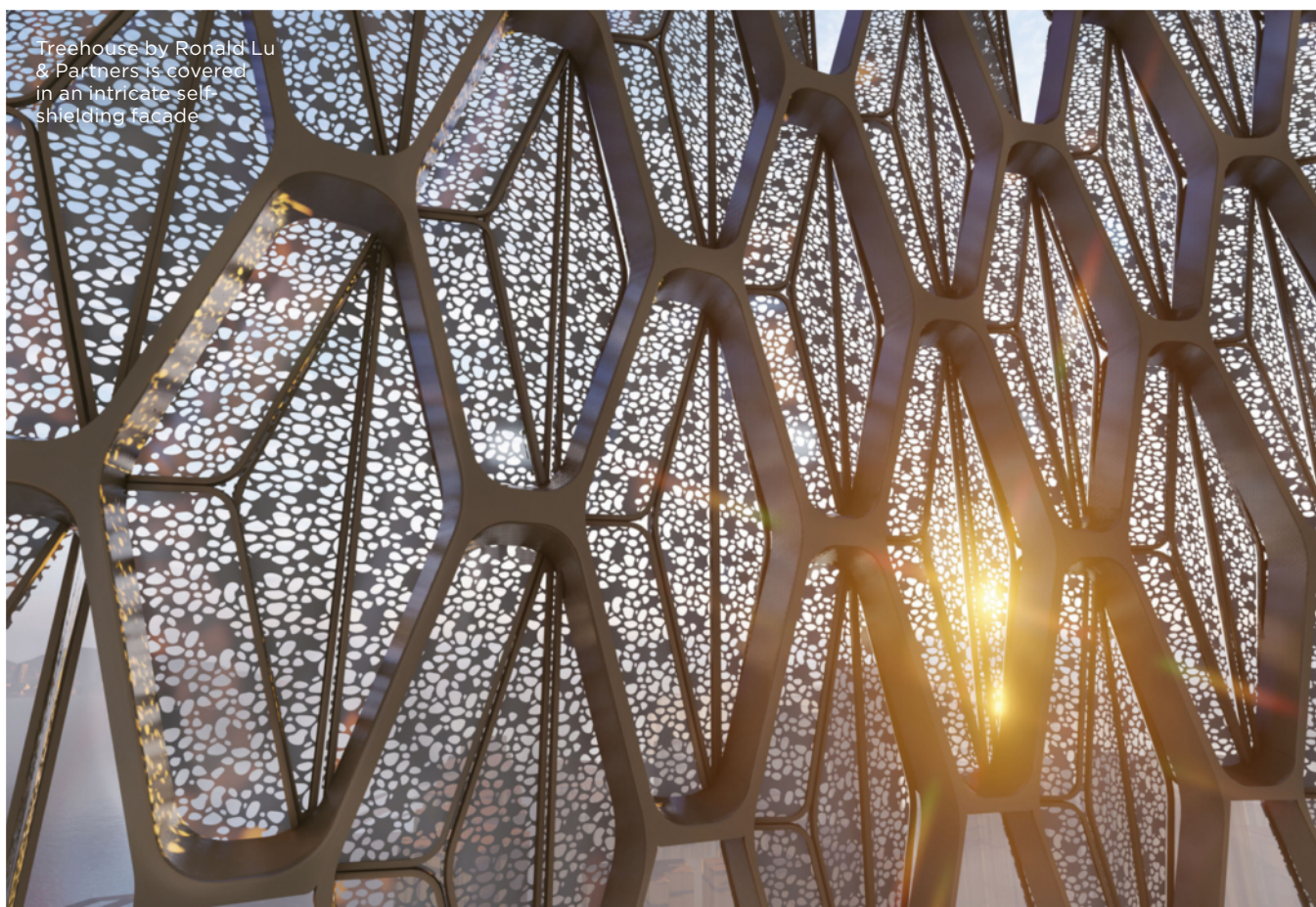


Treehouse by Ronald Lu & Partners is covered in an intricate self-shielding facade



design report

THE TIME IS NOW

Less glass, better insulation... and the ability to float? World-leading architects on changes the design world urgently needs to make

FEATURE Keith Flanagan

The biggest change to how architects are creating now, to the thinking behind all those grand designs, isn't a new aesthetic trend. It's our changing climate, which has long knocked on our doors, and is officially making itself heard. Hastily, visionaries and urban planners are shifting focus toward a different future, adapting home and building design for a different world. For perhaps the first time ever, the purpose of good design isn't to shape our own environments, but to listen to the atmosphere, and let our environment shape us.

'We need to create buildings that can withstand extreme elements that climate change will bring,' says Bryant Lu, vice chairman of Hong Kong's Ronald Lu & Partners, a force in future-ready design. 'Rising sea levels, super storms, increased floods, disruptions to transportation and supply chains, and more – but we also need to use design to help change the tide by reducing carbon emission and recycling waste.'

In our current state, we are not nearly ready, even in our own backyard. A recent 'Global Sponge Cities Snapshot' study of seven world cities by British firm Arup ranked London in last place, just shy of Shanghai, in terms of its 'sponge-like' nature and its ability to naturally absorb rainwater in case of flooding. As climate change brings more storms and heavier rainfall, urban centres like London lack permeable landscapes that manage excess water – think parks, ponds, and trees – and that's just one element we face in new climate change scenarios.

In response, architecture is embracing increasingly nature-based solutions. 'Moving away from thinking about "sustainable" towards "regenerative" design is needed,' says Kat Scott, sustainability and regenerative design manager at London's dRMM Studio. 'This will involve blurring the lines between buildings and landscapes, making spaces that humans and nature can flourish within.' In doing so, a number of bold names in



Urban Sequoia, a prototype by SOM, acts like a forest by capturing carbon, purifying the air

architecture imagine a future where cities aren't the concrete jungles we've grown used to seeing – in fact, many cities will float.

With designs that can seem stratospheric compared with everyone else, the Danish firm BIG Bjarke Ingels Group, founded by 'starchitect' Bjarke Ingels, is working with further-afield projects like Oceanix Busan, along the coast of South Korea – a prototype for a community of 'floating' hexagonal concrete platforms anchored to the seabed. In addition to generating their own utilities (solar panels will cover rooftops and will even float in the water to create energy, while a closed-loop system will harvest and reuse water), these modular 'islands' can accommodate rising sea levels, designed to rise in the water without floating away – all while withstanding extreme events like hurricanes, and even a tsunami.

But more tangible changes are afoot, too, as architects adapt traditional blueprints for everyday climate events as extreme weather begins to occur on a regular basis. 'In these cases, expect to see less glass, more insulation and better shading on most kinds of buildings, but particularly on residential ones,' says Fiona Cousins, Americas Region Chair at Arup.

ARCHITECTS ARE IMAGINING A FUTURE WHERE CITIES AREN'T CONCRETE JUNGLES – IN FACT, MANY CITIES WILL FLOAT

Architecture may place greater utility on common features like shutters (to protect glazing in increased storms) or awnings (to shade homes in increasingly warm climates) and other classic ideas already in practice. 'We can learn a lot from looking at architecture and built environments in hotter, wetter and drier places that are not necessarily reliant on new technologies or products to be achieved here – for instance, the whitewashed

buildings in the Mediterranean could easily translate to painting roofs white to reflect light (as is being done at scale in India already) and to using lighter colours for facades and urban realms to reduce urban heat islands rather than black for aesthetic reasons,' says Kat Scott.

Rising to the occasion, areas prone to flooding might see more homes hovering above the ground on stilts, a tried-and-true intervention for buildings in watery environments. March House, a project by

London architect Knox Bhavan, reimagined a 1920s home along the River Thames as a prefabricated and flood-resilient house thanks to galvanised steel stilts on concrete piles (eschewing the need for a concrete base, an industry standard that produces vast amounts of CO₂), allowing water to flow underneath in the event of a flood. Topping it off, architectural overhangs temper solar ►



gain while shutters and hidden slatted timber blinds on the exterior offer extra protection. A zinc roof doubles as a green roof with native wild flowers and grasses that save energy and improve biodiversity.

‘Every type of building can have a positive impact if we use nature-based solutions and carbon sequestering materials and technologies,’ say Kent Jackson, design partner, and Mina Hasman, senior associate principal and sustainability director, from Skidmore, Owings & Merrill’s (SOM) London studio. ‘All the carbon that gets absorbed can then be used to create biofuels, bioproteins, and additional building materials for roads, pavements and other infrastructure.’

In one of their latest prototypes, SOM unveiled a residential tower called Urban Sequoia that earns its perch in the city canopy: it would act like a forest by capturing carbon, purifying the air, and regenerating the environment. It claims it can sequester as much carbon as 48,500 trees through nature-based solutions, like a bio-adaptive facade of microalgae that generates biofuel, or making use of the tower’s ‘stack effect’ for direct air capture, drawing in air like a breathing tree.

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Biophilic elements abound throughout Ronald Lu & Partners’ Treehouse project, a vertical green skyscraper in Hong Kong. ‘These include an urban native woodland and an artificial wetland at grade, sky gardens, external and interior green walls and roofing, and nature-themed materials and furnishings,’ says Bryant Lu. The project, a net-zero building, doubles down

by promoting carbon positivity in a number of ways, from a self-shading facade to a rooftop solar power system that generates renewable energy.

But naturally, architecture of the future is increasingly connected with its environment and landscape – the actual earth around us will need to adapt, too.

‘In this perspective, also promoted by urban policies, urban gardens and new parks should be designed, city roofs should be turned into lawns, city walls into plant facades, and courtyards and empty spaces into green oases,’ says Francesca Cesa Bianchi, partner and director at Milan’s Stefano Boeri Architetti, the firm behind the Vertical Forest concept.

Building off its iconic Bosco Verticale prototype in Milan (a luxury apartment building covered with over 800 trees and



March House by Knox Bhavan reimagines a 1920s home as a flood-resilient house

20,000 plants), Stefano Boeri's latest Trudo Vertical Forest project, a social housing tower in the Netherlands, proves that the concept – cladding exteriors with trees – isn't just a luxury amenity. Here, the firm created a facade of prefabricated planters up and down the building with an external irrigation system that uses collected rainwater. The project can absorb over 50 tonnes of CO2 every year.

Bridging the gap even further between our built environment and nature, the Danish landscape architecture firm SLA is a leader in rethinking the spaces between buildings. From storm water management to heat-island mitigation, they aim to create spaces that are regenerative and biodiversity positive.

One chief example is the recent Al Fay Park project, an 'urban forest' park in Abu Dhabi. Cultivated on a former barren sand site, SLA planted over 2,000 native trees in an effort to enhance biodiversity, while sloping entrances create natural cooling throughout the park. 'The resulting microclimate reduces traffic noise and temperature and creates a forest-like environment,' explains Kristoffer Holm Pedersen, director at SLA. In addition to the many social benefits, the plantings

have attracted bees, pollinators, birds, and animals straight into the heart of Abu Dhabi.

Of course, there's also precedent to suggest that in many years from now, some architecture might rather look the same: as new and conventional construction requires vast amounts of

concrete and steel (two materials that release loads of CO2 during and after production) and burns plenty of fossil fuel in the process, a growing argument is to refurbish existing structures. 'We are seeing an uptick in the number of buildings that are being re-clad – usually with designs that have better thermal properties,' says Fiona Cousins. 'This can be achieved through improved glazing, [and] by reducing the proportion of glass – placing it more strategically to maximise daylight, or by adding

insulation to opaque areas.' The trend is no longer just about creating energy-efficient buildings, but being efficient with the buildings that already exist.

Whether new or old, we know one thing to be true today – many of our cities and structures were built for the climate we had, not the one changing before us. And that, too, is about to change.

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