

# SEA CHANGE



**FLOOD RESILIENT  
ARCHITECTURE FOR THE  
21ST CENTURY**

**01.02.20 – 16.05.20**

**Roca London Gallery**

### From Protection to Negotiation

In June 2016, the Seine River flooded Paris and left iconic images: the Eiffel Tower floating in a giant lagoon; the pyramid of the Louvre Museum reflected in a pond surrounded by historic facades. For the first time in decades, the museum's cellars were evacuated for fear of floodwater damaging thousands of precious artworks in storage. The previous evacuation took place 76 years before, during the World War II German bombing. Close to a century later, the idyllic Seine proved as threatening as the bombs. The 2016 Seine flood was not an isolated event – only two years later, in 2018, it burst its banks again.

What may seem like a colorful anecdote in a city like Paris, is a persistent drama in many regions of the world. In the same year, hundreds of people died, thousands were displaced, and millions saw their homes and livelihoods crushed by floods. 95% of the world's population lives less than six miles from a river, lake or coast. All whilst rivers are flooding and sea levels rising.

The surpass of historic maximums is no longer news but routine every few years. We are in denial of the environmental crisis, despite the evidence, and continue to apply the old recipes of protection. Is that the only possible answer?

Historically, in the Western Hemisphere, the reaction against rivers and their seasonal oscillations has been walls and attempts to contain. As a result, failure is a matter of time. The false perception of safety is often the reason for numerous losses of lives and wealth. Hurricane Sandy and its catastrophic effects in New York, with masses of water suddenly pouring over the protection walls, is a striking example.

We urgently need a paradigm shift: from *protection* to *negotiation*. The Dutch government applied this concept in a national operation developed between 2008 and 2014, 'Room for the River'. Dikes were relocated further away from the rivers and agricultural land adapted to floods with minimal harm. Before this, in 2001, Aldayjover Architecture and Landscape finalized the construction of the Gállego River Park in Zuera, Spain. This was the first public space and building of modern times designed to endure flooding without damage. Every year, part of the park is flooded, and the river helps maintain the park's vegetation. Every other year, the river water enters the bullfighting arena through the matador's door and exits through the bull's door, while the bullpens become temporary ponds.

Following the same principles, the Zaragoza Water Park for the 2008 International Exhibition gives a quarter of its area to the river seasonally. The river returns it back after a few days, and from the soil trees grow lavishly and the lawns explode with flowers.

The forest that cuts through the Aranzadi Park in Pamplona (2014) becomes a branch of the river several days of the year. Once the capacity of the river was duplicated through the park, the flooding of neighborhoods on the opposite bank was systematically reduced.

Compared to walls and pumping stations, parks and public spaces designed as hybrid infrastructures have the capacity to negotiate floods for the benefit of the city, with an unrivalled level of resilience (and service to citizens and the urban ecology). In order to change the paradigm of 'infrastructures of protection' (always insufficient and set for failure) to 'living with the river', informed citizens and transparency are the first steps. The education of the current generation, both in schools of architecture and entire universities, is essential to discover how we can inhabit the planet in a completely different way. Tulane University School of Architecture, situated in one of the most vulnerable and culturally significant cities in the world, New Orleans, is working at the forefront of this new framework.

### The Sponge Beneath Our Feet

The Assamese in their stilted bamboo homes knew all along. So did the Indonesian tribes of Sulawesi in their portable houses, and the Goan Portuguese in their bungalows, raised on brick plinths half a floor above ground. Occupying the ground with a structure does not guarantee the land will remain constant.

However, something changed in the Age of Exploration. As maps became the language for understanding our environment, land became locked in place and time, and the notion of 'ownership' emerged. However, how we located ourselves in space and time remained based on memory and experiences.

With our current dependency on digital navigation, our understanding of land has changed further. We are now accustomed to – and rely on – a constantly updating blue dot on a map, with fixed lines and boundaries, to tell us where we are in the world. But the fixed line between land and water we see on our screens, in reality is not fixed at all. Google Earth shows buildings and geography in three dimensions, and updates traffic movement in real time, but the oceans and rivers remain fixed, frozen, unflowing.

Rather than envisioning the Earth's surface as one that is below or above water, we should envision it as a sponge, with varying degrees of wetness. Our ability to manipulate that wetness – wring out the sponge – will decrease over time.

In India, 43% of its inhabitants live in fragile coastal areas. 560 million people live along the coast. They do not necessarily live there to enjoy the ocean view, but because it's the only place where water, livelihood and opportunities exist. Learning to live with the uncertainty and unpredictability of our environment – as our pre-industrial ancestors had to confront the unknown future – is crucial for survival. The variables we now face are on a scale never before imagined.

Whilst it's impossible to relocate or rehabilitate the 560 million people living on India's coast, and all the other coastal communities around the world, changes can be made to how we plan and construct the built environment to make these communities more sustainable.

Water is not the enemy. We rely on it as much as we have to guard ourselves against it. Changing rain patterns will force us to both harvest rainwater to endure longer dry spells, as well as make space for unpredictable excess. Architecture once again has to accommodate fluctuations in climate and weather patterns. In some instances this may mean having to shape our landscape more strategically. In others, it may result in our mode of construction changing from heavy, ground-based buildings, to either a lighter architecture, or one based on buoyancy. All with an increasing awareness that we are living on a sponge.

### The Grown Environment

Until recently, most discussions about urban development have solely been concerned with the quality of the *built* environment. Today, planners and politicians are becoming aware of the need for a *grown* environment. Understanding the connection between nature and our social and physical well-being has become crucial when designing resilient and sustainable cities.

As urban designers, nature needs to be the focal point of everything we develop, draw and think. Nature is the means by which we solve some of today's hardest urban challenges, while adding new social and cultural meaning to our cities. Thus, the aim of urban development should always be to increase every citizen's quality of life, as well as improving the biodiversity of every neighborhood.

The liveable city is made for people, not cars. Future urban spaces need to be multifunctional, but first and foremost they need to be created for people. People need nature, and by formulating a new type of city nature we can achieve balance. This is a city nature of high biodiversity, great aesthetic power and many different functional properties – from rainfall management and climate change adaptation, to protection against urban heat islands, and shielding buildings and infrastructure from wind and weather. But, above all, a city nature that creates the best environment for the users of the city.

Architecture, master planning, urban spaces and landscapes, are just some of the means that we use to put nature's processes into play. Our fundamental nature-based approach is that nature's grown environment and the built environment differ from one another. Although they are not comparable, they are complementary. And to us at SLA, they together constitute a holistic and nature-based urban development.

### Visions for a Water-filled Future

Over the past 50 years records show that the occurrence and severity of extreme weather has increased. Sea levels continue to rise as global warming melts the frozen parts of the world's oceans, putting communities and properties in coastal areas around the world at great risk.

We are at a critical point in history: as well as being the last generation that can stop climate change, we are also the first forced to live with its consequences. In the 21st century, dams, dikes and barriers can no longer be the default answer to flood resilience. Embracing the inevitability of a more water-filled future offers the most realistic and progressive solution.

*Sea Change: Flood Resilient Architecture for the 21st Century* explores the role architects can play in adapting our cities to a new climate reality. From small-scale adaptations of individual buildings, to city wide infrastructure, using a mixture of man-made and natural solutions, this exhibition presets projects – proposed and realised – that show how we can live *with* water in our built environment.

In addition to the projects featured in the exhibition, presented here are the voices of four specialists in the field of flood resilience, offering their visions for a built environment in a world where flooding is the new normal.

**THE**

**POWER**

**OF**

**DESIGN**

**AS WITH THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT AND THE PARIS AGREEMENT, WE KNOW “COMPLEX CHALLENGES CALL FOR TRULY COMPREHENSIVE AND INCLUSIVE APPROACHES AND TRULY TRANSFORMATIVE AND INNOVATIVE SOLUTIONS”. WE NEED TO UNRAVEL THE DIFFERENT INTERDEPENDENT DEMANDS AND CONNECT THESE IN INSPIRING AND SUSTAINABLE PATHWAYS.**

**FOR THIS APPROACH AND THESE RESULTS, WE NEED DESIGN: ARCHITECTURE, URBAN DESIGN AND LANDSCAPE ARCHITECTURE. DESIGN IS ABOUT BOTH THE PROCESS AND THE OUTCOME. IN ADDRESSING THE IMPACTS OF CLIMATE CHANGE, DESIGN IS INCLUSIVE, SEEKS SYNERGIES, LOOKS AHEAD AND PREPARES US AND OUR PLANET FOR AN UNCERTAIN FUTURE: FLEXIBLE, ADAPTIVE AND RESILIENT.**

**DESIGN IS COMPREHENSIVE BY NATURE, CUTTING ACROSS DISCIPLINES, UNITING RATHER THAN DIVIDING. ONCE WE UNDERSTAND DEPENDENCIES—HOW POVERTY AND HEALTH RELATE TO POOR INFRASTRUCTURE, HOW URBANIZATION TOUCHES UPON THE NEED FOR FOOD, ENERGY AND WATER, IGNORING JURISDICTIONAL BOUNDARIES—A DESIGN APPROACH EMERGES THAT INTEGRATES THIS UNDERSTANDING, AND IDENTIFIES OPPORTUNITIES TO SOLVE PROBLEMS HOLISTICALLY.**

**APPEALING TO THE IMAGINATION BUT GROUNDED IN ANALYSIS, DESIGN ENABLES US TO SKETCH NEW FUTURES AND DETERMINE THE STEPS THAT WILL GET US THERE, LINKING TODAY’S CONDITIONS WITH TOMORROW’S POSSIBILITIES. A COMPREHENSIVE PLAN CONSISTS OF REAL, INNOVATIVE PROJECTS TO IMPLEMENT AND INSPIRE OTHERS, KICKSTARTING DEVELOPMENT AND CATALYZING CHANGE. A TRULY INTEGRATED DESIGN CONNECTS SOCIAL, CULTURAL, ECOLOGICAL AND**

**ECONOMIC CHALLENGES. IT CONNECTS REGIONAL INTERDEPENDENCIES, LOCAL NEEDS AND COMMUNITY ASSETS, NOT BY A TRADE-OFF OF INTERESTS—THAT IS, NOT BY COMPROMISING—BUT BY BRIDGING GAPS BETWEEN QUALITY AND SAFETY, BETWEEN ECONOMY, ECOLOGY AND SOCIETY. INTEGRATED SOLUTIONS ADD VALUE ACROSS SECTORS, ACROSS SCALES AND THROUGH TIME, BUILDING A SUSTAINABLE BUSINESS CASE.**

**THIS PROCESS OF DESIGN IS INHERENTLY INCLUSIVE. DESIGN CHALLENGES THE DIVISIONS OF OUR DAILY LIVES BY DRAWING ALL INTERESTS, ALL ASPECTS, ALL QUESTIONS AND ALL PEOPLE INTO A COMMON UNDERSTANDING AND A NEW DEAL. IT INVITES US ALL TO CONTRIBUTE: OUR DIFFERENT NEEDS AND DEMANDS, OUR UNSPOKEN DREAMS AND IDEAS. BY MAKING THE ENVISIONED TACTILE AND THE AMBITIOUS PRACTICAL, THE DESIGN APPROACH INCREASES EVERYONE’S IMAGINATIVE CAPACITY AND HELPS US MAKE THE FUTURE TANGIBLE AND ACHIEVABLE. IN THIS WAY, DESIGN TURNS COMPLEXITY INTO COMPELLING AND INSPIRATIONAL IDEAS, AND TRANSLATES SOCIETAL ISSUES INTO SHARED AMBITIONS AND INSPIRING NARRATIVES ABOUT OUR FUTURE.**

**DESIGN HELPS US TELL EACH OTHER STORIES ABOUT WHAT COULD BE—STORIES THAT CONVINCED, SEDUCE AND MAKE US ALL BELIEVE IN THEM. AT THIS LEVEL, DESIGN IS TRULY INSPIRATIONAL AND ASPIRATIONAL, WHICH MAKES IT POLITICAL: PEOPLE WHO HAVE PARTICIPATED IN THIS PROCESS WILL FIGHT FOR IT AND WHAT IT PROMISES THEM. THIS IS WHY WE DEVELOPED REBUILD “BY DESIGN”—TO TACKLE THE FUTURE AND ESCAPE THE PAST WITH VISION, BY DESIGN AND IN COLLABORATION.”**

**Roca London Gallery**

Station Court  
Townmead Road  
London, SW6 2PY

info.londongallery@roca.net  
rocalondongallery.com  
+44 (0) 20 7610 9503

Monday to Friday 9.00 – 17.30  
Saturday 11.00 – 17.00

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