

# pulse

MOVEMENTS IN ARCHITECTURE

01 | 2010

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Architecture for water and air

## Gateway to the new world

by Foster + Partners

Airport BBI – a visit  
to gmp Architekten

Encounter with Airport 2.0

Flying carpet: Terminal 5  
at London Heathrow

Terminal design

**ABB**



Designing Osanbashi Pier in Yokohama brought international breakthrough for London-based architectural office FOA (Foreign Office Architects)

# To the point: Architecture for water and air

*pulse* in conversation with Alejandro Zaera-Polo and Fashid Moussavi (FOA)

## **For an architect what is appealing about designing an airport?**

In many respects what emerges here is that airports and shopping malls represent the new public spaces in contemporary major cities.

This has to do with the fact that we live in a culture increasingly influenced by globalization, in which spaces are linked at an ever faster rate. This is why in the future public life will take place at logistical hubs such as airports and ferry terminals. These places are by no means ethnically or culturally homogeneous. They are places in which various cultures and ethnic groups meet and mingle.

**In recent years, various eye-catching airports have been built. Would you agree that there is a trend to make airports into a country's calling card?**

An airport or a terminal for high-speed trains - these are the places that reflect a place's iden-

tity. At the same time they are the new gateways and hubs, not totally dominated by their internal functions but containing an inherent link between the local sphere on the one hand and, the world on the other. As such as an architect you need to address the question of a place's identity in the larger context and not merely reference the region and the local culture.

**In Europe, in coming years we are unlikely to see anything other than airport expansions. Is as a consequence a country such as China, where there is immense pent-up demand, actually not far more interesting for architects?**

In Europe and the US we have by no means reached the end of the line in terms of development. In many cases the infrastructure needs to be updated and adapted to the circumstances. In the years to come this is probably going to be the sort of task or challenge we will have to overcome in the so-called "Old World".

**In the case of the Osanbashi Pier you were confronted with the element water, what does this require of an architect?**

In Yokohama we also designed the pier as an analogy the shape of a wave. Indeed, the building has a very fluid character overall. Leaving this aesthetic decision aside there are of course many similarities between ferry terminals and airports. The facilities, the logistics and the safety requirements are all similar.

**Orchestrating various factors can be fairly overwhelming for an architect ...**

We like to work with set parameters and believe that these facilitate the project, set the direction and help find solutions we perhaps would not have come up with had we had more freedom.. We like talking to traffic engineers simply because they confront us with questions to which we have find a solution through design.

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The most spectacular example of a shell roof: With the TWA arrivals terminal in New York, Eero Saarinen established a completely new kind of airport architecture. The design recalls a bird of prey.

# Terminal design

Aviation has expanded into a global transfer system. Around the year 2000 about one and a half billion people traveled by plane each year, in 2025 the number is expected to hit nine billion. We are undergoing a process of acceleration that architecture has to master. The architecture of the terminal is a response, which has also asserted itself in other areas, for example, in ferry travel.

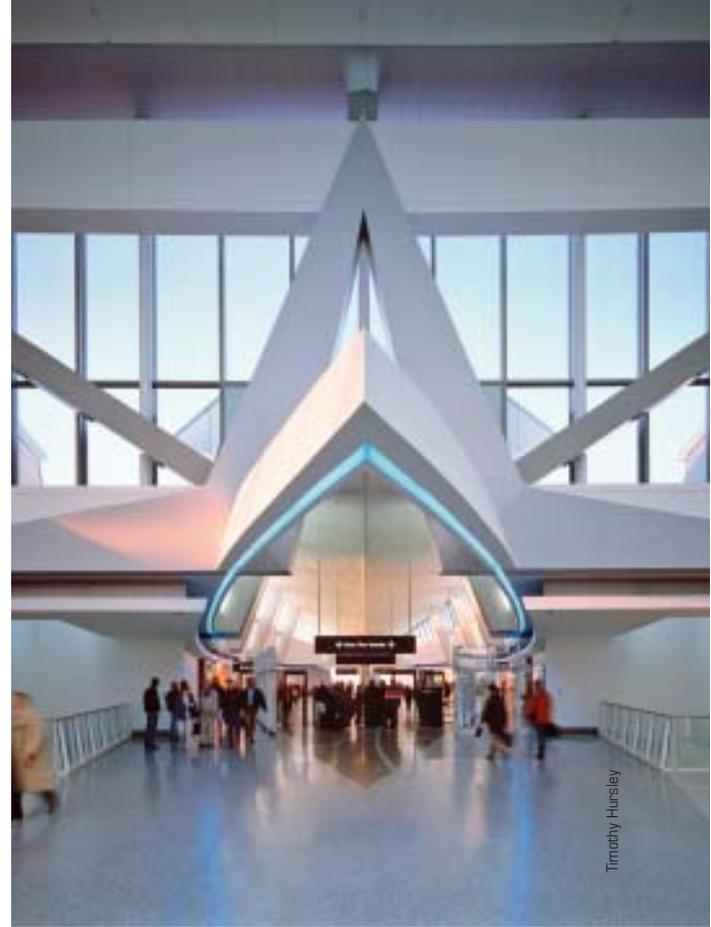
By **Koos Bosma**

When flying became a mass phenomenon in the 1950s and 1960s and large objects with jet engines filled airspace, airports morphed into veritable mega-structures. In the early 1960s, the price competition between the scheduled flights and no-frills charter flights had also spread to regular airlines. Airplanes were subsequently divided into Economy Class and Business Class. When propeller machines were replaced by jet aircraft able to fly at faster speeds and capable of reaching even the most remote destinations in the world within a reasonable space of time, a new era of flying began. Airliners transported 500 or more passengers, who poured into the terminal in an incalculable stream. In this new era planners and architects pondered over such things as the ideal runway configurations, the requirements of airline movement, and maintenance, passenger and freight care, mail, security checking and transfer procedures. Even though people had early on grasped the airport transfer machinery as being the fundamental task of regional infrastructure planners, it would take decades before bus, metro, train and road networks were ideally linked to the terminal. Questions relating to architectural style, construction methods, the material, construction plan

and building regulations had to be reconciled with citizens proud of their airport city status, with traffic flows, alarm devices, fuel storage, air-conditioning, signage and acoustics. After all, ultimately the public would judge the success of an airport by its efficiency, its smooth operation and the speed with which passengers were conveyed from the ground to the air.

## **Centralized handling machinery**

The design and furnishings of modern airports began to look like the preplanning of a real city. The special thing about this type was the conscious focusing on the car, which was assigned extensive parking space. The parking space was integrated at the access side in the round or polygonal terminal building. As a result, the airport building was transformed into a rotary traffic and with the help of elevators and escalators into a vertically oriented parking building. This concept formed the foundation for several European airports such as Geneva Cointrin (1968), Cologne-Bonn (1970), Berlin-Tegel (1969-1974) and Roissy 1 Charles de Gaulle (1968-1972).



Timothy Hursley

### Linear configuration

The linearity of this airport type is dictated by the highway as logistical backbone. To the left and right a series of modules extends through which passengers and airplanes are brought closer together. The Dallas Fort Worth International Airport (1965-1973) and Tampa International (1970) were the first American examples, which were equipped with a suspended railway enabling passengers to commute back and forth between the various terminals and the parking areas. For Roissy 2 A-D a flaring, elongated structure was built parallel to the expressway; passengers could leave their cars on the building's underground parking decks on a level with the gates where they were waiting for their plane. The linear system links up in a single line all the modes of transport and distributes passengers and cargo onto different levels equipped with special functions.

### Design and stress reduction

In the 1970s airport design underwent changes largely because of a gradual moving away from the prevailing clear design principles. The wave of airport hi-jackings and terrorist attacks during this time demanded higher safety standards in the airport buildings. Subsequently, the space in the terminal was divided into secure and less secure areas

as separated from one another by strictly monitored narrow passages. This resulted in passengers walking further and reduced transparency. Innovations in the 1980s and 1990s were primarily related to the architecture of existing airport types. The "face" of the airport was to be made more attractive - and celebrated the airport using architectural means. For example, parking zones and shopping areas were moved inside building, which emphasized the economic importance of visitors who did not have any travel plans. Airports are transient places in which comfort and design that exudes safety are key to reducing stress. The time that people spend in an airport is just as important commercially speaking as passengers' disciplined movement towards their gate - both require the planning of an architect. The logistic regime requires symbols and a certain emotional "bringing into line" in a veritably stoic environment. Clients and architects assume that travelers unconsciously associate flying with speed, light, sky, comfort and an efficient service. The architect confirms these associations using glass, light colors, comfortable seating and a smooth, efficient passenger check-in system. His aim is to make all objects appear to be permeated by the lightness of flying. Transparency in the truest sense of the word, brightness and an enthusiasm for light suggest the overco-

Nautical symbolism comes into play: The arrivals and departure area at Buffalo Niagara International Airport is designed to resemble a compass card. Kohn Pedersen Fox architects realized the prize-winning building in 1997.

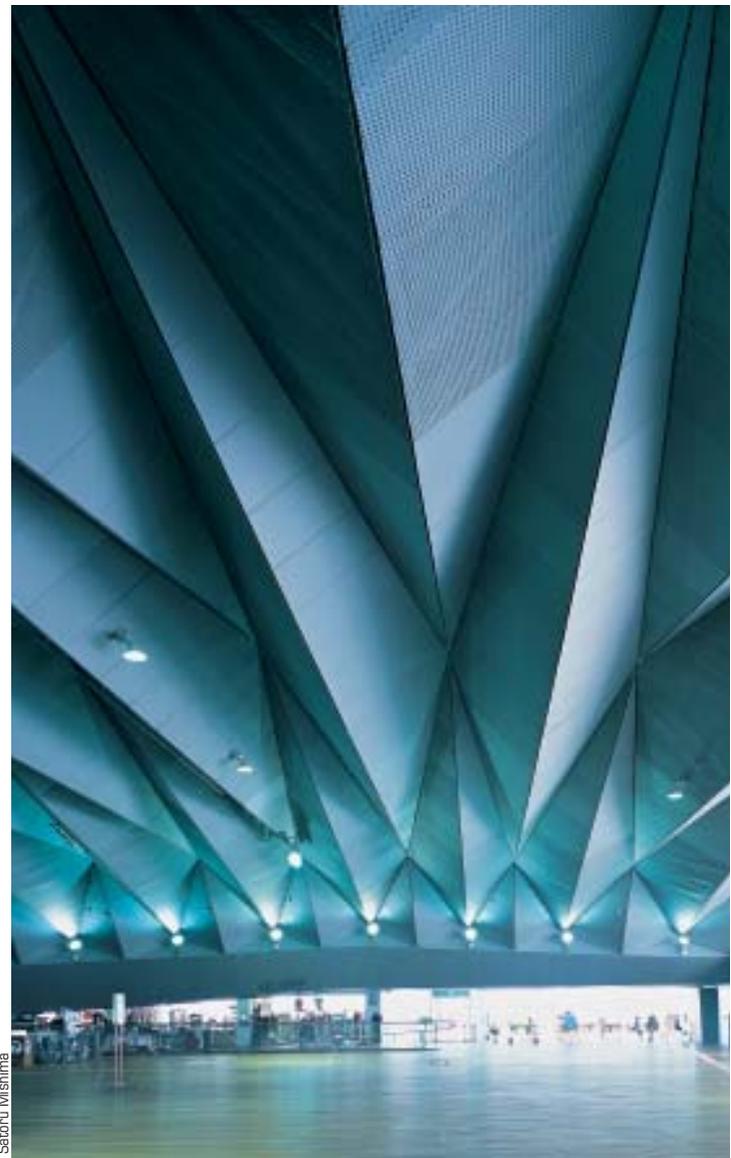
ming of barriers and promise a smooth take-off and landing.

### **Arcades and railway concourses**

In the United States in the 1950s numerous designs were produced that included spanning terminal areas with concrete shell roofs. The prevailing architectural principle was no longer egalitarian transparency but rather an immediately recognizable sculpture with a clear outline. In addition, the curving shapes of such a roof enabled a fascinating play of light and shadow in the interior of the terminal. Arguably the most spectacular example of this genre is the TWA building in Idlewild, New York. Eero Saarinen wanted to design the terminal as a place of movement by heightening the rituals of passage. His decision to employ shell roofs so as to articulate the desired symbolic figure ("bird in flight") enabled a fascinating interior, which does not feature a single straight line. The architecture of the 1960s and 1970s was characterized by elegance, speed, light and air, but the new monolithic structures such as Roissy and Berlin-Tegel employed their own concept whose starting point was the character of the airport as transport machinery. Roissy 1 presents the most clear prototype of this type of terminal. The cylindrical, circular-plan building is a condenser without a facade, which swallows up masses of people and later spits them out again. The center of the cylinder is hollow, which serves to create a sense of inner reflection. The empty space is criss-crossed by escalators, which convey passengers through the vacant space from the dark into the light. Above them they see the open sky and below them a bubbling fountain. Given the numerous demands for an elementary, light, transparent and flexible terminal building (as a skeleton or open structure), it was to be expected that the so-called high-tech architects would focus their attention on airport design. In the 1980s and 1990s the architectural composition of airport buildings was celebrated in two favored types of construction: the arcade and the railway concourse, both hybrids of street and interior space. Given that ferry terminals also face constantly growing demands in terms of logistics and safety and have to respond in their design to ever larger passenger and cruise ships, a similar development is to be expected. Passengers move through longer, open spaces resembling a transparent arcade or railway concourse. The line of stores, bars and cafés are flooded with light. Just like airport terminals, the arrival and departure areas of maritime stations also exude an aura of loftiness, transparency and comfort.

### **Geared towards future challenges**

For all the parallels, it is the new airports that receive the



Satoru Mishima

A terminal that has a special aura about it: The ferry terminal Osanbashi Pier, realized by FOD in Yokohama in 2002, creates an interesting interplay with its various logistics levels and, moreover, attracts city strollers.



Young Chea

The voluminous steel-glass dome of the Transportation Center in Seoul (above) realized in 2001 stems from the British architect Terry Farrell's office. Designed by RHW-Architekten, the temporary Cruise Terminals 1 in Hamburg (center) consists largely of containers. Today's cruise liners are lavishly equipped and resemble small, floating towns. Manufactured in Papenburg, the AIDA Luna uses products by ABB/Busch-Jaeger, amongst others.



Christoph Gebler



Ingrid Fiebak

greatest media attention: The roof of Hamburg international airport (1993-1994) was supported by two rows each of six solid reinforced concrete pillars, and four narrow diagonal steel struts branched out of each of the latter. The terminal is open and brightly lit; it resembles a simple space load-bearing structure. But the most impressive high-tech airport and one that could theoretically be expanded infinitely is Stansted (1986-1991). A bright structure – a gigantic roof – accommodates all the public facilities on the same level. The main concourse is both arrivals and departure area. The technical equipment and the parking space is housed in the base of the building. The long, strutted roof and the branching tree-like groups of pillars follow a predetermined pattern and modulate the light that pours into the building. Stansted comes across on the one hand like a minimalist, angular glass box and on the other like a celebration of light. Airport management must function in a turbulent environment, which is not only determined by cutthroat competition but is also oriented to the future, that is, to change and adaptation. This explains why certain sections of airport cities are abandoned or even removed without a second thought. A typological or architectural purism is repeatedly compromised. Even though the large airport as such will always live in a permanent state of change you can nevertheless always detect a large degree of consistency in its visible design. The continuity of these airport cities is not based so much on their design, but rather on the presence of structures. In order to avoid problems there is an attempt to order functions, rituals and uses. This, in turn, results in intelligent construction, a suitable scale and rhythm of spaces, and the design of clear and attractive interiors not to mention the guiding of human traffic flows. This type of structuring is supported by ideally presented buildings and marketing concepts. What is remarkable is that the creative disciplines are the most enduring ones.

**Koos Bosma** lectures on the history of architecture and heritage at Amsterdam University. Together with Helma Helinga, he edited the exhibition catalog "Mastering the City. North European City Planning, 1900 - 2000", Rotterdam 1997. This article is an adaptation of Bosma's article in the exhibition catalog "Airworld", published by Vitra Design Museum.

Waiting for their flights in a stylish atmosphere: Virgin Clubhouse at Heathrow Airport is a lavish club landscape created by Softroom architects.





From the tower through to the bistro area: A fully operational, uniform building management system is necessary to control the complex system "airport terminal". Photos: Facilities at Frankfurt International Airport

# Encounter with Airport 2.0

In regulating the incredibly complex building technology for an airport it is vital the allocation of functions and zones is organized efficiently. Naturally, the wishes and needs of building users should always be considered first. Improved, homogeneous, overall solutions not only make for more comfort, but also result in greater cost- and energy efficiency. In other words, Airport 2.0 is feasible and more than just pie-in-the-sky.

By **Dagmar Hohnecker**

Airports typically handle a diverse range of passengers: There is the demanding business man who appreciates information- and communication technology allowing him to deal with his correspondence using a cell phone, PDA or laptop. There is the holidaymaker, who wants to be entertained and put in the mood for his destination. Or the frequent flyer who wants to get from A to B inexpensively and quickly, or someone with special needs, a sick person possibly requiring medical support during the flight. Passengers come from every age group and may have greatly disparate expectations when it comes to handling technical solutions. Information, communication and entertainment systems that are easy to operate can become a comfort advantage. This not only holds for arrival and departure zones or waiting zones, but also for functional areas such as toilets, the check-in section or boarding zones.

## **Greater functionality thanks to building automation**

As regards building automation, it is not desired that passengers intervene in regulation systems. Nonetheless, they should be provided with a pleasant atmosphere. Air-conditioning, sound (announcements) and

lighting in the waiting areas should be as energy-efficient as possible. Intelligent solutions for heating and ventilation regulation can be adapted to the current requirements in the zones. This necessitates intelligent sensors for, say, CO<sub>2</sub> content, temperature or light incidence, sensors that relay the current data to the building automation system. These sensors can be integrated into existing KNX- or BACnet-systems via wireless networks (EnOcean, ZigBee). Equally advantageous is an intelligent guidance system for passengers beginning with parking options through to the boarding zone. Intelligent tags that are equipped with RFID (Radio Frequency Identification) or wireless chips can also be helpful in finding the right way. However, this latter option requires a wireless overlay network, in other words a network that is placed over an existing one (for example, ZigBee) and is installed across the entire airport building. A major advantage: it greatly simplifies passenger or baggage searches. Security is a crucial aspect in airport terminals. Crucial also for passengers. Intelligent video networked surveillance already provides a comprehensive image evaluation function with scenario recognition, which identifies



conspicuously abandoned luggage items, suspicious persons or a fire source and transmits alarms to the security department, the fire-fighting service, the rescue service or service technicians.

**Networked time entry terminals and access terminals**

Airport administration staff and service teams operate out of offices with access to suitable computer and telecommunications equipment. However, to ensure they can be reached in the entire building or anywhere on the airport complex, it should be possible to access such staff say via DECT (digitally enhanced cordless telecommunications) or wireless VoIP-systems (telephony via a data network) but also via r WLAN solutions. That said, in the interests of security all these systems should be kept separate from the communication services offered to passengers. Generally speaking, such staff are normally equipped with their own communication infrastructure: the BOS-System, an independent, non-public, mobile wireless service for authorities and organizations handling security tasks. Airline employees, security service staff, technicians, admin staffers or those working in restaurants and shops not to mention other service

providers that are permanently or temporarily in the building need to have personal keyless entry for their particular areas. Networked time entry and access terminals offer a wide range of identification options: From fingerprint, devices that scan vein pattern on the palms, iris analysis through to electronic keys (keycards) these systems offer a fundamental advantage: User profiles can be created or deleted at short notice. Linking the access terminals to the building automation system (especially for heating, air-conditioning and lighting) can also help further cut energy costs for the building. This is either achieved by depositing time plans showing when a room or zone should be used or by having the persons in a room sign on and off as it were. Only when someone is present does such a room go into "operating mode" and similarly it can adopt a "sleep mode", requiring less energy when it is not used. To simplify the work of operating staff and consequently cut maintenance costs, devices such as smoke detectors should ideally employ EnOcean-technology. Such devices do not operate on batteries (making annual battery changes unnecessary) or require power leads; instead they draw their power from ambient energy and can also store it.

Intelligent building technology for an airport unites the customary building automation for heating, air-conditioning and ventilation with areas such as security technology, lighting, shading and multimedia applications.



### **Homogeneous system solutions**

Networking systems are contingent on another planning aspect that should not be underestimated: System integration automatically implies a comprehensive and integral building management system so as to keep the complex system of the airport terminal in sight and be able to respond quickly in the event of a malfunction. In principle, you can say that proper planning translates into a considerable cost saving later on. Take the infrastructure area: forgetting to adjust a power lead can generate costs up to a factor 10. But this factor comes nowhere close to describing the scope of damage when a component is omitted from a system. Additional costs up to a factor of 100 are not uncommon as we are dealing in the software area with correspondingly high hourly fees. But not only every system needs to be planned in detail; the interaction of the systems also requires detailed analysis and planning. This aspect becomes even more crucial when you consider that building management should rely on as few systems as possible, and that they should be easy to operate and manage by a competent, not too large team of staff. The intelligent building technology for an airport unites the customary building automation

for heating, air-conditioning, and ventilation with the areas of security technology, lighting and shading, multimedia applications, information- and communication technology, access control, conveying technology, points-of-sale (cash dispensers or airline check-in counters) and guidance systems. It is the task of good planning to define the allocation of functions and zones. However, the secret controlling elements in such a planning are the building's users, their needs, wishes and demands. Technical highlights prove that clever solutions are possible and are used in practice. Additional innovations in the areas of communication technologies, audio systems and advances in security will increasingly improve building technology.

**Dagmar Hohnacker** has worked as a journalist specializing in data- and communication networks for twenty years. She is also on the Board of the building automation innovation network INGA e.V. and a member of the user group Netzwerke BGNW.

# Gateway to new China

Beijing Airport was intended to be an advertisement for the aspiring economic power China – and not only during the 2008 Olympic Games. In its design for Terminal 3, Foster Partners achieved a successful blend of tradition and exacting technical requirements.

By **Lasse Ole Hempel**

In an interview with the weekly newspaper "Die Zeit" in 2008, Norman Foster said that the romantic notion of flying would not go out of his mind. Then again it was Foster who in a survey amongst architects once described a Boeing 747 as the world's "most attractive piece of architecture". Likewise, the much-cited adage of Tempelhof as the "mother of all airports" goes back to the British architect who was knighted in 1990, and winner of many awards. Meanwhile, he has not only designed several major international airports but also an airliner, a business jet for carrier Najets, which Foster also uses for his own business trips.

## **Like gigantic wings**

Foster describes the new Terminal 3, which was completed in time for the Olympic Games in Beijing, as an homage to the charm and poetry of flying. Considering that his office only won the competition for the conversion and expansion of the airport as recently as November 2003, it is fitting to talk of a daring architectural and logistical venture that came to a happy end. After all, Terminal 3 covers an area of around 1.3 million square







Fu Xing

meters, making it the world's largest building to date. Beijing was gearing up for the Olympic Games and the idea was that on leaving their planes in summer 2008, visitors would immediately be overwhelmed by this architectural feat. With an eye to winning over passengers with an attractive view, Foster even abandoned the customary airport organization: incoming passengers enter the upper level first, where the broad glass façade ensures a majestic view of the surrounding runways. On leaving Beijing, passengers must be content with the lower level. Seen from the air the Terminal resembles two gigantic wings, which stand symmetrically opposite each other and are connected at the center by an intimate shaft. The entrance area is in Terminal 3A, the wing located to the west, which is for connecting and national flights, opposite this is 3B, which is reserved solely for international flights. Located in the middle of

the two, T3C serves national flights only. The two outlying poles are connected by an automated people mover (APM), which runs every minute and reaches a top speed of 80 km/hour.

#### **Daylight extends deep into the building**

Anyone who decides to cross Terminal 3 from north to south has to cover 3.25 km. As they walk, passengers are accompanied by the daylight which extends deep into the building's interior. This was achieved by perforating the roof construction with skylights designed to recall the appearance of a dragon's scales, while the coloring evokes the roofs of the Forbidden City. A sixteen-shade color spectrum comes into play to help people find their way around. Red dominates in the entrance in Area A, which gradually turns to orange as you move towards Area C, then finally ends in a rich yellow in Area B. The

The domed roof construction interspersed with generous expanses of glass allows sufficient daylight to penetrate deep into the elongated building (above). China's national colors dominate the Terminal interior and are repeated on the columns supporting the glass windows (right).



same color scheme is used for the roofing. The building's central axes are lined by characteristic red columns, and this recurring element seems to continue almost infinitely, underlining the gigantic extent of the building but also as a stylistic element evoking associations with the interior of a Chinese temple. The roof is a steel construction; the doming, which increases towards the center, recalls a cathedral. The roof construction is reflected on the ground and thanks to the daylight streaming in from above there is a sense of increased size. The roof construction narrows considerably towards the edges so as to create more intimate, calm departure and arrival areas. China's national colors of red, orange and yellow are also repeated on the supports of the spacious glass facades and comply with a concept that reconciles traditional Chinese culture with the world of an airport characterized by rationality and efficiency.

#### **Solar power and energy efficiency**

At present 35 million passengers pass through the airport every year, and planners expect this number to reach 50 million in 2012. Terminal 3 already has the dimensions to handle this volume of traffic, indeed it is designed for up to 60 million passengers a year. With numbers like this it is vital that environmental sustainability play a major role: This is why it was already determined at the planning stage that all rooms would allow the entry of daylight. Part of the façade was deliberately installed to face southeast to exploit natural solar power and keep the use of air-conditioning technology to a minimum. There is also a special system that controls and minimizes energy consumption, once again helping Terminal 3 to meet the standards of passive construction methods. During the conception phase, the emphasis was on concentrating functions and logistics on a limited

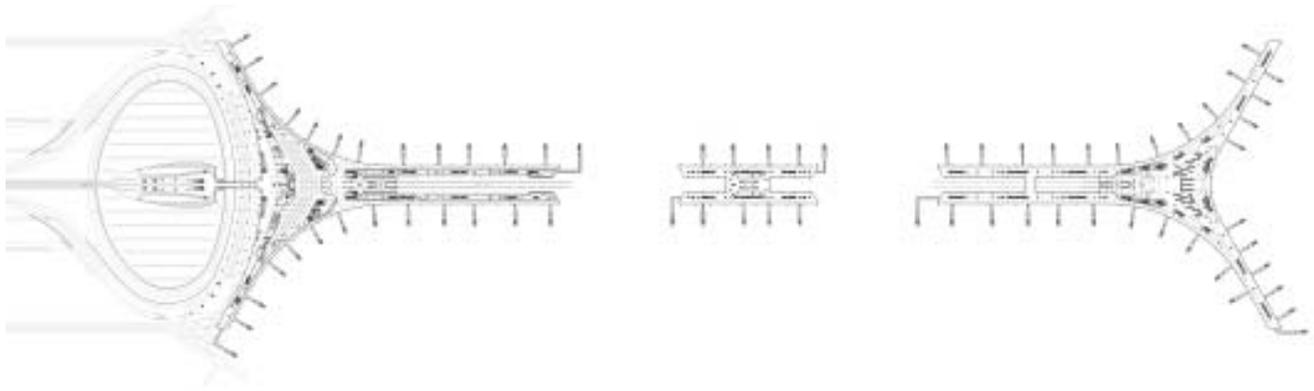


↗ 登机口 Gates C09,C10  
↑ 登机口 Gates C11-C28  
↑ 登机口 Gates C51-C58  
↑ 商店 Shops 

C09  
C10

↑ C11-C28  
↑ C51-C58  
↑ 商店 Shops  
↑ 登机口 Gates

C09  
C10



Layout



Cross-section

China's national colors red, orange and yellow run through Terminal 3 and make it easier for passengers to find their way around the world's largest building.

space to prevent them from being spread over too large an area. That said, the entire Terminal takes up 17 percent more floor space than all five Heathrow terminals. The choice of materials was determined by their being available locally; another key aspect was being able to harness local skills and services. Terminal lighting is controlled by EIB sensors by Busch-Jaeger and ABB Stotz-Kontakt, which operate on the basis of a KNX system enabling them to pass on information and possible error messages. The sensors are used throughout the airport building (though they remain hidden to passengers) and also contribute to energy efficiency.

## Project partners

### Client

Beijing Capital International Airport

### Architects

Foster + Partners

### Planners

Arup

### Integrated products by ABB/Busch-Jaeger

KNX system, ABB/Busch-Jaeger KNX sensors provide energy-efficient control of the lighting in the entire building and transmit any error messages that might occur.

# Heathrow's flying carpet

In London in the 1980s, "Heathrow Hassle" was the standard expression for describing the chaotic conditions at the airport. Terminal 5, developed by Richard Rogers and officially opened in 2008 goes a long way to easing the load for the London Heathrow hub. Moreover, the prize-winning building offers attractive views thanks to its glass roof construction and interiors flooded with light.

By **Britta Rohlfing**

Originally planned to handle 40 million passengers, in 2007 some 67 million passengers squeezed their way through the four halls of London Heathrow's arrival and departure terminals. Even minor hitches could trigger a whole chain of delays. Unanticipated events such as the crash-landing of a Boeing 777 in mid-January 2008 or the arrest of a suspected terrorist that same year brought air traffic to a standstill. As early as 1989, British Airways had determined to commission a new terminal that would handle more than 90 percent of its own flights. The architectural competition was won by Richard Rogers, but it took almost 20 years before the British architect was able to see his plan realized. A string of conditions imposed by the authorizing committees meant that the enormous logistical and spatial requirements had to be implemented in a much more confined area than was originally planned. Terminal 5 is part of a master plan: two rivers were diverted for the project, a new highway approach was constructed, two underground lines were extended. Yet the finished concept offers considerable flexibility for future expansion and conversion work.

## **A little closer to the skies**

The undulating roof of the main building – Europe's largest freestanding building – soon became the terminal's trademark. At a height of 37 meters, a protective glass hull envelops Terminal 5 from the entrance to the runway and gives passengers the feeling they have already come a little closer to the skies. Asked about the undulating shape of the roof, consisting of generously-sized glass elements, Rogers likes to compare it with a flying carpet that seems to hover above passengers' heads. Its construction rests on a system of arches anchored under the ceiling and tall, tree-like supports that dominate the edges of the building, where passenger and shopping areas are distributed over two levels. Passenger handling functions according to the single-level principle: in other words, all passenger movements are concentrated on a single level, while equipment, baggage handling and other functions are on the level below. Checking in is organized in Terminal 5 as one single forward movement. Check-in equipment features prominently and passengers can use special "bag drop" counters if they wish. Thanks to new high tech devices there

The roof construction rests on tree-like supports at the edges of the Terminal. Passenger and shopping areas extend over two levels.







Layout

The undulating roof soon became the trademark of Terminal 5. Checking in is organized as a single forwards movement thanks to a highly efficient baggage handling system.

is no need to remove either shoes or belts and laptops can remain in their bags.

#### Green piazza a part of the overall concept

Two components of the overall ecological concept: a specially developed ventilation system that adapts to the utilization level of the rooms, and shady roofing. The garden immediately adjoining the terminal is an important component in the overall concept geared towards ecological criteria and adds a sense of lightness to the sober business of flying. Planted with trees that will reach a considerable height, the piazza also serves as a transitional location between the parking building and airport terminal. This is also a logistical hub as underground and bus lines end a short distance away. Terminal 5 grabbed the headlines immediately after opening when the baggage handling system failed and tens of thousands of bags lost their way. It was a failure that has not been repeated since, nor should it be forgotten that Terminal 5 has been showered with prizes for its concept and sets new standards as regards its air-conditioning, lighting and environmental concept.



Katsuhisa Kikida

An unusual option was chosen for the transition between the main building and the parking areas: The light, shady roofs are not only eye-catching but also necessary for better energy efficiency.

## Project partners

### Client

British Airways

### Architect

Richard Rogers Partnership

### Planner

Arup

### Integrated products by ABB

KNX switch actuators, DALI gateway for the general lighting control system

# Waiting can be such a luxury

Lufthansa's First Class Lounges in Frankfurt and Munich are evidence of the fact that modern flying can be much more than bothersome safety precautions or a no-frills flying mentality. Divided into various zones, the lounges guarantee exclusiveness, absolute comfort and clarity – a design concept supplied by Frankfurt office Hollin + Radoske.

By **Sandra Hofmeister** Photos **Bernd Hollin**

"Our guests come here regularly, some every day even," confides the lady at reception. As such, her working day as one of Lufthansa's ground crew more or less resembles working in an office. She met the same passengers regularly, knew the times they came and left and their preferences, over the years she has established personal contact with them. Such rituals at the airport are not a given, but in Lufthansa's First Class Lounge in Munich, that opened in 2007, they are part of the daily routine. Only members of the HON Circle have access to the exclusive rooms in Terminal 2. These are passengers who have clocked up more than 600,000 miles – a status that clearly sets them apart from other frequent flier classes.

Guests include CEOs, board members and other regular travelers in the top luxury class, who spend their time from arrival to the start of their flight in the Premium-Lounge. Munich has the highest HON-density worldwide. For two years now, the airline with the crane logo has been receiving its best customers in a calm and harmonious atmosphere in a space that keeps them apart from the loud hustle and bustle in the departure lounge, yet is located centrally and offers a great many priorities.

The service also offers priority treatment in a limousine across the runway to the plane.

## Consistent color scheme

A trapezoid, tapering staircase leads from the lobby to the lounge on the next floor. Passengers have already handed in their luggage at reception. Entry and exit procedures together with all safety checks are carried out inside the lounge. This is why entry and exit is possible from two levels, for departures to the European Union and to non-EU destinations. Passengers arriving at the upper floor enter a spacious room divided into various zones, which are loosely connected with one another and yet separate from one another. The consistent color scheme of warm earthy tones creates a subtle emotional mood. It is a scheme featuring unobtrusive natural materials such as soft leather and floor to ceiling oak veneer, interspersed with indirect light strips and dark, patinated metal panels. The architects Bernd Hollin and Alexander Radoske developed the interior design concept for the first class interior back in 2005 for the recently opened premium terminal in Frankfurt/Main. "Lufthansa

A luxury that exudes calm combined with casualness: In the First Class Lounge in Frankfurt the partitions with bronze frames on both sides create privacy without being isolating.





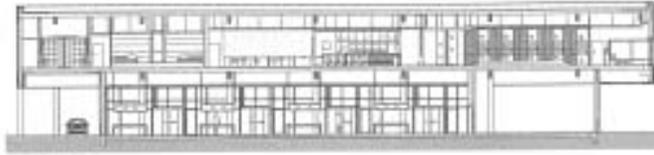
turns waiting time into a major attraction," wrote the magazine "Elle" at the time, and the travel press also praised the airline for its daring use of stylistically confident luxury. The exacting standards applied in Frankfurt traveled to Munich in the guise of a design manual, whose content the Aachen-based architects from the office K2 applied to the letter: color scheme, materials and furnishings are all elements of a corporate identity that characterizes both lounges in Munich and Frankfurt and was defined down to the last details, such as greywacke floor tiles and islands of hand-tufted rugs. The interior is immediately recognizable and classy, it avoids bright colors and offers an equal degree of comfort and privacy.

#### **The sophisticated technology remains invisible**

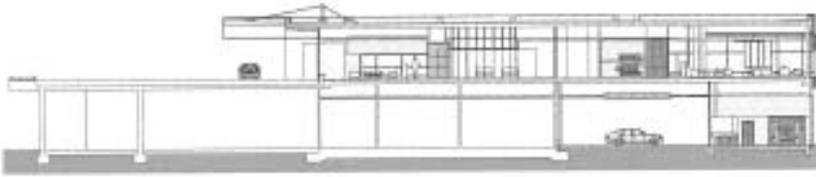
Every day several hundred guests spend time in the 860 square meter lounge in Munich. Lufthansa would not give exact numbers - discretion being part of the luxury

of premium travelers. As they await their flights it is seldom that any wishes they might have are not fulfilled. There are closed office rooms and guests can also retire to their own rooms with made-up beds. The loft-like lounge is divided into a bar- and restaurant area and a comfort- and relax zone. Guests can either help themselves to the buffet or eat à la carte. They can relax on one of the inviting lounge chairs in front of a crackling open fire projected onto a flat screen or take a seat in one of the classic geometric seating sections arranged around flat coffee tables offering enticing chocolate confectionary. In the rear section of the room there is a cigar lounge complete with humidor, separated from the remaining area by glass walls. The sanitary zone turns out to be a comfortable wellness area with separate marble shower baths and Jacuzzis, masseurs are also available if desired. The entire lounge is sound-insulated and its impressive array of sophisticated technology remains out of sight: A cooling ceiling with dark blinds provides

The seating sections of the Comfort Zone are grouped around the bar, styled in stainless steel and white marble (above). The interior decorators installed minimalist fittings by Antonio Citterio in the bathrooms (right).



Cross-section



Cross-section



pleasant air quality, while ceiling-recessed spotlights create subtle accents. The zones for communal use and communication areas have bright lighting, and there is a consistent use of shiny, white materials. In the quiet zones there is subdued, indirect lighting and gray and warm earthy tones dominate. Moreover, the respective lighting scenario can be controlled via a Busch-Jaeger touch panel. Thanks to the excellent sound insulation there are no unpleasant noises. Instead the atmosphere is subdued and relaxed, and far removed from the usual mood in airport waiting areas. Instead you feel as if you have been transported to a luxury design hotel. In line with the architectural concept, the hassle of waiting around for a flight is transformed into a relaxing stay – in one of the rest areas, in the restaurant or in one of the offices. As we leave, the reception lady confides in me that some members of the HON circle make a point of arriving early at the airport so as to spend as long as possible in the lounge.

## Project partners

### Client

Deutsche Lufthansa AG

### Interior architects

Hollin + Radoske, Frankfurt/Main

### Building technology

Ingenieurbüro A. Zitnik (Frankfurt),

Bachner Elektro GmbH & Co. KG (Munich)

Integrated products by ABB/Busch-Jaeger:

Color touch panel for the central control of lighting in the entire Lounge



## Transported by the elements

The statistics experts reckon that four billion people take to the air every year. In 2025, the number could be as high as nine billion. People are becoming increasingly mobile – a development also reflected in maritime transport. In response to such forecasts, architects are conceiving highly innovative solutions to handle the enormous floods of people worldwide.

### OMA: New Jeddah International Airport

Two million Islamic pilgrims travel to Mecca every year. Thanks to this onslaught during the so-called Hajj period, the entire region around the Holy City is in a state of emergency for a month. In order to handle the logistics of such huge crowds, Rem Koolhaas and his office OMA were commissioned to design an airport for the port city of Jeddah some 30 kilometers away. The architects' response was to concentrate the airport's organization by designing two different sized ring-shaped buildings for air traffic. At its highest point, the larger public airport measures 80 meters and consists of two stories. Arrivals and departures are dealt with on the top floor as the owners were keen to place equal importance on arrivals in Mecca with departures. To deal with the large numbers of pilgrims traveling in this short period, the lower level is also used. The smaller building is reserved for the Saudi royal family. However, architecturally the royal hangar is equal to its big brother in every way. A patterned, perforated concrete skin covers the building and evokes associations of a royal robe. The parking gates for the four terminals are conceived like gently indented hollows. In both rings, green areas, so-called oases, shorten passenger waiting times and help them forget they are in the middle of the Saudi desert.





**Giancarlo Zema: Trilobis 65**

Climate change and rising sea levels call for unusual design approaches: Where are people to live when land gets scarcer? Trilobis 65 makes us consider whether we should not simply create domiciles on the ocean floor. Four stories of luxury combined with incredible views are designed to prevent boredom: Below the control center there are living and sleeping levels for six persons. But the real attraction is three meters below the water surface: a viewing platform that invites residents to examine corals and marine life on the seabed. Solar cells provide the onboard electronics with power while the two engines run on hydrogen. As yet investors remain rather skeptical, but architect Giancarlo Zema is confident. In design terms the futuristic vehicle is inspired by prehistoric arthropods known as trilobites – which also gave it its name.

Giancarlo Zema Design Group

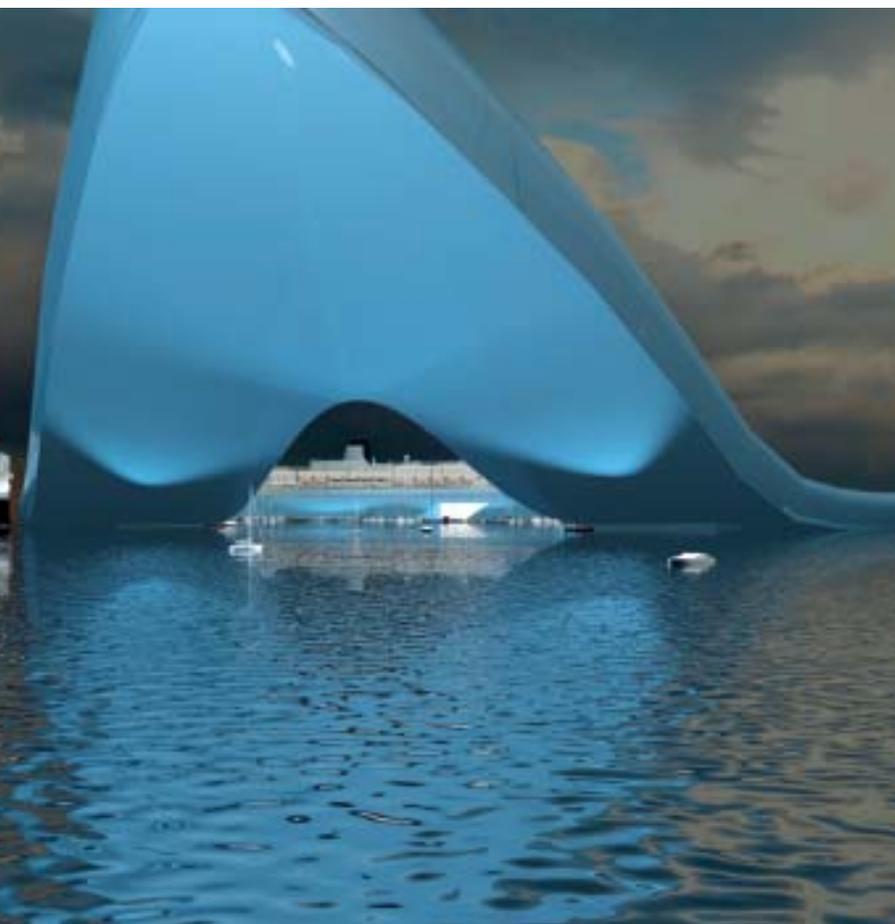


**Fuksas: Shenzhen Bao'an Airport**

Evidently, Italian architects Massimiliano and Doriana Fuksas also sought inspiration from maritime fauna: Over the structural skeleton they laid a light skin that recalls a gigantic manta ray and which will secure the rapidly expanding Chinese city of Shenzhen worldwide fame. Today, 12 million people live in the southern Chinese city, which is only separated from Hong Kong by a river. Through its airport, the metropolis seeks to present itself as airy and light: the fine web structure is to be slightly flexible and since the divide between wall and ceiling is omitted, a futuristic looking dome is created. The new airport, which is scheduled for completion in 2035, is to act as an additional hub in regional and global air traffic. Some 40 million cities lie just three-and-a half flying hours away making Shenzhen Bao'an Airport an ideal stopover and interchange.



Studio Fuksas



Waterstudio.NL and Dutch Docklands

### Waterstudio.NL: Cruise Terminal

The world's largest luxury liner is 360 meters long and as tall as a 19-story building. Given these dimensions, many people ask whether things are not going to get cramped in the one or other port. In response to such concerns the architects from Waterstudio.NL developed a highly spectacular design: In cooperation with development firm Dutch Docklands, they conceived a floating cruise terminal providing sufficient space to give a safe berth to three of the world's largest cruise liners simultaneously. The limbs of the triangular shaped terminal extend over 700 meters. One corner flips up from the water's surface and in jutting out makes the terminal visible from a long distance. The gigantic archway this lifted corner creates forms a spectacular entrance to the interior port. The terminal is constructed using lightweight materials and covered with bluish painted aluminum panels and solar collectors. Located out at sea, stay cables anchored in a slab in the seabed secure the terminal's position. The interior even offers space for a hotel, a conference tower and commercial space. Moreover, from the restaurant in the projection you get a breath-taking view out across the sea. The project is to be realized by 2014 off the man-made group of islands, Palm Jebel Ali in Dubai.





IGH d. d.

### IGH d.d.: Zagreb Airport

The competition for the new passenger terminal of Pleso airport just outside Croatia's capital ended with a surprise: It was not won by an architectural heavyweight such as Foster Partners, but an as yet unknown team of Croatian architects, who have agreed on the awkward name IGH d.d. The team designed a new passenger terminal, which should increase Zagreb's significance as an important hub between Central Europe and the Adriatic Sea. The nearby coast is referenced in visual terms: the elongated glass structure heaves up and down in a smooth undulating rhythm. In addition to the familiar renewable energy generation, the architects are planning trigeneration, in which three secondary energy sources (electricity, heating and cooling) are produced from a single primary energy source. The airport is scheduled for completion in 2012.

### BRT: Living Bridge

The city of Hamburg is gaining a new access point to the adjoining element of water, which is expressed in a confident return to historical models: a living bridge. Modeled on the famous Ponte Vecchio in Florence, the proud Hanseatic town is to receive a new attraction, which will link the Wilhelmsburg district with Hafencity. Architect's office BRT around Hadi Teherani had already presented plans for the 700-meter-long and 66-meter-wide structure back in 2005. An intensive participation process followed in which Hamburg's citizens commented on, discussed and finally approved the plans. Some 1,000 affordable apartments are to be built on the enormous bridge, which is also sure to attract passers-by. The Living Bridge could also take off in other cities, after all, it offers undreamt-of opportunities for urban, water-side living space with interesting prospects.

Gärtner und Christ



# "Karl Friedrich Schinkel is our analogy"

In 1965, the founders of the office Gerkan Marg and Partner surprised the industry with their design for Berlin Tegel Airport and secured their first major project. Meanwhile, gmp Architekten have conceived terminals in Stuttgart, Frankfurt and Hamburg. pulse met Meinhard von Gerkan and Project Manager Hans-Joachim Paap to talk about airport architecture and the joint project they are currently working on: Berlin Brandenburg International Airport.

By **Lasse Ole Hempel**

For 13 years, gmp Architekten in cooperation with the office JSK has been developing the new major airport for Berlin and Brandenburg, which is slated to open in November 2011. The original project has since been expanded so that gmp is not only responsible for the airport building but also for the operational building. The terminal is the nucleus of an area that in architecture jargon is supposed to look like a unified whole.

**These days airports serve as an advertisement or calling card for a city or region. What are you doing to make your concept do justice to Berlin and Brandenburg?**

**PAAP:** It was crucial for us that the airport reflect the identity of the region. One of the questions we asked ourselves in this context was what can Brandenburg and Berlin stand for in an architectural sense? Without a doubt there are people who would think of palace architecture and the landscaped parks – a combination of architecture and landscape boasting international standing, which has not been as perfectly preserved anywhere else as it has in Brandenburg. For us at gmp Architekten the rationalist Karl Friedrich Schinkel is a significant figure, as we likewise stand in the tradition of a rational

and functional architecture. Take, for example, the agora of the Altes Museum (Old Museum) in Berlin, which in its spacious character marks the transition between the adjoining Lustgarten (Pleasure Garden) and the entrance rotunda. We place special emphasis on the transitions in BBI Airport, on the threshold between two areas, for example between approach and terminal. In our case, an approach system that in other locations often recalls a highway bridge, liberally embedded into the surroundings. The approach is characterized amongst other things by colonnades and a paneled ceiling – a piece of architecture at a place where a metamorphosis takes place. Sensitive marking of transition areas ensures that passengers feel safe and are carefully guided towards the right terminal.

**What means do you use to express these transitions?**

**PAAP:** Our concept consists of spatial gestures, which treat landscape and architecture as being of equal importance. In order to make these visible within the building transitions between two zones – say between arrivals area and safety check, we have developed components that are characterized by firm concrete structures. The

Over forty years ago Meinhard von Gerkan designed Berlin Tegel Airport. Today, he and Project Manager and partner Hans-Joachim Paap are responsible for the face of the new Berlin Brandenburg International Airport.





With an expansive concept uniting landscape and architecture, gmp is designing an airport for the 21st century in Berlin. For Berlin Tegel (right) the architects developed a special after-use concept.

façade is also composed in this manner: The outer tectonics of prefabricated concrete sections is continued inside the building. A vast cantilevered roof that seems to hover above everything combines the land- and air-side face spatially with one another, spans the approach as an entry gesture and it is not for nothing that it recalls the Neue Nationalgalerie. Ludwig Mies van der Rohe once said: I have the space, create a place with a large overhanging roof and say: Something is happening underneath it, something that changes, a Museum of Modern Art. At the time people made a conscious decision not to define spaces in advance.

#### **How do you satisfy the increased need for security and safety?**

**PAAP:** This is where things such as spatial proportions come into play: In those areas where passengers are most likely to feel afraid, the ceilings are high. Moreover, the incidence of natural light is particularly evident here and this creates a maximum sense of wellbeing.

**VON GERKAN:** Naturally, all these things can only be really effective if you do not have an overload of advertising. I was able to visit the new airport in Hong Kong shortly after its completion. I was so taken by its lightness and clarity. Later it was turned into a shopping center, and now you have no idea where you are. You are drowned in advertising and it takes precedence over information about gates. The original structure of the building has been ignored and everything is jumbled up. The only thing that has remained of Norman Foster's ideas are the ceiling structure and the light. Chaos reigns in all the areas that are located at eye level. It has precious little to do with flying.

#### **How do you want to prevent a similar development in Berlin?**

**PAAP:** Early on in the planning process we spoke to the representatives of the non-aviation area. The latter is by no means without significance at airports. After all, these days more money is earned with non-aviation processes such as catering, parking, shopping or advertising than with actual flight operations. The aim is to keep non-aviation out of some areas in Berlin so that the orientation system does not suffer too much. There is enough space in the middle of the shopping area to ensure that people are not only able to perceive the quality of the high rooms, but also enjoy quality time there.

**Herr von Gerkan, as a young architect back in 1965, after winning the design competition you were com-**



#### **missioned to plan Berlin's Tegel Airport. How have the demands made of architects altered since then?**

**VON GERKAN:** Back then there was only a normal check-in and no other security checks at the gate itself. It all has to do with the fact that at the time Tegel was built, people did not even discuss the possibility of hijacking or consider security checks. Not a single airplane had been hijacked, and nobody could have imagined that anyone would think of placing themselves in danger during a flight by hijacking an airplane.

#### **So metal detectors were not employed at the time?**

**VON GERKAN:** No, you just handed in your luggage, that was all. Only customs officials checked incoming passengers – ridiculous in comparison to what is normal practice today in terminals.

**PAAP:** Yet Tegel Airport was designed as an originating airport. In other words, the Allies were allowed to fly in using the Pan Am, British Airways and Air France airlines, respectively. But passengers were only ever flown in or flown out, there was no transit traffic in Tegel. In BBI, by contrast, we expect that 20 percent of passengers will change planes in Berlin – and this number will rise. Under these circumstances it goes without saying that the airport as an entity becomes more profitable because passengers use the complex without entering facilities outside the airport; they may shop in the terminal and then they continue their journey. The hours that passengers spend at an airport are within the terminal environment and this, naturally, also leads to a new building design.

**VON GERKAN:** Presumably the conditions in Tegel would not have been any different even if we had been aware of these aspects back then. I remember that while we were working on the Tegel project I was presumptuous enough to claim that the entire retailing business –



Klaus Frahm

people referred to it earlier as duty free – would soon peter out. You see I said to myself: What reason should there be for a passenger to buy a product at an airport that he could get anywhere in the world? After all, it is not as if the products were always that exotic.

#### Did you have any models for Tegel?

**VON GERKAN:** No, the hexagon was the geometrical shape we opted for to realize a purely functional concept that sought to keep the distances between motor traffic – be it taxis, cars or buses – and the airplane as short as possible. This requires an elongated or rod-shaped building. The latter can extend out but then there are ends. And as soon as I join the ends together I get a circle, and then I shorten the average distance travelled. That said, in constructional terms the circle is a highly complex figure that costs a lot of money. For this reason, the hexagon is essentially a geometricized circular shape, which closes the rod to form a circle. We then had the motor traffic on the inside while the airplanes waited on the outside. After all, aircraft need a lot of space and cars only need a little. As such, this shape allowed us to solve the issue of spatial requirements automatically and to create short distances. This was all done under a single premise that no longer holds today, namely that it was sufficient to transport passengers from their cars to the airplane, to relieve them of their luggage and provide them with boarding tickets. This system becomes obsolete as soon as you introduce security checks. Because a decentralized system means you must have a security check at every point, it requires a large number of staff and consequently was never realized again anywhere in

the world. As such, it is no exaggeration to talk of uniqueness in this context.

**Around the same time, architects opted for a similar-looking solution for the Charles de Gaulle Airport in Paris: a central, round terminal.**

**VON GERKAN:** In Paris, the passenger and luggage handling level is on the periphery and the check-in area is in the middle. The problem is similar to the one you have in Tegel. But in Paris you do not travel into the building in which the respective gate is also situated. Rather, passengers must always cross the central cylinder to reach their departure gate. That is why there are these ramps in the middle. Ultimately, the Paris airport did not shorten distances but instead tends to maximize them

**PAAP:** What is interesting naturally is a concept that is partly decentralized as was employed in Stuttgart: We have several terminals, but they are linked through a logistics network. This means, say, that all the luggage checked in runs through a central inspection system. Tegel still relied on the decentralization principle: There is a waiting room at every gate- with the corresponding storage space. Tegel has 15 gates and accordingly 15 security-check points and luggage sorting points. By contrast, in the new BBI Airport there will be a central luggage sorting point, which translates into greater cost-efficiency. Add to this a so-called "one-roof-concept", i.e., all airlines are housed in a single terminal. This means common use. In Hamburg, by comparison, you have three terminals. All of them rely on the same system, but are located in separate buildings, and Lufthansa has its own terminal.

**VON GERKAN:** They are separate units, it is just that the largest member – in Germany this is currently Lufthansa – prefers to have its own building. The primary motivation is that from a certain size upwards it makes sense to divide things into their individual parts so that you don't let things grow too large. Then dividing things into subdivisions is an option.

**More than ever today, airport design is about experimenting with analogies. In Hamburg you modeled the passenger terminal on a wing. Is Berlin inspired by Schinkel?**

**VON GERKAN:** Yes, you could put it like that. In BBI we will forgo all futuristic touches and adopt a more traditional approach. We will focus on employing simple and clear structures to create a maximum of openness, liberty and clarity. This aside, we apply the principle of reduction.

Hamburg's attractive calling card: In Terminal 2 (left) the large curved roof unites the departure level with restaurant and visitor levels into a spatial continuum. Terminal 1 (right) continues the design approach.



# The sky's the limit

As a moving object of our modern age, the elevator is inextricably linked with the metropolis. Its invention permitted the expansion of cities into lofty heights. Naturally, the elevator as we know it today was invented – where else? – in America. Our author presents this cultural asset.

By **Wilhelm Klauser**

The year 1854 can be named as the year the safety elevator was born. It was this year that Elisha Graves Otis presented his latest invention to an amazed public: a steel safety cable. Standing on a platform in the Crystal Palace, he asked for the only rope holding him to be cut by way of demonstrating his safety device. "All safe, Ladies and Gentlemen! All safe!" he shouted when the platform did not hurtle down 15 meters. The development of this safety cable enabled the triumphal advance of the mechanical elevator. Initially, steam or hydraulic power was used to "elevate" it, and from 1889 it was raised using electrical power. In its early days elevator staff rode in the cabins and stopped them at the desired floor. From 1907 people were increasingly replaced by buttons. Over the decades the elevator's control mechanism was refined. The overriding aim for every building type is to achieve the best possible transport performance using a minimum number of elevators and shaft volume. "Up" and "Down" are the outcome of a radical simplification that ends with self operation. Elevators are fool-proof, but sometimes a sigh of frustration is heard when the cabin sets off in the wrong direction.

As a transport system, though, it has undergone few changes. It is still basically a cabin that travels up or down a shaft. Yet the modern city is inconceivable without it. And in a sense the automobile represents its antipode: While autos enabled the expansion of cities in a horizontal dimension, elevators effectively drove the expansion upwards. With the emergence of elevators people no longer had to live on the *bel étage*, close to the street noise, but resided in a lofty penthouse. The new rich moved their domiciles to those heights once reserved for servants. Suites are installed on the top floors of hotels, company directors rule from the highest floors. It comes as no surprise that a great literary confidence trickster began his career as a liftboy. Thomas Mann called him Felix Krull and imbued him with a certain longing for higher things. Today, elevator cabins travel an average of two or three meters a second. A transport mechanism that was once reserved solely for freight helped make the modern city what it is today. That such a device should advance to become a cultural asset is hardly surprising, even though it came to be overlooked in the course of the decades owing to its ubiquity.



1. ThyssenKrupp Elevator; 2. Focchia; 4. Otis

1



2

**1** | In **2003**, ThyssenKrupp launched the twin technology: Two elevator cabins travel in a single shaft, in part at different speeds and in opposite directions. This technology helped reduce the number of elevator shafts and the amount of material needed. Passengers select a destination and are subsequently assigned an elevator. The photo shows the two counterweights running parallel to one another. **2** | **1986** saw the completion of the Lloyds Building (by Richard Rogers) in London. One reason for the fame of this pioneering insurance building: the panorama elevators operating on the outside of the building, and which also underline its futuristic character. **3** | Elevator cabins around **1900** **4** | In **1854** Elisha Graves Otis presented his safety cable for freight elevators during the New York industrial exhibition in Crystal Palace: If the rope was cut, a spring caused several bolts to shoot out, which in turn wedged themselves into the teeth of a guide rail. "All safe, Gentlemen, all safe," shouted Otis to indicate to the bystanders that he had survived his demonstration. From this point onwards the Otis Elevator Company, set up one year earlier, became the epitome of safety, and the first orders were not long in coming.

3



4





## Busch-Watchdog Presence tech – Energy efficiency and maximum comfort

In intelligent and consequently energy efficient building technology, rooms are only lit when they are actually used. In this manner, motion detectors can serve as effective components in sustainable construction projects. In homes, offices or hotels the Busch-Watchdog detectors make both for valuable energy efficiency and also more safety and quality of life.

ABB/Busch-Jaeger motion detectors respond quickly and reliably as soon as they register warmth, and do not leave anyone standing in the dark in rambling staircases and large, poorly structured rooms. Busch-Watchdog systems welcome visitors with light, show them the way and warn against uninvited guests. In offices and conference rooms they make for agreeable comfort. Yet Busch-Watchdog is not only responsible for lighting, Busch-Watchdog Presence tech also control the air-conditioning of rooms. What is more, presence detectors can easily be integrated into a comprehensive building technology system.

Light, air-conditioning or heating is only provided when someone is in the office or home – Busch-Watchdog Presence tech detects motion, reliably controls connected consumers and also controls the air-conditioning of rooms.

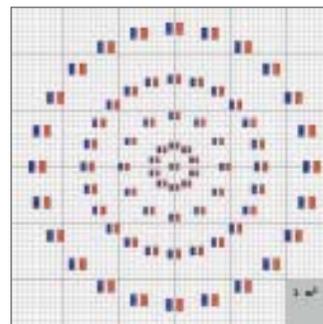


## Vigilant and versatile

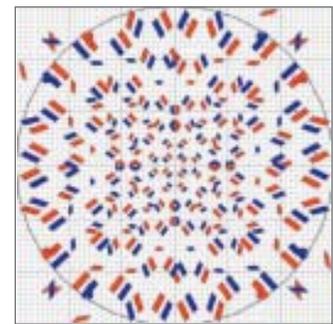
Busch-Watchdog Presence tech is characterized by intelligence, user-friendliness and versatility. In all kinds of rooms it ensures ideal lighting regulation combined with minimal energy consumption. Thanks to presence detectors, not only lighting systems but also heating, air-conditioning and ventilation systems can be intelligently regulated according to demands. Its detection precision is superior to every conventional motion detector. Four sensors and an optimized mirror-lens system guarantee maximum density of coverage. Busch-Watchdog Presence tech is activated by even the slightest movement. In other words, connected consumers are always available when they are needed, but individual user habits or work procedures must not be programmed in advance. When Busch-Watchdog Presence tech is initiated, the levels of brightness and the desired light-on time can be adjusted to prevailing conditions. These values can easily be modified or regulated retrospectively. To this end, the current value is transferred via infra-red remote control and saved. Using conventional keys or infra-red remote control, the automatic functions can be interrupted and connected consumers switched on or off. The large detection angle extends at the side as far as the wall. The range of four meters below the mounted device can be extended inexpensively at any time. In addition, it is also possible to infinitely adapt the light via a dimmer to the respective situation.



Sensor from a different manufacturer



Four sensors and mirror-lens system of the Busch-Watchdog Presence tech



The Busch-Watchdog Presence tech detection system, comprising four sensors and a mirror-lens system is superior, to conventional motion detectors that only feature a single sensor.

# How high is the undulating roof – also known as the "flying carpet" – of Heathrow's Terminal 5?

*pulse* asks a competition question in every new issue. The winners each receive a book.



**Please complete, copy and fax to:**  
**+49 (0)1805-66 99 09**  
**Email: pulse@de.abb.com**

**Yes, please.** I would like to receive 'pulse' regularly, postage free.

### Answer

The roof construction covering Heathrow's Terminal 5 has a height of  meters.

Name

Office

Street

Postcode/City/Country

Phone

Fax

Email



Maximilian Meisse (u.) Teague/Vitra Design Museum (o.)

### The prizes:

ABB/Busch-Jaeger will select two winners from among the correct entries. The winners will receive a copy of the book **Tempelhof** from Wasmuth Verlag or of **Airworld**, the Vitra Design Museum exhibition catalog. Closing date: 15 March, 2010. The winners will be announced in the next issue. The winners of the last competition were Reinhard Menne, Dortmund, and Dieter Gubernatis from Bad Malente.

## Preview pulse 02-2010:

### Energy efficiency

Modern energetic building planning in architectural practice – pulse 02/2010 shows successful and aesthetically attractive solutions.



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