

Madrid Barajas Airport

Madrid, Spain

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RICHARD ROGERS PARTNERSHIP AND LAMELA CHOREOGRAPH THE MOVEMENT OF PASSENGERS UNDER A SENSUOUSLY UNDULATING ROOF.

By David Cohn

Architect: Richard Rogers Partnership and Studio Lamela
Client: AENA
Consultants: Anthony Hunt Associates, TPS with OTEP, HCA (structural engineering); Arup (facade engineering); TPS, INITEC (m/e/p); Warrington Fire Research Consultants (fire); Arup, Speirs and Majors Associates (lighting); INITEC, TPS (airport)
General contractor: UTE

Size: 5 million square feet (main terminal); 3.4 million square feet (satellite); 38 gates total
Cost: 883.5 million euros (\$1 billion)
Completion date: January 2006

Sources

Aluminum standing-seam roofing: Corus

Curtain wall: Folcra; UTE

Bamboo suspended ceiling: Lindner AG

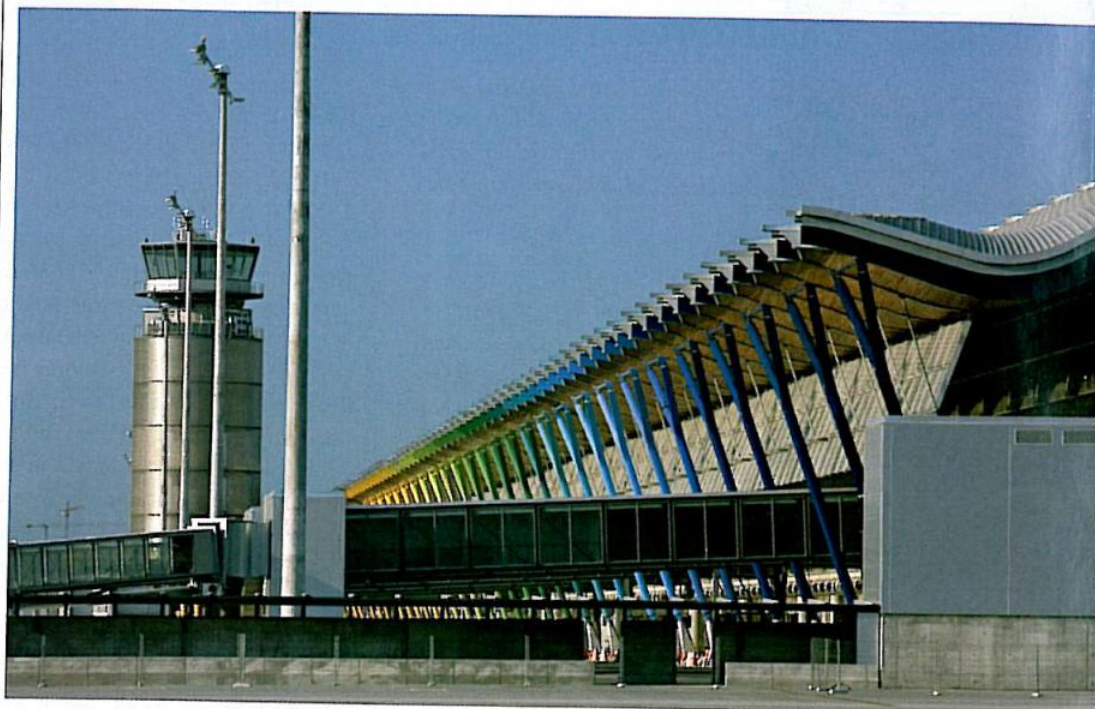
Skylight lanterns: IASO

Limestone flooring: Perlato from Levantina

Lighting disk and reflector system: Siteco + Siemens

Elevators: Thyssen; Krupp; Otis

For more information on this project, go to Building Types Study at www.archrecord.com.



As approached from the barren foothills that border the river floodplain on which it sits, the new terminal of Madrid's Barajas Airport is a glistening sea of roiling aluminum waves, its 25 acres of undulating roof barely held to the ground by its gaily painted supporting struts. Inside, vast halls and concourses stretch endlessly under this magic flying carpet, which extends protectively over glazed exterior walls.

"The vision to build big and bold came from the politicians," confirms

David Cohn is RECORD's Madrid-based Spain correspondent.

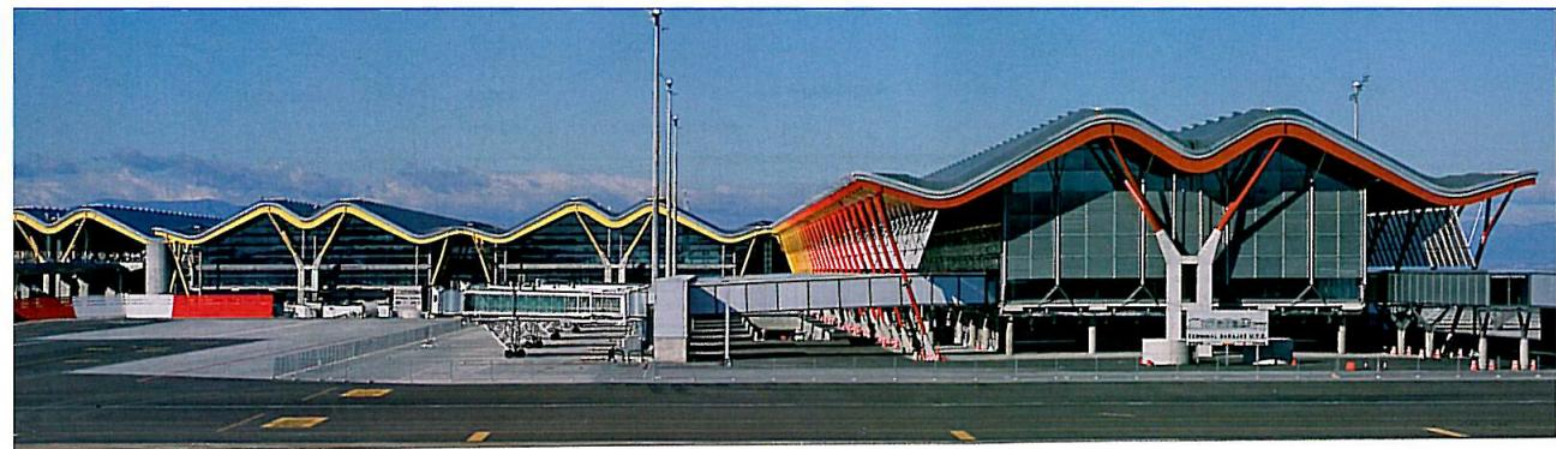
Simon Smithson, who headed the team from Richard Rogers Partnership for the project, which was jointly designed with Madrid's Lamela Studio. "There is a strong desire here to raise the profile of Spain within the European Union." The Spanish Ministry of Development viewed memorable architecture and generous passenger accommodation as essential to position Barajas as one of Europe's key airport hubs. (The obsolete and overcrowded main terminal is already Europe's fifth busiest.)

A 1997 competition for the terminal attracted teams led by Ricardo Bofill, Santiago Calatrava, César Pelli,

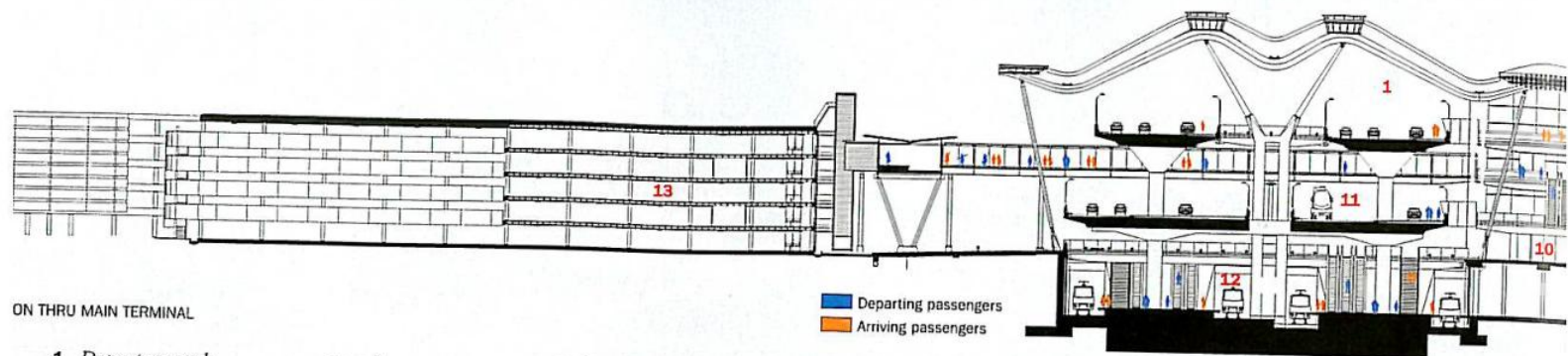
HOK, Rem Koolhaas, Frank Gehry, and others. With his father Antonio, Carlos Lamela, principal of Lamela Studio, invited Rogers to join in a bid. Their combination of fresh international star allure—Barajas is Rogers's first commission in Spain—and Lamela's political connections with the reigning national government proved a winning one. The firms formed a single team for the project, an unusual collaboration that both describe as "exceptionally successful."

Program

Together with two new runways, the new terminal increases Madrid's



Tapered-steel supports brace a roof that undulates in rhythm with the progression of the passenger from curb to gate (above). Gradations of color aid wayfinding (opposite). The roof also vaults between the metal purlins (below).



ON THRU MAIN TERMINAL

- | | | | |
|----------------------|--------------------------------|------------------------|--------------------------------------|
| 1. Departure curb | security | 7. Immigration | 11. Arrival curb |
| 2. Ticketing | 5. Departure/arrival concourse | 8. Baggage claim | 12. Train to terminals/city (future) |
| 3. Retail | 6. Train to satellite | 9. Customs/immigration | 13. Parking |
| 4. Passport control/ | | 10. Arrivals hall | |

capacity from a current 25 million passengers per year to 70 million, with room for growth. The statistics are staggering: The main terminal covers 5 million square feet, with 174 check-in desks and 38 gates along a ¾-mile-long concourse. Underground automatic trains convey passengers to a 3-million-square-foot, 26-gate satellite concourse. The project includes 9,000 parking spaces, mass-transit platforms, and highway connections. The price tag was a cool \$1 billion (883.5 million euros).

The expansion allows Madrid to postpone creating a distant megaport to replace Barajas, which is a convenient 8 miles from the city center. However, the new project's functionality will be compromised for years because the construction of a subway link between the new terminal and the existing ones, 1.5 miles away, is snarled in a political dispute over its financing. The airport will rely on buses for now.

Solution

The enormous program is organized by long bays running parallel to the runways. Tapered steel supports rise in great Vs out of concrete piers to support a roof that undulates above the departure level in rhythm with the progression of the passenger from curb to gate. Narrow, daylight-flooded atriums open two levels down to the arrivals floor, punctuating the flow at intervals along the way. Glass-bottomed bridges span these canyons, which are lined with glass-sided elevators and sculp-

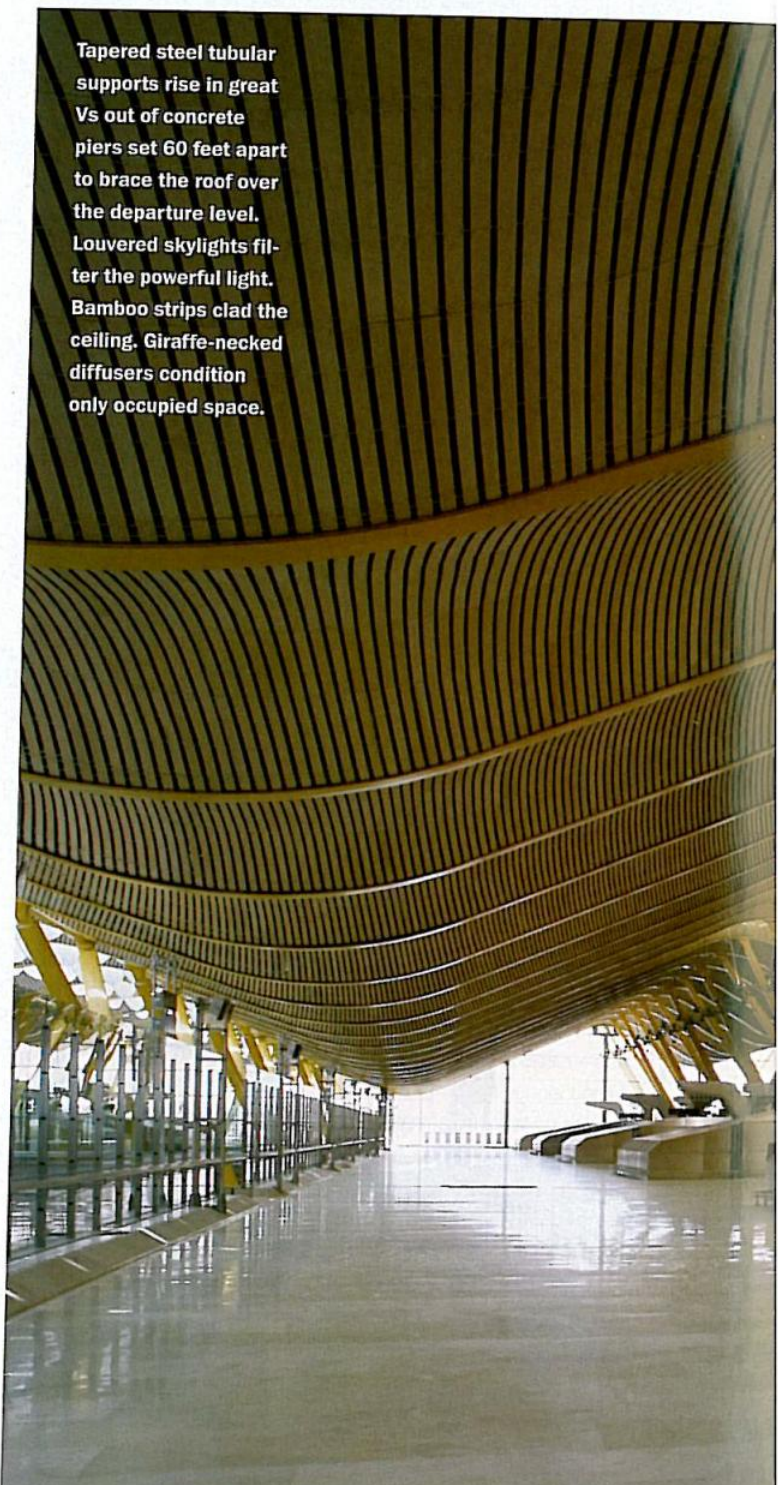
tured open stairs and ramps. Passengers can look up from baggage carousels and see the sensuous roof curves gently lit by the diffused light. This alternation of dark and light, closed and open, structures the process of both departure and arrival, dispelling passenger disorientation and stress.

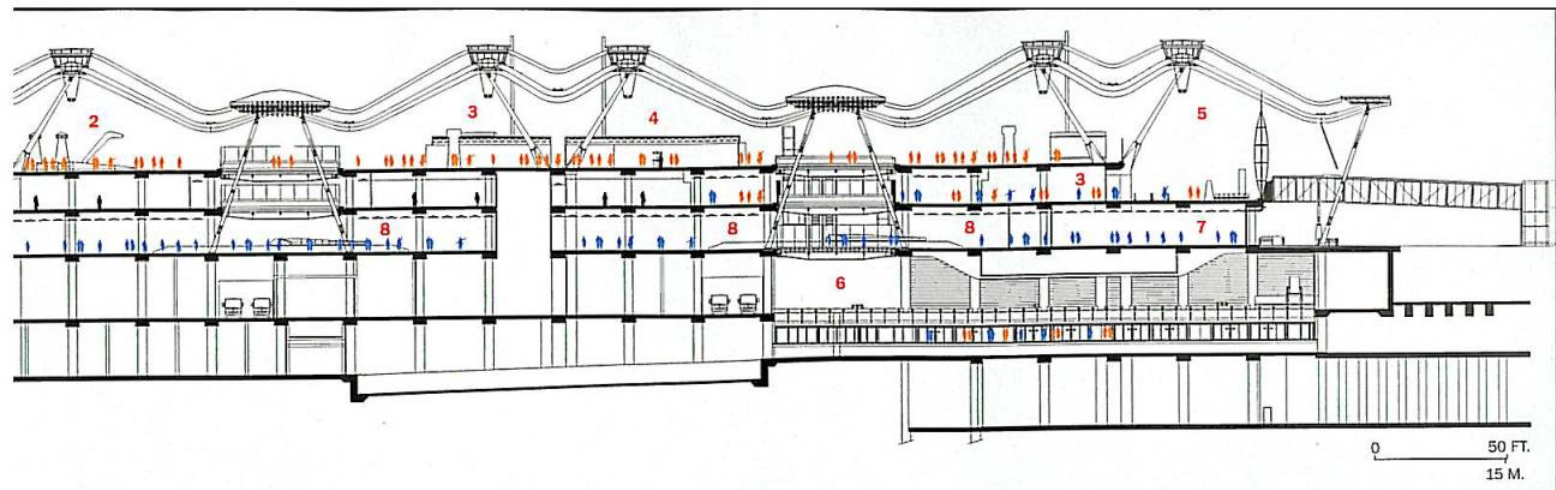
Given the inevitable changes the terminal will undergo over time, the architects established the broken floor plane and the high roof as defining, immutable design elements. Like a market hall, they expect that much of the floor area will fill with the elements that constantly change or adapt, such as concessions, security, and baggage handling. They hope to confine such "visual noise" as stores, signage, and other intrusions, but the architects have struggled to "protect the functional clarity of the scheme and the key architectural ideas," according to Smithson, as the retail and airline fit-out has proceeded. (It was still under way as this issue went to press, because a political dispute between airlines and the government delayed the opening, even though construction otherwise was completed early this year.)

The public concourses are conditioned by an energy-efficient displacement ventilation system, which uses low-velocity air delivered only to the occupied strata of space.

For Smithson and Lamela, the remarkable detailing of the facility—virtually every element was custom designed, from the elevator cabs to the structural steel—was not espe-

Tapered steel tubular supports rise in great Vs out of concrete piers set 60 feet apart to brace the roof over the departure level. Louvered skylights filter the powerful light. Bamboo strips clad the ceiling. Giraffe-necked diffusers condition only occupied space.





The lightness of the cable-braced wall at the double-loaded airside concourse maintains the tentlike quality of the roof. Suspended uplights and reflectors cast indirect light. The "radiators" (below left) diffuse air.







cially costly, given the scale of the project. Computer-assisted fabrication, and the fact that the cost premium for customizing elements is low compared to the U.S., kept costs competitive.

Smithson was impressed by the speed of the design-build process, which spanned nine years, even with the latest holdup. (The terminal will open to passengers in January 2006.) Rogers's Heathrow Terminal 5, by contrast, will have consumed 20 years by the time it opens in 2008. Smithson credits the progress to a lack of administrative snags and local-review hurdles. The broad political commitment to the project "overrides any public objections there might be." He also notes that costs were a third less than for a similar project in Britain.

Commentary

The rolling aluminum coils of the terminal's roofline—in spite of the buildings' size—are not an impressive presence from the runways; their impact is stronger at close range, when pulling up to the departures curb under the extended roof. The architects have chosen to emphasize the interior experience of the terminal, and have studied how to make that experience more pleasant in every respect. The design gives measure to the daunting, dramatic scale of the space—as well as the endless march of its columns and canyons under its high roof—by the way the canyons and bridges punctuate each stage of the passenger's progression: arrival, check-in, security control, waiting and shopping, boarding, and so on. The terminal is like a forest floor, marked with paths and landmarks but leaving room for the imagination to roam. Rogers and Lamela have created a unique and memorable public forum, a contemporary update of the rhythmic vaults of Spain's Cordoba mosque, its Gothic cathedrals, or its 19th-century markets and train stations, bringing a sense of place and arrival to the anonymous, interchangeable spaces of international air travel. ■

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Light from glazed end walls and louvered skylights overhead bring what Smithson calls "Madrid's fantastic daylight and a sense of changing time" into "canyons" (right) that structure the passenger's progress by alternating light and dark (opposite). Arriving passengers traverse the building on the lowest main level, lit in part by "wok" fixtures (below). The architects intended that the broken floor plane and the high roof remain defining, immutable design elements, allowing demised zones beneath to adapt over time to changing needs.

