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Norman Foster: Building an oasis

By Timur Moon - Nov 28, 2010

For Lord Foster, an architect must grasp all aspects of a city's life, from sculpting its sleekest towers to channelling its gutters and drains. Architects need to go beyond simply designing buildings, to extrapolate a world view that can revilatise whole neighbourhoods and offer its inhabitants a better life.

They must be versed in the whole gamut of urban planning, he says, creating an attractive ambience while encouraging social mobility, devising efficient ways to generate power while taking in the most minute and lowliest details, right down to the mechanics of the ventilation and smooth running of waste disposal.

They must be schooled in social theory while demonstrating business verve, understanding the implications of climate change while exuding mathematical expertise. They must combine a flair for physics with an artist's imagination, while assimilating traditional building methods, learned over centuries, with the cutting-edge advances of contemporary science.

Nowhere is this truer, he says, than Abu Dhabi, where the aridity makes a tolerable way of life dependent on power-hungry cooling systems. And being the Pritzker prizewinning architect behind Masdar City, it is a building and design challenge he is intimately familiar with.

The climate and natural resources of the Gulf have combined to make particular demands on engineers, Foster says, and the attempt to meet them is producing some of the most groundbreaking design developments in recent history.

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"Where else in the world is oil-drilling technology being piloted in sustainability projects where experimental drilling is tapping hot water deep underground to bring it to the surface in geothermal cooling, to release us from dependence on cheap energy?" he asks, with an enthusiasm that leaves him breathless.

Beyond the UAE, Foster's landmark edifices include the Berlin Reichstag, the Bilbao metro, Hong Kong's Chek Lap Kok international airport, the Millau viaduct in France, New York's Hearst tower, and the Swiss Re building in London, ubiquitously visible across the city and known to all as the Gherkin.

But recent years have seen him increasingly involved in the development of Abu Dhabi. It's a long-term interest, he says, crediting the maturity of thought that he believes has informed the planning of Abu Dhabi.

"We've been here a long time. It's a place that's fascinated us for many years. We've been actively involved for six or seven years, since a time when very little was happening. What was interesting then was how much thought was going into urban development. We're aware of a much more considered attitude here than in other cities in the region. It is self-evident that the attitude and mindset here are different."

The region is big business. Foster + Partners, the company he founded, has at least five large-scale projects underway in the UAE.

Last week, he unveiled his spectacular five-domed arc design for the Zayed National Museum, that forms part of the major programme of cultural expansion scheduled for Saadiyat island.

Foster's plan envisages a series of five elliptical winged discs set on a hilltop ringed by a canal.

The museum is due for completion in 2014. Along with Masdar, Abu Dhabi's Central Market and Al Raha Beach complex, and the Index at One Central Park in Dubai, it forms the centrepiece of the glittering array of projects that constitute his vision for the UAE.

There is a feeling that, like Le Corbusier's Chandigarh in India, or Gaudi's Barcelona, Lord Foster will figure as something of an auteur in the architectural development of Abu Dhabi, with his showpiece buildings becoming a signature feature of the city.

But on any scale, the other structures are dwarfed by the sheer scale of the ambition at play at Masdar, billed as a zero-carbon, zero-waste city, that will operate without cars, conditioning its own buildings through solar and geothermal power tapped from underground wells in the middle of the desert.

"You're doing the equivalent of putting a man on the moon," he says, "running laboratories with air-conditioning 24 hours a day in the middle of the desert, with no access to cheap oil, generating solar energy, and processing waste on site. You need to be very clever."

The basic power needs are heightened, of course, in a region where the economy is driven by oil, and in an age now hyper-aware that one day, fossil fuels will run dry.

"If, as an architect, you believe there is a future beyond cheap energy and gas, then it's very interesting. We're trying to anticipate a future where we make spaces comfortable without using cheap energy. This is generating an architecture that is unique."

The early developments of Lord Foster's career were noted for their hi-tech industrial design, twinned with their radical social theory. His landmark 1974 Willis Faber and Dumas building in Ipswich introduced open-plan office floors, along with roof gardens, swimming pool and gymnasium, and was hailed as an architectural breakthrough, credited with transforming the standard of life of workers in a town suffering grinding economic depression.

And with Masdar, he is once more entering unchartered territory. By absorbing the lessons of the past, and assimilating the traditional building heritage of the region, he believes he has been able to apply state-of-the-art technology to improve the quality of people's lives.

"Masdar is unique. There is a fusion of academic research and commercial application. The nation is fortunate in having large supplies of gasoline, but is investing in a future beyond the life of that resource. We're interested in architecture beyond the design of an individual building, in the use of sustainable energy after the lifespan of fossil fuels, beyond the life expectancy of our grandchildren."

In Masdar, as with the Zayed National Museum, he propounds an ethic of returning to traditional methods of construction to get "more with less", marrying state-of-the-art technology with the skills and building crafts honed over centuries.

"Before the modern movement, traditional methods of cooling were employed," he says. "We combined that with cutting-edge systems, using mirrors to focus and generate energy, run transport systems and create ventilated, partially shaded public spaces. In this way we will experience the city as more than a place to work, more than a home. It's never been done before, and it's there, and its working." Strategic deployment of geometry, for instance, can create a street grid that allows for more breeze. "With a lot of shade, and clever design to encourage air movement, we concentrate on the direction in which to point the narrow, shaded streets to maximise air flow."

Hills and elevated manmade promontories can be used to attract the wind, while providing a plinth for elegant architectural features that are visible for miles. "We build structures higher in the air, not to say, 'here I am' - though they do say that - but to seek to pull the breeze to a higher altitude. This was happening before anyone invented the generation of electricity.

"We must use the intellect and experience to build cool places in the desert, and through using these techniques, we can anticipate a world without cheap energy. If humanity aspires to those standards, we can learn from those traditions, to create desirable places to live."

His use of cooling towers is a recurrent feature, and has created markedly lower temperatures by drawing on traditional methods, he says. "In Masdar, the outside spaces are lovely. We've had our own research team looking into wind towers, water, shade, narrow streets, and we managed to reduce the ambient temperature - the temperature you feel and experience - from 52°C to 32°C. All those lessons fed into Masdar, and into the design of the Zayed National Museum."

Thermodynamic cooling systems, along with advanced solar power generation, and new techniques of recycling waste to provide energy, have all combined to harness technologies first developed in oil production for clean-energy production.

"We've been able to work with nature, while applying cutting-edge technology. In one pilot project, oil-drilling techniques were used to drill down two kilometres to access water, and then bring it to the surface in a cooling process. Around the labs in Masdar, there is another project that recycles waste and converts it to energy."

Nevertheless, there are obvious perils in urban development.

"In the centre of Abu Dhabi," he says, "you see glass walls, with the sun reflecting off them, coming back off black asphalt, so that you can't wait to get out of there and into a chilled building."

And the city is evidently blighted by its fair share of indifferent, uninspired architecture, he continues, pointing to the looming tower blocks that owe nothing to traditional practice. "There's been too much use of imported techniques. You could be anywhere in the world."

He hopes lessons can be learned from the mistakes of the past, with Masdar serving as an example. "When it comes to expanding on the centre of Abu Dhabi, we hope people will think, 'before we do more of the same, what potential is there to learn from Masdar, when it comes to extending the central area?' We must learn from the collective experience."

He should know. His plan for London's £18 million (Dh103m) flagship Millennium Bridge met with derision when it was felt to wobble precariously underfoot on its opening night. Now, however, after the application of correctional measures, it is a popular tourist attraction.

Masdar has not entirely escaped criticism from certain quarters. Most recently, The New York Times commented on its tendency towards propagating elitist enclaves of "gated communities", or ghettos of privilege that can thrive only by keeping out the masses.

Foster is outraged: "Here we have students, not some precious elite - there are students elsewhere in Abu Dhabi - and we have factories that make solar power. There are factories elsewhere in Abu Dhabi."

He attributes the criticism to professional jealousy. "Critics were just completely knocked out by what they saw," he says. "It was the first time in history that architecture took the front page of The New York Times. And they had to find something critical to say, to grit the wheels."

But, he acknowledges, there are lessons to be learnt from Masdar. "As cities evolve, we learn from things that work unexpectedly, and things that don't work as well. At Masdar, we conducted an experiment with 10 megawatt solar farms, with solar arrays on the roofs that overhang the edge. Would we do the same again? It's possible that we would seek to vary the mix.

"In previous centuries, for instance, the area around a city would be used for harvesting. Perhaps, around this traditional model of a walled city, the space outside the city could be used to harvest energy, with more solar panels on the ground, rather than on the roofs."

Three years ago, he called in a corporate finance house to find buyers for the firm he established in 1967. This year he turned 75, but while he may be seeking to sell his majority holding in a company valued at £500 million, his work is likely to keep him busy for years to come.

And, in realms ranging from business and technology to art, Abu Dhabi is at the crux of that work, he says. It's in a region that long endured some of the harshest conditions on earth, but where the discovery of a vast wealth of natural resources propelled it into a global hub and cultural melting pot. And it is his ambition to draw on that experience, he says.

"It is evident that things are happening in a different way here," he says. "It is no accident that this pioneering work is happening here and not anywhere else in the world. With Masdar, and with the museum, we're seeking to work with the elements, to do more with less. We'll be working the way people worked centuries ago - to make a desirable oasis in the desert."