s heightened standard for sustainable landscapes.

There are many influences out of a designer or contractor’s control that play a major role in the erratic application of water, including:

- **Uneven water application caused by wind drift and extreme temperatures.**

- **Water evaporation.** Plants may look beautiful with a glistening layer of water on the leaves and petals, but that water is wasted. Evaporation also occurs due to low humidity and spray nozzles that atomize the water because the pressure is too high.
- **Increased fungal growth on plants from excess moisture.** Unhealthy, diseased plants and flowers look unattractive and must be replaced, which can put a dent in any manager's landscape budget.
- **Damaged, slippery surfaces near buildings.** As nearly all of us have probably seen at one point, a broken or misplaced sprinkler is not only a nuisance (say, after you wash your car), but it can be potentially dangerous as well. Excess spray onto sidewalks, walkways and driveways may cause an accident.
- **Other natural or man-made obstructions that might hinder the proper performance of a sprinkler.**

Strict water restrictions and regulations in many areas throughout the U.S. and globally have caused facility managers to rethink their current landscapes as they relate to sustainability and public perception.

Progressive facility managers are expanding their knowledge of landscape solutions and more efficient irrigation alternatives. As such, they are learning that an efficient landscape does not have to mean an all-out ban on turf grass.

In fact, many are realizing that subsurface drip irrigation (SDI) technology enables commercial properties to keep the turf areas and significantly reduce water use.

What is SDI?

Subsurface drip irrigation applies water directly to a plant's root zone using polyethylene tubing (frequently referred to as drip line) buried below the soil

surface. This prevents common sprinkler issues like runoff and evaporation by reducing exposure to above-ground elements. SDI is already commonly used by farms to grow fruits and vegetables, and has been proven to use up to 70 percent less water than conventional irrigation methods.

SDI can be used virtually any place where overhead sprinklers are used and is the ideal method for creating an even wetting pattern throughout the soil profile. Its flexibility and reliability make it particularly well-suited for nearly any topography or environment, including:

- Long, odd-shaped or narrow areas
- Curvilinear design layouts
- Medians and center dividers
- Areas close to buildings and at-grade windows
- Athletic fields
- Auto dealerships and other parking areas
- Gardens
- High wind or constant wind areas
- Green roofs
- High-liability areas
- Vandal-prone and public properties
- Hardscapes
- Steep slopes and pocket walls

Flexible tubing can accommodate any layout, regardless of width or shape. Because there is no overspray, staining and discoloration of signage, hardscapes and landscapes are eliminated. It also prevents neighboring buildings and windows from getting wet or spotted with water.

On athletic facilities, fields can be irrigated and softened prior to play without wetting the surface, which helps to reduce impact injuries.

Plants sensitive to water on petals, such as roses, are protected since water is applied directly to the root zone. Drip lines can also be installed on urban green rooftops with minimal soil of 1 to 5 inches.

Consulting a landscape professional

For facility managers with properties that are currently in development or undergoing significant landscape changes,

now is the perfect time to consult with a landscape professional, as SDI can be installed on new and existing landscapes.

While the cost and water savings are undeniable, converting to SDI is a significant investment and does require some understanding of the overall installation. When speaking with a landscape professional, consider these questions:

Do I have to redo my entire irrigation system? How labor intensive will it be?

No — you can retrofit your existing system. The degree of labor intensity depends on the size of your facility and whether you choose to remove turf, use planters, do hardscape, etc. These are all options to discuss with your landscape contractor.

How much maintenance is required?

Minimal maintenance is required. The water filters should be cleaned two to four times a year depending on water quality.

Can we use sprinklers in conjunction with an SDI system?

It is possible to compromise and combine irrigation systems, which may be beneficial for facilities that have significantly varied landscape "zones," such as school campuses, public parks and auto dealerships.

Are there certain zones or areas that would benefit the most from installing SDI?

While SDI works well in all climates, it works especially well in regions that experience extreme weather conditions. In regions with arid climates, SDI helps "grow more with less," which means that it delivers an ultra-precise amount of water directly to the plant's root zone, which helps produce lush, healthy plants. There is no water lost to evaporation from scorching heat or blown away by blistering winds.

SDI has also allowed users in severely drought-stricken areas with major water restrictions to continue maintaining attractive landscapes.

However, it is safe to say that every region and climate can benefit from SDI.

How much water will I save?

In general, SDI in landscape applications can reduce water usage between 30-70 percent, but the number varies depending on a variety of factors, such as the inefficiency of the current irrigation system and the design of the landscape.

Can I use reclaimed water with an SDI system?

An SDI system is fully capable of handling reclaimed water. Dripline tubing, like all reclaimed water piping, faucets, valves and fixtures, is required by law to have purple markings to easily identify that recycled water is being used.

Will using SDI contribute toward LEED credits?

The LEED system does not certify individual products, but the combination of products used will contribute to the overall building project's earning of LEED credits. Dripline tubing earns points for credit if it meets the requirement for use of recycled content in manufacturing the product.

Case study: Southern California Municipal Building

The corporate headquarters of a Southern California utility that provides natural gas and electricity is a cluster of buildings

totaling more than 200,000 square feet spread out across 8.5 acres. Each building is surrounded by wide expanses of turf that has been carefully tended to in order to maintain a vivid green that matches the trees and shrubs, all of which reflects off the buildings' mirrored exterior panels. Walkways are lined with narrow and odd-shaped areas of shrubbery.

The offices were built in 1986, and stuck with using traditional spray heads and rotors. Over time, the facility management staff began paying closer attention to the significant downside of using sprinklers. Water runoff flooded the sidewalks and stained the asphalt, cars parked close to the grass and the buildings often fell victim to over-spraying and leaking or broken lines were frequent and inconvenient to repair. Because of the significant acreage, it was difficult and wasteful to water the entire property at the same time.

Southern California, though renowned for its remarkably mild climate and tourist destinations, remains stricken by drought conditions affecting the entire state. Mandatory water restrictions were imposed across all counties, prompting the utility company to consider different irrigation options.

After consulting with a contractor, the facility manager decided to do a

full landscape remodel. This meant retrofitting the old irrigation system of sprinklers and rotors to drip irrigation, adding smart weather-based controllers and water flow sensors and removing approximately 70 percent of existing turf and replacing them with planters. The asphalt parking lots were stained and damaged from years of water runoff, so they were redone. It took approximately three weeks, including hardscape design, to complete the project.

For the facility manager at the utility, water conservation was a top priority in choosing to redo its irrigation system. Though it is still too early to gauge, early estimates place the company's water savings at approximately 40-50 percent. To help further bump up savings, the contractor used flexible dripline to create watering rings around the plants instead of grids — an efficient way to use less water to irrigate widely spaced shrubs. **FMJ**



Mauricio Troche is the director of landscape and turf for Netafim USA. He started working for his father's lawn maintenance company and has worked in

the landscape wholesale industry for 23 years. Troche graduated from San Diego State University with a degree in marketing.

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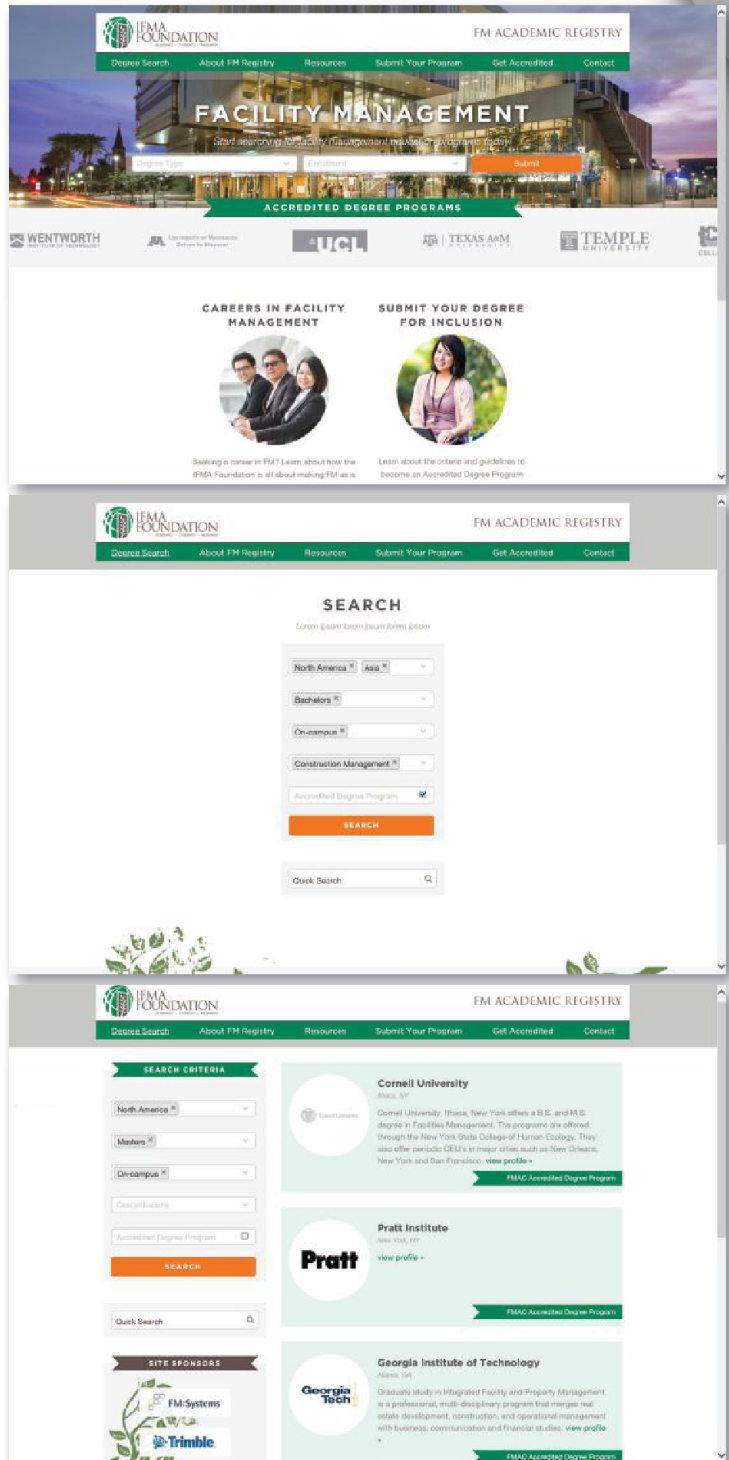
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We have launched a new online global resource called the FM Academic Registry, which catalogues every FM degree available in the world.

Students, parents and employers are able to quickly and easily search this free database to locate and obtain information on two-year, four-year and graduate facility management degrees available worldwide. Search criteria include online, on-campus and combination programs, areas of focus and geographic. We have started the site by listing the 30 Accredited Degree Programs and anticipate more than 50 non-accredited listings in the coming weeks.

This is vital information for students considering making FM a career of choice, and a one-stop resource that is greatly needed. We thank FM:Systems for underwriting the development of this new important tool.



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LEVERAGING SUSTAINABILITY TO FUND HIGHER EDUCATION CAMPUS IMPROVEMENTS AND ATTRACT STUDENTS

BY BOBBY JONES AND TAMMY FULOP

The U.S.' higher education institutions spend nearly US\$14 billion annually on energy and those costs are expected to climb. Yet even with stakes so high, many schools have long struggled to implement a comprehensive energy management strategy.

That task is becoming even more challenging with constrained budgets and new efficiency regulations. However, with the right facility improvement programs and funding mechanisms, this huge investment can be leveraged to tackle a wide variety of campus needs, including addressing deferred maintenance and improving the learning environment.

At the same time, colleges and universities are expected to be on the forefront of energy sustainability. Leadership in this area can prove to be a competitive differentiator and invaluable for both student and staff recruitment. According to the National Association of Scholars,¹ more than 1,400 academic programs in sustainability exist at 475

campuses. The campus sustainability movement has clearly progressed from the fringes of campus activism to become a key initiative from both an education and operations perspective. Universities that “walk the talk” can not only garner positive press, but also save 30 percent or more on utility bills.

However, many campus leaders simply don't know how to get started or lack the expertise or funds to do so.

Using energy savings for capital improvements

One of the key mechanisms driving energy-efficiency projects is through energy savings performance contracts (ESPCs). These contracts allow education and government institutions to pay for capital improvements over time without increasing taxes, tuition or debt load, making infrastructure and efficiency projects accessible for all schools, especially those that may not have been able to afford these projects otherwise.





Under an ESPC, little to no up-front capital is needed, as an energy service company (ESCO) provides the up-front funding by securing third-party financing. ESPCs allow colleges and universities to benefit from infrastructure improvement and sustainability programs.

In essence, the beneficiary simply reallocates money it would have spent on energy costs over the life of the contract to capital improvements. If the efficiency solutions do not generate enough cost savings to cover the guaranteed amount, the ESCO is required to cover the difference. This creates significant motivation for both the beneficiary, as well as the ESCO, to ensure that the energy-saving technologies implemented under the contract reach (or exceed) their expected payout.

According to Navigant Research, the U.S. ESCO market² for energy savings performance contracting and energy-efficiency retrofits will grow to US\$8.3 billion by 2020

from US\$4.9 billion in 2013, with a compound annual growth rate of 7.7 percent. This is a strong indicator of the increasing popularity of the ESPC financing model for facility modernization and upgrades.

Additionally, according to a recent study,³ nearly nine out of 10 higher education facility managers plan to increase or maintain their energy-efficiency investments over the next year.

Beyond energy efficiency: Driving economic development and campus improvements

By leveraging projected savings from the contract for funding over longer payback periods, ESPCs are changing the way higher education institutions across the nation are tackling the three-pronged challenge of maintaining aging infrastructure, improving their efficiency and sustainability performance, and ensuring safe, comfortable environments for students and staff.

THE CAMPUS SUSTAINABILITY MOVEMENT HAS CLEARLY BECOME A KEY INITIATIVE FROM BOTH AN EDUCATION AND OPERATIONS PERSPECTIVE.

Over time, schools can save millions of dollars in energy costs while reducing their carbon footprint and can reinvest those budget dollars back into programs that directly impact student learning.

Navigant Research has also found that schools and communities are increasingly interested in using energy performance contracts to finance other high-priority projects. In many cases, ESPC projects extend beyond the traditional energy-efficiency scope of lighting upgrades, HVAC equipment and building automation systems to also encompass information technology, security, water conservation and other building envelope improvements.

For example, a college may choose to install voice-over internet protocol technology, which provides a number of benefits compared to traditional phone systems including cost savings, service mobility and integration and collaboration with other applications. These types of projects contribute to overall improved operations for schools with long-lasting positive impacts.

Beyond facility and infrastructure improvements, energy partnerships also help promote public awareness of a school's fiscal responsibility, environmental initiatives and overall service to the community. Energy savings can be reinvested in projects like renewable learning labs, enhanced emergency services or cutting-edge stadium lighting to name a few.

For many institutions, saving energy also helps them attract new students and staff. In fact, more than 60 percent of students said a college's commitment to the environment would impact their decision to choose a school, according to a Princeton Review survey of more than 10,000 college applicants.

One higher education institution has used the ESPC model to transform its approach to sustainability and make a lasting impact on its community.

Energy-efficiency overhaul at Henderson State University

For Henderson State University, a four-year public liberal

arts university located in Arkadelphia, Arkansas, USA, going green has meant getting green — a lot of it. In total, its comprehensive two-phase energy-efficiency program will reap more than US\$9 million in energy savings over 20 years. That's enough to pay for crucial upgrades in their entirety and put money back into the school's operating budget at no cost to taxpayers or students.

Like many higher education institutions, Henderson State University faced the challenge of updating aging facilities with limited budget dollars. As a result, deferred maintenance became the status quo, and old equipment simply could not deliver the comfortable and efficient learning environment that students require to be successful. The university turned to the ESPC financing model to tackle major infrastructure upgrades and continue its mission of being good stewards of its resources by optimizing efficiencies across its campus.

University leaders implemented phase one of the project in 2013, which included central steam plant boiler upgrades and fan coil unit replacements. Phase two of the project will extend efficiency upgrades to include the installation of lighting retrofits and occupancy controls, an intelligent building automation system, utility sub-metering and a central chilled water plant, as well as electrical distribution system upgrades, building envelope infiltration reduction and water conservation upgrades.

The savings speak for themselves.

The improvements made across Henderson State University's buildings will reduce energy consumption by 30 percent, saving the school nearly US\$520,000 in annual energy costs over 20 years. In addition, the project will allow the university to reduce its deferred maintenance backlog by 25 percent and its critical infrastructure needs by 30 percent by 2020.

The project will also create significant environmental and economic benefits for the local community with energy savings equivalent to removing 2,767 tons of carbon dioxide from the atmosphere, powering 252 homes or planting 2,268 acres of new trees. The total economic impact of the project exceeds US\$10 million, including the creation of 117

new jobs, US\$16.6 million in additional business revenue and nearly US\$650,000 in state and local tax revenue.

Thinking outside the box: Sustainability role models

Henderson State University's aggressive program serves as a model of how to pair proactive facility management with community development.

ESPCs are changing the way higher education institutions are tackling the challenges of maintaining aging infrastructure, improving their efficiency and sustainability performance and ensuring safe, comfortable environments for students and employees. **FMJ**

REFERENCES

1. www.nas.org/articles/sustainability_faqs
2. www.navigantresearch.com/newsroom/energy-service-company-market-will-reach-nearly-8-3-billion-in-annual-revenue-by-2020
3. www.schneider-electric.us/documents/news/corporate/Higher_Ed_Survey_Press_Release_FINAL.pdf



Bobby G. Jones is vice president of finance and administration for Henderson State University. In July 1989, Jones became controller for Henderson State University, and was appointed to his current position in January 1999. In April 2011 he served as interim president of Henderson State University.

Jones holds BSBA and MBA degrees from Henderson State University and is a Certified Public Accountant. He is a member of the American Institute of Certified Public Accountants and the Arkansas Society of Certified Public Accountants and serves as a board member of the Arkadelphia Baptist Medical Center.



Tammy Fulop is a vice president of energy and sustainability services for Schneider Electric and has been with the company for 15 years. She is responsible for leading the energy solutions organization focusing on performance contracting and federal sales teams. Her teams specialize in

comprehensive solutions that address clients' overall financial, infrastructure, sustainability and energy goals in the education and health care as well as federal, state and local government sectors.



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DEVELOPING TRENDS IN SUSTAINABLE PACKAGING

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ARTICLE
Top Five Packaging
Trends for 2015

BY BRYON CRUMP

Shelf appeal has been regularly defined as the ability of a product and its packaging to entice the customer. Typically, this

has often referred to

the packaging's ability to "wow" the customer with an exciting array of specific colors or an eye-catching design.

Customers want to buy products that "jump off the shelf" and give them the feeling that they are making a smart purchase.



The retail business is just as competitive as ever and creating compelling packaging that will further entice the customer to buy a specific product is critical. However, as consumers have become savvier with more information about certain products and companies at their fingertips, packaging has gone beyond the colors, design and flash. Consumers are now demanding more sustainability in the packaging of the products they buy and in the companies of the products they buy from.

Meaningful brands

The sustainability culture continues to grow. As social media and the number of millennials in the workforce continue to increase, transparency and accountability is demanded by consumers. In a recent survey titled “Meaningful Brands” conducted by the global advertising agency Havas,¹ it is clear that a consumer will spend more money with a brand that “cares.”

In fact, “meaningful brands” that integrate sustainability outperform the stock market by 133 percent. Social and environmental values are merging with consumer attitudes and are now as important as traditional features including quality and performance.

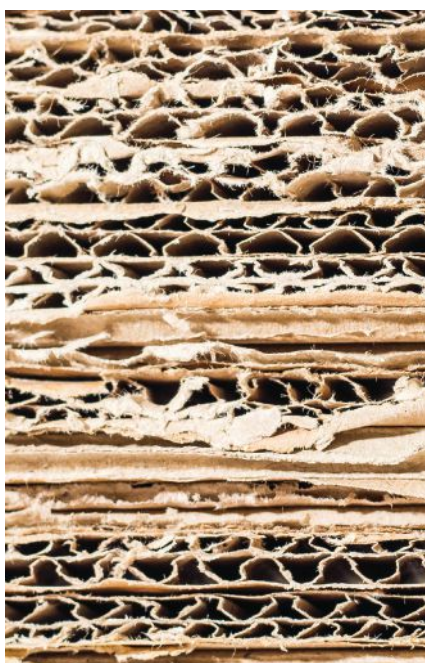
This shift in social responsibility is being fueled by a segment in society that has come to be known as the “aspirational.” Aspirational consumers define themselves by the brands they purchase and believe that they have a personal responsibility to purchase products that are good for the environment.

For these consumers, sustainability and corporate responsibility are at the very top of their priorities list when making educated buying decisions. They want to purchase with a purpose. They are materialistic, but they are committed to promoting and supporting companies and brands that practice transparent sustainability.

Henry Ford said, “A business that makes nothing but money is a poor business.”



APPLYING SUSTAINABLE PRACTICES INTO EVERYDAY WORKFLOW MATTERS.



It is remarkable how a quote from so long ago is still applicable today. The world is more socially conscious. As manufacturers, suppliers and distributors have learned, applying sustainable practices into everyday workflow matters.

Sustainable packaging

How much do consumers care about the environment when it comes to packaging? According to recent survey data compiled at Packaging Europe.com,² the majority of consumers think instantly of issues such as recycling and disposal when they think of sustainable packaging. Consumers also value packaging with the lowest possible material input or a small packaging size in relation to the contents as well as the recyclability of the packaging.

Packaging suppliers are now well aware of this growing trend, and consequently, the green packaging market is continuing to rise. Market Research Reports, Inc. recently announced it has added a “Green Packaging Market in the US 2015-2019” to its website.³ In the report, the green packaging market is expected to grow at a CAGR of 6.16 over the five-year period. According to the report, innovation in green packaging materials is a major contributor to market growth. The report identifies the main driver as demand for innovation in green packaging.

There are certain materials that are now banned from specific geographic areas due to their lack of sustainable qualities. For example, recently, New York City has increased its social awareness. As of July 1, 2015, single-use expandable polystyrene foam (EPS) products are not allowed to be possessed, sold or offered in New York City. It is estimated that Americans throw away 25 billion polystyrene coffee cups per year.

This is a very disturbing trend as EPS waste will often leak into marine environments and contaminate the water. Additionally, it is very difficult to recycle EPS. This is the biggest reason for

the recent ban. Sustainable packaging materials should be easy to recycle and turned into other sustainable materials.

In 2005, the Sustainable Packaging Coalition defined what makes packaging sustainable. According to the criteria, sustainable packaging is beneficial, safe and healthy for individuals and communities throughout its life cycle and it meets the market criteria for both performance and cost.

The packaging must be sourced, manufactured, transported and recycled using renewable or recycled source materials. It must optimize the use of renewable or recycled source materials. It must be manufactured using clean production technologies and best practices and made from materials healthy throughout the life cycle. It must be physically designed to optimize materials and energy and be effectively recovered and utilized in biological and/or industrial closed loop cycles.

What varieties of materials are considered sustainable?

Many plastic-producing companies are moving to what's known as post-consumer resin (PCR) as a sustainable solution. PCR plastic contains a blend of recycled plastic resins that would have otherwise been headed to a local landfill. Less petroleum is used to create PCR than a new resin, leaving a smaller carbon footprint.

Corrugated cardboard is another popular material that can be considered sustainable in the packaging world. It is a widely used packaging material that can be customized to ship and protect a long list of products. According to the Corrugated Packaging Alliance,⁴ the corrugated industry significantly reduced its greenhouse gas emissions by 32 percent between 2006 and 2010. Additionally, the effects of nutrient releases on receiving waters and soils decreased by 22 percent, and effects of

particulate matter emissions decreased by 14 percent.

One of the biggest issues that manufacturers are running into when trying to make their products' packaging more sustainable is that it generally sacrifices other critical elements, namely cost of materials. What companies are now learning, however, is that it is still possible to remain sustainable without raising the cost of materials. For both environmental and economic factors, more companies are beginning to use molded pulp in the packaging of their product.

Used for more than 100 years to make egg cartons, molded pulp can now be found across a broad range of industries. With sustainability's demand in packaging, suppliers are seeing benefits to this material in the packaging of a wide variety of different products. Unlike EPS, which is mostly petroleum based, molded pulp can be made from 100 percent recycled newspaper. The material

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THE GREEN PACKAGING MARKET IS CONTINUING TO RISE.

is cost-efficient, time- and space-saving and offers a solution to companies that are trying to meet the growing demand for sustainability in packaging.

Molded pulp is also one of the easiest materials to be recycled by the consumer. Nearly all curbside recycling programs will accept molded pulp alongside the recycled newspaper it's made from; this is once again a major difference between a sustainable material like molded pulp and a product like EPS.

The custom-designed nature that molded pulp possesses is also a strong selling point for the material. The material can be molded in a fairly short amount of time into a custom shape that fits the needs of any particular product. During transportation and warehousing operations, the custom-molded clamshells and trays are designed to easily nest when stacking, ultimately saving space.

With growing consumer demand, the influence of “aspirational” and an increased sense of corporate responsibility among businesses, there is more collaboration going on in the industry. Manufacturers of different kinds of sustainable materials are collaborating on projects that they had not done in the past.

For example, a particular product may need several different varieties of materials to complete the package. In order to fulfill the order, two materials manufacturers must work together to design a package that meets the required price point and satisfies the sustainable requirements the product may have. Molded pulp packaging manufacturers have teamed with corrugated cardboard packaging engineers in order to deliver optimal sustainable solutions.



The demand for sustainability is only going to grow more among both consumers and corporations. It used to be something that a company would try and do if it were cost effective, as benefits to the bottom line were not always apparent.

Today, it is clear that sustainability is not only a good idea, it is absolutely critical as a part of a company's reputation and social awareness. The fact that the packaging on a particular product is sustainable is just as important as its overall appearance. Consumers are willing to pay more for sustainability in packaging and perhaps more importantly, ignore those products whose packaging is not. **FMJ**

REFERENCES

1. www.theguardian.com/sustainable-business/2015/may/01/samsung-ikea-meaningful-brands-google-visa-microsoft-havas
2. www.packagingeurope.com/Packaging-Europe-News/62756/Sustainability-of-Packaging-Important-for-Customers-.html
3. www.digitaljournal.com/pr/2520478
4. www.corrugated.org/ViewPage.aspx?ContentID=70



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in 1995, the company's central U.S. location allows it to produce protective molded pulp packaging for electronics, computer, beverage, medical and telecommunication markets. Its award-winning in-house design team has been recognized for their packaging including an Institute of Packing Professionals AmeriStar Gold Award and a Technology and Innovation Award from the St. Louis Economic Council.



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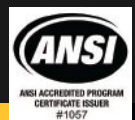
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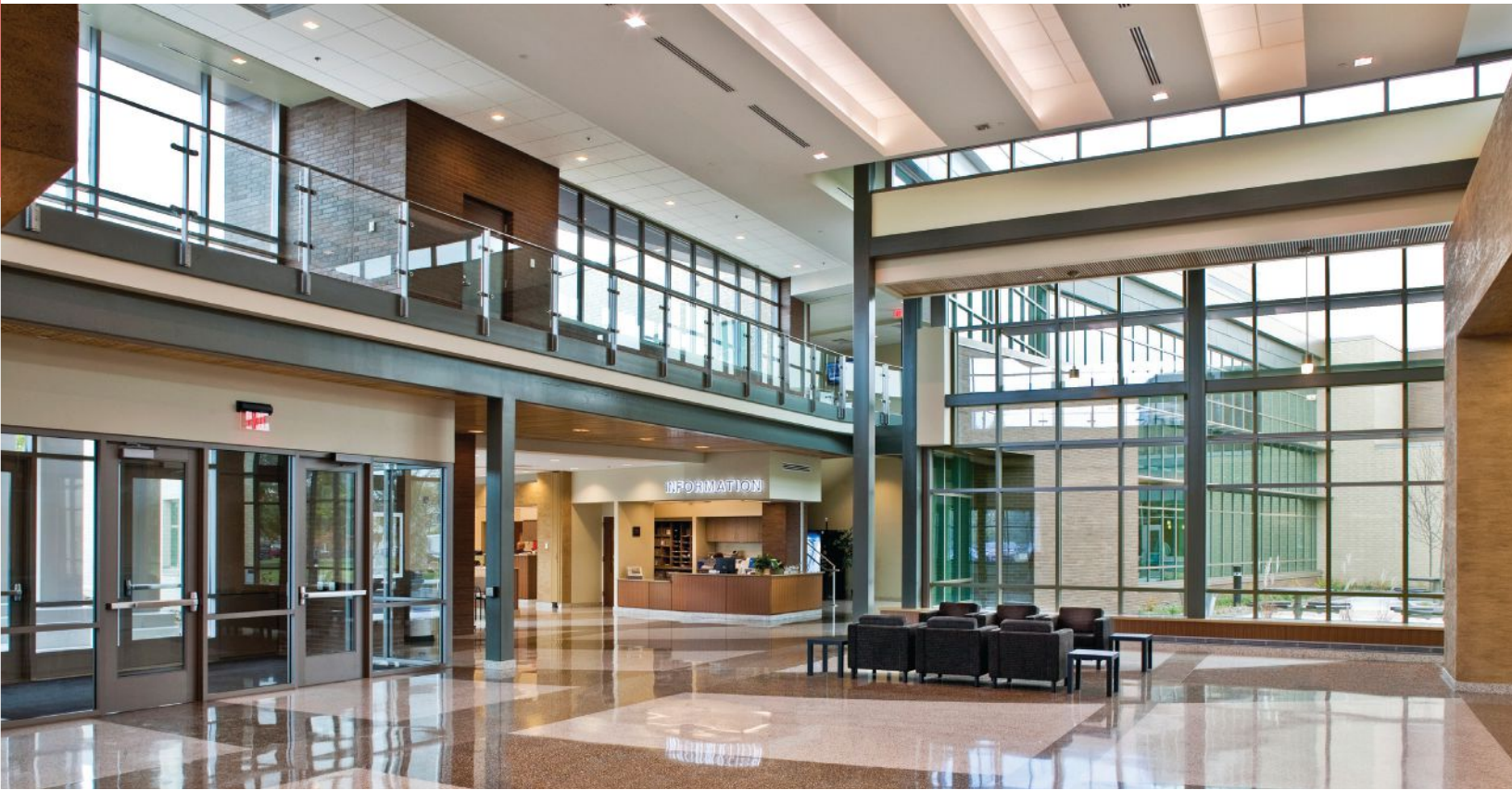
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CLIENT- CENTERED DESIGN: RICHFIELD MUNICIPAL CENTER

BY STEVEN ORFIELD

Some design projects are relatively straightforward with a great client, a great architect and a collaborative process. Others can be more nuanced and may require a more collaborative creative approach due to the interest of all parties in representing their respective areas of expertise and the need to determine a combination that best meets stated objectives.

In general, FMs want facilities that are conducive to a positive user experience and few building performance (BP) complaints, whereas designers tend to be more aesthetically oriented due to their expertise in the visual impact of architecture.

Collaborative projects usually turn out well due to similar client and design team philosophies, but it can be more difficult to negotiate projects in which user satisfaction and design are not given equal consideration.

Richfield Municipal Center

The Richfield Municipal Center is a good example of a building where the tension of competing philosophies resulted in a building synthesis that balanced science with aesthetics.

Starting with a good budget, ultimately an advanced 100,000-square-foot city hall was developed based on an overlay of traditional architecture with design research practices. The result was a high-performing building close to budget, due to the client's persistence in requiring that the project be building performance-based.

Background

Richfield is a southern suburb of Minneapolis, Minnesota, USA, located across the freeway from Minneapolis St. Paul International Airport. Mayor Debbie Goettel was interested in learning how building performance could be used to ensure that the new city hall project could be designed with a scientifically measurable approach. She wanted to preclude the complaints of building performance problems that are common in many civic and corporate projects.

At the time discussions began with the City of Richfield, the architect was not aware that the city was interested in building performance and research-based design process. However, the city council ultimately decided in favor of Orfield Laboratories (OL) as the building performance consultant, as they believed that consideration of thermal comfort, lighting, daylighting, acoustic performance and indoor air quality would complement the contributions of the architect.

Initial steps in schematic design

The architect initially developed a complex model of the building with 55 horizontally changing façade segments scaled to the surrounding residential neighborhood, as well as 11 different roof elevations. The building performance consultant expressed concern with the cost of the façade complexity and the possible loss of interior budget; however, the façade design remained very complex.

This is one of the difficulties of discussions between architects and clients: balancing a design approach with the allocated budget. Architects are trained to design visual façade articulation and scaling, and the level of complexity of some architectural designs, while potentially visually appealing, has the potential to inflate costs and potentially strain project budgets.

Clients, on the other hand, are called on to make façade decisions without being able to predict what portion of the budget they may ultimately represent. This can result in cost increases mid-project that detract from the budget allocated for interior design and performance standards, as was the case on this project.

The building performance consultant expressed the view that complex exterior shapes often result in complex interior shapes and place strong limits on flexibility. Thus, if the city hall were designed with a custom section for the police, one for the public, one for meetings and one for open and private offices, there would be little flexibility if one major department were to shrink or another to expand.

Instead, the consultant proposed that the façade and shell be designed with continuous space divided internally. This makes it relatively easy to implement changes, as the design materials, ceiling heights and scaling of spaces are similar.

Building performance standards and design

The City of Richfield adopted OL's Certified Building Performance Standards (CBPS) as part of the requirements for the design team. The standards provided exact building performance numerical targets and recommended practices for each area. The CBPS included acoustics, AV, lighting, daylighting, thermal comfort and indoor air quality.

In addition, research-based design consulting services included design, modeling, measurement and other efforts related to occupancy quality.

As the design proceeded into details, there were many points of discussion about performance and budgeting. Each of the disciplines had its own questions which required thoughtful discussion that incorporated consideration of building performance standards and architecture.

Daylighting

Daylighting design started with the goal of having no occupant at a significant distance from major windows. However, building design as originally proposed by the architect was too deep to meet daylighting performance standards, as it only provided half the occupants with the required amount of daylighting.

The consultant clarified that these standards were minimums that had to be met for all employees in the space. This was addressed by redesigning the depth between daylighting and seated occupants while largely retaining the general shape of the facade.

The initial daylighting scheme positioned large daylighting elements in public areas that would have a more limited impact on the occupants, and this was reassessed. Clear glass was mandated, and exterior daylight shielding and interior light shelves helped to control the residual glare. Subsequently, a building energy envelope study was presented by the architect, which indicated that shielding daylighting would require more energy in winter.



The consultant clarified that building envelope energy studies do not take into account building performance quality. For example, if a building were designed underground with no windows, an energy envelope study would show great savings and efficiency. This, however, is one of the fundamental flaws of energy-focused approaches. Energy and quality are rarely examined together coherently, as there are no energy envelope modeling programs that have this capability.

The consultant determined that exterior daylight shielding would not create additional costs, since the window shades that would be necessary without shielding would preclude any savings in energy. With these concerns addressed, the implementation proceeded with inclusion of daylight shielding, yet at the end of the project, a section of exterior shielding was taken out as the project was over budget.

Lighting

After a general scheme for an efficient lighting system was developed, the engineers selected a series of major luminaires based on confirmation from the lighting sales representatives that the fixtures would meet the CBPS standards. However, testing determined that the purchased fixtures did not meet the standards for lighting due to excessive glare. After this, the design, client and consultant teams worked with the lighting vendor to test and approve a new set of luminaires.

Acoustics

The BP acoustical requirements focused on a quiet HVAC system, low reverberation times in all occupied spaces,

speech privacy in offices and essentially no noisy spaces. This necessitated the use of a sound masking system.

The masking system originally submitted by the architect did not meet the performance specifications. The BP consultant designed a system with more speakers and better evenness, although due to budgetary pressures, part of the masking system was ultimately removed.

Thermal comfort and indoor air quality

The CBPS standards define thermal comfort according to models created by Kansas State University in the 1980s and incorporated in the ISO standards across Europe shortly thereafter. These standards take into account temperature, air velocity, humidity, radiant symmetry, etc.

In the case of the Richfield Municipal Center, humidification was needed in order to comply with these standards. A humidification system was designed but put on hold due to budget overruns on the project overall and is anticipated to be added post-occupancy when budget allows.

The CBPS standards call for a level of fresh air infiltration into all occupied spaces and this was accomplished on this project. Additionally, a set of air quality analysis standards was incorporated. A set of survey measurements was taken using CO and CO₂ as indicators of air quality, and these measurements were in compliance.

Performance commissioning

Performance commissioning was scheduled before



occupancy, and this commissioning evaluated all the areas of perceptual comfort. The initial results of testing demonstrated a building that met many standards without any further action. Some areas, such as office privacy, HVAC commissioning and adjustment of sound masking for optimal speech privacy were in need of further adjustment, and adjustments were ordered and completed.

This new approach has provided the City of Richfield with a very advanced building that supports the worker via dramatically higher occupancy quality standards, with the view that the workers are the greatest assets of the organization. Greater quality will be achieved when items removed from the budget are later installed. This project demonstrates that great user experience is strongly supported by advanced design research and an exceptional client.

Conclusions

The Richfield Municipal Center was a complex project. Without the building performance process, it could have been a building with suboptimal performance. Due to the focus and the diligence of the Richfield City Council and the cooperation of the architect, most potential issues were moderated or averted, making a dramatically better building overall.

This project underscores the importance of discussing and implementing building performance standards from the beginning of a design project in order to protect the integrity and comfort of occupants and visitors. **FMJ**

REFERENCES

1. Archi-Tech & Buildings. "Creation of the Architectural Research Consortium." May 2009.
2. ASID white paper. "Better Daylighting and Lighting Solutions." Orfield, Steven J.; Brand, Ph.D., Jay; Hakkarainen, Ph.D., Pekka. January 2005.

3. ASID white paper. "Better Sound Solutions." Orfield, Steven J.; Brand, Ph.D., Jay. April 2004.
4. Call Center Magazine. "Is it too cold in here? Don't rely on anecdotal tales to find out if your reps are happy where they work; instead use design research." Orfield Labs. September 2003.
5. Contract Magazine. "Critique: Occupancy Quality, Putting Forth a New Agenda for Sustainable Design." Orfield, Steven J. June 2004.
6. Cubed: The Secret History of the Workplace. Saval, Mikil. Doubleday. 2014.
7. Environment and Human Health, Inc. "LEED Certification: Where Energy Efficiency Collides with Human Health." Wargo, Ph.D., John. May 25, 2010.
8. Herman Miller white paper. "It's a Matter of Balance: Acoustics in the Open Plan." 2006.
9. IFMA's FMJ magazine. "Human Sustainability and Research-based Design in Higher Education." Orfield, Steven J. November/December 2014 issue.
10. IFMA's FMJ magazine. "Olmsted County Real Estate Assessment." Orfield, Steven J. September/October 2014 issue.
11. IFMA's FMJ magazine. "The Open Plan Office." Orfield, Steven J. September/October 2000 issue.
12. InformeDesign. Implications. "Design Success: Occupancy Research and Building Performance." Orfield, Steven J. September 2002.
13. Journal of Applied Psychology. "Stress and Open Office Noise." Evans, G.W.; Johnson, D.
14. NRCC Canada: Institute for Research in Construction. "Do LEED-certified Buildings Save Energy? Yes, But..." Newsham, G.R.; Mancini, S.; Birt, B. August 2009.
15. Office Insight. "Office Design Intervention: When the Owner Gets Involved." Jan. 16, 2006.
16. Olmsted County News. "Olmsted County's 2117 Building Wins CUDE Award." April 6, 2011.
17. St. Paul Business Journal. Tennant Comfort.
18. The Atlantic, "Our Cubicles, Ourselves: How the Modern Office Shapes American Life." Rosen, Rebecca J. April 2014.
19. The New Yorker. "The Open Office Trap." Konnikova, Maria. Jan. 7, 2014.
20. Today's Facility Manager. "Occupancy Research and Building Performance – Before and after studies related to new construction and renovation projects empower facility managers." Orfield, Steven J. Oct. 21, 2009.



Steven J. Orfield, the founder of Orfield Laboratories Inc. in Minneapolis, Minnesota, USA, has been involved in the architectural and product consulting field for four decades. From his start in acoustical and lighting research and design in the open plan office areas, he advanced into product

research and has developed extensive testing and evaluation methodologies for architecture and product research. He has taken a human factors approach to architectural technologies, with user experience as the principal criterion.

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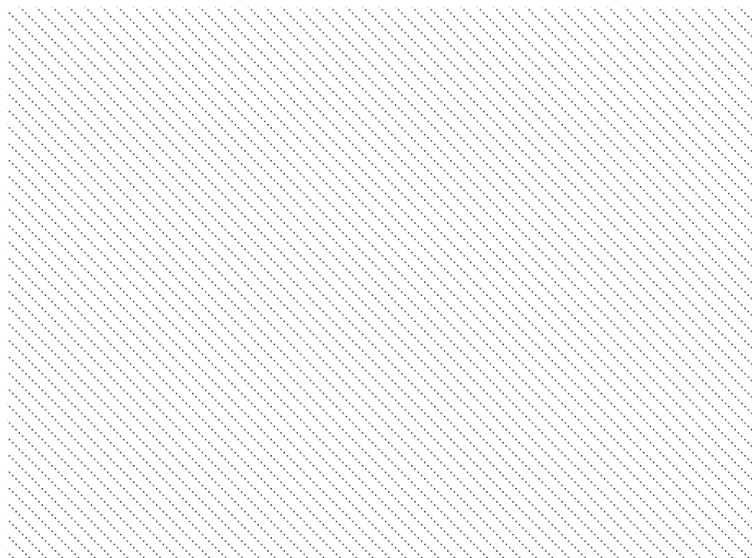
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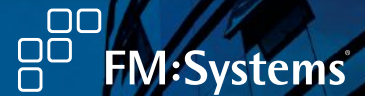
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F O U N D E R , P R E S I D E N T , F R I E N D :

Celebrating the Life of
George Graves



BY ERIN SEVITZ

When someone makes as profound a mark on as many lives as George Graves did, it can be said that they never truly leave us. As one of its original founders, Graves was an integral part of the birth of IFMA, but beyond his role as an FM trailblazer, he was also a husband, father, parishioner, fisherman, dancer and lifelong friend.



FMJ EXTRA



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PODCAST
2010 Interview with
George Graves

Early years

George Wade Graves was born Sept. 13, 1924, in Alfalfa, Louisiana, USA. He served the United States Army in World War II as a canine handler and ground scout. After his service, he earned a bachelor's degree in accounting and went to work for Texas Eastern Transmission Corp., a gas company in Shreveport, Louisiana.

However, he soon found that his passion lay outside of accounting and transitioned into the office services department with the help of a mentor. As the company grew, so did Graves, who managed the relocation of its corporate headquarters to Houston, Texas, in 1978. There, he established the company's first word processing department, began the automation of the internal company mail distribution process and established a reputation as a space planning maverick.

Graves was a continual innovator. He championed the flexible and efficient use of furniture systems as a move away from

the traditional office layout and played a role in advising furniture industry giant Herman Miller during its development of modular seating options. In addition, he was responsible for promoting Texas Eastern's first female manager.

Founding father

In May 1980, Graves hosted a meeting in Houston to establish a formal organizational base for a facility management association. By the end of the meeting, the National Facility Management Association (NFMA) had a constitution, bylaws, temporary offices and plans to expand nationally.

At the first NFMA meeting in October 1980, there were 47 participants — 25 were direct members of the association. The attendees from Houston helped establish the first chapter and committed to host the second annual national conference. Shortly after the 1981 conference, the name was changed to the International Facility Management Association to accommodate a growing Canadian membership.



In 1983, IFMA held its first annual Awards of Excellence and awarded Graves the Lifetime Achievement Award. He was in the first class of prestigious IFMA Fellows (the highest honor bestowed upon association members) in 1992. In cooperation with the Houston Chapter, the IFMA Foundation created an endowed scholarship in Graves' name in honor of his support of the FM profession.

Even after he moved on from IFMA, Graves still attended IFMA's annual World Workplace Conference and Expo and kept close ties with IFMA staff and members. He and his wife Joan received a Chairman's Citation from Francis J. Kuhn, CFM, CFMJ, in 2010 for their 30-year dedication to the association and for "excelling as IFMA spokespersons to magnify the human aspect of facility management." Graves continued to frequently visit IFMA headquarters for years, bringing with him a box of chocolates for the office and making sure he knew each staff member by name.



A lasting legacy

"We all strive to leave this world better off than we found it, and George Graves achieved this more fully than most," said IFMA President and CEO Tony Keane. "George's legacy is everywhere around us, and while we will miss his influential presence, we will always be inspired by the lasting impression he left on those whose lives he enriched. The IFMA family has lost a founding father, and while no one can replace him, we can celebrate his life and accomplishments by continuing to advance the industry to which he was so devoted." **FMJ**





GEORGE GRAVES

1924 - 2015

Graves died Aug. 28, 2015 and is survived by his wife Joan Graves (below at left), his daughters Carolyn Graves and Jane Ellen Graves Voisard, and his son Michael Wade Graves. In lieu of flowers, the Graves family has requested that donations be made to the George Graves Endowed Scholarship Fund. Online contributions can be made on the IFMA Foundation website.





CONGRATULATIONS TO IFMA'S SEPTEMBER AND OCTOBER MEMBERS OF THE MONTH

As members of the world's premier association with a network of more than 24,000 facility management professionals, IFMA recognizes how hard you work in your careers and in advancing the FM profession. It is through members such as you that the association has had a positive influence and made a difference in increasing the awareness of facility management.

In 2015 IFMA committed to further recognizing your accomplishments within the industry by developing a Member of the Month program. Members selected for this honor will gain additional recognition from their peers and IFMA.

Please join us in congratulating **Doug Snell** (September 2015) and **Collins Osayamwen** (October 2015). Refer to the Member of the Month podcast and video linked in the online version of this issue of FMJ to hear directly from them.

IFMA NEEDS YOUR HELP!

Nominate a member who has made a difference in the FM industry at www.ifma.org/membership/member-of-the-month or contact Senior Manager of Membership Lauren Krueger at lauren.krueger@ifma.org for information on the nominating process.

FMJ EXTRA



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PODCAST
Getting to Know
IFMA's September 2015
Member of the Month



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VIDEO
Getting to Know
IFMA's October 2015
Member of the Month

DOUG SNELL, CFM

Snell is the owner of a residential apartment business and manages all facets of real estate. He recently received the Meritorious Service Award from Ephrata Masonic Lodge #665 in Ephrata, Pennsylvania, USA, for achieving the Certified Facility Manager® designation and taking on an emergency repair and maintenance project. He has been integral in developing a facility strategic plan and developing a facilities operation manual as a volunteer trustee for the organization.

At IFMA, Snell has been involved in various volunteer capacities. Within his 26 years with the association he has served as president of the Central Pennsylvania Chapter of IFMA, leading the group's strategic planning. In addition, he was awarded a Chairman's Citation for his work on engaging the association's membership.

Snell has great passion for putting things together, whether that is through partnerships, relationships, gaining knowledge or simply spreading the word on the

professionalism of IFMA's credentials.

He has given many hours toward mentoring and helping raise awareness of the profession among students. Snell believes FM is a good path for the next generation and is making inroads with universities, trade schools and community colleges in the Pennsylvania area. He participates in seminars showing how IFMA provides a career path and is a living example of how to live that path. Through these efforts he and his group continually network with people to support the emergence of FM courses and degrees in colleges and universities.

Snell has an FM plan that he has been working off of for the past 26 years. He is open to sharing it with those who are interested to help spread the word.



COLLINS OSAYAMWEN, CFM, FMP

Osayamwen is a certified facility management consultant with more than 20 years of international experience developing FM optimization strategy, policy design and implementation of solutions that help clients improve and optimize their FM/real estate and other non-core business processes. He is the managing partner of SheltercareFM Consult.

Osayamwen has been involved with IFMA since 2005. He was directly responsible for the formation of the Abuja Chapter of IFMA in Nigeria and the Greater Accra Chapter of IFMA in Ghana. Over the years, he has served as the president of the Abuja chapter, chaired the structure and strategy committee, served as a member of various committees – including the 2009 IFMA World Workplace conference program committee – and volunteered for the IFMA Facility Management Consultants Council (FMCC) as the global liaison for Africa.

At IFMA, Osayamwen is an IFMA Foundation ambassador, a regular presenter of topical FM-related issues at conferences,

seminars and workshops around the world, and works with master's degree students to conduct FM research. He earned his CFM® in 2008 and FMP® in 2012, and in 2011-2012 was named IFMA's Distinguished Member of the Year. In addition, as a member of the IFMA Board of Directors (2013-2015) he worked closely with other stakeholders in Nigeria to institutionalize the FM industry in the country.

Osayamwen is actively involved in organizing and hosting seminars and workshops aimed at promoting knowledge, best practices and development of the facility management industry in Nigeria and the African continent. He helped the Abuja chapter organize an FMP program which has resulted in more than 200 people earning the FMP designation since 2010.



ASK THE EXPERTS

BY IFMA'S FACILITY MANAGEMENT CONSULTANTS COUNCIL



In each issue of FMJ, IFMA's Facility Management Consultants Council shares some commonly asked FM-related questions accompanied by advice from top FM consultants. The questions and answers presented in this section align with IFMA's core competencies following the themes outlined for the given edition of the magazine.

While the following answers are intended to be helpful, these responses should not be deemed complete and are limited in context by the space allocated. Please contact the individual consultants directly for further explanation of the opinions expressed.

The theme of this edition of FMJ is **"Reduce, Reuse, Recycle, Renew."**

The Facility Management Consultants Council (FMCC) represents more than 300 FM consultants from various countries around the globe. Its mission states, "The FMCC is the resource and voice for facility management consultants worldwide to leverage our collective expertise to benefit IFMA members, and the facility management profession."

Questions regarding the Ask the Experts section of FMJ can be directed to Mark Sekula, IFMA Fellow, CFM, FMP, LEED AP, president of Facility Futures, Inc., at msekula1@wi.rr.com.

Visit FMCC online at fmcc.ifma.org or join the conversation on the council's LinkedIn group at <http://linkd.in/1qAa8ae>.

QUESTION

What are the three most important things you would advise FMs to focus on when developing a sustainability program?

ANSWER: Opportunities in sustainability vary from industry to industry, and within industries. For example, food and grocery providers, heavy manufacturers, owners who lease office space, and public or private institutions present different contexts. I'll offer a general, configurable approach.

Focus on making an ROI case at the executive level.

The character and composition of the C-suite will influence the content and delivery of your presentation and promotion. Your acquaintanceship with as many of them as possible is important in this. If the organization has already adopted the triple bottom line (financial, social and environmental aspects) in its view of sustainability, the organizational vision, mission and policies will reflect this. Check it out with the company leadership.

Analyze and summarize direct costs and revenues for a particular, clearly defined program in a specified planning period, including key performance indications to report, and when. Distinguish start-up and steady-state costs. If top management is likely to be receptive, include indirect benefits that, all things considered, can accrue to the organization (if you do, you probably should say or be prepared to show how you will measure them simply and plainly). If the organization has a balanced scorecard, be guided by its content and work with its manager.

Market and manage. This program is young. It warrants attention and nurture. Staff, tenants and other stakeholders, even if not directly participating in the program, will appreciate hearing and seeing its impact. Before long, they will come forward with concepts and ideas.

ANSWERED BY:

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David Reynolds is with FM-CONSULT-CREATE and is located in Mississippi, USA. He joined FMCC in 2014, is a recent CFM and has held an FMP since 2004. His background is in systems, project management and consulting in small companies serving a variety of clients and industries. He holds degrees in science, engineering and allied health areas.

He focuses on FM as organizations adopt asset and risk management principles and practices, where clear, visible, interactive, maintainable, processes and models, data and measurements can better frame FM in alignment with organization strategies and objectives.

Reynolds' pro bono work includes construction, maintenance, safety and health. He is also a member of the IFMA Environmental Health and Safety Council.

ANSWER:

- Ongoing activities that engage facility occupants.
- Benchmarking against similar facilities on utility and carbon reduction tactics and strategies.
- Implementing a measurement system that can be supported over the long term.

ANSWERED BY:

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Ted Ritter is the immediate past president of IFMA's Information Technology Council, past president of the Greater Phoenix Chapter and current secretary of the FMCC. He has more than 30 years of experience in facility operations and project management. He has presented more than 100 presentations at conferences and has supported multiple publications. His expertise is well-regarded in the community with more than 50 completed facility-related technology and sustainability initiatives.

ANSWER:

- Get corporate buy-in.
- Avoid greenwashing.
- Continually communicate the benefits of sustainability.

ANSWERED BY:



Bill Conley

IFMA Fellow, CFM, FMP, SFP, LEED AP

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Bill Conley, IFMA Fellow, CFM, SFP, FMP, LEED AP, is facility manager at Yamaha Motor Corp. in Cypress, California, USA. Prior to that, he served as owner and chief sustainability officer of CFM2, a facility management and sustainability consulting company. Conley has more than 40 years of experience in the facility management profession and has been a proponent of sustainable operations for more than 20 years.

Conley has served on the IFMA board of directors, is a recipient of IFMA's distinguished member of the year award and has received the association's distinguished author award three times. He has been a regular contributor to FMJ for 20 years and has authored more than 50 articles for the magazine.

ANSWER:

Inclusion of staff/stakeholders. Make sure you have representatives from HR, corporate communication and perhaps even legal or IT resources at the table. However, it is also important to have the passionate at the table. Every company has a group of folks who live and breathe sustainability. Giving a few of them seats at the table helps spur creative solutions and develop internal champions who can help to shift behaviors and habits within the entire company.

Collect internal data. External sustainability-focused benchmarking data is great, but very hard to find. Create your own internal benchmarking data by pulling utility consumption data from at least two to three years prior. Your own data will help you understand where you have been and then drive the decisions as to where you want to go. Comparing yourself to other organizations is nice to be able to do, but you have to know yourself first. Also, while utility cost data is interesting, with variable prices it is hard to really use it as a comparative analysis measure.

Stick with utilization of energy, water and gas for starters — that will keep you plenty busy. You can also get great data from your waste management company on tons of trash that go to either recycling, waste, landfill or even composting, which again can help you set future strategic sustainability goals.

Partnering. Your custodial, waste management and landscaping companies may have some of the best ideas for changing practices and procedures around sustainability. Tap your vendors' knowledge and even their other clients to help you find best practices that can be implemented in your organization. They can also be great partners to help you educate your stakeholders on how to better support sustainability habits. For example, did you know that plastic bottles should be recycled without the cap on? Bottles with closed lids are harder to compact.

ANSWERED BY:

Alana F. Dunoff, IFMA Fellow, FMP
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Alana F. Dunoff, IFMA Fellow, FMP, has more than 23 years' experience as a strategic facility planner and more than 12 years as an educator. She is president of AFD Facility Planning, a consulting firm offering a full array of strategic facility planning services and dedicated to helping FMs achieve their goals with smart, actionable information.

Dunoff is an adjunct professor teaching at Temple University in the facility management Bachelor of Science program and an IFMA Qualified Instructor for the FMP credential.

ANSWER: What is the employee/stakeholder attitude toward sustainability? Are they all convicted believers in sustainability? Are they willing to separate waste streams (office paper, newsprint, cardboard, plastic, glass and organic and inorganic waste) or must the waste streams be limited to recycling or trash? Are they "green washed" sustainers, meaning they are for sustainability as long as it doesn't change their daily work routine?

What are the tangible benefits accruing to the company? Is there an ROI for the sustainability initiatives and is it sufficient to encourage a sustained sustainability program?

What are the things that contribute to sustainability but really are cost savings (or some other corporate driver)? Are you counting all company initiatives that contribute to sustainability and vice versa?

ANSWERED BY:

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After more than 30 years leading higher education facility planning, design, construction, operations and maintenance for six different universities, Ted Weidner, Ph.D., PE, AIA, CEFP, GGP, is an associate professor at Purdue University. He teaches in the construction engineering and management division, including courses in facility engineering and management, as well as infrastructure analytics. He is also participating an expert for the ANSI/ISO 18480 facility management standards. Weidner can be reached at tjweidne@purdue.edu.

ANSWER:

- Do you know your current carbon footprint?
- What is the level of stakeholder support?
- How are you currently measuring usage and what are the reduction goals?

ANSWERED BY:

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As managing director of the CBRE FM and Technical Solutions Group, Kenneth W. Staats is responsible for the FM services team related to account and business development support of corporate clients. He also manages the CBRE Technical Services Group and Corporate Fleet Program while supporting new business transitions, account transformation and refresh projects.

His focus is on providing solutions for facility management organizational structure, workflow process management tools, engineering maintenance programs and account refresh support.

BUILDING WELLNESS:

A FACILITY MANAGEMENT PERSPECTIVE



*This article is part
of a regular series
in FMJ Extended
contributed
by IFMA's
Environmental
Stewardship and
Sustainability
Strategic Advisory
Group.*

**BY
JOSHUA
KATZ
AND
ANDREW
GARNAR-
WORTZEL**

Wellness is a hot topic and one that covers a lot of ground. With its own set of buzzwords and acronyms, it can be complex terrain to traverse. Facility managers can be champions of wellness by utilizing recognized criteria to guide discussions around wellness, and then evaluating the success of their facilities in providing healthy environments.

Similar to how the U.S. Green Building Council has systemized the basis for achieving LEED certification, the International WELL Building Institute¹ has created a set of criteria to plan for and evaluate wellness. It is too early to say whether it will become as widely adopted as LEED, but its checklist of design and operational criteria for air, water, nourishment, light, fitness, comfort and mind provides a useful, comprehensive framework for any discussion around wellness.

Joshua Katz and Andrew Garnar-Wortzel, principals and workplace strategy and design experts at global design firm Gensler, recently sat down to share their views and insights on wellness. Their perspectives from the front lines can help facility managers implement both large- and small-scale wellness programs.



WHAT DO WE REALLY MEAN WHEN WE TALK ABOUT WELLNESS IN THE WORK ENVIRONMENT?

GARNAR-WORTZEL: Wellness is a composite term that encompasses the physical, mental and emotional well-being of employees — all of the things that contribute to employee health, and ability to perform in the workplace. Wellness can be about air quality, the quality of the water and food employers provide, health services that are provided on site, prayer rooms or even policies to reduce stress or email usage after hours.

KATZ: This is an evolution of the environmental and sustainability movement, which led to a lot of discussion around LEED, being a good citizen of the world and doing the right thing from an environmental perspective. Most of that had to do with the actual design and construction of a building and its interiors. Today's focus on wellness is the natural evolution of that — to think beyond the building to the people who occupy the building and how they operate in it.²



WITH SO MANY DIFFERENT VARIABLES AT PLAY, HOW CAN THE SUCCESS OF THESE WELLNESS EFFORTS BE MEASURED?

GARNAR-WORTZEL:

Often there is a very clear return on investment in terms of employer health care costs.³ This can be realized immediately in the form of lower-cost insurance premiums or over time through lower costs associated with fewer claims, reduced absenteeism and increased productivity.

KATZ: Recruitment and retention are huge metrics for success and motivators for implementing wellness programs in industries where there is a serious battle for talent, especially those seeking talent from a younger generation already concerned with wellness.

Much of the discussion on wellness in the workplace is being driven by the millennial generation, who, according to the U.S. Bureau of Labor, will make up roughly 50 percent of the U.S. workforce by 2020.

Where the previous generation of workers began the conversation on work/life balance, younger workers are striving for work/life integration. These workers tend to have a focus on living healthful lives, controlling the choices they make in their lives and expecting that their workplaces will, to some degree, mimic the environments they live in outside of the office. Having a work environment that provides individual control, choice and variety in its architectural and environmental settings is a fundamental component in the creation of a healthy workplace, and will remain a significant driver in the design and programming of the workplace for some time to come.

HOW DO COMPANIES ENCOURAGE COMPLIANCE AND PARTICIPATION FROM ALL LEVELS, INCLUDING SENIOR MANAGEMENT?

KATZ: You definitely need senior leadership buy-in or employees won't use these things. Going back 20 years to the beginning of the "dot com" era, you would see a lot of offices with a lounge or ping pong table that often went unused because they didn't actually fit the culture of the company.

The notion of wellness has to be looked at much more holistically, so it's not about one single activity or space but all of the things the space can accommodate in terms of a healthy physical and psychological environment.

GARNAR-WORTZEL: It's also critical to communicate that the intention of these measures is sincere and not just items to check off a list, or empty bait-and-switch promises to lure talent. The critical issues may also vary by where you are in the world.

For example, we have a client in Shanghai, where the outdoor air quality is often very poor. The employees care deeply about this problem and are sometimes distrustful that authorities are actually providing appropriate indoor air filtration. When they moved to a new site they took employees on a tour of the air handling system to see the filters and monitoring controls. Even with this, the staff is highly concerned and there are a lot of highly visible responses like air purifiers and pollutant-absorbing pouches scattered throughout the office to provide tangible signs of what is being done.

WHAT ARE THE IMPLICATIONS IN ALL OF THIS FOR FACILITY MANAGERS?

KATZ: I think that wellness and the focus on wellness is not a fad. It's here and is going to be an important driver of building design for some time. Many aspects of wellness design have an impact on the operation of a facility from a higher level of maintenance standard.

For example, this might be different filters on air conditioning units that will require a more intensive cleaning protocol or fresh fruit that needs to be monitored daily for spoilage. So there is an impact on the amount of time and staff that might be needed in a facility that employs a number of wellness attributes or that applies for WELL Building certification. Or, to a lesser extent, a wellness program could just involve something simple like having sit/stand desks.

GARNAR-WORTZEL: In addition to these maintenance-related things there are planning issues that are starting to have an impact. Just like LEED has a requirement for daylight, the quality of the environment in terms of how it makes people feel drives these priorities as well. You're seeing more emphasis on outdoor space;⁴ more emphasis on collaborative and social spaces. We're seeing things like internal walking paths and centralization of key amenities that encourage people to move throughout the building more than prior designs required.

There are facilities planning not just amenities but how all elements get zoned, what kinds of buildings make the most sense for their employees, and access to public transportation and walkability. So site selection and facility planning, various programmatic elements and programs. It's pretty comprehensive across site selection through site maintenance that has an impact.

KATZ: It's critical to coordinate the efforts of the people running the physical operation of the space with the HR and recruiting aspects of an organization. This whole notion of wellness has an impact of the operation of the facility, but the drivers of it are often coming from the HR side.

GARNAR-WORTZEL: Exactly. In many cases there may be some aspects of a wellness program that are paying for themselves. For example, adding in-house physical therapy to an existing fitness or medical facility saves time and money compared to having employees leave the office for services. Ready availability helps people stay on their prescribed program and get well faster, but also lowers the cost and reduces time away from work.

The person in the facilities world making decisions about where to spend money may not be thinking of that kind of return; he or she may be more focused on the cost of implementing these amenities.

WHAT KINDS OF PROGRAMMING COULD BE INTRODUCED BY A COMPANY LOOKING TO GET ITS FEET WET IN WELLNESS PROGRAMS?

GARNAR-WORTZEL: Many of the things you may choose to do for well-being purposes can be piloted at a lower cost than they can be implemented on a widespread basis.⁵ It's very common, for example, to introduce a handful of sit/stand desks or a few healthy options in the cafeteria and see what happens.

Taking care not to hide these things in places that are difficult for people to use is important. Find ways for those who ride their bicycles to not have to enter through the loading dock or trapeze in their sweaty

shorts past their coworkers to get to the shower. That sort of accommodation doesn't necessarily involve more space or more cost — just more thought.

BUT NOT EVERYONE IS GOING TO BIKE TO WORK. HOW DO YOU INTRODUCE WELLNESS IN A WAY THAT CATERS TO THOSE WHO ARE INTERESTED WITHOUT ALIENATING OR FORCING IT UPON THOSE WHO WOULD RATHER OPT OUT?

GARNAR-WORTZEL: Certainly some of the clients we work with are concerned about going to 100 percent healthy food in their cafeteria and then driving people to leave the building to get other food. The more typical response is to try to make it easier for people to get healthier options but not to mandate their adoption. Put the healthy food at eye level and the sugary snacks below, so if you really need those jelly beans you have to reach down to get them from the lower shelf.

KATZ: There has to be a balance so this doesn't feel like a one-size-fits-all mandate but instead nudges employees to make the healthy choice. For someone who manages and operates a space, choice is the last thing you might want because it means more variables for the facilities staff to manage. So there is a fine line between flexibility and choice that still allows the space to be maintained in a straightforward and not prohibitively expensive way.

GARNAR-WORTZEL: A typical fitness center might have 35 percent membership among the population of a company. But having wellness integrated throughout the work environment — offering 100 percent sit/stand desks, offering activity-based environments, increasing quality of food and water — will have an impact on 100 percent of the employees.

Of course fitness is important, but people need to understand that lots of little things have an impact on well-being. Many of them can be passively adopted. It's one thing to ask people to go to work out, but it's another thing to do something that encourages people to be healthier just by moving more throughout the course of their day.⁶

KATZ: One of the biggest frustrations articulated by users in the workplace is the inability to control their environment. This runs the gamut of things like adjustable desk height, control of the lighting, temperature and things like that. All of which play an important role in wellness: both people feeling that they have control, and actually having that control for themselves.

WHAT DO YOU SEE IN THE FUTURE FOR WELLNESS?

GARNAR-WORTZEL: There are a couple of organizations that have started to index the healthiest places to work. I can see in the future more focus on lists of this kind as health care costs go up and awareness of prevention through healthier lifestyles is growing.

KATZ: I believe that marketplace demand will drive new building design, existing building infrastructure retrofits and workplace design to accommodate attributes that contribute to healthfulness and well-being. Designers, HR practitioners and facility management leaders will need to be well informed and proactive to meet the needs of their clients and to lead the development of wellness initiatives. **FMJ**

REFERENCES

1. www.wellcertified.com/well
2. www.gensler.com/design-thinking/research/toward-a-wellness-based-workplace
3. <https://hbr.org/2010/12/whats-the-hard-return-on-employee-wellness-programs>
4. www.wsj.com/articles/workplace-designers-bring-the-outdoors-inside-1435796181
5. www.gensleron.com/work/2015/5/28/wellbeing-and-the-workplace.html
6. <http://blogs.wsj.com/atwork/2015/03/02/conference-room-seem-far-away-its-no-accident/>



Andrew Garnar-Wortzel is a principal and strategy director with 20 years at Gensler in New York concentrating on real estate and facilities strategy, workplace strategy, information solutions and change management. His most recent work includes design strategies that help clients achieve high-performance work environments on a portfolio scale, real estate portfolio optimization and the development of design strategies for mobile workplaces.



Joshua Katz is a New York-based licensed architect and a 21-year veteran at Gensler where he focuses on establishing design strategies for his wide-ranging client base, including consulting, technology and media firms, as well as higher education institutions. His experience spans from strategy through design and construction implementation. He has completed major projects for Deloitte, Comcast, NBCUniversal and NYU that each involved significant change to the organizations' previous models.



REDUCING BIOFILM IN COOLING TOWERS

BY CHRISTIE MCINNIS

Maintaining efficiently running cooling towers is essential for providing cooled water for air-conditioning, manufacturing and electric power generation. Any disruption in the system could affect the productivity and sustainability profile of the manufacturing plant or facility and could have a large financial impact.

Among the key concerns that could cause such a disruption is the presence of biofilm, which can have a crippling effect on cooling water systems.

Biofilm is made up of bacteria held together with polysaccharides, resulting in the formation of a film or slime layer on the substrate or surface in the water system. Biofilm can sometimes also form at the air-water interface and can be seen as floating mats in the sump of a cooling water system. Biofilm can potentially lead to equipment fouling, causing a reduction in heat transfer efficiency, microbiologically induced corrosion and possible flow restrictions.

Circulating water systems typically operate between 20 to 40 degrees Celsius, providing ideal breeding grounds for

bacteria. Bacteria like *Legionella* residing in the cooling water system biofilm can potentially be the source of outbreaks of Legionnaires' disease, so it is essential to keep biofilm in check to prevent any such outbreaks.

Treatment options

Facility operators have a variety of options to treat cooling towers to keep microbial growth at a minimum, including using a range of biocides, monitoring tools and bio-dispersants. Some water treatment professionals prefer oxidizing antimicrobials such as chlorine- and bromine-based biocides in either liquid or gaseous form; organic halogen donors; chlorine dioxide; and, to a limited extent, ozone.

These oxidizing biocide treatments are relatively inexpensive and very familiar to many people. Due to their familiarity, they are often perceived to be a safer form of water treatment than some other biocidal products.

Non-oxidizing biocides are another type of antimicrobial used by water treatment professionals. Unlike oxidizing biocides, which kill by a more indiscriminate oxidation of chemical species on the surface or within the cell,

non-oxidizing antimicrobials are targeted. Non-oxidizing biocides exert their effects on microorganisms by reacting with specific cell components or processes such as on the cell membrane or the cell's metabolism.

When it comes to controlling biofilm, in addition to being less corrosive than oxidizing biocides, non-oxidizing chemistries are less reactive, and therefore can penetrate biofilm better than oxidizing biocides. Also, given enough oxidizing biocide, many oxidizing biocides can "burn" off biofilm by killing the outer layer, which sloughs off to expose the layer of living cells beneath. These cells can then come in contact with the biocide, slough off and the process repeats.

If the entirety of the biofilm is not killed and sloughed off, the remaining living cells to grow into a new biofilm. Conversely, non-oxidizing biocides are able to penetrate the depth of the biofilm, reducing the number of remaining living cells. For these reasons, non-oxidizing biocides may be preferred to oxidizing biocides for the treatment of biofilm.

When looking for a more balanced and robust water treatment program, facility operators should consider using a combination of oxidizing and non-oxidizing biocides. Depending on the biocides chosen, a safer and more sustainable program may be developed. For example, reducing the amount of oxidizing biocide by periodically shocking a system with a non-oxidizing biocide can limit the amount of halogenated byproducts in the water for discharge, while reducing corrosion risk.

Additionally, oxidizing biocides are frequently used as maintenance biocides to reduce the total number of organisms in the system. Non-oxidizing biocides are best used periodically to bring the total microbial count down and to reduce biofilm that has built up in the system.

Solid biocides: A new treatment option

A new solid non-oxidizing biocide tablet technology is providing a convenient and sustainable option for small-to medium-sized closed-loop water systems. This tablet is easy to dose and treats biofilm, bacteria, algae and fungi. It has seen initial success in nursing home, hospital and school systems where complicated dosing equipment may be too large or rapid dissolution is necessary.

Solid biocides like the new tablet offer an improved safety profile to facility managers and those working to treat the system by reducing the risk of liquid spills, leaks and splashes. The water-soluble bag reduces the risk of dust from powder that can come into contact with skin. The fully dissolvable tablet and wrapper system leaves no residue or retrievable material. The tablet itself eliminates

the need for solvents, heavy metals for stabilization and pail or drum disposal as hazardous waste. The inherently biodegradable formulation contains no heavy metals or added formaldehyde.

While liquid antimicrobial products are typically 1.5 percent active, the tablet form offers a 7 percent active ingredient level. The higher level in the tablet enables lower volumes of material to be shipped for the same amount of water to be treated.

Addressing industry and consumer concerns

With the recent concerns over the threat of Legionella, the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recently published ASHRAE 188-2015, Legionellosis: Risk Management for Building Water Systems, providing guidelines on reducing the risk of legionellosis associated with building water systems.

The approved standard requires building owners to have and practice a program for cooling towers or evaporative condensers, whirlpool spas, ornamental fountains, misters, atomizers, air washers, humidifiers and other devices that release water droplets.

Non-oxidizing biocides have been found to be more effective than oxidizing biocides at controlling populations of Legionella bacteria in laboratory tests where the Legionella were grown inside amoebas. Legionella reproduce inside protozoa such as amoeba, where they gain some resistance to an oxidizing environment such as the inside of an amoeba or cooling system water dosed with maintenance doses of oxidizing bacteria.

Improving sustainability and operating efficiency

Biocide technologies can play a part in enabling a cooling water system to operate at optimum capacity, helping to reduce energy use and the need for added water. They are imperative to preventing biofilm, which can act as a natural surface for scale formation and microbiologically induced corrosion.

A customized treatment program using oxidizing and non-oxidizing biocides can inhibit microbes, algae, protozoa and fungi to help prevent the spread of bacteria such as Legionella. To determine if your biocide system is offering the most protection, contact a water treatment professional. **FMJ**



Christine McInnis is the global research and development water platform leader for Dow Microbial Control, a business unit of The Dow Chemical Company.

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DISASTER RECOVERY/EMERGENCY RESPONSE

Paul Davis National

Paul Davis National is a full-service general contractor specializing in emergency disaster mitigation and restoration services throughout North America. With more than 350 locations we can quickly get businesses back up and running after any fire, water, storm or environmental disaster. From the free First Priority preparedness program to reduce losses to complete contents restoration (including documents and electronics), structural drying and re-construction, we are a single-source solution.

www.pdnational.com | +1-888-663-7633

FM CONSULTANTS/SERVICES/PROVIDERS

AECOM

AECOM is a fully integrated engineering, construction and technical services organization with the capabilities to support every stage of the project life cycle.

www.aecom.com | +1-281-646-2400



ARAMARK Facility Services

Innovation is what Aramark brings to the everyday to deliver comprehensive facility management. United by a passion to serve, more than 270,000 employees make a meaningful difference each day for millions of people in 22 countries around the world. It's a quest for excellence that involves people with a strong sense of pride and passion in their work. This quest is simple in intent; complex in execution. It's all about continually finding the perfect balance of doing things incredibly well over and over again to deliver experiences that enrich and nourish people's lives.

www.aramarkfacilities.com | +1-800-901-7373

Sodexo Facilities Management

Sodexo increases our clients' competitiveness by delivering innovative workplace solutions that improve the building environment, employee engagement and enhance workplace and organizational effectiveness; ultimately delivering shareholder value.

www.sodexousa.com | +1-888-50DEX07

FM SERVICES

ABM

Building value with a leader in integrated facilities solutions

Do you seek — more than ever — to lower your facility's operating costs, increase efficiency and improve performance? ABM works with you to reduce expenses while keeping your property safe, clean, comfortable and energy efficient through stand-alone or integrated facility solutions.

www.abm.com | +1-800-874-0780

FM SOFTWARE

ARCHIBUS, Inc.

ARCHIBUS is the No. 1 global provider of real estate, infrastructure and facility management solutions and services. With more than 30 years of continual innovation, our industry-leading enterprise software delivers savings. Organizations of all sizes benefit from rapid deployment, improved business processes, lower life cycle costs, increased productivity and reduced TCO.

www.archibus.com | +1-617-227-2508

FM:Systems, Inc.

FM:Systems helps facilities and real estate professionals reduce costs and increase productivity. FM:Systems software improves management of space, occupancy, moves, maintenance, leases and property.

www.fmsystems.com | +1-800-648-8030

FURNITURE

The Senator Group

The Senator Group is a leading manufacturer of high-quality furniture for the corporate and hospitality markets, with showrooms across the globe including Ohio, Chicago and New York. The Senator Group works with Europe's leading design talent to produce contemporary furniture for its Allermuir and Senator brands — furniture that not only looks great, but is comfortable and ergonomic too.

www.thesenatorgroup.com | +1-419-887-5806

HVAC/INDOOR ENVIRONMENTAL QUALITY SOLUTIONS

ZOO Fans

ZOO Fans was founded in 2010 by its current president, Jeff Benton, and Cory Cochran, ZOO Fans' managing director of operations. We offer proprietary destratification fans designed to improve comfort in the ZOO — zone of occupancy. Our destratification fans lower operating costs in spaces with high ceilings or drop ceilings. In addition, our fans are used as spot coolers, to disperse humidity, to eliminate condensation on refrigerated equipment and to reduce sweating on concrete slabs.

www.zoofans.com | +1-855-966-3267

INDOOR AIR QUALITY**AeraMax Pro**

AeraMax® Professional sets the standard for high-performance air purification in the commercial sector. It is the only air purification product line featuring the patented EnviroSmart™ technology that automatically adjusts its settings based on the changing conditions within the room to optimize air cleaning performance while maximizing energy efficiency. AeraMax® Professional is designed to control source contaminants in shared spaces such as restrooms, cafeterias and other areas with high concentrations of people, helping to remove 99.9 percent of airborne particles. Visit www.aeramaxpro.com for more information.

www.aeramaxpro.com | +1-800-477-7940

JANITORIAL SERVICES/CLEANING PRODUCTS**Fresh Wave IAQ**

Odor management is a challenge that can adversely impact business goals and create significant health concerns in facilities. Fresh Wave IAQ® odor management solutions meet the odor control needs of many industries and eliminate the use of chemical-based odor abatement products. Effective on both organic and inorganic odors, our non-toxic products are made from natural ingredients, contain no harsh chemicals or harmful VOCs and are safe to use in any environment.

www.freshwaveiaq.com | +1-800-662-6367

Rubbermaid Commercial Products

Rubbermaid Commercial Products, headquartered in Winchester, Virginia, USA, is a manufacturer of innovative, solution-based products for commercial and institutional markets worldwide. Since 1968, RCP has pioneered technologies and system solutions in the categories of food services, sanitary maintenance, waste handling, material transport, away-from-home washroom and safety products. RCP, an ISO 9001:2000 manufacturer, is part of Newell Rubbermaid's global portfolio of brands and continues to develop innovative products.

www.rubbermaidcommercial.com | +1-540-667-8700

Staples Advantage

Staples Facility Solutions has an experienced team of specialists that will create a facility solutions program at a cost that is right for your business. We offer a wide assortment of wholesale facility supplies including janitorial cleaning supplies, breakroom and safety products. You can benefit from national coverage, expertise and the buying power of an industry-leading facility supplier.

www.staplesfacilitiesolutions.com

Veritiv Corp.

Veritiv is a North American leader in business-to-business distribution of print, packaging and facility solutions. Helping shape success for your business drives everything we do. Our name is based on this commitment and on the core strengths of our business. Derived from verity, it says we're true to our word, our beliefs and your needs. The words connective and active in our name signify that we collaborate with you to create solutions that work hard for your business.

www.veritivcorp.com

LANDSCAPE/MAINTENANCE/PLANTS/SERVICES/SUPPLIES**Netafim USA**

Netafim USA, based in Fresno, California, USA, develops and manufactures drip irrigation systems for agriculture, landscape and turf, greenhouse and nursery, mining and wastewater. Netafim offers an extensive range of irrigation solutions including driplines, filters, sprinklers, valves, water meters and automation equipment for complete dripline system installations. For more information, go to www.netafimusa.com.

www.netafimusa.com | +1-888-638-2346

LIGHTING**Graybar**

Graybar is a leading distributor of electrical supplies, communications, data network solutions, commercial and industrial lighting, and security equipment. Graybar helps its customers power, network and secure their facilities with speed, intelligence and efficiency.

www.graybar.com | +1-800-GRAYBAR

PEST CONTROL

Rentokil Pest Control

Rentokil North America is part of Rentokil Initial plc, one of the world's largest business service companies, operating in more than 60 countries worldwide. Ehrlich Pest Control, Western Exterminator and Presto-X Pest Control are all part of the Rentokil family of pest control companies in North America. They provide commercial pest control, bioremediation, bird control, vegetation management, bed bug control and termite control from 200 local offices in the U.S., Canada and Mexico.

www.rentokil.com | +1-610-372-9700

RESTROOM PRODUCTS

Dyson

Dyson has more than 1,500 scientists and engineers developing new technology globally. Dyson Airblade™ hand dryers are the fastest, most hygienic way to dry hands. No other hand dryer has the Dyson digital motor V4, HEPA filtration and Airblade™ technology. Engineered for different restroom environments: Dyson Airblade dB is 50 percent quieter than the original, Dyson Airblade V hand dryer is 60 percent smaller, and Dyson Airblade Tap hand dryer washes and dries hands at the sink.

www.dysonairblade.com | +1-855-720-6378

ROOFING

Sika Sarnafil, Inc.

Sika Sarnafil supplies high-quality thermoplastic roofing and waterproofing systems for commercial buildings. This includes energy-saving reflective roofs, vegetated green roofs and solar-ready roofing.

usa.sarnafil.sika.com | +1-800-576-2358

SECURITY

TownSteel, Inc.

TownSteel is a manufacturer of high-quality commercial-grade builder's hardware, including locks, door closers, exit devices, hinges and general hardware.

www.townsteel.com | +1-877-858-0888

TECHNOLOGY SOFTWARE TOOLS

Bluebeam Software, Inc.

Bluebeam Software's innovative desktop, mobile and cloud solutions push the limits of digital collaboration to enable facility professionals to do what they do, better. Bluebeam's award-winning PDF solutions are used by facility and operations management to speed up project communication by 60 percent, reduce printing and distribution costs by 80 percent and deliver electronic O&Ms for quicker access to critical information at the completion of a project.

www.bluebeam.com | +1-626-788-4203

WATER TECHNOLOGY

U.S. Water Services, Inc.

U.S. Water finds — and eliminates — the root cause of problems, utilizing an integrated approach that combines chemical, mechanical and operational knowledge to create a personalized approach to your most challenging water, energy and compliance issues. We use our in-depth industry knowledge and experience to enhance your system reliability, efficiency and profitability to provide an immediate and long-term ROI.

www.uswaterservices.com | +1-866-663-7633