

**Performance-
Driven Design**SM

by CallisonRTKL

STATE OF THE [GREEN DESIGN] UNION

CallisonRTKL Sustainability Update

CALLISONRTKL[®]
A DESIGN CONSULTANCY OF ARCADIS



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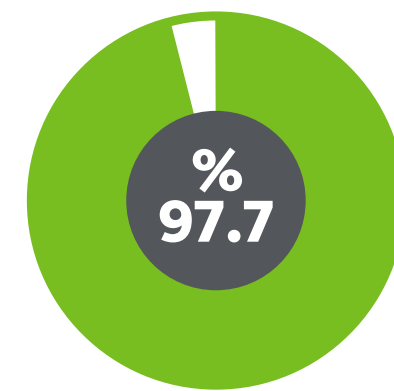
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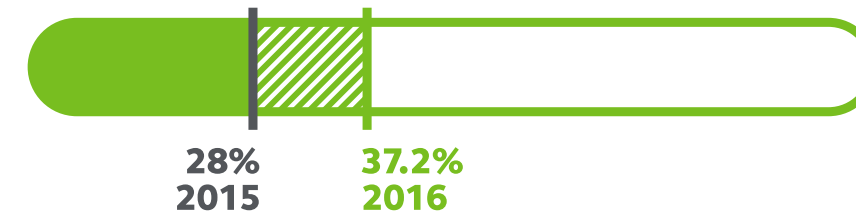
The Update

2016 Achievements

**97.7% OF PUBLIC
WORKPLACE
PROJECTS
ARE GREEN**



**AIA 2030
COMMITMENT
GONE FROM 28% TO
37.2% IN 2016**



**95% OF OUR
HEALTHCARE
OUTPATIENT
PROJECTS
ARE GREEN**

**60% OF OUR
HOTEL PROJECTS
ARE GREEN**



**935 LEED GA/AP
ACCREDITED
EMPLOYEES**



**87% OF OUR
MULTI-FAMILY
RESIDENTIAL
PROJECTS
ARE GREEN**

When it comes to design, the state and future of the union are green. But what does that really mean? The definition of sustainability has changed and is no longer ruled by a rigid checklist. Certification is still important in some circles, but clients are becoming generally less interested in

pursuing green building certifications. That's not to say that clients don't want sustainably designed projects or that they don't see the value that sustainability brings to the bottom line, but it's a broader sensibility and commitment that guides our design work rather than very specific requirements.

Despite wide-ranging bad news about climate

change and recent proposals to slash environmental regulations and budgets, the market has spoken on sustainable design and the consensus is that it's here to stay. And that's true from the crunchiest startups to

the biggest corporate institutions. A 2014 study by the Carbon Disclosure Project, a non-profit organization, found that S&P500 corporations leaning towards sustainability saw an 18% higher ROI than those that are not and 67% higher ROI than those that didn't disclose emissions information at all.

Other signs show that the free market is heading in a greener direction as well. The [Global Real Estate Sustainability Benchmark](#) (GRESB) is just one organization issuing standards for how companies should disclose sustainability performance and enabling financial institutions to make better lending choices, and it's growing rapidly — it now covers more than 66,000 assets across 63 countries on 6 continents with a total gross asset value of \$2.8 trillion. These numbers are impressive, but the real marker of success for GRESB and the planet is this: companies and funds reporting to the GRESB significantly improve over time. Entities reporting for 7 years outperform the global average by 12 points and even the most staunch climate change deniers can't argue with a bottom line like that.

The Big Questions

As architects, we sometimes fall back on “eureka moments” but as an industry, we're still searching for institutional policies that can ensure

Entities reporting for 7 years outperform the global average by 12 points and even the most staunch climate change deniers can't argue with a bottom line like that.

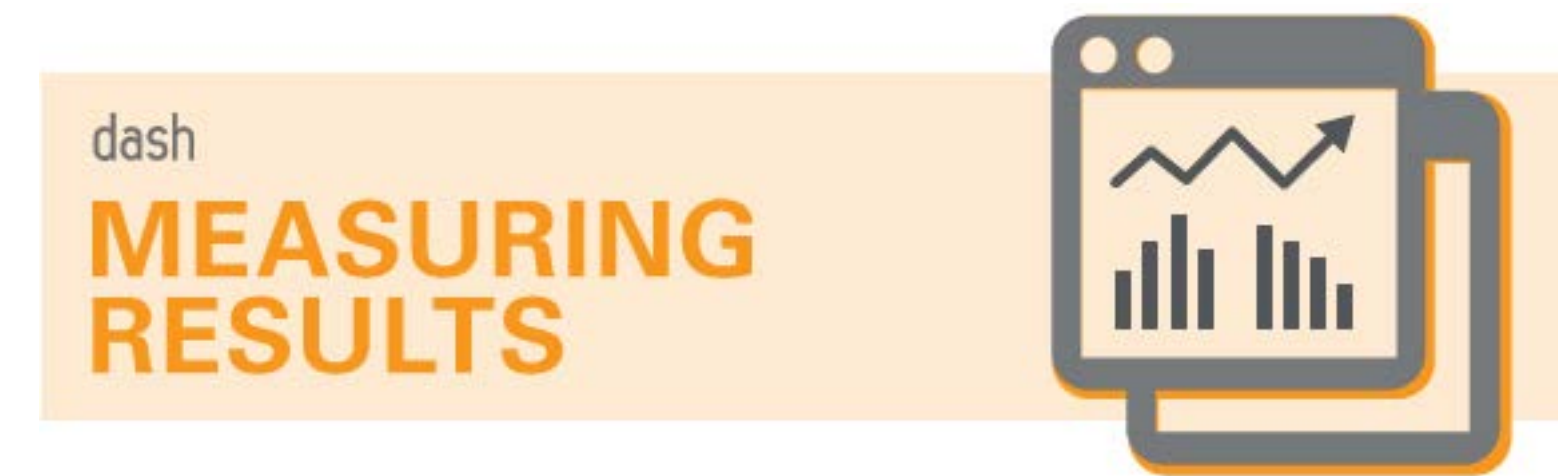
every project incorporates sustainable ideals. It's easy to talk about automating processes and raising the bar on energy, water and cost savings, but it's quite another thing to actually do it across the board.

As a practice, we work on so many different scales, in so many different sectors with so many different clients that it's difficult to talk about sustainable design and resiliency without being overly general. In this update, we went directly to a few of CRTKL's most creative design minds to get their take on the big questions of planet-wide resiliency and urbanistic approaches to sustainability, medium-sized questions of how to make architecture more sustainable, and even small-scale, but no less important, questions of making interiors that are better for the earth and their occupants.

Looking Ahead

Finally, what can we say about where green design is headed? Instead of just looking inward to our own practice, we've looked across the industry to see how values are changing among architects and our clients. Today's most innovative projects are a jumping-off point for the cutting-edge ideas of the future, and in that same vein, our 2016 sustainability update

includes highlights of some of CRTKL's biggest innovations, best projects and most important pieces of research over the past year.



CRTKL is planning a few major sustainability announcements in 2017, including a new DASH tool, which is a repository of project performance metrics that allows us to compare our work against both internal and external benchmarks, our first net zero shopping center and a design for one of the most sustainable office towers in Europe coming online. While we wish we could share all the details now, suffice it to say that 2017 is poised to be a very green year indeed for our practice.



The Big, Medium & Small Questions of Sustainability

The Big Question

The Big Question: What does a truly sustainable city look like?

Design is everywhere. For better or worse, it affects our lives every day, on every scale. From the way your pen flows across the paper, how your office chair swivels, how you get to work, and how it makes you feel when you step into your favorite store. And when all those things become sustainable and combine with infrastructure, planning, flood prevention and the latest resilient design technology, you get a truly sustainable city. A community that not only exists in a certain place, but makes that place better.

So, how do architects and planners take an urbanistic approach to sustainability? How can we, as an industry, push to create truly sustainable cities? Well, you have to start with an urban mindset.

“Urbanism is inherently a sustainable proposition,” says CallisonRTKL Vice President Doug McCoach, who leads the planning and urban design studio in New York City. “We continue to see migration to urban areas, which is a good thing if you’re comparing it to suburban or even ex-urban sprawl. But issues of resiliency and flood prevention are becoming a much more urgent issue in cities across the planet. The water isn’t going to stop rising any time soon. Our challenge is to work with rising water levels instead of against it to protect buildings and people, and become part of the ecosystem again.”

But what about places that don’t have the infrastructure to support a city-level population? What about places that want to attract people back to their downtowns? McCoach says these are places where designers can make a big positive impact and increase sustainability in a big way.

“We have these ‘distressed assets,’ also known as Brownfield Sites, all over the East Coast and we’re being asked to introduce new uses to make them

The Big Question

“Urbanism is inherently a sustainable proposition.”

productive again. To make them not just environmentally sustainable, but economically and socially. The most exciting thing is that we’re seeing and contributing to the reinvention of these places and implementing the best of what we know about cities.”

CallisonRTKL Vice President Jorge Beroiz sees something similar happening in the UK and Europe.

“We are pushing technology to create healthier, more sustainable, more efficient buildings and cities. Our ultimate goal is to not just to be energy or carbon neutral, but to actually create more clean energy than a building uses. To even make a building that responds to its environment, like a tree that provides shade in the summer and maximizes sunlight exposure in the winter. Buildings that react in this way are the future of architecture and of cities.”

Beroiz sees a major shift from just a few years ago. “It used to be that we complied with the code. Certainly, codes are getting better, but that’s not enough for us anymore. We must push beyond what is currently possible. It’s a great moment to be a designer.”

The Devil is in the Details... and the Data

Both McCoach and Beroiz agree that research and so-called Big Data are revolutionizing urban planning, architecture, flood prevention and resiliency strategies.

In an urban planning context, McCoach says it’s about quantifying human behavior and patterns. “Arcadis [CallisonRTKL’s parent company] recently collaborated on a [report on autonomous vehicles](#) and how they’re going to fundamentally change our cities. Uber and Lyft were disruptors in a number of areas when they came out, from car ownership and rental to taxis and even food delivery, but now they’re going even further. The sheer amount of data they generate is astounding; in a city like New York, these companies are tracking movements every two minutes, every day. They know where cars are going and where people need services, so suddenly this somewhat controversial tech and big data are harnessed to help people. The data can be leveraged to show patterns and support economic development and community interests.”

The Big Question

“I think the breakthrough is going to take the form of remembering what was good about cities all along.”

McCoach recognizes the controversy inherent in using people’s data, but says the benefits to communities outweigh the drawbacks.

“The question is how much you trust this technology. It’s getting more secure, but there’s always risk. I do think big data is inevitable with

the digitization of everything. As inarticulate things become data collectors, reporting on different aspects of their use, whether it’s the shirt you’re wearing or the pencil sharpener or your fridge, all of a sudden, all this data is being thrown out there. It’s inevitable that it will find a use in terms of shaping how people live.”

And what does this mean for urban planning projects and architecture?

“I think the next step will be for us to start building data collection into

our projects. There was a long time through the 70s and 80s when people really pushed back against tech and progress. That pendulum has swung totally the other way. People are very trusting now. It’s hard to even think about designing a city without this level of technology—when he

invented the lightbulb, did Edison foresee that you could see cities from space because of his invention? Did Steve Jobs know that he wouldn’t just change telecoms with the iPhone, but would completely change the way communities and individuals socialize with each other? We can’t really predict how big data and connectivity will change lives next, but we know that it will.”

On a different scale, Beroiz is working with tech, data and research to enhance the sustainability and resilience of cities on an individual building and mixed-use development level.

“We’ve been involved in important [research on using treated timber](#) for much larger developments and super tall buildings because it’s inherently more sustainable than concrete or steel. Specifically, Cross-Laminated Timber (CLT) is already being used in low to mid-rise buildings, but once we get the first super tall tower made entirely of timber with a low carbon footprint, many more will spring up. From there, the technology will evolve rapidly. I predict that the concrete industry will respond to these innovations with their own sustainable solutions, and in this way, competition becomes a driver for making the whole planet healthier.”

In terms of other technologies, Beroiz says that there’s a lot more work to be done and more innovation to come.

The Big Question

“Creativity thrives with density in urban places. And that’s what good planning is all about.”

“There are a few façade materials that could absorb pollution and carbon from the air, but the research doesn’t back up all the claims. If we could actually create a building to do that, it would be almost like curing cancer. It’s the Holy Grail of sustainable design research. We’re working with university research departments to help moves things along. It takes time and funding, but I’m optimistic. I do think we will have this kind of technology across the industry, along with a great number of CLT buildings, in less than 20 years.”

Back to the City

Both Beroiz and McCoach say that, ultimately, shifts toward urban environments are driving sustainable design technology and flood prevention strategies, and in turn, sustainable design technology is enabling more people to live in cities.

“The younger generations are really pushing every industry to be more sustainable. Gen X and Y, certainly, but even the Baby Boomers are looking for places to live and work that reflect their values of not harming the planet,” Beroiz says.

He also says that this is a major market factor and shift for corporations, who see it as a way of future-proofing their assets.

“In office buildings, corporations want to attract the best talent. So they almost have to have a sustainability story, an eco-friendly ethos. And they can’t just say the right words anymore; they have to deliver. The information is so accessible that if you say you’re “green” but your headquarters is a toxic office building, you won’t be around for long.”

Beroiz sees parallels between sustainable design and other social movements.

“The older generation has undergone a mind shift. It reminds me of the smoking ban in the UK a few years back. There was so much pushback against it, and now, no one would even think about lighting up in the office or the pub. The trajectory is the same for sustainability. It might be difficult or expensive to implement at first, but in the end, I don’t think anyone will regret the innovations and research we’re going through now. It really shows what one generation can do.”

And in terms of citywide initiatives, McCoach says necessity will be the mother of reinvention.

“I think the breakthrough is going to take the form of remembering what was good about cities all along. We have clients come to us because people have realized that the suburban office park that they took for granted is totally obsolete. It’s a morgue. They now have this opportunity

The Big Question

to reinvent this place in favor of community-oriented design. That's always been the foundation of good planning, all the way back to the Roman Coliseum.”

McCoach says his move to New York last year from the Washington, DC, area has been truly validating to his lifelong philosophy of sustainable urbanism.

“I live in Brooklyn. It's six times the size of [Washington] DC. I'm just impressed that folks here generally have a positive, supportive attitude about getting along. There's just an incredible depth of experience here and it's proof that creativity thrives with density in urban places. And that's what good planning is all about.”

The Medium-Sized Question

The Medium-Sized Question: How do we design better buildings?

It's the reason designers go to architecture school. It's the multi-million-dollar question in architecture: How do we design better buildings? To be more explicit, How do we create a better built environment while also minimizing our impact on the environment?

[According to Architectural Record](#), only 10 percent of architects say we're doing enough to combat climate change and just over a quarter (28 percent) say that their own organizations are. Two-third of architects partly blame the profession for climate change and more than half (58 percent) feel personal guilt about it. [The AIA also recently clarified](#) the industry stance on climate change.

Clearly, there are plenty of complex emotions about sustainability to go around, but what do we do about it? Yes, sustainability is the answer. But technology is what's behind all of it. Groundbreaking innovations are always welcome, of course, but measurement and analysis are just as big a part. And even the software we use is beginning to revolutionize the way architects work to give them more time for better, more creative, more sustainable solutions.

And this isn't some distant prospect, nor should we lose hope. CallisonRTKL Designer Jason Wheeler says software is making design better every year, even every six months.

“Within computational design and the building industry, things change so rapidly, that it's getting more streamlined every year. Even in a few years ago, we had to frequently recreate drawings in different software platforms. Now, we create a model in one software program that can “talk to” a model on another platform. It cuts down on errors and a lot of time, and it also gives us the ability to analyze our designs in a deeper way more quickly,” Wheeler says.

But Wheeler says it's not just about the process; computational design is genuinely making buildings more efficient.

“Architects used to need a specialist or consultant to get a lot of this data

The Medium-Sized Question

and analysis, but with computational design models and software, we're able to get precise data ourselves and change different design elements to get a better, more efficient result."

CRTKL Senior Associate Vice President Pablo La Roche PhD says we have individual technologies that make buildings better and more sustainable, but that's just the first step.

“Everything has to work together to improve performance; you can't pinpoint one specific innovation and call it a day.”

“Everything has to work together to improve performance; you can't pinpoint one specific innovation and call it a day. You have to understand the concept and background of what you're trying to achieve, and that's something that's frequently missing across our industry.”

“For example, in passive heating and cooling strategies, you use the building itself as the air conditioner or furnace. To me, that's what is exciting about sustainable design; it's about how we connect the performance of the building with the form of the building. I'm less excited

about low-flow toilets and healthy materials; those are things that we should all have, but you can use the architecture to impact the user in a big way.”

“As another example, take the drought regulations in California. We're not supposed to irrigate lawns during the day because you lose a lot of water through evaporation. But I questioned if this was always the right thing to do, so I did some tests and created a pipe embedded in a green roof; it cools the roof while irrigating it and the pipe with the water cools the whole building. It goes against established “rules” but it can save a lot of energy when done correctly, and since power plants use a lot of water to generate electricity, you're saving water as a byproduct of saving energy. It's a good example of why it's so important to understand the entire system and wider principles rather than stick with rules without asking more questions.”

Data, Data Everywhere

Some architects spend years waiting for a one-off burst of inspiration, but Wheeler and La Roche say that measurement and data are the equally important, if potentially less exciting, siblings of brilliant innovation.

“Data is a big deal. The analysis and the numbers behind how our projects are performing are what push us toward more creative solutions, and I think that's going to only get more crucial in the future. I think architects are going to be designing the processes more than the buildings

The Medium-Sized Question

themselves. The industry will start automating a lot more processes,” Wheeler says. And if “automation” sounds like a death knell for the industry, Wheeler says that’s not the case.

“[Automation](#) doesn’t mean architects will be obsolete, but the workflow will change. We won’t need someone sitting in Revit to make every single sheet. We can automate that, which frees up our time as designers as we get on tight budgets and timelines. That means better designs and more creative solutions.”

La Roche sees creativity as the uniquely human component in design. After all, a computer might be able to design a by-the-book efficient building, but only with current, accepted protocols and guidelines.

“I believe in the research component. Build it and test it. Demonstrate that it works and others will follow. So even if your client says that a sustainable design will cost more, once you have the data to prove your idea, most clients will see the light.”

“We have a project in Singapore, for example, where the client wanted a “green,” building but didn’t know where to start. We were looking at an envelope with a double-skin façade, but those usually don’t work in the tropics because they keep cool air out. We came up with a way to do it that works well in the climate. We’ve tested it and the client is

now excited about marketing the building innovation. It’s the data that sold the design.”

And the Built Future is Bright

There’s a lot of doom and gloom about the future of the planet, climate change, and even the design industry, but both Wheeler and La Roche are cautiously optimistic. And “building better buildings” is not just a pipe dream.

“We’re at the beginning stages as an industry, but everything is going to be an evolution of carbon neutral and carbon positive buildings [buildings that have a negative carbon footprint]. That’s the definition of sustainability—how do we make lives better for us and other animals?” says Wheeler.

“I think if we look at how animals have sustained life, it will solve some of our problems and keep us from continuing to destroy life. The industry is starting to pay more attention. I think the more we’re open to new ideas and new ways of working, the better we’ll become. The more we’re set in our ways and continue to do things the way we’ve always done them, we will hinder our progress. One of the reasons I’m so passionate about computational design is that it helps people think differently.”

The Medium-Sized Question

La Roche is also optimistic, but sees that it would be easy for progress to stall. “We have to understand that we’re in an era of fossil fuels. This era is just a little blip in time. If we don’t look forward, we’re going to be left behind. If we innovate, it will put us ahead ecologically and economically.”

“In the end, I don’t believe that you can have good architecture if it’s not sustainable. If it’s harming the environment, it’s not an ethical design. Period. If it’s not performing well, it’s not good architecture.”

La Roche says a shift in approach has the potential to have a much bigger impact than a single technological breakthrough.

“It’s our industry. It’s up to us. Innovation isn’t about looking at books or seeing what’s been done before, it’s doing it ourselves, and that kind of entrepreneurial spirit is what our industry has to reclaim to stand a chance of moving forward.”

The Small-Scale Question



Indoor environments may be as much as **10X** more polluted than the outdoor environment

The Small-Scale Question: Can interior design improve lives?

Humans spend most of their time indoors. In fact, some [surveys suggest](#) that we spend [upwards of 90%](#) of our time in enclosed spaces. This statistic is startling, but it's even more shocking when we acknowledge that indoor environments may be as much as 10 times more polluted than the outdoor environment. Today, [air pollution is the number one environmental cause](#) of premature death, and sick building syndrome (SBS) is more prevalent than ever. There are spaces out there that are not only hurting the planet, but ruining our health.

It may seem like a negative outlook for the built environment, but in reality, these facts leave us with the drive and demand for cleaner, healthier, greener buildings. On a macro level, the architecture industry is striving to be better, and interior designers have often been on the front line of the fight for sustainability and wellness. But zooming in, there are numerous micro-trends that are pushing the industry swiftly in the right direction. We've even seen the growth [rate of green building certifications slowing](#) as interior designers begin to make sustainable, healthy design choices part of every project.

The new question is: can we design spaces that actively and positively affect their occupants? Is it feasible that interior designers are the key to thinking about wellbeing?

“Creating buildings that measurably improve occupants’ lives is no easy feat. It takes research and specialized knowledge and is far more complicated than just plopping employees in front of a window with a nature view. It means utilizing holistic design, raising sustainability standards, designing for healthy behavior and looking at the trends that drive each industry,” says CallisonRTKL Associate Vice President Liz Wozny. “But it’s possible. And the industry is doing it.”

The Small-Scale Question

Seeing Green

One way designers are creating healthier interiors is by bringing the outside in. Plants help purify the air, improve indoor air quality and capitalize on the scientific phenomenon biophilia, [the theory](#) that humans have an intrinsic desire to make connections with nature and it can be utilized to design more health-conscious interiors.

“We should look toward biology to inform our design solutions because it promotes health, productivity and well-being,” said Wozny. “One of our favorite ways to incorporate nature is through living walls. Living walls are essentially vertical gardens that remove harmful toxins and VOCs, act as a natural air purifier, moderate noise levels and help reduce heat gain by up to 10°C—all while exhaling oxygen as a byproduct of photosynthesis.”

And biophilic design can be utilized across the board. CRTKL worked with one global company to design an office with access to nature as a top priority. The interiors team implemented a plant partition in the office’s community pantry. Using snake plants as a pop of green, the team created a beautiful space that also serves to clean the air by reducing CO2 levels.

“Using green, healthy materials in buildings is not important; it’s essential.”

“Interior design plays the biggest role in improving people’s lives,” said Wozny. “In a workplace, for instance, you’re at desk for 8-10 hours every day. As designers, we have to realize that we are designing a space in which people will spend the majority of their days and weeks. Good design can make all the difference in employee or resident satisfaction and health.”

In fact, according to Fast Company, [green offices can make employees healthier and more productive](#), and a [new study](#) found that workers in green offices scored 26.4% higher on cognitive tests and had 6.4% higher Sleep Quality scores than those who did not work in high-performing buildings.

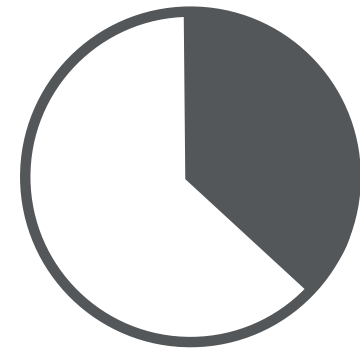
The Big Ask

So how do we get there? And how can interior designers impact the industry in a sustainable way?

“Using green, healthy materials in buildings is not only important; it’s essential,” said Wozny. “We have to push the boundaries of materials. And that means asking manufacturers to disclose product information, among other things.” Interior designers have a massive impact on the built environment. According to one ASID study, these designers

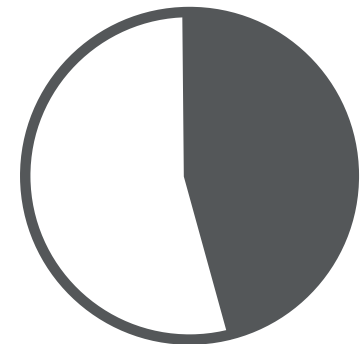
The Small-Scale Question

In A Survey of 200 Canadian Building Owners



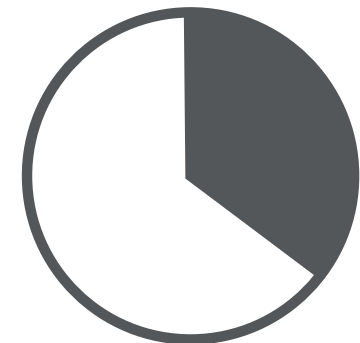
30%

said investing in healthier buildings had a *positive impact on the building's value.*



46%

said they were *easier to lease.*



28%

said they *commanded premium rents.*

[specify products in some 9 of 10 residential and commercial projects.](#)

This means that designers have the power to create healthier buildings while at the same time demanding that the industry step up to the sustainability plate.

CRTKL, along with some of the biggest names in design, has pledged to be a part of this change by committing to [mindfulMATERIALS](#), a design industry initiative that provides a common platform for manufacturers to clearly communicate transparency and optimization information for their building products. The program is essentially a push for manufacturers to share product information so that designers can make responsible, informed decisions for people and planet when specifying products. Additionally, CRTKL is part of the [Health Product Declaration Collaborative](#).

“Our projects are inherently sustainable because that’s the way we practice. It’s the CallisonRTKL way,” said Wozny. “But being a leader in sustainable interior design means being proactive. It’s easy to get complacent when codes require a minimum level of sustainability, but we have to go beyond that. We have to create our own internal bars that hold us to a higher standard, which is one of the main reasons we are participating in mindfulMATERIALS.”

What’s on the Inside Counts

But just using sustainable materials is not enough, said Wozny.

“Today, our industry is more aware of the impact we have on the environment, but we have to take more of a leadership position in front of our clients, communities and cities,” said Wozny. “The first step is awareness. After that we have to begin to innovate as an inherent part of our projects. We can build on that research and move forward.”

The driver behind this research will be demand. And according to our designers, the demand is steadily growing. According to a [recent survey by Dodge](#), more than a third of respondents are projecting at least 60% of their respective project portfolios to be green by 2018.

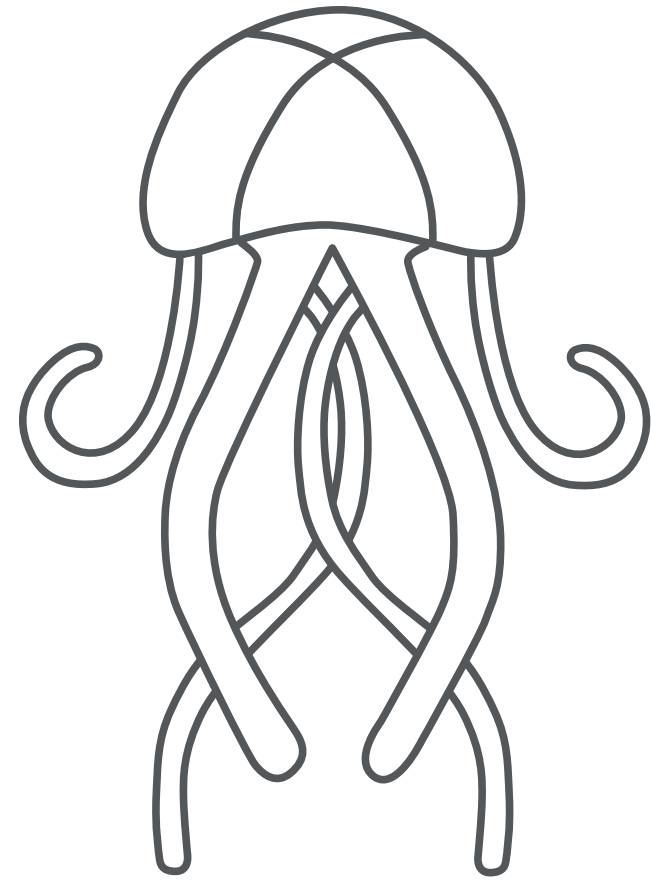
“It’s a great time to be a designer,” Wozny said. “Consumers are changing and they’re demanding a different, healthier type of design. This leaves us so much room to innovate and create interiors that are not only beautiful, but are also sustainable.”



Green Design Innovations

Cnidaria Halitus:
Harnessing the
Sun and Tides for
Potable Water





The forty
Cnidaria Halitus
we proposed will
generate an
average of

160
thousand gallons
of water per day.

As a part of [The Land Art Generator Initiative \(LAGI\)](#), CallisonRTKL developed [Cnidaria Halitus](#)—jellyfish-shaped technology that harnesses the natural forces of the sun and the tides to produce 160 thousand gallons of potable water per day for the city of Santa Monica.

“We thought, what if we create an “air organism” that breathes and produces potable water?” said CallisonRTKL Vice President John Eric Chung. “We even gave our organism a pseudo-scientific name: Cnidaria Halitus, which roughly means breathing jellyfish. The main skin of our jellyfish technology is similar to scientific balloons made from polyethylene—the same type of material used for plastic bags. This membrane will float in the air to imitate the motion of jellyfish.”

Relying completely on solar and tidal energy, the Cnidaria Halitus transforms seawater into potable water, all without using non-renewable energy. The process begins in the ocean. The breakwater is used to channel currents into slits at the base where the turbines are located. This harnesses kinetic energy of the tides to generate electricity. The electricity is then used to pump the water up to small boilers, located inside the jellyfish, and to aid with the evaporation process during the night. Inside the jellyfish is a flat lens called a [Fresnel lens](#). The axis of the Fresnel lens tracks the sun in its daily trajectory across the sky, maximizing heat collection and absorbing about 7.4 kWh/m² per day.

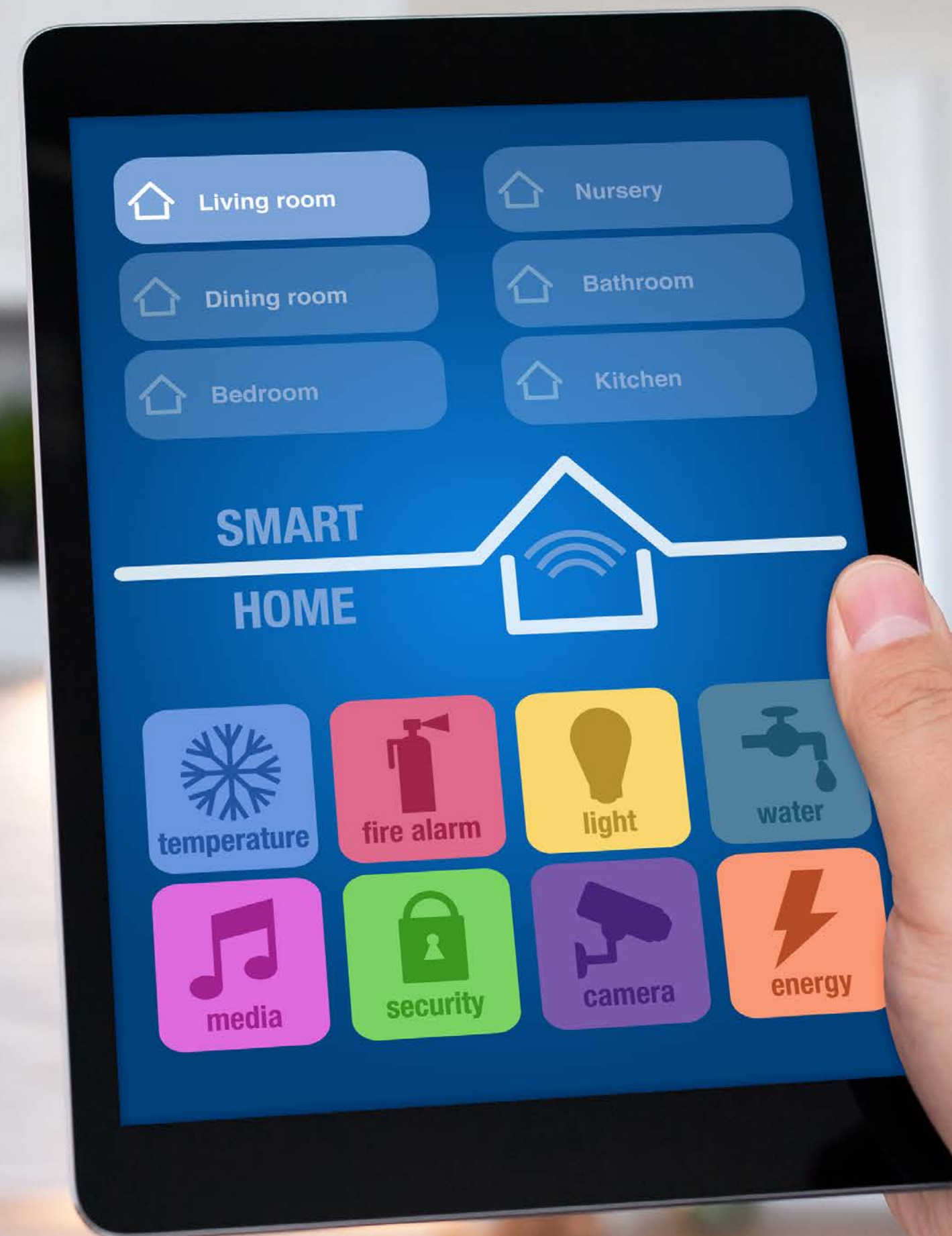
The boiler itself consists of a double glazed envelope that allows solar radiation concentrated from the Fresnel lens to enter, while reducing conduction losses—much like an evacuated tube collector found in domestic solar heaters. All of the energy absorbed inside the evaporation chamber is transmitted by conduction to the water flowing inside the pipes, concentrating it in a very small volume of water which then evaporates and travels to the sides of the Fresnel lens where it is ejected as vapor inside the polyethylene membrane.

The vapor condenses on the cooler inner surface of the polyethylene membrane and falls, thanks to gravity, into collectors. Each of these distillers can evaporate about 4000 gallons of water per day. Supported by a semi-rigid stem, the jellyfish will rise and fall organically due to the change in buoyancy from the steam-condensation cycle, as if they are alive.

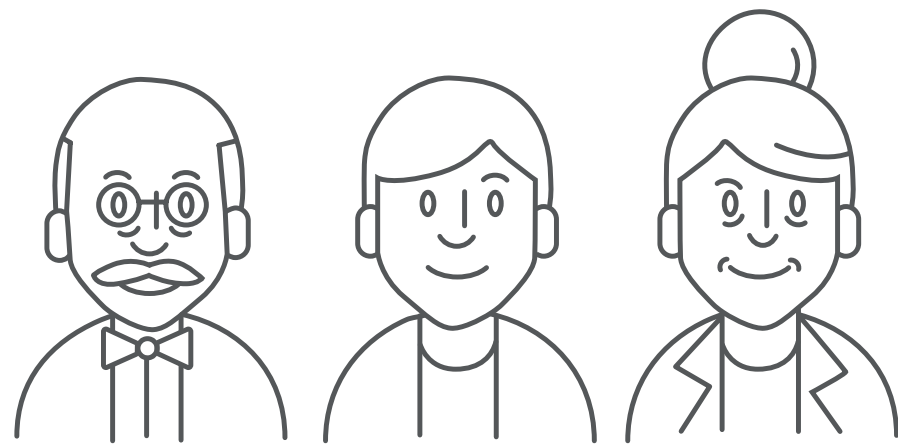
“The forty Cnidaria Halitus we proposed will generate an average of 160 thousand gallons of water per day, or about 2% of the potable water consumption in the city of Santa Monica,” Chung said.

This project provides a visible solution to California’s water problem, creating awareness while providing carbon-free potable water from the ocean. In order to combat climate change, the design industry must look for innovative, green solutions that not only improve quality of life, but that respect and honor the environment.

Sustaining Inclusion: The Wired-to-Enable Home



81 PERCENT



of adults with autism live with their aging parents, which is an unsustainable system

Sustainability isn't just about building green buildings. It's also about inclusion and providing quality environments for all. The quality of buildings and spaces has a strong influence on the quality of people's lives, and research has found that disadvantaged people are far more likely to live in poor quality environments.

Currently, 81% of adults with autism live with their aging parents, which is an unsustainable system. As a part of the Autism Speaks "House to Home," competition, CallisonRTKL developed the "Wired to Enable" or W2E Home. The competition explored how sustainable principles and retail-inspired designs can support those with autism and help them integrate with the community.

"The W2E home focuses on independence, communication, accessibility, security, safety, technology and sustainability," said CRTKL's Arianne Ponce. CRTKL's project combines residential and retail concepts to create a multi-resident space where autistic users can both live and work. Facilitated by technology, the W2E home would be clustered into themes that provide developmental, communication and production opportunities for the residents and larger community.

"For example, one theme could be food," Ponce said. "This would involve spaces for food preparation as well as production areas for the planting, tending and harvesting of food. This allows residents to remain self-sufficient and work as a team. Our team even added a space for retail to help connect occupants with the community."

The buildings would also incorporate many green features, including passive strategies, utilizing daylight and views to increase the connection between the occupants and the environment. Open spaces would provide opportunities for recreation and urban farming in cooler latitudes.

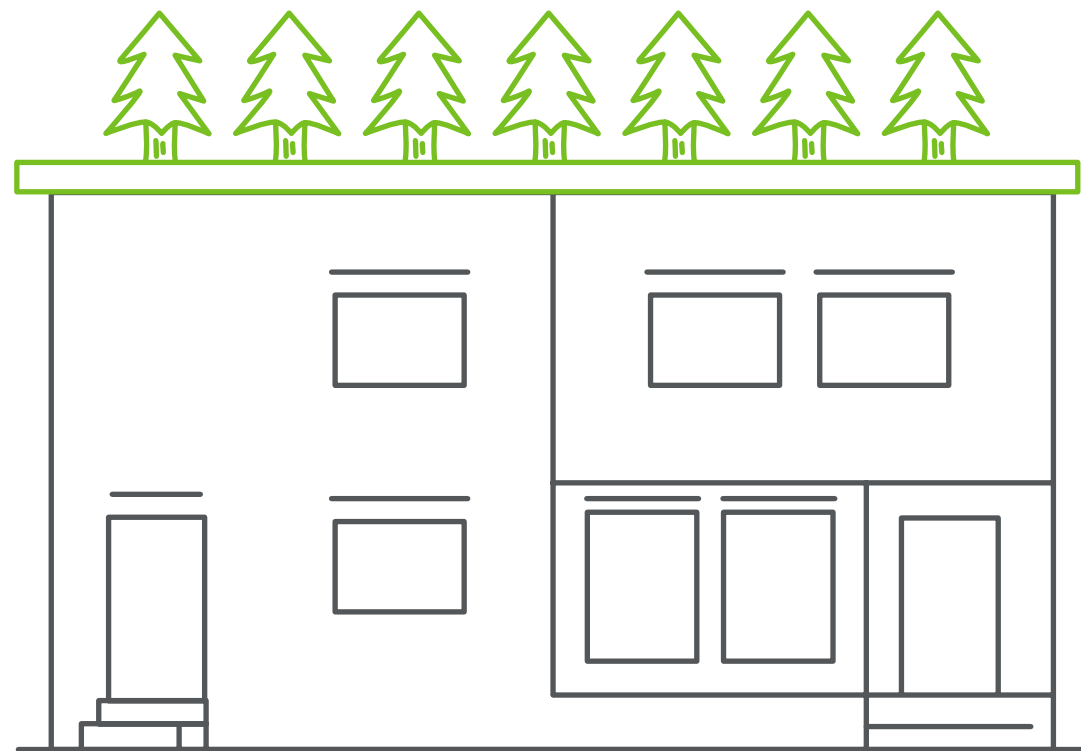
The W2E home could be implemented in locations with different densities, but the higher densities of cities provide more access to urban amenities, more work options and more opportunities to connect in spaces like libraries, public swimming pools, movie theaters and parks.

"Our design aims to help residents live and feel at peace, but with options to challenge them and push them out of their comfort zones if needed," Ponce said. "This would be a home about erasing barriers."

Green Breakthrough: The Xylem



Over the past two years, CRTKL Associate Vice President Pablo La Roche and the PDD team have been developing the “Xylem”—a first-of-its-kind



By maximizing the cooling impact of the green roof, it can reduce the perceived temp. by an incredible 5°C compared to shaded areas.

technology used to regulate outdoor thermal comfort through shading, air movement, water circulation and a vegetated roof. The Xylem facilitates a viable, self-sustaining approach to managing the temperature outside. By maximizing the cooling impact of the green roof, it can reduce the perceived temperature by an incredible 5°C compared to shaded areas.

“We named the Xylem for the compound tissue cells of the same name that exist within plants and wood fibers that circulate water and direct nutrients upward,” said La Roche. “But it’s more than just named for the cells; in this case, design replicates nature.”

The elevated planter circulates water from the base upward through its structural core and conductive cladding to create radiant cooling in the area surrounding the Xylem. “Xylem

facilitates natural ventilation and outdoor comfort in a passive, cost-effective and scalable way that will be useful in ever-developing global cities,” La Roche said.

A single Xylem pod provides thermal comfort at the user level, while a cluster can improve quality of life on a larger scale. When combined into a community of clusters, the Xylems significantly reduce the amount of paved surface in contact with solar radiation, also mitigating the heat island effect. It can also be modified for specific microclimatic conditions, and its form—conceived based on optimal performance, manufacturing and fabrication technologies, and aesthetics—is ideal for rainwater harvesting and storm water mitigation.

“The Xylem is no longer just our dream. We are expecting to begin construction on the project in September 2017 in Jakarta and hope to complete the flagship by the end of 2019,” La Roche said. There has also been interest from a major developer in Dubai. “Seeing the Xylem become reality is a huge step forward in increasing the comfort of outdoor spaces while also promoting sustainable and green design in growing urban centers.”

Tree Houses: Seattle Mass Timber Tower Study



Now, more than ever, developers are looking for ways to create projects that are affordable, thoughtful and sustainable. Some of CallisonRTKL's top designers have [published an approach](#) that may incorporate all three of these factors in a new and, until now, untested technique—using wood and wood fiber in super tall towers.

Mass timber construction (MTC), including engineered woods such as cross-laminated timber (CLT) and nail-laminated timber (NLT), is a highly sustainable solution and is already used in buildings above ten stories. But when it comes to buildings in the 30-40-story range, the financial, regulatory and constructability implications of this technology are not well understood or currently accepted by the building community at large.

“Mass timber products such as CLT or NLT are incredibly sustainable,” said CRTKL's Amir Lotfi. “They're renewable, have a lower embodied energy footprint than concrete or steel and capture carbon dioxide rather than emitting greenhouse gases during their production.”

Of course, the process is not simple, and there is still much research to be done, but CRTKL's study revealed the distinct performance advantages of mass timber construction over concrete construction technologies. These advantages include equal or lower construction prices, shorter construction times, commercialization of carbon sequestering, the marketability of locally made products, reduction in construction waste, and scientifically substantiated positive effects on health.

“In our study, we found that the use of CLT in taller buildings is certainly achievable from a structural point of view, but to achieve super tall heights, the structure would likely need to be a hybrid,” Lotfi said. “This is a continually evolving process and more research and technological advancements will only continue to make mass timber towers more feasible. This report is not an answer. Rather it is the beginning of an important discussion about mass timber construction, cross laminated timber, nail laminated timber and their uses in buildings above ten stories.”

Download the full report from [CallisonRTKL's website](#).

The Case for Hope: Design and Climate Change



In July, 2016, the Passive Low Energy Architecture (PLEA) conference welcomed some of the leading names in sustainability. Architects, designers, academics and scientists from 48 countries came together to discuss the most promising low-energy innovations of the year, and inventions that could substantially reduce human impact on the planet and climate change.

CallisonRTKL sat down with the keynote speakers and other notable attendees to get their thoughts on design as an agent for saving human life on the planet. The result is this [video](#).

“The built environment has a tremendous impact on the planet and the trajectory of climate change, and I think most people understand how devastating climate change will be to the human population on this planet if we don’t take action,” said CallisonRTKL Associate Vice President Pablo La Roche.

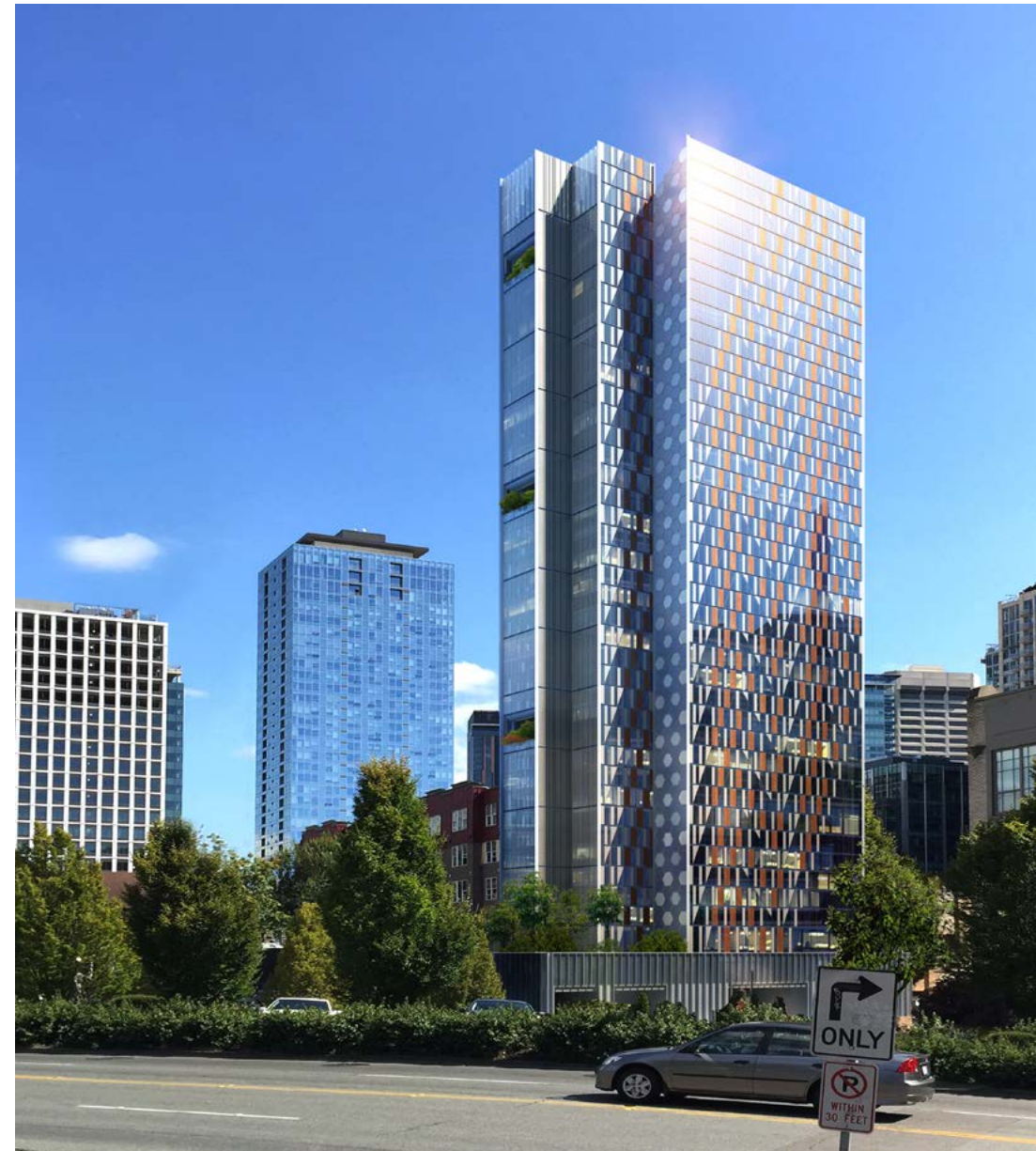
“Organizations and conferences like PLEA show that we already have the technology to change that. But in order to truly make an impact, we need buy-in from clients, cities and politicians, not just the architecture industry.”

CallisonRTKL has also released two other videos featuring interviews with the same thought leaders: [Cities, communities and resilient design](#) and [High-Tech/Low-Tech Resiliency](#). View all three videos on [CallisonRTKL's Vimeo channel](#).



Sustainability News

CallisonRTKL has seen an uptick in sustainable design thought leadership and publications around the world are taking note. Read on for a select list of articles and interviews about CRTKL's green design work and concepts.



Amir Lotfi
Mass Timber High Rise



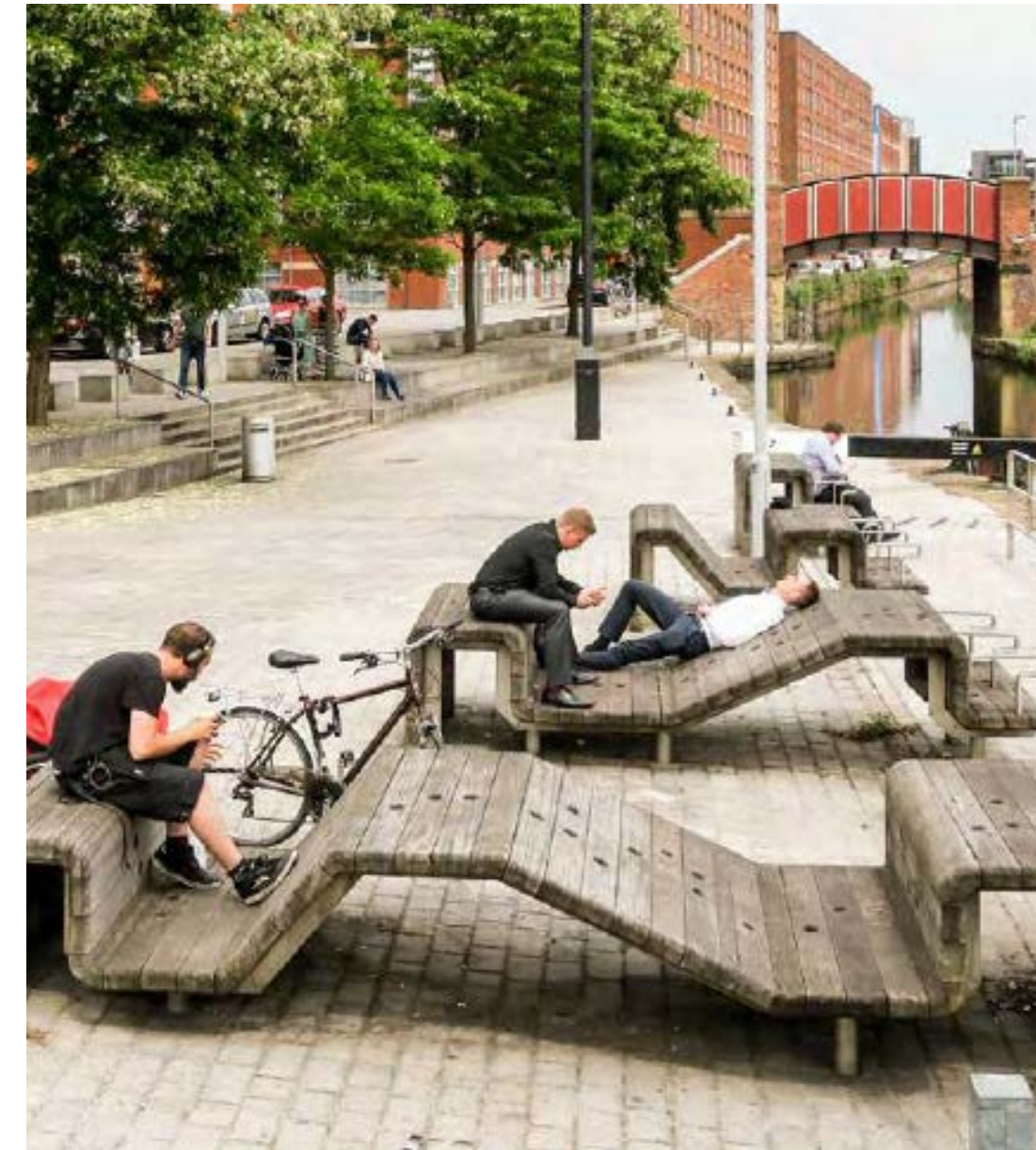
Eddy Santosa
Five ways to achieve high-performance buildings using energy modeling



John Badman
Manchester Shows the Way to Sustainable Cities



Kenneth Turner
The Tower of the Future



Michael Dillon
Make It Manchester: New Residential
Quality Guidance Promotes
Innovation and Sustainability



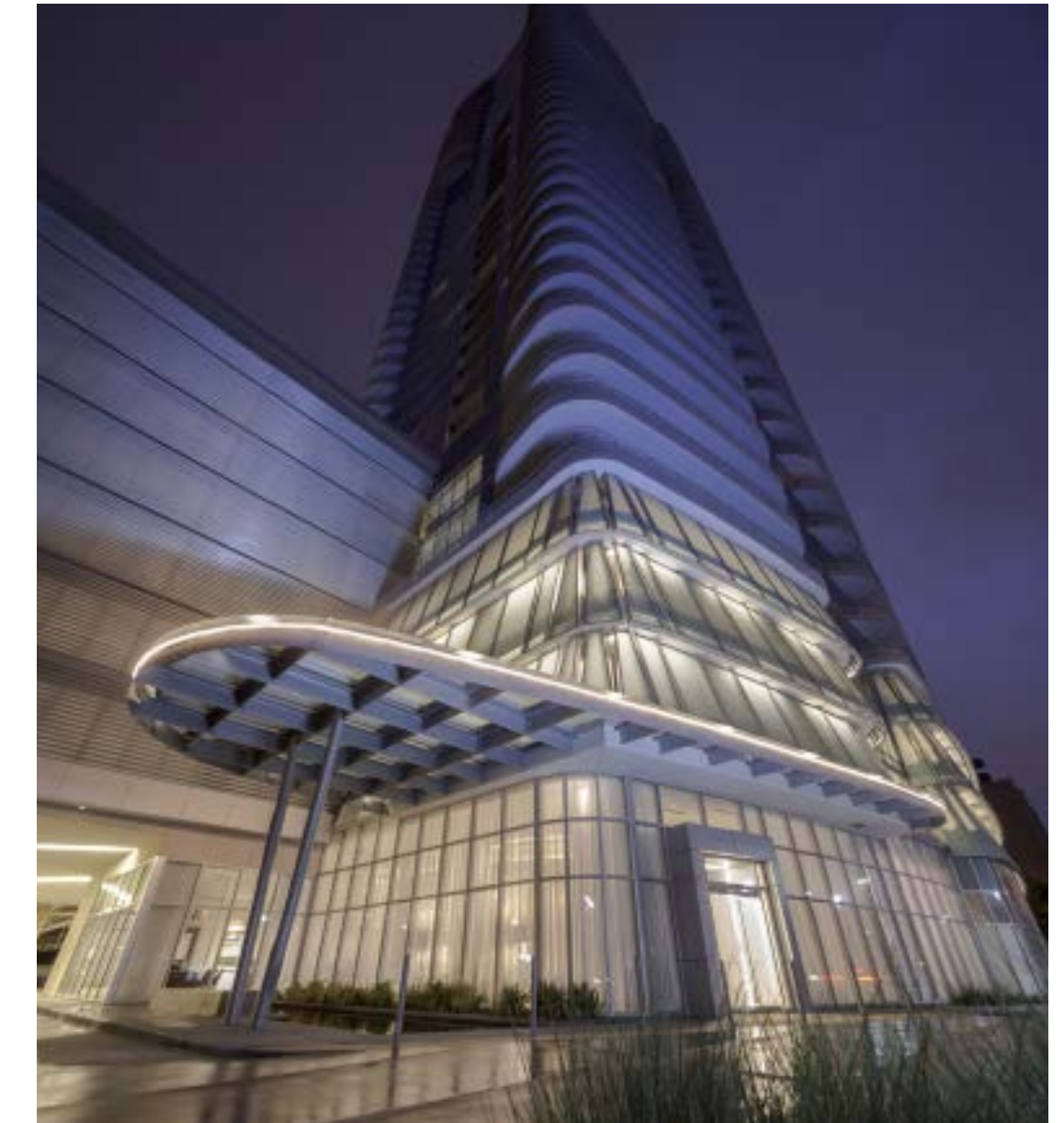
Michael Militello, Amar Shah
Brainstorming: rainmaking buildings
could alleviate California drought



Kristin Tilley
DATÜM: Eco-Friendly Tourism



Chadstone
7 ways we can turbo-charge retail sustainability



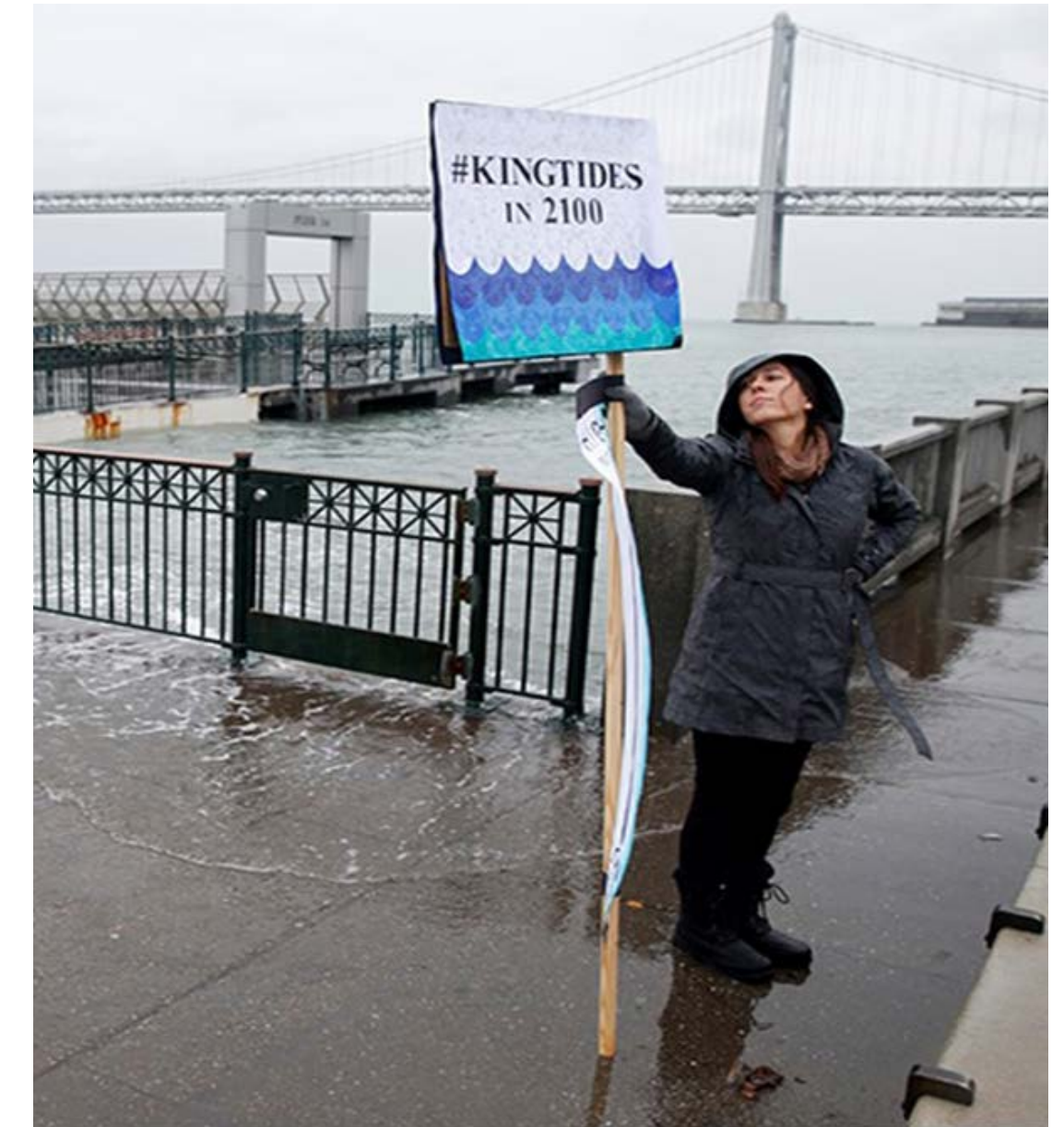
Tom Brink
Sustainable designs add a breath of fresh air to luxury apartments



Brendan O'Grady
Indoor plants: Natural fit



Pablo La Roche
The Case for Hope: Design and Climate Change



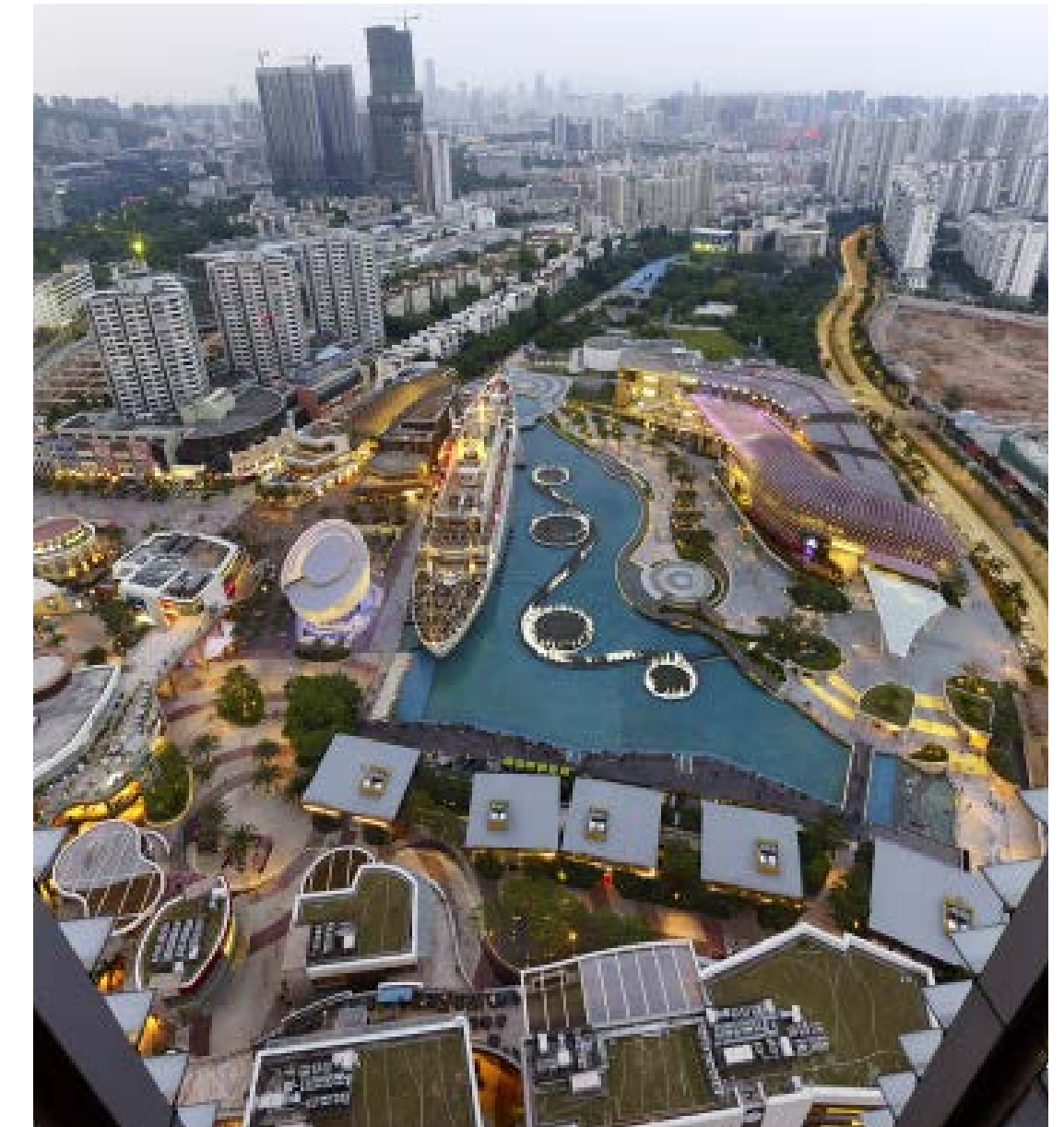
Nate Cherry
Future Proofing Urban Waterfronts



Harold Thompson, Noel Aveton, Brian Adams
Strategic alliance between DMA and International CallisonRTKL for smart cities management



Pablo La Roche
Panel Summary: The State of Sustainability in the AEC Industry



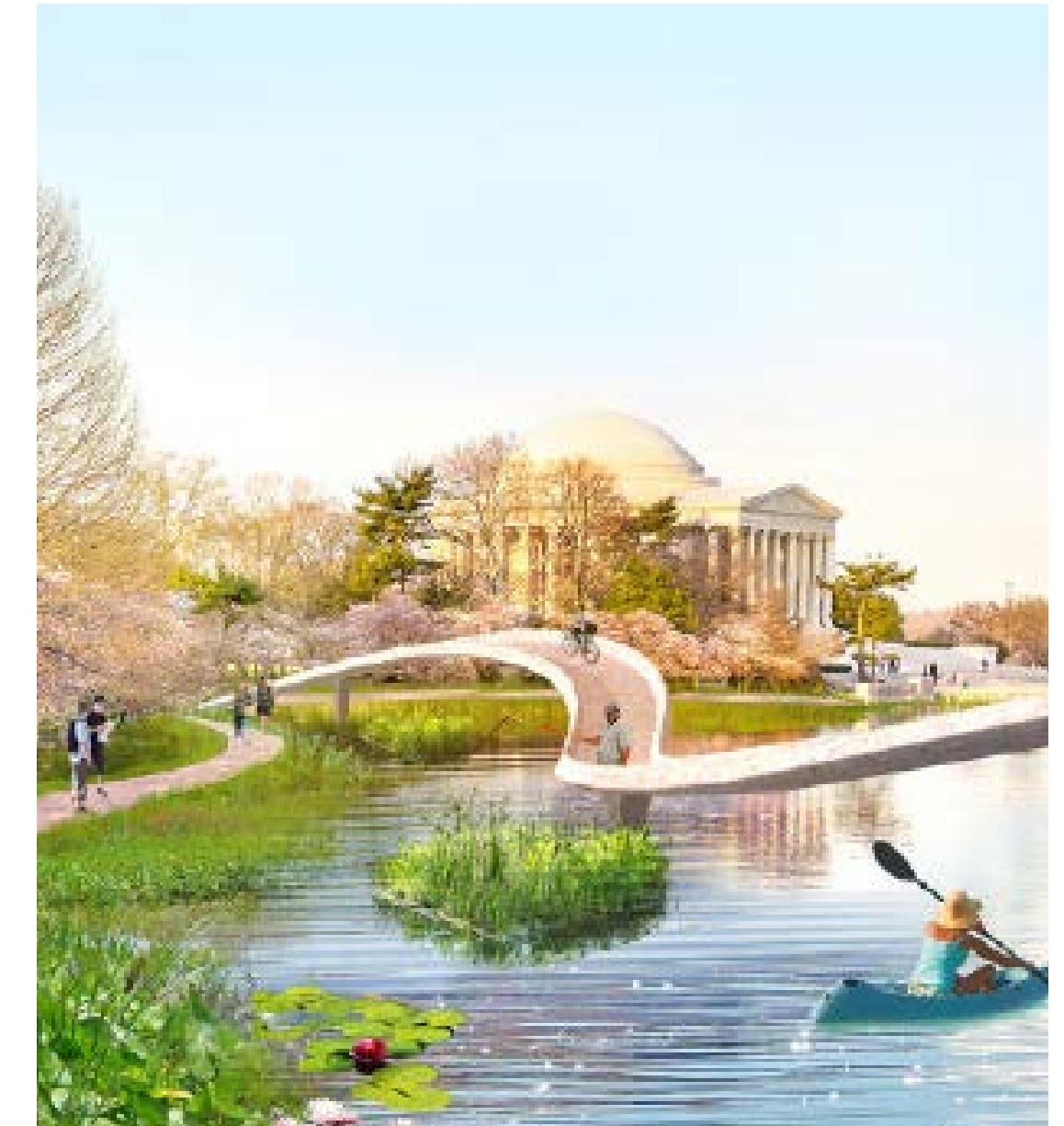
Amber Richane
Designer of water attraction at Hong Kong's Ocean Park on making our fun more green



Fantasy art: the future of energy and water technology - in pictures



Pablo La Roche
Biophilic pods beat the shade when it comes to outdoor cooling



CallisonRTKL Wins Open Architecture Collaborative's Inaugural National Treasures Design Competition



REI
The Case for Material Reuse



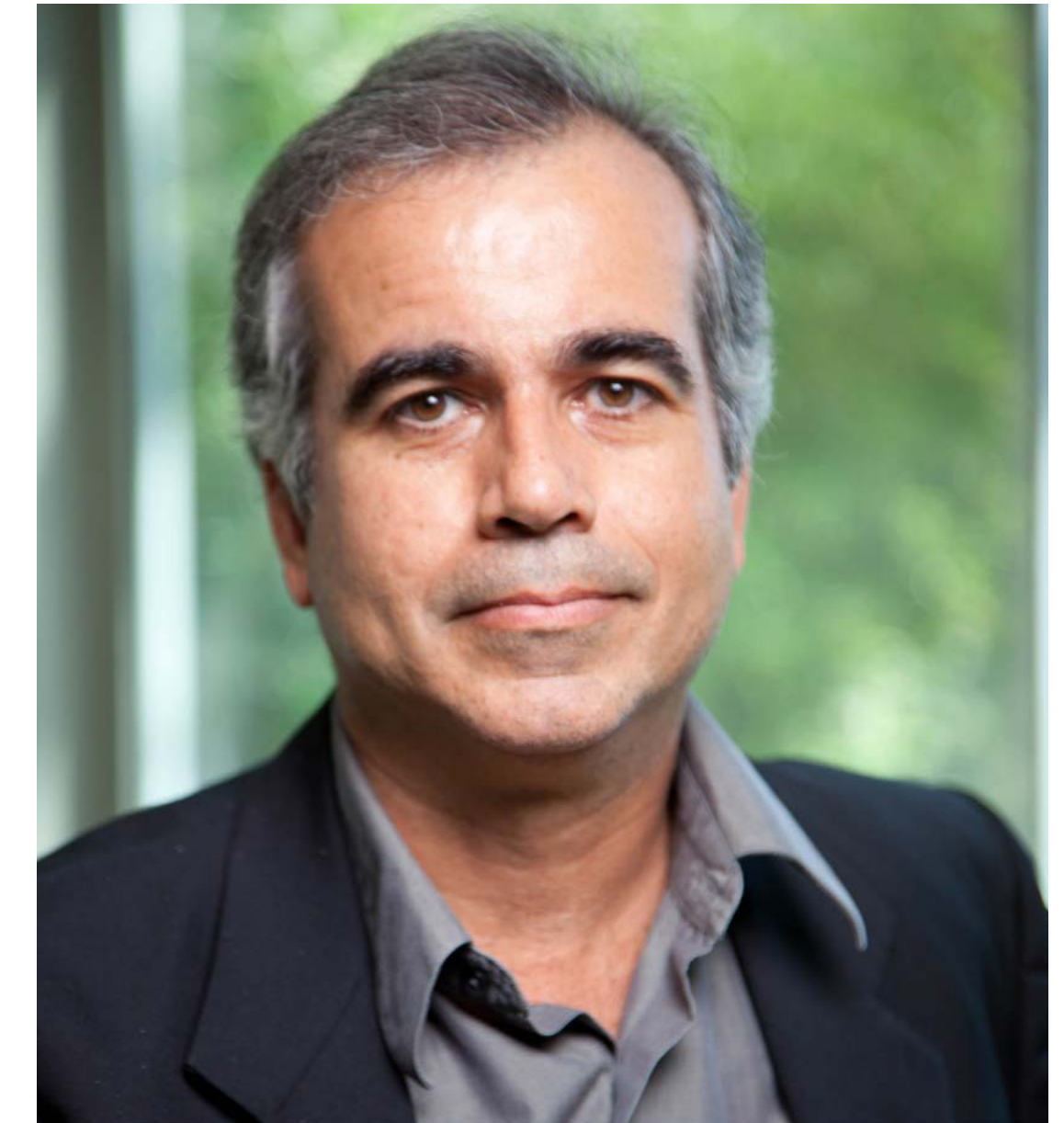
Amber Richane
Design Manifesto



Amber Richane
Member of U.S. and Global Steering Committees for the WBCSD



Amber Richane
Presented “Green is the New Black” at Greenbuild 2016 and Coverings



Pablo La Roche
Research paper collaboration titled Occupants and Energy Performance: the Schrage House



Pablo La Roche

Research paper collaboration on cooling with water and green roofs



Pablo La Roche

Research paper collaboration on the cooling effects of a water-air heat exchanger combined with a green roof

Additional Articles

[It's Only Natural; Joey-Michelle Hutchinson](#)

[CRTKL's Eddy Santosa to Speak at Gulf Coast Green; Eddy Santosa](#)

[Holiday Gift Ideas for your Mother \(Earth\); Nate Cherry](#)

[DATÜM: High-Rise Innovation; Kristin Tilley](#)

[Reimagining a California Beach Community; James Mellor](#)

[Seeing Green: Biophilia and Retail are a Natural Fit; Brendan O'Grady](#)

[Cnidaria Halitus: Harnessing the Sun and Tides for Potable Water; Pablo La Roche, John Eric Chung, Danxi Zou, Jingyan Zhang and Tianyi Deng](#)

[Matthew as Metaphor; Nate Cherry](#)

[Tesla: How a Super-Fly Car Can Change the World; Jodi Williams](#)

Additional Articles

[Building from the Heart; Pablo La Roche](#)

[Green Breakthrough: the new invention behind sustainable temperature control; Pablo La Roche](#)

[CRTKL Awarded Four Texas ASLA Professional Awards](#)

[Sustainability Rules at Callison RTKL-Designed 2929 Wesleyan](#)

[“Mobility, Accessibility and Sustainability” panel during the Driving to the Future Event at SmogShoppe in LA.; Amber Richane, Nate Cherry](#)

[How feasible is a 40-story timber residential tower?; Amir Lotfi](#)

[DATÜM: 7 Predictions for 2017; Kristin Tilley](#)

[Mass timber: From ‘What the heck is that?’ to ‘Wow!; Joey-Michelle Hutchison, Amir Lotfi](#)

[A Nose for Trends; Clayton Whitman](#)

Additional Articles

[Seattle mass timber tower](#)

[Exelon Baltimore Headquarters Achieves LEED Platinum](#)

[CallisonRTKL Wins U.S. Design and Development Gold, Commendation Awards; Tyson's Corner](#)

[Associate Vice President Mark Palmer Receives DuPont Emerging Leader Scholarship; Mark Palmer](#)

[CallisonRTKL Hosts National Treasure Design Competition Awards Ceremony, Takes Home Top Prize; Laura Cohen, Augustina Soler](#)

[Chicago's Presence Center for Advanced Care Achieves LEED Gold; Sandy Faurot](#)

[CallisonRTKL's Pablo La Roche to Chair Passive Low Energy Architecture Conference; Pablo La Roche](#)

[Seattle Mass Timber Tower Study](#)

[High-tech/Low-Tech Resiliency; Pablo La Roche](#)

Additional Articles

[Cities, communities and resilient design; Pablo La Roche](#)

[CallisonRTKL releases video on resilient architecture, The Case for Hope: Design and climate change; Pablo La Roche](#)

[Top 130 Green Building Architecture Firms](#)

[Konsultan Gedung Ramah Lingkungan; Eddy Santosa](#)

[Facades pro Brendan O'Grady on beating the heat in Dallas; Brendan O'Grady](#)

[Storytelling through Materials; Michael Gaffney](#)



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CallisonRTKL is a global architecture, planning and design practice. Over the last 70 years, we have created some of the world's most memorable and successful environments for developers, retailers, investors, institutions and public entities. Our work has set us apart as the number one retail design firm in the world and a top-five architecture practice across multiple disciplines and sectors. Under the Arcadis umbrella, we continue to expand our sphere of influence and the depth and breadth of our resources. Our team of nearly 2,000 professionals around the world is committed to advancing our clients' businesses and enhancing quality of life. callisonrtkl.com

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