Norman Foster Foundation

Droneport

Press Clipping

THE TIMES

Publication
The Times

Date
26/05/2016

Format
Printed

Tiny airport where future is taking off

The droneport structures, designed by Lord Foster of Thames Bank, left, can be built in weeks using local materials

A prototype of the "world's smallest airport" has been unveiled at an architecture festival in Venice (Jonathan Morrison writes).

Designed by Lord Foster of Thames Bank, the droneport, which was built in 13 days by five people, represents a first step in a visionary scheme to deliver vital medical supplies to impoverished parts of Africa.

Lord Foster has drawn on his experience of designing airports as well as lunar studies conducted with Nasa to design a vaulted brick structure that can be constructed out of local materials by relatively untrained workers.

The droneports could host a medical centre, post and courier rooms, an ecommerce trading hub and a drone manufacturer.

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Lord Foster insists that there must be an "infrastructural leap" if they are not to be left behind by commerce and medicine. But he believes that every small town on the continent can have one of his droneports by 2030.

He envisages his droneports operating two parallel networks: a "redline" using smaller drones to deliver medical and emergency supplies weighing up to 10kg and a commercial network called the "blueline" transporting equipment, electronics and ecommerce items weighing up to 100kg.

"This is a first step along the way but it is an important one," Lord Foster said.

"This project can have a massive impact through the century and save lives immediately. We're turning a technology associated most with killing into a technology for living."

A pilot project in Rwanda will be launched later this year.

The initial plan is to complete three of the structures by 2020, enabling a network of drones to send supplies to 44 per cent of Rwanda. More than 40 droneports could be built in subsequent phases, with the country's central location allowing a rapid expansion to neighbours such as Congo.

The Observer

Publication
The Observer

Date
29/05/2016

Format
Printed

Ideal home exhibition – for real world problems

A sense of social purpose drives this year's Venice biennale, and while good intentions don't always translate into good ideas, the best combine usefulness, economy and beauty

Rowan Moore
@RowanMoore

Architects are insecure about their usefulness. They work with buildings, which are generally large, expensive, long-lived and important to life, but it's not always obvious what is significant about the specifically architectural aspect of their work – the refinements and rearrangements to the functional object that might otherwise come into being without architects' help. If they have some influence over large budgets, it is developers or politicians who usually make the real decisions. At best, an architect can be like a jockey on a horse. Often, he or she is more like the groom, who puts nice plaits in its mane and tail.

They're also open to accusations of self-indulgence, of hijacking commissions to fulfil their creative whim, never more than in the age of "iconic" architecture that may or may not be now coming to an end. Hence the appeal of what is sometimes called "humanitarian architecture", where architects apply their skills to helping people in disaster zones or suffering extreme need. What, indeed, could be more useful than helping in such situations? Nothing, as long as the architects really are helping. Otherwise they are only taking their self-indulgence to a higher level, at the expense of people least able to afford it.

Such issues are raised, if not completely answered, by this year's edition of the Venice architecture biennale, the world's biggest exhibition of architecture. Under the slightly sententious title of Reporting from the Front, it aims, says its Chilean director Alejandro Aravena, to explore "the social, political, economic and environmental end of the spectrum". It is not the first time that the biennale has declared a social purpose, but the idea is pursued more vigorously than before.

There is a display on the water tanks in Medellin, Colombia, that once stood in fenced-off areas of grass around which settlements grew up, now opened up into public oases. The Indian architect Anupama Kundoo has built a mock-up of her Full Fill Home, which uses hollow blocks of ferrocement to achieve "speedy and affordable housing units that have low environmental impact". Wang Shu and Lu Wenyu show beautiful panels of brick and tile as part of their campaign to support traditional rural techniques, by using them on a new museum in the city of Fuyang.

Norman Foster, with the help of his Foster Foundation, has produced a full-size prototype of his impressive plan to build "droneports" in inaccessible parts of Rwanda, where drones can deliver medicines, tools and other essentials. Using a combination of high and low technology, the ports are to be vaulted structures in bricks made out of local earth, which can be built at least partly with local labour. In Venice he and his team are demonstrating how they will be built.

One of the most memorable displays is in a tent-like structure created by the German architect Manuel Herz and the National Union of Sahrawi Women. With a combination of photographs, maps and specially woven tapestries, it shows the camps in Algeria created by refugees from Western Sahara since its occupation by Morocco in 1975. Here, says Herz, they have created "a place of emancipation and self-governance, truly democratic, and not a place of misery". The institutions of society – ministries, a

parliament, schools – are housed in buildings that, despite their rough building techniques, are planned with "incredible beauty".

Aravena's theme is not only applicable to cases of great need, though it tends to be interpreted in that way. The "front" he describes is any situation in which an architect can deflect or guide the forces that go into buildings and places such that they have a greater public benefit. It can mean the conversion of expanses of landfill into parks by the Catalan architects Batlle i Roig. The Portuguese Eduardo Souto de Moura shows how he was asked to modify a youthful work of his, a market in the city of Braga, into a completely new use as a dance and arts centre. Heroically, he was prepared to rip the roof off his early masterpiece and leave it as a part ruin.

The biennale consists of distinct elements. There are the huge 16th-century corderie, or ropeworks, of the Arsenale and a large central pavilion in the gardens dedicated to the biennale: in both venues the director chooses the content. The gardens also contain national pavilions where individual countries interpret his theme as they see fit. Among these is the British pavilion where the young curators respond to housing need by proposing new ways of living in homes. Their concepts are strong and their installation elegant, although the latter does not always connect perfectly with the former. The Polish pavilion concentrates not on architects but on the construction workers for which the country is famous, and on the pressures and dangers of their lives.

If "humanitarian architecture" sometimes turns out not to be humanitarian, it is not always architecture either. In the urge to do good, or to be seen to do good, architects can forget their skills of making spaces and buildings that are desirable to inhabit. But the biennale includes some corrective installations, for example by the venerable Portuguese Álvaro Siza and the Chilean Pezo von Ellrichshausen, that are simply about enclosing spaces and capturing light in delightful ways. It is not clear how they fit the curatorial theme, but they enrich the show.

The strongest exhibit combines constructional wonder with the possibility of usefulness: under the title of Beyond Bending, the Block Research Group of Zurich construct beautiful and delicate vaults that update traditional techniques and economise on building materials. The weakest is called Matrex, its inclusion inexplicable, a mixed-use building for the Skolkovo business zone near Moscow. For symbolic reasons not worth repeating, it chooses to insert the shape of a multistorey matryoshka doll into a pyramidal exterior, a model of which is then displayed with intrusive blue lights and buzzing noises.

There are many pitfalls in a project such as this year's biennale, not all of which are avoided. The voices of the people in whose name much of the work is done tend to be in the background, except in films where they express their gratitude and happiness for the results. Poverty and informal construction can be sentimentalised, romanticised and patronised, sometimes made into aesthetic of brownness and low droning music. At its worst, the biennale can look like a Fairtrade garden furniture shop. Truly terrible captioning – badly lit, small type, obscure wording – doesn't help.

What could be more useful than helping people? Nothing, as long as the architects really are helping

Ultimately, none of the work on show is verifiable, at least in the context of the biennale. Any form of intervention has social and economic ramifications – well-meaning volunteer work, for example, might put local builders out of business – and it takes knowledge of each and every situation to know whether interesting-sounding proposals for water-gathering towers in Africa or for helping crime-ravaged parts of Mexico will have the effect they promise. The Venezuelan pavilion shows small community projects sponsored by the same government under whom the economy is currently tanking, which makes you wonder if the former are a poor substitute for fixing the latter. The biennale is therefore a series of suggestions as to what might be a good idea, rather than evidence of actions that work.

Sometimes the benefit might flow less from architects to the poor than in the opposite direction. Low-cost, low-technology construction returns architecture to its roots, of laying one block on another by hand, and making best use of light and climate. In an age otherwise dominated by mechanised and impersonal building processes, it enables you to see in a finished structure the story of its making.

If the biennale offers no more than suggestions, they are nonetheless engaging, enriching and sometimes enlightening. Compared with previous more Eurocentric biennales, it presents a realigned perspective of the world of architecture, in which Latin America, Asia and Africa take their rightful place. Although the big old names of architecture are still there, a substantially new cast of creative characters is offered. It feels like a new world.

Publication
av proyectos

Date
01/10/2016

Format
Print

Droneport

Una red de hangares para drones en África que entre en funcionamiento en 2020, y con el objetivo de que todas las aldeas del continente dispongan de un *droneport* propio en 2030: es el ambicioso primer proyecto de la fundación creada por Norman Foster y recién establecida en Madrid. La EPFL planteó a Foster el reto de diseñar estos pequeños hangares por su experiencia en aeropuertos y sus conocimientos como piloto. El hangar está concebido como un *kit* compuesto por el encofrado básico y la maquinaria para fabricar ladrillos. Construido por las comunidades locales, las materias primas se obtienen en la zona, lo cual reduce el coste del transporte y lo hace más sostenible.

Drones for Africa

A droneport project for Africa with an initial plan for three buildings to be completed by 2020, and a larger network so that every small town in Africa can have its own droneport by 2030: this is the ambition of the first project of the foundation created by Norman Foster and recently established in Madrid. The EPFL approached Foster with the concept because of his combination of airport design experience and knowledge of flight as a pilot of sailplanes, helicopters and aircraft. The Droneport is devised as a 'kit-of-parts' including the basic formwork and brick-press machinery. Built by the communities, the raw materials are locally sourced, reducing transport costs and making it more sustainable.

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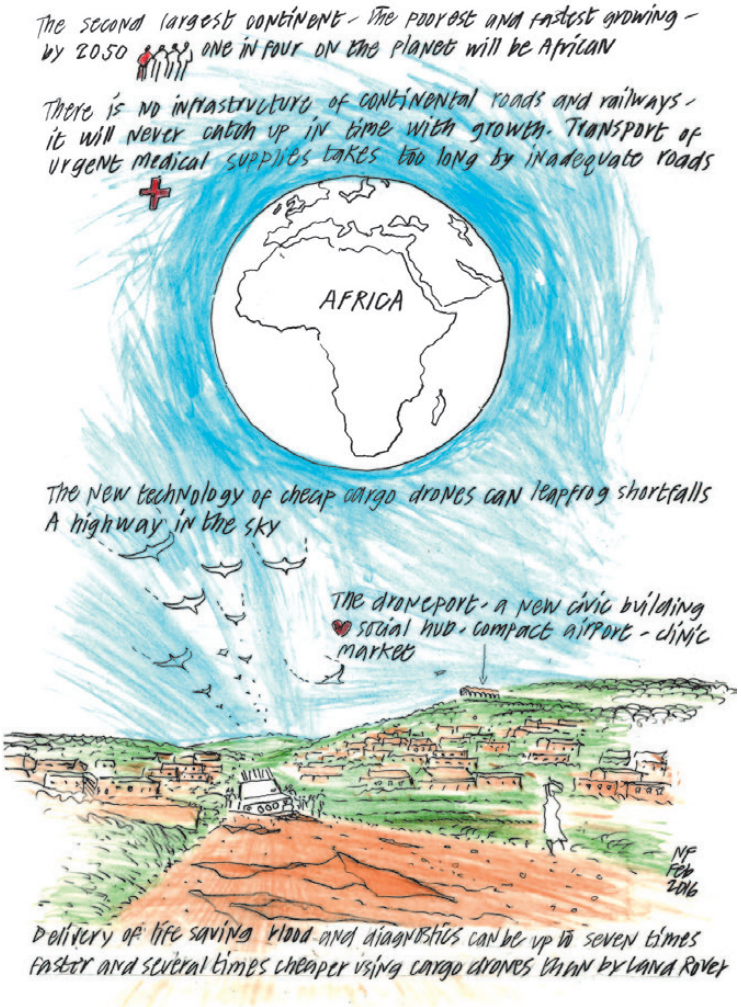
Foster + Partners, London and Madrid: Norman Foster, Narinder Sagoo, Roger Ridsdill Smith, Emma Gibb, Tom Budd, Tom Cubitt, Andy Coward, Jonathan Cox, Taba Rasti

076 2016

The Norman Foster Foundation

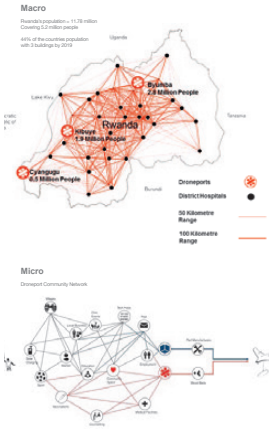
Venice 2016 Architecture Biennale

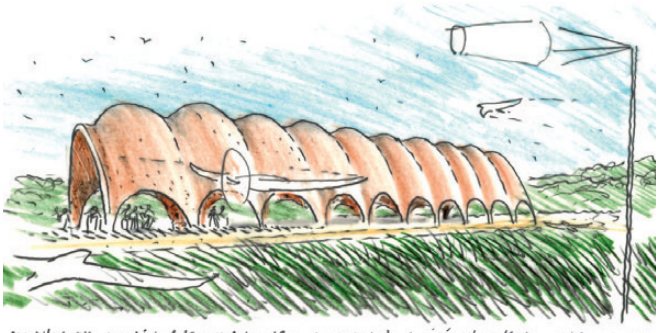


Combinando la última tecnología de los drones con la construcción tradicional de las bóvedas, la Fundación Norman Foster propone crear una nueva infraestructura en el continente africano, que permita distribuir material médico y otros suministros en zonas de difícil acceso. El proyecto piloto tiene su base en Ruanda.

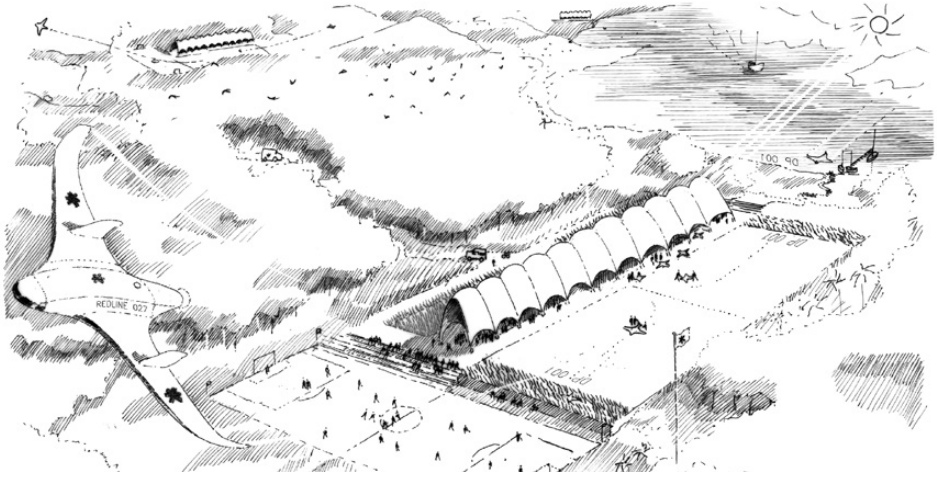
Combining the latest drone technology with traditional vault construction, the Norman Foster Foundation proposes building a network of droneports to deliver medical supplies and other necessities to areas of Africa that are difficult to access due to a lack of infrastructure. The pilot project is based in Rwanda.

Creación del prototipo Droneport.
The Norman Foster Foundation
Making the Droneport Prototype.
The Norman Foster Foundation
https://goo.gl/5jMwID





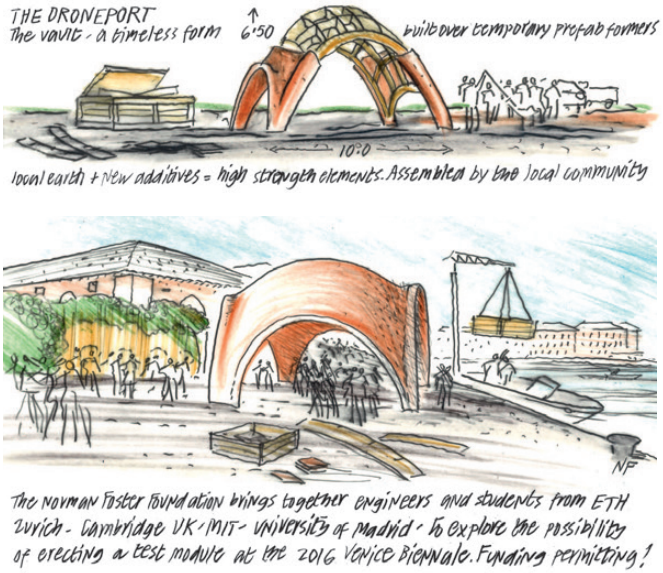
modules are combined to produce the droneport - a civic structure of the early and the landscape - a social hub - clinic - post office - market



38 2016 **AV Proyectos 076**

La construcción es sencilla y utiliza materiales de la zona, de manera que las comunidades locales pueden fabricar las bóvedas con sus propias manos y medios. Las estructuras se apoyan sobre cuatro bases de piedra y se levantan con dos capas de ladrillo; al tratarse de elementos modulares, las cúpulas pueden unirse para crear espacios flexibles en función de las necesidades.

The construction is simple and materials are locally sourced so that the communities can put the vaulted brick structure together with their own hands and means. The structures rest on four stone bases and are built using two layers of brick. The elements are modular, so multiple vaults can also link together to form flexible spaces based on demand and needs.



En la actual edición de la Bienal de Venecia la fundación del arquitecto británico construyó un prototipo del Droneport con universidades de todo el mundo e ingenierías que fabricaron para el proyecto un ladrillo especial de alta resistencia: el Durabric.

At the 2016 Venice Architecture Biennale the Norman Foster Foundation built a Droneport Prototype with the collaboration of universities around the world and engineering firms who manufactured a highly resistant type of block termed 'Durabric.'


NORMAN
FOSTER

LA VANGUARDIA

Publication
La Vanguardia

Date
26/05/2016

Format
Printed

Cultura

El gran escaparate de la arquitectura mundial

VENECIA

Arquitectura, un atajo a la igualdad

La Bienal aboga por los más desfavorecidos

ESTRELLAS. Aunque no son, como en otras ediciones, protagonistas, algunas estrellas arquitectónicas tienen su lugar en esta Bienal. Tadao Ando exhibe espléndidas maquetas en madera de la Punta de la Dogana. Norman Foster, su aeropuerto para drones en África. Renzo Piano, sus trabajos en la periferia urbana. Richard Rogers, en un stand rosa chillón, sus investigaciones para la construcción de viviendas modulares y algún consejo: "Cuanto más se mezcla en términos de funcionalidad, ingresos y edades, más humana es la ciudad". Sanaa, sus pabellones transparentes para rehabilitar la isla de Inujima. David Chipperfield, su pabellón en el desierto. Y Peter Zumthor un recreado y refrescante paseo entre bambúes.

BBC NEWS

Publication
BBC News

Date
31/05/2016

Format
Digital

Droneports: Building the world's smallest airport

31 May 2016 Last updated at 06:27 BST

Leading architects from across the globe are showcasing their ideas in Venice this week.

Among them is Lord Foster who has taken up the challenge of building the world's smallest airport, in Rwanda.

The aim is to create a network of droneports to deliver medical supplies to some of Africa's most inaccessible locations.

Will Gompertz went to meet him.

BBC NEWS

Publication
BBC News

Date
26/05/2016

Format
Digital

Venice Biennale builds a brighter future

By Will Gompertz Arts editor

An office made out of a reconfigured water pipe, part of this year's Venice Architecture Biennale

With thoughts on how to house Millenials and designs for an airport for drones, the visionary architects and curators at the Venice Architecture Biennale are looking to the future.

"If we're going to talk the talk, we have to walk the walk," insists the Pritzker Prize-winning Chilean architect Alejandro Aravena - curator of this year's Venice Architecture Biennale.

"[The Biennale] is not about the advancement of architecture but about improving the quality of life... and the way architects try and do that is through the built environment.

"The first thing was to define what are the front lines, what are the challenges, what are the problems?

"Inequality, migration, pollution and the production of waste are the kind of things every single citizen suffers or experiences."

So, instead of "producing more debris", he decided to create the first room of his sprawling exhibition in Venice's Arsenale out of the waste materials from the unwanted exhibition stands used in last year's Art Biennale.

British Council

Aravena has created a room out of waste materials

The walls of the room are constructed from 100 tonnes of discarded plasterboard, layered horizontally to look like elegant rows of chalky bricks, while the ceiling shimmers with the effect of a huge mass of misshapen metal studs hanging down like stalactites from above.

For him, "value should not be dependent on the cost of materials, but from the way you deal with them."

It's a point underlined in a modelled plan for how a modern European city might respond, in architectural terms, to a large influx of migrants.

It shows a public realm designed by the architect, around which are a series of low-rise apartment blocks that have been plumbed and wired but have little else - for example, there are no dividing walls or windows.

These, says Aravena, would be supplied by the new resident after taking a trip to the local DIY store. Basic, yes - but far better, he thinks, than a tent in a muddy field pitched on the edge of a city.

i-Generation living

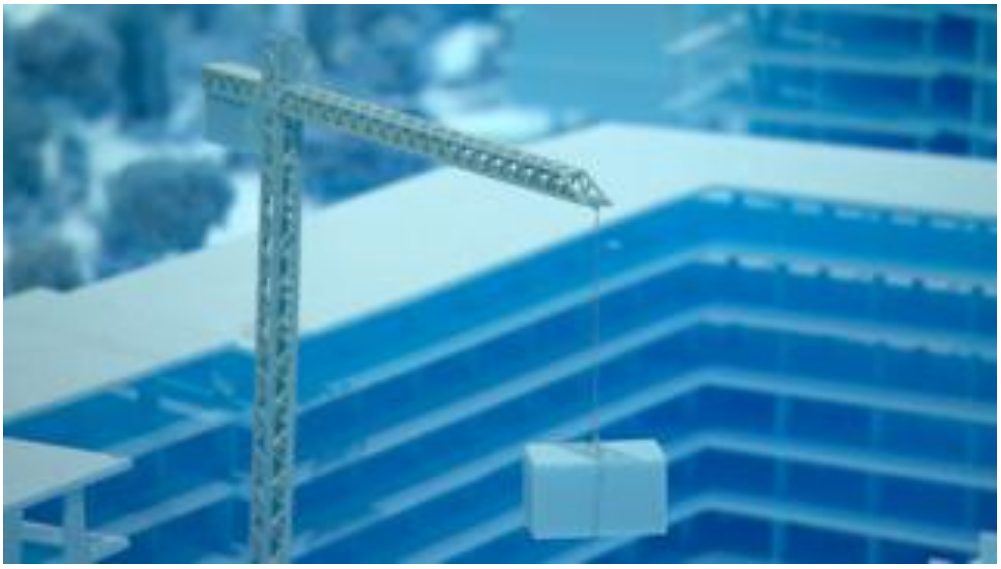
His concerns about the practicalities of city living in the 21st Century are echoed in the British Pavilion, which has been commissioned by the British Council.

Three young curators have presented an exhibition that explores possible answers to the country's housing problems.

An over-sized mock-up of the front door to 10 Downing Street sets their show and ideas into a political context, while questioning the Elizabethan notion of a front door

for all.

They argue that our attitude to the home needs to change - it shouldn't be how big it is, but how long do you need it for.



The British designs explore possible answers to the country's housing problems.

Hence, their exhibition starts with A Home For Hours, a crash-pad full of day beds in which resources are pooled for a better quality of life, where domestic appliances, board games, clothes and shoes are shared.

It's an idea that might seem a little far-fetched to some, but for those Millennials who have grown up in an age of student debt and rocketing house prices, it could present a practical solution to a pressing problem.

Another room is a Home for Days, consisting of two "Zorbs", giant spherical inflatables into which you can jump and sleep - the concept being that we already spend so much of our time living in a virtual bubble, why not go the whole hog and live in an actual one?

A Home for Months, meanwhile, is a tiny two-storey tower containing a bed, bathroom and kitchenette - a structure designed to be arranged in rows within a larger room where residents would share communal spaces.

It's a contemporary take on the boarding house: affordable city living for the i-Generation.

'Mind power'

The celebrated architect Lord Foster is also in Venice presenting his latest creation - not, this time, a fancy tower block or gorge-spanning bridge, but a modest, vaulted brick-built building which he claims to be the world's smallest airport.

It's the next stage in a project he's being working on for some time, which would see this "drone-port" installed in Rwanda as a base from where remote-controlled machines can take off and deliver much needed supplies to inaccessible areas.

It looks a little like a mud hut, but is actually a highly complex computer-based design that is the result of a partnership with the Massachusetts Institute of Technology.

British Council

Lord Foster's 'drone-port' is a collaborative project with the Massachusetts Institute of Technology

With the aid of cutting edge computer science and buried steel tension ropes, the largely self-supporting structure uses a fraction of the materials such a building would normally need and can be made with minimum expertise.

It's a project that fits perfectly with Aravena's vision for this Biennale.

"The scarcer the resources, the greater the need to think creatively about the use of those resources - and that, in the end, is down to mind power, it is creative.

"To build quality projects doesn't mean you have to have costly materials."

The Venice Architecture Biennale runs from 28 May to 27 November 2016.

THE TIMES

Publication
The Times

Date
31/05/2016

Format
Digital

Jonathan Morrison, Architecture Correspondent

May 31 2016, 12:01am,
The Times

Tiny airport where the future is taking off

The droneport structures can be built in weeks using local materials

A prototype of the "world's smallest airport" has been unveiled at an architecture festival in Venice.

How a drone port would look

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VINCENZO PINTO/GETTY IMAGES

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Lord Foster designed the structures
CARLOS ALVAREZ/GETTY IMAGES

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"This project can have a massive impact through the century and save lives immediately. We're turning a technology associated most with killing into a technology for living."

A pilot project in Rwanda will be launched later this year.

The initial plan is to complete three of the structures by 2020, enabling a network of drones to send supplies to 44 per cent of Rwanda. More than 40 droneports could be built in subsequent phases, with the country's central location allowing a rapid expansion to neighbours such as Congo.

Le Monde

Publication
Le Monde

Date
12/10/2015

Format
Digital

Le Rwanda accueillera le premier drone-port au monde

Les autorités d'aviation civile rwandaises sont actuellement en train d'aménager un cadre législatif permettant le développement de drone-port, une première mondiale qui pourrait bouleverser le transport de marchandises dans les zones reculées.

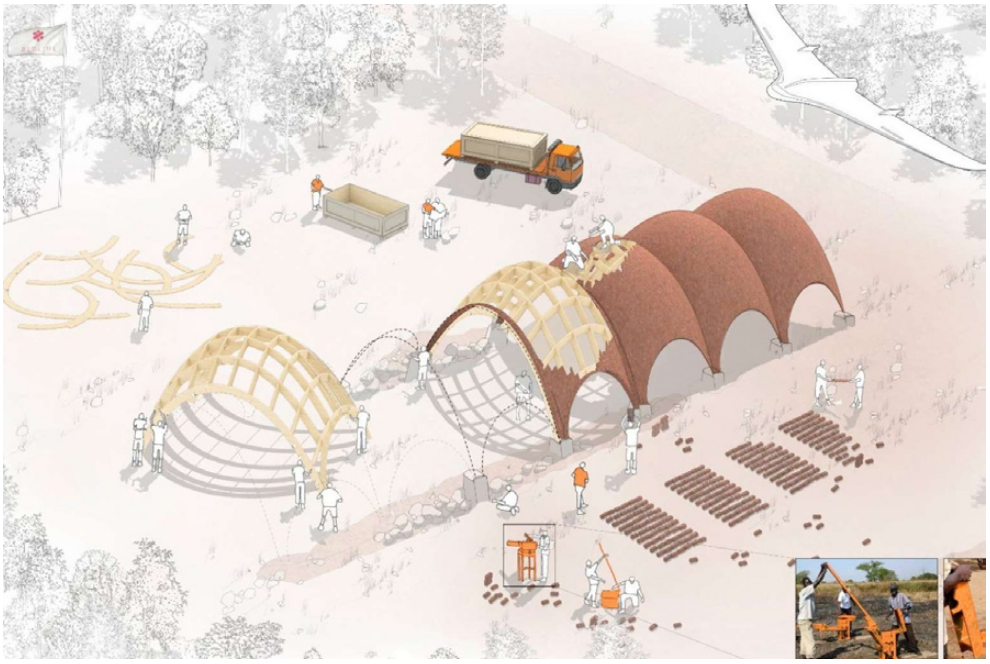
Joan Tilouine Le 12.10.2015 à 11h12

Par

Ce sera le premier drone-port au monde, sur les rives rwandaises du lac Kivu, à Kibuye. Cinq dômes au bout d'une piste de terre ocre qui abriteront des drones de trois ou six mètres, lesquels feront des va-et-vient, transportant des colis de 10 à 100 kg, que ce soit de la volaille, des médicaments ou des poches de sang. A terre, une poste et une clinique sont prévues sur le site pensé par l'architecte britannique Norman Foster qui travaille depuis janvier dernier sur ce projet, à la demande de Jonathan Ledgard qui dirige le centre Afrotech de l'école polytechnique de Lausane (Suisse).

Lire aussi « Il y aura un usage commercial de drones-cargos en 2019 »

« *Norman Foster a réalisé le plus grand aéroport de la planète, à Pékin. Il va réaliser le plus petit aéroport du monde, en Afrique, le moins cher possible, et intégrant une myriade de technologies* », expliquait au « Monde Afrique » M. Ledgard en juin dernier. Les premiers vols devraient se dérouler au début 2016 à Kibuye et les opérations commerciales pourraient démarrer trois ans plus tard. Selon la proposition dévoilée par le cabinet Foster & Partners, des dizaines de drones-ports pourraient ensuite se créer à travers le Rwanda et peut-être dans la région.



Le Rwanda a été privilégié pour cette expérience, parce que le transport de marchandises est complexe dans ce petit pays vallonné d'Afrique centrale. Mais aussi en raison de son cadre législatif plus souple et sa politique de développement faisant la part belle aux nouvelles technologies.

Lire aussi **L'Afrique s'apprête à vivre sa « drone révolution »**

Si l'Afrique du Sud ou le Kenya ont adopté des régulations très strictes quant à l'usage de drones dans leur espace aérien, les autorités d'aviation civile rwandaises sont actuellement en train d'aménager un cadre législatif permettant le développement de drone-port à des fins humanitaires et commerciales. Ces propositions seront soumises au conseil des ministres prochainement et devraient entrer en vigueur en 2016.

Plusieurs pays d'Afrique ont été approchés pour accueillir ce premier drone-port. Et les initiateurs de ce projet discutent avec les responsables angolais, botswanais, ougandais, tanzaniens ou mozambicains. « *Nous recherchons d'abord un lieu sécurisé dans un pays où les autorités locales participent au projet en identifiant les besoins des populations défavorisées,* explique M. Ledgard. *Car nous tenons à ce que nos "cargos-ports" se trouvent dans des zones pauvres et reculées où les drones livreront des produits de première nécessité tels que des médicaments, de la nourriture et des produits médicaux* ».

Selon les études du centre Afrotech, les drones-cargos pourraient assurer à terme 10 à 15 % du transport de marchandises dans les pays qui les auront accueillis.

Lire aussi **Bientôt, des escadrilles de drones dans le ciel africain (1/3)**

Lire aussi **Bientôt, des escadrilles de drones dans le ciel africain (2/3)**

Lire aussi **Bientôt, des escadrilles de drones dans le ciel africain (3/3)**

The Telegraph

Publication
The Telegraph

Date
21/09/2015

Format
Digital

Lord Norman Foster to build world's first droneport in Rwanda

The British architect is working on a large-scale project to build 3 droneports to deliver medical supplies and electrical parts

Lord Norman Foster, the British architect who has built iconic buildings like the Gherkin in London, is building the world's first "droneports" in Rwanda.

The goal is to transport urgent medical supplies and electronic parts to remote parts of the East African country via unmanned flying vehicles or drones.

"There will be about 2.2 billion people in Africa by 2050, or 1 in 4 inhabitants of the planet will be African. How can their infrastructure even think about keeping up with this expansion?" Lord Foster told the Telegraph.

The solution is clear: cargo drone routes have value wherever roads are limited. "Only a third of Africans live within 2km of an all-season road," Lord Foster said. There are currently no continental motorways, almost no tunnels, and not enough bridges that can reach people living in far-flung areas of the continent.

The architecture firm Foster + Partners are working with Lausanne-based university École Polytechnique Fédérale de Lausanne (EPFL) and its associated initiative Afrotech on the project, which includes three separate droneports and is expected to be built within four years.

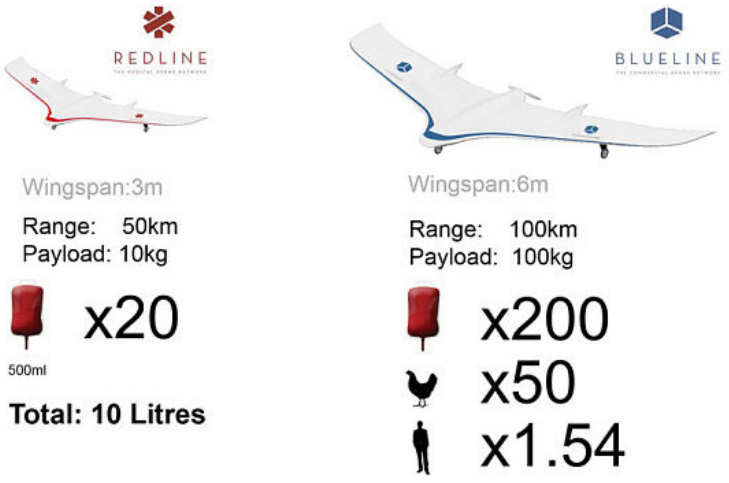
The architecture firm's construction plans Photo: Foster+ Partners

“[Afrotech director] Jonathan Ledgard approached me and said you’ve built the biggest airport in the world, now how do you feel about doing the smallest one?” Lord Foster said.

Each droneport will operate two parallel networks of drones, which are being designed by engineers at Afrotech/EPFL and Imperial College London.

The Redline drones will have a wingspan of 3m and can deliver medical and emergency supplies weighing up to 10 kilograms, such as 20 adult blood transfusions or vaccines and drugs.

The commercial Blueline drones can deliver heavier equipment, electronics and e-commerce items weighing up to 100 kilograms.



Drones will make 2 types of cargo deliveries: emergency medical supplies vs

electronics and e-commerce

“For example, an entire village can be deprived of water because a vital component of a pump has broken down,” Lord Foster says. “The drone can deliver in 1/12th of the time that it would take a Land Rover to get through.”

The droneports will be designed as a row of vaulted brick structures and will host a health clinic, a digital fabrication shop to make spare drone parts, a post and courier room, and an e-commerce trading hub.

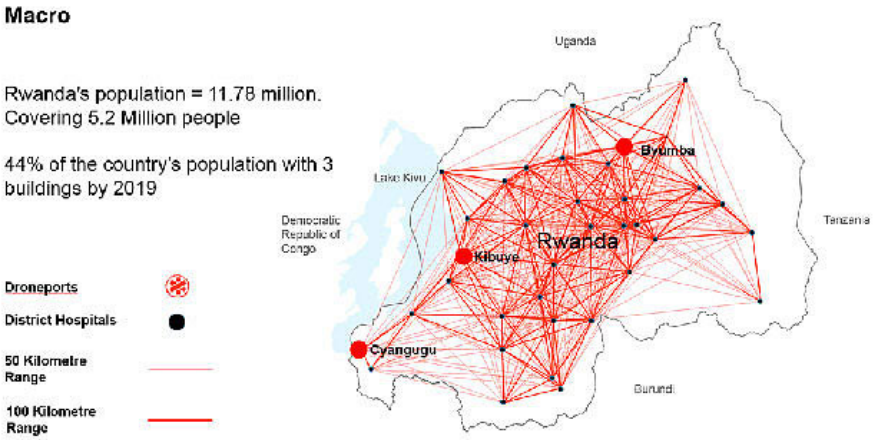
I

It is estimated that drones flying from the port will be able to cover 44 per cent of Rwanda.

Rwanda’s challenging geographical landscape makes it an ideal test-bed for the pilot project, but it won’t just stop there.

Lord Foster says he sees the potential for droneports to become as commonplace as petrol stations, and there are plans to expand the scheme across Rwanda and into neighbouring countries such as the Democratic Republic of Congo.

“This project can have massive impact through the century and save lives immediately,” he said.



This map shows how many Rwandans the 3 new droneports could reach

The Droneport project is an evolution of Foster + Partners' airport schemes in Mexico City, Jordan and Beijing, as well as a project to build a habitation on the Moon. The lunar project, in association with the European Space Agency, used a basic inflatable framework and sourced raw materials, like moondust, locally - very similar to the principles behind the droneports.

Lord Foster said, "What started as the world's smallest airport could become bigger than the biggest airport, in terms of sheer scale and impact."

EL PAÍS

Publication
EL PAÍS

Date
15/05/2016

Format
Digital

‘High tech’ de barro en un aeropuerto de drones

Anatxu Zabalbeascoa 15 MAY 2016 - 21:31 CEST

Recreación de la cúpula tabicada que Foster ha ideado para el aeropuerto de drones en Ruanda, siguiendo el modelo de Guastavino.

En la próxima Bienal de Venecia, Norman Foster, símbolo durante décadas de la arquitectura *high tech*, mostrará su particular homenaje al valenciano Rafael Guastavino, descrito por Oriol Bohigas como el primero y el más internacional de nuestros arquitectos. Lo hará cuando descubra la maqueta 1-1 de la cúpula tabicada que ha ideado para su aeropuerto de drones en Ruanda. Aunque el británico no hable de Guastavino directamente, el hecho de que haya elegido la Universidad Politécnica de Madrid para construir sus bóvedas reconoce el invento español.

Lo cuenta Carlos Martín, el bovedista —especializado en yeserías mudéjares y barrocas— que la está construyendo. “Cuando vino a vernos fue el día más feliz de mi vida”. ¿Qué deuda tiene la bóveda de Foster con Guastavino? “Toda. Es guastaviniana, pero su diseño es más moderno”.

Guastavino (Valencia, España, 1842–Baltimore, Estados Unidos, 1908) fue un arquitecto no-arquitecto que marcó la identidad de los edificios públicos de Manhattan, una ciudad sembrada de rascacielos que elegía para sus inmuebles bajos —como el célebre Oyster Bar de Grand Central Station—, un invento medieval español. Guastavino y sus clientes tuvieron el valor de apostar por una técnica constructiva milenaria en tiempos de incipiente industrialización. El valenciano fue además prolijo (construyó más de 1.000 edificios) e hizo gala de los mismos atributos

que caracterizan a los proyectistas legendarios: renació varias veces de sus cenizas y dejó pufos económicos y sentimentales en varias ciudades del globo.

Si como personaje Guastavino encarna el sueño americano, como profesional dotó de identidad la arquitectura pública norteamericana. ¿Por qué dejó entonces de construirse con el sistema que tan buen resultado le dio a él? Manuel Fortea —que trabaja analizando el deterioro de la cúpula de la catedral neoyorquina de St. John de Divine, la mayor ideada por Guastavino— opina que por dos razones. La primera, porque quedó fuera de las enseñanzas académicas. La segunda, porque no existe normativa. “Eso en una sociedad garantista como la nuestra es matar la técnica, porque las aseguradoras no la aceptan”, dice. El libro de este profesor de patología en la Escuela Politécnica de Cáceres, *El origen de la bóveda tabicada,* ha sido traducido por la Universidad de Columbia. En él se sitúa en Almería, y hacia el siglo XI, el origen de este tipo de bóveda, que él atribuye a la confluencia de una técnica de origen bizantino con un material local —el yeso— que permite poner un tabique en horizontal. El propio Fortea, y otro arquitecto experto en bóvedas, Julio Jesús Palomino, construyen en Sierra Leona un orfanato empleando esa técnica.

Además de su belleza, ¿qué hace relevante a la técnica de las bóvedas tabicadas hoy? Su duración, su precio, su falta de mantenimiento, su rapidez constructiva, el hecho de que sean ignífugas y que su construcción supone un ahorro energético del 30% respecto al hormigón o al metal, explica Fortea. ¿Nos acercará el *más por menos* de la crisis económica al renacimiento de una alta tecnología que se aplica ensuciándose las manos?

The Observer

Publication
The Observer

Date
29/05/2016

Format
Digital

Venice architecture biennale 2016 – ideas for real world problems

Rowan Moore Sun 29 May 2016 07.00 BST

A sense of social purpose drives this year's Venice biennale, and while good intentions don't always translate into good ideas, the best combine usefulness, economy and beauty

One of Block Research Group's 'beautiful, delicate' vaults. Photograph: Italo Rondinella/La Biennale di Venezia

Architects are insecure about their usefulness. They work with buildings, which are generally large, expensive, long-lived and important to life, but it's not always obvious what is significant about the specifically architectural aspect of their work – the refinements and rearrangements to the functional object that might otherwise come into being without architects' help. If they have some influence over large budgets, it is developers or politicians who usually make the real decisions. At best, an architect can be like a jockey on a horse. Often, he or she is more like the groom, who puts nice plaits in its mane and tail.

They're also open to accusations of self-indulgence, of hijacking commissions to fulfil their creative whim, never more than in the age of "iconic" architecture that may or may not be now coming to an end. Hence the appeal of what is sometimes called "humanitarian architecture", where architects apply their skills to helping people in disaster zones or suffering extreme need. What, indeed, could be more useful than helping in such situations? Nothing, as long as the architects really are helping. Otherwise they are only taking their self-indulgence to a higher level, at the expense of people least able to afford it.

> *The Polish pavilion concentrates*

Such issues are raised, if not completely answered, by this year's edition of the Venice architecture biennale, the world's biggest exhibition of architecture. Under the slightly sententious title of Reporting from the Front, it aims, says its Chilean director Alejandro Aravena, to

not on architects but on the construction workers for which the country is famous

explore “the social, political, economic and environmental end of the spectrum”. It is not the first time that the biennale has declared a social purpose, but the idea is pursued more vigorously than before.

There is a display on the water tanks in Medellin, Colombia, that once stood in fenced-off areas of grass around which settlements grew up, now opened up into public oases. The Indian architect Anupama Kundoo has built a mock-up of her Full Fill Home, which uses hollow blocks of ferrocement to achieve “speedy and affordable housing units that have low environmental impact”. Wang Shu and Lu Wenyu show beautiful panels of brick and tile as part of their campaign to support traditional rural techniques, by using them on a new museum in the city of Fuyang.

A mock-up of Anupama Kundoo’s ‘speedy and affordable’ Full Fill Home. Photograph: Vincenzo Pinto/AFP/Getty Images

Norman Foster, with the help of his Foster Foundation, has produced a full-size prototype of his impressive plan to build “droneports” in inaccessible parts of Rwanda, where drones can deliver medicines, tools and other essentials. Using a combination of high and low technology, the ports are to be vaulted structures in bricks made out of local earth, which can be built at least partly with local labour. In Venice he and his team are demonstrating how they will be built.

One of the most memorable displays is in a tent-like structure created by the German architect Manuel Herz and the National Union of Sahrawi Women. With a combination of photographs, maps and specially woven tapestries, it shows the camps in Algeria created by refugees from Western Sahara since its occupation by Morocco in 1975. Here, says Herz, they have created “a place of emancipation and self-governance, truly democratic, and not a place of misery”. The institutions of society – ministries, a parliament, schools – are housed in buildings that, despite their rough building techniques, are planned with “incredible beauty”.

Norman Foster's prototype for a droneport. Photograph: NORMAN FOSTER FOUNDATION with Redline-EPFL and Ochsendorf, DeJong & Block with Block Research Group ETH Zurich

Aravena's theme is not only applicable to cases of great need, though it tends to be interpreted in that way. The "front" he describes is any situation in which an architect can deflect or guide the forces that go into buildings and places such that they have a greater public benefit. It can mean the conversion of expanses of landfill into parks by the Catalan architects Batlle i Roig. The Portuguese Eduardo Souto de Moura shows how he was asked to modify a youthful work of his, a market in the city of Braga, into a completely new use as a dance and arts centre. Heroically, he was prepared to rip the roof off his early masterpiece and leave it as a part ruin.

The biennale consists of distinct elements. There are the huge 16th-century corderie, or ropeworks, of the Arsenale and a large central pavilion in the gardens dedicated to the biennale: in both venues the director chooses the content. The gardens also contain national pavilions where individual countries interpret his theme as they see fit. Among these is the British pavilion where the young curators respond to housing need by proposing new ways of living in homes. Their concepts are strong and their installation elegant, although the latter does not always connect perfectly with the former. The Polish pavilion concentrates not on architects but on the construction workers for which the country is famous, and on the pressures and dangers of their lives.

Manuel Herz Architects with the National Union of Sahari Women's tent. Photograph: Francesco Galli / courtesy: La Biennale di Venezia

If “humanitarian architecture” sometimes turns out not to be humanitarian, it is not always architecture either. In the urge to do good, or to be seen to do good, architects can forget their skills of making spaces and buildings that are desirable to inhabit. But the biennale includes some corrective installations, for example by the venerable Portuguese Álvaro Siza and the Chilean Pezo von Ellrichshausen, that are simply about enclosing spaces and capturing light in delightful ways. It is not clear how they fit the curatorial theme, but they enrich the show.

The strongest exhibit combines constructional wonder with the possibility of usefulness: under the title of Beyond Bending, the Block Research Group of Zurich construct beautiful and delicate vaults that update traditional techniques and economise on building materials. The weakest is called Matrex, its inclusion inexplicable, a mixed-use building for the Skolkovo business zone near Moscow. For symbolic reasons not worth repeating, it chooses to insert the shape of a multistorey matryoshka doll into a pyramidal exterior, a model of which is then displayed with intrusive blue lights and buzzing noises.

If the biennale offers no more than suggestions, they are nonetheless engaging, enriching and sometimes enlightening

There are many pitfalls in a project such as this year’s biennale, not all of which are avoided. The voices of the people in whose name much of the work is done tend to be in the background, except in films where they express their gratitude and happiness for the results. Poverty and informal construction can be sentimentalised, romanticised and patronised, sometimes made into aesthetic of brownness and low droning music. At its worst, the biennale can look like a Fairtrade garden furniture shop. Truly terrible captioning – badly lit, small type, obscure wording – doesn’t help.

Ultimately, none of the work on show is verifiable, at least in the context of the biennale. Any form of intervention has social and economic ramifications – well-meaning volunteer work, for example, might put local builders out of business – and it takes knowledge of each and every situation to know whether interesting-sounding proposals for water-gathering towers in Africa or for helping crime-ravaged parts of Mexico will have the effect they promise. The Venezuelan pavilion shows small community projects sponsored by the same government under whom the economy is currently tanking, which makes you wonder if the former are a poor substitute for fixing the latter. The biennale is therefore a series of suggestions as to what might be a good idea, rather than evidence of actions that work.

A Block Research Group vault. Photograph: La Biennale di Venezia

Sometimes the benefit might flow less from architects to the poor than in the opposite direction. Low-cost, low-technology construction returns architecture to its roots, of laying one block on another by hand, and making best use of light and climate. In an age otherwise dominated by mechanised and impersonal building processes, it enables you to see in a finished structure the story of its making.

If the biennale offers no more than suggestions, they are nonetheless engaging, enriching and sometimes enlightening. Compared with previous more Eurocentric biennales, it presents a realigned perspective of the world of architecture, in which Latin America, Asia and Africa take their rightful place. Although the big old names of architecture are still there, a substantially new cast of creative characters is offered. It feels like a new world.

LE FIGARO

Publication
Le Figaro

Date
30/05/2016

Format
Digital

Biennale de Venise: Norman Foster dévoile son aéroport de drones

le 30/05/2016 à 19:29

Au bout de la Corderie, sur l'Arsenal, vous attend une des plus belles surprises de la Biennale d'architecture 2016: le prototype pour un droneport au Rwanda par l'agence de Norman Foster.

L'architecte qui a réalisé le plus grand terminal au monde, pour les J.O de 2008, à Pékin - l'équivalent de 17 stades de foot pour un budget de 2 milliards d'euros! - est en passe de construire le plus petit aéroport de la planète, en Afrique, sur les rives rwandaises du lac Kivu, à Kibuye. Il consiste en une succession de dix voûtes de 6,50 mètres de haut sur 10 de large, soit quelque 100 mètres de long.

Sous nos yeux, le sujet est en train de prendre forme. Sur les bords de la lagune, tout au bout de l'Arsenal, on peut voir un embryon de ce projet pas si fou car, selon le cabinet Foster & Partners, des dizaines de drones-ports pourraient se créer dans la région, voire en Afrique où la population croît rapidement: «En 2050, un habitant sur quatre viendra de ce continent alors que les infrastructures ne suivent pas» est écrit sur une grande plaquette que l'on vous distribue avec des dessins aquarellés très poétiques signés de Foster.

Le visiteur a pu toucher du doigt l'un des dômes qui sera érigé au bout d'une piste de terre ocre qui abritera des drones chargés a priori de transporter des colis de 10 à 100 kg, contenant nourriture, sang et médicaments. Ce dôme a une forme voûtée composée de deux couches d'un nouveau type de blocs de terre comprimée appelés Durabric , technique développée par la Fondation LafargeHolcim pour la construction durable avec les chercheurs du Groupe de recherche Bloc de l'ETH Zurich et MecoConcept à Toulouse.

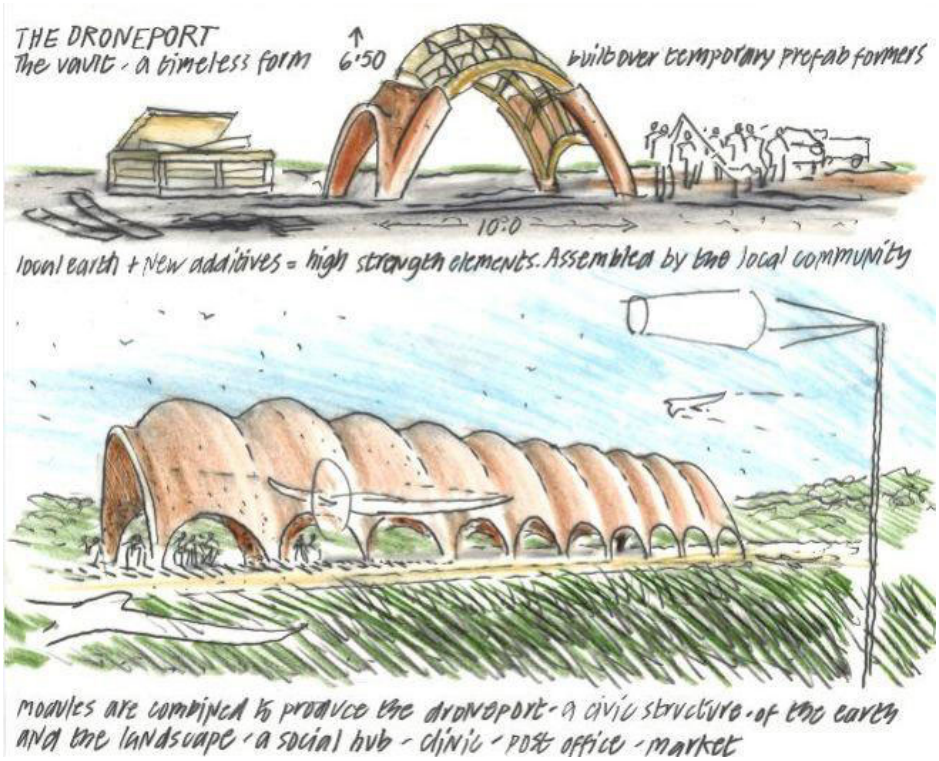
Un projet très inventif

Très inventif, ce prototype est la fierté de la fondation Norman Foster qui a une approche holistique de l'architecture et travaille au développement de nouvelles technologies pour répondre aux besoins humanitaires des pays émergents. Celle-ci étudie également comment un matériau de construction à énergie solaire développé par Olafur Eliasson (prochain artiste de Versailles en juin) , appelé SolarBrick , pourrait être imprimé en 3D dans les ports de drones futurs. Cette lumière pourrait fournir un éclairage artificiel dans les zones où l'électricité est rare

Depuis janvier, Norman Foster travaille à sa réalisation. Le Droneport sera exploité par Red Line , une société de drone conçu par Jonathan Ledgard à l'Institut fédéral suisse de technologie à Lausanne pour servir les communautés en développement.

Les premiers vols devraient démarrer début 2016 et les opérations commerciales trois ans plus tard. Pourtant hautement technologique, ce projet s'inscrit parfaitement dans la thématique imposée par le commissaire de la Biennale, Alejandro Aravena, Chilien prônant l'architecture utile et sociale. revenant à des savoir-faire et des matériaux locaux. Foster est venu défendre ses idées sur cette nouvelle architecture «substainable» (écoloqique) promis à un bel avenir.

Foster est pleinement dans l'actualité, lui qui a pourtant construit la soucoupe volante d'Apple, siège futuriste de l'entreprise de Steve Jobs à Cupertino (2016) ou encore le terminal spatial galactic pour Virgin au Nouveau Mexique.«Seulement un tiers des Africains vit à moins de 2 km d'une route praticable en toute saison, a rappelé l'architecte. Il n'existe pas aujourd'hui d'autoroutes transcontinentales, presque pas de tunnels, et pas assez de ponts pour pouvoir atteindre des gens qui vivent dans des zones reculées».



C'est la raison pour laquelle le Rwanda a été choisi pour cette expérience. Compte tenu de la complexité du transport des marchandises dans ce petit pays vallonné d'Afrique centrale, il faut trouver des solutions utiles et peu coûteuses.

Mais aussi en raison de son cadre législatif plus souple et sa politique de développement faisant la part belle aux nouvelles technologies, comparé à d'autres pays de ce continent, notamment le Kenya ou l'Afrique du sud. «Le budget n'est pas encore arrêté, confie l'agence de Foster. Tout dépend du site où il sera construit exactement»

AJ THE ARCHITECTS' JOURNAL

Publication
The Architect's Journal

Date
07/06/2016

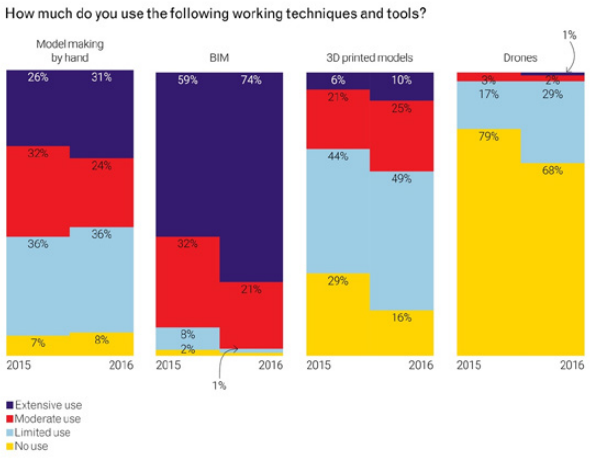
Format
Digital

Drone use by AJ100 practices takes off

7 JUNE, 2016 • BY RICHARD WAITE

The growing use of drones is among the key changes in how practices work on a day-to-day basis, according to the practices featured in this year's AJ100

In 2015 almost eight out of 10 firms said they had no experience of the emerging 'eye-in-the sky' technology; 12 months later that proportion has dropped to 68 per cent, with one practice saying it is using drones 'extensively'.



Norman Foster recently revealed a prototype droneport at the Venice Biennale (*pictured*). The project is the first to be built by Foster's charity, which plans to build a network of the droneports across Africa to deliver medical supplies in areas that are difficult to access.

Other findings from the AJ survey into architects' working practices revealed that Building Information Modelling (BIM) use has continued to balloon. In 2015, 59 per cent of AJ120 firms said they were using BIM extensively – in 2016, 74 per cent of firms in the AJ100 are doing so. Only one firm says it had yet to have any involvement with the technology.

There has been further growth in 3D-printed models too – with only 16 per cent of practices not yet using the technology.

Wallpaper*

Publication
Wallpaper

Date
31/05/2016

Format
Digital

Best of the rest: starchitects pull in the crowds at Venice Architecture Biennale

ARCHITECTURE / 31 MAY 2016 / BY DAVID PAW

Three heavyweights of contemporary architecture go on show during the Venice Architecture Biennale. Pictured: the Norman Foster Foundation's Droneport project at the Arsenale's gardens was conceived as a response to Africa's exploding population and lagging infrastructure. *Courtesy Nigel Young and The Norman Foster Foundation*

There's a saying that the writer and chef Anthony Bourdain likes to use to epitomise the attainment of success, and the perpetual recognition that said success tends to create. To paraphrase, one goes to see a band like the Rolling Stones because you know that they're going to play *Satisfaction*, and peering through the crowds, thronging a trio of exhibits at this year's Venice Architecture Biennale, one gets the feeling that, come rain or shine, the crowd-pleasing combination of blockbuster names and dramatic centrepieces will always pull the masses in.

Such sentiments do not diminish in the least the power of these exhibits; if anything, they make the displays during this year's Biennale by Frank Gehry, Lord Foster and the recently departed Zaha Hadid even stronger.

Gehry's exhibition at the Espace Louis Vuitton near the city's teeming Piazza San Marco retraces the story of the architect's dream of 'designing a magnificent vessel for Paris that symbolises France's profound cultural vocation', referring to his dramatic design for the Fondazione Louis Vuitton in Paris that opened in 2014. Entitled 'Building in Paris by Frank Gehry con l'intervento di Daniel Buren', it was initially unveiled in Paris for the inauguration of the Fondation, but has been imparted new life via a special redesign by Gehry Partners. The building's architecture is being presented via a series of scale models.

The Canadian-American architect's display is evenly matched by artist Daniel Buren's spectacular in-situ installation that shares main billing with the exhibition, which works with the space's glass roof to create a striking multicoloured vision in line with the artist's best work.

Literally flying closer to the Biennale's 'Reporting from the Front' theme is the Droneport concept, revealed by the Norman Foster Foundation at the Arsenale as its inaugural project. Conceived as a response to Africa's exploding population and lagging infrastructure, each Droneport will serve as a base from which Unmanned Aerial Vehicles (UAVs) can deliver emergency medical supplies to remote communities previously difficult to access by conventional means, with the maiden flight set to launch later this year in Rwanda.

'The Droneport project is about doing "more with less", capitalising on the recent advancements in drone technology – something that is usually associated with war and hostilities – to make an immediate life-saving impact in Africa,' says Foster. The structure's vaulted form is made from two layers of a new type of compressed earth block dubbed Durabric, developed by the LafargeHolcim Foundation in conjunction with researchers at the Block Research Group from ETH in Zurich and Meco Concept in Toulouse.

Last, but certainly not least, is an artfully grand tribute to the late Zaha Hadid, organised by the Fondazione Berengo cultural institution and set within the walls of the spectacular 16th century Palazzo Franchetti. While no tribute or retrospective could truly encompass the breadth of Hadid's work and process, this abridged version will more than suffice for most. Spanning her early works – including the distinctive, competition winning Peak in Hong Kong – all the way to works set to be completed by her studio ZHA this year (such as the Port House in Antwerp), the exhibition will offer new appreciation and insight to both experienced observers and architectural neophytes.

In particular, longtime fans will be glad to see familiar works juxtaposed with detailed visualisations; three milestone projects (the evergreen Vitra Fire Station, Rosenthal Center for Contemporary Art in Cincinnati and the MAXXI Museum of 21st Century Arts in Rome) are given their own dedicated spaces, alongside a room reserved for Hélène Binet's powerful images of the studio's built work. In a career decorated with innumerable accolades and awards, it's fitting that the architect's first tribute exhibition takes place during what is considered by most to be the world's biggest architecture celebration.

The Droneport will serve as a base from which Unmanned Aerial Vehicles (UAVs) can deliver emergency medical supplies to remote communities. *Photography courtesy Nigel Young and The Norman Foster Foundation*

designboom®

Publication
designboom

Date
26/05/2016

Format
Digital

norman foster constructs droneport prototype at the venice architecture biennale

billed as 'the world's smallest airport', a full-scale prototype of the norman foster-designed 'droneport' has been assembled at the 15th international architecture exhibition. the proposal — the inaugural project of the norman foster foundation — seeks to create a network of similar facilities capable of delivering medical supplies and other necessities to inaccessible regions. the ambition is that every small town in africa, and other emerging economies, will have its own droneport by the year 2030.

making the droneport prototype
video courtesy of the norman foster foundation

the pilot project, which will be launched later this year, is based in rwanda — a country whose physical and social geography poses multiple challenges. the initial plan for three buildings, to be completed by 2020, will enable the network to send supplies to 44% of rwanda. subsequent phases of the project could see in excess of 40 droneports across the country, potentially saving thousands of lives. rwanda's central location could also allow easier expansion to neighboring countries such as congo.

jonathan ledgard, founder of the pioneering redline cargo drone network, approached norman foster with the concept owing to his airport design experience, and knowledge of flight as a pilot of sailplanes, helicopters, and aircraft. foster then enlisted the help of colleagues narinder sagoo and roger ridsdill smith, who developed the modular vaulted system.

'africa is a continent where the gap between the population and infrastructural growth is increasing exponentially,' explains **norman foster.** *'the dearth of terrestrial infrastructure has a direct impact on the ability to deliver life-giving supplies, indeed where something as basic as blood is not always available for timely treatment. we require immediate bold, radical solutions to address this issue. the droneport project is about doing 'more with less', capitalizing on the recent advancements in drone technology – something that is usually associated with war and hostilities – to make an immediate life-saving impact in africa. rwanda's challenging geographical and social landscape makes it an ideal test-bed for the droneport project. this project can have massive impact through the century and save lives immediately.'*

jonathan ledgard, founder of redline added: ***'it is inevitable on a crowded planet, with limited resources, that we will make more intensive use of our sky using flying robots to move goods faster, cheaper, and more accurately than ever before.*** *but it is not inevitable that these craft or their landing sites will be engineered to be tough and cheap enough to serve poorer communities who can make most use of them. droneport is an attempt to make that happen, and to improve health and economic outcomes in africa – and beyond. we are proud to have norman foster — an architect with extensive personal experience of flying – as the design lead on this project.'*

able to transcend geographical barriers such as mountains and lakes, cargo drones can access areas unreachable by road. with africa's population set to double to 2.2 billion by 2050, it would require unprecedented levels of infrastructural investment to catch up with the continent's exponential growth. consequently, the utilization of drones is viewed as an important factor in africa's development.

in foster's design, a fleet of specialist drones could potentially carry blood and other life-saving supplies over 100 kilometers, providing an affordable alternative to road-based deliveries. parallel networks would operate two separate services, the 'redline' using smaller drones for medical and emergency supplies; and the commercial 'blueline', transporting larger payloads such as spare parts, electronics, and e-commerce — subsidizing the redline network.

conceived as a new building typology, the terminus will present a strong civic presence, providing space for the safe landing of quiet drones. importantly, the scheme also includes a health clinic, a digital fabrication shop, a post and courier room, and an e-commerce trading hub, allowing it to become an integral part of local community life. the droneport is imagined as a 'kit-of-parts' where only the basic formwork and brick-press machinery is delivered to site. the project's raw materials, such as clay for bricks and boulders for the foundation, are locally sourced. the vaulted brick structure can be put together by members of the community, giving local workers important construction knowledge.

located at the end of the arsenale, the pavilion serves as a symbolic gateway to the newly opened public park. the possibility of it remaining as a permanent structure is also under consideration. the color of the earth-based products is a careful match with the historic buildings which surround it. the prototype vault comprises two outer surfaces, with an inner layer of traditional tiles. compared to traditional burnt clay bricks, the use of stabilized earth does not require intensive use of fuel to achieve its performance.

Publication
Dezeen

Date
27/05/2016

Format
Digital

Norman Foster reveals vaulted Droneport prototype at Venice Architecture Biennale

Jessica Mairs | 27 May 2016 | 12 comments

Venice Architecture Biennale 2016: Foster + Partners has unveiled the first full-scale prototype of its Droneport concept at the Arsenale, which is designed to transport medical supplies to remote regions in Africa using unmanned flying vehicles (+ slideshow).

The structure is the inaugural project from the Norman Foster Foundation, set up by the British architect to anticipate technological advances in the field, respond to humanitarian needs and encourage a more "holistic" view of architecture.

The vaulted form is made up from two layers of a new type of compressed earth blocks called Durabric, developed by the LafargeHolcim Foundation for sustainable construction with researchers at the Block Research Group from ETH in Zurich and MecoConcept in Toulouse.

At the opening of the Droneport, Foster told Dezeen that the arching structure may be retained as a permanent fixture in the Arsenale's grounds, forming an entrance pavilion to a small garden beside the Italian pavilion.

"This is a permanent structure and it would be a really great shame to take it down," he said.

"The Droneport project is about doing more with less, capitalising on the recent advancements in drone technology – something that is usually associated with war and hostilities – to make an immediate life-saving impact in Africa."

Its pilot project is to be launched this year in Rwanda and completed by 2020, and firm's ambition is that every small town in Africa will have its own drone port by 2030.

The Droneport will be operated by Red Line, a drone company conceived by Jonathan Ledgard at the Swiss Federal Institute of Technology in Lausanne to serve developing communities.

While the primary objective is to transport medical supplies such as blood, there are also plans to establish a cargo network.

The Norman Foster Foundation is also exploring how a solar-powered building material developed by artist Olafur Eliasson, called SolarBrick, could be 3D printed in future drone ports.

The material has its roots in Eliasson's design for a solar-power light named Little Sun, and would feature a solar panel on its outer surface to power an LED light on its inner surface. It could provide artificial lighting for drone ports in areas where electricity is scarce.

The Droneport follows Foster's airport schemes in Mexico City, Jordan and Beijing, as well as lunar projects including a Mars habitat for astronauts constructed from 3D-printed soil from the planet's surface.

Drones are already widely used for filming and surveillance, but designers and companies are now exploring ways to develop delivery services and medical aid.

Both Amazon and Google have been testing drone delivery, and a graduate from TU Delft has developed an unmanned aerial vehicle with built-in defibrillation equipment to treat heart attack sufferers.

This year's Venice Architecture Biennale opens to the public this weekend and continues until 27 November 2016.

Project credits:

Architecture: Foster + Partners
Collaborators: Block Research Group, Redline, MecoConcept, LafargeHolcim Foundation
Construction: Carlos Martín Jiménez, Sixto Cordero, Luisel Zaya, Segundo Victor Simba, Luis Alfonso Tituania Male

ICON

Publication
ICON

Date
02/06/2016

Format
Digital

Venice Architecture Biennale

REVIEW 02.06.16

The Norman Foster Foundation hopes that every small town in Africa will have its own droneport by 2030

The Netherlands manages to avoid the pitfalls of indulgent self-reflection by looking at the country's involvement in various UN missions across the globe. The greatest shame is that the ample pavilion misses the opportunity to properly showcase the proposed transformation of a UN camp into a future community by relegating the already small-ish model to the corner. Belgium's front is to embrace its slapdash craftsmanship – the mixture of installation, photomontages by Filip Dujardin and real-life examples, with minimal text makes you wish that this excellent curatorial effort was directed at some of the more pressing issues that are presented in a less attractive manner elsewhere. The British Pavilion – curated and designed by Shumi Bose, Jack Self and Finn Williams – presented not one, but five visions of new models of living. But only the entrance hall, which displays the ideas of the curators themselves, makes immediate impact – and the issues raised here are difficult to discern in the rest of the pavilion.

Large-scale installations – or at least a selection of a few, well-chosen models and artefacts – seem to be the best way to exhibit at the event. Whether it's the Norman Foster Foundation's droneport at the tail end of the Arsenale, or the V&A's more scholarly look at copying and deployment of models in architectural and artistic preservation, these efforts truly communicate to the broad audience. It is no coincidence that the winner of the Golden Lion for the best exhibition, Paraguayan firm Gabinete de Arquitectura, filled the largest room of the Central Pavilion with its enormous brick arch built by unqualified labour. And that NLÉ won a Silver Lion for its scaled down model of its Makoko Floating School in Lagos, moored in the Arsenale basin.

HYPERALLERGIC

Publication
Hyperallergic

Date
07/06/2016

Format
Digital

ARTICLES

Norman Foster's High-Concept Drone Airport Will Bring Aid to Rwanda

Carey Dunne June 7, 2016

Norman Foster Foundation, rendering for Droneport (2016) (all images courtesy Norman Foster Foundation)

By 2030, every rural town in Africa could be equipped with an undulating red brick droneport, designed by starchitect Norman Foster, to serve as a hub for deliveries of crucial medical supplies. Dubbed the "world's smallest airport," a full-scale prototype of the first droneport has been unveiled at the 15th International Architecture Biennale in Venice. The design aims to help compensate for the dearth of infrastructure on the world's second-largest continent, which often prevents people in far-flung regions from accessing life-giving supplies.

Africa's population is set to double to 2.2 billion by 2050. The gap between the population and infrastructural growth is drastically widening: Only a third of Africans live within a mile of an all-season road. There are no continental highways and not enough bridges and tunnels to meet the needs of most communities. "Something as basic as blood is not always available for timely treatment," Norman Foster, founder of Foster + Partners, said in a statement. "We require immediate bold, radical solutions to address this issue." The proposed solution: Use flying robots, or cargo drones, to carry supplies over mountains, lakes, and deserts to inaccessible communities. "The Droneport project is about doing 'more with less', capitalizing on the recent advancements in drone technology — something that is usually associated with war and hostilities — to make an immediate life-saving impact in Africa," Foster said.

The pilot droneport program will launch later this year in Rwanda, the mountainous, landlocked East African country nicknamed "Land of a Thousand Hills." Three droneports, to be completed by 2020, will allow the drone network to send supplies to 44 percent of the country. Parallel drone networks will operate two separate services: The "redline" will use smaller drones for delivering medical and emergency supplies, while the commercial "blueline" will transport bigger loads, such as spare parts, electronics, and e-commerce.

"Rwanda's challenging geographical and social landscape makes it an ideal test-bed for the droneport project," Foster said. He expects the pilot program to "save lives immediately." The architects plan to expand the droneport network first to the neighboring Congo, and then to all African countries and other developing economies, over the next 15 years.
The Pritzker Prize-winning Foster, an airport designer and pilot of sailplanes and other aircraft, was tapped as design lead by Jonathan Ledgard, director of Afrotech and founder of Redline, a network of leading roboticists, architects, and logisticians developing Africa's drone delivery network. The Droneport is the inaugural project of the Norman Foster Foundation.

"It is inevitable on a crowded planet, with limited resources, that we will make more intensive use of our sky using flying robots to move goods faster, cheaper, and more accurately than ever before," Ledgard, also an acclaimed novelist, said in a statement. "But it is not inevitable that these craft or their landing sites will be engineered to be tough and cheap enough to serve poorer communities who can make most use of them."

The design is not only tough and cheap, but also beautiful, an undulating chain of vaulted modules in red brick. To create construction jobs, the architects intend for the droneports to be assembled by local community members: A kit of the basic framework and brick-press machinery will be delivered to each site, while clay for bricks and boulders to build the structures will be locally sourced. Each droneport also features a health clinic, a digital fabrication shop, a post and courier room, and an e-commerce trading hub. If all goes as planned, the droneport will become a nexus not just for flying robots but for human communities, too.

Publication
Archdaily

Date
09/06/2016

Format
Digital

Norman Foster Explains How Drones in Rwanda Could Lead the Way for New Cities

09:30 - 9 June, 2016 | by Jan Doroteo

Back in September, Foster + Partners released details of their designs for a droneport in Rwanda, a humanitarian initiative that seeks to jumpstart and navigate the infrastructural challenges of emerging economies. In this video, Foster and others involved in the project explain the process of realizing the droneports, giving further details on its inclusion in this year's Venice Biennale—with engaging new architectural visualizations to boot.

The project, which is slated to begin construction this year, was initiated by Jonathan Ledgard of Afrotech-Redline, who specifically approached Foster for his background work in airports and aviation. This striking juxtaposition between the low-tech landscapes of emerging economies and high-tech drones exhibit one of the key concepts behind the droneport: technological leapfrogging. The phrase refers to the adoption of advanced technology in areas where preexisting technologies are lacking, solving these areas' challenges faster or more cheaply than the previous technologies ever could.

These initiatives are fruitful not only for the sites being serviced but technology in general, as scientists and researchers are given the opportunity to explore and innovate new technologies that may have no immediate purpose in the crowded technological landscape of developed countries. While drones in Russia are being used to deliver pizza, there is space and, in fact, a need in Rwanda for drones to serve as medical units. Multiple research labs and students from EPFL, MIT, Polytechnic University of Madrid, and ETH were tasked with innovating on the common thin-shell structure to withstand natural forces and to fit into the local context. The LafargeHolcim foundation was also responsible for innovating their pre-existing product, known as Durabrick, to create a new product that could be used as the building material for the droneports.

For the project's execution the firm envisions a "kit-of-parts," providing only the basic formwork for the structures and the brick-press machinery—with labor and materials sourced locally. The project's greatest attribute is described best by Norman Foster himself: it is about helping emerging economies "with minimum imported products and maximum engagement with the local communities."

The droneport project not only bypasses immediate technologies that are traditionally considered necessary infrastructure for developed countries, but it also envisions a new kind urbanism—one that is perhaps less dependent upon highways, personal automobiles and subsequent gridlock. These are all elements of cities which, in recent years, have been problematized but at the same time have been irreplaceable in servicing the metropolis. In a few South American cities, we have seen the development of new urban transport options such as cable cars as a solution to the inadequacy of (or complete absence of) roads. Technological leapfrogging has the potential to flip the common narrative, allowing emerging economies not to play "catch up" but to be leaders in development. With the success of the droneport project yet to be determined, could we start looking forward to a new model of cities?

ARCHITECTURAL RECORD

Publication
Architecture Record

Date
02/06/2016

Format
Digital

Venice Architecture Biennale Dispatch: Spotlight on Africa

Droneport

The droneport is the inaugural project of the Norman Foster Foundation.

Photo © Nigel Young/The Norman Foster Foundation

Three of the most eloquent voices at the Venice Architecture Biennale addressed different aspects of the same question: Can architecture improve lives in Africa?

The first such voice belonged to Kunlé Adeyemi, the Nigerian architect who, at the behest of director Alejandro Aravena, built a replica of the Makoko Floating School, which Adeyemi created in 2013 for a watery slum in Lagos. In its current location, off the vast Arsenale where Venetians once built ships of war, this A-frame ship for learning is startlingly fitting.

The second such voice belonged, surprisingly, to Norman Foster—an architect normally associated with glistening first-world projects. But Lord Foster came to the Biennale to unveil his Droneport. If that sounds science fiction-y, it isn't. The inaugural project of the Norman Foster Foundation (established by the architect and his wife, Elena), the structure is meant to house drones for humanitarian purposes. The architect passionately described how drones could be employed to bring necessities, including medical supplies, to remote villages in Africa with no reliable road access. "Drones could go from killing machines to living machines," he said, envisioning fleets of unmanned craft with wingspans of 20 feet or more performing vital services.

In order to deliver these necessities, the drones will need secure places to load and unload on the ground. Jonathan Ledgard, a former journalist and founder of the Pioneering Redline Cargo Drone Network, enlisted Foster to design the ports, which he did with the Cambridge, Massachusetts-based engineering firm Ochsendorf, DeJong & Block. Made of hollow clay bricks, the vaulted droneport is designed to be built largely on site in Africa. Only the molds and hand tools would have to be delivered; the rest of the work could be done by locals (In Venice, the port was built by students). A pilot project with the government of Rwanda — think of it as a pilotless pilot project — is already underway, said Foster.

Basel-based architect Manuel Herz answered the question about Africa with his project about the refugees of Western Sahara. Herz has devoted a decade (so far) to documenting the plight (and not unoccasional pleasures) of the Sahrawi people, forced by war to escape from Moroccan military forces to Algeria in the 1970s. They live in camps, but they have subverted the "temporary housing" paradigm by bringing intelligence and even humor to the designs of their houses, public buildings, and communal spaces.

For the Sahrawis, the camps are a literal form of nation-building. The trouble is that "instead of solving the problem of the Western Sahara politically, it has been solved architecturally," says Herz, describing the architectural victory as only a stopgap. Working with the Union of Sahrawi Women, Herz set out to make both an architectural and political case, first persuading Aravena to let him have a prime location for his pavilion — said to be the first at a Biennale devoted to a people in exile —in the center of the Giardini. From outside, the pavilion resembles a tent covered in silvery jute. Said Herz, "I wanted something more than the shack you might expect."

Inside are images in two very different media: Large photos by RECORD contributing photographer Iwan Baan capture the lives of Sahrawis, while vividly pictorial black and white rugs woven by some 30 Sahrawi women offer maps and architectural renderings in a personal yet direct manner.

Through this exhibition, Herz hopes to make the Sahrawis more visible. Adeyemi hopes to find a permanent home for his second floating school—which took home the Silver Lion award—after the architecture Biennale closes in November. And Foster, a lifelong aviation junkie, hopes his involvement will bring attention to a project that could help millions on the ground.

Artlyst

Publication
Artlyst

Date
27/05/2016

Format
Digital

Norman Foster's Drone Airport Design Unveiled At Venice Architecture Biennale 2016

27 May 2016 / Art Categories Art News, News / Art Tags Droneport, Norman Foster /

The prototype for a droneport designed by the British architect Sir Norman Foster has been built on site in the Arsenale in Venice and will be unveiled at a Press Preview during the 15th International Architecture Biennale on Thursday 26 May at 15:00. The droneport prototype is the first project to be presented by The Norman Foster Foundation. The proposal is to create a network of droneports to deliver medical supplies and other necessities to areas of Africa that are difficult to access due to a lack of roads or other infrastructure and the ambition is that every small town in Africa and in other emerging economies will have its own droneport by 2030.

The pilot project – which will be launched this year – is based in Rwanda, a country whose physical and social geography poses multiple challenges. The initial plan for three buildings, to be completed by 2020, will enable the network to send supplies to 44 per cent of Rwanda. Subsequent phases of the project could see in excess of 40 droneports across Rwanda, and the country's central location could allow easier expansion to neighbouring countries such as Congo, saving many thousands more lives.

Jonathan Ledgard, Founder of the Pioneering Redline Cargo Drone Network, a concept he developed at the Swiss federal institute of technology in Lausanne (EPFL), approached Norman Foster with the concept because of his combination of airport design experience and knowledge of flight as a pilot of sailplanes, helicopters and aircraft. Foster then shared the challenge with his colleagues Narinder Sagoo and Roger Ridsdill Smith at Foster + Partners. Working with their teams, the basis of a modular vaulted system evolved. It has fallen to The Norman Foster Foundation to advance it beyond early feasibility stage and has led to the present team to design, engineer and implement the project through to a built reality.

Lord Foster, Chairman and Founder of Foster + Partners and Chairman, The Norman Foster Foundation: "Africa is a continent where the gap between the population and infrastructural growth is increasing exponentially. The dearth of terrestrial infrastructure has a direct impact on the ability to deliver life-giving supplies, indeed where something as basic as blood is not always available for timely treatment. We require immediate bold, radical solutions to address this issue. The Droneport project is about doing 'more with less', capitalising on the recent advancements in drone technology – something that is usually associated with war and hostilities – to make an immediate life-saving impact in Africa. Rwanda's challenging geographical and social landscape makes it an ideal test-bed for the Droneport project. This project can have massive impact through the century and save lives immediately."

Cargo drone routes have utility wherever there is a lack of roads. Just as mobile phones dispensed with landlines, cargo drones can transcend geographical barriers such as mountains, lakes, and unnavigable rivers without the need for large-scale physical infrastructure. Just a third of Africanslive within two kilometres of an all-season road, and there are no continental motorways, almost no tunnels, and not enough bridges that can reach people living in far-flung areas of the continent. It would require unprecedented levels of investment in roads and railways to catch up with the exponential growth in Africa's population, which is set to double to 2.2 billion by 2050. An 'infrastructural leap' is essential using drone technology and clean energy systems to surmount the challenges of the future.

The specialist drones can carry blood and life-saving supplies over 100 kilometres at minimal cost, providing an affordable alternative that can complement road-based deliveries. Two parallel networks would operate services, the Redline using smaller drones for medical and emergency supplies; and the commercial Blueline that would transport crucial larger payloads such as spare parts, electronics, and e-commerce, complementing and subsidising the Redline network.

The Droneport offers a new typology for a building, which it is hoped, will grow into a ubiquitous presence, much like petrol stations have become dispersed infrastructure for road traffic. The proposal will have a strong civic presence, based on sharing and multiple uses. It allows for safe landing of quiet drones in a densely packed area, and includes a health clinic, a digital fabrication shop, a post and courier room, and an e-commerce trading hub, allowing it to become part of local community life.

The project is an evolution of Norman Foster's previous experience in building airports, as well as earlier lunar building studies conducted in association with the European Space Agency. Just as the structures designed for the moon use a minimal inflatable framework and 3-D printed lunar soil, the Droneport is imagined as a 'kit-of-parts' where only the basic formwork and brick-press machinery is delivered to site, and the raw materials, such as clay for bricks and boulders for the foundation, are locally sourced, reducing material transport costs and making it more sustainable. The central idea is to 'do more with less' and the vaulted brick structure with a minimal ground footprint, can easily be put together by the local communities. Multiple vaults can also link together to form flexible spaces based on demand and needs of the particular place, and the evolution of drone technology. The Droneports will also be manufacturing centres for drones, generating employment opportunities for the local population. By giving the local people the construction knowledge, the project seeks to leave a legacy that will initiate a change that is bigger than the building itself.

The creation of a Biennale pavilion was made possible by The Norman Foster Foundation which brought together professors and students from five universities across Europe, the UK and America along with a foundation for the building industry and its related research laboratory. Its theme fit perfectly with Alejandro Aravena's motto "Reporting from the Front". Its construction in Venice was filmed to serve as a model for replication by local communities in emerging economies such as Africa, South America and parts of Asia. Although initially a response to the droneport, the construction system is applicable to a wider range of needs – markets, schools and medical facilities for example.

Its location at the end of the Arsenale is symbolic as the gateway to a newly opened public park. The possibility of it remaining as a permanent legacy is now under consideration. The colouration of the earth-based products, which were specifically made for the project, are a careful match with the historic buildings which surround it. It would be a timeless addition to the Biennale site and virtually maintenance free.

The project has been realised by The Norman Foster Foundation on a very tight timescale, 6 months overall, 4 weeks on site – made possible by the close links between the engineer partners of ODB and their universities. John Ochsendorf teaches at MIT, Matthew de Jong at Cambridge and Phillipe Block, with his research group at ETH Zurich. Jonathan Ledgard, originator of the drone port concept and founder of Redline, developed the idea at EPFL in collaboration with the Laboratory of Intelligent Systems (LIS) of Dario Floreano.

An interim feasibility study involved the construction of a half size vault at the Polytechnic University of Madrid headed out by Professor Santiago Huerta. This was realised by a Master Mason, Carlos Martín Jiménez, attached to the project with two students from MIT – Sixto Cordero and Luisel Zaya. The same team, expanded with Segundo Victor Simba and Luis Alfonso Tituania Male moved on to Venice to create the present pavilion.

The Madrid exercise enabled the combined resources of the LafargeHolcim Foundation for Sustainable Construction and their research laboratory in Lyon to develop a special earth-based product for the project. 18,000 customised elements have been produced for the pavilion. The challenge was to ensure a compressive strength of at least 10 MPa whilst minimising the weight and size of each brick.

The prototype vault comprises two outer layers of this custom product with an inner layer of traditional tiles from Valencia. The special product is of stabilised earth – a reliable, affordable and environmentally friendly building material. Compared to traditional burnt clay bricks, they do not require intensive use of fuel to achieve their performance. LafargeHolcim

INTERIOR DESIGN

Publication
Interior Design

Date
01/06/2016

Format
Digital

Early Venice Standouts Build a Brighter Future

June 1, 2016
By Meghan Edwards

VIEW SLIDESHOW

For the 15th International Architecture Exhibition at La Biennale di Venezia, which is shaping up to be particularly intriguing, curator and 2016 Pritzker Architecture Prize winner Alejandro Aravena seems to be favoring exhibits that tackle some of today's biggest social challenges, such as economic inequality, energy consumption, public space, and natural disaster, all under the umbrella theme of "Reporting From the Front".

Late last week, the Norman Foster Foundation unveiled its biennale contribution: a full-scale Droneport that could be used to house a network of drones delivering medical and other life-saving supplies to underdeveloped areas of Africa. The pilot project is slated to launch later this year in Rwanda, comprising three buildings that are meant to service 44 percent of the country. By 2030, the foundation's hope is that every small town in Africa will have its own Droneport. "The Droneport project is about doing 'more with less', capitalizing on the recent advancements in drone technology—something that is usually associated with war and hostilities—to make an immediate life-saving impact in Africa," explains Sir Norman Foster.

The temporary or informal structures that arise following natural disasters like earthquakes and floods, or during urban transformation, are seen in the U.S. and Brazil pavilions. The theme of Chile's pavilion, "Against the Tide", is the transformation of how people live in the nation's southern central region, which is very rural. Architect and curator Juan Roman selected 15 student projects—such as rest stops, pavilions, and public areas—using local or reused materials to explore how architecture can help people living in precarious conditions.

An emphasis on how traditional crafts can support design during economic unrest and decline punctuates several exhibitions, including the first collaboration between the Biennale and the Victoria and Albert Museum. At the Arsenale, museum's "A World of Fragile Parts" puts a positive spin on the much stigmatized idea of copies. Examining the threats faced by global heritage sites—natural disaster, neglect, violence, urbanization—the exhibition explores the 200-year history of copying cultural artifacts and how this practice can aid in preserving visual languages.

The Turkish Pavilion is titled Darzanà and features a massive sculpture taking the form of a boat, Batarda, constructed of reused materials found in Istanbul's abandoned dockyard. By connecting Istanbul and Venice as two ports with a shared architectural heritage of shipsheds (called “volti” in Italian and “göz” in Turkish), the project questions whether it’s possible to transform borders and areas of conflict into spaces of consensus.

Sound installation takes the spotlight at the Australian Pavilion, where the Australian Institute of Architects presents "The Pool" in the Venice Giardini, curated by Aileen Sage Architects with Michelle Tabet. Stories and narratives told by Australian cultural leaders—such as Olympic gold medal winning swimmers Ian Thorpe and Shane Gould, environmentalist and 2007 Australian of the Year Tim Flannery, and fashion designers Romance Was Born—are projected around a physical pool, each one touching on a different way the concept of the pool impacts Australian society. Steel-framed lounge chairs punctuate the space, designed in collaboration with Elliat Rich.

As part of the GAA Foundation’s exhibition "Time Space Existence" at the Palazzo Bembo, Singapore-based firm WOHA's "Fragments of an Urban Future" takes on some of the urban challenges of today's megacities (unprecedented population growth and housing needs, accelerated climate change, and the need to preserve biodiversity). A selection of WOHA’s most recent work shows how the firm’s vertical ecosystems transform these challenges into amazing models for sustainable building.

“In Therapy: Nordic Countries Face to Face”, the exhibition of the Nordic Pavilion, compares three Scandinavian countries—Finland, Norway, and Sweden—for a deep dive into the region’s contemporary architecture and what it signifies for each one’s evolving culture. Curator David Basulto culled 500 open-call submissions down to 300 projects to form a contemporary architectural survey. Among them, nine key projects represent typologies with social underpinnings, including Foundational Architecture, which addresses basic needs like shelter, healthcare and education. The exhibit borrows Abraham Maslow’s 1954 “Hierarchy of Needs’” as a lens to examine projects that have been instrumental in constructing contemporary Nordic society.

The biennale opens on May 28 and will run through November 27, 2016.