INSIDE: SOLAR & BATTERY > PAVING & SEALCOATING > PLUMBING

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# D

Bedbugs are on the rise in Hawaii condos, say experts, including Delia Miske of Kamaaina Termite & Pest Control. Taking prompt action is the best solution.

### **PRACTICAL TIPS FOR DEALING** WITH THE HOMELESS MEET A MANAGER: MIKE GORDON

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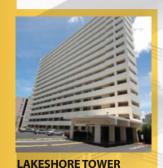
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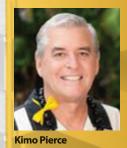
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#### NEW BOARD MEMBER ORIENTATION

Hawaiian Properties hosted a new board member orientation on April 20, 2019. We discussed the roles and responsibilities of new board members and the basics of serving on the board. Attendees had an opportunity to ask questions, meet more of the Hawaiian Properties team, and were provided with valuable resources to help them be successful in their new board member role.



"Information was very helpful! Very well organized!"

-Kevin Kuykendall, Village On The Green

"The orientation gave me all the necessary information needed as a new board member."

-Larry Blumer, Ridgeway D

"The information made me feel more relaxed about my new role."

-Susan Trombley, Ke Noho Kai Townhomes





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"Good night, sleep tight, don't let the bedbugs bite."

Turns out the age-old phrase has nothing to do with blood-sucking pests of prehistoric origin, but rather with the mechanisms of beds centuries ago.

Go ahead, Google it.

Although even that may not convince all of the Hawaii households afflicted with bedbugs, or concerned about an infestation in their own abodes. I was shocked to learn that most of those affected reside in condominiums and apartments. In fact, say experts we consulted for a pair of stories, it's entirely predictable. The good news is treatments are available, if you act quickly.

Also in this issue of BMH, Hawaii's homeless problem continues to be a problem for building managers, both commercial and residential. Kudos to BOMA Hawaii for bringing the topic to the forefront with an informative seminar, which we cover.

The popular Meet a Manager feature continues with Mike Gordon,

VP and senior property manager at Hawaiian Properties. He's one of many former military members finding success in



building management.

Condo attorney Jane Sugimura offers a wrap-up of bills affecting condominiums at the 2019 Legislature, as well as city bills.

And our experts offer tips on paving, solar and battery storage and plumbing.

Oh, and check out all the smiles at the recent NAIOP awards in Faces.

BTW, with bedbugs as our cover story, we've never put an issue of BMH to bed, so to speak, with such irony.

Mahalo,

**Don Chapman** Editor | Building Management Hawaii Don@tradepublishing.com





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# Hawaiiana Salutes Residential Managers!

Hawaiiana Management Company, Ltd. recognizes the tremendous contributions by Hawaii's Residential Managers. As they go about their daily responsibilities, Hawaii's General Managers, Resident Managers and Site Managers affect and improve the quality of life for all those living in condominiums and homeowner associations in Hawaii – an estimated one in six Hawaii residents! It is with this in mind that we take a moment to thank you for a job well done. It would be impossible for us to achieve success without our thriving partnership with you.



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In my 25+ years of building management, I can honestly say that Hawaiiana has maintained a level of consistency and professionalism that makes it both easier and more enjoyable to do my job as general manager of a 206-unit property. As many in my field know, Hawaiiana provides education, support and growth opportunities not always found with other companies. I have seen companies come and go, but Hawaiiana has outlasted them all, and continues to grow and thrive. Hawaiiana remains the industry leader in association management in Hawaii!

Michael Turman, ARM®, AMS®, CMCA® General Manager Ala Wai Plaza Skyrise

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As a site manager, I have worked with five different association management companies in Hawaii, and Hawaiiana is by far the best, most effective and professional company. Our Hawaiiana Management Executive is consistent, thorough, accurate, and always available to provide answers to the sometimes complex questions which arise at our property.

Erika Rain Baker Site Manager Mokuleia Beach Colony





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#### ASSOCIA HAWAII BOARD MEMBER SPOTLIGHT



#### KEVIN RATHBUN, PRESIDENT, OCEAN POINTE COMMUNITY ASSOCIATION HONORED BY HAWAII HOUSE OF REPRESENTATIVES

Longtime Community Association leader and retired Navy veteran, Kevin Rathbun, was recently honored by Hawaii's House of Representatives for his services to the country, the community and the State of Hawaii. Rathbun said, *"I truly appreciate receiving recognition for my volunteer efforts. I have always believed that giving of yourself and 'paying it forward' to your community is important and makes it better for those who live there. Receiving the Proclamation in front of the entire House of Representatives was one of the most humbling moments of my life!* 

A large part of my community service is my involvement with HOA Management Companies. I have worked with all of the large ones and when it comes to the best, Associa Hawaii is the one. Their customer service, professionalism and attention to detail is what sets them apart from the rest.

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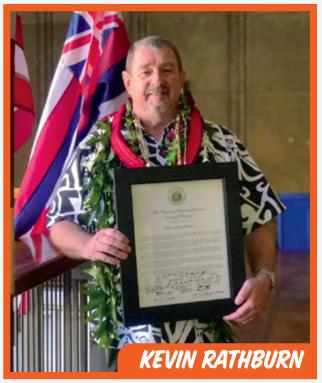


Photo Courtesy of Kerrie Prowse, President, Ke 'Aina Kai Comm. Assn.

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# contents

June 2019 | Volume 35 | No. 6

#### 6 Editor's Note: Don Chapman

#### 12 Legal Matters

Condo lawyer Jane Sugimura takes a look at bills the Legislature looked at this year

#### 14 Don't Let the Bedbugs Bite

Bedbugs are on the rise in Hawaii condos, expert says. Prompt treatment is the best solution

#### 20 Meet a Manager

Mike Gordon, Hawaiian Properties VP, finds that a military background is great preparation for a career in building management

#### 24 How to Curb Homeless Incursions

Practical tips for building managers who face a homeless problem

#### 54 Community Corner

Free fire alarms for seniors, another legal suit over luxury tower Waiea's quality, bulky item trash pickup rules

#### 56 Faces

NAIOP hands out its annual awards

#### **RAILINGS & STAIRS**

#### 28 Abel Libisch

What a property manager needs to know to ensure safety and enhance longevity





#### **PAVING & SEALCOATING**

#### 32 Geoffrey Long

How solid is your swale? What property managers need to know

#### 34 Kia Kamauu

Treat your parking lot like the valuable asset it is

#### **PLUMBING**

#### 36 Maurice Torigoe

Condominiums provide plenty of plumbing nightmare possibilities

#### 38 Eric Lecky

Unclogging the mysteries of clogged pipes

#### SOLAR

#### 40 Ted Peck & Matt Choy

Improved solar battery storage is changing the way we do electricity

#### 44 Robert Johnston

What to look for in a solar contractor for commercial buildings

#### 46 Rachel Fukumoto

Having a problem with low water pressure? New incentives can help with an upgrade

#### 48 Fred Brooks

Photovoltaic systems need regular maintenance. Here's a checklist

#### **50** Jonathan Shick

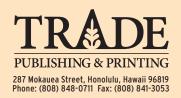
Pros and cons of a rooftop solar system

#### 52 Zoltan Milaskey

Add 'energy manager' to the job description of the modern building manager

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### **IT'S A WRAP!** What passed in the 2019 Legislative session

ere's a look at legislation that can impact condo boards and associations: ACT 007 (SB725): Requires associations to hold ballots and proxies for 90 days (versus 30 days) after an association election.

ACT 014 (SB1288): Allows electronic voting under specific circumstances; this is voluntary and associations are not being mandated to use this system. It is for larger associations and timeshare projects.

**ACT 027 (SB1325):** Allows associations to invest in government money market funds. This clarifies an established practice already used by some associations.

The following bills were passed by the Legislature and have been sent to Gov. David Ige for his review and approval. The deadline for the governor to give notice of his intent to veto a bill is June 24. The deadline for the governor to sign or veto a bill is July 9. If a bill is not signed or vetoed by the July 9 deadline, it becomes law without the governor's signature.

**SB551:** This bill allows power of sale foreclosures under certain circumstances as specified in the bill and affirms the Legislature's prior intent (in 1999) to allow associations to do non-judicial foreclosures based on express language in the statute despite the lack of express language in a condominium's governing documents.

**SB552:** This bill extends the time by one year for developers to amend public reports that were created under HRS Chapter 514A, so that condo units created by those public reports can be sold. This is not an extension of Chapter 514A, which was repealed on January 1, 2019.

**SB767:** This bill would increase the handyman exemption, which is cur-





rently \$1,000 (including Hawaii GET), to \$1,500 (excluding Hawaii GET).

**HB61:** This bill clarifies Act 195 that was enacted last year to allow associations to establish priority of payments for any amounts over and above the regular monthly common area maintenance charge, e.g., sub-metered utility charges, HO6 reimbursement charges. Late fees, fines and legal fees cannot be included in the list of priorities.

If you want to review the language of these measures, here's the link to the State Legislature: capitol.hawaii.gov/ login/login.aspx.

Meanwhile, at City Hall:

**Bill 96 (2018), CD1, FD1:** Amendment to Ordinance 18-14 Re Fire Safety (signed May 2). This bill clarifies the Fire Safety Ordinance that mandates fire sprinklers throughout a high-rise residential building over 10 stories that has closed interior corridors, unless the building can get a passing score on a Life Safety Examination conducted by a certified licensed professional as follows:

- Mobility score on Matrix will be the same for all buildings at 1.5 only if the AOAO provides the licensed professional with an emergency evacuation plan for the building and a recent list of vulnerable residents and unit numbers.
- Allows association staff to assist licensed professionals in gathering information for the Matrix.
- Extends the six-year deadline to get a passing score if the building experiences a delay in getting per-

mit approval for repairs necessary to get a passing score.

- Requires the Honolulu Fire Department to report to the Council on compliance issues every six months for a two-year period until May 2021, which would allow AOAOs and licensed professionals to share their concerns regarding implementation of the Ordinance.
- Amends the list of buildings that are subject to the Ordinance and requires the Honolulu Fire Department to update that list on their website.

**Bill 13 (2019) CD1:** Collection and Disposal of Refuse (Bulky Item Pick-ups & Refuse Fees). The hearing on this bill occurred on May 14, which called for implementing a new program for bulky items that required making appointments for pick-ups and payment before pick-up would occur.

City Department of Environmental Services Director Lori Kahikina informed the Budget Committee the bill would be amended to provide that in multi-unit residential buildings, owners/residents-and not the resident or site manager or the property manager-will be required to call the city for appointments for bulky item pick-ups. The director also said that the bulky item pick-up pilot project, set to begin June 3, is a work in progress and changes may occur during implementation. The pilot project involves residences, including multi-unit residential buildings, from Foster Village to Hawaii Kai, and is scheduled to last six months or longer. For more information, go to the city's website at opala.org. The committee eliminated the refuse fee requirement as there was no support on the Council for garbage fees.

Stay tuned-this is not over yet!

Jane Sugimura is an attorney with Bendet Fidell Sugimura, specializing in condo law. Reach her at Hcca.hcaao@ gmail.com.

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# **Bedbug Cases on the Rise**

# The tiny critters can overwhelm even high-rise towers if not treated quickly

#### **BY DON CHAPMAN**

ow tough is it to get rid of bedbugs? Well, they've been around at least since the time of the dinosaurs, according to recent scientific research. Which means bedbugs survived whatever exterminated the dinosaurs, and everything that has come and gone since.

And, clearly, they predate beds.

"Bedbug' is actually a misnomer," says Mike Worden, operations manager of Kamaaina Termite and Pest Control and a 10-year veteran of the pest control business. "They also like baseboards, and we find them behind dressers, in carpets, in curtains, in rattan furniture and sofas."

And that's not all.



Mike Worden

"Movie theaters, airports, airline seats, taxis," says Delia Miske, Kamaaina president and CEO, whose business is "50 percent termites, 30 percent bedbugs, 20 percent cockroaches." (The same gas that kills roaches also works for bedbugs, Miske says, but bedbugs require twice as much of it, which makes bedbugs more expensive to eradicate.) A simple eveball



Delia Miske

test is not always enough to detect bedbugs, says Worden, because "bedbugs are naturally cryptic. Unlike ants or roaches, they like to remain hidden. They prefer crevices."

But the real problem with bedbugs, they agree, is the stigma.

"People are embarrassed to admit they have a problem," says Worden. "They'll go to the hardware store and



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Bedbug infestation was so bad at the King Kamehameha Hotel in Kona, it required tenting the entire structure

buy a generic pest product. They won't be specific with the clerk about getting a bedbug product. It's like buying condoms: 'Oh, we know what you're doing tonight.' People won't talk with family about it. We try to combat this. Bedbugs are a community problem."

"People assume you must be unsanitary," adds Miske, "but it can happen to anybody. We've seen them in the nicest buildings."

Worden tells of treating one family's home repeatedly, and the bedbugs always showed up after family gatherings: "We told them, we'd better check your sister's house, too."

As reported in the accompanying sto-

ry, bedbugs are hitting Hawaii condominiums and apartments harder than single-family homes and even hotels.

"It has a lot to do with the close proximity of residence to residence," says Worden. "Bedbugs gravitate to a heat signature. If people, let's say, in unit 10, go on vacation for a couple of weeks with the air conditioning off, bedbugs (in an adjacent unit) may sense heat coming from the next-door unit and go there—they can sense heat through a wall. And it's often bedroom to bedroom because of mirror-image, reverse floor plans."

Tom Tsukano, Xtermco VP who has nearly 38 years in pest control, says his

company has seen an increase in bedbug cases "over the past 15-20 years. I think it's because people are doing more traveling."

And while arguments about Hawaii vacation rentals tend to focus on the state's housing shortage and the quality of life in local neighborhoods, Miske sees another issue.

"There's a definite influx with so many more vacation rentals," she says. "If you have short-term rentals, it's best to do monthly monitoring."

While little can be done in the way of prevention, much can be done to treat a problem once it is identified.

"The most important things for

a building manager to know," says Miske, "is look for small red bites on tenants. Tenants should report it if they see just one or two bedbugs. The quicker you do a treatment, the less likely you'll have a big problem."

In the near term, says Worden, "if you suspect bedbugs, put loose clothing in the dryer on high to kill the eggs,

> "Bedbugs are a community problem." -Mike Worden

then vacuum and use a rubbing alcohol spray-alcohol breaks down the membrane of eggs."

But alcohol has no residual effect, so proper professional treatment should follow.

With female bedbugs able to re-



produce every 10-14 days—"They're worse than rabbits," Miske says-and a propensity to spread their eggs around multiple locations, and with EPA rules preventing tenting just one building unit, big problems can happen quickly. Worden recalls one Kaakako high-rise of 210 units that had to be completely tented: "We had to move everybody out, a huge undertaking."

But that was nothing compared to

the tenting of the entire King Kamehameha Hotel in Kona.

"We set a record for the biggest bedbug fumigation," says Miske. "The problem was just too big. It took months of coordination. We flew up 30-40 employees, worked with local pest companies, too. It was quite a feat."

"You truly have to treat this like cancer," says Worden. "You cannot wait to treat it."



# Don't Let the Bedbugs Bite

#### The bloodthirsty insects pose a problem for apartments and condominiums

#### **BY BRANDON BOSWORTH**

awaii's bedbug problem is getting worse. Orkin released its 2019 report on the Top 50 Bed Bug Cities in the U.S., and Honolulu came in at No. 43, up from No. 48 the year before.

"The number of bedbug infestations in the United States is still rising," says Tim Husen, an Orkin entomologist. "They continue to invade our homes and businesses on a regular basis be-



cause they are not seasonal pests, and only need blood to survive."

Husen says any type of property is prone to bedbugs. "It has nothing to do with sanitation. We have treated for bedbugs everywhere, from newly built upscale homes to public housing."

"It's difficult to quantify, but Hawaii definitely has some bedbug issues," says Rick Cooper, senior director of services at Terminix. "Bedbugs are prevalent in all states,



**Rick Cooper** 

especially where there are lots of travelers coming through. The threat gets higher."

According to a 2015 "Bugs without Borders" survey by the National Pest

Management Association, the top three places where pest professionals report finding bedbugs are apartments/condominiums (95 percent), single-family homes (93 percent) and hotels/motels (75 percent).

Bedbugs are always in motion, travelling from place to place in luggage, clothing and other belongings. They are capable of rapid population growth with an adult female laying two to five eggs per day (up to 500 in her lifetime), often making treatment challenging.

To combat the problem, Cooper says it is important for properties to have "well-written procedures" in place. "The entire staff needs to be educated," he says. "All staff should be familiar with what a bedbug infestation looks like."

Because of their small size and ability to hide, bedbugs can be difficult to see during the day. But they leave behind black, ink-like stains that can be spotted more easily. According to Cooper,

cleaning staff are often "the first line of defense. They need to know what to look for and what to do. Inspections need to be multi-faceted."

If bedbugs are discovered somewhere on a property, Cooper says "there is a range of very effective treatments" available. If the infestation is found in a single room, Cooper says "a block of rooms above, below, next door and across the hall from the infested room needs to be inspected. There's a good chance it's spread by the time staff notices it."

Various monitoring devices exist that can make spotting bedbugs easier, though Cooper says "most properties are lagging behind in using them. Managers are concerned about the guests seeing the monitors."

Monitors are placed in areas where bedbugs typically reside, such as around beds, chairs and sofas. Some monitors utilize lures to attract bedbugs, increasing the chances of spotting them. "Monitors are very effective, and increase the chances of detecting an infestation," Cooper says.

According to Cooper, one treatment

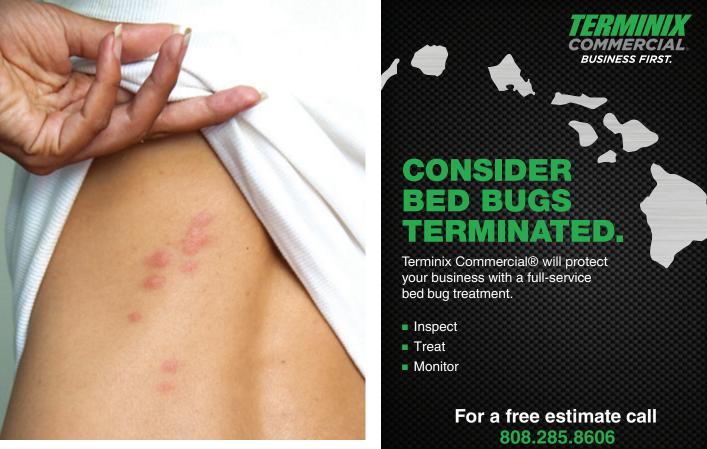


PHOTO COURTESY CENTERS FOR DISEASE CONTROL AND PREVENTION

Bedbug ingesting blood from a human

is often enough to resolve the problem, though sometimes several treatments are required. "It's also typically necessary to replace all the furniture in the infected room."

While a bedbug infestation isn't a good thing for a property's image, Cooper says it does not have to be a disaster. "If staff have proper training, they can put a positive spin on the problem by stressing how proactive they are in dealing with it," he says. At the end of the day, Cooper says, "bedbugs are a part of life," and "there's nothing a property can do to prevent bedbugs."



Bedbug bites



### From Howitzers to Housing

The skills Mike Gordon acquired as an Army artilleryman transfer well to building management

#### **BY DON CHAPMAN**

During his decade in the United States Army, Mike Gordon mostly blew things up.

"I started in the artillery, did that seven years, fired all kinds of things, including self-propelled howitzers, depending on the unit I was with," says Gordon.

But his superiors saw potential in another area—he had the personality to work with people, one-on-one.

"After about a year on the gun line at Schofield Barracks, they took me off and I became a battalion career counselor," the University of Nebraska alum says. "We all know what a recruiter is—I was the recruiter who kept service members in the service."

His people skills would eventually lead to a successful career in residential property management. In other words, his job these days is to keep things from blowing up with condo associations.

#### Title, company:

Vice President/Senior Property Manager, Hawaiian Properties, since October 2018. I manage a team of other property managers and also oversee staff training, and I carry my own portfolio, some of the higher and more difficult accounts.

#### Q: How long have you been involved with building management?

A: Going on 27 years.

#### Q: There seems to be a lot of former military personnel involved in property management.

A: Here in Hawaii, anyway, but that's not necessarily the case on the Mainland. I was in Seattle for 12 years and didn't see it there. Here, I think it's a lot of people like me—I came here, got out, wanted to retire here. Given



our military background—juggling different responsibilities, doing preventative maintenance, these things are very common in most occupations in the Army—it doesn't surprise me. For somebody just getting out, one of the biggest expenses here is housing, so a job like a resident manager provides not only compensation, but housing. It's a perfect job for them. In most cases, military people are disciplined, early risers, self-starters and qualify very well for this line of work.

#### What led you into building management?

A: When I got out, the Cold War was over and the military felt we didn't need as many service members. So they started creating job fairs, partnering with local businesses that might have an interest in employing former military. I went to one in about 1992, I think at Fort Shafter. There was a representa-



Mike Gordon confers with (left to right) Kekoa Giron, Chelsea Pollard, Tim Lu and Ryan Nitta

20 BUILDING MANAGEMENT HAWAII JUNE 2019

tive of Chaney Brooks, and they were looking for property managers. They'd hired military members in the past, and what they discovered is that property management is very similar to what a staff officer does in the military.

I actually applied at two offices. Chaney Brooks at the time had two offices, one in Waipio—Waikele was in development at the time—but I was overlooked. I was quite disappointed and considered becoming a police officer, which my wife didn't like, but then about a week later I got a call from the Coral Street office. I was hired as a community association manager in February of 1993, mostly in Waikiki— Aloha Surf Hotel, Marina Towers and Parkside Tower in Moiliili.

I loved the work, really took to it and thought this is something I can do. What I liked was the flexibility. The Army is so regulated—what time is formation, what time do you have to report, what time is such and such?and that all went away with property management. That translated as authority to me. What I mean by that, a property manager has responsibility for a portfolio of properties and buildings, and I was responsible for the revenue end of the business that I'm overseeing, and I could pretty much come and go as I pleased as long as I met that goal and responsibility.

At Chaney Brooks, I was basically an enlisted man, but by the time I left in 2000, I was assistant VP, so I was more like a captain. One thing I had an opportunity to do, which may have led to my rapid advancement at Chaney Brooks, I had an exclusive relation with Schuler Homes, which was doing a lot of development—all of Country Club Village in Salt Lake and conversions like Royal Tower.

### Q. Sounds like a good place to be. Why leave?

**A:** I met the president of a competitor company at a national conference. I'd acquired my PCAM certification, the highest designation in this industry, and I was one of the earliest, so it was a bit of a big deal. At that time Chaney Brooks was very diversified. Condo



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#### From page 21 ►

management was the largest department, but also the costliest and the lowest profit margin, so they sold their portfolio to Certified, which today is Associa. A lot of my colleagues walked over with the business. I decided to go another route and joined Hawaiiana as senior management exec and team leader, but also managed upscale buildings like Discovery Bay.

I did that seven years, was very happy. That said, I was in my early 40s, and my wife Agnes (an accountant) and I decided we would like to live here, but at our ages we were still marketable, and chose to relocate to the Mainland with the intent to come back. My mother is a Japanese national—I was born in Japan, an Air Force brat—and she was living in Seattle, having problems with her husband's health, and that's why we chose Seattle. We had a five-year plan that turned into 12.

### Q. You were very successful in the Northwest.

A: It's a different world up there. At Chaney Brooks we had 30 to 40 property managers; at Hawaiiana, 75. I went to a company in Seattle that was very small, only 12 property managers, but we were still the second-largest property management company in Washington state.

Property management is really not a profession up there. Remember, you're in the land of Microsoft, Amazon, Boeing, Starbucks, Nordstrom's, Costco-they all originated there. Those are where people make their profession. This was not considered a profession in Seattle. So the job was much harder, and humbling for me, coming from Hawaii where this is big business. We have companies that are among the biggest in the United States right here on this island. We have strong support with CAI's local chapter, and the majority of the population reside in or own some form of community association unit. It's just not that way in the Pacific Northwest.

In fact, all the way up to the time I left, my board president of a property up on Capitol Hill in Seattle was notified I was returning to Hawaii, and he said, Mike, you're an upstanding guy, I don't expect anybody to be a property manager forever, I understand why



Mike Gordon and wife Agnes

you're getting out of this. I had to say I'm actually returning to Hawaii to do property management.

#### Q. Speaking of boards, let's just say they aren't created equal.

A: Some people might say that a good board is all on the same sheet of music and they're all cohesive. That's not necessarily true. The reason you elect many members of a board is you want representation from different thoughts, different groups. If you're going to have a community of many families in one place, there are going to be different opinions, different values, about what represents their best interest in this community. It's good to have diverse thoughts. But the board has to be a collective, act as a democracy, and has to do that amicably and professionally.

We have a lot of misbehaved boards. If they don't get what they want, they get upset and begin to manipulate and sabotage. That's where it goes south. Or we have a board member who strives to become president of the board, so as not to contend with a person who may not see it his or her way, and they start to make unilateral decisions. As a property manager we really have to look out for that. It states clearly in state law and every governing document that each decision made by the board has to be made by the majority of the board. We're talking board actions such as expending funds, committing to contractual liabilities, or spending liabilities, or establishing rules and policies. These things have to be determined and voted on by the board, and it has to be a majority. You can't have a board that knows a good percentage of the board—three, four, five members—are not necessarily seeing it their way, so they'll unilaterally make a decision and then instruct the management company or the site manager to execute measures to do things that are in their favor. That's when we have to steer them back. It happens frequently.

### Q: How is tech affecting your industry?

A: Before it was phone calls and faxes, which evolved into emails, and now it's websites and tools like phone apps. New tools are being invented and tested that may take over from email. Let's say one of our property owners wants to make a maintenance request—and we deal with this every day—they can do it with an app and track it to the end.

We're partnering with aXess Point, running demos of a new app with five or six properties. It's doing very well, we intend to launch in June or July.

#### Q. Finding good managers is difficult. What are you looking for?

A: Communication is a major trait you need in this business. You have to be verbally savvy and have great written communication skills. Half of what we do is writing. We need a paper trail policies, minutes, correspondence. We have to communicate to our clients what the policies and provisions of governing documents are, and why we operate this way. Most of this communication is done in writing. A person who can't write very well, better than average, probably will not do well in this business.

And you can't be too shy. You have to be comfortable in front of people. When we go to a board meeting, we are expected to direct the board—they make the decisions, but we have to provide them with every tool and every piece of advice so they make sound decisions. We don't try to lure them, to sway them one way or the other, unless they're going in a direction that is unlawful or not in the best interests of the association. We're loud and clear on that. But if there are feasible options, we have to inform the board. To do that we have to be verbally savvy.

Here in Hawaii, we also have to be culturally savvy. When I go to one board meeting, my demeanor can be much different than at another building. We have to be able to service different groups of people. We have to earn their trust.

Mechanical, we can teach that. We

want somebody smart enough to be trainable. There are a number of subjects we have to be knowledgeable about—physical management, soliciting bids and being resourceful, able to talk with many different professions, including landscaping, mechanical contractors, janitorial, security, elevator maintenance. We don't have to be experts at any one thing but we do need to understand the lingo.

### • What do you enjoy most about the business?

A: When there is a really serious loss, and people are grossly impacted by it ... There was a case in Seattle, the loss was \$3 million in one unit. A valve broke at the top, water came shooting out, and we had a difficult time finding the shutoff valve. And of course, it happened in the middle of the night, 26 units affected. Most had to be vacated, million-dollar units. I was on the phone throughout the night.

We're accustomed to pacifying angry people, but these folks were beyond anger. They were distraught, they were broken. To be able to use my knowledge of coverage and process, counseling them on the process, helping them with an action list. . . . Despite the circumstances, I was greeted with hugs. They were just looking for help at that point. I realized I had knowledge they didn't, and to be able to help them and relieve them, that's the most rewarding thing you can do in this business. Without me these people cannot be relieved. In circumstances where my profession is legitimized, where I'm the go-to guy, is the time this job is most rewarding.

### • What's your best advice for other managers?

A: We're in the business of juggling many things at one time, and there may have been times in my career when I put undue stress on myself. Just remember that some things have to be responded to all the time, but don't over-extend yourself. There are things that don't necessarily have to be done today. As Jeff Dickinson once told me, it's a marathon, not a sprint.

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# How to Curb Homeless Incursions

BOMA Hawaii presents best practices for Isle businesses and property managers

#### **BY BRETT ALEXANDER-ESTES**

meeting on May 8 at the Hawaii Prince Hotel, presented strategies to protect businesses and other private property.

In 2018, Hawaii's homeless numbered 6,530, according to a Statista online database.

BOMA speakers included Lt. Gov. Josh Green, Institute for Human Services Executive Director Connie Mitchell and Lee Donohue, director of security at Securitas Security

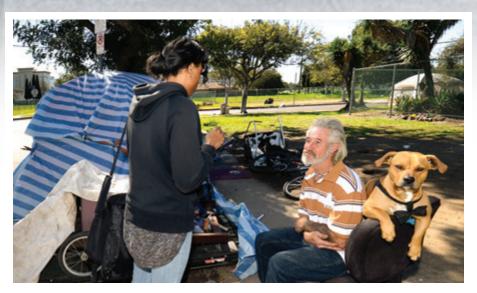


Josh Green

Services USA Inc. and former chief of the Honolulu Police Department.

The panel presented their recommendations within a framework of "compassion and accountability."

According to panel speakers, Honolulu businesses are dealing with homeless crises around the clock. Effective responses, they said, include contacting the right social service and government



agencies, targeted actions by owners and security personnel, and maintaining robust property lighting and utility protection.

#### Connie Mitchell

#### Alternatives

911

Calling 911 is typically a first reaction when attempting to remove a disruptive person or to summon medical help, says Mitchell of IHS, but other resources can be quicker and more effective. These include:

• The Institute of Human Services (IHS) Outreach: 447-2833



Lee Donohue

- Honolulu City & County Dept. of Facilities Management: 768-3343
- Non-emergency Services: 311 (Mobile 311 Apps)
- 447-2855Honolulu City &

- Honolulu Police Department Community Policing: 529-3111
- Emergency Medical Services (EMS): 911
- Hawaii Health and Harm Reduction: 853-3292
- Honolulu Police Department (Emergency): 911
- Chinatown Joint Outreach Center: 545-3694
- Punawai Rest Stop: 599-9750
- Aloha United Way: 211

#### **IHS Outreach**

Mitchell recommends calling IHS Outreach caseworkers "if you see someone who looks vulnerable, who has some major issues or injuries" and who often stays in the same location. "There's a good chance (Outreach) will be able to find that person pretty easily" if you describe that person in terms of "what they're up to."

Ideally, Mitchell says, the needy person is willing to accept help. Often, a mentally ill person says he or she wants help, Mitchell says—and when a caseworker arrives, they refuse it. However, with repeated contact, IHS Outreach "may well be familiar with them if they're in our jurisdiction," Mitchell says. "We'll be able to go out the next time we're in that area. Which is pretty frequent. Most of our folks . . . do the rounds every week, at least four times, (so) they'll probably find them."

#### Department of Facilities Management

Mitchell says proprietors can call DFM if people "are blocking passage on a public sidewalk, or a property, or if they are causing any kind of environmental concern." DFM will then come and clear the area.

If people regularly congregate, or are relieving themselves on sidewalks near a property, Mitchell says, "You can just let them know, 'We're power washing this area every morning (or whenever), so you may as well go someplace else.'" If people remain, owners can call DFM, too, since it also clears sidewalks for power washing.



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Please see page 26 ►





From page 25 ►

#### Mobile 311 Apps / Honolulu 311

These federal and local government-sponsored apps can be downloaded to instantly relay photos and reports of damage to public and private property and other issues to local authorities. Go to https://play.google.com/ store/apps/details?id=com.citysourced. honoluluhi&hl=en\_US to download Honolulu 311.

#### Honolulu Police Department Community Policing

HPD plainclothes officers monitor assigned districts and are trained to recognize and respond to individuals who may need redirection or referral.

HPD's District 6 (Waikiki) Community Policing Team, for example, helps with citizen patrols, neighborhood security watches, responds to an Active Threat/Critical Incident and provides 16 other services.

Call HPD's main line at 529-3111 and ask for your district's Community Policing contact.

#### Hawaii Health and Harm Reduction

"If you find what you believe is IV drug equipment," Mitchell says, "you report that (to HHHR). They can go out and look for the drug users in that

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area." HHHR exchanges clean needles for dirty needles one-for-one, and guides drug users to other social service providers.

#### Emergency Medical Services (EMS)

Call EMS when you see someone who is unconscious, unresponsive, clearly disoriented or has a debilitating untreated injury.

#### Honolulu Police Department (Emergency)

If you see someone who is "up to no good, like they are trying to rob people, then you do need to call the police (at 911)," Mitchell emphasizes.

When owners or managers call the police to remove a person, Mitchell says, an "order to vacate" can be issued to legally bar the person from the premises. In this case, the reporting party the owner or manager, or their security personnel—must provide responding officers with a document that verifies employment or ownership of the site.

The Chinatown Outreach Center and the Punawai Rest Stop both provide on-the-spot help such as social services and basic medical care. The Chinatown Center also gives homeless visitors a bus pass to shelters, and the Punawai Rest Stop in Iwilei also provides washing machines and dryers, showers and other essentials.

#### **Aloha United Way**

"Perhaps you know someone who is being evicted ... or is behind in their rent or utilities," says Mitchell. "Or someone just approaches you they're homeless, they need help, they want help. If you call United 211, they have a whole consortium of services that are available, and they can direct you to the right organization." When dealing with homeless issues, the panel said, business owners and property managers often feel like they're on their own. But using best practices can be very effective, and can be the first step in uniting a commercial block, a community and the state as a whole in ending a humanitarian crisis that now affects everyone in Hawaii.

For more information on available resources and social service providers, contact IHS at 447-2900 or 447-2800.



### **Something to Hold Onto** Things a property manager must know to ensure safety and enhance longevity



**Abel Libisch** 

ailings are critical for a building's life safety, and this is especially true for stair railings. Stairs have several functions with which the railings cannot interfere: They need to allow the free movement of people and furniture in both directions, and they function as the main fire escape routes for the building.

Railings are responsible for providing safety on the staircases, even in poor visibility.

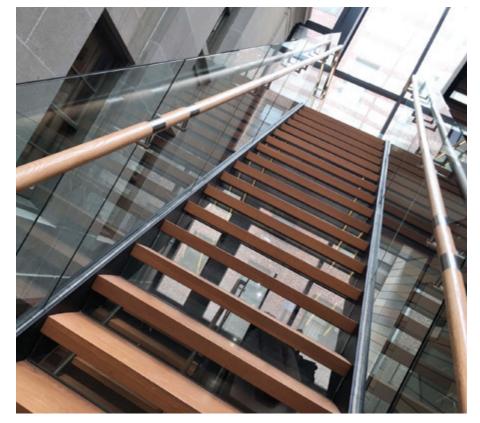
**Guardrails** are in place to prevent accidental falls, and are at least 42 inches tall in commercial and 36 inches tall in residential applications.

**Handrails** serve a different purpose than guardrails. They provide guidance for people walking up and down stairs, and are installed at a height of 34 to 38 inches. The height is measured from the stair nosing. At residential buildings, the guardrail and handrail can be one and the same.

Handrails must be continuous for the full length of each stair flight, and are not to be obstructed along the tops and sides. The shape and size should be comfortable for the human hand, between 1 1/4 inches to 2 inches in diameter for commercial use. Handrails must extend at least 12 inches beyond the last riser nosing.

At the bottom, the handrails' downward slope must continue beyond the first riser nosing for a horizontal distance equal to one tread depth. These extensions need to return to the wall, to the walking surface, or to the railing post, forming a "P" shape. There must also be a minimum of 1 1/2 inches between the handrails and walls or guardrails, called "Knuckle Clearance," with a maximum projection of 4 1/2 inches into the walkway.

Guardrails are required for any stairs with a drop greater than 30 inches. On a typical guardrail, the widely known



4-inch rule applies: No opening on a guardrail should be large enough for a 4-inch sphere to pass through.

This rule was created to prevent small children and objects falling through the railings. The only exceptions are the stairs where, due to the geometry of the stairs, the rule is less stringent: Openings between railing components must be less than 4 3/8 inches, and the triangular area between the bottom rail and the stair tread must prevent a 6-inch sphere from passing through.

On new construction, architects design the staircases with the current railing requirements in mind. This is usually not the case where a failing railing system is being replaced on an existing building.

An interesting feature of older buildings is that they commonly don't have a 42-inch tall guardrail on staircases, as old building codes only required them to be 36 inches tall, and they functioned as a handrail at the same time.

When attempting to install a code-compliant railing system on these buildings, we often find that the staircases become too narrow, and do not meet the fire escape route requirements anymore. In these cases, the only solution is to install the new railings on the side of the staircase instead of on top of it, creating additional space for the handrail. These dramatic changes of the building's appearance always need to be approved by the building department.

It is imperative to pay close attention to these details and always follow the current building codes, as building inspectors do take these rules seriously. Make sure to consult with a profes-



sional, and hire a licensed contractor to assist with the design and installation of stair railing systems.

Abel Libisch, an architect, is project engineer at Elite Railings & Windows, a supplier and installer of aluminum railings and windows for condominium and commercial installations. Working alongside architects, engineers and consultants helps the company remain at the forefront of technology by utilizing state-of-the-art products, material and techniques available for all types of railing and window installations. Reach him at erw@erwhawaii.com or 842-7245.



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### How Solid Is Your Swale?

Here's what property managers need to know



A swale is a channel or control point within a parking lot or roadway designed to catch, control and direct surface water runoff, either to a catch basin or a storm drain. For property managers and property owners responsible for the upkeep of these areas, here are the best industry options available to you when addressing swale repair and maintenance.

#### Concrete Swales: Today's Best Option

Concrete swale installation is the highest upfront cost solution to water control and drainage issues. Concrete swales require the least amount of maintenance over time, making it the best option for water control in the market today. Concrete swale installation involves creating a channel, usually three to four feet in width, to control the flow of water to catch basins or drains within a parking lot or roadway. A properly-installed concrete swale should be sloped correctly, with a quarter-inch of fall per foot to allow water to flow properly down its middle point to the nearest catch basin or drain.

Properties with poor drainage or slopes will often encounter issues with sitting or standing water. If drainage is poor, concrete is the best product to hold sitting water as it will not deteriorate, and will allow water evaporation within a 12- to 24-hour period. It is recommended that when installing a concrete swale, a new aggregate base



course is installed under the concrete to ensure a solid foundation. Fiber-reinforced GatorBar mats installed 12 inches on center provide additional tensile strength.

Expansion-control joint installation can control cracking. As this area will see constant water flow, the best approach to maintaining your concrete swale will be ensuring that the proper waterproof caulking—I recommend Sikaflex—is installed to all expansion joint and cracked surface areas every three to five years to protect and extend the life of your investment after installation.

#### Asphalt Swale Repair and Maintenance Solutions

Due to budgetary constraints, condo associations are often forced to install asphalt swales, as their initial upfront cost is less than concrete. On the down side, asphalt swales need much greater proactive maintenance and repair programs to control deterioration and structural failure. With proper proactive maintenance on asphalt swale areas, associations often apply approximately the same amount of maintenance funding as they would pay upfront for concrete swale installation.

The best maintenance options when dealing with asphalt swales are:

- Remove and replace the old asphalt pavement within the swale area with a minimum of two inches of new, hot State Mix Asphalt.
- Install either cold-applied Gator Pave crack fill or hot-applied CrackMaster 6690 crack fill material around saw cut joints and middle seams prior to sealing as added protection from water intrusion.



• Apply one to two coats of Seal-Master Seal Coat every three to five years to encapsulate and seal the new asphalt pavement in the swale area to prevent water intrusion and deterioration.

#### Concrete or Asphalt? Being Prepared is the Best Approach

Due to the amount of funding required to install and maintain either asphalt or concrete swale areas within your property, the best approach is to contact a contractor and ask their assistance in drafting a long-term maintenance program and budget to ensure your property stays on top of its required maintenance.

To ensure you are prepared and your budget will support the proper maintenance, here are some points to touch upon when seeking professional guidance on your maintenance program. Ask the contractor to touch upon:

• What type of material is best suited for your drainage areas—concrete or asphalt?



- What is the upfront cost and scope of work to install the recommend-ed material?
- What is the long-term maintenance costs associated with the upkeep of these drainage areas? By following a contractor-created maintenance program, associations can properly plan and save for the upkeep of their swale and drainage areas. These plans will keep your property protected

from water intrusion and drainage issues now and in the future.

Geoffrey Long is a senior estimator and project manager at DC Asphalt Services. He has been actively involved in the asphalt industry for the last eight years and has extensive knowledge in the field. DC Asphalt Services, which is based in Campbell Industrial Park, performs asphalt and concrete work. Reach him at glong@hawiiantel.net.

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our parking lot is the "welcome mat" to your property, providing both image and functionality to your building, whether commercial or residential.

A scheduled program of pavement maintenance that includes sealcoating and crack filling will more than double the life of your asphalt pavement and provides maximum curb appeal.

Sealcoating and crack filling are a fraction of the cost of repairing or replacing asphalt pavement.

#### What is Asphalt Pavement?

Asphalt pavement, also known as hot mix, is a simple blend of two main components, molten liquid asphalt (the black glue or binder) and crushed rock or aggregate.

#### Why Does Asphalt Pavement Deteriorate?

Left untreated, asphalt pavement will deteriorate rapidly. The asphalt binder that holds the pavement together begins to oxidize and weather soon after installation. Moisture penetrates the asphalt, causing damage and deterioration to the pavement. Oil, gas and salt cause further damage to the pavement surface. All of this environmental distress is why asphalt goes from a newly laid, fresh black appearance to a drab, aged, oxidized gray appearance.

#### Sealcoating Protects and Beautifies Asphalt Pavement

Sealcoating pavement sealers replenish the binder that is lost through weathering and aging, and provides a barrier to moisture intrusion as well as ultraviolet rays, chemicals and salt.

And just as important, sealcoating beautifies pavement, enhancing the image and curb appeal of commercial properties, condominium driveways,



### **Pavement Condition Index**

Scheduled Maintenance 📃 No Scheduled Maintenance



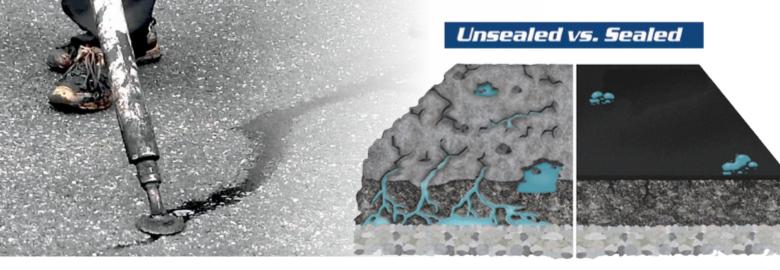
roadways and more. Sealcoating provides a rich, black "like new" appearance to otherwise drab and worn-out pavements.

#### Crack Filling: A Major Component of Successful Maintenance

Moisture intrusion into and through cracks in pavement is a leading case of base erosion and pavement failure, including alligatoring (severe cracking) and potholes. Crack filling with hot rubberized or cold-applied crack filler prevents moisture intrusion into pavement cracks by providing a waterproof barrier.

#### Pothole Repair: Avoiding Costly Liabilities

Potholes represent an annoyance to vehicle traffic and a serious trip-



ping hazard to pedestrians. To avoid potential liability, potholes should be filled immediately upon discovery with either cold patch or hot mix material. Filling potholes is a relatively easy and inexpensive process.

#### Asphalt Pavement Patching

Severely damaged pavement requires patching using either infrared patching techniques or full-depth asphalt repair.

Infrared patching involves heating up and re-melting the damaged asphalt, raking and then compacting the asphalt to produce a "like new" asphalt patch area.

Full-depth asphalt repair involves cutting out and removing the damaged asphalt, repairing the base and replacing it with fresh hot-mix asphalt. Fulldepth asphalt repair typically provides better long-term results.

So ask yourself if the "welcome mat" to your property projects a neat, professional image? Or does it portray a drab, run-down image? Either way, a scheduled program of pavement maintenance can protect and beautify your parking lot's image, at a fraction of the

cost of new asphalt, and for years to come.

Kia Kamauu, SealMaster Hawaii plant operations manager, oversees the manufacturing processes at SealMaster Hawaii, one the largest pavement maintenance product providers in the state. Providing products to various clients, he sees the concerns faced while looking for a contractor, and the challenges contractors sometimes have while working with potential clients. Reach him at kkamauu @sealmasterhawaii.com.



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### Best Practices to Avoid Clogged Pipes

A condo unit has plenty of plumbing nightmare possibilities

est practices for condo owners and property managers include having an annual plumbing checklist for the building to ensure better health and welfare for the community.

First and foremost is the condition of sewer, waste and vent piping. With new technology, cameras will help determine the condition of the sewer, waste and vent piping. At the same time, it tells you if you need to snake or power spray your drain lines.

Next is your water line. Have your booster pump system checked annually. If you have a centralized heating system, check it annually. If you have individual heaters for each unit, recommend that condo owners replace it every 10 years. Most condominium associations have in place a mandatory checklist for each unit.

At this time, they should have a professional plumber check each unit for what needs to be done. Some of the damaging things that could occur in the unit include the washing machine. When the user is through with the washing, turn off the valve. Most washing machine hoses are not the pressure



type. When not replaced, it could burst and flood the unit.

The water closet is another fixture that could do damage to the unit. Best practice would be to hold down the lever to be sure it flushes properly. The reason for this is the tendency to flush and go, and a number of things can happen. The fill valve might get stuck and the water will keep on running, or the water closet could get stuck and overflow. Ignore handy wipes with labels saying it's OK to flush down the water closet. In fact, wipes will clog the drain and will not break apart like toilet paper.

In the bathtub or shower, placing a strainer on the drain will help catch the hair going down the drain. The lavatory drain is a little tricky—you need to remove the pop-up stopper to clean the drain.

The kitchen sink, with or without garbage disposal, will clog if too much rice, potato skins or grease goes down the drain.

Maurice Torigoe is the owner of M. Torigoe Plumbing, founded in 1985. His plumbing career began in 1969, and today he is an ABC Hawaii plumbing instructor at Honolulu Community College. He is past president of the Hawaii Chapter of Associated Builders and Contractors, and past and 2019 president of the Construction Education Fund. Reach him at 841-4417 or maurice@hawaii.rr.com.





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# **Unclogging the Mystery** of Clogged Pipes

Sometimes gravity is not enough to drain away wastewater

f all the piping systems in your building, did you know that the only system not pressurized is the drain, waste and vent (DWV) piping? Hot and cold water supply pipes for potable drinking water, pipes for air conditioning, most sprinkler systems, even gas pipes for cooking all rely on pressure to move material (water, gas or refrigerant) through the pipe. Your drain system relies on simple gravity.

The concept is that by flushing waste down the pipes with water, for example by flushing a toilet or running a faucet, gravity will aid the water in removing waste from the building. Unfortunately, the advent of water-efficient fixtures, such as low-flow toilets and aerated faucet heads designed to reduce water consumption, mean there is less water to help carry away the waste. The result is a greater opportunity for build-up within your piping system and an increased likelihood of clogs.

#### What Goes Down Must Come Up

Because DWV systems are not pressurized, they must breathe. When you turn on your sink's faucet, water goes down through the sink drain into the P-trap underneath your sink. As water builds in the sink, it pushes through the P-trap and down into the drain line. In doing so, the water is replacing air in the pipe, but that air needs someplace to go. This is where the vent pipe comes into play, enabling the air to escape, thus allowing the system to "breath."

P-traps are designed to keep the stinky air given off by the wastewater inside the pipe, thereby preventing odors from backing up into your apartment. Instead, the vent lines run all the way up through the roof of your building, venting into the atmosphere,

While you may think a pipe this clogged has to be a drain line, it is actually a vent line that has been completely filled with corrosion, preventing the DWV system from functioning properly

where the odors immediately dissipate into the outside atmosphere so you don't smell them.

Because smaller amounts of water are used these days, waste will often sit in the pipes for extended periods of time before being completely purged from the building into the city's wastewater system. By sitting longer in your pipes, decomposition begins to occur, increasing the amount of gases moving up through the vent lines. The more gas you have, the more corrosive the environment becomes inside the pipe, making your vent lines more vulnerable to problems.

Corrosion, shale build-up, rust and even drain line back-ups that flow up into the vent portion of the piping system can all cause the vent lines to become compromised. Sometimes we pull pipe from a building and owners

assume it's the drain line that is clogged because the pipe is completely full of debris, when in fact it's a vent line that has become clogged with corrosion, preventing the drain system from functioning properly. (See Figure 1)

#### **Preventative Maintenance** is Your Friend

If your community does not have a pipe cleaning or maintenance schedule, you need to implement one. Without it, you will be more susceptible to clogged pipes. If you are not having clogs yet, start on a maintenance plan now and you can significantly extend the usable life of your plumbing system. Your current plumbing service provider is the best place to start, and they can provide recommendations for maintenance options and a proposed schedule.









The reduced capacity of this drain line was causing serious back-ups, and was not fixable with a snake or hydro-jetting, but rather required a full system pipe replacement.

#### **Identifying Your Clog**

If you already have symptoms like back-ups, slow drains or odors, it means your system is no longer operating as it was engineered to perform. There are typically two types of clogs: one-off blockages from someone putting something down the drain that they shouldn't have, and systemic clogs resulting from a compromised plumbing system.

#### **Cleaning Your Pipes**

Clogs can be cleared in a number of ways including a mechanical "snake" that is inserted into the pipe with the intention of breaking up the obstruction, and hydro-jetting which employs a high-pressure stream of water to break through any blockages and clean out the pipe. It's kind of like pressure washing, but for the inside of your pipes. Snakes work best for shorter runs (50 feet or less) and for smaller diameter pipes. Hydro-jetting works better for longer distances and larger pipes, but carries the risk of doing damage to older, degraded piping systems.

Either way, breaking up a clog and clearing a pipe blockage is as much of an art as it is a science, so hire someone who is experienced with diagnosing and unclogging drains, as it will surely save you money in the long run.

#### **Replacing Your Pipes**

If you have tried clearing your clogs and find that blockages continue to come back, you most likely have a systemic problem that needs a more serious solution. In this scenario, an appropriate next step is to visually inspect or "camera" your lines to see what kind of blockage or breakage you may have, where it is located and whether or not it is severe.

If your problems appear to be building-wide, work up a clear game plan with your contractor regarding your options. If your clogs are systemic, or beyond repair, it may be worth exploring pipe replacement options. (*See Figure 2*)

Today, full-system pipe replacements are more common than you would think, with contractors offering options where residents do not need to move out, and where water is guaranteed back on nights and weekends.

Eric Lecky is the chief marketing officer at Sage Water, Hawaii's leading pipe replacement contractor. Sage Water has replaced more than 32 million feet of pipe in over 85,000 occupied residential units. Reach him at elecky@ sagewater.com.



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#### EXPERTS | SOLAR

### The Maturing Use of Stationary Storage

New battery technology is changing the way we do electricity

awaii is in many ways leading the way in the intermediate stages of an electricity storage • boom. Battery costs continue to go down, dropping by as much as 35 percent in the last 18 months, and grid electricity costs continue to rise.

Facility owners and utilities are growing in their understanding of how to extract value from storage. We still have a ways to go, but it is clear that grid storage is here to stay, and will change the way society does electricity. Now is a great time to invest, but it is important to understand the nuances of the current and future values of energy storage and the tax and regulatory environment before making a commitment.

#### Storage Systems

Lithium ion batteries continue to dominate the energy-storage landscape. Other chemistries are being explored and are in development, but none are currently competitive in respect to both price and maturity. Having said that, there are actually two main chemistries for stationary and electric vehicle applications, the two markets dominating demand. Lithium Nickel Manganese Cobalt Oxide (NMC) and Lithium Iron Phosphate (LFP) are the two dominant chemistries today. NMC is more power-dense and capable, but LFP is usually less expensive and safer.

In addition to variation in battery types, energy-storage systems require sophisticated power electronics and software. These are the components that control and integrate the energy storage so that it is able to provide the expected value for a facility or the utility grid, or both. With the right power electronics solution, an energy-storage





system becomes easily controllable and modular with simple expansion or reprogramming as a facility's needs change and grow.

Facilities managers looking to invest in energy storage should look beyond the batteries to the full energy-storage system package. And don't be confused by discussions around price per kwh. You may hear numbers like \$200-300/kwh, but that is for the battery alone. Installed costs will run \$700-1,000/kwh, which includes enclosures, controls and switchgear.

#### Storage Benefits

The most reliable benefit that energy storage provides is allowing excess daytime PV production to be stored for use later at night. Especially as Hawaii's electric grids achieve a higher percentage of energy during the day from solar, this is an important feature of energy storage. In fact, many individuals who want to install solar at their homes or businesses are not allowed to push any of their excess PV production into the grid because of new utility rules. Since PV production

often exceeds electric load during the middle of the day, energy storage has become an essential part of many new PV systems.

For many commercial facilities, demand charges make up a large part of electric bills. These charges are based on a facility's peak load. With energy storage, batteries can cover a portion of peak load, significantly reducing the demand charge. The value is greatest for facilities that have a "spiky" load that peaks for short periods throughout the day.

In addition to savings on utility bills, energy storage can provide backup power for critical electrical equipment. The potential for backup power is greatly enhanced when PV and energy storage are combined. This allows a facility to become a self-sustaining microgrid able to operate independently of the utility grid during emergencies.

#### Microgrids

In a microgrid system, energy storage provides power on demand when it is



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– Brian Bowers



#### From page 40 🕨

needed, while PV generation recharges batteries on a daily basis, allowing the facility to continue operating indefinitely. This kind of system does not rely on diesel fuel, which can become scarce in emergency situations. With an effective emergency operations plan, critical loads such LED lights, water pumps for firefighting systems and elevators can be maintained during short- and long-term electrical outages.

Much is happening with utilities in their thinking around storage. Utilities see that storage is here to stay, and while utility-scale storage is cheaper for them than storage behind the meter, you can reduce your costs even more by deploying storage on your site. In the near future, energy storage will provide values beyond individual facilities as Hawaiian Electric rolls out its grid-services programs. These programs will pay customers for enrolling their energy storage assets to perform critical grid stability functions.

Energy stakeholders, including Hawaiian Electric, the Public Utilities Commission and the Legislature, are in agreement that a stable grid with high renewable energy penetration requires energy assets to work in a coordinated fashion to improve energy service for everyone. As a part of this vision, facilities with energy storage will get paid for the services that their energy storage provides to the larger grid.



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#### "Stacking"

The most exciting thing about energy storage is that many of these values can be achieved at the same time, or "stacked." A battery that stands ready to provide backup power if the grid goes down can also discharge when load spikes to keep demand charges in check, and it can also store daytime production for use at night. And as Hawaiian Electric gains the capability to tap into and pay for the use of energy storage assets through demand response, the ability to "stack" values will grow even more.

Energy storage assets can last for more than 20 years, with battery replacements about every 10 years. During that time it is important to have a system that is flexible to be "future proofed" as new opportunities for value arise.

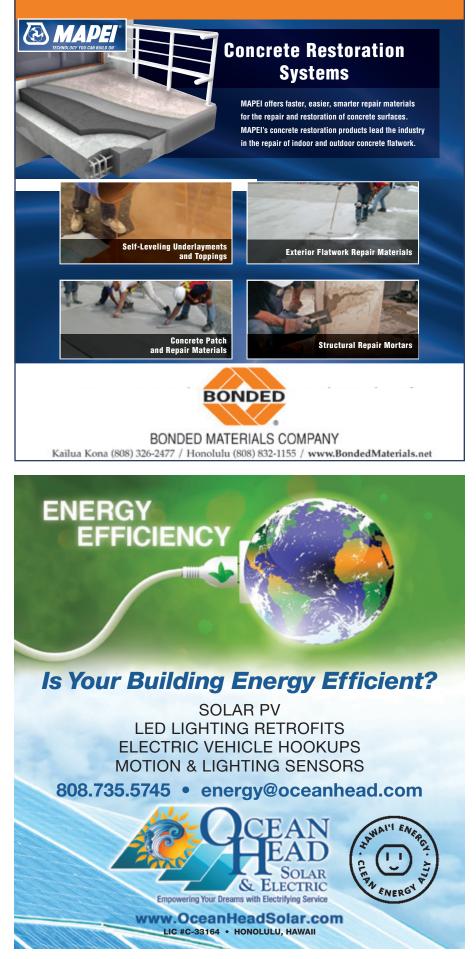
#### **Energy by Design**

To maximize the benefits from energy storage, customers should work with trusted partners with the expertise to recognize the right solution for their individual needs, both financially and technically. This means a partner who understands everything from the broad view of utility policy to the details of electrical load analysis. Sophisticated companies are even able to provide nomoney-down financed solutions that make energy storage an easy decision.

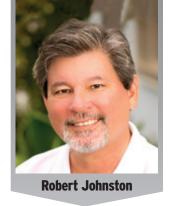
With the right partner, energy-storage assets can be designed to meet the exact needs of a particular facility, taking into account goals today and in the future.

Ted Peck is the CEO of Holu Energy, a full-service energy development company, and a partner of EnSync Energy Systems, a leading energy management technology company. He has more than 25 years of senior leadership experience in business, government and energy management, including development of the Hawaii Clean Energy Initiative as the state's energy administrator. He can be contacted at ted.peck@holuhou.com.

Matt Choy works in project development at Holu Energy, where he seeks to maximize the financial return on investment for customers who choose to invest in energy systems. Before joining Holu, he worked on energy policy at the federal and state level. He can be contacted at matthew.choy@holuhou.com.



# What to Look for in a Solar Contractor for Commercial Buildings



It starts with experience in the commercial sector

n an industry as popular as the solar industry, there are multiple contractors. How do you choose the one who is right for you?

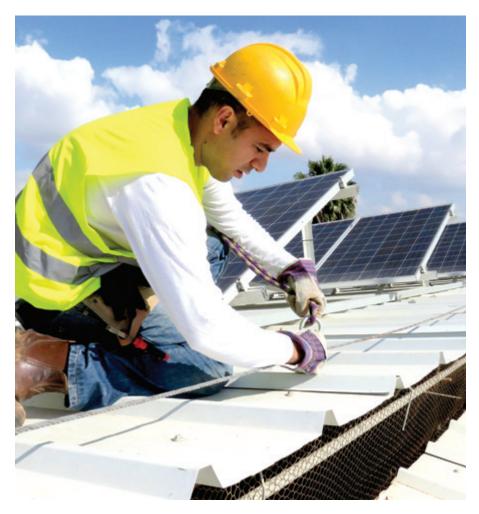
Experience in the commercial-industrial space is significantly different than that of residential contractors, and should be the first thing you look for in your evaluation process. The design, engineering and interconnection options are more intricate for commercial buildings. Further complicating the process is that each island has its own rules. You want to look for a contractor who has operated on multiple Hawaii islands.

A key area of differentiation for commercial contractors is safety protocol, which is considerably more rigorous for commercial-industrial buildings than it is for homeowners.

Hawaii Occupational Safety and Health Administration (HiOSH) is one of 26 jurisdictions approved by the federal Occupational Safety and Health Administration (OSHA) to operate its own state safety and health program.

Another area of distinction is the overall makeup of commercial-industrial buildings: Roofs are higher; there are public areas and a larger number of occupants in the building and in the surrounding area.

Installing solar on a building in heavily trafficked commercial spaces is an entirely different process than on a single-family residential dwelling. Look for a contractor who has a variety of commercial experience from shopping centers to warehouses. These contractors understand the scope and idiosyncrasies of indus-



trial projects, and have developed a sixth sense about issues and how to work out solutions.

The nitty-gritty, however, is in the analysis of the available interconnection programs. Residential contractors deal with limited interconnection programs, whereas commercial contractors must analyze multiple options.

An experienced commercial solar contractor should be able to give you a track record of analyses they have performed for other customers. Ask for references and a list of clients. There are a number of different approaches, including a storage component, and a top-notch contractor should provide a variety of interconnection options. These include the permits needed and the approximate time needed to get them.

Also, place value on a contractor who can maximize the productivity and longevity of the solar installation with its operations and maintenance



program. Preventive maintenance in Hawaii with its proclivity for rust is key. A good O&M program looks for the early signs of corrosion and rust, makes repairs before a problem develops, and also notes which areas are more likely to develop issues in the future. Regular inspections and maintenance are imperative for a successfully operating system.

If something does go wrong, you want a contractor who'll immediately roll a truck and make repairs. Downtime is not your friend.

Yes, there are multiple commercial solar contractors and several who can fill the bill for all or some of the recommended specifications above. Make trust the tipping point in your selection.

Trust that your contractor will be available to you in the years to come. Trust that they are involved in the Hawaii community and value their reputation. Trust that they will continue to be your partner and provide the best possible advice and service.

Bob Johnston provides management and financial expertise and oversees the day-to-day operations of Hawaii Pacific Solar (HPS) and is the co-founder of Landtec, a Maui-based real estate development company. Before forming his own company, Johnston was vice president of finance and development for Hilton Head Company, one of the largest real estate developers and resort operators in the Southeast. Johnston sits on the boards of Hawaii Nature Center and South Maui Renewable Resources (SMRR). Contact Hawaii Pacific Solar at hawaiipacificsolar.com.

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# **Boosting Low Water Pressure in Your Facility**

New incentives are available for a system upgrade



Rachel Fukumoto

he top floors of condos and apartments in Hawaii tend to have amazing views of our Island paradise. But as you might imagine, one of the tradeoffs can be poor water pressure for people who live there.

We've all heard the awful stories: Folks not being able to take a shower when the washing machine is running, or the water slowing to a virtual stop right in the middle of someone shampooing their hair. That's no way to live.

One effective way for building owners and property managers to address this issue is to upgrade the facility's domestic water pumps, more commonly known as booster pumps. Any building taller than six stories, whether it's an apartment complex, hotel, hospital or dormitory, has booster pump systems that can be sized correctly for the facility.

Retrofitting to the latest booster pump with variable frequency drives (VFDs) not only means consistent, increased water pressure for all floors, but the pumps also provide 20 percent to 50 percent savings in electricity usage related to water pumping.

With or without a VFD, booster pumps still run 24/7. But with the installation of a VFD, your booster pump system would be able to adjust itself depending on the demands of water use in the building at any given time. This means your booster pumps can idle down when your tenants don't need as much water, which leads to greater energy savings and a lower electric bill.

Financial incentives are currently available on Oahu and Hawaii Island and in Maui County that can help pay for booster pump upgrades. Your building may be eligible to receive significant rebates if it meets the following requirements:



- The project must be a booster pump retrofit only.
- Total motor horsepower (HP) must be less than or equal to the existing system, limited to system reduction of less than or equal to 129 HP.
- All motors must meet Consortium for Energy Efficiency (CEE) Premium Efficiency Standards.
- Project must be pre-approved before retrofit work begins.

Right-sizing your booster pump system is one of the keys to success. Be sure to perform a water audit of your complex (and energy audit, while you're at it). Contact a professional who can assess the water pressure, and determine what's right for your building's needs. Installing an energy-efficient booster pump might be the right solution for your water pressure woes.

Rachel Fukumoto is an energy efficiency adviser with Hawaii Energy who serves as a program specialist. Rachel is primarily responsible for assisting building managers in identifying energy-saving opportunities and implementing efficiency and conservation initiatives to reduce utility and operational costs. Reach her at 848-8554, rachel.t.fukumoto@leidos.com or go to hawaiienergy.com/incentives/ pumps-motors.

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# What's Your Photovoltaic System Maintenance Plan?

A checklist of what to do and things to look for

ongratulations! You have taken the step that upgrades your property by saving electricity, and have purchased a photovoltaic system.

But now what? Do you just leave your investment to sit and do its solar thing?

No. You need a plan to ensure your investment will work for the long haul. Your installer should have given you the installation guides on your equipment, and in each of those guides is a maintenance section. They recommend an annual cleaning and inspection to keep your system at its peak, and to ensure you maintain your warranty.

You want to have—at a minimum—a basic photovoltaic system maintenance plan. This plan will include, but will not be limited to:

**System Knowledge.** Explains the layout of the system, and where everything is located. Keep the as-built drawings in a binder.

**Equipment Knowledge.** Explains the equipment's basic specifications, and what their functions are. Keep the equipment manuals in the binder near the equipment.

**Monitoring Knowledge.** Explains how the monitoring system works on your site, and how to use the interface and interpret the data. Keep the monitoring manual in the binder. If these are unknowns, contact a trusted company that can provide this information and explain these procedures.

- Schedule regular monitoring intervals and a method to record the data.
- Schedule a visual inspection of the system annually (at a minimum).
- Schedule a comparative analysis

of system performance to ensure your system is performing as expected (this can be set up with a good monitoring system).

- Schedule system cleaning annually (at a minimum).
- A photovoltaic cleaning and maintenance company can help set up these items if they are not in place already. Since an independent PV cleaning and maintenance company is usually not affiliated with the installer, it can work as a neutral third party to help guide you through your ownership, just as you would hire an accountant to work with your books, or a lawyer in a legal matter. They are always third-party people who work to protect you and your best interests.

When you build a solid PV system maintenance plan, this will ensure that you understand what is on the roof and the functions of your property's system. You must also maintain a good record of work done on the system. It is designed to last more than 20 years, so you want to make sure it operates as designed the whole time. The best way to keep any piece of equipment operating for a long period is through regular maintenance.

During a system inspection, think of system items that will be checked as being located on a line. It is recommended to start at the utility interconnection, and look for any disconnects in this area. When looking at the utility meter, look at the connection from the PV disconnect. This should be labeled as a "PV system disconnect." This can be referenced to your solar PV labeling requirements in accordance with NEC code 690 and 705. If you have a central inverter, you want to make sure it has the proper labeling that shows what the system is able to make. You also want to check if any creatures-such as mud wasps—are living in the handles.

You will also want to look at related equipment in the area, and make sure that it is in good shape and that you do not have any corrosion.

When you get to the PV system itself, you are going to want to make sure





the piping and all the pull boxes are in good condition. You are looking for any damage—rusting, corrosion. You will check under the PV panels—yes, under the panels—looking for hanging wires, animal infestation or nesting.

When looking at the PV panels, you want to check the connecting clamps that hold the panels in place on the racking. Looking at the panels, you want to see if there is any physical damage or blemishing on the panels. You are checking to make sure there are no obvious issues.

Here are some images and examples of what to look for:



Labeled system disconnect



Proper labeling on the disconnect that displays system production numbers. This handle was home to a happy mud wasp.



Bending conduit on the roof. This can damage the wires and lead to problems.





Hanging wires that sit on the roof deck are subject to sitting in ponding water.

ajestic

Hanging wires: They will continue to rub against the roof deck and expose the circuits, creating a safety hazard.



Broken conduit at the junction box. This conduit was broken by bending and then pulling out. Wires are now exposed to the elements, becoming damaged and are creating a hazard from the edge of the piping.

Please see page 58 ►



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#### EXPERTS | SOLAR

## **Rooftop Solar: Pros and Cons**

How a great solution could turn into your biggest nightmare

awaii is one of the best places to live in the world, with amazing weather year-round, a wonderful spirit of aloha and an abundance of natural resources everywhere we turn. Hawaii enjoys 250- to 300-plus days of sunshine a year, making it the perfect environment for solar photovoltaics (PV).

And while it is important to protect our valuable natural resources and build a sustainable future with PV, we also need to focus on installing PV systems to the highest standards possible.

PV installation is typically seen in one of three ways: rooftop, canopy, ground-mount. Building-integrated solar photovoltaics (BIPV) is the technical term for rooftop solar.

Rooftop systems are the most prevalent installations in Hawaii for several reasons, including cost of installation and lack of available land for carports and ground-mount systems. They also provide the building owner with a valuable asset on their building and when done correctly—can increase property values.

But a successful PV installation is one that properly integrates with, and preserves, the surface it's being installed on. If the PV system is not properly installed and compatible with the roof, it can lead to a multitude of problems down the road costing time, money and unnecessary headaches for building owners and operators.

The two main types of rooftop PV are ballasted and mechanically attached systems. Ballasted systems sit on top of the roof surface and rely on weight—"ballast"—to hold the system in place and prevent wind uplift. Mechanically attached systems are physically attached to the building structure, usually by means of mechanical fastening or connecting to the building's structural components.

While ballasted PV systems typical-50 BUILDING MANAGEMENT HAWAII JUNE 2019

ly are much easier to install and less impactful to building occupants, they have their drawbacks. Most ballasted systems sit relatively close to the roof surface, usually allowing no more than six inches between the bottom of the PV panel and the roof surface. These low clearance systems are not as exposed to wind loads, but do prevent access to the roof surface and can create additional heat loading on the roof membrane.

Additionally, the concentrated load from the ballasts can crush the roof at the ballast support areas if the roof materials are not strong enough. This can lead to ponding water and accelerated degradation of the roofing materials. If the roof structure is not strong enough, the added weight from the ballasted PV system can, in the most extreme case, cause significant structural degradation and even potential collapse.

If you are considering a ballasted PV

system, it is important to think about the following three questions:

- Can my roof system support the added concentrated loads from the ballast pans?
- Is my roof in good enough condition that I won't have to worry about maintaining or accessing it for the life of the PV system?
- Do the ballast supports provide sufficient protection to prevent cutting or damaging the roof?

The other typical rooftop PV installation is mechanically attached systems. These types of installations have several benefits over ballasted systems, including increased structural capacity, ability to provide clearance between the array and the roof surface, and easier maintenance of the roof and PV wiring.

For long-term roof maintenance,

Ballasted PV System with slip sheets beneath ballast pans





mechanically attached systems with high roof clearance (greater than 12 inches) allow for inspection and maintenance of the roof. They also allow for airflow between the roof and the PV system, which helps dissipate heat loading. But they also have several downfalls. The installation is more impactful on building occupants, especially on concrete decks where the noise from the anchor installation can cause significant disruption to building operations.

Additionally, they involve opening up the roof system to attach the racking, which requires protection from leaks and proper flashing of the racking penetrations. Another issue with having to penetrate the roof membrane to install mechanically attached systems is loss of roof warranty if the flashing work is not done by a roofer certified by the manufacturer of the roof.

While each type of rooftop PV has its pros and cons, there is one common factor that applies to both types: It is important to have a roof system that has a life expectancy close to the PV system, which is typically more than 25 years nowadays.

Two common themes with rooftop PV are installation of old or failing roofs and improper integration of the PV system with the roof system. Improperly installed rooftop solar can lead to problems as simple as leaks to loss of warranty and even disastrous failures, in extreme cases.

When considering the installation of rooftop solar, be sure to ask lots of questions. Specifically ask whether your PV contractor has retained the services of a licensed, qualified roofer prior to starting a project. By paying attention to these key factors, you will be able to make an investment in renewable energy that provides years of headache-free benefits.

Jonathan Shick is the owner of Pono Consulting Group, a full-service construction management consulting firm in Honolulu. He has served as general contractor, consultant, designer, quality assurance manager, construction manager, project manager and expert witness for more than 13 years, with eight years specifically focused in roofing and solar. Reach him at jonathans@ponocg. com or 213-0533.



Poorly sealed flashing at PV standoff





# Your New Job: Energy Manager

The new reality of running a building in the 21st century

ou probably didn't apply for it, and maybe they didn't even tell you it was your job, but guess what—you are now an energy manager. This is the reality of building management in the 21st century, and this job comes with a lot of new duties: tracking and reducing energy usage, billing tenants and common areas.

Do you have solar? How well is it producing? And what about EV chargers and battery storage?

Managing your business's energy can be a confusing and time-consuming process, but fortunately there are a host of solutions to help you through these changes. Choosing the right ones can save you both time and money.

#### **Tracking Energy Usage**

As an electricity consumer, you receive a monthly bill showing your daily consumption. This gives you an overall sense of the amount of power you consumed, but little information on where and how it was used. To really find out where your power is going, you need a smart CT (circuit transformer) meter.

Smart CT meters read the power coming through your breaker box and transmit that data over the internet. This allows you to look at specific circuits in much smaller time increments (generally 15 minutes), and see how much energy was consumed.

As management thinker Peter Drucker says, "You can't manage what you can't measure." The smart CT gives you the measurements to make smarter decisions. Most building managers can reduce their overall consumption by 8 to 10 percent with just this tool alone. Changes to off-hour lighting and HVAC schedules can be seen the next day and thus optimized much faster. Having interval data allows you to balance your large loads complicated when you have 50, or 100, different meters to gather data from.

#### A Good Solar Plan

As we move forward toward Hawaii's goal of 100 percent renewable energy by 2045, solar panels are popping up everywhere. With the right planning, these can be a great way to save on energy costs. Poorly planned, just the opposite can be true.

If you are thinking of adding solar panels to your building, one of the first things you need to know is your base load. This is the minimum amount of power consumed throughout the day to keep your building running. Simply dividing up your HECO bill will not give you accurate data.

The base load tells you how much PV energy you could produce and consume on-site. Any extra power produced will be sold back to the grid at almost half of the current rate. If you build too large of a PV system and end up overproducing, you will find the cost savings of your system to be significantly less than projected.

In addition, solar systems require maintenance for optimal production. Components will break or go offline,

#### and avoid peak demand charges.

#### **Sub-Metering Tenants**

Do you charge your tenants for electricity? In the past this has been done by taking the total electricity for the building and dividing it by the square footage for each tenant. The problem is that it creates no incentive for tenants to reduce their power consumption, since any savings are shared with everyone in the building.

Revenue-grade smart meters solve this problem. These are CT meters that meet higher standards so that the data can be used to bill tenants. By adding a smart meter to tenants, you are able to charge them for their actual consumption.

One often-overlooked challenge with sub-metering comes in the reporting and billing. Most smart meters provide you with web access to the data, but how they provide it varies significantly between manufacturers. Some store their data in the cloud, giving you 24/7 access. Others store it on the device, and if that device goes offline you can't see your data.

Some will give you an individual login for each meter, while others aggregate multiple data streams. This can get





and if not fixed quickly the lost production multiplies. Adding an energy storage system (ESS), aka batteries, to the energy mix adds a level of complexity that should be discussed in a dedicated piece. However, it's safe to say that having the proper monitoring in place will make sure your investment is giving you the returns you deserve.

#### **EV Charging**

According to Bloomberg, electric vehicle sales are expected to grow rapidly over the next 10 years, reaching annual sales of over 30 million cars by 2030. This is going to require a lot of chargers, and for you as an energy manager this will become an important responsibility.

Choosing the right location for your EV chargers can be one of the most important decisions. Having to trench and fill concrete can easily double your costs. You also need to make sure that adequate power supply and necessary breakers are nearby.

You will also need a plan to finance

the electric costs of charging. Different chargers have different software and unique features. Some offer the option to pay for a charge with a credit card, while others have account-based billing for employees or tenants. One common complaint for EV drivers is that chargers are out of service. Don't forget to include a plan to monitor and maintain your chargers.

#### Things to Consider

Most new components (solar, EV chargers, energy monitoring, tenant metering) are internet-enabled, giving you some monitoring and access to data. As you move along with your energy plan, you may find it makes sense to see all of these different data streams in one location. Software-based monitoring services can pull data from all of these devices, letting you see it in one central dashboard.

Make sure to use a licensed contractor for installation, and that all components are 100 percent functioning before making the final payment. Log into every device as they are installed to make sure they are transmitting the correct data.

Also get a copy of the as-builts, logins and passwords, warranty sheets and any permitting information that was part of the project. Going back to track this down can be very frustrating and time-consuming.

Choosing quality components, qualified installers, and testing the system before signing off will save you a lot of time and money. These projects are long-term investments that should save you money for years to come.

Zoltan Milaskey is the founder and president of Mana Monitoring. He holds a master's in environmental management and has more than 10 years of experience in the construction and renewable energy industry in Hawaii. Reach him at 280-1395 or zoltan@ manamonitoring.com or go to manamonitoring.com.





# Woes at Waiea

#### New board files lawsuit against Nordic for building defects

#### **BMH STAFF**

Spending \$3.6 million for a condominium will buy you a lot.

A lot of trouble, that is, including loud popping sounds coming from windows that resemble sonic booms.

At least, that's what the board of the luxury Waiea condo tower in



Kakaako's Ward Village alleges in a lawsuit filed in state court last month. The suit against contractor Nordic PCL Construction Inc., as well as possible still-unnamed sub-

Kenneth Kasdan

contractors, designers and suppliers, raises again claims originally brought in a 2017 suit by Waiea developer The Howard Hughes Corporation. That case sought \$75 million in damages for what it claims are defects in construction, plus cost overruns and late delivery. The board at that time with a majority of members affiliated in some way with Hughes—declined to join the suit but reserved the right to file its own suit against Nordic at a later time.

A judge ultimately dismissed the Hughes suit, saying Hughes had not followed legal protocol that calls for mediation to be attempted in such instances. An April election replaced four of five board members with ties to Hughes.

The board's new case alleges the building has more than 100 defects, causing it to be so unsafe that it is not habitable, resulting in property devaluation.

That clearly is not what owners thought they were getting in the 171unit building that was billed as "the pinnacle of luxury living" when it opened three years ago. The average unit cost at opening was \$3.6 million.

A Nordic spokesman declined to comment on the ongoing legal matter. In the previous case, Nordic argued that defects, including the curved windows, were caused by Hughes' design plans, not the work

"Instead of being one of the most sophisticated, luxurious buildings in Honolulu, Waiea is riddled with construction defects, several of which have marred its reputation and market value."

of any contractor or subcontractor.

Other problems cited in the board's suit include discolored pool grout, ill-functioning pool cabanas, faulty air conditioning, inconsistent hot water delivery and a parking garage door that doesn't work properly.

The board's suit claims: "Instead of being one of the most sophisticated, luxurious buildings in Honolulu, Waiea is riddled with construction defects, several of which have marred its reputation and market value."

Kenneth Kasdan, an attorney representing the Waiea board (and an occasional *BMH* contributor), said



more than 65 percent of owners voted to file the suit.

A pending countersuit brought by Nordic claims Hughes failed to pay \$40 million for completed work and was ultimately responsible for delays and cost overruns, and asks the court to attach liens to still-unsold Waiea units.

Another pending suit was brought by subcontractors against both Hughes and Nordic. The board is asking to join that complaint while also pursuing its own case.

Nordic last month delivered another Kakaako residential project, Ke Kilohana, to Hughes.

# Taking a Load Off Building Managers

#### The city considers changes to rules for bulky item pickup

Condominium resident managers and their aching backs—got an apparent reprieve last month when the City & County of Honolulu's Department of Environmental Services reconsidered a proposed change in rules for bulky item pickup. The change would have put the responsibility for scheduling pickups of bulky trash items for residents—and for storing those old couches and washing machines until the scheduled pickup—squarely on the shoulders of building managers.



*BMH* legal columnist Jane Sugimura, in her role as president of the Hawaii Council of Associations of Apartment Owners, had a hand in the decision to revisit the pilot

Jane Sugimura

program that involves 70,000 condos and single-family homes from Foster Village to Hawaii Kai.



Many buildings have just one person to do building management, she said, adding that it's both unfair and impractical to ask a site manager or resident manager, usually an employee of the association, to schedule large-item pickups for a building with hundreds of units. It could turn into a fulltime job in larger buildings, while also posing a potential liability issue for an association to have an employee moving large items to the curb the night before a pickup.

The sudden change is why the city is calling this a pilot project, DES deputy director Tim Houghton said, allowing for policy revisions, to which he could be amenable.

The new policy was nevertheless scheduled to go into effect on June 3, pending changes.

Sugimura said associations prefer that individual owners be responsible for scheduling pickups of large items.

### Free Smoke Alarms for Seniors

No smoke alarm in your home? Or is your smoke alarm more than 10 years old? Does your alarm need new batteries? When was the last time you tested it?

The American Red Cross of Hawaii, in conjunction with the Honolulu Fire Department and other partners, is offering to install free smoke alarms in the homes of Hawaii seniors.

It's a serious problem, as Hawaii has learned too well in recent years. On average, according to the Red Cross, seven people die every day in the United States because of home fires. They say a working smoke alarm cuts the risk by 50 percent. If you have an interest in being part of the solution, call the Red Cross at 739-8111, leave your name, phone number and address. You'll receive a callback to schedule an appointment to install smoke alarms.

The Red Cross Home Fire Preparedness Campaign's goal is to reduce home fires by installing smoke alarms, teaching residents how to test them monthly, and helping create and practice a fire escape plan to get residents out of their home in two minutes or less.

Homes with children under the age of 18 may also qualify.









James and Kathie Hallstrom

Jeremy and Noelle Shorenstein, Derek Lock, Connie Lau, Mel Kaneshige

### NAIOP Presents Kukulu Hale Awards

#### PHOTOS BY NATHALIE WALKER

The Hawaii chapter of the National Association of Industrial and Office Properties presented its annual Kukulu Hale Awards on May 3 at the Royal Hawaiian's Monarch Room. The awards recognize excellence in the Islands' commercial real estate industry as well as top developers and engineers.



Duff Janus, Ian MacNaughton, Emily Reber Porter, Brett MacNaughton



Dean Hirabayashi, Marie Imanaka, Jenny Lee, Timothy Yi 56 BUILDING MANAGEMENT HAWAII JUNE 2019



Tiffany Tabbal, Michael Jenkins, Taryn Takiguchi



Glen Kaneshige, Larry Heim, Joyce Timpson, Jason Suapaia, Francisco Gutierrez



Phil and Jennifer Camp



Mike Taylor, Sean Tadaki, Alana Kobayashi Pakkala, Patrick Kobayashi



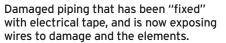
Daniel Cody, Scott Settle, David Berry



Layne and Evelyn Machida

Guy Churchill, Carol Marx, Jackson Nakasone, Sasha Settle, Margaret Murchie, Paul Marx



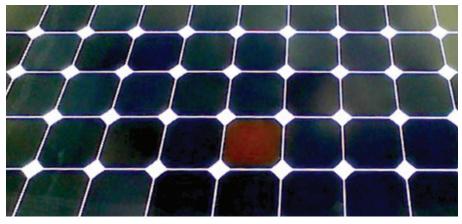




This damaged wire caused a short in the system, and has an arc mark on it. Luckily, that was all that happened due to the wire not being properly secured and protected. A burn mark can be seen on the rail



This end clamp is properly installed, but the grounding clip is not being used as intended.



Burn mark on panel.

Fred Brooks concentrated in engineering while serving eight-and-a-half years in the U.S. Navy. He earned a bachelor's degree in environmental science at HPU while taking photovoltaic engineering courses. He began working in the photovoltaic industry in 2006, and started the first solar cleaning and maintenance company in Hawaii in 2009. His credentials include Certified Energy Manager, Certified Energy Auditor and Level II Thermographer Certification. Reach him at 772-4705 or fred@ pacificpanelcleaners.com.



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