

**Performance-
Driven Design**SM

by CallisonRTKL

STATE OF THE [GREEN DESIGN] UNION

CallisonRTKL Sustainability Update 2018

CALLISONRTKLTM
A DESIGN CONSULTANCY OF ARCADIS



Contents

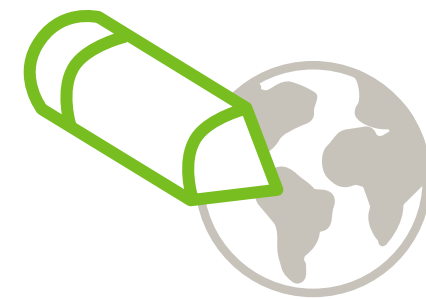
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Introduction

There comes a time when every citizen of the planet needs to stand up for what they believe in. At CallisonRTKL, after spending the last three years focused on defining what we mean by sustainable design, the time has come to put a stake in the ground. And that's where we stand on Performance-Driven Design—it's the simple but compelling idea that design is not just about creating beautiful buildings but creating buildings and places and experiences that support communities, economies and the planet.

Within our PDD team, we have seen a real uptick in requests for all those things that make us better, more responsible design professionals—wind studies, solar studies and other assessment that can make every single one of our projects more sustainable, more resilient. And whenever we need a reminder of why we do what we do, we return to a few key truths:



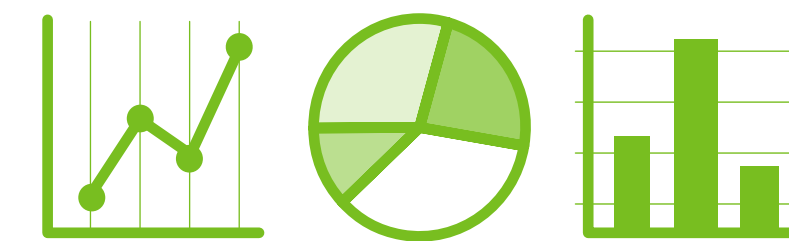
Design can change the world

In the right hands, design is an incredibly powerful tool. We can make any space more efficient, we can dramatically mitigate the effects of climate change and we can bring entire communities together. But it takes *Performance-Driven Design* to make any of those things happen.



Design *should* change the world

However you define it, PDD is the basis for making any project better. It could be something small like choosing environmentally friendly paint and linens to orienting facades to lower heat gain and innovating new ways to save energy. In every case, our projects should make a positive impact.



Data drives everything

Research, modeling and data drive our design decisions and ideas. When we try to convince clients to be more innovative, more sustainable and have a bigger, better effect on communities, we have numbers to back us up.

This year's sustainability report comes at a time when we acknowledge that we still have a long way to go as a company, as an industry and as a human race when it comes to reducing waste and lowering greenhouse

gas emissions. As you read through, take a look at where CallisonRTKL stands on our 2030 Climate Commitment. Read through some of the latest and greater global trends for inspiration. And check out some of our most innovative work on the boards.

And above all, remember that as designers, what we do and the choices we make on a daily basis can have far-reaching implications. Choose wisely.

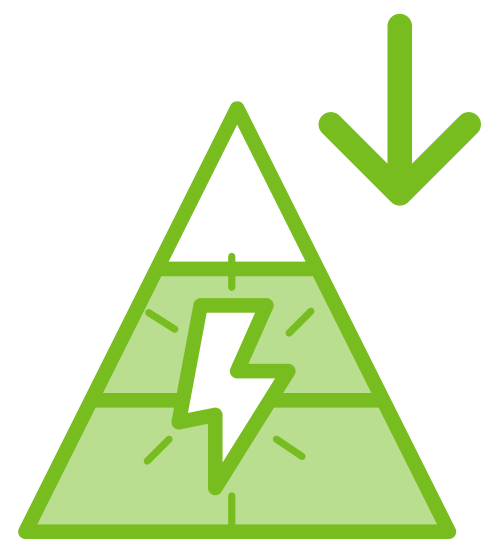
Whenever we need a
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Pablo La Roche
Associate Vice President



2017 Achievements

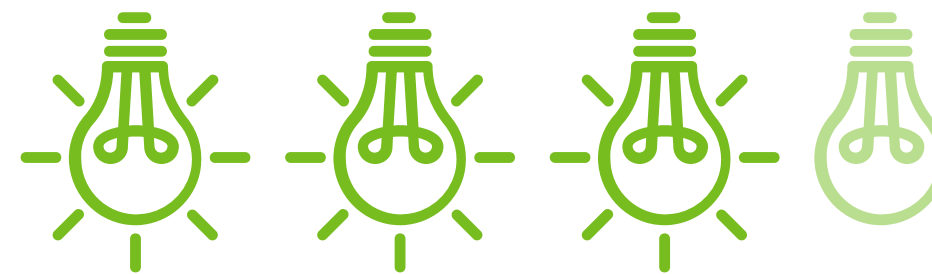
We've been talking a lot about the future so far. Now let's take a look back at some of our green achievements in 2017.



In 2017, we saw predicted energy use intensity reduced by a third.



We increased the percentage of our projects that will collect actual EUI data by 20% in a year.



We saw our lighting power density reduced by about a quarter in 2017, and an uptick in the percentage of our projects undergoing energy modeling.



Where we see a major impact in our green achievements is in the sheer scale of it all. Across 300 million GSF of work reported last year, sustainable design has a positive impact on the environment.

EUI Energy Use Intensity. It measures a building's annual energy use per unit area. It is typically measured in thousands of BTU per square foot per year (kBtu/ft²/yr) or kWh/m²/yr.

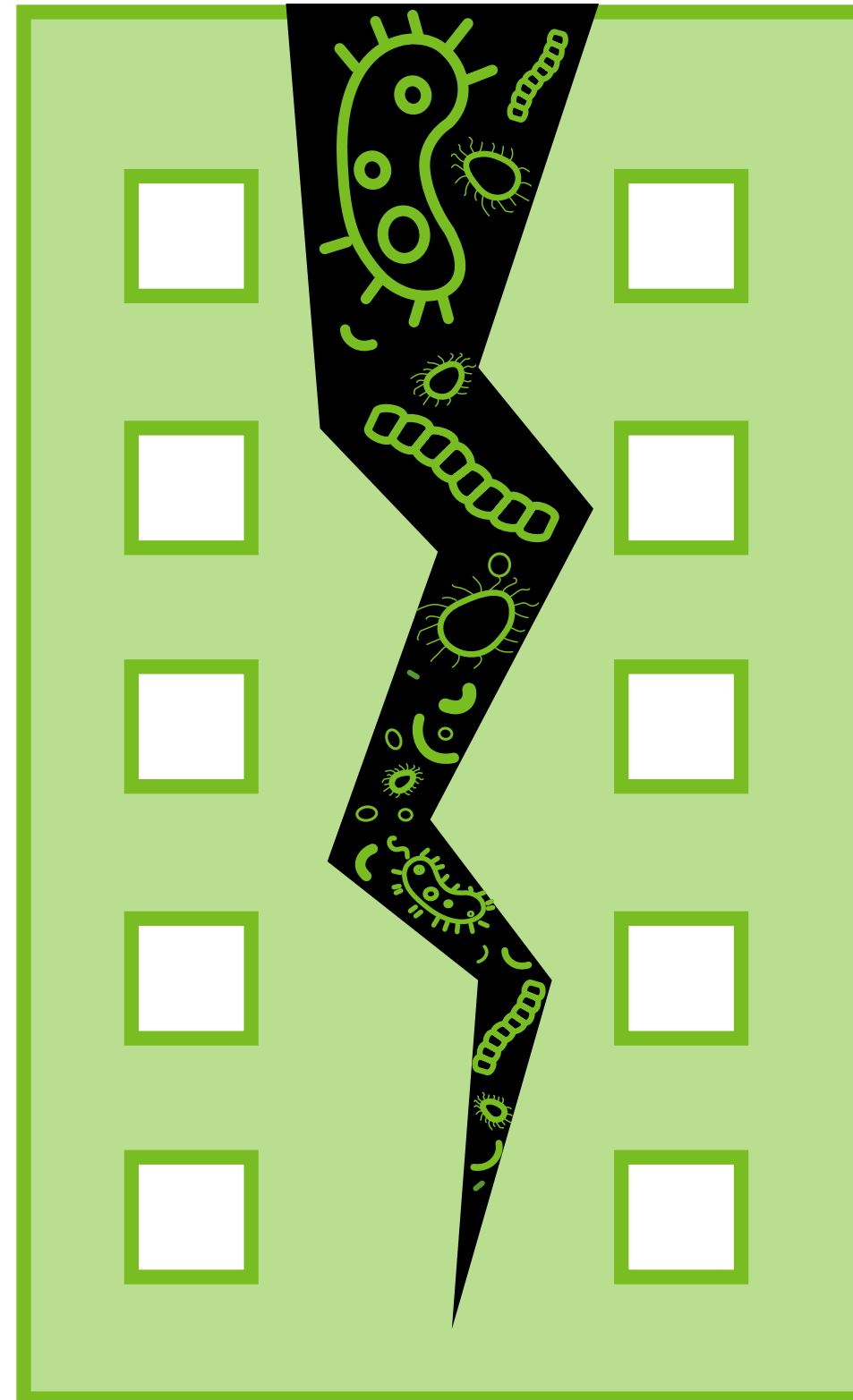
pEUI Predicted Energy Use Intensity. This measures a projection of what a building's annual energy use per unit will be.

Lighting power density (LPD) is the lighting intensity per square foot of room floor area (W/sf).



Global Trends in Sustainability

Global Trends in Sustainability



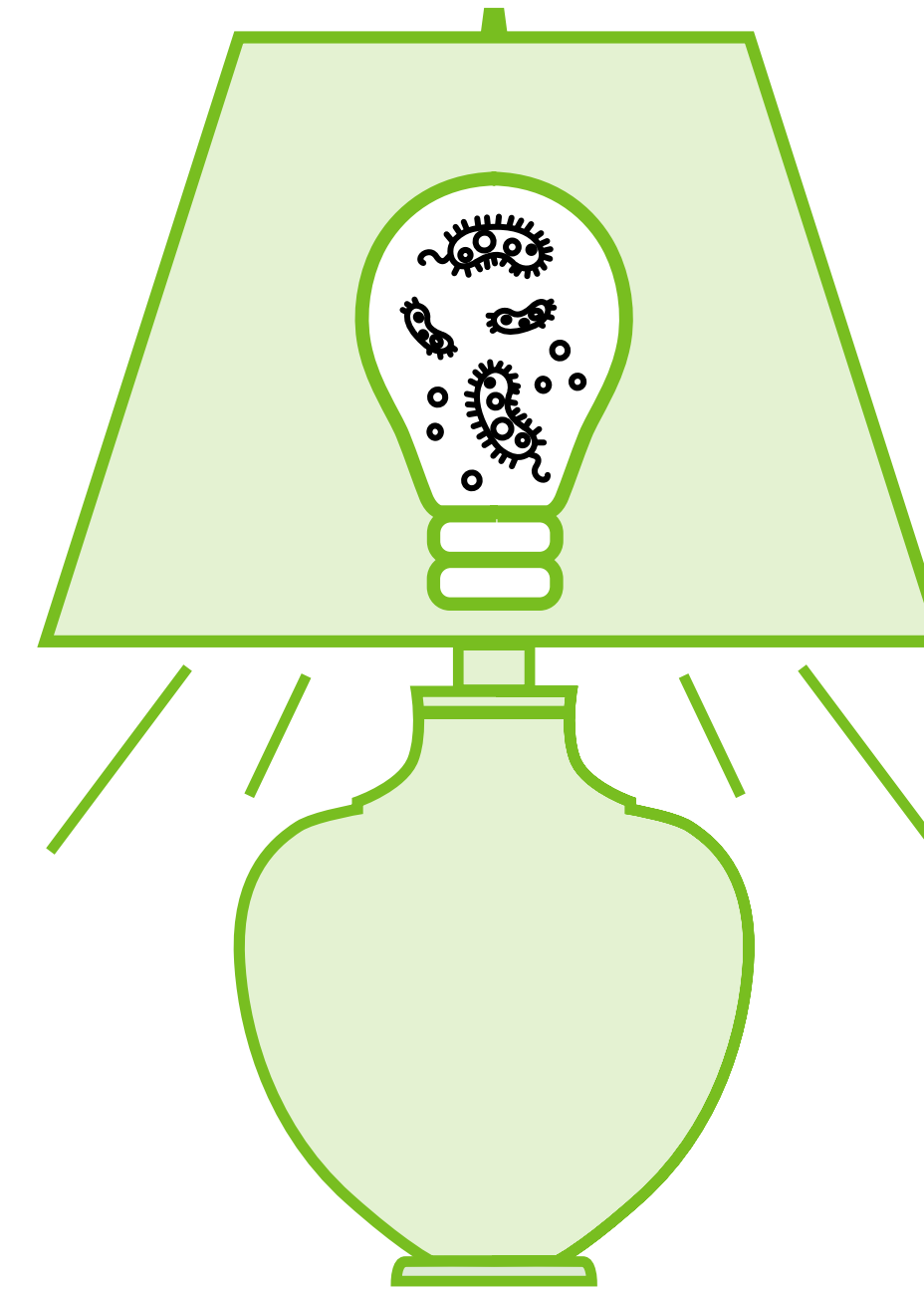
Building, Heal Thyself

It sounds like the stuff of science fiction, but there has been some hype surrounding self-healing materials. Companies that produce everything from smartphones to camping gear are getting in on the game. From an architecture and design consultancy standpoint, we're most excited about [self-repairing concrete](#). This nifty material uses bacteria and lichen to repair cracks, which means a significantly longer lifecycle for buildings and a more sustainable footprint.

Global Trends in Sustainability

Read by the Light of Bio-luminescence

What if we stopped talking about LEDs versus incandescent lightbulbs and started talking about an easier way to *feed* our light fixtures? With the [power of bioluminescent bacteria](#), that may become a reality. There's a way to go before this is commercially viable (do most people want to clean and feed their lights every few weeks?) but the idea and technology are promising steps toward zero waste, zero electricity lighting solutions.



Global Trends in Sustainability

Fun with Fungi

Online shopping and delivery have exploded, and so has the amount of packaging that goes along with it. Thanks to some [intrepid inventors](#) and [even our military](#), you may soon be able to plant that packaging in your backyard or compost it, rather than have a recycling bin full of cardboard thanks to a biodegradable material made from mushrooms. There will even be implications and applications for architecture as more living exterior and interior design materials hit the market.



Global Trends in Sustainability



The Bio-Filter Bonus

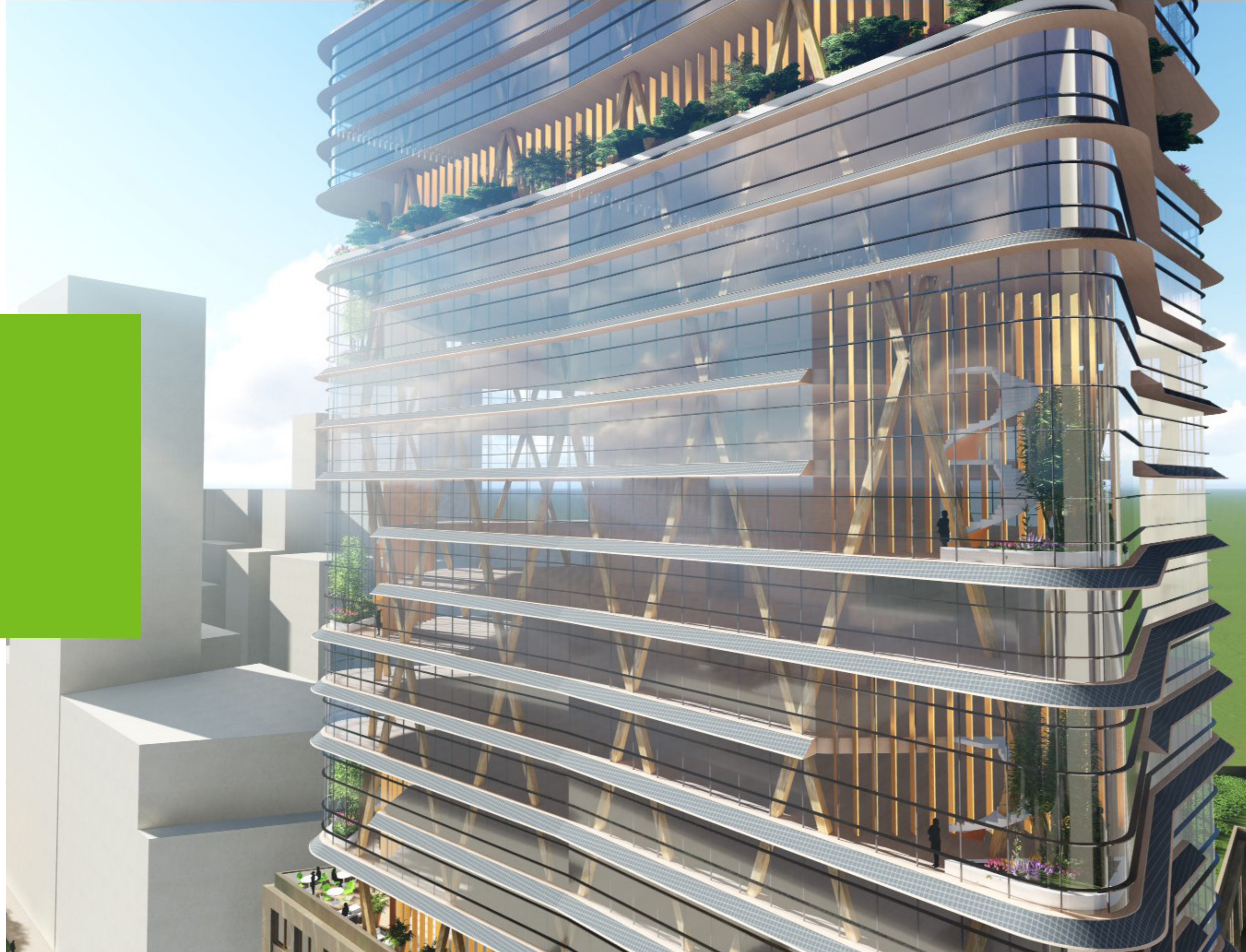
For architects working on sustainable solutions, the end goal is designing a building that doesn't just *limit harm*, but that actually *improves* the environment and community around it. That includes buildings that create more clean energy than they use or facades that clean pollutants from the air. Buildings as bio-filters are becoming much more prevalent as well, filtering out contaminants in waterways and soil in some of the world's most congested, polluted cities.



Project Spotlight

The Beacon

Amsterdam, The Netherlands

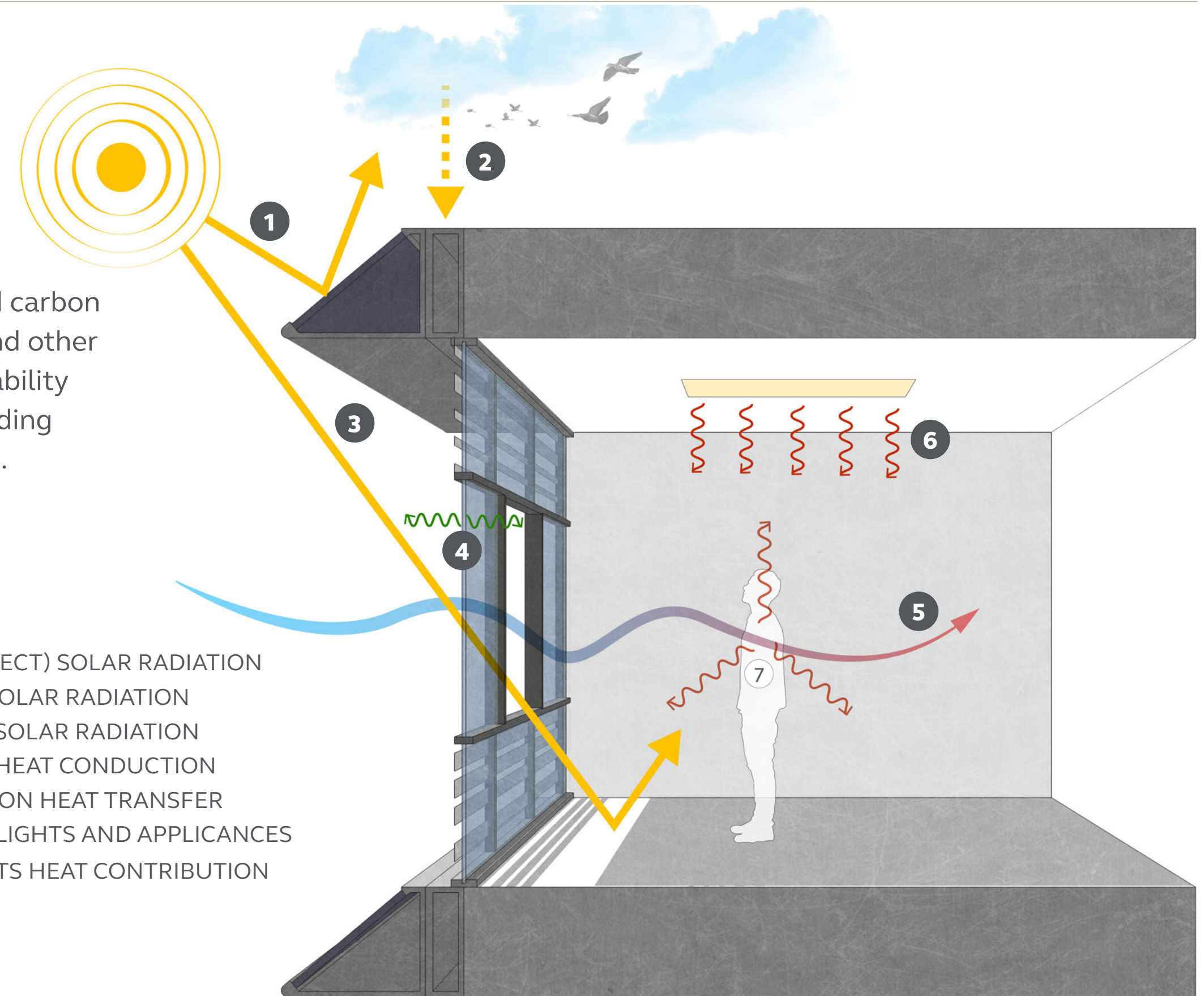


Located in Amsterdam, the Beacon is a net zero energy and carbon neutral design that incorporates offices, residential units and other amenities. The 390,000-SF building achieves these sustainability goals through optimizing every system in the project, including energy and operation, construction, water, waste and social.

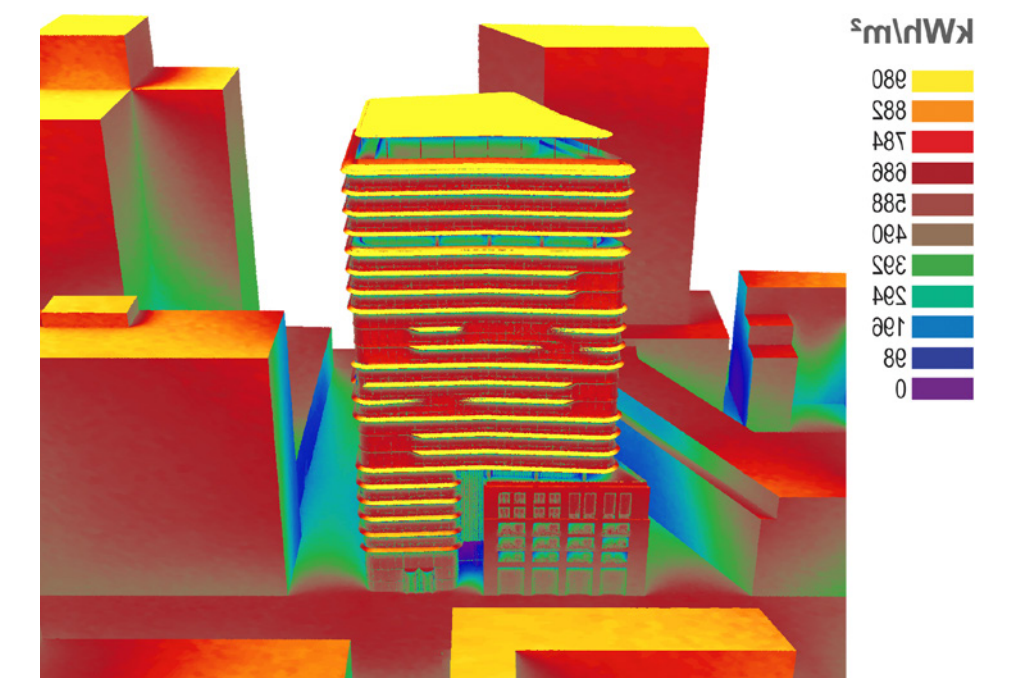
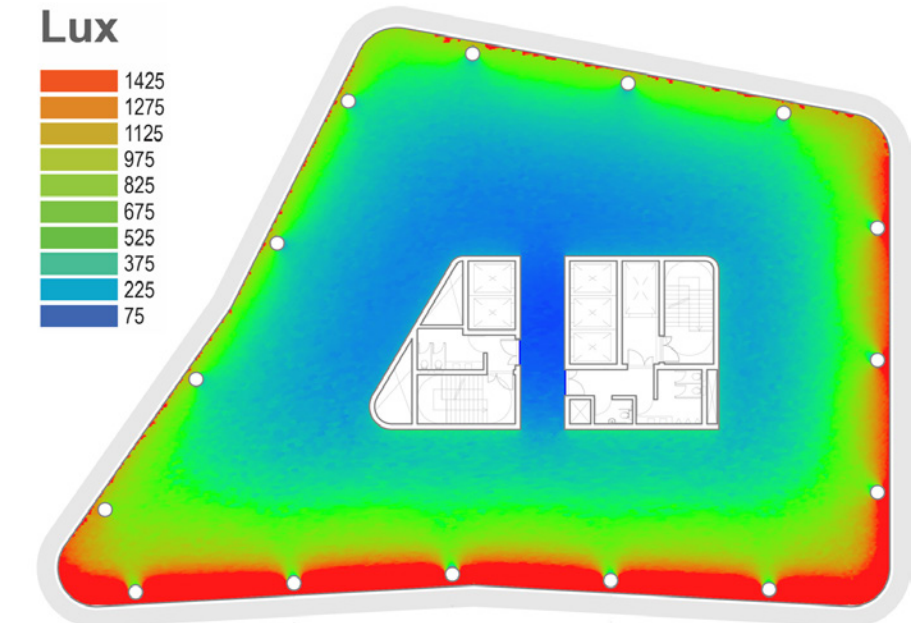
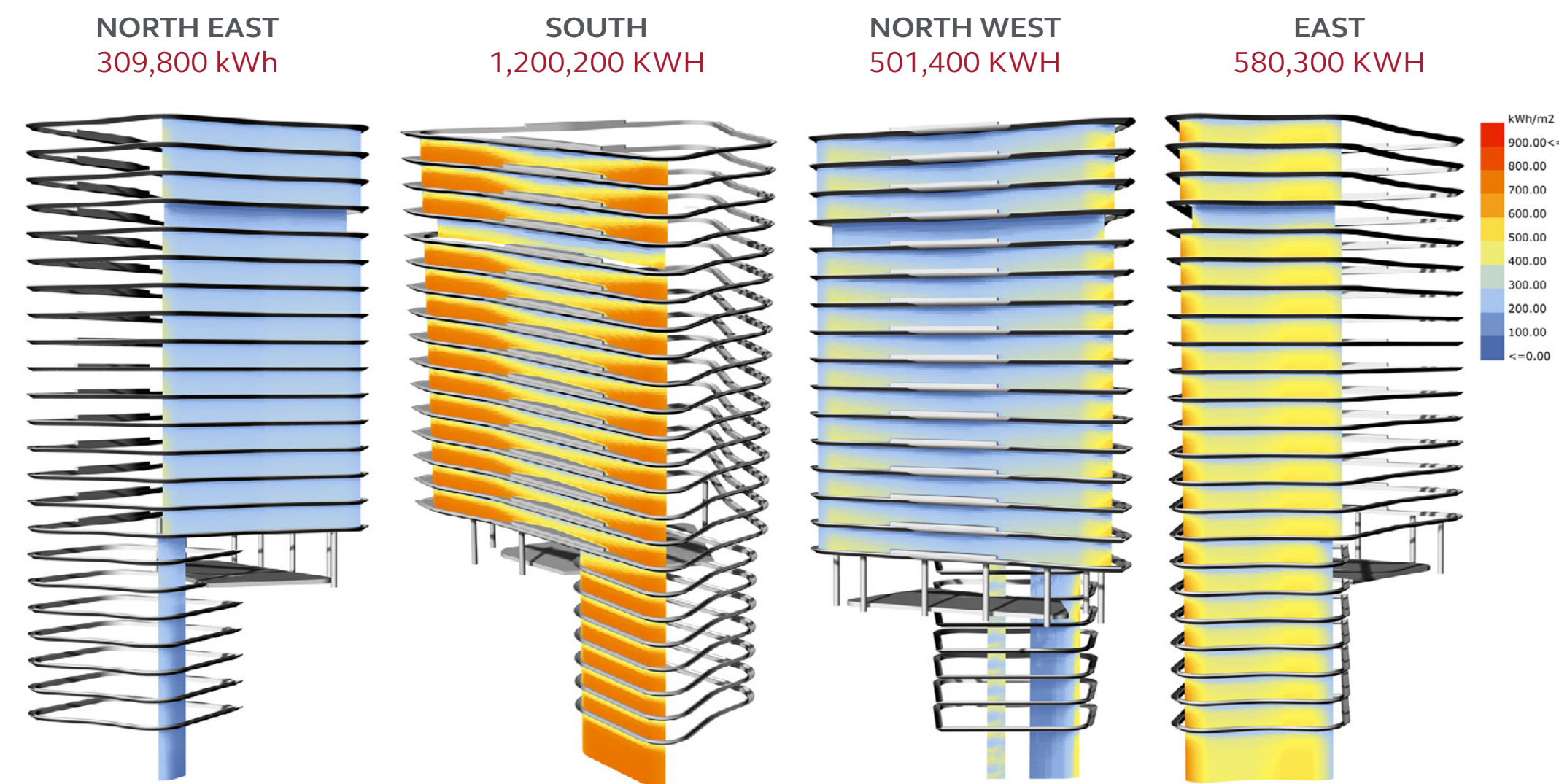
zero

net energy
and carbon neutral

- 1 BEAM (DIRECT) SOLAR RADIATION
- 2 DIFFUSE SOLAR RADIATION
- 3 WINDOW SOLAR RADIATION
- 4 WINDOW HEAT CONDUCTION
- 4 VENTILATION HEAT TRANSFER
- 5 ELECTRIC LIGHTS AND APPLIANCES
- 6 OCCUPANTS HEAT CONTRIBUTION



Daylight availability helped to define the initial building envelope and CRTKL studied several massing options to determine the form that would maximize daylight in the office space. A high-performance envelope, natural ventilation, renewable technologies (wind and solar), passive strategies, phase change materials and timber construction are all integrated in the project and enhance its sustainability profile. An energy budget of 50 kWh/m²/year ensures enough renewable energy is generated onsite to offset this energy consumption.

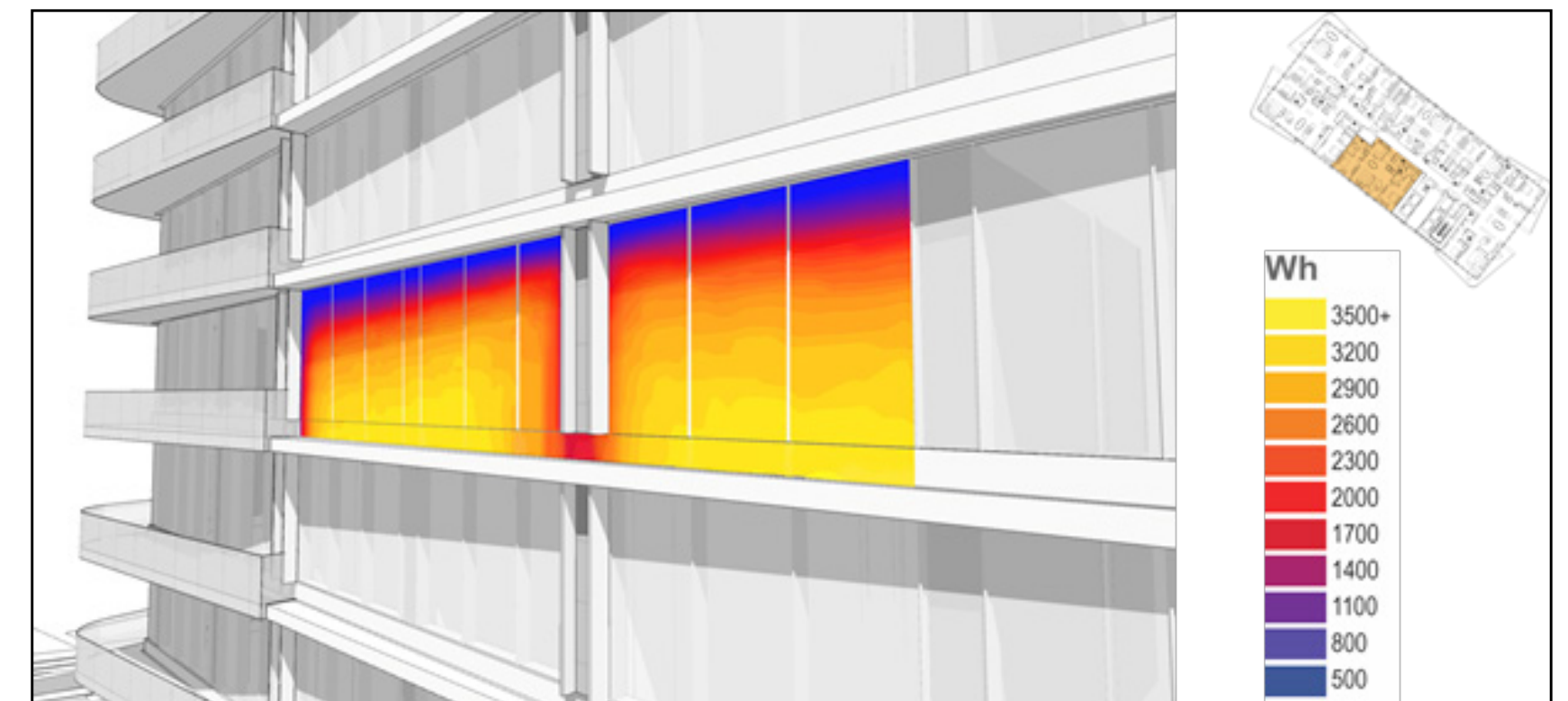
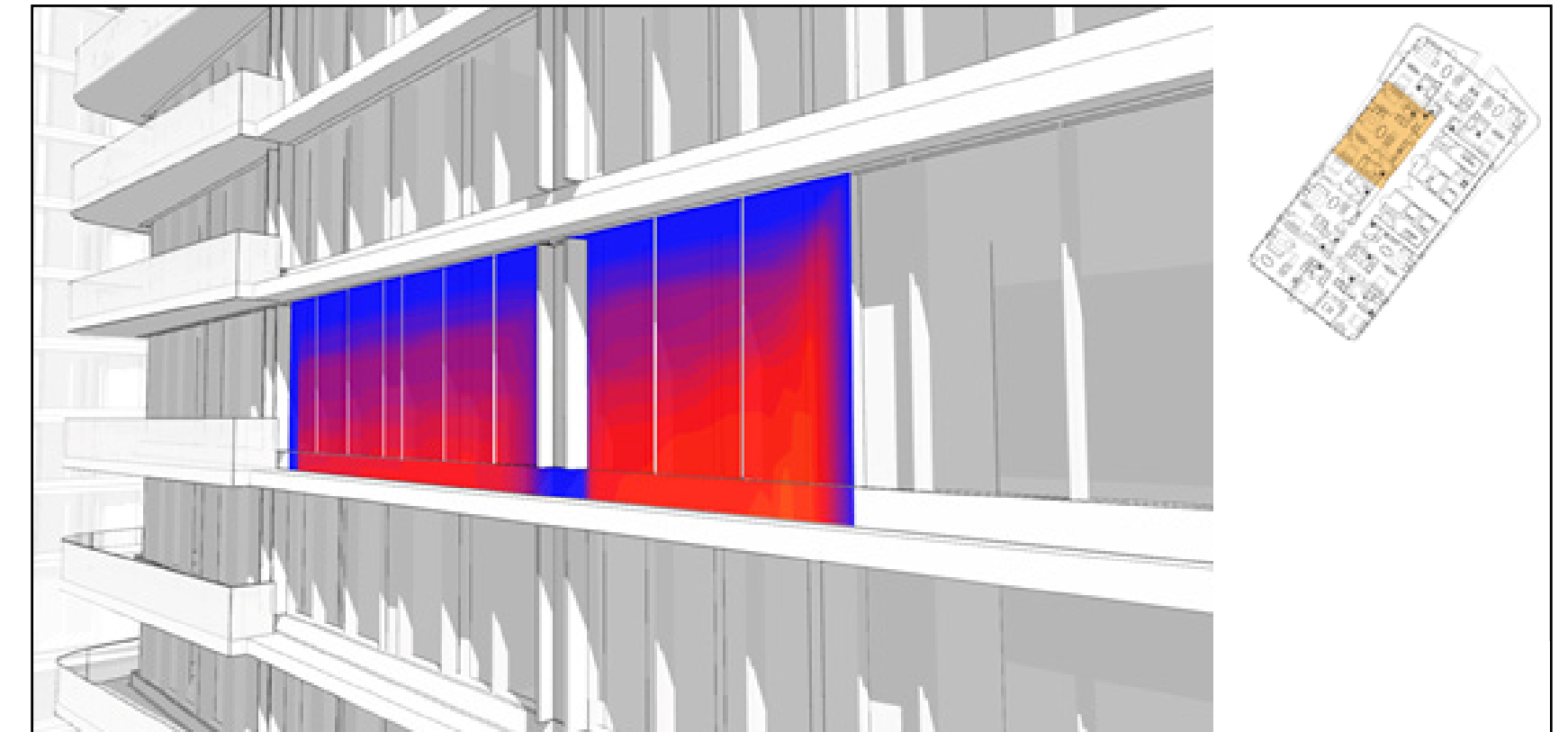


Oceanwide Plaza

Los Angeles, California



This Downtown Los Angeles mixed-use development is a component of the iconic LA Sports and Entertainment District master plan and includes luxury residential towers, 5-star hotel and retail. The 1.5 million-SF project is targeting LEED Gold and the design covers several energy and water conservation measures. CRTKL carefully studied the envelope to maximize daylight. The horizontal fin on the facade is more than just an architectural feature; it actually reduces solar gain.



The team made health and wellness a priority when designing the project—its three high-rise towers sit on a 200,000-SF retail podium with a large lawn, children’s playground, barbecue areas, a pool and a running track.

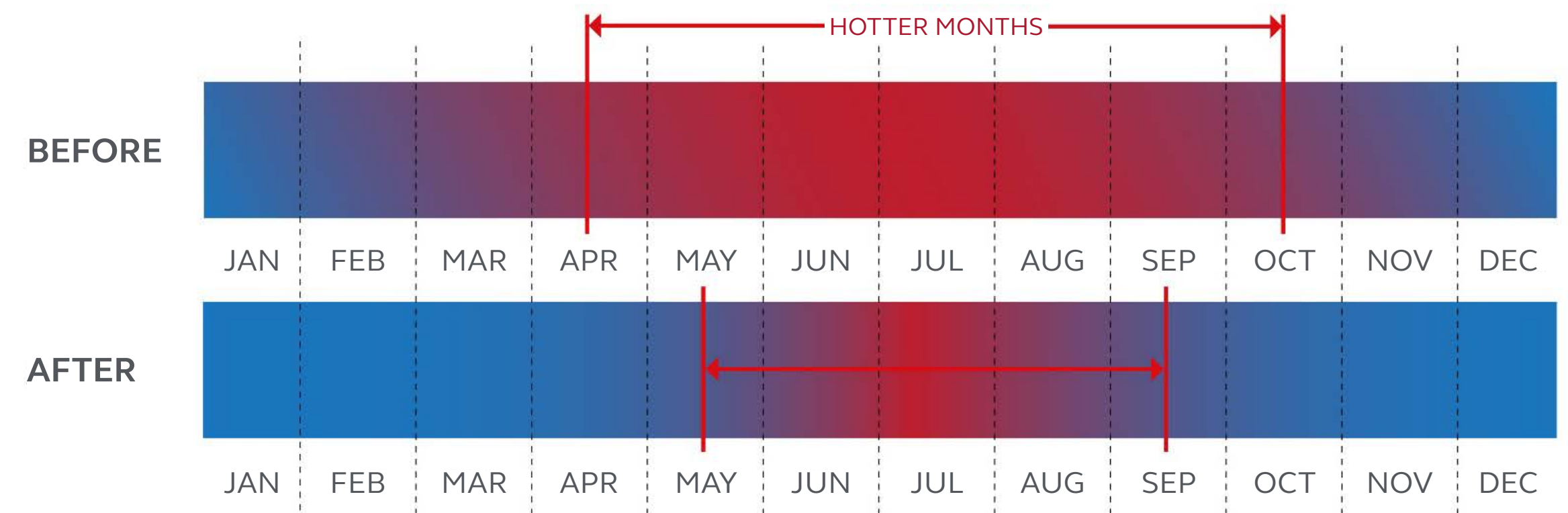


Achieving Outdoor Comfort

in Extreme Climates



For our PDD team, you could say that 2017 was the year for thermal outdoor comfort. We have implemented a series of strategies that, in various combinations, can reduce outdoor temperatures in very hot climates without any additional energy expenditure. This reduces the need for air conditioning and harmful refrigerants.



1

SHADE

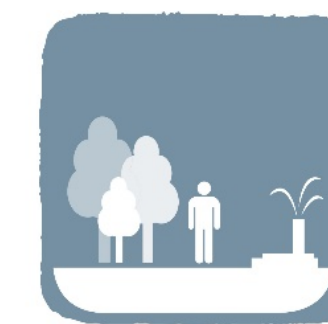
reduces radiant gains to the occupants and building surfaces



2

SHADE MOVEMENT

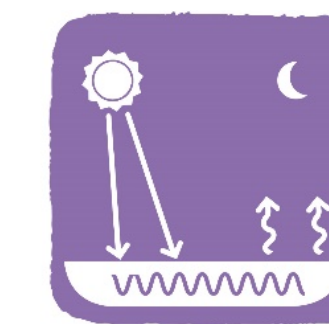
improves evaporative cooling at the skin level



3

EVAPORATIVE COOLING

promoted by water features



4

THERMAL MASS WITH EMBEDDED PIPES

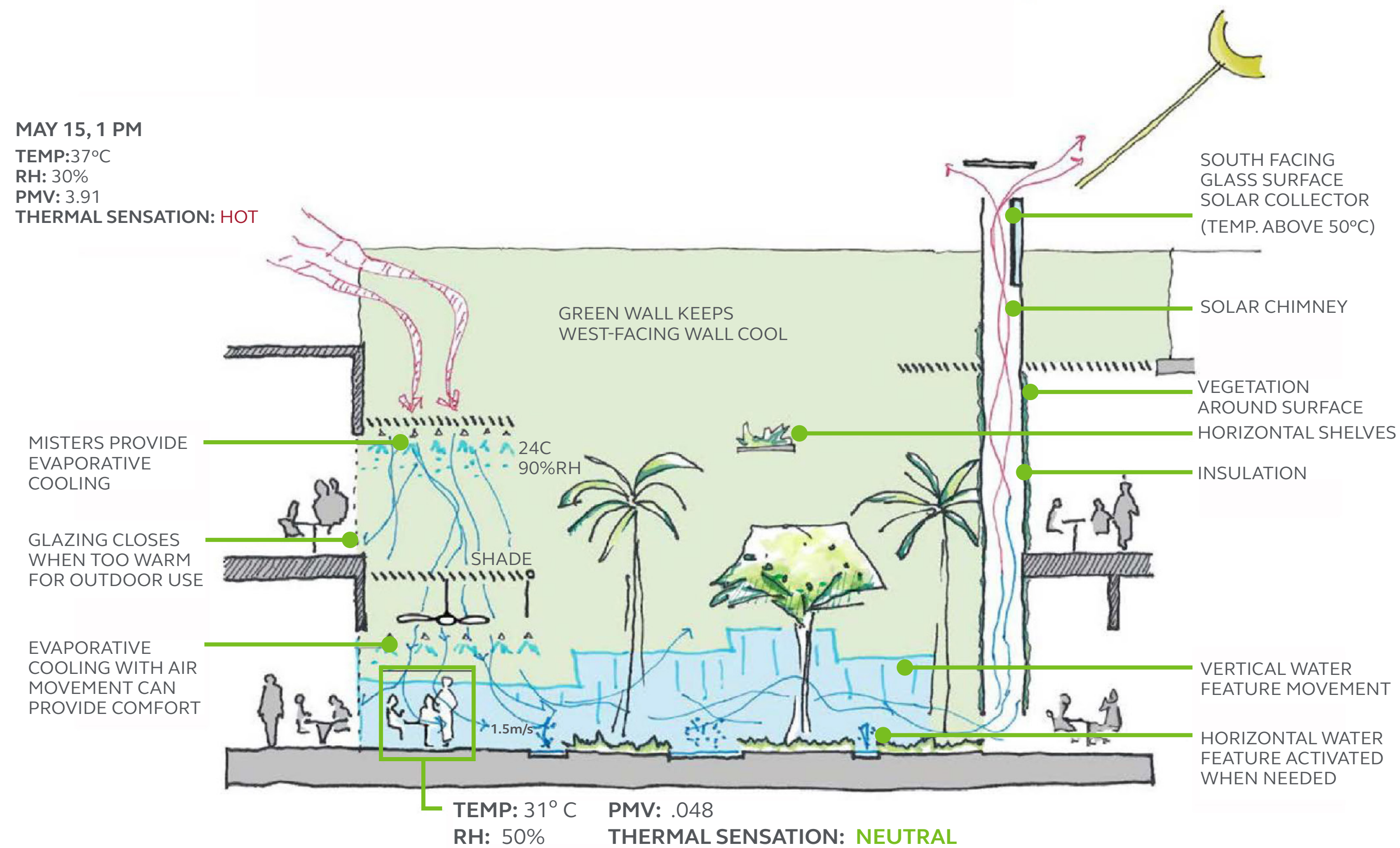
promotes radiant cooling



5

GREEN SURFACES

reduces solar gains in surfaces exposed to the sun



In a courtyard at a shopping center, for example, we would implement several passive strategies: enhanced shade, air movement, evaporative cooling, thermal mass with radiant pipes and green surfaces. None of these are effective on their own, but together, in different combinations, they can significantly reduce the temperature even in the world's hottest climates.

Cairo Children's Hospital

Cairo, Egypt



Energy savings and other “green” metrics are important, but Performance-Driven Design is about looking at the big picture of sustainability as well. The Cairo Children’s Hospital is a perfect example of that big picture thinking. Once built, it will be the largest pediatric cancer hospital in the world and have the first proton therapy treatment center on the continent of Africa. The project spans more than two blocks in the middle of Cairo, essentially rebuilding an entire neighborhood.



This comprehensive campus has inpatient, outpatient and academic buildings, and in terms of enhancing quality of life, children are treated for free and the hospital aims to raise the survival rates to those of the United States. On top of all that, the hospital is built to LEED standards, encompassing energy savings, roof gardens, reduction in water use, high-performance building envelopes, minimized indoor and outdoor pollutants, as well as other sustainable practices and efficient systems.





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.



Sustainable Designs Add a Breath of Fresh Air to Luxury Apartments

South China Morning Post, January 17, 2017 (**Tom Brink** quoted, 2929 Wesleyan pictured)



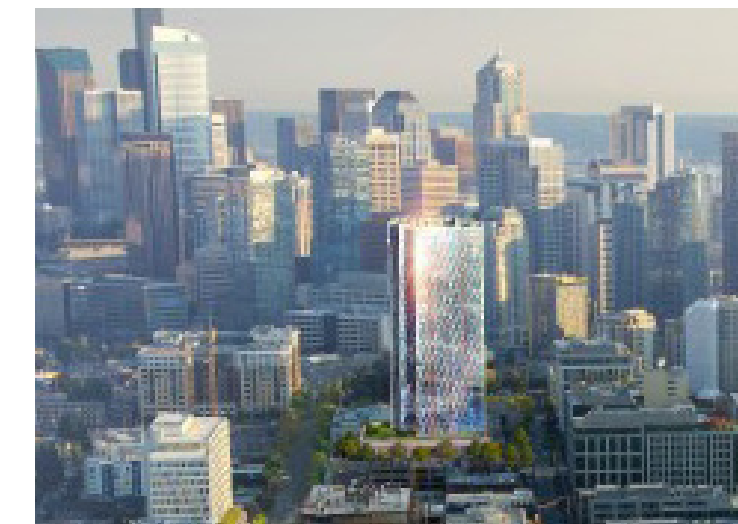
It's Only Natural

Retail Environments, March 2017 (written by **Joey-Michelle Hutchison** with images of REI SoHo, Chelsea Collective, Dhamani 1969 and Erno Laszlo)



Indoor Plants: Natural Fit

Retail Focus, January 19, 2017 (Brendan O'Grady and **Joey-Michelle Hutchison** quoted, Chelsea Collective pictured)



Mass Timber High Rise

Civil + Structural Engineer, March 1, 2017 (written by **Amir Lotfi**)




How Feasible is the 40-Story Timber Residential Tower?

Construction Specifier, February 2, 2107 (written by **Amir Lotfi**)



Five Ways to Achieve High-Performance Buildings Using Energy Modeling

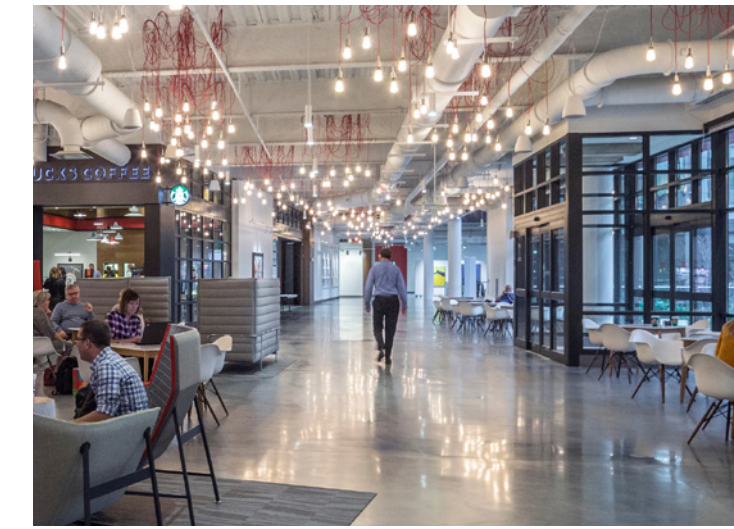
AIA, March 1, 2017 (written by **Eddy Santosa**)

 [Click on text to go to link](#)



Biophilic Design Brings the Outside in for Happier, Healthier Humans

Redshift, April 5, 2017
(**Brendan O’Grady** quoted)



Five Design Trends to Watch in 2018

Baltimore Business Journal, December 27, 2017 (**Jennifer Barnes** featured and American Greetings pictured)



Reclaimed Wood Rejuvenates Retail Interiors

Green Operations, Spring 2017,
(**Douglas Dohan** quoted)



Evidence-Based Design in Healthcare

CRTKL blogpost written by **Angela Crum**




Full-Court(yard) Press: How American Greetings Creative Studios Stands Out by Going Out

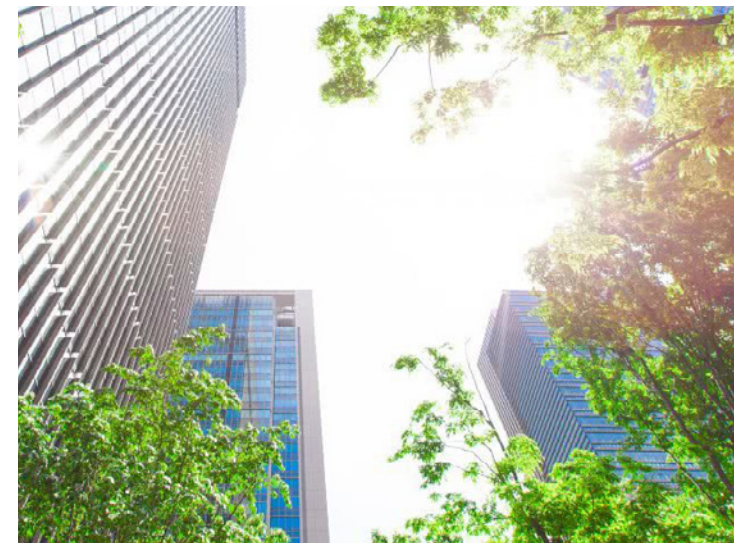
The Leader, December 2017
(written by **Jennifer Barnes**)



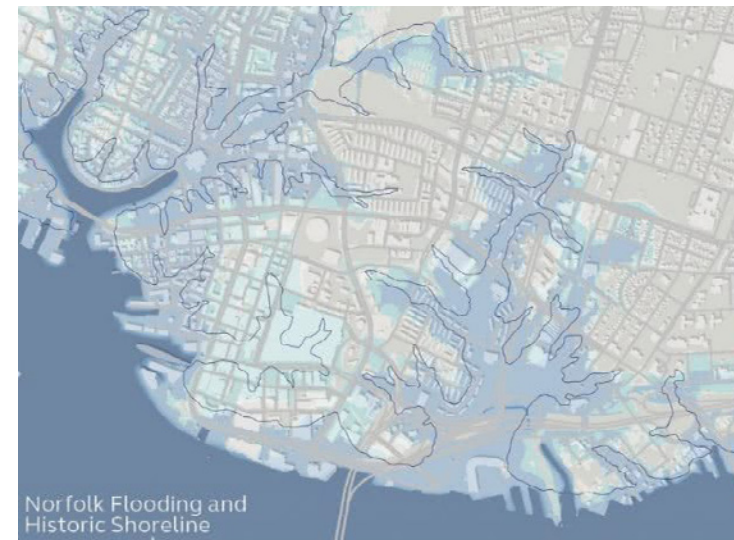
Learning the Language of Sustainability

CRTKL blogpost written by **Kelsie Whittington**

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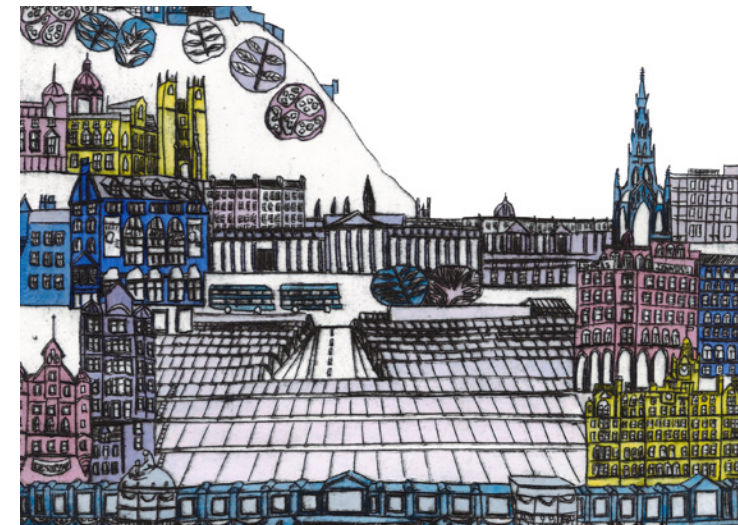
5 Concrete Ways to Begin Reversing Climate Change



Designing for Regenerative Resiliency

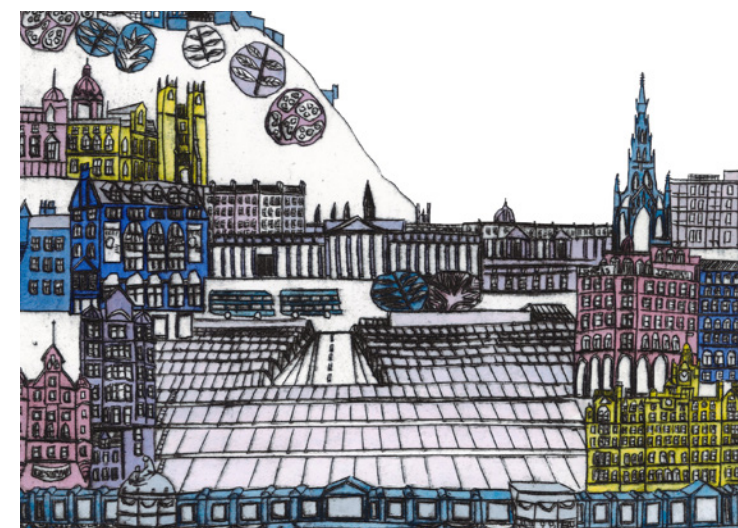
CRTKL blogpost written by **William Quattlebaum**

 [Click on text to go to link](#)



A Practical Method to Design Building Shade

A Presentation at Passive Low Energy Architecture Conference (PLEA) 2017
Pablo La Roche and Arianne Ponce
Edinburgh, UK July 3-5, 2017



Thermal Assessment of Different Configurations of Roof Ponds for Passive Cooling Purposes

Presentation at Passive Low Energy Architecture Conference (PLEA) 2017
Jose Manuel Almodovar and Pablo La Roche



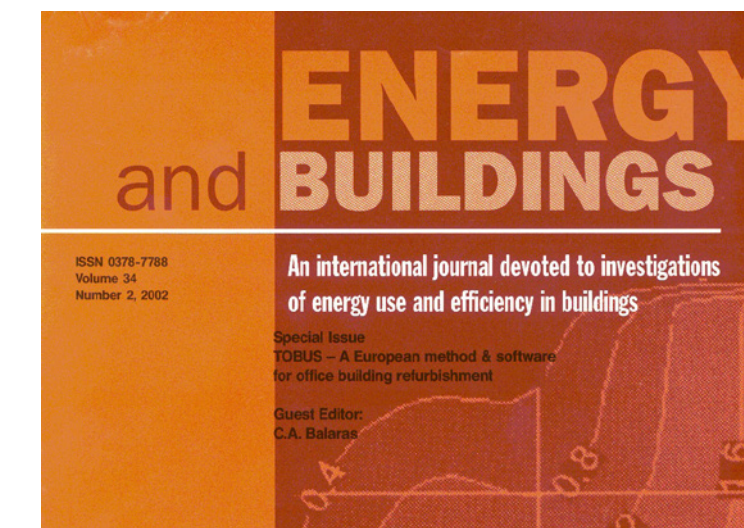
Carbon Neutral Architectural Design

Pablo La Roche
CRC Press/Taylor Francis Group 328p.
2nd edition, released July 2017



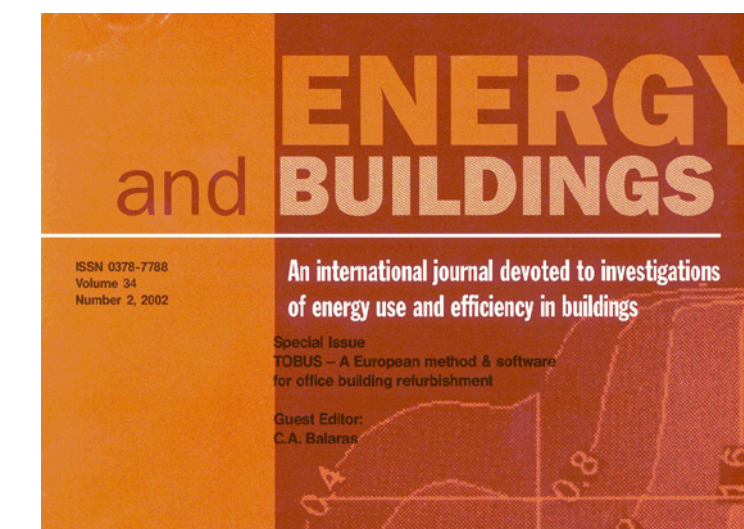
Special Issue: Passive Low Energy Architecture Association (PLEA): Effects of Envelope & Materiality in the Built Environment. A selection of the best papers from the PLEA 2016 Conference in Los Angeles

Journal Architectural Science Review
Guest Editors: Pablo La Roche, Marc Schiler, Paula Cadima




Water-to-air heat exchanger and direct evaporative cooling in buildings with Green roofs

Energy and Buildings
Umberto Berardi, Pablo La Roche, Jose Manuel Almodovar



Investigation on the cooling performance of green roof with a radiant cooling system

Energy and Buildings
Pablo La Roche and Dongwoo Yeom

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About Us



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. Our team of nearly 2,000 professionals around the world is committed to advancing our clients' businesses and enhancing quality of life. callisonrtkl.com

Contact

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CallisonRTKL.com

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